

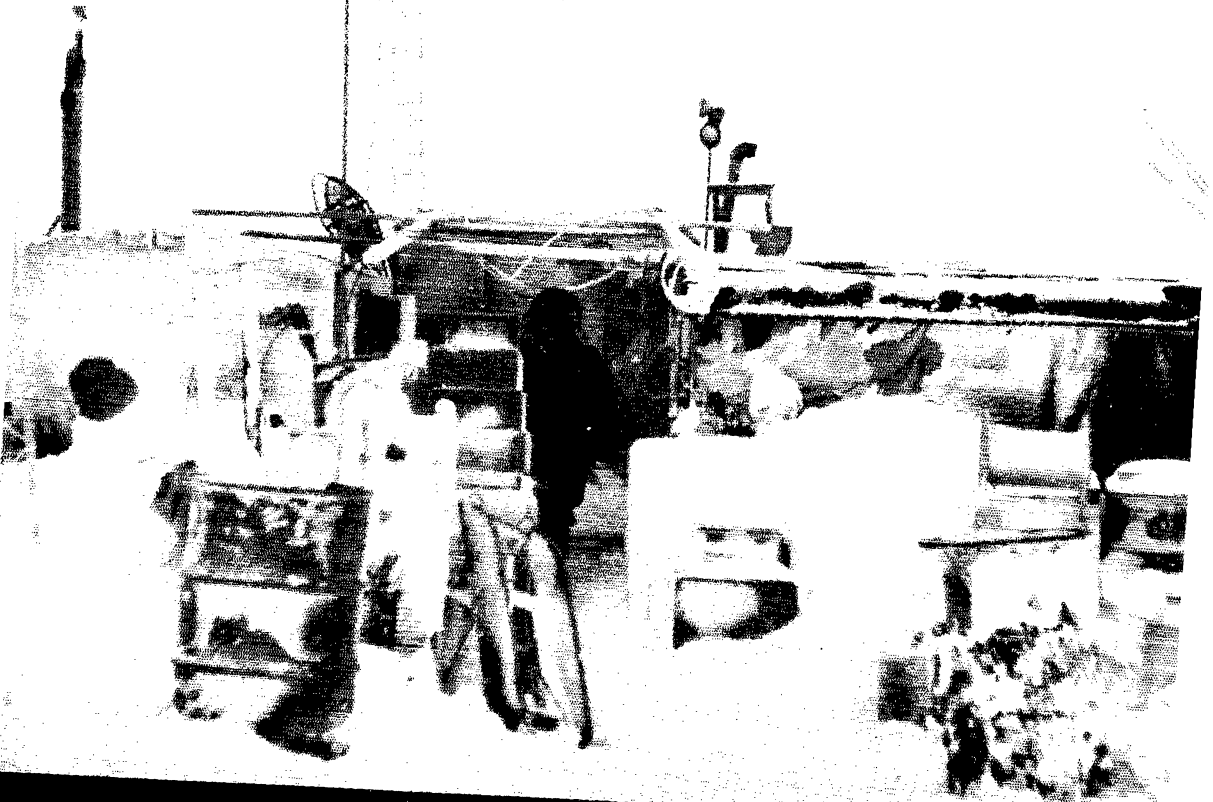
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February 1961

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FEATURES: Beam-deflection, high level sideband modulator for low-noise, high-stability signal, Hallcrafters' exclusive 5.0 mc. quartz crystal filter with sideband rejection of *50 db. or more*; C.T.O. direct reading in kilocycles to *within 1 kc.*; 10-meter coverage in four band-switched segments (calibration accuracy same as lower bands); 144 watts plate input (P.E.P. two-tone). Five band output (80, 40, 20, 15, 10 meters). All modes of transmission—CW, AM, S.S.B. Unwanted sideband down 50 db. or more. Both sidebands transmitted on A.M. Precision gear driven C.T.O. Exclusive Hallcrafters patented sideband selection. Logarithmic meter for accurately tuning and carrier level adjustment. Ideal CW keying and break-in operation, Push To Talk and full voice control system built in. Keying circuit brought out for teletype keyer.

FRONT PANEL CONTROLS, FUNCTIONS AND CONNECTIONS: Operation—power off, standby, Mox., Cal., Vox.—P.T.T. Audio level 0-10 R.F. level 0-10. Final tuning 80, 40, 20, 15, 10 meters. Function—Upper sideband, lower sideband, DSB, CW. Meter compression. Calibration level 0-10. Driver tuning 0-5. Band selector—80, 40, 20, 15, 10 meters. High stability, gear driven V.F.O. Micro-phone Key, and Headphone monitor jacks.

TUBES AND FUNCTIONS: 2-6146 Power output amplifier. 6CB6 Variable frequency oscillator. 12BY7 R.F. driver. 6AH6 2nd Mixer. 6AH6 3rd Mixer. 6AB4 Crystal oscillator. 12AX7 Voice control. Audio Amp. 12AU7 Audio Amp. and Carrier oscillator. 7360 Modulator. 12AT7 Sideband selecting oscillator. 6AH6 1st Mixer. 6AH6 4.95 Mc. Amp. 6AU6 9 Mc. 5R4GY HV Rectifier. 5V4G LV Rectifier. OA2 Voltage Regulator.

REAR CHASSIS: Co-ax antenna connector. FSK jack A.C. accessory outlet. Line fuse. Control connector ground stud AC power line cord. Cabinet 20" wide, 10½" high, and 17" deep. Approximate shipping weight 86 lbs. (Conforms to F.C.D.A. specifications.)



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HT-33B Linear Amplifier: Beautifully engineered with extra-heavy-duty components, the HT-33B is *conservatively rated* at the maximum legal limit. You are guaranteed one of the big signals on the band, plus the effortless performance that means so much to efficiency and long life. (Conforms to F.C.D.A. specifications.)

FREQUENCY COVERAGE: Complete coverage of amateur bands; 80, 40, 20, 15, 10 meters.

FEATURES: Rated *conservatively* at the maximum legal input. Third and fifth order distortion products down in excess of 30 db. Built-in r.f. output meter greatly simplifies tune-up. All important circuits metered. Maximum harmonic suppression obtained through pi-network. Variable output loading. Protection of power supply assured by circuit breaker. HT-33B is a perfect match to Hallcrafters' famous HT-32 in size, appearance and drive requirements.

CIRCUIT DETAILS: This power amplifier utilizes a PL-172A high efficiency pentode operating in class AB1. The tube is grid-driven across a non-inductive resistor, thus assuring the maximum stability under

all possible conditions. Band switching is accomplished by one knob which selects the proper inductance value for each band. The output circuit is a pi-network with an adjustable output capacitor, accommodating loads from 40 to 80 ohms. 2 panel meters are provided: one is circuit switched to measure Grid current, screen current, plate voltage and R.F. output voltage. A second meter continuously monitors cathode current of the PL-172A.

TUBES: (1) PL-172A high power pentode; (2) 3B28 rectifiers; (6) OA2 screen regulators.

FRONT PANEL CONTROLS: Meter selector; Filament switch; High Voltage switch; Bias adjustment; Band switch; Plate tuning; Plate loading.

PHYSICAL DATA: Gray and black steel cabinet (matches HT-32) with brushed chrome knob trim. Size: 8¾" x 19" (relay rack panel). Shipping wt. approx. 130 lbs.

REAR CHASSIS: Co-ax input; co-ax output; filament and bias fuse; cutoff bias relay terminals; screen fuse; ground terminal.



Rugged as a boxer . . . sensitive as an artist!

SX-101A Receiver: Today's heavy-weight champion, with technical features way ahead of its time.

FEATURES: Complete coverage of 80, 40, 20, 15, 10 meter bands *plus* a 2 and 6 meter conv. band; Dual scale S-meter functions with AVC off. Special 10 Mc. position for WWV. Dual conversion. Exclusive Hallcrafters' upper-lower sideband selection. Tee-notch filter. Full gear drive from tuning knob to gang condensers. 40:1 tuning knob ratio. 100 kc. evacuated marker crystal. Five steps of selectivity from 500 cycles to 5000 cycles. Direct coupled series noise limiter for improved noise reduction. Sensitivity—one microvolt or less on all amateur bands. 52 ohm antenna input. Antenna trimmer. Relay rack panel. Double spaced gang condenser.

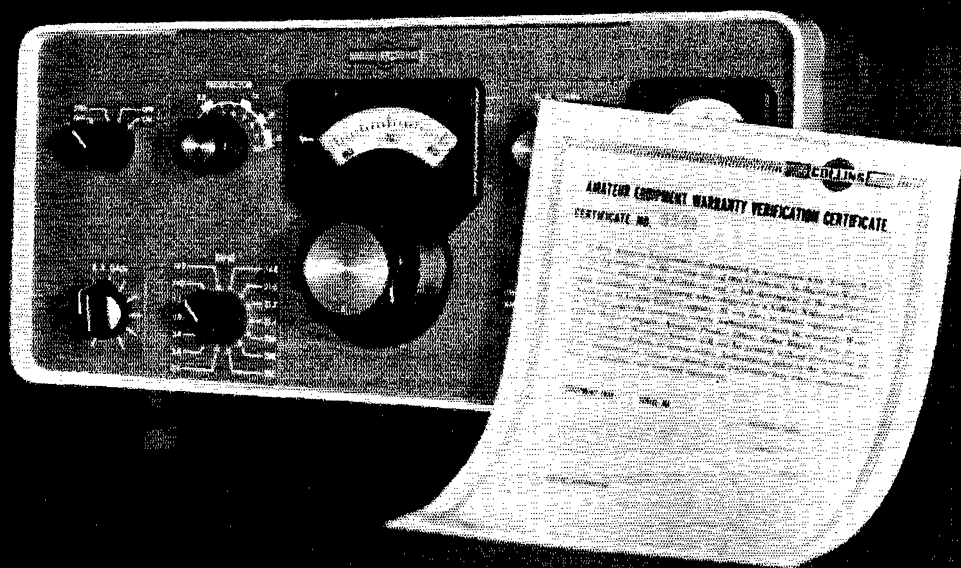
FRONT PANEL CONTROLS: Main tuning knob.

Pointer reset, antenna trimmer, tee-notch frequency, tee-notch depth, sensitivity, band selector, volume, selectivity, BFO, response—(upper-lower-sideband AM-CW). AVC on/off, AVC fast/slow, ANL Cal. Rec./standby.

TUBES AND FUNCTIONS: 6DC6, R.F. amplifier—6BY6, 1st converter—12BY7A, high frequency oscillator—6BA6, 1650 kc. i.f. amplifier—12AT7, dual crystal controlled 2nd conversion oscillator—6BA6, 2nd converter—6DC6 50.75 kc. i.f. amplifier—6BJ7, AM detector, A.N.L., A.V.C.—6BY6 SSB/CW detector—6SC7 1st audio amplifier & B.F.O.—6K6, audio power output—6BA6, S-meter amplifier—6AU6, 100 kc. crystal oscillator—OA2, voltage regulator—5Y3, rectifier.

PHYSICAL DATA: 20" wide, 10½" high and 16" deep—Panel size 8¾" x 19"—weight approximately 74 lbs. (Conforms to F.C.D.A. specifications.)

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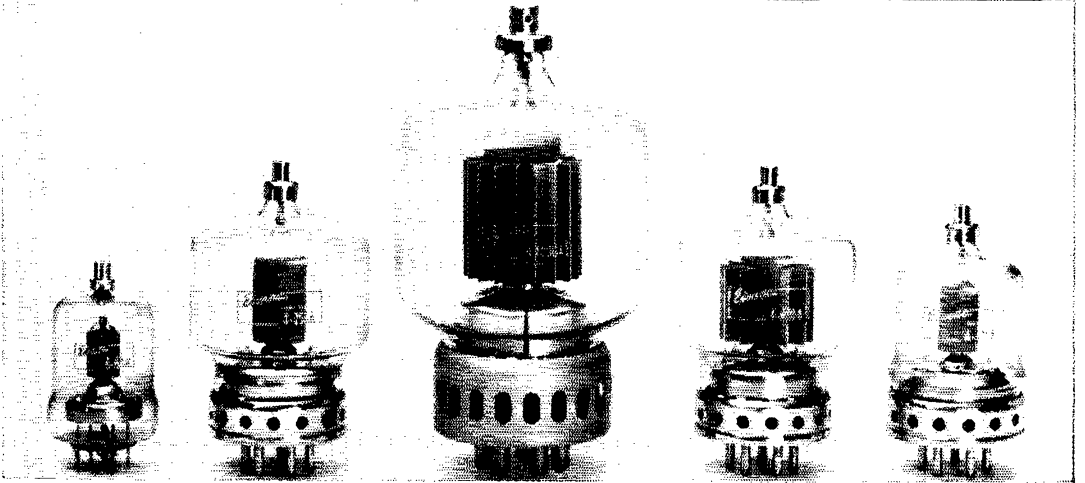
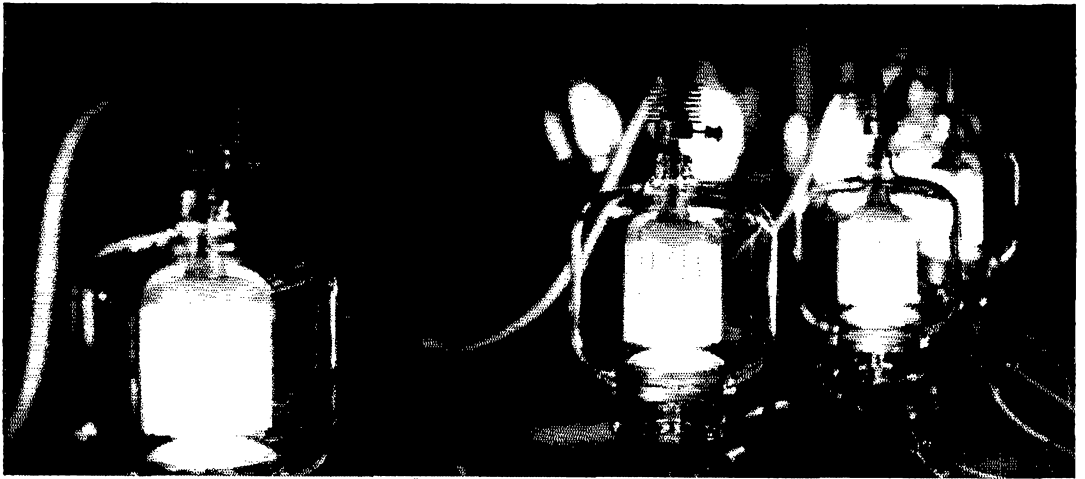
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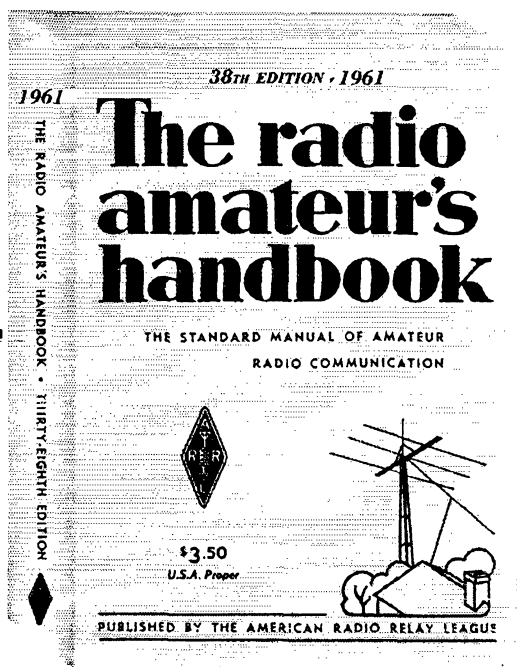
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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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

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

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

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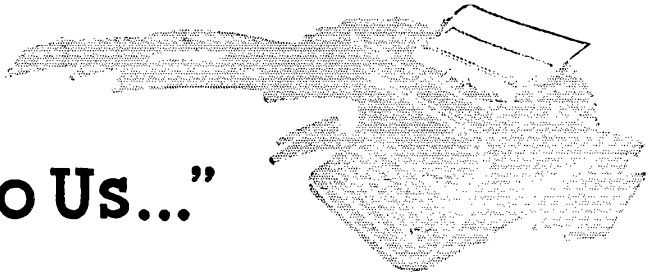
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"It Seems to Us..."



THE WOUFF HONG

In an institution as old as amateur radio, traditions and symbols of the art appear and become a part of it. Our traditions are many, among them our long record of self-policing, our dedication to public service in emergencies, our amazing versatility in experimentation, our instant response to the call of our country in time of war. But of the symbols, only one — aside from the ARRL diamond — has become a part and parcel of the framework of amateur radio, the symbol of its finest traditions, its long and glorious history.

That symbol is the Wouff-Hong. Every ham should know its origin.

It seems to us that now is a good time to retell the story of this famous and beloved part of the very fabric of amateur radio. The appearance of the Wouff Hong among the gadgets on the December cover aroused the curiosity of many of our members. Visitors to Headquarters and to W1AW, seeing either the original or one of the many replicas in our buildings, ask what it means. New members of the Royal Order of the Wouff Hong, initiated during the midnight convocations of the Order at League Conventions, ask, "But where did it come from, in the beginning?"

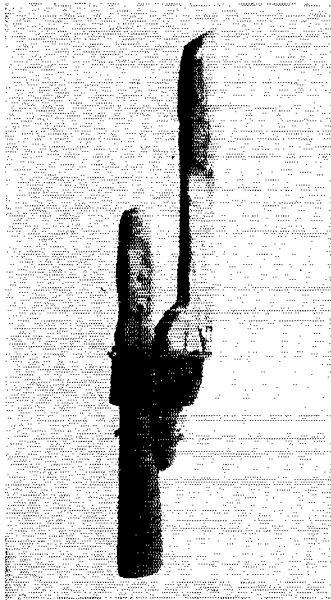
It started back in 1917, in the very earliest days of ARRL and *QST*, when an anonymous amateur, writing under the title "The Old Man," created a wonderful series of humorous stories in the magazine. In a pithy, irascible style he assailed all that struck him as criticizable about ham radio operation of the period in his famous "Rotten Radio" series beloved to this day by all who read them. He pitilessly exposed the poor operating practices of the day, yet did it in a way which drew chuckles

even from those recognizing themselves as the special targets of his ire.

In one of those stories, "Rotten QRM," he launched forth with examples of some of the poor sending cluttering up the band in a particular QSO to which he was listening. The gibberish included the words "wouff hong" which, apparently, was being used by someone on somebody else.

It turned out to be one of those priceless pieces of spontaneous word invention. Instantly, it caught on with the gang. Although T.O.M. himself admitted at the time he didn't know exactly what a wouff hong was, it quickly became something with which both to attack bad operating practices and to discipline their perpetrators. Within three months, the editor of *QST* found it necessary to write an editorial on the growing demand from the gang for wouff hong. How rapidly this situation might have developed had not World War I intervened is a matter of speculation. But the tradition had been established, the Wouff Hong created in the minds of thousands of amateurs as some mythical instrument of torture to be used in enforcing good operating practice in amateur radio.

When *QST* resumed after the war, one of its first contributors was T.O.M. In an early 1919 issue he contributed an article "Rotten Starting" to work off steam on the slowness with which our government was getting around to let us operate again. At the conclusion of this article appeared the following: "In the meantime . . . I am sending you a specimen of a real live wouff hong which came to light out here when we started to get our junk out of cold storage. Keep it in the Editorial sanctum where you can lay hands on it quickly in an



emergency. We will be allowed to transmit soon and then you will need it."

The object was duly received at Hq. The Editor, fully mindful of the historic significance of the occasion, took the instrument to one of the first Board meetings in New York, May 3, 1919, subsequently duly reporting in *QST* that "each face noticeably blanched when the awful Wouff Hong was . . . laid on the table." By an action still a part of the League's official records, that Board voted that the Wouff Hong be framed and hung in the office of the Secretary of the League. There it remains to this day.

We know the significance of the Wouff Hong. We don't know the significance of its

weird shape. Not even the beloved T.O.M. (revealed, after his death, as none other than our first president, Hiram Percy Maxim) ever explained that. Nor was the precise manner of its use ever prescribed, although it perhaps may be guessed with a little imagination. But as the years passed, it continued to grow in the affections of amateurs the country over, old-timer and youngster alike. It became the inspiration of the Royal Order of the Wouff Hong, the amateur secret society of ARRL convention. Today, it is thoroughly entrenched in the lore of amateur radio as its most sacred symbol.

The Wouff Hong! — see it when you next visit ARRL Hq. QST

27th ARRL International DX Competition

Phone: Feb. 3-5, March 3-5; C.W.: Feb. 17-19, March 17-19

All amateurs are invited to take part in ARRL's annual DX Competition. Each of the four 48-hour contest periods start on Friday at 2400 GMT and ends on Sunday at 2400 GMT on the dates shown.

Certificates will be issued to the highest-scoring c.w. and phone operator in each country and each United States and Canadian ARRL Section. And there will be special certificates for club leaders and multioperator stations and a cocobolo gavel to the top club entry.

The DX will be shooting to trade contest data with as many W/K, VE/VO, KH6, KL7 stations as possible. U. S. and Canadian amateurs will transmit RS and RST reports plus states or provinces, while the returns from overseas will be five- and six-figure numerals indicating signal reports and powers input.

Free contest forms, though not required by the rules, are now available from the ARRL Communications Dept. When requesting them, please advise whether you expect to enter the c.w. section, the phone section, or both.

The complete rules announcement may be found in the January issue of *QST* (p. 77).

NOVICE ROUNDUP REMINDER

Event: Tenth Annual ARRL Novice Roundup! Starts: January 28, 1961, 1800 Local Time. Ends: February 12, 1961, 2100 Local Time.

Complete information, including a sample log form, may be found in the January issue of *QST* (p. 76).

Get off those cards, radiograms or letters for ARRL's convenient log forms.

COMING A.R.R.L. CONVENTIONS

March 24-25 — Michigan State, Bay City.

April 7-9 — Delta Division, Chattanooga, Tenn.

April 8-9 — New England Division, Swampscott, Mass.

April 8-9 — Southeastern Division, Orlando, Florida.

May 26-29 — Southwestern Division, Phoenix, Ariz.

August 26-27 — Central Division, Springfield, Ill.

September 15-17 — New York State, Niagara Falls.

Strays

It is with great regret that we note the passing, in this month's Silent Keys on page 21, of two well-known amateurs, both victims of heart attacks. George Doorakian, W1DLT, had been with FCC for the past twenty years, as a war-time monitoring officer, later as Radio Engineer, and since 1952 as Assistant District Engineer in Charge of the New England district. Many W1s will remember his strict but fair administration of their amateur examinations. George was very active in the formation of TVI committees, partic-

ularly in the early days of commercial television.

Everett W. Mayer, KP4KD and former 9BG, 4KD, K4KD, W9CCB, had served as ARRL QSL Manager for Puerto Rico since 1947. He was Section Communications Manager of the old Puerto Rico-Virgin Islands section in 1930-1931, and assistant SCM 1940-1945, acting SCM 1945-1948 and SCN 1948-1950 of the West Indies section. A radio amateur since 1913, Ev was well-known on the air, especially for his participation in the DX contest, Sweepstakes, and CD Parties.

Improved Version with Better Performance

The BC-453 as a Tunable I. F. in a Multiband Receiver

BY CARL H. ERICSON,* W2PPL

An earlier article¹ described the construction of a receiver using a modified BC-453 as its main tuning element. This article pointed out some of the limitations, and the closing comments indicated that some improvement might be expected by using either a surplus Command receiver of a higher frequency as the tunable i.f., or by using a BC-453 with unmodified tuning range, separated from the front end of the receiver by an intermediate converter section. Questions received concerning these suggestions, and also an inherent curiosity on my part, prompted a little further investigation along these lines. The receiver described here is a result of this work.

Rather than to repeat comments relative to points in the BC-453 that are common to this receiver and its predecessor, the interested reader is referred to the previous article. Also, since the product detector and audio sections remain essentially the same, they will not be dealt with in detail here. The first model was built to a size and standard of economy that did not make allowance for many frills. The new model includes some desirable refinements, such as an S meter, a notch filter, two speeds of a.g.c. and a general-coverage front end.

Higher Intermediate Frequencies

While the general performance of the original receiver was good, it did suffer somewhat by having an image ratio of only about 45 db. on the higher-frequency bands. In part at least, this was due to the low frequency (about 1 Mc.) of the tunable i.f. amplifier. An attempt was made to overcome this deficiency by going to a higher order of oscillator-signal separation through the

* 183 Burbank Drive, Snyder 28, N. Y.

¹ Ericson, "Tunable-I.F. Receiver Using the BC-453," *QST*, September, 1959.

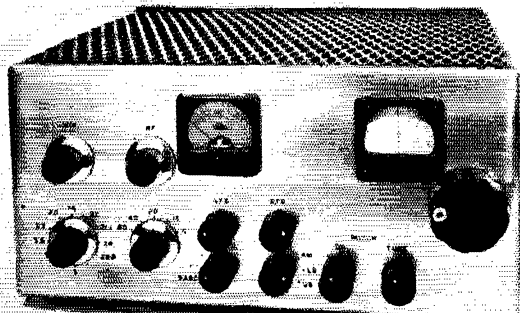
A triple-conversion receiver using the BC-453 as the main tuning element. At the left are the mixer and r.f. tuning controls (above), and the h.f.o. and r.f. band switches. Grouped at the center are the a.f. and r.f. gain controls (above), and the a.g.c. and function switches. At the right, below the BC-453 tuning control, are the depth and tune controls for the notch filter.

This triple superhet using a BC-453 Command receiver as the tuning element has better image suppression than an earlier version described by the author. Added features include an S meter, a T notch filter for suppressing heterodynes and a two-speed a.g.c. system. The receiver covers all bands, 80 through 10 meters. With additional crystals it may be used on other frequencies within this range.

use of a BC-455 as the tunable element, instead of the revamped BC-453. The wide characteristic of the i.f. strip of the BC-455 was shaped with a two-section half-lattice crystal filter, and some tests were run. The results were not encouraging. Although the filter provided a reasonably good "nose" characteristic, the far skirt attenuation was not sufficient to qualify in a really first-class receiver. This fault might have been overcome by further work on the i.f. strip. However, in the course of making the tests, it became obvious that the frequency stability of the BC-455 was measurably inferior to that of the BC-453. So it was decided that this was not the best approach and further work along this line was abandoned. The improved version then developed around the suggested alternative of using an unaltered (as to frequency range) BC-453 as the chief tuning element, with an intermediate crystal-controlled converter section between it and the crystal-controlled front end.

Front-End Circuits

A diagram of the circuit, exclusive of the unmodified portion of the BC-453, is shown in Fig.



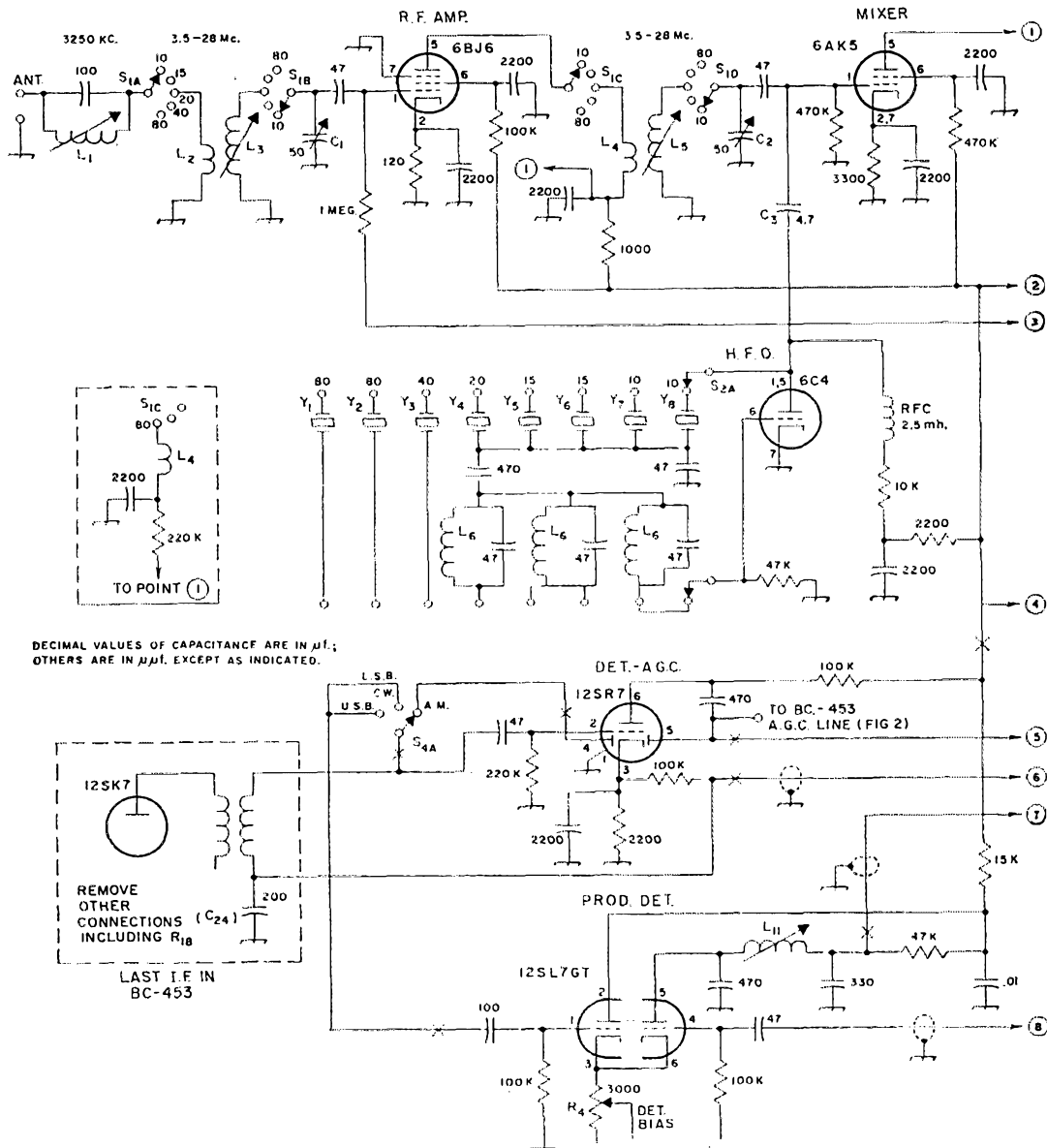


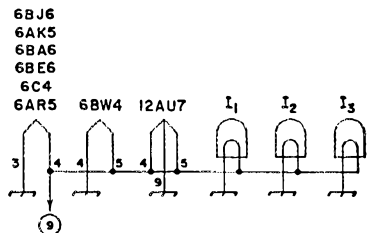
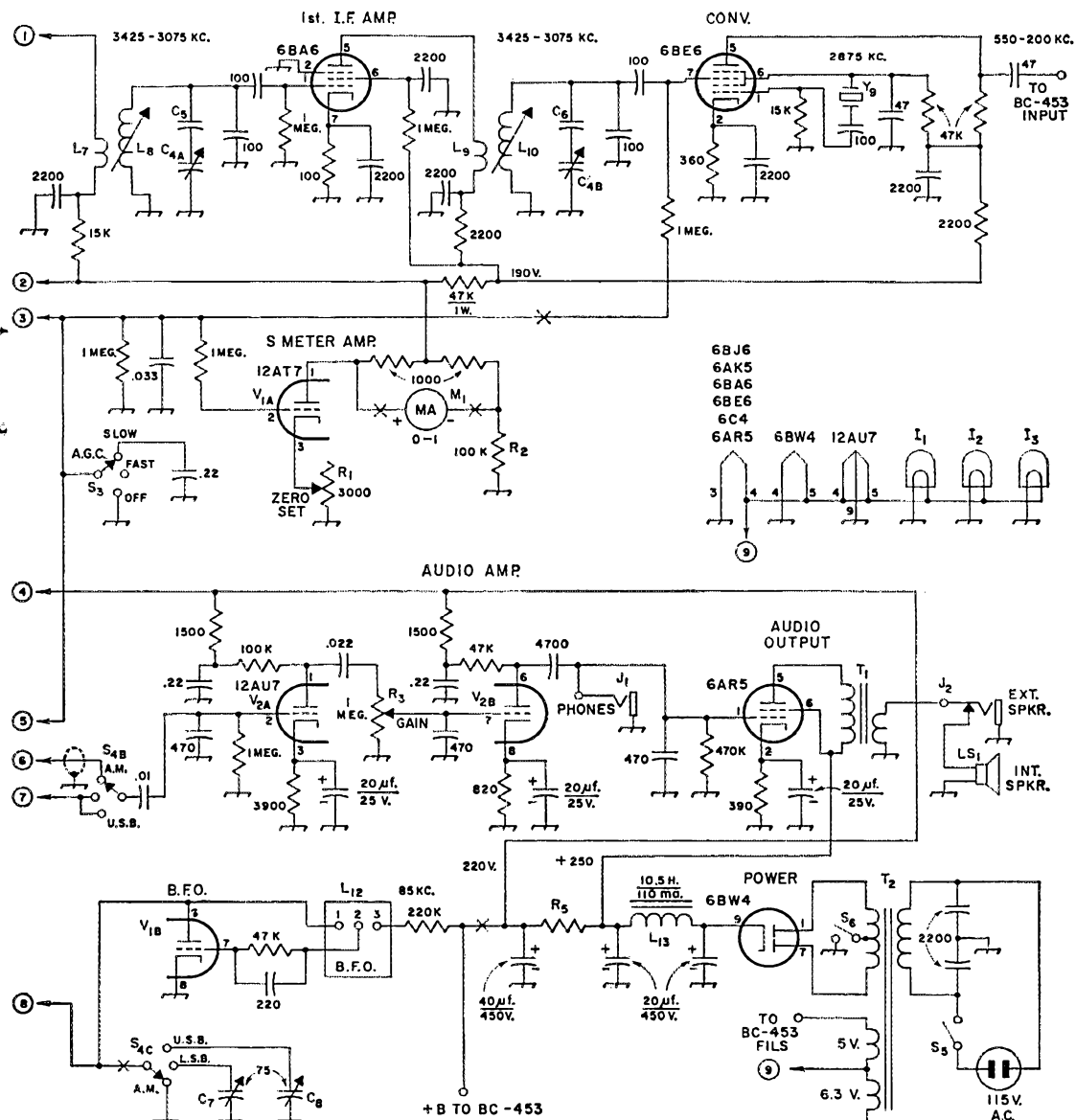
Fig. 1—Circuit of W2PPL's receiver. The unmodified portion of the BC-453 used as a tunable second i.f. is not shown. Unless otherwise indicated, resistances are in ohms and resistors are $\frac{1}{2}$ -watt composition. Fixed capacitors having values less than $0.001 \mu\text{f.}$ should be mica or stable ceramic; those having values from 0.001 to $0.0022 \mu\text{f.}$ should be disk ceramic; capacitors of larger value may be paper, tubular ceramic or disk ceramic, excepting those marked with polarity, which are electrolytic. At S_1 , coils for other bands are connected to the appropriate switch points in the manner shown.

Point 1 is a common connection for all L_1 coils except the one for 80 meters, which is connected as shown in the detail at the left.

- C_1, C_2 — $50\text{-}\mu\text{f.}$ air trimmer (Hammarlund MAPC-50-B or similar).
- C_3, C_5, C_6 —See text.
- C_4 —Broadcast-replacement-type dual variable capacitor (see text).
- C_7, C_8 — $75\text{-}\mu\text{f.}$ air trimmer (Hammarlund MAPC-75 or similar).
- I_1, I_2, I_3 —6-volt dial lamp.
- J_1 —Open-circuit jack.
- J_2 —Closed-circuit jack.

- L_1 —70 turns No. 36 enam., scramble-wound on $\frac{1}{4}$ -inch iron-slug form $\frac{3}{8}$ inch long, approx. $30 \mu\text{h.}$ (Miller 4500 form).
- L_2 — L_6 , inc.—See coil table.
- L_7, L_9 —40 turns.
- L_8, L_{10} —70 turns (inductance approx. $30 \mu\text{h.}$).

Above coils are scramble-wound with No. 36 enameled wire to a length of about $\frac{1}{8}$ inch on $\frac{1}{4}$ -inch iron-slug forms (Miller 4500). Primary and secondary windings are spaced about $\frac{1}{16}$ inch. If other forms are used, the number



- of primary turns should be in approximately the same ratio in respect to secondary turns as shown above.
- L₁₁—85-kc. filter coil, 4–30 mh., ferrite core (Miller 6315 TV width control).
- L₁₂—B.f.o. unit in BC-453 (see text).
- L₁₃—Filter choke (Stancor C-1001 or similar).
- LS₁—5-inch loudspeaker mounted in receiver.
- M₁—0–1-ma. d.c. meter.
- R₁, R₄—3000-ohm wire-wound control (IRC WP-3000 or similar).
- R₂—See text.
- R₃—1-megohm control, audio taper (IRC Q13-137 or similar).
- S₁—R.f. band switch—2-section 4-pole 5-position ceramic rotary switch (CRL PA-2011).
- S₂—H.f.o. band switch—2-section 2-pole 11-position ceramic rotary switch (CRL PA-2005). Extra positions are used for frequencies outside of amateur bands.
- S₃—A.g.c. switch—1-section 1-pole 3-position ceramic

- rotary switch (CRL PA-2001).
- S₄—Function switch—1-section 3-pole 3-position rotary switch (CRL PA-2007).
- S₅—Power switch—on r.f. gain control.
- S₆—Stand-by switch—s.p.s.t. toggle on R₃.
- T₁—Output transformer: 7000 ohms to voice coil, 4 watts (Stancor A-3878).
- T₂—Power transformer: 650 volts, c.t., 150 ma.; 6.3 volts, 5 amps.; 5 volts, 3 amps. (Thordarson 22R06).
- V₁, V₂—See text.
- Y₁—6825 kc. (covers 3400 to 3750 kc.).
- Y₂—7125 kc. (covers 3700 to 4050 kc.).
- Y₃—10,425-kc. overtone (covers 7000 to 7350 kc.).
- Y₄—17,425-kc. overtone (covers 14,000 to 14,350 kc.).
- Y₅—24,425-kc. overtone (covers 21,000 to 21,350 kc.).
- Y₆—24,525-kc. overtone (covers 21,100 to 21,450 kc.).
- Y₇—31,425-kc. overtone (covers 28,000 to 28,350 kc.).
- Y₈—31,725-kc. overtone (covers 28,300 to 28,650 kc.).
- Y₉—2875 kc.

1. An incoming signal anywhere in the range of 3.5 to 30 Mc. is amplified by the 6BJ6 and is then converted down to a range of 3425 to 3075 kc. by the 6AK5-6C4 combination. In this 3-Mc. range, the signal is further amplified by the 6BA6 and is then converted again by a 6BE6 down to the 200-to-550-kc. range of the unmodified front end of the BC-453. Where the width of an amateur band in kilocycles exceeds the 350-kc. range of the BC-453, the band is split into two segments. In the interest of frequency stability, both the 6C4 and the oscillator section of the 6BE6 are crystal-controlled. The h.f.o. circuit is the Pierce for the 3.5- and 7-Mc. bands, while overtone circuits are used for the higher frequencies.

The 6BJ6-6AK5 combination provides a sensitive low-noise front end. While it has not been tried on 6 meters, its very good performance on 10 meters suggests that it might work quite well on the higher-frequency band. It will be noted that separate tuning controls are provided for the first two circuits of the receiver. This does not mean that the operator must have three hands to tune the receiver. Any modern receiver has an antenna trimmer, and C_1 serves just that function and nothing more. Adjustment of C_2 will seldom be required in tuning the ham bands. However, by the substitution of suitable crystals in the h.f.o., frequencies outside the amateur bands may be covered. In this case, C_2 will be found useful. Adjustable iron-slug coils are used in these circuits not only to maintain high Q without going to excessive bulk, but also to provide a means of adjusting the tuning so that C_1 and C_2 will not need attention in switching from one band to another.

First I.F. Amplifier

In choosing a frequency for the first i.f. amplifier, there was a temptation to locate in the 3.5-to-4-Mc. range, and convert all higher frequencies to this band. This would make it unnecessary to convert signals already in the 80-meter band. However, with a tunable i.f. there is always the problem of keeping signals at the same frequency as the i.f. from "riding through" when using the receiver on other frequencies. In this respect, it was reasoned that it would be more difficult to deal with a local 80-meter ham signal than with a commercial signal which in most cases will be originating at some distance. Even if this were not the case, any means used at the input of the receiver to suppress i.f. "ride through" would have to be switched out when receiving on 80

meters if the i.f. were in this band, thereby adding a complication.

If a still higher i.f. were to be chosen, the problem of reducing image response at the input of the second i.f. (200 to 550 kc.) would be more difficult.² For these reasons, a first i.f. just below the 80-meter band (3425 to 3075 kc.) was finally selected.

The tuning of this first i.f. section is ganged with the tuning of the BC-453. This was done with great reluctance, and only after quite a battle in an attempt to arrive at band-pass circuits that would be reasonably flat over a 350-kc. tuning range and also be down at least 60 db. at 400 kc. off one end. This order of selectivity was never approached, so the only option left was to tune the stages. In this manner it is easily possible to obtain the desired 60 db. of image suppression. If the tuning range were limited to 200 kc., as is done in some commercial receivers, it might be possible to achieve the desired performance with band-pass circuits. However, this would require a larger number of crystals and no improvement would be gained in bandspread or tuning rate, since these are fixed functions of the BC-453. Aside from the problem of designing a suitable mechanical method of coupling the dual tuning capacitor C_4 to the tuning shaft of the BC-453, no difficulty was encountered with the gang-tuned system, and tracking was extremely easy to accomplish.

Modifying the BC-453

The portion of the BC-453 following the last i.f. transformer was stripped down except for the 12SR7 and 12A6 sockets. All heaters in the BC-453 are rewired in parallel. After removing one of the "shoe-button" capacitors from the h.f.o. coil unit, the unit was moved to the top of the chassis, mounting it over the hole formerly occupied by the power plug.

The 12SR7 was rewired to serve as the a.m. detector, a.g.c. amplifier and rectifier, as shown in Fig. 1. A.g.c. is applied to a total of four stages — to the 6BJ6 and 6BE6 preceding the BC-453 and to the 12SK7 r.f. stage and 12SK7 first i.f. stage in the BC-453 itself. S_3 (Fig. 1) provides two a.g.c. time constants. The revised a.g.c. connections in the BC-453 are shown in Fig. 2. A

² Here the author has in mind the difficulty of maintaining the same order of selectivity in absolute terms as the frequency is increased, the separation between signal and image being fixed by the second i.f. (the 200-550-kc. range of the BC-453 in this case). The tuned circuits of the first i.f. must have sufficient selectivity to reject this image. — Ed.

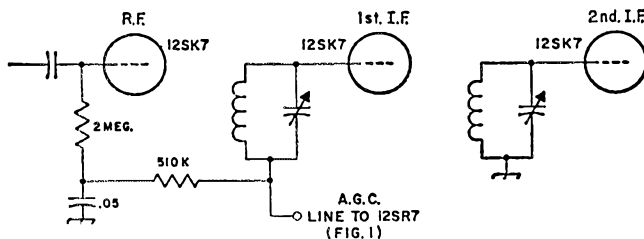
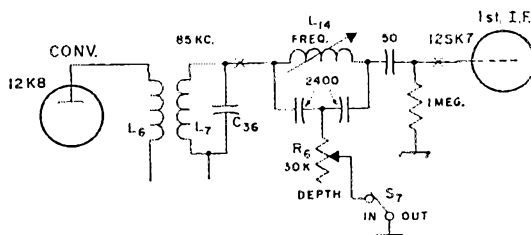


Fig. 2—Revised a.g.c. connections in the BC-453. Resistances are in ohms; capacitances in μ f.

Fig. 3—Circuit of the T notch filter and its connections to the BC-453 i.f. strip. L_{14} is an iron-core inductor (see text). R_6 is a carbon control and S_7 a rotary snap switch. Resistances are in ohms; capacitances in μmf . Capacitors should be mica.



manual gain control (20K wire-wound) was installed in the usual manner, from the "sensitivity control" line in the BC-453 (Pin 1 on the front connector) to ground.

The 12A6 socket is used for the 12SL7 product detector. A miniature socket was installed at the rear of the chassis for a 12AT7, using the 12-volt heater connection in parallel with the other 12-volt tubes in the BC-453. One section of this tube serves as the b.f.o., while the other is used as an S-meter amplifier. These circuits are included in Fig. 1. In the S-meter circuit, full-scale sensitivity of the meter is preadjusted by the selection of a suitable value for R_2 (approximately 100K). R_1 provides a zero-scale adjustment. All other portions of the receiver are assembled on a separate chassis. In Fig. 1, points where interconnections between the two chassis are needed are indicated by a cross mark. The addition of a T notch filter (to be discussed presently) between the 12K8 converter and the first 12SK7 i.f. amplifier completes the alterations in the BC-453.

The dashed square in Fig. 1 shows the connections to the output circuit of the last i.f. amplifier in the BC-453. This output can be switched between the diode detector of the 12SR7 for a.m. reception, and the 12SL7 product detector for s.s.b. and c.w. reception. The mode switch (S_4) also controls the b.f.o., shifting its frequency, by means of C_7 and C_8 , for either upper or lower sideband reception, and connects the audio amplifier to the selected detector. With this method of sideband selection, zero-beating an incoming carrier will require different settings of the tuning dial, depending upon which of the two b.f.o. frequencies is in use. Therefore the best way to calibrate is to use maximum indication on the S meter. This discrepancy in zero-beat points is avoided in a selectable-sideband system of the type where a single setting of the b.f.o. serves for both sidebands. However, such a system would require two crystals at Y_9 adjusted to the required frequency separation of about 1.5 kc.

T Notch Filter

The unmodified 85-kc. i.f. strip of the BC-453 can be aligned to produce an effective band width of about 2.5 kc. This will give very good intelligibility on s.s.b. and the selectivity is adequate for normal c.w. operation. If greater c.w. selectivity is desired, a Q multiplier might be in order. At 85 kc., it certainly should be capable of excellent performance. For nulling out heterodynes, a T notch filter was preferred to the Q multiplier.

This was installed in the 85-kc. i.f. strip as shown in Fig. 3. The inductor used for L_{14} is a very high- Q slug-tuned coil from an impulse transmitter, and is not commonly available. However, it should not be difficult to obtain a replacement coil for one of the commercial receivers using a notch filter on 50 or 85 kc.³ The range of adjustment is approximately 2 to 4 mh. The screw of the slug was extended through the panel so that it could be operated by a knob. The switch S_7 disables the filter when its use is not desired.

Audio Amplifier and Power Supply

The unit includes a new three-stage audio amplifier using a 12AU7 dual triode for the first two stages and a 6AR5 in the output stage. The power supply is a conventional one using a 6BW4 rectifier and a capacitor-input filter. A resistance-capacitance section of the filter drops the voltage to 220 for all except the power-output stage. The circuits for both of these sections are

³ The inductance required with the capacitances shown in Fig. 1 is approximately 3 mh. This is the approximate inductance of Part No. 051-102270 used in Hallcrafters SX101-A receiver with larger capacitances for an i.f. of 50 kc. — Ed.

Coil Table

Band	80	40	20	15	10
L_2	10	7	5	4	3
L_3	60	30	20	17	10
L_4	40	20	20	17	10
L_5	60	30	20	17	10
L_6			16	14	6

All above coils are wound on $\frac{1}{4}$ -inch iron-slug forms (Miller 4500). Approximate inductance values for L_3 and L_5 are 70, 17, 4, 2 and 1 μh ., respectively, from 80 through 10 meters. If other forms are used, turns on L_2 and L_4 should be in approximately the same ratio in respect to turns on L_3 and L_5 as shown above. Coils for 80 and 40 meters are scramble-wound with No. 36 enameled wire within a length of about $\frac{1}{2}$ inch, with 1/16-inch separation between primary and secondary coils. The 20- and 15-meter coils are wound with No. 30 enameled, single-layer, with primary turns interwound between secondary turns, no space between adjacent turns. The 10-meter coils are similar but wound with No. 28 wire. The oscillator coils L_6 are single-layer, close-wound with No. 30 for 20 and 15 meters, and No. 28 for 10 meters. Approximate inductances are 3, 1.5 and 0.7 μh ., respectively, 20 through 10 meters.

also included in Fig. 1, pages 12 and 13.

Construction

Circuitwise, this receiver is somewhat more complex than the original model; nevertheless, actual construction turned out to be easier. With no need for pruning and retracking the front end of the BC-453, much of the labor is eliminated. The use of a much larger chassis than before speeded up assembly to a considerable measure.

The top view of the receiver shows the BC-453 to the left, bolted against the side of an 8 × 12 × 3-inch aluminum chassis. The chassis serves as a mounting for all r.f. stages ahead of the BC-453, the audio amplifier and the power supply. This section also includes the a.g.c. and mode switches.

Although it is much easier to buy a commercial cabinet than to build one, suitable boxes are not too common. Ready-made units, if of a size and shape to suit the builder, frequently do not provide adequate venting, especially in the cover. The aluminum cabinet shown is home-made. It is 14½ by 7 inches at the panel and has a depth of 12 inches. This size accommodates the chassis mentioned which provides plenty of working space and leaves room for future growth.

Looking into the open top of the receiver, the front-end stages are in the upper right-hand corner of the large chassis, and the tunable intermediate stages are in the upper left-hand corner. At the rear are the audio stages and the power supply. The b.f.o. can and the 12AT7 are at the rear of the BC-453 chassis, behind the loudspeaker.

Ganging

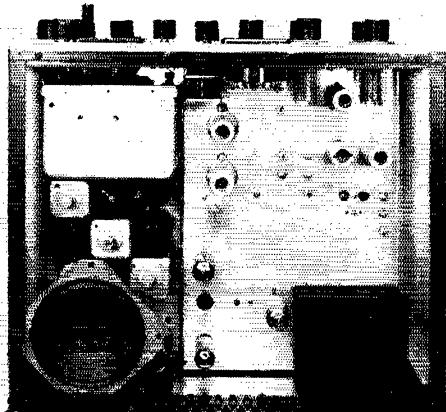
Ganging of C_4 to the tuning shaft of the BC-453 was quite easily accomplished by means of a cable and pulley arrangement, details of which are shown in Fig. 1. C_4 , it will be noted, is mounted in the front corner of the large chassis, close to the BC-453 with its pulley lined up with the hub on the tuning shaft of the BC-453. The shaft of the latter has a total rotation of 280 degrees, while the range of C_4 is limited to a maximum rotation of 180 degrees. This difference is compensated for adequately by making the diameter of the pulley at least 1.5 times the diam-

eter of the hub on the tuning shaft. This causes the shaft of C_4 to rotate more slowly than the tuning shaft. If the diameter of the pulley is less than 1.5 times the diameter of the hub, C_4 will reach the end of its rotation ahead of the tuning shaft. However, the diameter of the pulley may be greater than 1.5 times the diameter of the hub and still function satisfactorily, since the desired frequency range may be obtained with something less than the full rotation of C_4 . (In my receiver the full rotation is not used.) The reason for this is that the frequency range covered by C_4 is limited primarily by the 100- μ mf. capacitors shunting C_4 and the series capacitances C_5 and C_6 . For the same reason, the capacitance values used in the sections of C_4 are also not critical. As a matter of fact, the capacitor that I used is of the superhet-replacement type, one section having a much larger maximum capacitance than the other. In spite of this difference, the tuning over the small frequency range required is essentially linear and tracking was no problem.

The usual type of b.c. replacement variable does not provide very good shielding between sections. To improve the shielding, a semi-circle of metal was soldered to the shaft at a point midway between the two sections and rotated 180 degrees in respect to the rotor plates. When the plates are in mesh, the outside rotor plates do the shielding; when they are out of mesh, the added plate provides a shield between stators.

Dial

The sketch of Fig. 4 includes a new 4-inch dial made of aluminum, painted white, and attached to the tuning-shaft hub. The panel es-cutecheon, which is cut and filed from plastic, was shaped to match the face of the S meter and painted black. A hairline was scribed on the Plexiglas window and blackened. The original dial was not removed since it provides a convenient reference in marking the new dial. The tuning shaft is simply set to a mark on the original dial while a corresponding mark is scribed on the new dial. It should be pointed out that the conversion system used results in reverse tuning at the BC-453; that is, the low-frequency end of the ama-



In the upper right-hand corner, the 6BJ6 r.f. amplifier tube is between the r.f. and mixer tuning capacitors, with the mixer and h.f.o. tubes below. The dual tuning capacitor of the first i.f. is in the upper left-hand corner of the large chassis, to the left of the S meter, with the first i.f. and second converter tubes, and the 2875-kc. crystal below. In the lower part of the main chassis are the power transformer and rectifier, and the two audio tubes. The BC-453 chassis is to the left. The b.f.o./S-meter tube may be seen partially hidden by the speaker. The empty socket between the audio tubes is a spare.

four range comes at the high-frequency end of the BC-453 dial.

Adjustment

This receiver can be assembled and made to perform with a minimum of test instruments. However, a grid-dip meter, v.t.v.m., and signal generator are very useful, of course. The signal generator and v.t.v.m. are almost indispensable in adjusting the tracking of the i.f. tuning, and in checking the spurious responses — especially the latter.

The 6BA6-6BE6 section of the receiver was made operative and tuned up before activating the front end. For preliminary adjustment, mica trimmers were used at C_5 and C_6 , and these were adjusted, along with the slugs of L_3 and L_{10} , until proper tracking resulted. Then the trimmers were removed, their capacitances measured, and fixed capacitors of equivalent value substituted. A final adjustment was made by means of the coil slugs only. This whole operation is quite simple to perform and tracking is excellent. The capacitances of C_5 and C_6 are likely to work out to be about 100 $\mu\mu\text{f}$.

With the lower-frequency portions of the receiver functioning properly, attention was turned to the front end. The coil slugs in the overtone oscillator should be adjusted in each case for maximum S-meter reading consistent with quick-starting of the crystal. In the interest of best signal-to-noise ratio on 10 meters, it would be well to try several values of injection coupling capacitance (C_3) and also to try a number of values for the grid resistor in the 6AK5 mixer. The values shown worked best for me but may not be optimum in every case.

The few problems that arose were solved as follows:

Feed-through of signals in the 3-to-3.4-Mc. range was eliminated by the antenna wave trap shown in Fig. 4, the slug of L_1 being adjusted to reject the offending signal.

A slight tendency toward oscillation in the 6BA6-6BE6 stages was cured by using short

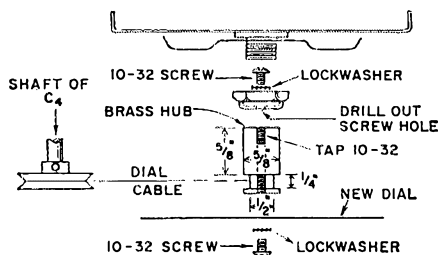


Fig. 4—Sketch showing the ganging arrangement and mounting of the new dial. See text for other details.

lengths of coax for the connections between C_5 and C_6 and their respective coils L_8 and L_{10} .

Because of the high over-all gain of the receiver, some overloading showed up on 80 meters. A 220K voltage-dropping resistor, with the necessary additional bypass, was connected at the bottom end of the 80-meter coil as shown in the detail in Fig. 1. This reduces the gain of the r.f. amplifier sufficiently to correct this condition.

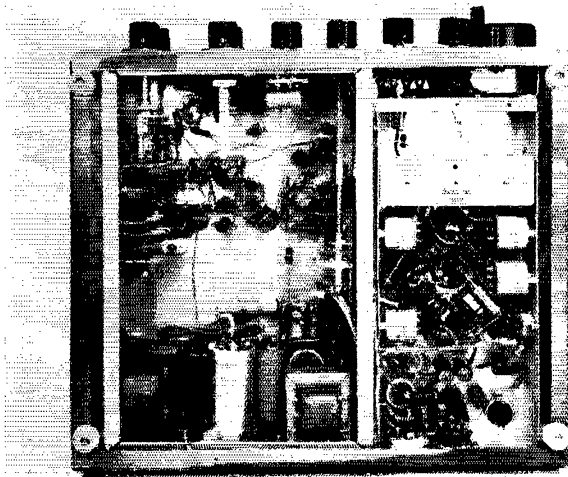
L_{11} in the output of the product detector was adjusted for minimum r.f. from the b.f.o. on the grid of the first audio amplifier. Some r.f. will be sure to appear here, but adjustment of L_{11} should reduce it to a level that will prevent blocking of the audio stages. However, it was found that the little that did sneak through was amplified to a higher level in the audio stages and its harmonics showed up every 85 kc. on the dial of the BC-453. This last trace was eliminated by the fixed capacitors connected from grid to ground in the audio amplifier.

Calibration

No provision has been included for readjusting the receiver to original calibration should this be found necessary. It is possible that a variable capacitor across Y_9 would serve the purpose. The total drift from a cold start is only of the order of a hundred cycles on all bands, so recalibration should not be necessary.

The original calibration will depend, of course, on how close the crystal frequencies are to the

Bottom view of the triple-conversion receiver. Near the top of the main chassis (left) the h.f.o. crystal switch is to the left, the band switch is at the center and the shaft of the mode switch to the right. The various slug-tuned coils are grouped around their associated switches. At the bottom are power-supply filter components and the audio output transformer.



specified values. The operating frequencies of surplus crystals have been found to be quite close to their marked values. Surplus crystals, however, are not usually available for the higher frequencies. The accuracy of nonsurplus crystals will, of course, depend on price category. Also, overtone crystals often oscillate a kilocycle or two off the marked frequency, the amount of departure depending on the circuit and its adjustment as well as the crystal itself. This may present a problem if a very accurate single-dial calibration is desired for all bands. The author was able to compensate for much of the inaccuracy encountered by the use of padding capacitors across the crystals. These are not shown in the diagram because the values required will vary in each individual case.

The arrangement of the receiver lends itself well to additions or modification. If one already has a high-frequency converter that will work into or can be made to work into the 3-Mc. converter, he is encouraged to make use of it if he so desires. Other combinations of crystal frequencies may be used. However, before purchasing crystals of

other frequencies, it would be very prudent to chart the fundamental and harmonic frequencies up to 30 Mc. for each oscillator. The h.f.o. and the BC-453 h.f.o. beyond the fifth harmonic can be disregarded, but if any of the other harmonics fall within an amateur band, or within the frequency range of the variable i.f. section, choose another set of crystal frequencies. These charts take time to work out, but are well worth the effort in the long run.

And what of the finished product? Well, this is a compact receiver, modern in performance and design. Front-end noise is low and the overall gain is very high, so it does quite a job on DX. Its high order of stability and the 2.5-ke. bandwidth make it excellent for single-sideband reception. Since the BC-453 has a tuning rate of about 10 kc. per turn of the knob, s.s.b. signals easily slide into tune, and this applies to 10 meters as well as 80. In general, it is a sound basic design that can be modified to suit individual requirements, or altered as one's thinking changes through the years. This may be the station receiver here for a long time to come. [QST]

Strays

This ham radio — you never know what will happen next. Take, for instance, the recent experience of K2DJT/4, K4SJH, OA4KY and OA4EP. It seems that the Auxiliary Red Cross Volunteers of Lima, Peru, got themselves on a TV quiz program in Lima, in which they had an opportunity to win themselves a new ambulance by completing four tasks. One of these tasks was a dilly — it required that they get the autograph of U. S. president-elect John F. Kennedy! OA4KY, like a million or more Peruanos aware of the Volunteers' plight, thought ham radio might help, and he reached K2DJT/4 in Margate, Florida. The vacationing New Jerseyite passed along the request for Mr. Kennedy's signature to the Pompano Beach *Sun-Sentinel*, whose Mr. Frank Farece got through to the president-elect's staff at Senator Johnson's ranch and received an okay. Word went back to Peru, and a telegram, just in time for the final TV show, was also acknowledged by ham radio.

Murphy's Law stepped in, and the Volunteers goofed the fourth and final task, answering incorrectly a question thrown at them on the program, and thus failed to earn their ambulance. But they did win \$260 and some merchandise prizes. More important, amateur radio, the United States and its new president gained new friends and new stature in the important South American city. [Thanks to KP4HQ, mm and the *Sun-Sentinel* for this story.]

MARS celebrated a dozen years of service in November. It now has a membership of about 15,000, some 70 per cent of whom are civilians.

FEEDBACK

We got our contributors mixed up in the December issue. On page 51 we credited a portable mast holder to K1CCL, when the credit really belonged to K1CLL. Our excuse is that the call K1CCL was fresh in our mind — he had an item in the October issue!

"Some Applications of the Semiconductor Diode," by W6VAT in the January issue — in Fig. 1 on page 42 it is the *positive* terminal of C_2 that should be grounded.

Another missed credit. We failed to mention that the photographs for the article "A Dead Art?" on page 55 of January were taken by Jim McCoy, W0LQV.

OUR COVER

W1FVY looks out his front door to see whether he should shovel the walk before breakfast. See the story on page 40 of this issue.



New Jersey — The third annual dinner and hamfest of the East Coast V.H.F. Society will be held at Neptune's Inn, located on Route 4 near River Edge, N.J., on Saturday, February 25. Activities begin at 1900. The program includes installation of officers, presentation of awards to outstanding amateurs, speakers, entertainment, and plenty of good food. Tickets are available only in advance at \$5.00 per person. If you don't find them at your local distributor's, contact Roy King, K2BNQ, 55 Woodland Ave., Montvale, N.J. Group seatings if purchased in blocks of five or more.

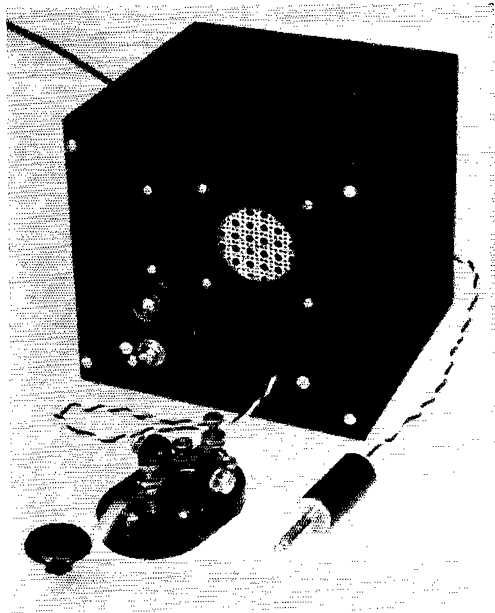
• Beginner and Novice

This view shows the completed unit. The switch at the lower left corner is S_1 . Just above the switch is the neon bulb. The leads coming out of the back connect to P_1 , which is used when the unit works as a monitor.

A Combination Code-Practice Oscillator-Monitor

Two Units for the Price of One

BY LEWIS G. McCOY,* WIICP



In order to obtain an amateur license one must learn to send and receive the International Morse code. A good way for the newcomer to learn the code is with a code-practice oscillator. The code-practice oscillator described here produces an audio tone similar in sound to the signals one would hear when listening with a communications receiver.

After obtaining a license and getting on the air, nearly every amateur working c.w. needs some method of monitoring his "fist" to know that the code characters he makes are correct. This is particularly true of the Novice who wants

* Technical Assistant, QST.

to increase his speed and send accurate code. Many times the Novice, because of being restricted to crystal-control, must work stations on a different frequency than his own, which makes it difficult to monitor his sending with his receiver. If he tunes to his own frequency there is always the danger of not being able to find the station he is working when the time comes to stand by. The unit to be described here serves the dual purpose of a code-practice oscillator and a monitor which is independent of the receiver. The oscillator has sufficient speaker volume to take care of large code-practice groups such as those sponsored by radio clubs.

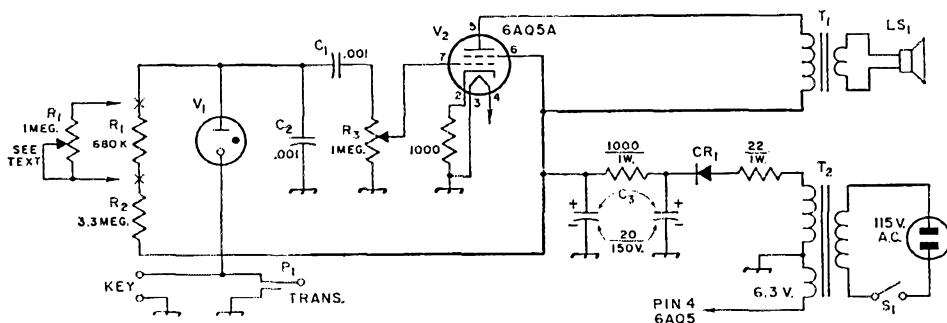
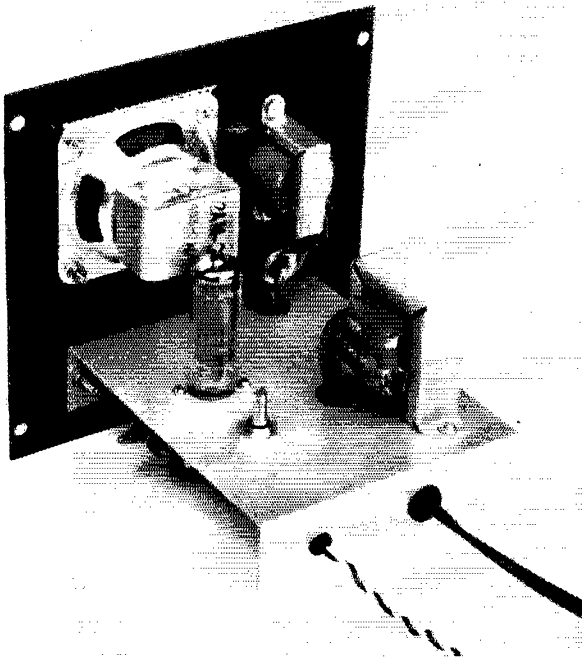


Fig. 1—Circuit diagram of the code-practice oscillator-monitor. All capacitances are in $\mu\text{f.}$, resistances in ohms; unless specified otherwise, resistors are $\frac{1}{2}$ watt.

- C_1, C_2 —0.001- $\mu\text{f.}$ disk ceramic.
- C_3 —Dual 20- $\mu\text{f.}$ electrolytic, 150 volts.
- CR_1 —Selenium rectifier, 50 ma. (Sarkes-Tarzian type 50).
- LS_1 —2-inch p.m. speaker.
- R_1 —0.68 megohm, $\frac{1}{2}$ watt.
- R_2 —3.3 megohms, $\frac{1}{2}$ watt. (Or variable—see text.)
- R_3 —1-megohm control.

- P_1 —Plug, to fit transmitter.
- T_1 —Power transformer, single tube to voice coil, 5000 to 3.2 ohms (Knight 62G064).
- T_2 —Power transformer, 125 volts, 15 ma.; 6.3 volts, 0.6 amp. (Stancor PS8415, Knight 61G410).
- V_1 —Neon bulb, NE-21.
- V_2 —6AQ5A.



The Circuit

The audio oscillator (that portion of the circuit that makes the tone) consists of R_1 , R_2 , V_1 , and C_2 in Fig. 1. When one side of V_1 , a neon bulb, is connected to ground via the key, the circuit oscillates, producing an audio tone which is coupled to the grid of a 6AQ5 through C_1 . The signal is amplified in the 6AQ5 and fed to the speaker through T_1 . R_3 serves as a volume control to adjust the loudness of the signal.

To the right of the speaker is T_1 , the output transformer. Just below T_1 is the neon bulb, supported in a rubber grommet. The power transformer is at the right of the chassis and the 6AQ5 and volume control are on the left.

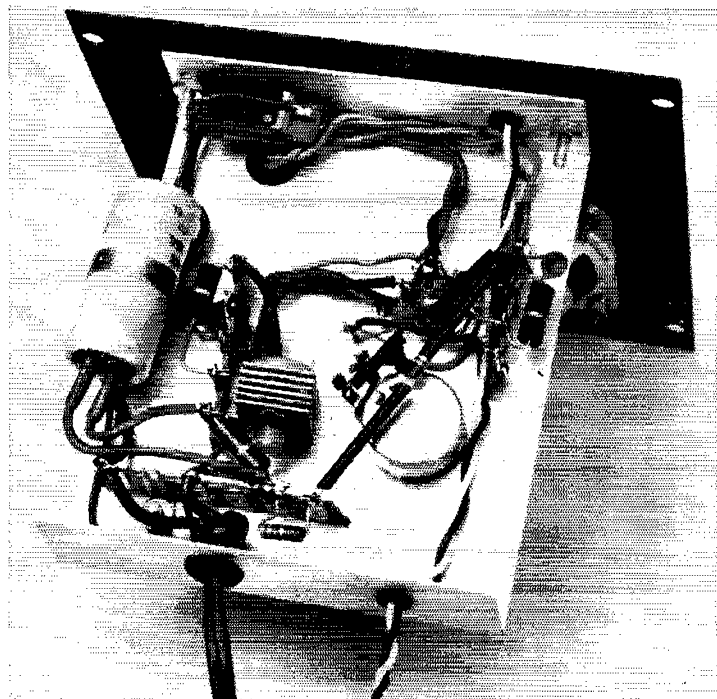
When the unit is used as a monitor, P_1 is plugged into the key jack of the transmitter. More about this in a moment.

The power supply is a half-wave rectifier circuit with capacitor input. A dual 20- μ f. electrolytic capacitor, C_3 , with a 1000-ohm resistor serves as the power-supply filter. Voltage out of filter is approximately 130 volts d.c.

Building the Unit

Most of the components are mounted on a $1 \times 5\frac{1}{8} \times 4$ -inch aluminum chassis (Bud CB-1619). The speaker, output transformer, and neon bulb are mounted on the panel of a $6 \times 6 \times 6$ -inch cabinet (Bud CU-1098). Note in the bottom-view photograph that the power-supply components are mounted along one side of the chassis with the oscillator along the other side. There is nothing critical about the placement of the parts, but it is a good idea to follow the general layout shown. The volume control on the unit shown here was mounted on the chassis just to the rear of the 6AQ5. If desired, this control can be mounted on the front panel.

The neon bulb is mounted on the front panel and supported by a $\frac{1}{2}$ -inch-diameter rubber grommet. Having the bulb on the panel shows you when the oscillator is working, since the neon bulb blinks on and off as the unit is keyed.



At the left of the chassis in this bottom view is C_3 , the dual electrolytic capacitor. To its right is CR_1 . The 6AQ5 socket and volume control are at the right hand side of the chassis.

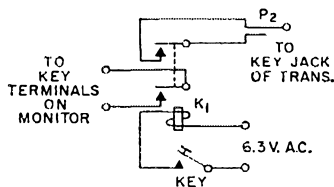


Fig. 2—Circuit showing method of connecting a keying relay to the monitor.

K1—Keying relay, double-pole, single-throw, 6-volt a.c. coil (Advance GHA/2C/6VA or equivalent).

Using the Code-Practice Oscillator

When the unit is completed, connect a key to the oscillator and try it. If you want a lower-pitched tone you can reduce the value of R_1 . Increasing the value raises the pitch. Try a 0.56-megohm, $\frac{1}{2}$ -watt resistor to lower the pitch, or 0.82-megohm, $\frac{1}{2}$ -watt to raise it. If your junk box has an extra 1-megohm control, you can connect it in the circuit in place of R_1 and vary the pitch with the control. If you decide you want to put in a pitch control, Fig. 1 shows how it can be done. The control is inserted in the circuit in place of the fixed resistor at the two points marked "X."

As a Monitor

In order to use the unit as a monitor, plug P_1 into the key jack of your transmitter and connect your key to the oscillator key leads. The monitor is designed to be used primarily with cathode-keyed transmitters where one side of the key jack is connected to chassis ground and the other side to the cathodes. Check the circuit diagram of your transmitter to make sure that one side of the key jack is grounded. If it is not, the monitor should not be used in its present form. If the key jack is grounded and your rig uses some other type than cathode keying, you can try the monitor to see if it works. If it doesn't, then a double-pole single-throw relay should be used to key the monitor and transmitter separately. The method for connecting a 6-volt a.c. relay is shown in Fig. 2. One arm of the relay is used to key the monitor and the other arm to key the transmitter.

QST

Strays

Looking for a QSL from Nevada? Then work K7KBN, who has plenty of QSLs. Seems that a local printer made a slight error. K7KBN asked for 500 cards, but received 5000! (He didn't tell us whether he had to pay for the extras. — *Ed.*)

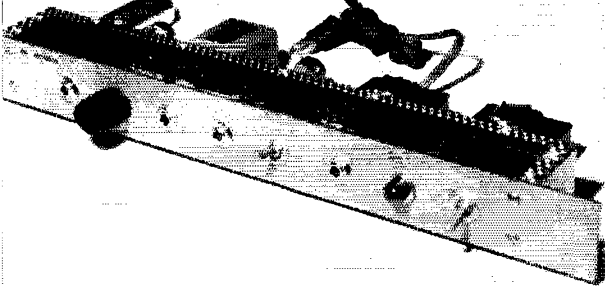
On the other hand, WA2ERJ worked a fellow who said he would be glad to send WA2ERJ a card but did not want one in return.

The son of DL3GG was the one-millionth person to immigrate to the United States.

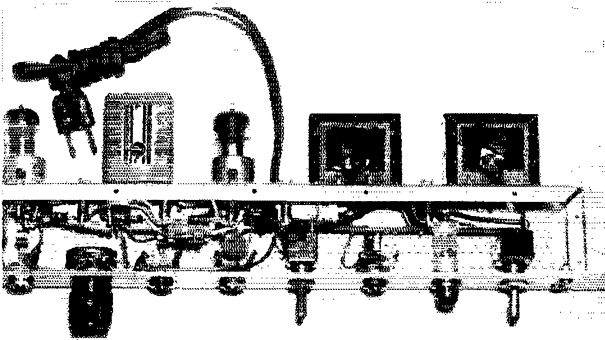
Silent Keys

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

- W1CWA, Donald F. Clark, Rockville, Conn.
- W1DLT, George Doorakian, Waltham, Mass.
- W1GRU, Howard W. Andrews, Bridgeport, Conn.
- W1JQA, Joseph F. Brewster, Randolph, Mass.
- W1NLM, Everett A. Erickson, Bethel, Conn.
- W1SUA, Willis H. Lolse, Hamden, Conn.
- W1VFA, Leslie Baglee, Pittsfield, Mass.
- W2AXS, Herbert Gelb, Cranford, N. J.
- W2CMU, Charles D. Hayden, Babylon, N. Y.
- W2EDZ, Joseph H. Lemrow, New Hyde Park, N. Y.
- W2FWK, Edwin S. Maloney, Valley Stream, N. Y.
- K2GRW, Thomas F. Connors, Jersey City, N. J.
- K2GUY, George M. Gilbert, Binghamton, N. Y.
- WA2HEA, Frank S. Sharp, Vineland, N. J.
- W2JA, Dave Carruthers, Hillsdale, N. J.
- W2JSJ, William Baxendale, Bay Shore, N. Y.
- W2ROP, Foster B. Crocker, Fayetteville, N. Y.
- K2TIQ, John A. Cormack, Butler, N. J.
- K2UQN, David L. Ulrich, Madison, N. J.
- W3GGT, Walter K. Goodman, Landisville, Penn.
- W3JCT, William F. Mote, Newark, Del.
- W3KDV, Norman E. Brooks, jr., Baltimore, Md.
- W3OGN, Walter S. Lovett, jr., Emporium, Penn.
- W3PUG, Helen Wilson, Silver Spring, Md.
- W4AKH, John J. Collins, Fort Pierce, Fla.
- K4AOX, Basil A. Williams, Rossville, Ga.
- W4EYX, Gordon Walter, Falls Church, Va.
- W4FD, Ernest H. Braek, Midville, Ga.
- W4HVA, Alexander L. Jones, Columbus, Ga.
- W4IM, Brock Angle, Fort Lauderdale, Fla.
- K4KSN, Dudley R. Bridgewater, Asheville, N. C.
- K4QLG, William J. L'Ecuver, Sarasota, Fla.
- W5EKA, Walter H. Featheringill, Bartlesville, Okla.
- W5KEA, M. L. Thompson, Dallas, Tex.
- W6AU, Carl Frunk, Modesto, Calif.
- K6FE, Clifford M. McNally, Lancaster, Calif.
- K6HAJ, George H. Clark, North Hollywood, Calif.
- W6KGF, Wallace A. Sweeney, Oakland, Calif.
- W6LKA, Carl H. Utz, Etna, Calif.
- W6PH, Dan G. Bardin, Salinas, Calif.
- K6PYV, Harold A. Tillotson, Lancaster, Calif.
- W6SHT, Frederick R. Baese, Watsonville, Calif.
- W6VOK, John P. Erdman, San Jose, Calif.
- W6VUO, Edward E. Fraters, Arlington, Calif.
- W7FLQ, Charles McLaughlin, Spokane, Wash.
- W7HSQ, Julian Carmichael, Centralia, Wash.
- W7PT, Richard H. Wright, Portland, Oreg.
- W7QIE, John R. Mitchell, Chehalis, Wash.
- W7SWY, William Milliron, Phoenix, Ariz.
- W7TJY, Fred O. Minchin, Gardnerville, Nev.
- W8NCS, Carter Rogers, Richwood, W. Va.
- W8QVK, Charles E. LeMasters, Canton, Ohio
- W8SU, Raymond C. Hagerty, Detroit, Mich.
- W8YLI, Robert Burnside, Flint, Mich.
- W8ZOO, Nolan C. Kelly, Hudson, Mich.
- W8ZQC, Fred A. Jones, sr., Olmsted Falls, Ohio
- W9ABR, Victor H. Knitter, Chicago, Ill.
- W9HLB, Howard F. Hinman, Chicago, Ill.
- W9ICY, Albert J. Titus, Anderson, Ind.
- W9OMA, Clarence Fabney, Polo, Ill.
- W9OXZ, Robert C. Hutchins, Preemption, Ill.
- W9TUC, Carl E. Lawson, Springfield, Ill.
- W9BSO, Donald C. Atherton, Cedar Rapids, Iowa
- K9LXK, Frank H. Eich, Omaha, Neb.
- K9PYG, Robert G. Claussen, Mankato, Minn.
- KP4KD, Everett W. Mayer, San Juan, P. R.
- VE1AEA, J. L. Blades, St. John, N. B., Canada
- VE3ATP, V. J. M. Hastings, Toronto, Ont., Canada
- VE3BZN, Fraser I. MacAdam, Sudbury, Canada
- VE3KM, T. W. Clemence, Hamilton, Ont., Canada
- VE3YR, George Crawford, Burlington, Ont., Canada
- VP1HA, Leopoldo H. Alpouche, El Cayo, British Honduras



Assembled on a 1-unit rack panel, W1PKC's modified "Little Oskey" makes up into a compact strip that should fit in well with other equipment. Perforated aluminum is used for top and bottom covers for the chassis.



Keying Monitor—Receiver Muter for Low-Level Blocked-Grid Keying

BY FRANK BLANCHETTE,* W1PKC

Plan view shows the arrangement of parts inside the chassis. The "Operate-Zero" switch is at the center in this layout.

Modified "Little Oskey"

"Oskey" has been a popular c.w. accessory, but in its original form it was limited to use with transmitters having cathode keying. Here's a method for adapting it to blocked-grid.

LITTLE Oskey¹ is an automatic switching monitor usable with any cathode keying system.

As originally described, it blocked the receiver output while injecting a sidetone, keyed with the transmitter, into the phones. The system is fine for use with cathode keying of one or more transmitter tubes. However, it couldn't be used here because the rig uses blocked-grid keying of a silenced v.f.o. in which a Class-A buffer stage following the oscillator is keyed.

A check of the voltage at the key showed that the blocking voltage for the Class-A stage was in the vicinity of -27 volts. Since this voltage was obtained through a high resistance between the negative supply and the grid, it was apparent that the slightest loading would reduce the voltage considerably. After the usual head scratching and some pencil pushing, the circuit shown in Fig. 1 worked out.

The Circuit

This arrangement uses the same receiver output switch and mixer circuits as "Little Oskey." The voltage tripler using the three 1N34s furnishes -25 volts to the cathode of the tone-oscillator tube, V_{2B} . The plate circuit of this

* 263 Bouchard Ave., Dracut, Mass.

¹ Campbell, "Little Oskey," *QST*, October, 1955; also, *The Radio Amateur's Handbook*, 1959 edition, keying chapter.

same tube receives a negative voltage through J_4 from the keyed stage. Any voltage greater than -25 will work satisfactorily. In my setup it is -27 volts, so while the key is up the oscillator plate is 2 volts negative, and when the key is pressed the plate circuit goes to ground, which is then 25 volts positive with respect to the cathode. This is sufficient to trigger off the oscillator.

The same -27 volts from the key is applied to the d.c. amplifier (V_{2A}) grid through the 2.2-megohm resistor. This grid voltage is sufficient to cause the voltage at the plate to be $+25$ volts with the key open, and when the key is pressed the plate drops to 15 volts. This voltage is applied to the grid of the switch tube, V_{1A} , whose cathode is held at $+26$ volts by a voltage divider from the $+140$ -volt line. Since the voltage excursion at the plate of V_{2A} depends upon the voltage actually present at the open key terminals, a 100K potentiometer, R_1 , is used to set the cathode of V_{1A} approximately 2 volts positive with respect to its grid.

When keying, the voltage at the grid of the switch tube drops sufficiently to cut the tube off, practically, and no receiver output can be heard. The response of both the switch tube and the oscillator is fast enough so that a signal breaking in can be heard even through a series of dots. When first using this circuit there was some difficulty with key clicks generated within the monitor itself, but these were effectively eliminated by employing two crystal diodes wired back-to-back across the headphone output as shown. No distortion was noticed with the receiver gain set for normal headset listening, and a by-product of this limiting is the elimination of static crashes and the like.

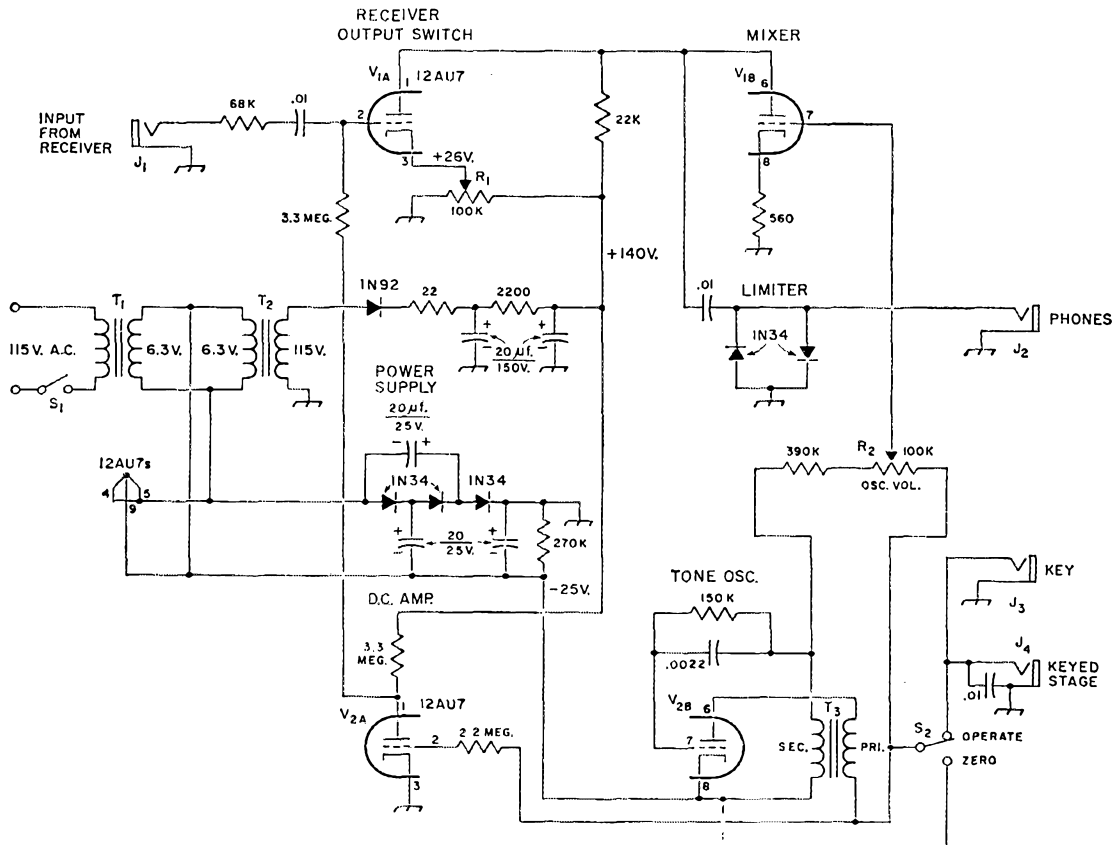


Fig. 1—"Little Oskey" circuit modified for use with grid-block keying. Capacitances are in $\mu\text{f.}$; resistances are in ohms, fixed resistors are $\frac{1}{2}$ watt.

J_1 – J_4 , incl.—Open-circuit phone jack.
 R_1 , R_2 —100,000-ohm potentiometer.
 S_1 —S.p.s.t. toggle.

S_2 —S.p.d.t. toggle.
 T_1 , T_2 —Filament transformer, 6.3 volts, 1.2 amp.
 T_3 —Interstage audio, secondary-to-primary turns ratio 2:1.

The "zero-operate" switch, S_2 , enables the operator to key the transmitter without triggering the Oskey. This is useful when the v.f.o. is being keyed while tuning it to a desired frequency. In the "zero" position S_2 disconnects the key from the monitoring circuit and applies -25 volts to the grid of V_{2A} , allowing the receiver to operate normally while keying the transmitter.

Construction

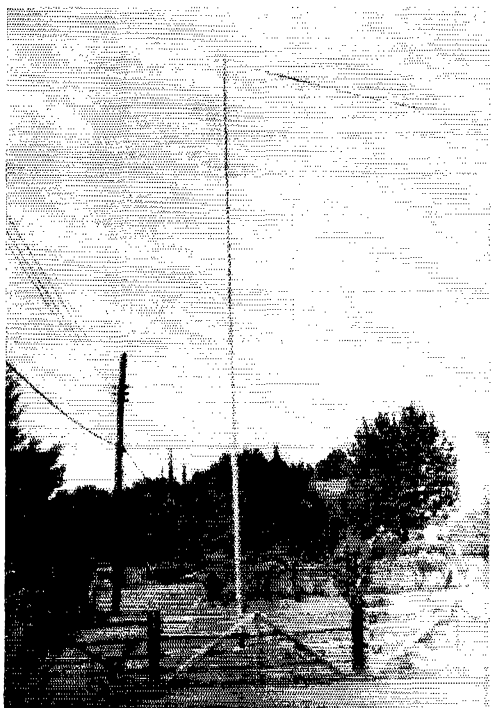
No particular precautions need be taken when building this unit except for keeping receiver signal leads away from a.c. leads. The writer built his unit in a standard $1\frac{3}{4}$ -inch relay rack panel, using a U-shaped chassis with screen top and bottom as shown in the photographs. J_3 is marked "Input" on the panel, and is for a

² Since the positive voltage is not especially critical, there appears to be no special reason why the power-supply circuit could not be simplified considerably and made more economical by using a "TV booster" transformer (typically 125 volts at 20 ma., and 6.3 volts at 0.6 amp.) in place of the two filament transformers. A voltage divider across the rectifier-filter output could be grounded at the proper point to give -25 volts for the bias circuit. This would eliminate one transformer and the separate rectifier-filter. — Editor.

plug from the blocked-grid stage. The cathode-set potentiometer, R_1 , may be placed on the rear chassis apron since it need be set only once, when initially placing the monitor in operation. The two power supplies used are essentially copies of the original version² with the exception of the 1N92 diode employed for the $+140$ -volt supply. The 1N92 was used here to conserve space; a low-current selenium rectifier would do just as well.

Using It

The jacks are practically self-explanatory: Receiver output is plugged into the "Receiver Output" jack, headphones into the "Phones" jack, and the key and keyed stage into their proper jacks. Turn the unit on and, using a 20,000-ohms-per-volt meter or a v.t.v.m., measure the voltage at the grid of V_{1A} . Next, adjust R_1 so that the voltage at the cathode of V_{1A} is one or two volts more than at the grid. With the receiver feeding a signal into the input, the signal should be heard in the phones. Key the transmitter and adjust the oscillator gain control for comfortable sidetone volume. QST



This clean-looking 37-foot mast is sturdy and can be put up with a minimum of effort. The two sets of guys are of nonstretching fiberglass rope.

The mention of rain downspouting will ring a bell for many an old-timer. However, few of the early-day models possessed the features described here that make the difference between a liability and an asset.

Making Use of Inexpensive Rainspouting

BY HENRY R. LENZ,* W3DVY

A Sturdy Lightweight 37-Footer

BEING from the school that believes that the best return in enjoyment for the amateur's dollar is in antennas, I have given a lot of consideration to antenna-construction problems. When I recently decided to change the location of my dipole, I was faced with the problem of putting up a new pole.

In considering various materials for pole construction, I ran the gamut of beer cans, irrigation pipe, wood A-frame, steel masts and other types. I finally came up with the rainspout idea. Since the material for the pole itself would cost me only about \$6.80, including taxes, I figured it was worth a try. The results have been extremely successful and, since the idea is somewhat novel, I thought perhaps other hams would like to know about it, so hence this article.

The antenna pole itself is made of four lengths of 4-inch round corrugated galvanized rainspouting. Galvanized spouting was selected over aluminum because of its higher rigidity, ease of soldering and lower cost. The construction employed results in amazing sturdiness, light weight, erection with ease, and low cost by most standards.

The spouting comes in standard 10-foot lengths with one end having deeper crimping than the other to facilitate joining two pieces together. The spouts as received can be joined together for about 3 inches with very little trouble. However, this does not provide sufficient rigidity for use as a pole. About one foot of

telescoping seems to be required. At first this presented a problem. The difficulty was solved by using a chain-type pipe wrench to deepen the crimping of the inner pipe. I am sure that



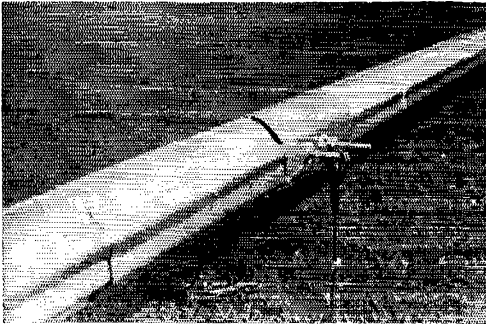
Steel fence posts are used as guy anchorages.

* 1938 Maplewood Ave., Abington, Penna.

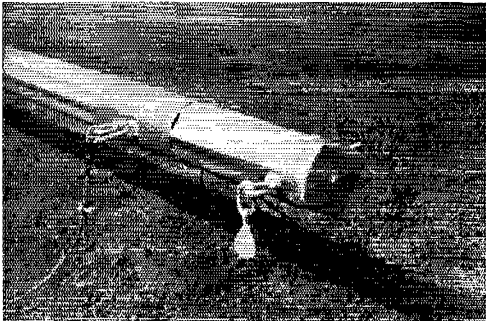
with some ingenuity other ways of getting these pipes together for about one foot can be found. The snugger the fit, the better the joint, of course. In addition to the telescoping, several sheet-metal screws were used to further secure the joint. The joint was then finished off by soldering. The heads of the sheet-metal screws were also soldered to prevent loosening by any vibration in the pole.

Just a couple of tips in making these joints. Most well-organized ham shacks are void of acid solder. It is well worth the time to procure some before attempting to solder the galvanized spouting. Another worthwhile thought for consideration when joining the 10-foot sections is to do it on a flat surface such as a cement sidewalk. This will help to prevent any bowing at the joint. Once the screws and solder have been applied, the joint can't be straightened. The inner section at each joint should always be the lower one to avoid seepage at the joint.

Two sets of guys and a pulley were attached with through eyebolts. These bolts can be pulled up tight without collapsing the spouting if a wood spacer is inserted in the pipe. A piece of 2 X 4 makes a snug fit and is ideal as a spacer. The holes for the eyebolts were drilled through the pipe and the 4-inch dimension of the spacer. A 3-foot length of 2 X 4 was also inserted in the bottom of the pole to provide a bearing for a pivot and pin used to anchor the pole. To provide for any possible weakening of the pole caused by the drilling, a piece of 9-inch-wide galvanized flash-



The mast is strengthened with an internal wood block and external band of galvanized flashing at the point where the guy fittings are attached.



The top of the mast is fitted with a cap to prevent rain seepage.

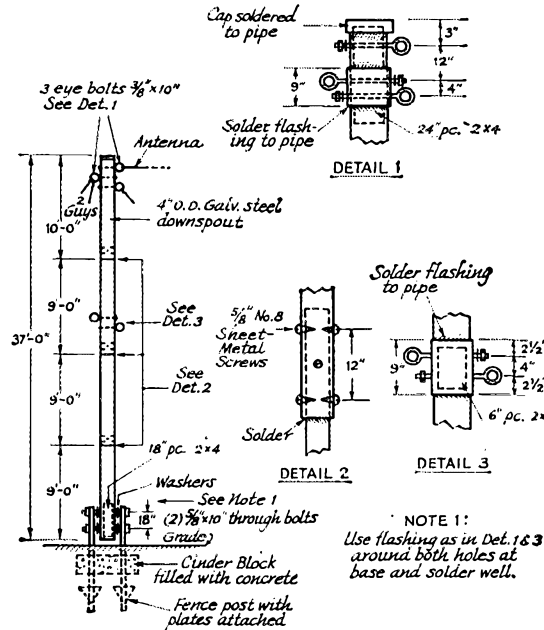


Fig. 1—Sketch showing details of assembly of the rainspout mast.

ing was soldered around the pipe, covering the area of the holes. This provides double metal and increased rigidity in this area. A tip at this point may be helpful. Use a piece of paper wrapped around the pipe to make a template for cutting the flashing, and use sheet-metal screws to hold the flashing in place while soldering.

I used two U-shaped 6-foot carbon-steel fence posts for the pivot pin. Other base supports could be used, of course, depending upon what is available. Each of the fence posts was driven about 3 feet into the ground through a pre-positioned buried cinder block. The hollow block was then filled with concrete. The guy anchors were also 6-foot steel fence posts, but of the T-shaped variety, and the same cinder-block technique was employed. All of the fence posts come with a steel plate welded near the base, which, of course, helps to keep the post from being pulled out of position by the strain of the guys. The cinder block also adds bearing surface to keep the anchors from changing position. All posts were coated with roofing compound between the cinder blocks and a point a few inches above the surface of the ground. The fence posts cost about one dollar apiece from a mail-order house.

For the guys, 500-pound-test plastic-covered fiberglass rope was selected. This material is easy to work with and since it is a good insulating material no other insulators are required. The fiberglass rope supposedly does not stretch, therefore turnbuckles were not provided to keep the guys taut.

Calculations were made which indicated that

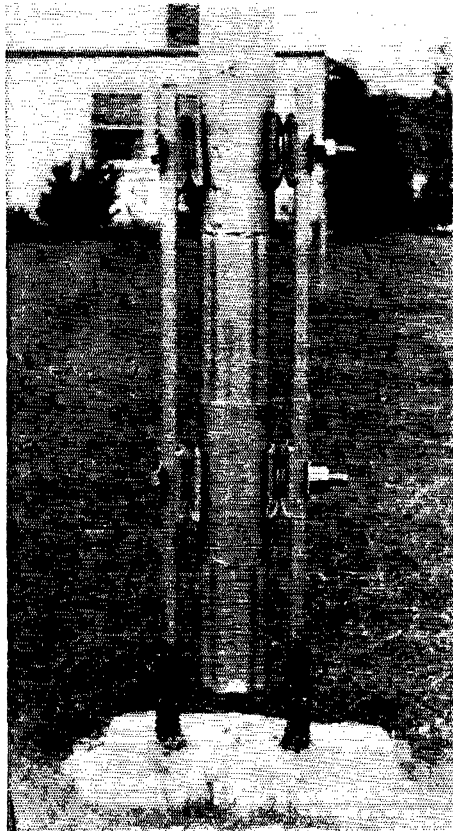
the installation will withstand winds well in excess of 100 miles per hour. Two days after the pole and antenna were installed, they were subjected to the over-60-mile-per-hour winds of Hurricane Donna with no damage resulting. As a matter of fact, the top of the mast barely moved in the strongest blasts.

The pole has sufficient rigidity so that when it was pulled up in position and pinned, it was self-supporting without the guys. However, guys certainly should be provided for a structure of this type.

Three persons pulled the pole into position within about 5 minutes after the pivot was inserted. The installation turned out to be a very simple operation because of the lightness of the pole.

The pole was finished off with a cap made from a left-over piece of flashing. A coat of aluminum paint dressed up the entire job.

With an occasional repainting, I anticipate a long and useful life from the pole. It should last at least until I get the bug to again change the antenna location.



This arrangement at the base of the mast provides "tilt-over" action. The supports are steel fence posts imbedded in concrete. The spacers between the supports and mast are utility-pole washers. Wood blocks or pipe flanges may be made to serve the same purpose. See text and Fig. 2 for a suggested insulating mounting if the mast is to be used as a 40-meter vertical radiator.

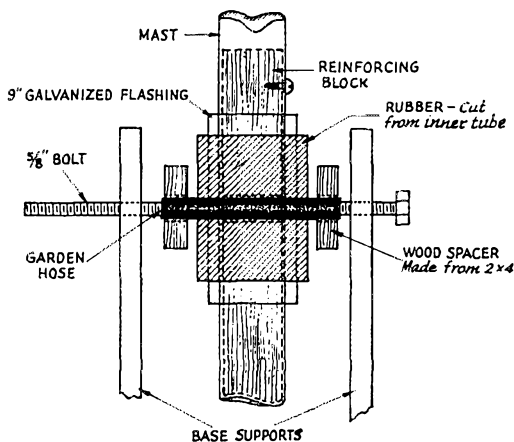


Fig. 2—Sketch showing method of insulating the base of the mast for use as a vertical radiator.

Insulating Mounting

The construction described can be modified quite easily to permit the pole to be used as a vertical radiator. Perhaps the simplest method is to use wood 2×4 s or 4×4 s instead of the fence posts for support. If it is desired to retain the metal support, refer to the sketch of Fig. 2. A length of garden hose is slipped over the pivot and anchoring bolts and the hole in the mast is drilled out to accommodate it. Since the wood block inside the pipe forms a broad bearing, there is no danger of cutting of the hose by the weight of the mast. A section of automobile inner tubing is drawn over the flashing reinforcing section, and wood spacers are used between the mast and the metal supports. The excess electrical length can be compensated for by a series capacitor at the base. As an alternative, the insulation can be dispensed with and the mast may be shunt fed as described by W9ERU¹. Either system, of course, requires a good ground connection close to the base of the mast.

QST

¹ "Hubbell." Feeding Grounded Towers as Radiators," QST, June, 1960.

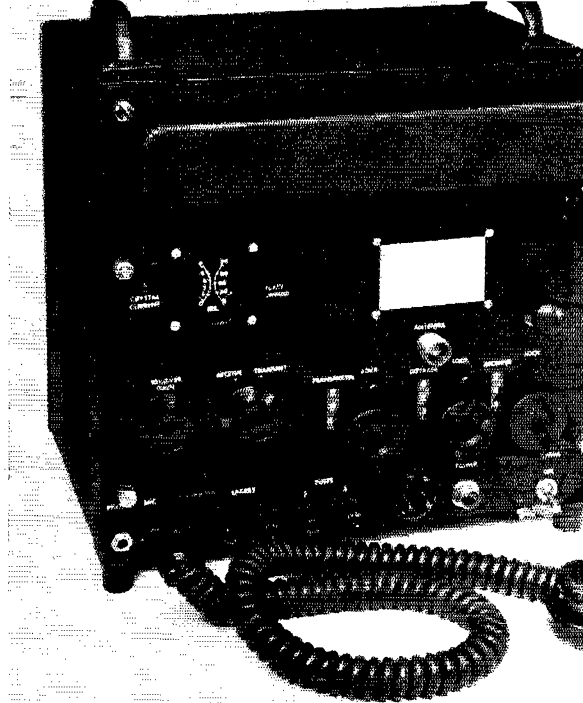
Strays

Nominations for the annual Cosmos G. Calkins Memorial Award must be mailed to the award committee before Feb. 28, 1961. The purpose of the award is to give recognition to that Michigan amateur who has performed the most outstanding public service for amateur radio in Michigan during the past year. The facts and all information on the services rendered by the amateur must be submitted in writing and countersigned by the officers of the sponsoring club or by three individuals submitting the nomination. Mail nominations for the award to the Central Michigan Amateur Radio Club, % Currin L. Skutt, W8FSZ, 119 N. Foster St., Lansing, Mich. The award is to be presented at the annual Grand Rapids gathering in April.

De luxe APX-6 conversion by W1CUT. The chart frame is mounted on a false panel that covers up many unused holes. Plate current and crystal current are monitored simultaneously with the dual meter at the left. Illumination for the counter dials is supplied by a hooded dial light at the right center of the panel. Push-to-talk operation is built in.

*Additional Conversion
Information for the APX-6,
Plus Antenna Ideas*

BY EDWARD P. TILTON,* WH1DQ



Practical Operating Hints for 1215 Mc.

RESPONSE to the APX-6 conversion article in September *QST* showed that the idea of getting started on 1215 Mc. for a few dollars and some fairly simple revamping of a surplus item is attractive to a good many hams. The enthusiasm of early APX-6 owners has also been a factor in the demand for more 1215-Mc. information. There's something about getting things rolling on 1215 that intrigues the newcomer, and brings nostalgic memories to the old-timer. It's rather like the early 5-meter days all over again.

Many people have asked us where to get APX-6 units. The picture changes frequently, so browse around in publications that carry surplus ads in quantity. There are thousands of the things around, we understand, but mostly in the surplus houses of the Los Angeles area. Several versions of the equipment have turned up; some with motor-driven tuning mechanisms, and one with two transmitter oscillators in parallel. We've seen the APX-6B and the APX-7, neither of which lends itself to conversion to amateur use as readily as the APX-6. We do not have detailed conversion information on any but the early model, used in the September *QST* article.

Some Conversion Hints

With many people doing the job, new ideas were bound to crop up after the first article went to press. One of the neatest conversions yet seen is the work of W1CUT, shown herewith. Laird made use of as many of the holes in the original unit as possible, and then fitted a panel to the drop front to cover others. A new black-crackle

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

paint job, white decals, and a calibration chart set off the appearance beautifully.

Handsome is as handsome does—and W1CUT's APX-6 has operating features, too. A dual meter (surplus) displays mixer crystal current and transmitter oscillator plate current. Carrying handles facilitate portable work, and a hooded panel lamp is a great aid in field work at night. Modulator and power supply are built in. Operation is push-to-talk, or by a panel control. Either way provision is made for opening the ground return from the crystal when transmitting, so that transmitter r.f. cannot make the crystal draw excessive current, regardless of the adjustment of the t.r. system. The 22-ohm resistor connected to the yellow lead internally in the APX-6 is removed, and connected through the send-receive switch, as shown in Fig. 1. A speaker is mounted on the cabinet wall, in back of one of the shielded ventilation louvres.

Earphone and microphone jacks are in the lower left corner of the panel. The a.c. line runs through the regular fuse equipment of the APX-6, and the spares have turned out to be mighty handy. The power connector was replaced by a standard a.c. fitting. A red-jewel pilot light and an a.c. on-off switch complete the line of "hole fillers" across the bottom of the unit.

Several who have converted APX-6s according to the procedure in the September *QST* article noted an error in a part number. Where R_{360} is mentioned in the section on receiver conversion the number should have been R_{380} .

And here's an idea from WA6GHW. Glen made his transmitter oscillator cover the entire band by

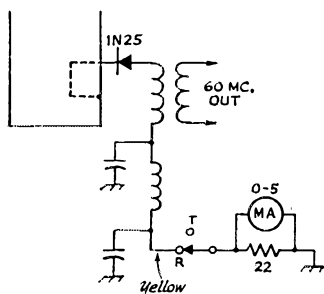


Fig. 1—Method of breaking the ground return to the APX-6 mixer crystal to prevent excessive crystal current when transmitting. The switch is a section of the send-receive control. The 22-ohm resistor is the one formerly connected internally.

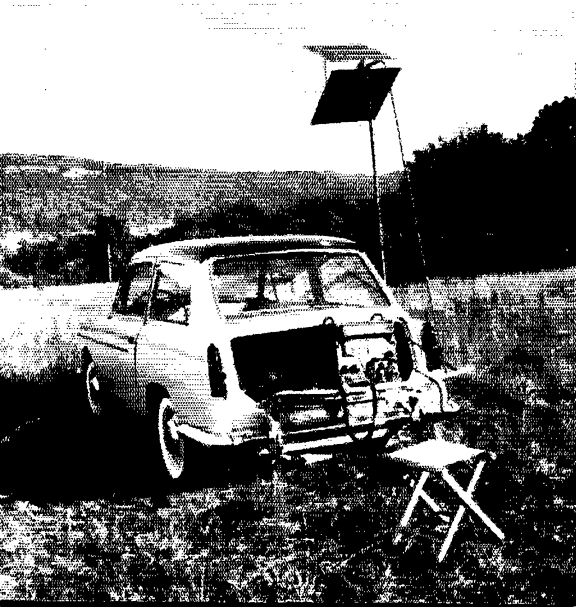
cutting off the tuning plunger a quarter inch. This may be a simpler matter than putting a false bottom in the plate cavity.

Antenna Ideas

Playing with the pint-sized antennas used on 1215 Mc. may turn out to be more fun than operating on the band, especially for amateurs who have been antenna experimenters on lower frequencies. As happened when we made our first 420-Mc. arrays in the ARRL Lab years ago, our 1215-Mc. antenna work generated plenty of kibitzing. Antenna principles stare you in the face when you work with "large" arrays of table-top dimensions, and everyone within sighting distance immediately wants to get into the act.

Demonstration antennas we've made thus far include long Yagis, a quad (driven element 2¼ inches on a side!), a rhombic 2 wavelengths on a leg, and a collinear array of 8 half waves in phase backed up by a plane reflector. Though the author is an old hand with antennas, he never fails to learn something from work with u.h.f. antenna models. What's more important, it's fun!

The W1CUT portable station, set up to bounce 1215-Mc. signals from the rocky sides of Talcott Mountain, in the distance. Corner reflector folds for flat carrying. A.c. power is obtained from a 12-volt inverter.



It is helpful to form the habit of thinking in centimeters rather than inches in this work, for

$$\lambda \text{ (cm.)} = \frac{30,000}{f \text{ (Mc.)}}$$

A half wavelength for the low end of the 1215-Mc band is about 12.3 cm., but how long is a half-wave dipole, or a director, or a reflector? Here we run smack into the *K* factor that you've seen (but probably ignored) in the *Handbook* and *Antenna Book* all these years. You may hear it said that "Yagis don't work at this frequency." Correct this to read "Yagis cut to *Handbook* dimensions without regard to length/diameter ratios don't work."

Beam elements for 10 to 20 meters usually have length/diameter ratios of 200 to 400, and common beam antenna designs are based on this. To keep in scale at 1215 Mc., we must use fairly fine wire for elements. Welding rod and other large-diameter conductors are usable, but the elements will be quite a bit shorter than you'd expect from low-band experience. Elements that run through a metal boom must be adjusted to take the effect of the boom into account, as the boom diameter will be a considerable percentage of the element length at this frequency.

The experimental Yagi shown here has No. 20 wire elements mounted on ¾-inch wooden dowels, supported on small wooden bases. With these movable elements you can make up Yagis that agree closely in performance and dimensional proportions with information in two classic *QST* articles dealing with long Yagi arrays.^{1 2} We use this model as a receiving antenna for demonstration purposes, with a 2-volt 60-ma. pilot lamp (No. 49) connected in the center of the dipole element for a visible indicator. Don't be upset by the strange length of this element — it was trimmed for maximum indication in the lamp, and its length takes the loading effect of the lamp into account.

Best results were obtained on 1220 Mc. with the following: reflector — 12.3 cm.; dipole with lamp — 14 cm. end to end, with 2 cm. additional in each half bent up to solder to the lamp; first director — 10.9 cm.; each director thereafter — 0.1 cm. shorter. As with the W2NLY-W6QKI experiments on 144 Mc.,³ tapered Yagis give slightly better bandwidth than those with all directors the same length, with hardly measurable difference in forward gain.

Long Yagis have not yet been tried by the writer in actual communication, so nothing has been done with feed methods for them. Tom Kirby, W1EUI, in an MS thesis at Northeastern University, made long Yagis for 2400 Mc. and fed both single bays and stacks, using the familiar delta match and balanced phasing lines. The stacks were fed at the midpoint of the system with coax and a detuning sleeve. He has since made up some beautiful 4-stack Yagi arrays for

¹ Kmosko and Johnson, "Long Long Yagis," *QST*, January, 1956, p. 19.

² Greenblum, "Notes on the Development of Yagi Arrays," *QST*, August and September, 1956.

1296 Mc., using welding-rod elements and copper-pipe booms and supports, in true plumber's delight style.

Corner-reflector systems are popular, and for good reason. They are uncritical as to dimensions, and they give nice clean patterns and reasonable gain over a wide frequency range. Corner-reflector arrays built by the writer and WICUT have sides roughly two wavelengths square, and a 60-degree corner angle. One of our photographs shows WICUT's portable job with folding sides. The corner angle is maintained by brass hinges of the type used for drop-leaf furniture, available in most hardware stores. One of the sides is bent so that when it is opened for use the reflector has a vertical surface about $1\frac{1}{2}$ inches wide at the vertex. This is backed up by a wooden block which takes the dipole assembly horizontally and a supporting pipe vertically.

A removable dipole assembly is shown in the third picture. A one-wavelength rigid section of coax was made from $\frac{7}{8}$ -inch copper tubing, with $\frac{1}{4}$ -inch tubing for the inner conductor. Standard $\frac{3}{4}$ -inch insulating spacers were used, one to each assembly, though suitable insulators can be cut from any reasonably good insulating material. At one end of the $8\frac{1}{2}$ -inch coax section a quick-disconnect (Amphenol Type C, UG-568/U) fitting is soldered in place. The flange was ground off even with the outer edge of the copper tube, for appearance sake. Dipole elements of $\frac{1}{4}$ -inch tubing were soldered to the end of the inner conductor, and the inside of the outer conductor, in a manner that should be clear from the picture.

The rectangular object slipped over the dipole coax is a detuning sleeve, made from flat pieces of flashing copper cut as shown in Fig. 2, bent and clamped to the coaxial line. It acts as a choke, to prevent r.f. from flowing on the outer conductor of the line, which would cause unbalanced radiation from the dipole. A similar sleeve was made in cylindrical form, $1\frac{1}{8}$ inches in diameter, from a single piece of copper. Because of its uniform spacing with respect to the dipole and its feed system, it seems to have a slightly more symmetrical pattern than the rectangular shape, though the difference is too small to show up in a practical way.

In practice, the dipole and its rigid coax mount are slid in and out of the corner assembly, until the position is found which gives the highest indication on a field-strength meter. When we obtained an s.w.r. measuring device that works on 1200 Mc. we found that the position of the

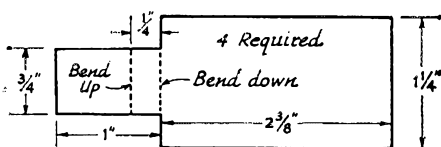


Fig. 2—Details of one side of the detuning sleeve for the 1215-Mc. dipole. Four such pieces are cut from flashing copper and soldered together to form the sleeve shown in the photograph of the dipole assembly. A similar arrangement can be made from a single sheet of copper, and bent into either cylindrical or rectangular form, if desired.

dipole which gives maximum field strength is not the same as the one that gives the best match. When the dipole is set for maximum gain in a 60-degree corner, the impedance is nearer 75 ohms than 50, so 75-ohm cable might give slightly better results where long runs are involved. If the coaxial portion of the dipole assembly is made one wavelength long, as in our design, 75-ohm coax with 50-ohm fittings should not create impedance-matching problems.

A Collinear Array with Screen Reflector

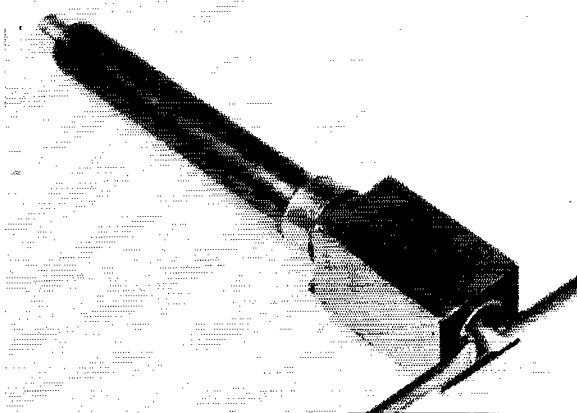
APX-6 enthusiasts of the Springfield area organized a mass-production job on collinear arrays. Carpentry and screen design were by W1RVW, electrical details by W1QWJ.

The array uses four bays of eight half waves in phase each, separated a half wavelength between element ends. The elements and phasing lines in each bay are made of welding rod, supported on $\frac{3}{8}$ -inch wooden dowels. Phasing lines between bays (A, B, C, D) are 300-ohm Twin-Lead, connected as shown in Fig. 4. Assuming an impedance at each bay of about 300 ohms, the midpoint between each pair is about 150 ohms. Here there are two Q sections of $\frac{3}{8}$ -inch tubing, with the spacing adjustable. These two Q sections feed Twin-Lead phasing lines (E, F) that run to the central feed point, where a combination detuning sleeve and coaxial Q section converts the balanced line to unbalanced coax, for the main run to the station.

The impedances do not need to be known exactly, provided that the operator has an s.w.r. bridge.³ The spacing of the tubes in the two Q sections is adjusted to give zero reflected power on the main transmission line. Be sure to keep the spacings of the two Q sections alike as this

³ Burhans, "U.H.F. Coaxial S.W.R. Bridge," *QST*, June, 1960, p. 30.

Dipole used with 1215-Mc. corner reflector arrays. The rigid coax is one wavelength long. Rectangular object at the dipole end is a detuning sleeve, to prevent radiation from the outer conductor. Dipole elements are $\frac{1}{4}$ -inch copper tubing, each 5.4 cm. ($2\frac{1}{8}$ inches) long.



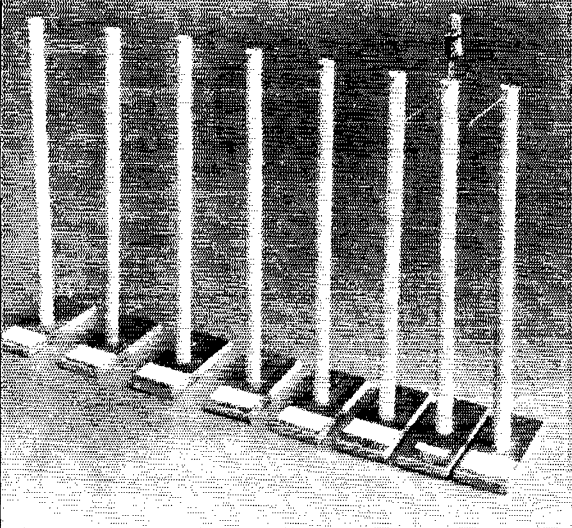


Table-top Yagi for 1215 Mc. Elements are No. 20 wire mounted on $\frac{3}{8}$ -inch wooden dowels. Effects of varying spacing and element length can be shown clearly with such a setup. Similar models of all types of arrays used on lower bands can be used effectively for demonstration of antenna principles and are fine radio-club program material.

adjustment is made; otherwise it may be possible to find a combination that provides a match, but does not radiate well. A precaution against this happening is to check the radiation from each bay with a field-strength indicator. With the pickup device close, it will be possible to see the pattern of one bay at a time, and the meter indication should be the same for each. At a greater distance out in front of the array the radiation combines into a single very sharp lobe.

Use of these screen-reflector arrays has made a tremendous improvement in 1215-Mc. results for W1QWJ and others. Several paths that were marginal with corner-reflector systems now show strong signals, and at least one path that was unworkable with the corners is solid with the big screens. The pattern with wide-spaced bays is very sharp, so continuous rotation and good control of position are required. TV rotators that move several degrees at a jump are out of the question.

Checking Antenna Performance

Commercial test gear for u.h.f. use comes high, so unless you have access to a laboratory you'll want to make your own. A field-strength indicator is a must, but it can be simple and inexpensive. The dipole-lamp combination used in our table-top Yagi is a start. Mounted on a stick, it can be held in the hand without too much effect on the indication. With 10 to 15 watts input to the APX-6, and a corner-reflector antenna of the type we've been talking about, a glow can be obtained in the lamp at distances of 2 to 3 feet away from the transmitting dipole. The 8-element table-top Yagi will pick up enough energy at 8 feet or more to give a bright glow in the dipole lamp. Squaring the ratio of the distances to the receiving dipole, for a corresponding brilliance indication, gives a rough indication of antenna power gain.

The lamp is good for rough adjustments, and for demonstrations, but fine adjustment calls for an indication that can be written down for record and comparison. The simple circuit of Fig. 3 will do it. The connecting wires from the r.f. chokes to the meter can be any length, so a remote-indicating device is a logical step. A 100-microampere meter is nice to have for this purpose, but ranges up to 1 ma. can be used by moving the pickup antenna closer to the power source.

Work on antennas should be done in a flat open area, preferably at least 50 feet across, and devoid of objects that can cause reflections. Tests made indoors nearly always suffer from the effects of walls, furniture, and the moving bodies of curious onlookers. A directive antenna for the indicator reduces these side effects but cannot eliminate them. Even the best amateur setup is unlikely to be entirely satisfactory for measurement purposes. A haywire arrangement in your basement, or on a table top at the radio club, will be lots of fun—but don't expect to settle antenna arguments involving meaningful numbers with it.

About Transmission Lines

Though almost any coaxial line has high losses in the u.h.f. region, it usually turns out to be superior to any form of balanced line. Possibly a carefully-made transmission line using large conductors, close spacing, and a minimum of bends would be the answer, but don't expect good performance from any kind of cheap-and-easy balanced line. Radiation and insulation losses run up alarmingly with any of the stuff commonly used for TV work.

Inexpensive coax will have at least 4.5 db. loss for a 50-foot run, at 1215 Mc. This means that you will have no more than one-third of your transmitter power left at the antenna end, even if you achieve a perfect match—but if the 50 feet of line is not wasted in horizontal runs even this loss may not be too bad. On this band losses due to absorption by tree foliage, buildings and other obstructions may be far higher than line losses, so getting the array up in the clear will almost certainly pay off in improved coverage, even if you must use some-

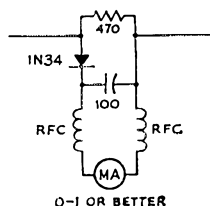


Fig. 3—Field-strength indicating device for use with the APX-6 in antenna work. R.f. chokes are a few turns of wire on $\frac{1}{2}$ -watt resistors. Leads from these to the meter can be any length, permitting the pickup device to be set up remote from the operating position. Dipole length should be trimmed for maximum meter reading. Parasitic elements may be added for greater sensitivity.

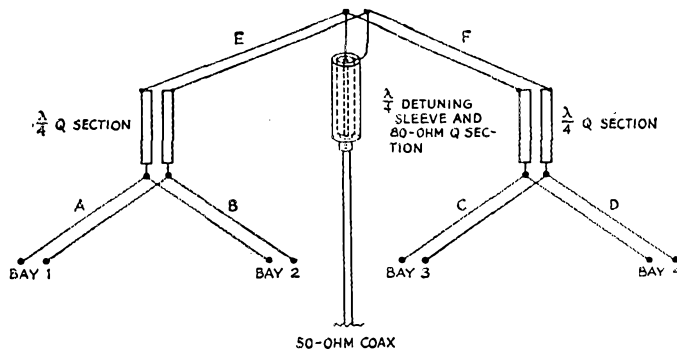


Fig. 4—Details of the feed system used on a 4-bay collinear array by W1QWJ. A, B, C and D are Twin Lead phasing sections each $1\frac{1}{2}$ wavelength ($11\frac{1}{2}$ inches) long. E and F are the same material $1\frac{1}{2}$ inches (2 wavelengths) long. The two parallel-bar Q sections are $1\frac{1}{2}$ -inch brass tubing, $2\frac{3}{8}$ inches long, about 1 inch center to center. At the midpoint of the phasing system is a coaxial balun and Q section. The outer sleeve is $1\frac{1}{2}$ -inch copper pipe, set into a matching pipe cap. The inner sleeve is $3/8$ -inch copper pipe, and the center conductor is $1/8$ -inch. The small tubing is connected to the inner conductor of the coax, while the $3/8$ and $1\frac{1}{2}$ -inch pipes form a quarter-wave line, shorted at the bottom end, and connected to the braid of the coax. The assembly is $2\frac{3}{8}$ inches long.

thing like RG-8/U. RG-17/U is much better, and there are several types of coax now being made that are as good, or better. These are expensive on a cost-per-foot basis, but if you look at them in terms of the cost-per-watt in the antenna, they may make real sense.

You can't judge coax by its price, however. The writer is the proud owner of a 150-foot coil of $3/8$ -inch copper-tubing coax, which has a $1/4$ -inch inner conductor mounted in ceramic beads. We'd been saving it for a deluxe u.h.f. installation for some time, but upon trying it on 1215 Mc. we found that it was a perfect attenuator. A 50-foot section that shows excellent characteristics at 50, 144 and 220 Mc. passes no measurable r.f. on 1215! We understand that it has a similar quality on 432 Mc. W1FZJ tells us that some years ago he and W8WJC got nowhere with the same stuff on that band.

The best coax can be ruined by the wrong fittings. The so-called "u.h.f." connectors definitely

are not for 1215 Mc. Only the constant-impedance fittings (series N, HN, C, Improved BNC, and LC) are suitable for use at this frequency, in applications where a high standing-wave ratio is harmful.

Thanks, Men!

Getting started on a new band is necessarily a cooperative venture. No matter how much work one person does, it goes for naught if someone else isn't around to talk and work with. We were fortunate in having a group of v.h.f. enthusiasts in the Connecticut Valley who quickly became u.h.f. enthusiasts when the APX-6s appeared on the scene. Many hams in the Springfield and Hartford areas have contributed to the success of our 1215-Mc. project. Their help is gratefully acknowledged. Without fellows like W1QWJ and W1CUT, particularly, it is unlikely that our 1215-Mc. ground-breaking would have been very productive.

QST-

Strays

Hey! Hot dope for the DX contest. The Navy has given its blessing (thanks to the Director of Naval Communications, Adm. Frank Virden) to a DXpedition which will journey over to Kure Island from Midway in order to participate in all sessions of this year's ARRL DX contest. Four officers and four enlisted men, led by KM6BQ, are using up some of their leave time, and paying all their own expenses, in order to provide what appears to be a "first." FCC has been asked to assign a special call sign, and while it is the policy of ARRL's DXCC Committee never to announce new country status of such a remote spot in advance of actual on-the-air operation, a word to the wise should be sufficient. During the c.w. sessions, look for Kure Island on 7025, 14,050,

21,050, and 28,050 kc. During the phone week ends, the gang will be operating sideband on 7205, 14,300, 21,400, and 28,650 kc.

Newest aluminum solder to come to our attention is TIN-A-LUM, and it is certainly among the best we have used. It can be worked with an ordinary soldering iron, and requires no flux with aluminum and its alloys. (Ordinary fluxes are required for copper, brass and ferrous metals.) The soldered joints showed good strength in the tests we made soldering aluminum to aluminum and copper to aluminum. Production Metals, Inc., 299 Pavonia Avenue, Jersey City 2, N.J., are sales agents for the new solder.

S.C.F.M.—An Improved System for Slow-Scan Image Transmission In Two Parts*

Part II—Circuit Details

BY COPTHORNE MACDONALD,** WA2BCW

Last month author Macdonald described the tests which proved subcarrier frequency modulation (s.c.f.m.) superior to subcarrier amplitude modulation (s.c.a.m.) for slow-scan facsimile work. Here are the circuits he used to generate and receive s.c.f.m. signals.

THE equipment used for the s.c.a.m. portion of the slow-scan tests reported last month was that described in the August and September, 1958, issues of *QST*¹. Slight modifications were made to the sweep circuits to give the proper sync pulses and sweep durations. For transmission and reception of s.c.f.m. signals, an "outboard" s.c.f.m. modulator and demodulator was added.

The Modulator

The s.c.f.m. modulating circuitry shown in Figs. 1 and 2 is quite simple in operation. Basically, the flying-spot scanner video output varies the frequency of a multivibrator oscillator by varying the voltage to which the multivibrator grid resistors are connected. V_{2A} is a cathode follower which converts the high-impedance output of photomultiplier tube V_1 to a lower impedance and at the same time limits the upper and lower frequencies of the multivibrator to preset limits. This is done by limiting the possible range of

* Part I appeared in *QST* for January, 1961.

** Westinghouse Electric Corporation, P. O. Box 284, Elmira, New York.

¹ Macdonald, "A Narrow-Band Image Transmission System," *QST*, August and September, 1958.

voltage swing at the cathode of V_{2A} .

Let's look at the extreme cases: If no light falls on the photomultiplier tube, there will be little or no voltage drop across load resistor R_1 . The V_{2A} grid and cathode voltages will then closely approximate the voltage at the arm of the white frequency potentiometer, R_2 , and they can be no higher. With considerable light on the 931-A, a large drop will exist across R_1 , and the V_{2A} grid voltage will drop to almost zero. Due to the V_{2A} cathode circuit voltage divider, of which black frequency control R_4 is a part, the cathode voltage cannot fall below a preset value regardless of the drop across R_1 .

During the period between sync pulses, V_{4A} conducts and V_{4B} is cut off. Under these conditions, the voltage at the grid of V_{2B} tends to approach the V_{2B} plate voltage, producing a situation where there is little voltage drop across V_{2B} . The video output of V_{2A} is thus used to swing the V_3 grid resistor return voltage between the preset limits—these being chosen to give 1500-c.p.s. output at the black limit and 2300 c.p.s. at the white limit. When negative sync pulses are applied to the grid of V_{4A} , V_{4B} conducts and pulls the grid of V_{2B} to a low voltage. Then the V_3 grid resistor return voltage settles at a value determined by the divider which contains the sync frequency potentiometer, R_3 . Multivibrator output is 1200 c.p.s. under these conditions.

When the multivibrator grid resistors, R_5 and R_6 , are returned to a high d.c. potential, the feedback capacitors, C_1 and C_2 , discharge rapidly and give a high oscillation frequency. When the return voltage is reduced, the discharging occurs at a slower rate, and the oscillator frequency goes down. The audio output from the multivibrator

The author's s.c.f.m. adapter is built on a $3 \times 4 \times 17$ -inch chassis. In this view the modulator is on the right. V_4 and V_2 are at the extreme end, and the three knobs are on the sync-, black- and white-frequency potentiometers. V_3 is next to the sync-frequency pot. From right to left along the side panel are a phono jack for applying the signal from the photomultiplier tube, output jack J_1 , a potentiometer which is not used, a power switch and a jack for feeding the s.c.f.m. output of the receiver to the demodulator. The three chokes nearest the middle of the chassis are part of the band-pass filter used in the s.c.f.m. tests. The demodulator tubes, from left to right, are V_7 , V_6 and V_5 . The knob for gain control R_7 is between V_7 and V_6 , and the low-level output jack, J_3 , is near the bottom corner. T_1 and T_3 are next to V_6 and V_5 , respectively, L_1 and L_2 , the discriminator coils, are on the front side of the chassis. Power connections are made to the terminal block, and the leads coming out the lower corner carry video output and sync output and input, T_2 , L_3 , and their associated parts are mounted on another chassis next to the monitor cathode-ray tube.

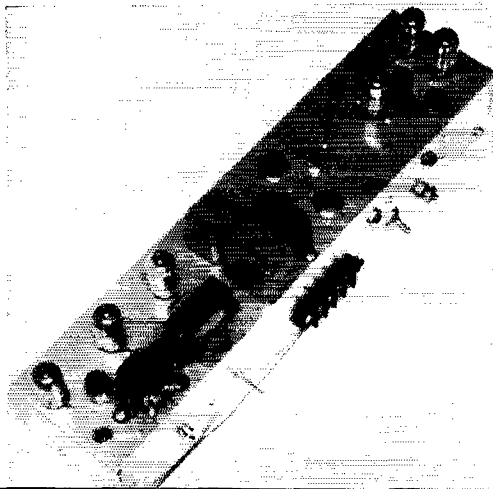
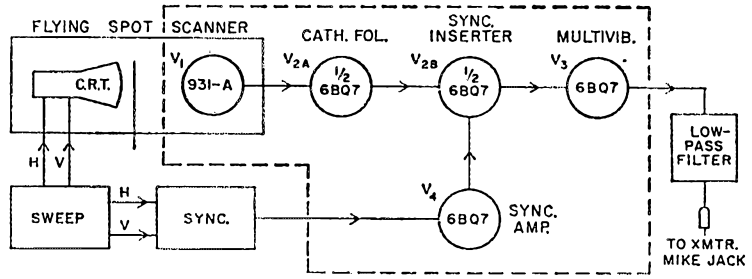


Fig. 1—Block diagram of the subcarrier f.m. slow-scan generator. The circuits included within the dashed enclosure are diagrammed in Fig. 2. CRT, sweep, and sync circuitry is essentially the same as described in the author's earlier article.



is coupled from one of the plates through capacitor C_3 .

It should be noted that the multivibrator output is rich in harmonics which must be suppressed. A low-pass filter which attenuates frequencies above 3 kc. should be used between the multivibrator and the transmitter modulator. With a.m. transmitters already incorporating low-pass audio filtering and with some filter-type s.s.b. transmitters, all audio frequencies above 3 kc. are suppressed within the transmitter itself. With these transmitters the extra audio filter is not required.

Adjustment is simple. Pin 7 of V_{2B} is temporarily connected to ground, and the sync frequency control is set to give 1200-c.p.s. output. Pin 7 is then ungrounded, and Pin 2 of V_{2A} is temporarily grounded. The black frequency con-

trol is then adjusted until the output frequency is 1500 c.p.s. Next, Pin 2 of V_{2A} is ungrounded, and the 931-A is placed in darkness. The white frequency control is then adjusted to produce 2300-c.p.s. output. In operation, the 931-A voltage and/or the CRT brightness is adjusted to produce a pleasing balance between black and white in the slow-scan monitor picture.

A source of standard frequencies may be a concern to those who do not have access to a calibrated audio oscillator. Since 1200 c.p.s. is exactly one octave higher than the 600 c.p.s. transmitted by WWV during certain periods, the two can be compared by ear or with a scope. The white and black frequencies do not have to be set with any great accuracy, and a piano or other musical instrument, can be used to advantage. $F\#_5$ is 1480 c.p.s., and D_6 is 2349 c.p.s. if the

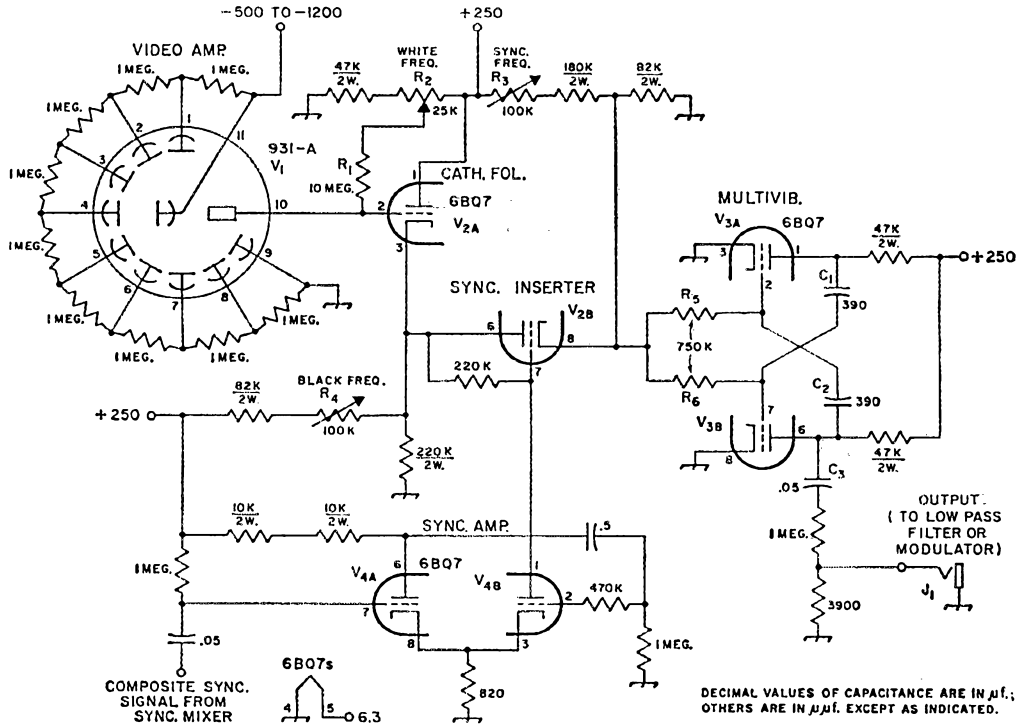


Fig. 2—Circuit diagram of the outboard s.c.f.m. modulator. Signal polarities are correct for using a photographic negative as the image source. Unless otherwise indicated, resistances are in ohms, and fixed resistors are 1/2 watt. Variable resistors are 2-watt composition potentiometers. Capacitors may be paper, mica, or ceramic, as available.

J1 is a microphone-type connector; other component designations are for text reference.

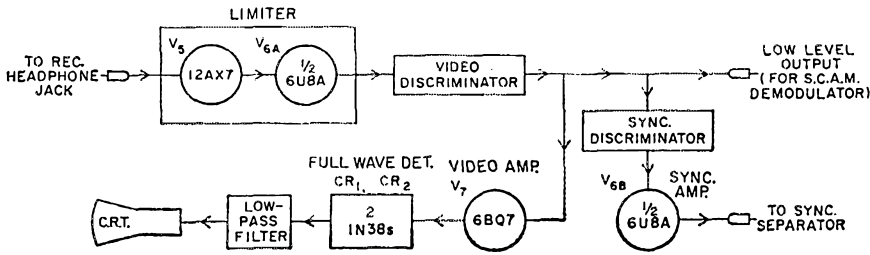


Fig. 3—Block diagram of the demodulator used for subcarrier f.m. slow scan.

instrument is tuned to the standard pitch where A is 440 c.p.s.

The Demodulator

The complete s.c.f.m. demodulator is diagrammed in Figs. 3 and 4. V_7 , CR_1 and CR_2 and their associated circuitry can be eliminated if the unit is to be used as a converter for an existing s.c.a.m. receiver. In this application, the s.c.a.m. receiver is plugged into the low-level output jack.

V_{5A} , V_{6B} and V_{6A} are limiter amplifiers which remove variations in the amplitude of the received tone produced by fading or other causes. The output of V_{6A} is fed to a low-pass type of discriminator having the output *vs.* frequency

characteristic shown in Fig. 5. The L_1C_4 parallel combination resonates at 2300 c.p.s. and has a high impedance at that frequency. At frequencies below 2300 c.p.s., the impedance is proportionately less. The output of this filter, then, is a tone whose amplitude varies inversely with frequency. This tone can be handled in the same manner as s.c.a.m. to reproduce the original video. The discriminator linearity is not perfect, but it produces very satisfactory results.

As mentioned above, the discriminator output can be taken off through J_3 and fed to an s.c.a.m. demodulator. Alternatively, the signal is amplified in V_7 and applied through isolating transformers T_1 and T_2 to a full-wave detector. The

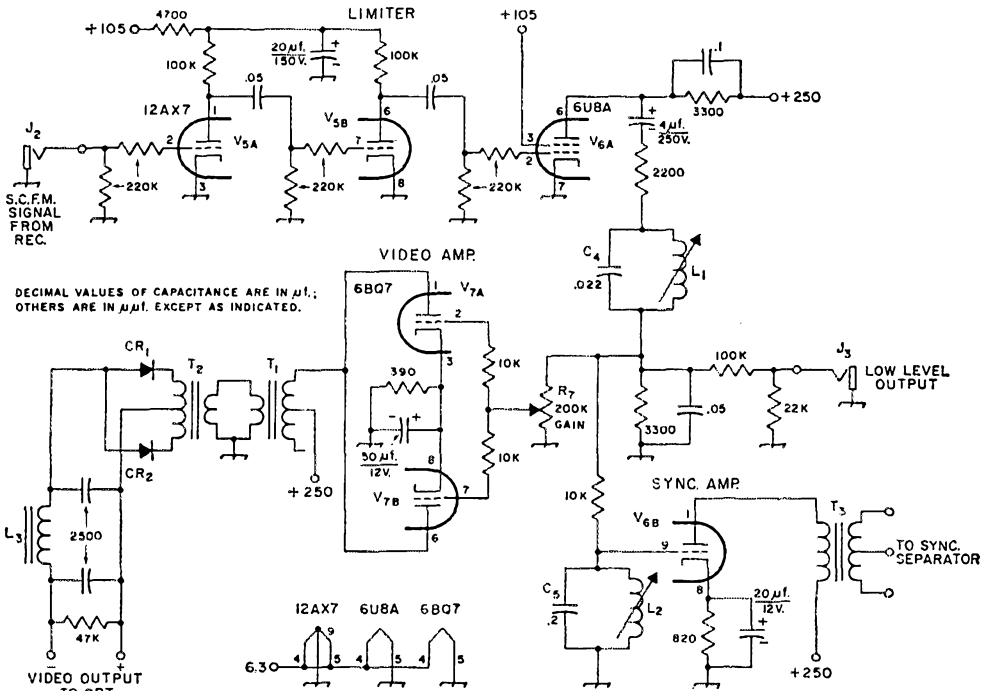


Fig. 4—Circuit diagram of the s.c.f.m. demodulator. Unless otherwise indicated, resistances are in ohms, and fixed resistors are 1/2 watt. Capacitors marked with polarity are electrolytic; others can be paper, mica, or ceramic.
 C_4 —0.022- μ f. paper, mica or ceramic.
 C_5 —0.2- μ f. paper.
 CR_1 , CR_2 —Germanium diode (1N38, 1N39B, etc.).
 J_2 , J_3 —Microphone-type connector.
 L_1 , L_2 —45-215-mh. 130-ohm TV width control (Stancor WC-14). L_1 used with slug fully inserted.
 L_3 —12 henrys, 20 ma. (Thordarson 20C52).
 R_7 —200,000-ohm control, audio taper.
 T_1 , T_2 —Audio output transformer, p.p. plates to voice coil (Thordarson 24S60).
 T_3 —Audio interstage transformer, 1:3 ratio (Thordarson 20A19).

output of the detector is fed to the CRT grid through a low-pass filter which passes 0-1000 c.p.s. but removes the ripple from the waveform.

Since the video discriminator output is appreciably higher at 1200 c.p.s. than at 1500 c.p.s., the sync could be separated at this point. To secure maximum immunity to noise and QRM, however, a narrow-band sync discriminator is used. The bandwidth of the L_2C_5 tuned circuit which forms this discriminator is only about 300 c.p.s. at the 3-db. points (see Fig. 6). Because of this narrow bandwidth, the 5-millisecond bursts of 1200-c.p.s. tone which are used for horizontal sync build up to maximum amplitude in the tuned circuit just before the end of the burst. This gives sync triggering on every burst along with a small noise bandwidth.

The only adjustment required is setting the sync discriminator frequency. This can be done by feeding a 1200-c.p.s. tone into the limiter and adjusting the slug in L_2 to give maximum output at the secondary of T_3 .

Construction and Use

The s.c.f.m. modulator is slightly less complex than its s.c.a.m. counterpart, while the demodulator is slightly more complex. Both s.c.f.m. circuits use inexpensive, readily-available components, and both can be fitted into a 10 X 4-inch chassis area. No special layout or constructional

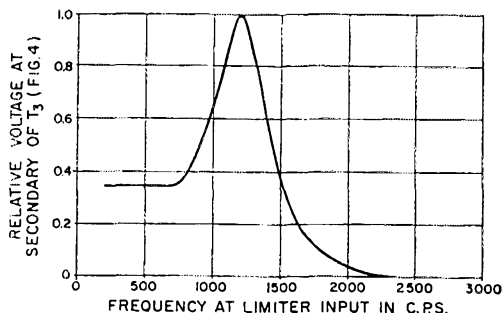


Fig. 6—Output vs. frequency characteristics of the sync discriminator used to separate the 1200-c.p.s. sync bursts from the composite signal.

precautions are required beyond those normally employed in audio-amplifier work.

A few comments should be made about the communications receiver and the method of tuning. The i.f. bandwidth should be such that modulating frequencies from 1000 to 2500 c.p.s. are reproduced at close to the same amplitude by the receiver. For example, when a.m. transmissions are being received, the receiver i.f. bandwidth should be about 5 kc. for optimum results. If less than 5 kc. is used, important modulating frequencies will be lost; if very much greater than 5 kc. is used, the noise and interference problems get worse just as in the case of phone reception. If selectable sideband reception of a.m. or s.s.b. is used, an i.f. bandwidth as narrow as 1.5 kc. can be used to advantage if the receiver is tuned so that all significant frequency components fall within the i.f. pass band. The carrier insertion frequency in s.s.b. reception can be adjusted either during a voice transmission or by tuning the injection oscillator frequency for maximum sync pulse output as viewed on a scope or "magic-eye" tube connected across the secondary of T_3 .

If a receiver with a very wide i.f. bandwidth is used, an audio filter having a response characteristic such as shown in Fig. 4 of Part I of this article will cut down QRM and QRN when used between the receiver output and the slow-scan limiter input.

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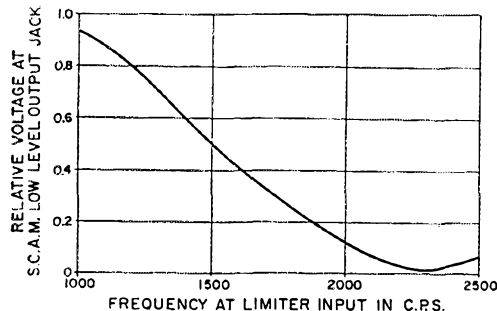


Fig. 5—Output vs. frequency characteristics of the video discriminator which converts the received s.c.f.m. signal to s.c.a.m.

Strays

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The DL1FK Compact Multiband

Beam Antenna

BY RICHARD AUERBACH,* DL1FK

The short beam with loaded elements still remains the sole solution for a multitude of hams who want a directive antenna for DX work without exceeding restrictions on space or violating aesthetic sensibilities. This one is light yet rugged, and employs a unique method of band shifting.

FOR the average amateur, the assembly of a full-size rotary beam for the high-frequency bands presents problems that are not easily solved. Even when suitable space is available, and there are no other restrictions to circumvent, there is a natural inertia to overcome because of the mechanical difficulties and expense involved. This is true especially if it is necessary to put up a separate antenna for each band. It is therefore quite understandable that there has been much interest in the various forms of single compact beam antennas capable of three-band operation. Antennas of this type, usually being full-size for 10 and 15 meters, have given very good results on these bands, and any disadvantages that may be inherent in some types of "short" beams when operated on 20 meters have not been too apparent during the now-ending period of increasing and decreasing sunspot maximum.

The author has tried many of the suggested designs of the so-called miniature triband beam,

* Octaviostrasse 21, Hamburg-Wandsbek, Germany.

and has thoroughly examined their respective advantages and disadvantages. The upshot of all this investigation has been the development of a new-style three-band beam which does much to eliminate electrical drawbacks of, and improve the performance over, some other constructions. In addition, much thought has been given to the mechanical design with the result that such a three-band beam antenna can be made light enough to be easily handled, and turned readily by a small TV rotator. Yet it is strong enough to resist the onslaught of weather that has persistently caused damage to other heavier designs, so that they had to be given up.

The Driven Element

The electrical design is shown in Fig. 1. The physical length of the driven element (A) is approximately $\frac{1}{2}$ wavelength for 15 meters. End loading is used for 20 meters in preference to center loading so that the resistance of the loading inductor will not be at a high-current point. On 10 meters, the driven element operates

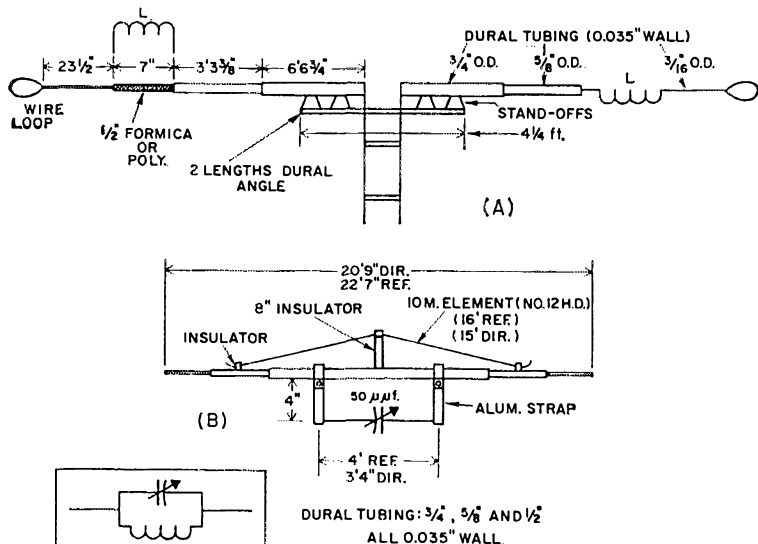


Fig. 1—Sketch showing details of the driven element (A) and parasitic elements (B) of the DL1FK 3-band beam antenna. The equivalent of the 15/20-meter parasitic elements is shown at the lower left. Wire loops at the ends of the driven element are approximately 4 inches long.

DL1FK's 3-band compact beam may be easily roof-mounted by one man. A short section of slack feed line between the feed point and an anchor on the mast permits rotation.

as two half waves in phase with a theoretical gain of possibly 2 db. over a half-wave element. On 15 meters, the two sections also operate in phase, but since they are less than one-half wavelength long, the gain over a dipole will be slight. While some matching system might be devised for feeding the driven element with low-impedance coaxial line, the use of a tuned open-wire line is by far the simplest, and losses are minimized.

Parasitic Elements

A unique part of the design lies in the parasitic elements, Fig. 1B.¹ The physical lengths of these elements are also approximately those suitable for director and reflector for 15 meters. On 20 meters, the capacitor and the loop formed by the center section of the antenna, and the capacitor connecting leads comprise a tuned circuit on which the end sections are tapped. The end sections being less than one-half wavelength long present a capacitive reactance as viewed by the tuned circuit. This reactance is nullified by adjustment of the capacitor which tunes the combination to resonance at 14 Mc.

On 15 meters, this tuned circuit will have a net capacitive reactance, shortening the electrical length of the element. To compensate for this, the physical length is extended as necessary over that normally used for 15 meters.

Separate parasitic elements are used for 10 meters. These also serve as mechanical bracing for the lower-frequency elements, as shown in Fig. 2B.

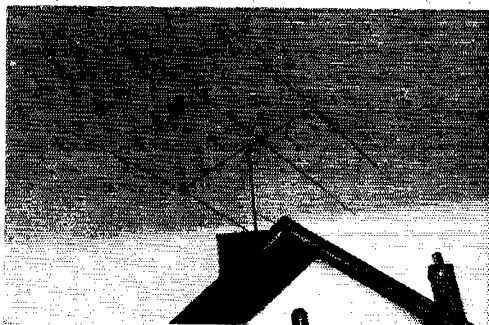
The element spacing is a compromise — 5 feet for the directors and 8 feet for the reflectors. This results in director spacings of approximately 0.14, 0.1 and 0.07 wavelength, and reflector spacings of 0.23, 0.17 and 0.12, respectively, for 10, 15 and 20 meters.

Construction

Essential dimensions are given in Fig. 1. The thin-wall tubing used for the elements has a tendency to yield in the face of a strong wind and, although the swaying and shaking of the elements in severe gusts looks dangerous, I have had no trouble with breakage of the elements or damage to the gears of the rotator. In cutting the tubing sections to length, an allowance of several inches should be made for telescoping at the joints. At each joint, the tubing should be slit lengthwise for a short distance, and the joint made secure with a clamp. The coils *L* each have 6 self-supporting turns of No. 12 wire, 1½ inches in diameter, turns spaced out to a coil length of 4 inches. The element is broken by a short section of insulating rod at the points where the coils are inserted.

The boom is 13½ feet long and consists of

¹German patent application A30652-A12438GM.



two parallel lengths of 1-inch dural tubing spaced 5 or 6 inches. Clamps, such as shown in Fig. 2A, may be used every foot or so to maintain the spacing and provide cross bracing. As an alternative, the members might be bolted together with spacers between.

The boom is attached to the rotator by clamping it between a pair of rectangular dural plates, as shown in Fig. 2B. A short length of tubing that will fit the rotator socket is welded to one plate.

When using a light rotator, it is important that the rotator be mounted at the top of the supporting mast with only the short stub of Fig. 2B between the rotator and the antenna. Any slight vertical force at the ends of the boom arrives at the bearings of the rotator greatly magnified through lever action which increases as the distance between the rotator and the boom is made greater.

The position of the mounting on the boom should be adjusted to distribute the weights evenly on the two sides. The weight of the length of transmission line necessary to cover the distance between the feed point and the mast, with allowance for slack, should be included. The parasitic elements may be bolted or clamped directly to the boom, making sure that this is done at the exact center of the element. The mounting for the driven element is attached to the boom in the same manner.

The tuning capacitors for the parasitic elements should be enclosed in weather-tight plastic boxes attached to the boom. The connections between the capacitors and the clamps are made of antenna wire.

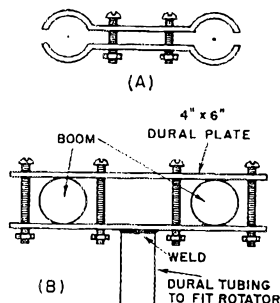


Fig. 2—Sketches showing a boom-spacing clamp (A) and arrangement for mounting the boom on the rotator (B).

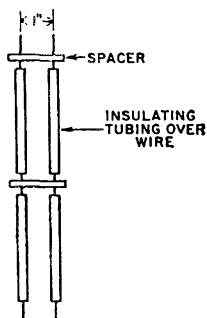


Fig. 3—This sketch shows details of DL1FK's open-wire line. Flexible antenna wire is fed through spacers and sections of insulating tubing. No fastening is necessary.

10-Meter Elements

The 10-meter parasitic elements are made longer than needed at first. Anchor one end at one of the insulators with several inches of wire extending beyond the insulator. Run the other end of the element wire through or around the insulator and bring enough tension to bear so that all sag disappears when the element is balanced at the center. The excess length of wire beyond the insulator may be snipped off a little at a time (or rolled up) as necessary to tune the element.

The complete assembly, including rotator and a short roof-type mast, can easily be handled by one man.

Transmission Line

Although the lower losses of open-wire transmission line as compared to coax, even when the coax line is matched, are well recognized, many constructors prefer to use coax cable because of the mechanical difficulties involved in applying open-wire line to a rotating beam antenna. The author made his own open-wire line of flexible antenna wire, as shown in Fig. 3. Between spacers, which are about 12 inches apart, the wire is covered with 1/4-inch insulating sleeving. The spacers are drilled for the wire and no fastening to the wire is necessary, since the tubing keeps the spacers in place on the line. This open-wire line has been in service at DL1FK for over five years and has suffered no damage in banging against roof tiles, gutters and other obstructions.

Adjustment

Since the transmission line is tuned, no adjustment of the driven element is necessary. The parasitic-element tuning may be done with the antenna elevated 10 feet or so above ground, if it is impracticable to do it at higher elevation. Approximate resonant frequencies for the parasitic elements are as follows:

Operating f	Director	Reflector
28,400 kc.	29,400 kc.	27,600 kc.
21,250 kc.	21,700 kc.	20,800 kc.
14,250 kc.	14,550 kc.	13,950 kc.

The parasitic element lengths should initially be slightly longer than the dimensions given in Fig. 1B. The reflector is adjusted first, and then the director. The capacitor should be adjusted for the 14-Mc. band, then the over-all length adjusted for the 21-Mc. band. After each adjustment at 21 Mc., the capacitor should be retuned for 14 Mc. After the 15/20-meter elements have been tuned, the 10-meter elements may be pruned. In doing this, I simply wound the ends of the wire up on an insulated screw driver. In this way, the length of the element can be easily increased again by unwinding if it is found that it has been made too short.

When the resonant frequencies begin to approximate those given above, the final adjustment should be made with a field-strength meter, checking for minimum backward radiation, since this indication is sharper than the forward radiation. Adjustment of the capacitor will be found to be quite critical. In making the f.s. measurements, care should be taken to keep the transmitter output coupling or tuning adjusted for constant input to the transmitter.

In coupling the line to the transmitter, I use a separate antenna coupler for each band, fed with low-impedance line from the transmitter. The couplers are adjusted for the lowest s.w.r. on the low-impedance line at the design frequency (see *ARRL Antenna Book* or *ARRL Handbook*).

With the transmitter at DL1FK running about 100 watts input, outstanding signal reports have been received from all points on the globe in spite of the fact that the antenna is not ideally situated in respect to surrounding objects, as can be seen in the photograph.

QST



February, 1936

... This was the issue in which the famous Lamb noise silencer was introduced, and the article has been a standard reference ever since.

... Other technical articles described a simple regenerative receiver with separate beat oscillator; a 2-tube 3-band transmitter running 200 watts on c.w. and 75 watts phone; an unconventional receiver for the ultra-high frequencies; audio output limiters for improving the signal-to-noise ratio in reception; a 10-meter converter; a detector circuit for reducing noise interference in phone reception; using a metal-tube mixer; neon-bulb audio oscillators; types of distortion in phone transmitters; and the usual collection of hints and kinks.

... There were a few random remarks by The Old Man.

... The eighth international DX competition was announced.

... There was an article by F. D. Merrill on how to read *QST* so as to get the most out of it. This was aimed particularly at the technical reader.

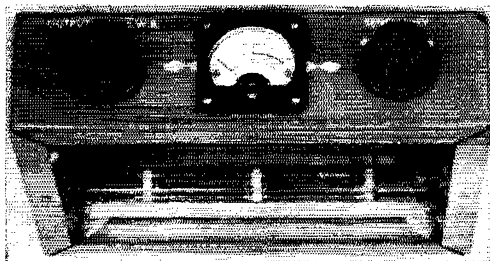
... The "Correspondence" column had quite a hassle going on the matter of restricting ARRL voting privileges to those members who were 21 years or older.

Customizing the AM-2

Popular S.W.R. Meter

in a New Package

BY JOHN HOWARD,* K8MME



Across the front of the s.w.r. indicator are the forward/reflected power switch, miniature meter with its new scale, and sensitivity control. Here the bottom plate has been removed to show the directional coupler assembly mounted against the rear panel.

FEW hams will question the usefulness of a forward/reflected power meter which can be left in the transmission line at all times to monitor output and s.w.r. The Heath AM-2, a kit version of the Monimatch,¹ is such a device in reasonably-priced, prefabricated form. The aim of this project was to use the AM-2 "works" but come up with a more compact instrument that would be in better keeping with the decor of the station.

A 5 × 7 × 2-inch aluminum chassis was used to house the AM-2 directional coupler and a new miniature (1 9/16-inch square) meter. The unit shown has a gray hammertone finish (from a spray can) and is lettered with white decals. To fit the coupler assembly into the chassis, the end corner of the mounting flange of each coax connector must be nipped off, and about 1/16 inch must be filed from each end of the coaxial line section. Screws through the remaining connector mounting holes secure the coupler to the rear apron of the chassis.

Choosing a Meter and Giving It a New Scale

The large meter supplied with the AM-2 has a 0-100- μ a. movement. One of the small imported 0-1-ma. meters was used in the modification. The reduced sensitivity may or may not be acceptable, depending on the frequency

* Apartment C-107, 1336 Brookline Road, Cleveland Heights 21, Ohio.

¹ McCoy, "Monimatch, Mark II," *QST*, February, 1957.

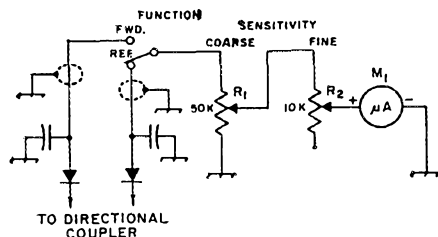


Fig. 1—The modified sensitivity control circuit. The diodes, capacitors and switch are part of the AM-2 reflected power meter. Resistances are in ohms.

M₁—Miniature d.c. microammeter or 0-1 milliammeter (see text).

R₁, R₂—Composition control, linear taper (R₁ is part of original AM-2).

and power level. The 0-1-ma. meter can be set to read full scale with just 5 watts at 6 meters and about 50 watts at 10 meters, but it is usable at lower frequencies only with high power. Most constructors will probably want to use a more sensitive meter.²

Whatever meter is selected can be equipped with a per cent reflected power/s.w.r. scale by photographing the original AM-2 meter and mounting a reduced print over the dial plate of the miniature meter. When photographing the meter face, drive the pointer off scale to the left with the zero adjust screw and light the scale from the right side to cast the pointer shadow further off scale. Pointer, shadow and any other extraneous material showing up on the negative can then be opaqued before making the final print.

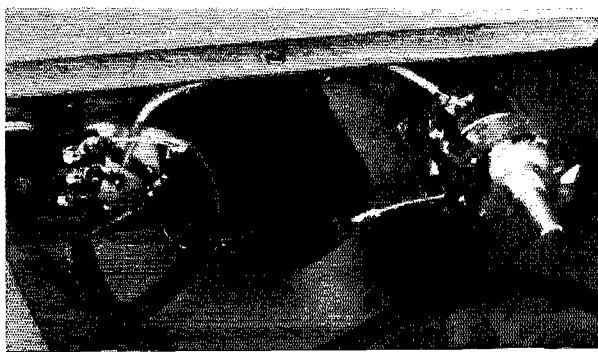
Fine Sensitivity Control

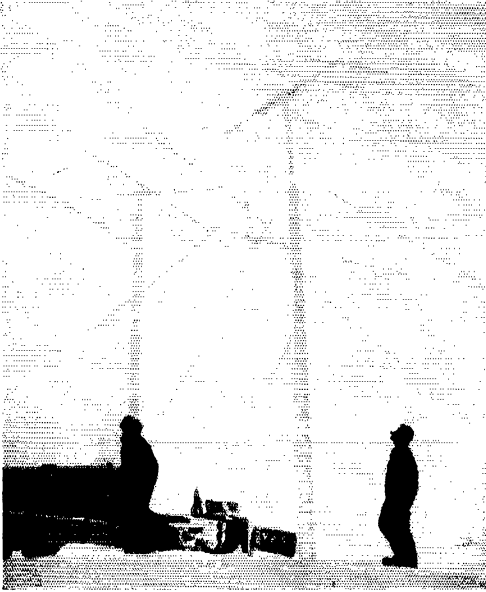
With the original sensitivity control, a 50,000-ohm potentiometer, setting the meter for full-scale deflection on forward power was a rather critical operation. Fig. 1 shows how this potentiometer, R₁, is retained as a one-time coarse adjustment only, and a 10,000-ohm variable resistor, R₂, is used as the operating control. The two are fastened back to back by soldering the common connecting lugs together and smearing a bit of solder across both view of the well-

(Continued on page 132)

² For example, the 0-50- μ a. Lafayette TM-200 available from Lafayette Radio for \$4.95.

Inside view of the front panel. The back-to-back coarse and fine sensitivity controls are on the right.





W1FVY, left, and W1JD peer through the driving snow at the ice-encrusted beams of K17FLC. Trap beam for 10, 15 and 20 at the left, 5-element 50-Mc. array at the right.

More on Six-Meter DX Operation from Fletcher's Ice Island

BY

ROBERT H. MELLEN,* W1JD

AND

CARL T. MILNER,* W1FVY

Ice Island Revisited

IN October, 1959, after our U. S. Navy Underwater Sound Laboratory Research Group had spent more than six months on Fletcher's Ice Island T3¹, plans were already in the making to return to the Arctic Ocean, this time to Drift Station Charlie. There were high hopes that ice drift would take this floe station north, giving us a chance to continue operations near the North Pole. The fates were against us. In January, just as we arrived at Fairbanks, Alaska, the bad news came that Charlie was breaking up and evacuation was in progress. There was only one alternative — back to T3!

Fletcher's Ice Island, which was off Barter Island when we left last fall, had been drifting westward, parallel to the coast of Alaska, less than 100 miles offshore. When we finally arrived late in January the sun was about to make its first appearance after two months of winter darkness. The temperature was dipping below minus 40 degrees F. Time and again the north winds rose above 50 m.p.h., whipping the dry snow to a white fury that obliterated vision and threatened to freeze us in our tracks.

Our equipment, which had been flown out to the island in huge C-130 aircraft, was dragged out on the sea ice about a mile from the main camp, and the arduous preparations for the winter operation began. Three small huts, 6 by 12 feet, one for the generator, a second for housekeeping, and the third crammed to the overhead with scientific gear, comprised the advance camp. With the help of our crew of six, including W6UFI from San Diego and two Eskimo boys

from Point Barrow, the work went on in spite of cold and darkness. At minus 50 degrees fuel oil turned tacky and ceased to flow. Cold generators refused to start until heated for hours with a blowtorch. Even the blowtorch succumbed to the cold and sputtered out, making it necessary to carry two, playing one on the other during the heating process. Antifreeze in cans had the consistency of jelly. However, after many days of almost complete frustration, we gradually learned to cope with the harsh environment. In our advance camp the heaters burned steadily and generators quit less often. Slowly the serious business of survival fell into a routine. Even though the storms still threatened to topple antennas and the drifting snow all but engulfed the shacks, inside it was comfortable and warm and the sounds of hams' signals drowned out the howling of the wind.

In the cramped quarters in the instrumentation shack, space was found for the KWM-1 and Viking II-6N2 combination of last fall, as well as Tapetone 6- and 2-meter converters and miscellaneous receivers. Newly added to the lot was a W1JD 4-400A 6-meter rig, home-built but not completely debugged, and a URM-47 receiver for monitoring 20 to 400 Mc. Somewhere outside under a snowdrift lay the latest acquisition, a Johnson 6N2 Thunderbolt loaned to us by GE's Advanced Research Center, through the efforts of Clayt Roberts, K2OUX.

The antenna farm gradually took form. First, the Mosley Tribander was erected at some 35 feet for use with the KWM-1. A 5-element Mosley 6-meter antenna joined ranks at 25 feet, later to be topped with an 11-element Cushcraft for 2-meter trials. Finally, a 75-meter dipole was erected, to take advantage of the unusually good

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

¹ Mellen, Milner and Williams, "Hams on Ice," *QST*, January, 1960, p. 11.



local skip to Alaska in the evening hours.

Contact was established with W1PHP on 15 s.s.b. at the first try on January 27. This was the first of a series of QSOs with home via W1RQU, the USNUSL club station, and W1PHP, with schedules on 20 at 2030Z weekdays. Our friends of the previous summer, operating W7BCJ/MM aboard the icebreaker *Staten Island*, somewhere in the Chuckchee Sea, broke in to arrange skeds on 20. We also chatted with the *Burton Island*, KC4USI, in the Antarctic, not knowing at the time that she was destined to carry us back to T3 several months later for the summer operations. During the early evening hours, 75 opened up regularly to Alaska, enabling us to check in with the Arctic Net in Fairbanks and the Sourdough Net in Anchorage. The exotic Alaska names like Kotzebue, Tanana, Shemya and Adak became as familiar as New London and Hartford. Until the end of February, as KG1FN we had been rare DX on 75, but now we officially became KL7FLC and we were one of them.

Six-meter openings occurred frequently in the evening hours, often until past midnight, with traces of Channel 2 TV carriers, and multiple-carrier signals between 49 and 50 Mc. However, it was not until February 27 that KL7AUV was heard weakly. Info from him and VE4TX, Winni-

peg, revealed that our 50.04-Mc. automatic keyer had not been heard up to that time. After a few days' lull, AUV was again heard on March 4 at 1100 AST, and on the 9th at 2300 contact was made, to give us our first winter QSO on 6 meters. It turned out that Jack had been off the air during several earlier openings but had heard us. Signals were rough, with bursty QSB, unlike the steady rock-crushers of the previous summer. On March 14 the 6N2 Thunderbolt was dug out and fired up to meet a 2-meter sked with KL7CLH between 1830 and 1930 AST. Dick hoped for an inversion, to get our sigs over the Brooks Range into the Fairbanks area, but the continued high winds prevented the air from settling down. Further attempts on 144 Mc. until the end of our stay on March 28 were also without results.

All considered, the winter v.h.f. experience was almost as unprofitable as had been the spring of the year before. A few contacts with Anchorage, lots of Channel 2 TV and various experimental signals below the band via short skip, but of what use is short skip, when the total number of active 6-meter stations within a 1000-mile radius is one? We were, however, on the track of one of the mysterious signals on 49.6 and 49.605 Mc. and had identified the call as KC2XDO. As the westward drift continued, the signal became more constant until finally it could be heard steadily.



Carl Milner, W1FVY, second from left, and Bob Mellen W1IJD, join two Eskimo helpers from Point Barrow, outside the hut that housed KL7FLC.

We were sure it must be near Point Barrow, only 80 miles away.

With the winter scientific program completed at the end of March, it was time to lock up the huts and head for home again. We would be returning in a few months. The only measures required were to take down antennas and other outside gear for storage and pull the huts back to high "ground" to prevent flooding during the summer melt.

The return home took one of us (W1IJD) through Point Barrow where it was found that KC2XDO was indeed located there, in the capable hands of KL7AFK. Al has been working for the Bureau of Standards in Barrow for quite some time, operating the ionospheric sounder and various propagation transmitters. The 49.6-Mc. transmitters which were used for meteor scatter to Anchorage are now off the air and, as was pointed out to Al, would be quite suitable for ham-band operation. Hope he has taken the hint!

W1FVY stopped off at Fairbanks to visit the 75-meter gang, with KL7BET acting as host in a whirl of social activity, which included a lecture to the Midnight Sons Lions Club, on "Life at T3."

By the end of July we were again headed back for the ice. In the middle of the summer-melt season we planned to get to T3 by Navy ice-breaker. The USS *Burton Island* (now K7ISD/MM) was preparing to operate in the Arctic Ocean, and arrangements were made for transportation. The Ice Island in our absence had continued the westward drift past Point Barrow about 80 miles to the northwest, and was now hard aground in the shallow Chuckchee Sea. At first it looked as though she might break loose and head north, but after only one short period of drift she slammed back on the mud under the drive of the continuous easterly winds. The shock of grounding this last time broke off a section about two square miles in area, refuting the expert opinion that "T3 can never break up."

Further confusion was added later in September when our ice at Colby Bay, which was

thought to be permanently attached to the island, broke away and disappeared over the horizon. This break occurred only 50 feet from our huts and caused us to hurriedly pull back farther on the island, especially when large cracks began to appear in the island ice all around the area. Our real estate became shore-front property, with the calm Arctic Ocean at our doorstep! Fortunately, we had acquired an outboard motor boat which we were able to use to salvage equipment which had drifted off when the sea ice broke away. Transportation around the island by boat was quite comfortable and convenient, until the pack ice drifted back and the remaining water froze over too hard to break with the small boat.

Several changes had taken place during our short trip home. The new camp commander, Ed Cohagan, and his first sergeant Neilson had relocated the main camp and had installed a power line to our advance camp at Colby Bay. We no longer had to generate our own power. What luxury! With the rotation of Air Force personnel, K4JXL, W4LTD and W5TOI had gone home and W9DVM, veteran of Drift Station Alpha, arrived to operate the main camp station, KL7FLB. Phil had been giving code classes since his arrival and soon there were three new hams on the island, including Captain Ed and Neil. In all, the hams numbered six out of a total of 24 people on the station, not including visitor Chaplain Mike Carriker, KH6AMH, who came to spend a few days later in the summer.

By August 10 all the equipment was back in operation and 6-meter transmissions started again. The usual skeds were held on 20 with W1RQU and W1PHP as before. KL7AFK also joined us to relay info when band conditions were bad.

On the home front changes had taken place also, at W1RQU. Beside the regular operators W1AXV and W1HSG, we now had a new addition, Captain "Andy" Andrews, K1PST, ex-K6GEO, who had recently become commanding officer at USNSUL.

The 4-400A rig had been retired in favor of the 6N2 Thunderbolt, which was now run with approximately 800 watts input. On August 17, the first good evening, 50-Mc. operating netted a QSO with old reliable VE4TX in Winnipeg, about 2400 miles to the southeast. The 19th brought 800-mile skip to KL7AUV, who reported that VE8BY was active in Yellowknife, only 1400 miles southeast of us. On August 28, the 6-meter band started to open regularly, netting contacts with KL7AUV, KL7DKN, VE4TX and VE8BY. On September 2, all TV channels from 2 through 6 were heard, with the m.u.f. above 85 Mc. at 1830 AST. The big break occurred on September 4, starting at 2045 AST, when W7EMX, W7RT, W7PUA, W7RDY, and W7INX were worked. The band stayed open until about 2200. This came at the tail end of an extensive east-west opening in the "South 48," which netted W7RT and W7RDY numerous East Coast and Middle West contacts, and ended with KL7FLC, to give them both their 50th state on 6.

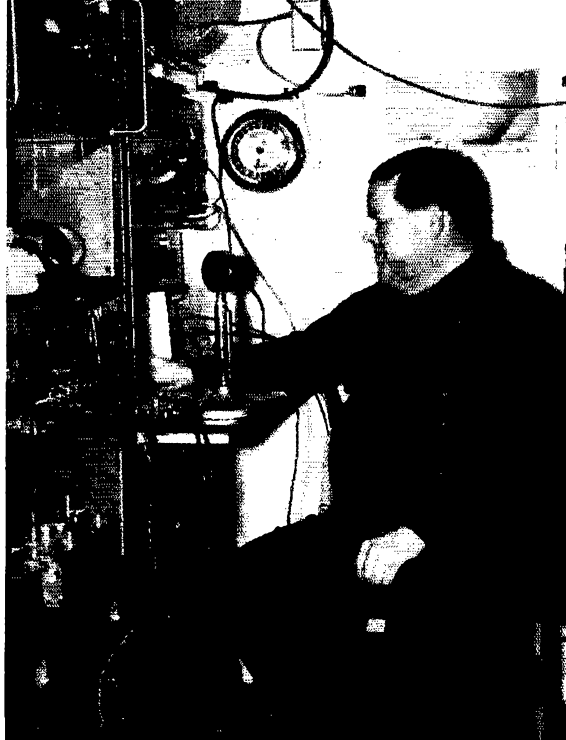
Openings to Yellowknife, Winnipeg and Anchorage continued, and KL7FLC had several three-way QSOs with VE8BY and VE4TX, lasting several hours, with readable signals all around. All contacts were c.w. When VE4TX tried phone he was almost unreadable, due to rapid flutter, even with S9 signal strength.

On September 7, after a QSO with VE8BY, Fairbanks TV came in for over an hour with 9-plus audio. At that time the m.u.f. moved up above 90 Mc., and when searching the higher frequencies, we accidentally came across a 108-Mc. signal signing the call BIG. This is a navigational aid at Big Delta, more than 600 miles southeast of us.

The band opened again on September 8 at 1015 AST to give us our only QSO with the Middle West, W9GNS in Minot, North Dakota. His attempts at phone again showed rapid QSB and only fair readability, even though signals were at 9-plus levels. Later that evening TV channels 2 to 6 were again heard, including two U. S. stations: Channel 3, Duluth, and another U. S. station on Channel 4 not identified.

Openings continued up to termination on September 18, but skip was short with only VE8BY coming through.

Altogether our 6-meter activities from the Arctic Ocean cover a period of approximately 17 months, with one gap in December and January and another in May, June and July of 1960. During the first summer, long skip occurred from July through September. This opened around midnight at the lower end of the path, moving west with time. Openings seemed to correlate with aurora but lacked any sign of the usual growl. Signals were strong and fairly steady with some QSB. Contact most frequently occurred along a zone indicating a single mirror reflection from the auroral zone. There were some exceptions to this, however; for example, VE4TX at Winnipeg and other signals heard from Utah and California. There were also reports that we were heard in Florida and Tennessee, though full con-



Warm and comfortable inside the shack, W1FVY relaxes at the operating position of KL7FLC. Rack at the left houses a 75A-4, GPR-90, and 6- and 2-meter Tapetone converters. Viking II, v.f.o. and KWM-1 are next to the wall.

firmation of these has not been made.

During the winter and spring, short-range openings in the evening appear to be the rule, although there is not much evidence on which to base any conclusions. One report has it that we were heard in North Dakota in November when K4JXL was operating the equipment.

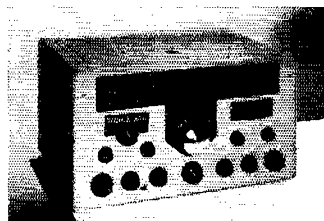
Later in the second summer, T3 was off Point Barrow and less than 200 miles away from the auroral zone. None of the stations worked showed the trend of falling along the reflection zone predicted for the new location. Then, too, the signal characteristics were different, with rapid QSB and evidence of multiple arrivals, sometimes with Doppler shift. A possible mode would be oblique reflection from the auroral zone rather than mirror reflection from it. On the other hand, the fact that Yellowknife and Winnipeg could be worked simultaneously might be explained by double hop. It is interesting to see that the maximum range seemed to agree with the experience last summer — 2500 miles. However, new reports of having been heard by W8s and W1s indicate that this may not be true either.

Quite surely, all the longer-range propagation has been associated with evidence of aurora and generally-disturbed h.f. conditions. The September 4 experience of W7RT and others seems to highlight the summer 1960 trend. While local auroral conditions were evident in the States, a long skip occurred between coasts. KL7FLC was in the position of being last in line on this occasion, instead of in the driver's seat, as we had

(Continued on page 130)

• Recent Equipment —

RME-6900 Amateur-Band Receiver



THE RME-6900 communications receiver covers all the amateur frequencies between 3500 kc and 29.7 Mc. in five ranges and, in addition, includes the 10- to 11-Mc. band for reception of WWV and WWVH time signals. It contains many electrical and mechanical features that simplify the operation of the receiver. RME has done this by employing a "Modemaster Switch" which chooses the proper bandwidth, a.g.c. characteristics, and other essentials when you switch from one mode of reception to another.

The 35-pound receiver measures 17 inches wide, 12½ inches deep and is 9¾ inches high. It has a panel of gray vinyl-bonded aluminum, trimmed in charcoal. The receiver cabinet is also finished in gray and has a hinged top lid for easy access to the receiver innards.

The rotating-drum slide-rule tuning dial measures 11½ inches long and is advanced by turning the front panel BAND SWITCH control. Tuning is controlled by a single tuning knob which is stepped down in a ratio of 54 to 1 to the main tuning capacitor. Actual tuning ranges are 10 to 11 Mc., 3.5 to 4.0 Mc., 7.0 to 7.3 Mc., 14.0 to 14.4 Mc., 21.0 to 21.5 Mc., and 28.0 to 29.7 Mc. One rotation of the tuning knob tunes about 25 kc. on the 80-meter band, 15 kc. on 40 meters, 20 kc. on 20 meters, 20 kc. on 15 meters and 80 kc. on 10 meters. A vernier dial directly below the main tuning dial is calibrated from 0 to 100 for logging purposes.

Fig. 1 shows a block diagram of the 6900 receiver. Signals arriving from the antenna are amplified in the 6BA6 r.f. amplifier, V_1 . An

antenna trimmer is provided to peak up the input circuit. The r.f. gain control is situated in the cathode circuit of V_1 , as are also the receiver muting terminals. These terminals, which are in series with the r.f. amplifier's cathode-to-ground connection, are brought out at the rear of the receiver and are normally shorted. To mute the receiver (during transmitting, for instance) the terminals can be opened by a switch or relay external to the receiver.

Amplified signals from the r.f. amplifier are converted to the first i.f. of 2195 kc. in the pentode section, V_{2A} , of a 6U8. Oscillator injection is provided by the triode section, V_{2B} , of the same 6U8. The frequency of oscillation of V_{2B} is controlled by one section of the three-gang main tuning capacitor.

Leaving the first mixer, the 2195-kc. signal is converted to the second i.f., 57 kc., in the second mixer, V_3 , also a 6U8. The pentode section functions as the mixer and the triode section is a crystal-controlled oscillator operating either on 2254 kc. or 2251 kc., depending on the desired mode and/or sideband. The proper crystal is switched in the circuit by the mode switch, which in the case of s.s.b. also selects the proper b.f.o. frequency for upper- or lower-sideband demodulation.

Output from the second mixer, V_{3A} , is coupled into a 6C4 triode i.f. amplifier, V_4 . The interstage coupling at 57 kc. consists of two separate slug-tuned LC circuits with capacitive coupling between taps on the coils. The value of the coupling capacitor is changed by the mode switch (section

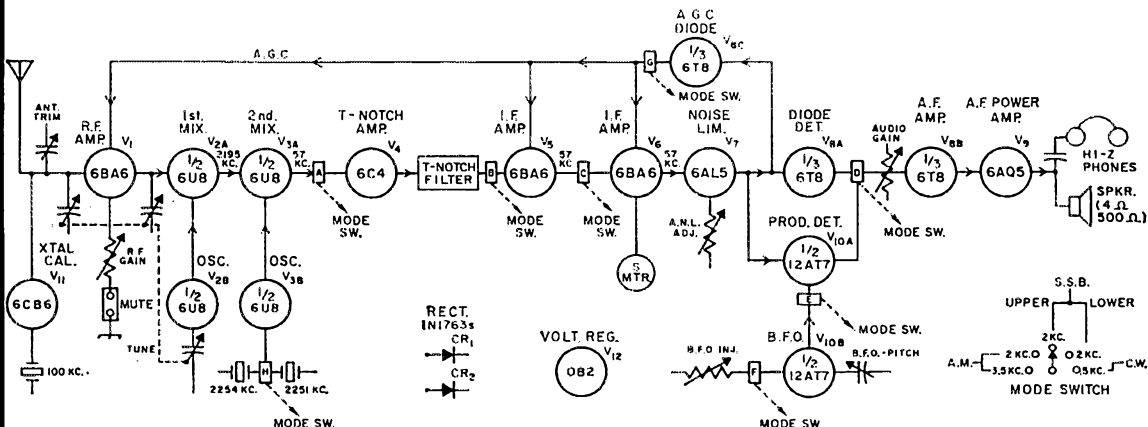


Fig. 1—Block diagram of the RME-6900 receiver.

A in Fig. 1) to give the desired selectivity. After amplification, signals are led into a T-notch filter that has a single panel control, labeled **HET NULL**, to vary the null frequency. This control allows the operator to notch out undesired heterodynes. The notch can be moved across the i.f. pass band.

Another i.f. amplifier, V_5 , amplifies the i.f. signal, and again the coupling constants shape the selectivity and are controlled by the mode switch (sections B and C in Fig. 1). I.f. amplifier V_6 , a 6BA6, in addition to boosting the i.f. signal, contains the S meter in its cathode circuit. The S meter is calibrated from S1 to S9 in 6-db. steps and in 10-db. units over S9.

Following the last i.f. amplifier, V_6 , is the 6AL5 noise limiter, V_7 , which can be turned on and off from the front panel. Also coupled to the on-off switch is the noise-limiter bias control, which sets the level of clipping. Since the limiter operates at the i.f., it can be used in all modes of reception.¹

In addition to its other functions, the mode switch automatically switches in the proper detector for either a.m., c.w., or s.s.b. reception. When a signal arrives at the detectors and the mode switch is in a sideband position, the signal is routed to the product detector, V_{10A} . This detector is a single triode — one section of a 12AT7 — with cathode injection of the b.f.o. voltage; except that the cathode resistor is in the range usually used for Class A amplification, there is nothing circuitwise to distinguish it from an ordinary triode detector of the plate-rectification variety. The b.f.o., V_{10B} , uses the second section of the same 12AT7 and is turned on by the mode switch. In s.s.b. reception there is no need to worry about the b.f.o. pitch since the beat frequency is automatically placed in the proper relation to the signal.

If the mode switch is placed in the c.w. position, the same product detector is used but the b.f.o. pitch and injection are controlled from the front panel. The variable b.f.o. injection feature, according to RME, is of value in weak-signal c.w. reception. However, the instruction manual does not go into detail on this feature and it was difficult for the writer to detect any definite benefit in actual on-the-air use.

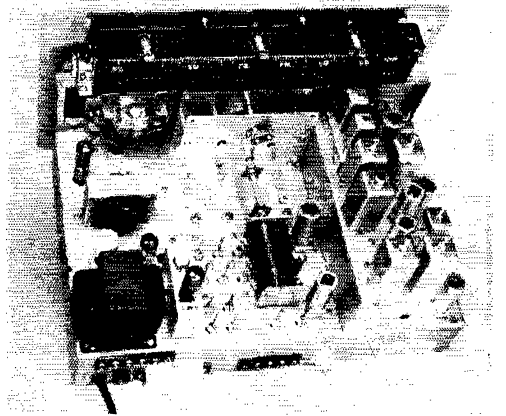
In a.m. reception the diode detector, V_{8A} , demodulates the signal in a full-wave rectifier circuit. This configuration is probably used because the ripple frequency is twice the original and is easier to filter. Therefore there is less chance for regeneration or oscillation in the i.f. system, since the detector circuit is indirectly connected back to the i.f. stages via the a.g.c. circuit.

The a.g.c. circuit consists of the a.g.c. diode, V_{8C} , along with RC constants which shape the a.g.c. characteristics for fast attack-slow decay for s.s.b. reception and fast attack-last decay for a.m. reception. As shown in Fig. 1, a.g.c. is applied to the r.f. amplifier, V_1 , and the

i.f. amplifiers, V_5 and V_6 . The proper a.g.c. delay is controlled by the mode switch (section G in Fig. 1).

Output from the operating detector is switched by means of the mode switch to the a.f. preamplifier, V_{9B} , the triode section of the 6T8. An audio gain control in the grid circuit provides the desired degree of audio output from the receiver. The a.f. preamplifier is followed by an audio power output amplifier, V_9 , a 6AQ5 power pentode. Audio output is rated at 1 watt. Two audio output impedances are provided by the two secondary windings of the 6900's audio output transformer; one is a 4-ohm output for direct connection to the speaker voice coil and the other is 500 ohms for connection to low-impedance audio accessories. These two outputs are available at the rear of the receiver. Also, a high-impedance output connection for headphones is provided on the front panel.

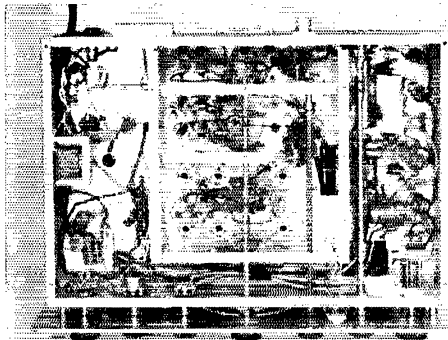
Frequent mention has been made of the mode switch. Its sections are marked A through H in Fig. 1. Practically all receiver operation is controlled by this single switch, although some of the minor jobs performed by it were purposely not mentioned earlier. Sections A, B, and C determine selectivity; D selects the detector; E controls the b.f.o. and its frequency (on s.s.b.), and F its injection (on c.w.); H chooses the proper second conversion oscillator crystal. The mode switch has five positions marked as shown in the lower right of Fig. 1. Moving clockwise from the bottom left: In the 3.5-kc. a.m. position, the diode detector is in the circuit, the a.g.c. is set for fast attack and fast decay, and the i.f.



This view of the RME-6900 shows the slide-rule drum dial. Directly under the dial and to the left is the plastic-encased S meter. The main three-gang tuning capacitor is at the center, flanked by the r.f. amplifier and mixer tubes and the inductor tuning slugs. The i.f. stages are grouped to the right, with power supply and audio circuits to the left. The 100-kc. crystal-controlled calibrator, which is furnished as standard equipment with the receiver, is just to the right of the power transformer. The rear apron connectors are visible in this view. Muting terminals and the terminals to the external relay are covered by a metal channel cover.

Either a coaxial or terminal-strip connection can be made to the antenna.

¹ Essentially the same as the Bishop-type limiter described by Stiles ("I. F. Noise Limiter") in June, 1960, *QST*.



The r.f. and mixer circuits are housed in the center compartment in this view of the RME-6900 receiver. All of the oscillator coils are wound on ceramic forms. The long shaft in the center is the band switch. To its right is the antenna trimmer. The long shaft outside the compartment and to the right is the crystal-calibrator switch shaft which extends back to the rear of the chassis where the calibrator is mounted.

response is 3.6 kc. at 6 db. down and 11 kc. at 60 db. In the 2-kc. a.m. position, the same conditions exist except that the i.f. response is reduced to 2 kc. at 6 db. down and 7.3 kc. at 60 db. The next two positions are for sideband reception. The 2-kc. bandwidth is used, the a.g.c. system is set for fast attack and slow decay, the b.f.o. is turned on and positioned for the proper sideband, the b.f.o. injection level is set, the proper crystal in the second conversion oscillator, V_{3B} , is switched in, and the product detector is turned on. When sidebands are changed, the proper crystal in the second conversion oscillator, V_{3B} , is turned on and the b.f.o. is shifted to its proper

position. The fifth and last position on the mode switch is the c.w. position. Here the bandwidth is changed to 500 cycles at 6 db. down and 3.3 kc. at 60 db.; the b.f.o. injection and pitch are shifted to panel control, and the a.v.c. system is grounded. The second conversion oscillator, V_{3B} , is positioned for upper-sideband beat note.

A crystal calibrator is furnished with the RME-6900 receiver. It consists of a 100-kc. crystal-controlled oscillator, V_{11} , a 6CB6, capacitively coupled to the antenna input circuit. A three-position switch on the front panel turns on the calibrator when in position 1, but leaves the external antenna connected to the receiver. Position 2 disconnects the antenna, but leaves the calibrator on. The third position is calibrator off, antenna connected. By checking the calibrator against WWV/WWVH on the 10-Mc. band, the receiver may be calibrated for accurate dial readings. A CAL ADJ control on the front panel positions the dial pointer for correct calibration.

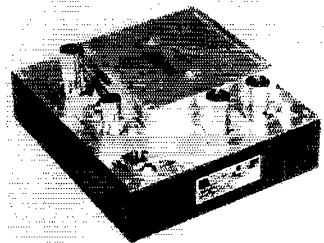
The receiver requires about 55 watts at 117 volts, 50/60 cycles. The power supply uses a pair of 1N1763 semiconductors in a full-wave rectifier circuit, and voltages for critical stages are regulated by an OB2 gas regulator, V_{12} .

Rear chassis connections for the 6900 include the 1- and 500-ohm audio output terminals, muting terminals, terminals for external relay control (these terminals connect to the REC-STBY-TR switch on the front panel) antenna and ground terminals, antenna coaxial connector, fuse and line cord.

A 10-page instruction manual is included with the receiver. Although rather brief, it does contain a well-detailed parts list, some alignment and maintenance data, and a schematic diagram.

— E. L. C.

The Tapetone TC-432 Crystal-Controlled Converter



THE usual approach in amateur circles for attaining low-noise reception at 432 Mc. is to hear down on r.f. amplifier design, and let mixer performance fall where it may. Tapetone does it the other way around in the crystal-controlled converter shown herewith. They build the best possible crystal mixer and follow it with a low-noise i.f. amplifier, but use no r.f. amplification ahead of the mixer at all. This has some virtues worth keeping in mind when you are trying for optimum u.h.f. receiver performance. Not the least is simplicity. Another is that such a converter provides a base on which to build for the best possible signal-to-noise ratio later on.

The TC-432 gives excellent results in its own right. The manufacturer claims a noise figure of 6.5 db., which is not easy to beat with r.f. amplifier stages using vacuum tubes. With this as a start, you can "go for broke" with a parametric amplifier, and come up with a noise figure around 1 db. This kind of performance makes possible reliable coverage on 432 Mc. that compares favorably with the best we can do on 141 or 220 Mc. Even without a paramp, the TC-432 should give better weak-signal reception than most of us have ever seen this high in frequency.

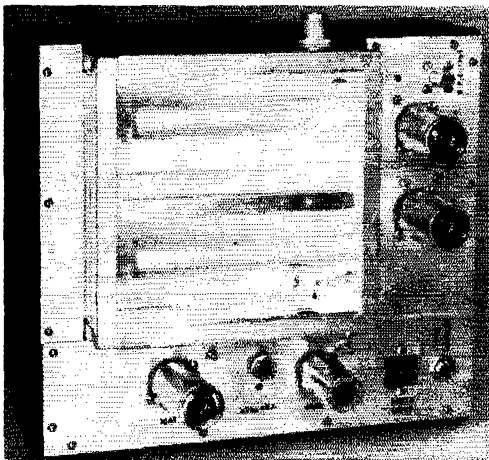
The Tapetone converter front end is beautiful in its simplicity, as may be seen from the open-

top view. The entire assembly is silver plated. Two coaxial tanks are used, one as a preselection circuit and the other as a crystal mixer line. Both have inner conductors of $\frac{1}{8}$ -inch tubing, capped at the ungrounded ends, to provide capacitance for tuning. They are housed in adjacent rectangular compartments, and tuned by means of grounded plates adjusted from outside the compartments. The conductors are 5 inches long and the compartments $5\frac{1}{8}$ inches long and 3 inches square.

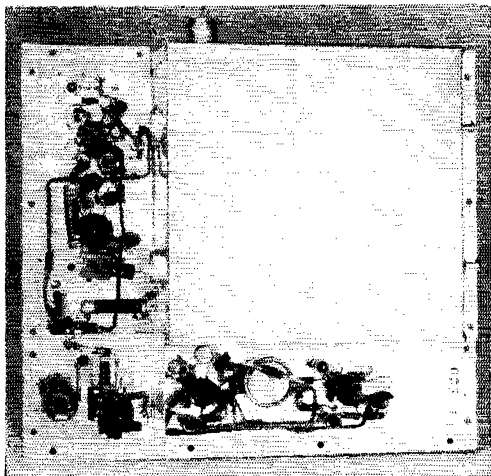
Tuning screws run through the ends of the compartments. They are fitted with round poly beads which bear against the capacitor plates. The latter are formed so that they spring back away from the caps on the ends of the inner conductors, as the screws are run out. This provides a very high-Q tuning system that is mechanically smooth and electrically noiseless.

Snowy-white silver surfaces don't photograph well, so tank circuit details may not be entirely clear, but they are easily described. The antenna coupling loop and coaxial fitting are at the top of the first picture. Coupling between the cavities is by means of a rectangular hole $1\frac{1}{4}$ by $1\frac{1}{2}$ inches in size in the partition between the lines. The mixer crystal is mounted in the end of the second compartment, and connected to a small loop that runs over to the inner conductor. This loop couples in the injection voltage, through a small hole in the bottom surface of the mixer line, as it appears in the picture. This light coupling to the injection chain is undoubtedly a major factor in the fine performance of the crystal mixer.

Also important is the i.f. amplifier following the mixer. When no r.f. amplification is used, the noise figure of the following stages determines the over-all performance of the converter. The TC-432 has a cascode amplifier using two 6BC4s



Top view of the Tapetone 432-Mc. converter, with its slide-on cover plate removed to show the high-Q tank circuits. They are a preselection circuit, top, and a crystal mixer line, below. The two tubes at the bottom are for developing the injection voltage. Those at the upper right are for a cascode i.f. amplifier.



Bottom view of the TC-432, showing the injection stages, bottom of the picture, and the i.f. amplifier at the upper left. Adjusting screws for tuning the r.f. assembly are visible at the right end of the tuned-circuit compartment.

following the mixer. This establishes the noise figure of the i.f. system at probably below 2 db. The i.f. range of the converter tested here was 26 to 30 Mc., but other ranges may be had on order. The injection string uses a 12AT7 and a 6AK5 to provide the needed energy at 406 Mc.

Noise figure and gain of the TC-432 are substantially constant over the spread from 432 to 436 Mc., and the sensitivity compares favorably with the crystal-controlled converter that has been in the *Handbook* for several years. This latter unit is the best we've been able to do with vacuum-tube r.f. amplifiers in 432-Mc. work to date.

The Tapetone converter is 9 by 10 inches in size. All construction is on the top plate, which is fastened to a $2\frac{1}{2}$ -inch chassis. Power requirements are 6.3 volts at 1 ampere, and 150 to 200 volts d.c. at 50 ma. — E. P. T. QST

Strays

KH6DEX says that with all the beatnik talk now becoming a part of the vocabulary, you're really not with it if you continue to call a shack a shack. The proper term now is "ditpad."

OH2YV wishes to point out that the Certificate Hunter's Club of K6BX is antedated by the Award Hunter's Club established in 1957 by a few European amateurs. This award is presented to those applicants who demonstrate that they have 25 awards from four continents. For a copy of the complete rules, write to V. J. Velamo, OH2YV, Isokaari 4 B 30, Lauttasaari, Helsinki, Finland.

The IARU Secretary tells us that K5WAC has applied for the WAC award.



Hints and Kinks

For the Experimenter



V.H.F. FIELD-STRENGTH METER

TRANSMITTERS with less than one watt output require very sensitive field-strength meters for measuring output, and the circuit in Fig. 1 shows

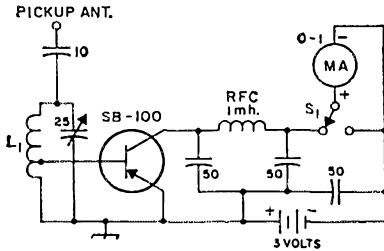


Fig. 1—Transistor field-strength meter. Capacitances are in $\mu\text{mf.}$, resistances are in ohms, resistors are $\frac{1}{2}$ watt.

- L_1 —6 $\frac{1}{2}$ turns No. 20 enam., $\frac{1}{2}$ -inch diam., spaced diameter of wire. Tap 2 turns from cold end.
- S_1 —S.p.d.t. switch.

the schematic for one I use with my portable six-meter flea-power rig. A small pickup antenna is usually sufficient for close-range measurements, but a dipole can be used for supersensitivity. Almost any r.f. transistor can be used in the circuit. However, sensitivity falls off when the inexpensive audio types are used. Switch S_1 is wired so that the meter terminals are shorted when the unit is switched off, thus protecting the meter movement.

— Howard J. Hanson, W7MRX

MOBILE BIAS SUPPLY

FIGURE 2 shows the circuit of an inexpensive regulated mobile bias power supply that can be constructed in just a few hours. The transformer, T_1 , is a common 6.3-volt center-tapped filament transformer. For 12-volt operation, a 12.6-volt filament transformer can be substituted. The 1000-ohm resistor in series with the base is to limit the peak current applied to the base. Output from the rectifier, CR_1 , is about 80 volts negative, which is dropped through the 50,000-ohm resistor to provide a constant current source for the zener diode regulator. The zener diode, CR_2 ,

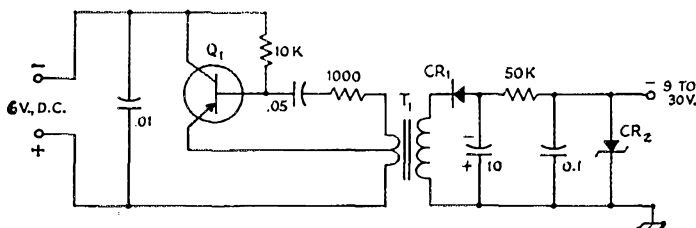


Fig. 2—Circuit of the regulated mobile bias supply. All capacitances are in $\mu\text{f.}$ All resistors $\frac{1}{2}$ watt.

CR_1 —Silicon rectifier (Starkes Tarzian M150).

CR_2 — $\frac{3}{4}$ -watt zener diode. [Motorola $\frac{3}{4}$ M6.8Z (6.8 volts); $\frac{3}{4}$ M10Z (10 volts); $\frac{3}{4}$ M15Z (15 volts); $\frac{3}{4}$ M20Z (20 volts); $\frac{3}{4}$ M25Z (25 volts); $\frac{3}{4}$ M30Z (30 volts).]

Q_1 —2N307 or equivalent.

T_1 —6.3-volt c.t. filament transformer.

regulates the voltage and gives the desired bias value. The author has been using this supply now for almost a year without any breakdown or malfunctioning.

— Burton C. Winkler, jr., W1ZHY/2

NOTES ON THE HEATHKIT GW-30 TRANSCEIVER

THE performance of the GW-30 hand-held ten-meter transceiver can be improved by using a 12-volt battery pack and by removing a few turns from the toroid antenna loading coil. Eight penlight cells wired in series, bundled together and taped, will fit in the battery space normally occupied by the nine-volt battery furnished with the kit. All of the transistors still run within their dissipation ratings. For a better match to the whip antenna, remove turns one at a time from the toroid antenna loading coil while observing the relative output on a field-strength meter until maximum output is obtained. Also, a phono jack can be mounted on the chassis under one of the flaps of the leather case with its center terminal connected directly to the antenna terminal on the push-button send-receive switch. This will provide a low-impedance unbalanced output terminal for connecting an external antenna, such as a beam or d.f. loop. Connecting a d.f. loop to the GW-30 turns the unit into a transmitter hunter. K8DCE and myself won first place in a local transmitter hunt by using this combination!

After the above modifications were made, hand-held operation of the unit resulted in contacts over one mile to fixed or mobile stations. Using a beam antenna, K8LAP reported my signal "loud and clear" over a distance of a couple of miles. Of course, radiation from the superregenerative receiver in this case could be a problem.

By the way, concerning sources of subminiature 10-meter crystals to fit the GW-30, the type ML-18 crystals can probably be obtained from the Midland Mfg. Company, 3155 Fiberglass Road, Kansas City, Kansas, or from Anderson Electronics, Altoona, Penna., or from Sherold Crystals, Kansas City, Missouri.

— Al Robertson, K8BLI

FIVE-AND-DIME SPACERS

FOLLOW plastic cylinders of various lengths are sold in five-and-dime stores and are packaged in many different colors and lengths. These spacers are called "Indian beads" and make marvelous bushings for mounting terminal strips, sockets and other parts above a chassis or panel. The beads normally sell for about 25 cents a package.

— Merritt F. Malvern, W2ORG

MOBILE TRANSISTOR CONVERTER

THE mobile converter shown in Fig. 3 is a modified version of the one that appeared in "Hints & Kinks," *QST*, June, 1959. One outstanding feature of this unit is its ability to tune 75 meters, 40 meters, the CHU, WWV and 4507.5-ke. CAP frequencies with just one 3200-ke. crystal! The various frequency relationships are as follows:

Frequency (ke.)	Crystal Frequency (ke.)	B.C. Receiver Setting (ke.)
3800-4000	3200	600-800
7200-7300	6400 (3200 × 2)	800-900
7335 (CHU)	6400	935
5000 (WWV)	6400	1400
4507.5 (CAP)	3200	1307.5

As shown in the second column, the second harmonic of the 3200-ke. crystal is used on 40 meters, CHU and the WWV frequency. With the values shown in Fig. 3, C_1 is almost at full capacity on 75 meters, with 40 meters coming near minimum capacity. The CHU frequency is just above the 40-meter setting. Capacitor C_2 is adjusted for optimum performance after the converter is connected to the b.c. set. Be sure to touch up the b.c. set antenna trimmer, too. The converter and its power supply are shown in the photograph and were constructed in a Bud CU-

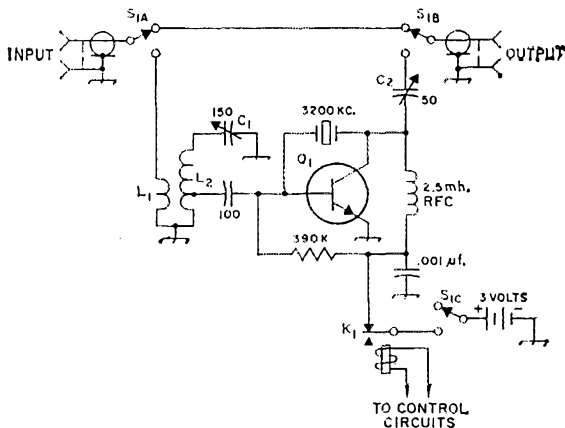
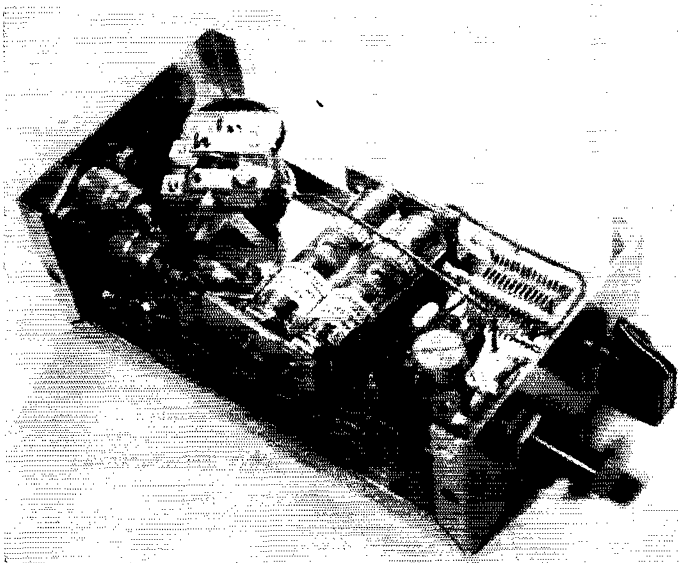


Fig. 3—Circuit of the transistor converter. Unless otherwise indicated, capacitances are in $\mu\text{mf.}$, resistances are in ohms. Resistors are $\frac{1}{2}$ watt.

- C_1 —140- $\mu\text{mf.}$ variable capacitor (Hammarlund APC-140).
- C_2 —50- $\mu\text{mf.}$ trimmer capacitor.
- K_1 —S.p.d.t. relay.
- L_1 —25 turns No. 28 enam., $\frac{1}{2}$ -inch diam.
- L_2 —43 turns No. 28 enam., $\frac{1}{2}$ -inch diam., spaced $\frac{1}{8}$ inch from L_1 . Tap 6 turns from cold end.
- Q_1 —2N233 n-p-n transistor.
- S_1 —Three-pole two-position rotary switch (Centralab 2007).

3006-A Minibox. All of the components, including the relay, are contained in the box. One note of caution: If this unit is used with a medium- or high-power transmitter, some sort of protection should be set up to prevent r.f. damage to the transistor. This could be accomplished by using a zener diode across the input circuit, or a spare set of contacts on K_1 to short the antenna terminals during transmit.

— C. F. Williams, W0OMN



W0OMN's mobile transistor converter.

The Backfire Antenna

AN item of correspondence in the January, 1960 issue of *Proceedings of the IRE*¹ under the above title caught the eye of a number of u.h.f. antenna experimenters, and generated a fair amount of "Why don't we use this?" mail for the writer. The best way to answer these inquiries seemed to be to try the idea, since we already had a tabletop antenna setup for 1215 Mc. that could be adapted readily to the backfire principle.

For those who do not have access to antenna-expert Ehrenspeck's letter, the idea is that a plane reflector can be mounted in front of what is normally the forward director of a Yagi antenna, to reverse the directivity, narrow the beam pattern and increase the gain. In an example cited, the gain of a Yagi two wavelengths long was increased by 3 db., while the minor-lobe content was substantially reduced and the main lobe sharpened from 41 to 20 degrees. This resulted from the use of a reflecting disk two wavelengths in diameter. A Yagi with a 2.5-wavelength boom and a plane reflector 4 wavelengths in diameter gave a gain of 20.5 db. over isotropic, an improvement of 6 db. over a Yagi of similar length without the plane reflector!

Anyone who has tried to build up the gain of an array that already has 14 db. knows that decibels come hard at this point. Adding 6 db. to a 14.5-db. Yagi looks almost like black magic, at first glance. Can amateurs expect to duplicate this feat? Will the end justify the means?

Like other ways of improving antenna performance, backfire gain is no something-for-nothing proposition. Note that a reflector 4 wavelengths in diameter was needed for the 6-db.

¹ Ehrenspeck, "The Backfire Antenna, A New Type of Directional Line Source," *Proc. IRE*, Jan., 1960, p. 109.

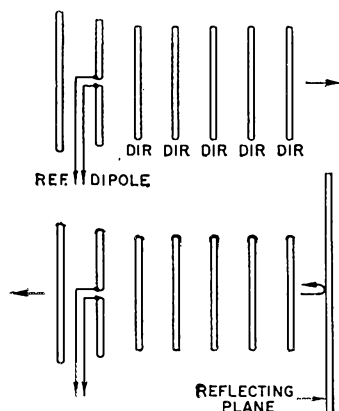


Fig. 1—The backfire Yagi employs a large reflecting plane out in front of a conventional system to reverse the directivity. Because this makes each element work twice, and effectively doubles the length of the Yagi, a gain of 3 db. or more is possible.

improvement. This rules out use of the idea by most amateurs, except for frequencies above 420 Mc. — and a reflector 8 feet in diameter would be needed at that frequency. A few extra Yagis in phase, or a large-but-light collinear array, might be a better solution to most hams' need for higher gain.

The backfire idea suggests potential applications that some amateur u.h.f. enthusiasts might find attractive, however. One is the use of a single reflecting plane for two or more antennas. A 432-1296 combination might be interesting, for example. An array of 16 driven elements in phase for 432 Mc. would require a screen reflector roughly 8 by 10 feet in size. This would make a wonderful plane for a really long (in terms of wavelength) 1296-Mc. Yagi, on the opposite side of the reflector. This might be a relatively simple way of obtaining an honest 20-db. gain at 1296 Mc. — a feat that is by no means as easy as some might think from having listened to "gain" figures that are often bandied about in amateur circles.

We tried backfire reflectors of various sizes with 1215-Mc. Yagis of from 3 to 9 elements, and found it possible to develop appreciable gain with any Yagi, provided a sufficiently large plane was used. How much gain, did you say? After long experience in working with antennas in confined spaces, we are a bit chary with gain figures. Without a properly-designed antenna range, you can't measure gain with any degree of reliability — and there is no antenna range in the ARRL Lab. Possibly some sunny day next spring we might do a little better up on our flat roof. To more than merely reverse the directivity of a Yagi we had to use a sheet of aluminum 20 by 28 inches (almost 2 by 3 wavelengths) in size. A sheet 34 by 36 inches (about 3½ by 3¾ wavelengths) gave a gain indication close to 3 db.

With reflections from all over the place it is impossible to get a suitable reference-antenna reading with a dipole. This trouble drops off with increasing directivity in the reference antenna, but it is never eliminated. Our estimates of gain are, therefore, likely to be on the low side most of the time, and inaccurate always, but they do show that the idea works, and that it is not a particularly fussy business to get at least some benefit from the installation of such a plane reflector.

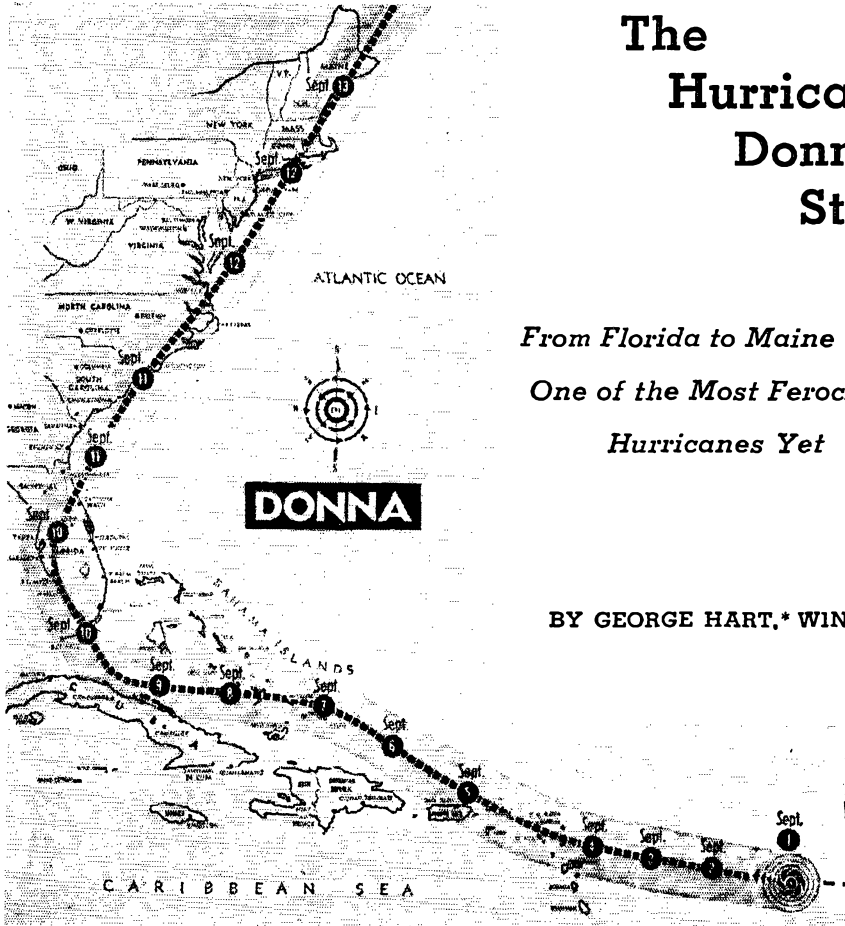
We did not get anything that looked even close to 6 db., and we suspect that there is more than meets the eye in the IRE item to be taken care of before one does achieve such a gain. It is not entirely clear, for example, just what should be done in the way of element lengths and spacings when one goes to the backfire principle. It seems fairly obvious that you do not simply make up a

(Continued on page 130)

The Hurricane Donna Story

From Florida to Maine With One of the Most Ferocious Hurricanes Yet

BY GEORGE HART,* WINJMJ



ANY WAY you look at it, Donna was a mean old gal. She was born in the South Atlantic around Sept. 1 and slowly started moving westward, bearing down relentlessly on the West Indies and wreaking havoc among the many small islands thereof, taking a swipe at Puerto Rico and Cuba in passing, and giving vent to her full fury on the tip of Florida and the Keys. She seemed then to be about to continue on into the Gulf of Mexico, but suddenly changed her mind, as women will, and cut back to hit Florida's west coast, cross the peninsula northeastward, and scream up the East Coast, gathering speed but losing some of her considerable power as she went. Not until she reached the New England states did she split up into squalls and dissolve into torrential rain. Even in her dying throes she showed considerable destructive power.

Thanks to modern weather forecasting techniques, neither her visitations at various places nor her power were surprises to the populace, but this did not prevent disastrous flooding and wind destruction, and the need for emergency communications facilities to go into action. To this

end, untold numbers of amateurs in Florida and the entire East Coast were active. This is their story.

It isn't just difficult to compile concise and chronological information from sketchy reports, bulletins and newspaper clippings; it's well-nigh impossible. We can only do our best to give you the story of what went on in Florida during and after the hurricane struck.

Florida

The Keys and the Florida peninsula were affected by Donna on Sept. 9 and 10, but this wasn't the extent of the emergency work. The amateurs continued operating through Sept. 14 before normal facilities were restored so that they could knock off.

As Donna approached Florida, amateurs throughout the peninsula activated their emergency nets — and Florida has a big bunch of them — and prepared to carry on, with emergency power if necessary. When the hurricane rounded the Keys and headed inland, it was soon apparent that the nets' best efforts over an extended period of time would be required. K4ENN went to Tavernier in the Keys and was the only

* National Emergency Coordinator, ARRL.

Donna map and track above courtesy *The Miami News*.



The Red Cross station in Miami, K4IWT, was manned 24 hours per day from Sept. 9 thru 13. Operators shown, l. to r., are W4IIS, K4RJJ, K4QHG and K4JWM. Eight other operators also worked.

communications throughout the night and into the following day, handling traffic concerning road conditions, tide heights, identification of bodies and requests for aerial survey, rescue equipment and personnel, doctors and medical personnel. W4JRK was on from Marathon and provided perhaps the first communication with Miami (to K4UUO) after the full force of the hurricane struck and isolated that town.

Along the southwestern coast Donna rolled on her merry way. Everglades City, Naples, and Fort Myers felt her sting as she tore down power and communications lines in wild abandon. Amateurs struggled to get their generators to run, tried to coordinate their efforts and establish a communications headquarters. In time the AREC groups in Collier and Lee Counties got on the air. Traffic from Red Cross, civil defense, Florida Highway Patrol, sheriff's departments and many others started to flow out of and into the hard-hit disaster area. Amateurs worked until they dropped from exhaustion.

Much of the communicating took place in the Florida Emergency Phone Net on 7295 kc., and much of it was confusion because of inept operating by amateurs not familiar with net procedure who insisted on talking when they felt so inclined and disregarded the pleas of the NCS to stand by until or unless called. "Wish I had a hammer to hit some of these guys over the head with," said W4JWM during one wild session of breakers. But despite the frequent poor examples of net operating, things got done. FEPN operated solid from Sept. 9 through Sept. 14, acting as a general clearing house for emergency calls and accumulating representation from some hard-to-reach places such as Naples (W4ACT), Fort Myers (W4MWI), Everglade City (K4PMF/mobile) and Key Largo (K4AJ), and key points such as Miami (K4IWT), Jacksonville (K4GHG), Atlanta (W4MIP) and Tampa (W4IWM). Some of the other control stations of this net (and believe us, they deserve medals) were W4AZ, K4TFI, K4FDH and W4IYT.

The FEPN was also active on 3910 kc. most

of the time, with Dade County CD Control Station K4TFS at the helm. Because of the terrific QRM on this frequency, FCC Miami was asked to declare this an emergency frequency, and this was done on a voluntary basis. W4WWW in Tampa assisted in clearing the frequency and contact was maintained with W4MWI in Ft. Myers.

A newspaper clipping from an unknown source (could be W0WJK), indicates activity from W4DVC mobiling along the Keys highway, W4IJS and W4INJ in Atlanta, W4INQW at Key West and W4ODR in Memphis. The problem was long skip, and W0DPT did some relaying for the boys to effect some emergency traffic handling that would otherwise have been impossible. This appears to have been on the evening of Sept. 9.

A complete and detailed report from K4UUO in Miami gives details of his contact with Marathon and the Keys. Frank was aroused at 0530 on Sept. 10 by a phone call from Coral Gables Police Dept. who wanted contact with the Florida Keys. Just as he reached his shack, the power went dead, so he fired up his 3-kw. generator and went to work. At 1240 he ran across W4JRK in Marathon sending QRRR, the first outside contact in ten hours. This station was operating precariously in two feet of salt water, but traffic handling started immediately in connection with medical supplies, food and water. This traffic was passed immediately to the Red Cross and to Homestead Air Force Base. Then came floods of personal traffic, and two extra telephone lines were installed to supplement K4UUO's party-line phone. With the help of family and neighbors, the traffic was kept flowing. On Sept. 11 a net was formed on 7250 kc. and more Keys stations started reporting in, such as W4TFT/4 and W4CNZ in Key West and K4EUB in Islamorada. K4FFT reported in for Homestead Air Force Base. W4JRK (W4JRQ operating) remained on the air during the whole time and did a marvelous job. Traffic was handled for the Miami postmaster, Public Gas Co., Red Cross, Civil Defense, many other agencies, and hundreds of individuals. K4UUO's log shows operating time of 120 hours, during which time 412 messages were received, 250 messages were sent (of which 233 were originated), 395 long-distance telephone calls were made and 19 telegrams were sent. An impressive record for K4UUO.

The gang in Fort Myers were preparing for Donna on Sept. 7, in a meeting at which both the EC and RO were present. As a result, Fort Myers gave a good account of itself during the emergency. On Sept. 9, club station W4MWI was established at City Hall, with W4CQZ and K4KPE operating. Red Cross shelter stations were operated on six meters by W4s TKS KET SMK, PJG, K4ZIF and KN4UVZ. In general, communications were somewhat sporadic because of equipment failures. K4GUE was on from Fort Myers Beach for several days, but left on Sept. 10 with K4ZAP to bring equipment to Ft. Myers, leaving Ft. Myers Beach without

communications for many critical hours. K4MAQ came down from Dade County with the c.d. bus and some badly needed generators and worked for days with W4KOB in getting operators organized and setting up solid communications. On Sept. 12 the c.d. bus left for Naples, where it was more urgently needed. Operators at K4MAQ and W4MVI worked around the clock handling hundreds of urgent messages for c.d. and Red Cross, squeezing in welfare traffic where possible. The City Hall station was on the air for a full week. Stations other than those already mentioned in the Fort Myers operation were K4s UNJ RQY VGN LHD GAF OBD, W4s KPO KCW KOI, KN4VSN, W1ORP/4.

In St. Petersburg, W4GAC was set up at City Hall, operated mainly by W4WMC and assisted by K4s CVD NAN HQA and W4WPF. W4SEA was moved into Red Cross headquarters. K4PMK, county control for 6 meters, was a very busy lad. Other stations participating in the emergency were W4s YU GUH/mobile OND OYZ ENF ZEB YZ APV LTE PWB, K4s AVH/mobile, PBP, MYJ EAC LYS CGN YCY RKY OUD YKU/mobile PHF EHY.

Members of the Daytona Beach Amateur Radio Assn. and the AREC furnished the only means of communication in the Daytona-Ormand Beach area during the hurricane. Base stations at Red Cross headquarters were on six and ten meters, operated by K4s AUJ CXL BYU, W4s NPP UHL and EC K4UJW. Mobiles stationed at strategic points included K4s KTQ PAC VNA, W4s BRP PLO HNV PGL. Assistant ECs W4SDR and K4RNR also spent long hours acting as liaison between the various nets. Power was off almost everywhere and nearly all telephones were out. The mobiles were able to relay requests for supplies, doctors, medical assistance, etc., to the Red Cross, police and fire headquarters and the sheriff's office. K4BYU, stationed at a high school, drove up the front steps into the entrance, leaving only the rear end of the car containing the antenna on the outside. Other mobiles performed similar odd services, often other than communications, to keep lines open and make the operation more efficient.

Although Tallahassee was not in the storm's path, Western Florida SEC W4MLE had his gang on the job furnishing reports of Donna's effect on Florida cities and towns to c.d., Red Cross, weather bureau and radio network officials in the state capital. Most of the operating was done by W4s CMG GAA MLE, K4s VLE and UEU. K4ARK headed an expedition to a small seacoast town without resident amateurs and established communication from that point; he was aided by K4s GXV and IYJ.

About the only other report from Florida is that K4JWQ was handling traffic out of Tampa on 15 meters, his efforts badly hampered by QRM.

There remains a list of amateurs who took part in the above or related activities who have not so far been mentioned. We're not guaranteeing the accuracy of any of these calls because most of



K4UUO maintained contact with W4JRK in Marathon, Fla., one of the Florida towns hardest hit by Donna's fury on Sept. 10. Operator is at lower left. K4VSB assisted in the operation at this station.

them come from a tape recording of phone nets: K4s ADY BN POO TIE YYP DBT DPZ FQM HNA KIC KDN KRG LQS LHP NCN QJH RAB RHJ RWQ RVM UEB VSB YWZ, W4s AYQ BMN FFD JPP NEI OPZ AB AOK CPW POC QNX RSU VTJ CDB DDW EUL HLE HQZ IMD OPZ RJU ROD UZZ VTJ WKH YWX ZSX, K8DWI/4, VE3IM/4, W3WII, W3UA, K1BNQ.

Up the Coast

After leaving enough destruction to keep the boys in Florida busy for a few days, Donna headed up the East Coast, a bit too far out to sea to cause as much ruckus in the Carolinas and Virginia as she did in Florida, and by the time she got into the middle Atlantic and New England states she was beginning to show signs of weakening. W3ECP, whose monitoring succeeded in adding quite a few calls to the above list, was keeping close watch on the situation from the nation's capital and noted that at times net control of Florida nets was assumed by distant stations because of skip — for example, on Sept. 10 K1IZM in Boston was NCS of the s.s.b. net on 7285 for a time; on the morning of Sept. 11 W5FNB in Gulfport, Miss., took an NCS stint; and that same evening W8TII was heard relaying traffic to Ft. Myers from other Florida points.

On the morning of Sept. 11, Red Cross officials requested activation of W3PZA at the District of Columbia chapter house; however, W3ECP continued monitoring from his home station until 1930, when activities were transferred to W3PZA. As Donna approached the North Carolina coast and began to be felt in Maryland, the Maryland Emergency Phone Net was activated at about 2230, and this was followed by activation of Prince Georges County AREC. Emergency communications preparations went on until midnight, with amateurs maintaining a close monitoring watch on the hurricane. Reports of evacuation of beach areas were handled by W3BM.

On Monday morning, Sept. 12, Second Army MARS made 4025 kc. available for hurricane work and a number of MARS stations reported



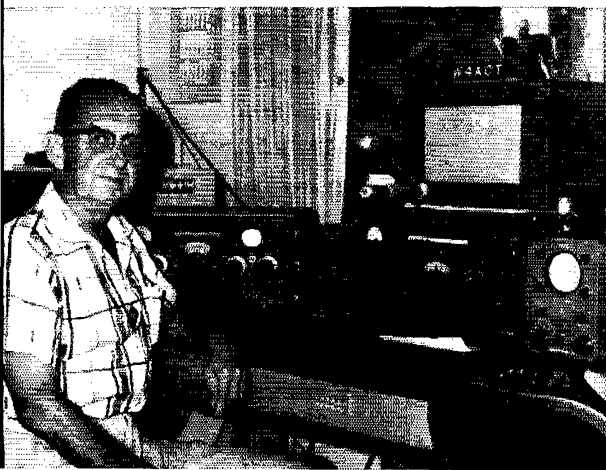
W4ACT and his AREC group furnished the only communications with Naples, Fla., for three days running. Don is EC for Collier County and caught very little sleep during the hurricane.

in for duty. W3HCL took over at W3PZA. Reports of damage in southern Maryland were reported by W3EHB, and W3CVE put out a request for available c.w. operators to report into WARN, the Weather Amateur Radio Net on 7115 kc.

Most of the activity at this point appears to have been observation, with little evidence of a communications emergency. K3GZK took over as NCS of MEPN in the morning of Sept. 12, collecting reports on storm damage and progress. W3BM reported damage at Ocean City, W4OID said that the hurricane seemed to be developing two "eyes" and was broadening, and at 1115 W3QQB said the storm had definitely passed out of influence in his area (Dover, Del.) and conditions were leveling off. At 1340 W3EQK mobile in Vienna, Va., reported main roads clear. About all that remained was to assist in clearing welfare traffic into and out of Florida.

But this isn't all to the story. Donna had extended her influence over a wider area and was consequently less ferocious at any particular point, but amateurs in the northeast remembered how Diane had dumped billions of gallons of water on them in 1955, and were fearful of the same thing happening again. Besides, although Donna was weakening, she was by no means

Communication was just one of W4LQS's jobs during the disaster. In addition to a magnificent job as Asst. EC for Collier County, Fla., he served as Red Cross Disaster Chairman for the area.



broken up. So the amateurs in the northeast girded for the worst. In Burlington County, N. Y., K2CMN activated his RACES group at 1100 on Sept. 12. Control Station K2QGE was manned on 6, 10 and 2 meters. Flooding conditions at Browns Mills and Medford Lakes brought mobiles into action so that townships in a direct path of flood waters could be alerted for possible evacuation. Those most active in Burlington County were K2s HJY MOV GWM YBN TQM DEI VHK PWQ, W2s WKI GOK, WA2s ECT HJI NDK WY2s LCB LCA.

The Brooklyn, N. Y., Two Meter Net was activated by EC W2LDC at 0800, Sept. 12. Mobiles were assigned to patrol the water's edge, and when the storm struck at noon several of the stations were forced to go on emergency power. Contact was maintained with the six and ten meter nets, under the direct supervision of Brooklyn EC K2OVN. In addition, contact was maintained with Nassau and Suffolk Counties. Net was secured at 1828. Stations participating were K2s QQH GGD PJJ KVL SLD DHC LFR DNY CMJ HAM DDT, W2s ER KEP YHS OKU, WA2s GAB BST INM.

Rhode Island RACES-AREC swung into action at 0200 on Sept. 12 and remained active until 2200 the same date. Circuits were set up for the Weather Bureau, public utilities, the naval base at Newport, the Red Cross, and a broadcast station. Controls were established at the state control center in Scituate and the state house in Providence, on two and ten meters. Twenty-two cities and towns were represented in these nets, with most towns also having local nets in operation. A net on 75 meters was tied in with state control on 3980 kc. The Roger Williams Net operated with the Red Cross on six meters, and the R. I. Mobileers worked well as a unit. SEC W1PAZ sends in a list of 78 participants on a statewide basis.¹

SEC W1AOG for Eastern Mass. reports Donna operation from six cities and towns in the area. In Somerville, EC W1OFK alerted his group at 0600 Sept. 12, and mobiles covered hospitals, c.d. headquarters, police and fire stations; those participating were K1s GQY GQZ JKR BUF KZP JOV PXX, W1s LVE SIV. In Milton, EC W1MMQ directed coverage of police and fire stations and hospitals with two mobile units and two fixed stations operated by K1s HDY GGP LKM JZI IMP LPK, W1s BNU IJH KCR. In Medford, units were stationed at the police station, the Highway Dept. and the Water Dept., operated under the jurisdiction of EC W1LVK by W1s EGY AKA MEJ OSQ CZO AQV PSV PTD AUP HRW LUS AVO AOG LVK ZON JUR ZDN. In Burlington,

(Continued on page 132)

¹ K1s JYL ELI DPY EGE MCT ABB ABR ADK EGD EGH IAL HZE KCA CVP EBM JPB IIT LNP BWD, K1s MOE LDJ MKR NYK MXM, W1s CCN ISF AUL JFF TXL MXX OMC VBR NAIR ULII ULS WKI BBN VSZ CN LUO PXI DTW HYL ETM JHF WHG LU RZQ JND SVQ ZUF WFZ CRD SXX TBY YRO IHW YAO PAZ AFO WKZ POP YKQ OGY JYF ZGH LZV MNC VAY VEM NQH TGD KPM CBS OKC DHG YDH.

Project OSCAR

— *Something of the Background*

Bill Orr, W6SAI, has been chosen by the Project OSCAR Association to process the publicity on the project. Starting on this page is some background info on OSCAR, and if you will turn the page you'll get some of the technical details from Don Stoner, W6TNS.

AMATEUR RADIO has a date with space in 1961, according to Fred Hicks, W6EJU, Chairman of the Project OSCAR Association, Sunnyvale, California.

It is hoped that the first amateur satellite will carry a 100-milliwatt transistorized beacon operating in the international portion of the 2-meter band. Negotiations to implement the amateur equipment within an existing space project are under way, and there is hope that approval will be granted.

This significant news, which is designed to put amateur radio right into the middle of the space age, is expected to stir tremendous interest among the amateur fraternity, which for the first time in history will be able to monitor an amateur radio station in space.

Project OSCAR — *Orbital Satellite Carrying Amateur Radio* — is planned as a long range program to arouse and maintain amateur interest and participation in space communications. The activity thus applied is expected to produce far-reaching results in the development of tracking technique, especially when viewing the amateur's well-known capability for improvisation. The Project is planned as a means of arousing the interest and will provide guidance for assisting teen-agers in selecting an engineering career by permitting their active participation while learning. It also will provide a mutual meeting ground

for citizens of all the countries which will be completely free of all military or political aspects, and thus promote better international relations.

The first beacons are proposed to be relatively simple, with sufficient power to be heard by the average amateur with good equipment. Later, more refined packages will be designed that will require a higher degree of preparation, and more critical tracking gear. These will be repeater stations, couriers with recording and playback capability, and even television packages are envisioned. The units will radiate from one-tenth watt to one or more watts output. Some will radiate on two frequencies, providing a cross check for doppler shift measurement to secure more accurate checks on orbital pass times.

All of the equipment has been designed to be separated from the carrying vehicle. This will remove any need for classifying the packages, will prevent the vehicle body from affecting the radiation pattern, and will guarantee that the OSCAR frequencies will not interfere with the radio carried in the primary project. Suitable QSL cards are being prepared for issuance to participants who provide tracking data to the Project headquarters at Sunnyvale, California, and a certificate based on the OSCAR project design will be presented to persons who have performed outstanding service to the Project. Already, many worthwhile ideas have been submitted for future packages, and breakthroughs are expected from the amateurs for problems that are now affecting official projects.

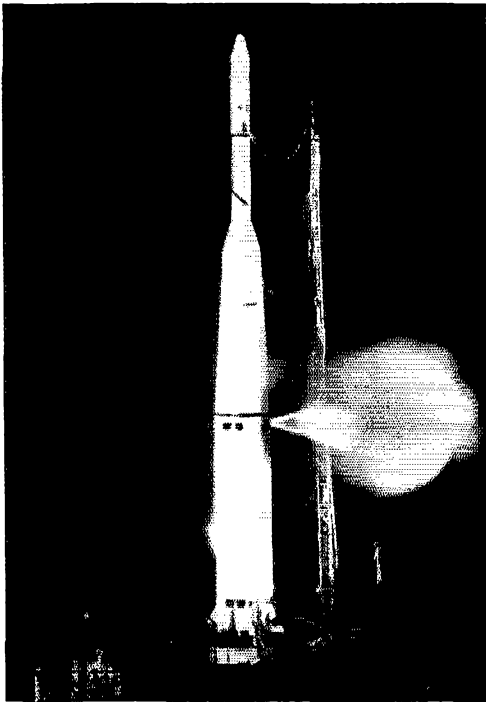
OSCAR was born following the publication in 1959 of an article¹ by Don Stoner, W6TNS. Stoner suggested that hams who were being left out of space exploration should build their own

(Continued on page 138)

¹ *CQ Magazine* April 1959, p. 84.

West-coast hams hope to transform "Project OSCAR" from a hope into hardware. OSCAR Committee includes (l. to r.) M. C. Towns, jr., K6LFH; M. K. Caston WA6MSO; Fred Hicks, W6EJU (Chairman); Ray Hill, K6LQQ; N. K., Marshall, W6OLO; and B. Barrick, W6OON. W6EJU holds mock-up of a proposed 144-Mc. satellite transmitter composed of a hollow dipole antenna enclosing transistorized 2-meter transmitter. Placed in orbit by a "piggy-back" process, the QRP transmitter would cover thousands of miles as it swept across the heavens.





Before long this sort of spectacular activity may herald the launching into space of an orbital satellite carrying amateur radio. This one happens to be the Delta launch vehicle which boosted the communications satellite Echo I into orbit last August. That's liquid oxygen being vented at center right. (NASA photo)

Project OSCAR

— *Something of the Future*

BY DONALD L. STONER,* W6TNS

Last May the League Hq. received word of a fascinating project brewing in California, but with a request not to release the information in QST pending more tangible progress. The project envisioned the first step of the radio amateur body into the field of space communications. Now it has left the science-fiction category and seems on its way to realization. Here for the first time we have the story direct from W6TNS, who originally conceived of Project OSCAR. QST and W1AW will bring you the latest official information from the Project OSCAR Association.

It can truthfully be said that "Man's desire to communicate still offers our greatest opportunity to achieve peace on earth and good will toward all mankind". By the same token a lack of communication can, in time, lead to the total destruction of mankind just as easily as plugged communication channels can stifle a giant industry.

Even before the beginnings of recorded history, man has had an unswerving desire to communicate with his fellow beings. This basic drive has resulted in the invention and discovery of many devices to achieve this end. Certainly one of the most significant was the invention of wireless. Radio communication has developed into one of the most efficient means of learning possible. To the radio amateur it is certainly one of the most pleasurable.

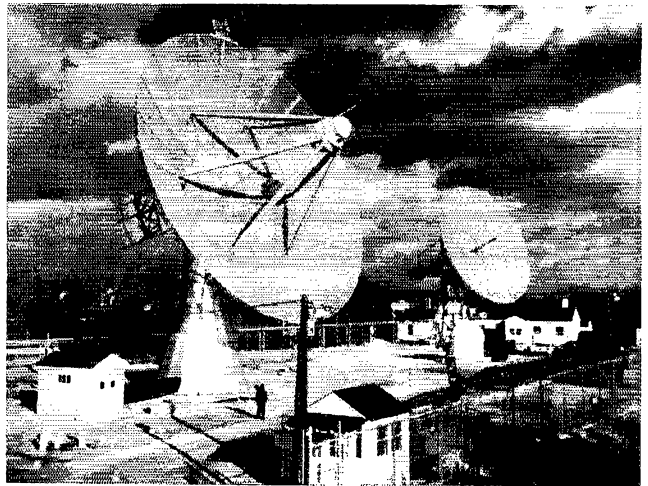
* Alta Loma, California.

The 1961 radio amateur operates from a comfortable hamshack and manipulates the controls which bring to life to his modern transmitter and ultra-sensitive receiver. Surely this must be the ultimate in communication. But is it?

Like his caveman ancestors, the radio amateur has a few basic drives of his own. It is this driving force which sets him apart from his neighbors and friends. In addition to improving his knowledge of electronics and making his equipment work just a little better than it is designed to do, he is unusually receptive to new ideas and techniques. Although the pressure of daily life reduces his spare time to a minimum he looks forward to exploring new frontiers in the field of communication.

One might, at first, question if there actually are any new frontiers to explore. The writer is inclined to feel that we, as amateurs, have only

This is the TIROS tracking center at Fort Monmouth, N. J. Amateurs will get a chance to track OSCAR, but nothing this complicated is contemplated. An article in an upcoming issue of QST (right now it looks like the March issue) will tell you how to go about this tracking business.



scratched the surface. Prominent experimenters such as W4AO, W6NLZ, KH6UK, W1FZJ, and others, tend to prove the point.

What you are about to read might well be found in a typical Larson E. Rapp thriller. However, be assured that this is not an April Fool joke. Quite the contrary, it represents many hours of work and planning on the part of quite a few radio amateurs. Unlike an April Fool article, the proposal to be outlined is quite within the realm of possibility. However, just as in a football game, no one person is in a position to carry the ball alone. The assistance of the amateur fraternity would be absolutely necessary for the successful completion of such a project.

Sputnik Fever

The writer, like hundreds of other amateurs, contracted "Sputnik fever" shortly after the Soviet Union orbited its massive satellites. Like many others, a stiff feeling in the neck (caused by a horizontal head, and a vertical body) persisted for several days after an extensive sighting period.

The radio signals received from the Soviet earth satellites were extremely strong, considering the transmitters were one watt and 0.75 watts respectively for the 20- and 40-Mc. telemeter channels. The ducting effect, observed by many amateurs on 20 Mc., allowed reception occasionally as long as 32 minutes, which represented a flight over more than one-quarter of the earth's surface. Amateurs contributed greatly to the tracking program, by supplying information on reception of the Sputniks and propagation conditions effect on signals originating outside of the ionosphere. Amateurs were the first to observe the unusual effect of receiving signals from Sputnik when it was on the other side of the earth.

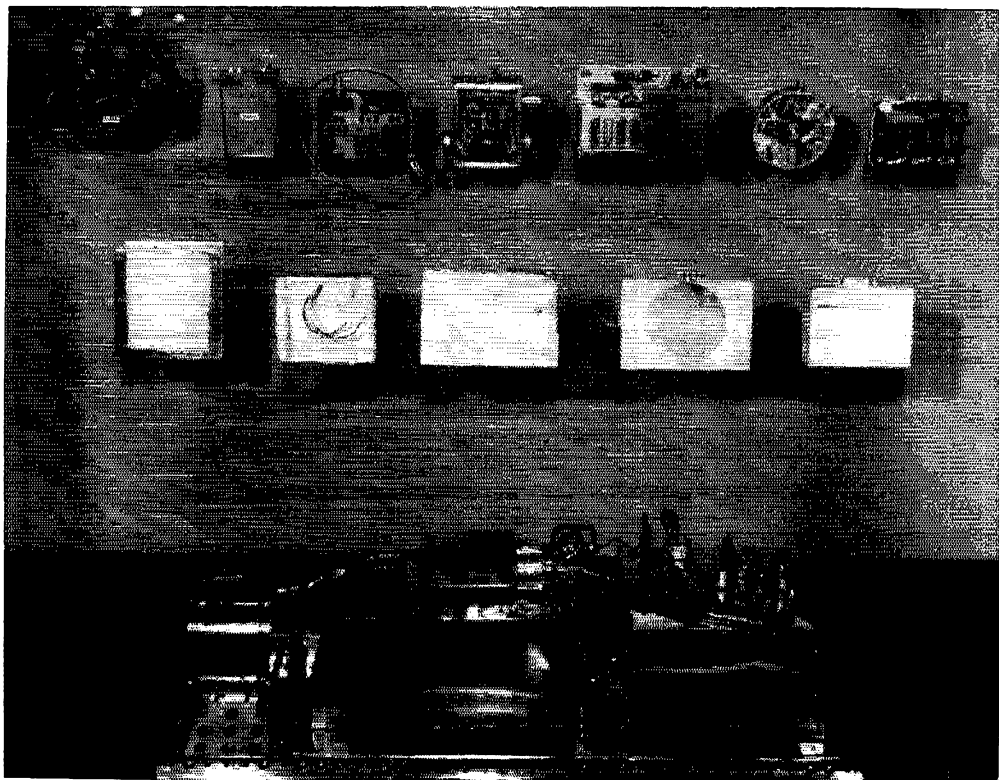
Although the American satellites did not have the "muscle" of the Sputnik, the Explorer and Vanguard vehicles which followed in the wake plowed by the Soviet Union were impressive when distance versus transmitted power was considered. The Vanguard I (orbited March 17, 1958),

although only 6.5 inches in diameter, set a record for outer space DX of something in excess of 200,000 miles per watt! Since this satellite is important to the discussion which follows, a description of the Vanguard electronic system is in order.

The Vanguard I satellite carried two transmitters into an orbit which reached a maximum altitude of 2160 miles (apogee) and a minimum of 407 miles (perigee). Since the perigee is well above the earth's friction-producing atmosphere, the satellite is expected to stay in orbit for several years.

The "high-power" transmitter in Vanguard I was supplied by mercury cells and generated about 20 milliwatts (0.02 watts). The other QRP transmitter was powered by the sun, using solar energy conversion cells, and delivered approximately 10 milliwatts of r.f. power output. The two transmitters used Western Electric transistors (one each) and the transmitting frequencies were separated by approximately 30 kilocycles. One quartz crystal was mounted in a canister, along with the other components, at the mechanical center of the satellite body. The other frequency-determining crystal was mounted on the "skin" of the satellite. Since the inner crystal was thermally insulated, there existed a temperature difference which caused the frequency separation to shift, thus supplying the ground observers with an accurate estimate of the temperatures in outer space. In addition to this basic information, subsequent observations of the Vanguard I orbit revealed many important facts about the size and shape of the earth.

After about three weeks of operation the mercury cells discharged and the "high-power" transmitter was silent. The sun-powered transmitter is still operative and is expected to function for many years. It is very easy to identify reception of Vanguard I due to its characteristic "whirring" sound. The solar cells power the transmitter directly without an accumulator system. The axial rotation of the satellite causes varying output from the solar cells (due to the changing angle between sun and cell) which ac-



This shows you how the SCORE equipment is put together. In the top row, left to right, are the recorder, the zinc-silver oxide battery, the receiver, the d.c. converter, the transmitter, the beacon, and the control circuit. The middle row shows how the equipment looks after it has been encapsulated. Finally, at the bottom, is the completed installation. An amateur satellite installation would have to have this same fine attention to detail.

tually modulates the transmitter.

The amazing fact about Vanguard I (and the point of this discussion) is the tremendous distance spanned, and the area coverage, by this transmitter generating only 0.01 watt. The author was able to consistently hear the chirp of Vanguard I using only a "cut down" conical television antenna. No attempt was made to track or follow the satellite, and yet reception periods of six minutes were often noted. At one time three successive "passes" of the satellite were recorded. Since the earth's rotation moves the receiving point about 1500 miles for each orbit, this indicates a lateral reception range of roughly 3000 miles. If we assume the satellite's velocity to be 18,000 miles per hour, it is not unreasonable to believe that the satellite was more than 2000 miles from the receiving antenna and still audible!

Although Vanguard's transmissions were c.w., the 20-milliwatt transmitters in the Explorer series transmitted amplitude-modulated telemetering information. The periods of Q-5 reception were shorter than for the Vanguard I. Possibly this can be attributed to the fact that it is easier to detect a carrier in noise than to recover amplitude modulation. Even so, the distances covered by the 20-milliwatt transmitters were truly amazing.

Communication Satellites

The "seed" which resulted in the OSCAR program was planted when the news of the SCORE (Signal Communications by Orbiting Relay Equipment) satellite launching was released. The Atlas vehicle programmed SCORE directly into orbit around the earth, without the assistance of multiple stage rockets. The expended Atlas casing contained a 140-pound complete radio receiving and transmitting station remotely controlled from the earth. When the tracking transmitter signal (108 Mc.) was received from the satellite, a control signal from the ground station energized a tape recorder through a command and intelligence receiver. In effect, the tape recorder was used to "take dictation" from the ground station. As the satellite continued across the continent, it was interrogated by the various ground stations. The recorder played back the information originally recorded on the tape mechanism. The President's famous *Peace on Earth* message, you may remember, was the original transmission.

Naturally this process could be repeated as many times as desired simply by recording other information over the erased tape. Thus, such a satellite could be invaluable as an information

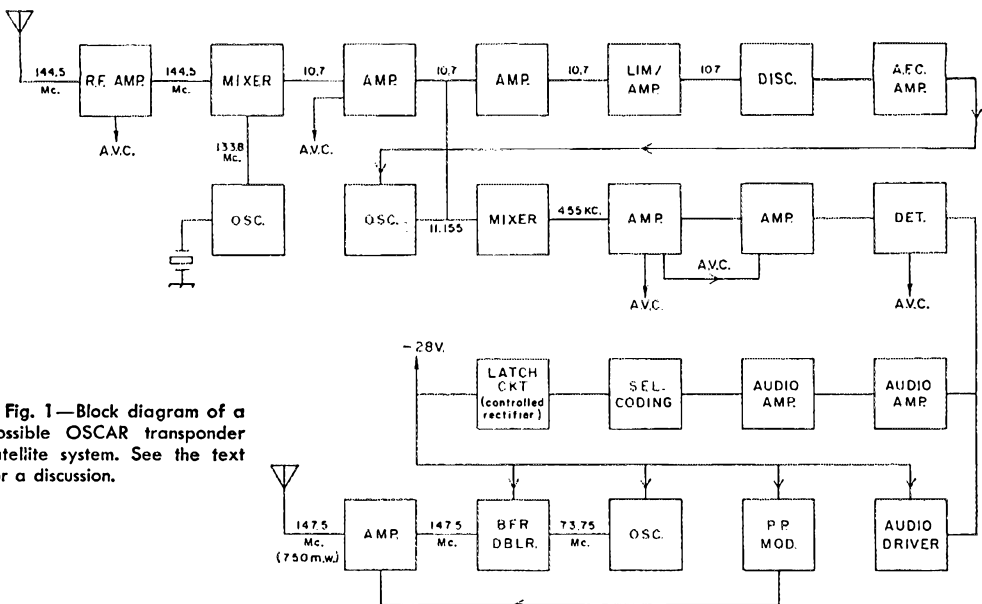


Fig. 1—Block diagram of a possible OSCAR transponder satellite system. See the text for a discussion.

carrier. The SCORE satellite was capable of storing teletype, telephony, or virtually any type of information which could be transmitted by amplitude modulation. This type of communications satellite is called a *delayed repeater*.

Echo is another interesting earth satellite used for communication purposes. Contrasted to SCORE, Echo is a *passive* repeater since it carried no electronic equipment other than a 108-Mc. beacon transmitter used for tracking the huge balloon with interferometer systems.

Late in 1960, a new communications satellite called "Courier" was injected into orbit. This active satellite was designed to relay information between ground stations either instantaneously or by delayed tape recordings. Courier represents another communications experiment adding to our knowledge in this space age.

An Amateur Satellite

Shortly after the SCORE experiment, the writer was discussing the tremendous potential of such a satellite with ARRL Southwestern Division Director Ray Meyers, W6MLZ. One of the reasons that delayed tape recordings were employed in SCORE was the lack of sufficient ground stations (only three were used). It was pointed out that of the more than 200,000 amateurs in this country, conservatively at least 10,000 were active on 144 Mc. What a tremendous reserve of manpower to observe, track, and supply the many answers still to be determined for satellites to be used for communication purposes!

If the 10- and 20-milliwatt transmitters in Vanguard and Explorer had been operating on 144 Mc., reception would have been at least as good (and probably better) than the average amateur's reception of 108-Mc. satellite transmitters. This assumption is predicated on the fact that most of the 108-Mc. receiving installations were jerry-rigged and many amateurs on 144 Mc. have beams with at least five elements,

and are able to rotate them. Even if the 20-milliwatt transmitters had been amplitude modulated, it seems reasonable to assume that the period of reliable signal reception would exceed five minutes for overhead and adjacent passes.

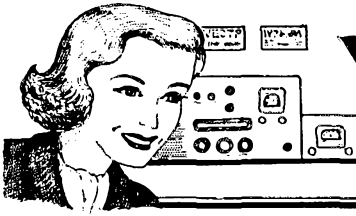
We may also assume that if the satellite contained a 144-Mc. receiver, with a sensitivity exceeding 0.5 microvolts, it would be capable of reliable reception from two-meter ground stations. Earlier it was stated that the 20-milliwatt Vanguard transmitter was easily received with dipole antennas. If the receiving dipole were located in free space (at the same distance as Vanguard), and Vanguard were on the ground, then the conditions would be reversed but roughly the same. Thus it seems quite likely that a two-meter ground station, running ten watts or so, could be easily received out to several thousand miles. With a directional array, the range would be further increased.

On September 10, 1960, Division Director Meyers met both with the writer, and with Dr. Henry L. Richter (W6VZA), chief of the Space Instrumentation Section of Jet Propulsion Laboratory, and Mr. Fred M. Hicks (W6EJU), to discuss the feasibility of such a project. It was thought that the project should be undertaken in at least two phases, the first being one that could be accomplished in a short period of a time with existing equipment. Amateurs throughout the world could cooperate by monitoring and submitting data through the American Radio Relay League, which would coordinate efforts of the radio amateurs.

Phase One

Amateurs working with various space programs would design and package a very low power space transmitter weighing between one and two pounds, transistor operated and powered by either battery or solar cells. It would generate a

(Continued on page 140)



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

THE following is the "reconstruction" of a talk delivered by Lee Eastman, W6AWI, during the YL-XYL luncheon program of the ARRL Pacific Division Convention at San Mateo last Fall. Lee's talk was enthusiastically received, and it was suggested that he reassemble his notes for the benefit of others. W6AWI is the OM of Gladys, W6DXI, 1960 president of the YLRL.

An Orchid to the Ladies

I started learning something of the mysteries of radio at an early age. Sometime later I discovered women. Then I found while the first subject could be discussed at any time, the second was a touchy one. I have a firm rule — never talk about women. But I think it is time someone spoke up and passed out a few editorial posies to the girls. This gives me an excuse to break a long-standing rule.

Today two-letter calls are a rarity, but women hold their fair share of them. There are still some women operators around who pounded brass during the World War One period. Many served in our communications system even at that early date. I don't think that Gertrude (Mrs. John Reinartz, K6BJ) has ever had proper credit for those hourly tests with John which proved that frequencies below 200 meters could provide reliable communications to the Arctic. I recently asked an Armed Services Public Information officer how many women served in communications during World War II. The answer was, "We can't tell you. The records are not kept separate, but you can be sure there were thousands of them." The girls¹ did a terrific job teaching code and relieving men for more active duty. Admiral Bruton, in paying tribute to all women in radio, said in 1957 — "In our Navy and Naval Reserve we have many WAVE radiomen, small but growing numbers of WAVE electronic technicians and communications technicians, as well as a number of WAVE officers who are valuable and unusually well-qualified communicators and cryptographers."

The group of women who serve at home is the greatest in number — those who man the rig during emergencies of all kinds, those who are members of the MARS, AREC, CAP, various nets, etc. — the traffic handlers, the rag chasers who, importantly, keep the ham frequencies in use.

One of you girls, Mae Burke, W3CUL, won world-wide recognition for her enormous contributions in the field of public service. At the time she received the Fifth Edison Radio Amateur Award in 1957 Mae operated daily in six c.w. nets. She had handled 312,000 messages since 1949 and

* YL Editor, QST: Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

¹ W6AWI's reference here is not limited to licensed women amateur radio operators only. — Ed.

had operated 1825 days without missing a schedule. And Mae had continued to reap top BPL honors monthly since 1957. There are many other YLs who may not have quite the record W3CUL has, but who daily do their bit of public service efficiently and most willingly.

To all of the girls who participate in this wonderful hobby of ours — for broadening your horizons and making life more interesting for your families, your communities, for yourselves — an orchid!

WRONE WEEK — Feb. 20-24, 1961

Sponsored by the Women Radio Operators of New England

Object: A contest for members of the Women Radio Operators of New England YL club (WRONE) to contact as many YLs in New England as possible. YLs anywhere may participate, but the method of scoring given below should be noted. The primary purpose of the contest is to give the YLs of the six New England states a chance to get better acquainted.

Time: Contest begins at 8:00 A.M. Feb. 20, 1961, and ends at 8:00 P.M. Feb. 24, 1961.

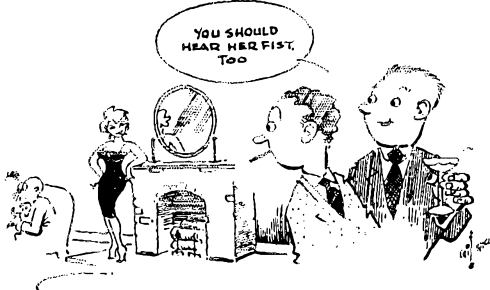
Scoring: One contact with each station permitted (any band). Score 1 point if YL worked is YLRL member; 2 points if YL is WRONE member; 3 points if YL is both YLRL and WRONE member; ½ point if she is neither WRONE nor YLRL member.

Logs: Copy of regular log, with YLRL and WRONE member indication, must be received no later than March 11, 1961. Send logs to Mary Hadley, KIADY, RFD 1, Box 145, Brewer, Maine.

Prize: High scoring WRONE member will receive 100 Miss WRONE QSLs.



Thirty-five YLs met at San Antonio for the seventh annual party of the Texas YL Round-Up Net. The photo shows K5MJW, K5CRH, W5WXT, and W5ERH (standing) plotting election campaign strategy. New officers elected at the business meeting were W5JCY, Pres.; K5IMD, V.P.; W5ERH, Secy.-Treas.; W5ZPD, Pub. Chmn. The new GAB YL club extended an invitation for the 1961 TYLRUN party. (Photo via K5OPT.)





Officers of the Los Angeles YLRC for the 1960-61 term are left to right: K6LMV, Corresponding Secy.; WA6AOE, V.P.; K6ANG, Pres.; K6OAI, Treas.; K6JCL, Rec. Secy. The LAYLRC, one of the first of the YL clubs, was organized in 1946 and now has over 100 members. (Photo via K6TFN.)

Coming Events

YL-OM Contest — Sponsored by the YLRL. Phone section Feb. 25-26; C.w. section March 11-12. See rules in last month's column. Logs must be postmarked not later than March 31, 1961, and received by W1ZEN no later than April 15, 1961.

WRONE Week — Sponsored by the Women Radio Operators of New England, Feb. 20-24, 1961. See rules in this column.

San Diego YLRC will hold a convention in May. Details forthcoming in a future issue.

YL Nets

The following nets may be added to the schedule of YL Nets and Round Tables published in last month's column. C.W. — 3600 kc. Friday, 1400 EST, WRONE.



W6AWI, a man who spoke his mind about women at the Pacific Division Convention at San Mateo. Lee Eastman is flanked by K6ENK, W6DXI (his wife) on the left and W6BDE, Vi McCoy, and W6QGX on his right. (Photo by W6USE.)

PHONE — 50.56 Mc. Monday, 2000 PDT, WA6ALK, NCS.

3920 kc. Monday, 0800 EST, W8HAV Mgr.
50.65 Mc. Wednesday, 1400 EST, WRONE.
3850 kc. Saturday, 1000 PDT, W6QYL NCS.

Clubs

Rhode Island YLRC — New officers are Pres. K1DWH; V.P. W1JHY; Secy. W1ZOK; Treas. W1CEW.

WRONE — All N.E. YLs are invited to informal luncheon meetings the first Saturday of each month at the Abner Wheeler House, Rte. 9, Framingham, Mass., at noon.

Los Angeles YLRC — K6KCI, custodian of the Lads 'n Lassies Certificate, points out that no endorsements are given for working additional members. Copies of logs are not returned. Postage is not required but appreciated. (See Dec. 1960 column for complete rules.)

Strays

The Third Edition of the *Radio Amateur Licensing Handbook* (112 pages, 5½ × 8½", paper covers), the best source of authoritative information on licensing in Canada, is now available from Dept. Q, Radiotelephone Directories of Canada, Ltd., 119 West Pender Street, Vancouver 3, B. C., Canada for \$2.00. The book is written in a lively and readable style by Jim Kitchin, VE7KN, regional supervising radio inspector for the Department of Transport. The new edition contains the recently-changed Canadian phone allocations, and an expanded section written especially for amateurs of the United States intending to operate in Canada.

In addition to advice on the mechanics of licensing in Canada, the manual also contains a wealth of practical and technical information such as wire-size tables, Q signals and abbreviations, the color codes, schematic symbol chart — and even a memo to wives and mothers of hams!

As a part of the Boy Scout Week observance, the *Boy's Life* Radio Club will conduct a Ham-boree February 7-12. A medallion will be awarded to the Scout in each of the 12 BSA Regions who gets the highest score. Though only active Scouts will be eligible for awards, any ham now or

formerly connected with Scouting can participate. To get in, call CQ BSA, and exchange the following: message number, call of station being worked, your call, signal report, Scout rank or position and date. You get one point for each "message" received and one for each sent, multiplied by the number of BSA regions you work. Logs go to Hamboree, *Boy's Life*, New Brunswick, New Jersey, before March 1.

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.

New amateur application forms 610 and 610-A are now getting initial distribution. See item on page 63, January *QST*. However, as stated in that item, old forms may be used until June 30, 1961. If you are sent old forms, use them; please don't burden FCC with additional correspondence asking for the new forms instead.

The World Above 50 Mc.

1215-1300

2300-2450

3300-3350

5650-5925

10,000-10,500

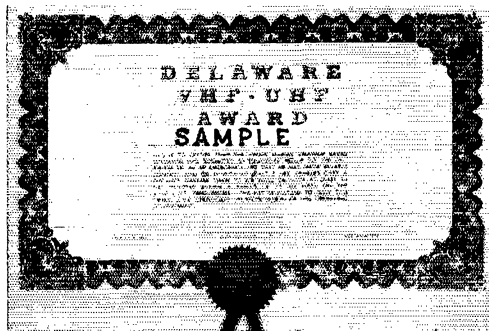
21,000-22,000

30,000-?

CONDUCTED BY SAM HARRIS,* W1FZJ

THE majority of the serious v.h.f. workers are active on v.h.f. by choice. Most of them have served their apprenticeship on the lower frequencies and are qualified to operate the v.h.f. bands as knowledgeable amateurs. All of these people are well aware that passing the license exam is only the first step in becoming a ham. Unfortunately, many of us have forgotten the years of learning required to become experts in the mores of our hobby, and have a tendency to expect all license holders to be hams. Such, of course, is not the case. How can you expect a newly licensed Technician, for instance, to be familiar with *E_s* skip? Where in the *License Manual* is propagation mentioned? How can this Technician find out the answers to his questions if you don't make an effort to pass along the good word? He won't find it in the *License Manual* and unless you tip him off, he won't know about the wealth of information available from the ARRL. The *Radio Amateur's License Manual* was written to aid the prospective licensee in preparing to take the FCC examinations. The information contained therein, qualifies the aspirant to operate amateur radio equipment but in no way qualifies him to understand the basic methods of propagation available to him. The League publication *How to Become a Radio Amateur* covers many of the phases of getting on the air and the course in radio fundamentals prepares the budding ham for many of the problems he will meet in getting on the air. The ARRL *Antenna Book* deals quite extensively with all types of propagation as well as with all types of antennas which are available to the average ham. Other publications such as *Hints and Kinks for the Radio Amateur*, *Single Sideband for the Radio Amateur* and the *Radio Amateur's Handbook* provide an extensive library

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



New certificate award offered to the v.h.f.er by the Delaware Six Meter Emergency Net.

of information not only for the new ham but as a reference for any amateur station. It may come as somewhat of a surprise to many of you, but many new amateurs have been given their license examinations by other amateurs and have never been advised of the availability of these League operating aids. In fact, some amateurs are not even aware of the ARRL as an organization. Consider the plight of the poor Novice who not only doesn't know how to get on the air, but doesn't even know where to write and ask. No one can be blamed for this situation but you. You, the amateur, give the examination and start the fledgling ham on his way but fail to give him the advice necessary to keep him on. Now, having recently read each of the various books published by the ARRL as aids to amateur radio operators, I must admit that there appears to be a gap in information between getting your station on the air and determining what you're supposed to be able to do once you have it on the air. The fact of the matter is that almost every method of v.h.f. propagation is in fact covered in the first chapter of the ARRL *Antenna Book*. Now despite some rumors to the contrary, I personally have never met or talked to a Novice or Technician who did not want to know more about his hobby. I have, however, on numerous occasions heard so-called Old Timers deploring the lack of erudition among the newcomers. At the same time I have observed a considerable lack of information passing by the same people. Surely your duty as an expert v.h.f. man is to help the newcomer, not criticize him. The very least you can do is to quote from your own *Handbook* — or don't you have one?

Parametric Amplifiers and Moon Bounce

We received many requests for more information on parametric amplifiers. As a result of these, we are preparing a question and answer paper for distribution to all who request it. We do not contemplate a construction article on paramps. We heartily recommend the 1296-Mc. paramp article in January *QST* by Troetschel and Heuer.

Moon-bounce news is all concerned with people getting ready. As of the present, we know of only one station on the air (W1BU) and one station ready to listen (W8LIO). W6HB is in the throes of moving and rebuilding. Australia and Germany expect to be operative by next spring. We have prepared a folio of information on moon bouncing in general and are prepared to send same to any who request. The W1BU installation is not operating on a regular schedule, but we will be glad to fire up for anyone who wants to listen.

50 Mc.

Information reaching us from Richard Sowler, W8FEM, gives out with the good news that Robert Martinon, FM7WZ, is operating on 50 Mc. daily at 1900 GMT, on c.w. or phone; frequency is 50.040. Bob runs about 50 watts into a 4-element beam, and receives with a home-made converter

which is fed into a BC-342. FM7WU is also active on six and operates 50.060 Mc.

Up in the Northwest Territory, Pete, VE8BY, has had a few openings into VE3, VE4, W7 and W9 lands; these occurring on November 16, 24, 25, and December 1. The December 1 opening started just before 0600 GMT and although Pete first went on c.w. he had no takers. When he went to phone he contacted five W7 stations within twenty minutes. One of the stations worked in Oregon was Ken, W1NX, who informs us that he now has all VE call areas worked on 50 Mc. Ken says that the tip-off to the VPS opening was a weak aurora which lasted about two and a half hours previous to contacting VE8BY.

One more report from K6QXY says that the openings seem to be predominantly North-South; good openings to Canada and South America. On October 18, Bob heard two Wyoming stations during the first E skip of the season, and on October 25 worked Hawaii. His states worked total now stands at 49 with Alaska still to go.

A skip report from Fresno and W6BJI says that the west coast had a ball during the first part of December. On the 2nd of that month XE1GE and XE1OE were coming in between 1930 and 2215 to give Mexican contacts to many of the faithful. There were also openings on the 4th, 5th, 6th, 8th, and 11th of December, with the opening on the 6th bringing in excellent single- and double-hop contacts, Florida, Colorado, Alabama, Oklahoma, Texas, Louisiana, Mississippi, Arizona and Georgia. The big question again is — shall we or shall we not move to the west coast!

Seems that business is picking up on 50 Mc. in the Chicago area, with a number of old timers from the low frequencies seeking new fields to conquer. C.w. is slowly picking up, with stations in Illinois and Indiana on every night, and the average working distance about 150 miles. Gary, K9HWC, runs 40 to 50 watts into a five-element beam, and is on c.w. every night looking for ground wave. He also operates two meters with 250-watts input on c.w. Gary sez he'd like to see more c.w. in the Technician part of the two-meter band and that more people would tune above 145 Mc. for c.w.

Word has arrived from Arkansas that Stan Pepper, K5PPM, should be making quite a little noise on 50 Mc. by the time this appears in print; using 100 watts and a five-element beam forty feet up.

Our old friend George, K3HRF, has raised his states worked to 39 including Hawaii, which he worked one morning at 0700. The portable site used by George (1975 feet) is set up and working well, but not used very much so far, due to the pressing obligations of business and the season. However, he expects to be very active from both locations on both six and two meters.

A report from Walt Stock, W4IIS, gives some details of his portable operation. Seems that Walt has made 15 field trips at three-week intervals during the period between November 15, 1959, and November 15, 1960. He has made 372 contacts with 89 stations worked from the Lake Placid, Florida, location with all except two contacts being more than 120 miles.

A sad story received from John Chambers, W6NLZ, who has had all kinds of equipment trouble, even though he's been one of the faithful few to keep skeds regularly come what may. He says that on December 3 the transmitter would not load, the receiver heard no noise, and the antenna needed repairing. After taking care of the several situations, John is now back on the air for his daily stint, which is the same as it has been for the past nine months. For the unknown 50-Mc. operator; operation is at 50.010 Mc., starts at 0800 PST, ends at 0830 PST, and the sked is for anyone who cares to listen for John. He transmits the first 2½ minutes of each five-minute period and listens for the last 2½ minutes of each period. Starts with the beam east and slowly rotates it north so that by 0820 or 0825 it is usually Northwest. To date the stations most reliably contacted have been K7ICW, W7RUX, W7QDJ, K6RNQ, W6FZA, W7RT, K7AAN, and W7RDY. Not too many of the v.h.f. gang are as faithful in the keeping of skeds as is John and our best wishes and sincere admiration go to him. He suggests that we all work to increase our system gains so that by next summer everyone can be doing a better job. His own goal is to achieve an additional 9 db. over his present system.

A most interesting test and experiment is going to be carried out sometime during the coming summer by Howard Hanson, W7MRX and his brother, W7BPK. Seems the boys have a walky talky which runs about half a watt on six meters and which they plan to take to the top of Mount

Ranier. A preliminary test made from one of the lower slopes had such good results, despite the fact that they did not have line-of-sight conditions, that they believe there is a good chance of getting a signal into Oregon, Washington, and perhaps northern Idaho. Sounds like a fine expedition to keep an eye on, and we'll let you know if possible when a definite date is set.

Speaking of publicity (and who was?), we found out via the Lynn, Massachusetts, *Daily Evening Item* that one of the most enthusiastic YLs in this area has been having a very tough time of it. Marge Cole, K1NDS, and her OM Tracy, W1EWY, apparently believe in "excitement." It started off with the birth of their fifth child; within a period of just a few weeks this happy event occurred followed by two fires and a robbery at their home. Marge then developed "somepin new" and was forced to return to the hospital. The saving grace? Ham radio, of course. A ham physician at the hospital learned that Marge is a ham and contacted the Massachusetts VHF Society. That was all that was necessary. Marge may be laid up, she undoubtedly is lonesome for the five little ones, we can't see how she can fail to be blue, but she does now at least have ham radio at the hospital. Thanks to the Massachusetts VHF Society.

Numerous reports concerning aurora and E openings have been received and it's most interesting to compare reports from various parts of the country. For instance, K1CXX in Auburn, Maine, reports aurora on November 3, 12, 15 and 24 but says it was very poor on all four dates. Dick heard K8MIMM in Ohio telling a W9 that this was the best aurora in months (Nov. 15) but not so in Dick's case. On the other hand, W0LUF in Boulder, Colorado, reports aurora on November 12, 13 and 15, and says it was very good. K4KYL reports aurora on November 12, 15 and 27, adding that the November 15 aurora was not very good; while W1NKA says that this one was very good in his area. W1NKA also reports South Americans coming through on Monday, November 14, about 0615 following a good auroral session. Three stations report hearing XE1OE on November 14 — K8SUJ, Ohio; K8NEY, Michigan; and K0GIC, Kansas. All said XE1OE had 5-9 signal. From other stations we hear that K3CNN has not heard any signals on 6 meters. K6TVC says "nothing special" on 6 during November. K6SIX reports that "generally speaking band conditions on 6 were not favorable during November". K7BBO sez the month of November was "not bad" on 50 Mc., and the boys in Denver and Boulder, Colorado say "We never had it so good."

Clubs and Nets

The Delaware Six-Meter Emergency Net is now offering a certificate to anyone interested. Rules as follows:

1. If less than 75 air miles from Dover, Delaware, contact and QSL at least ten net members. If more than 75 miles (air) from Dover, contact and QSL at least five net members.

2. Send a log extract listing date, time, frequency and name of each station contacted and QSL'd with to K3AXW, 1416 Oak Hill Drive, Wilmington 5, Delaware. Do not send confirmations with the applications, as the stations listed have to have the applicant's QSL card before the certificate can be issued. A spot check can be made locally. (All participating Delaware stations QSL 100 per cent.)

There is no charge for the certificate.

Any contacts on or after January 1, 1960, may be counted.



Lenna Suominen, OH1NL, holder (one end) of new 144-Mc. European DX record.

2-METER STANDINGS

WIREZ	32	8	1300	W6WSQ	15	5	1390
WIAZK	28	8	1205	W8NTZ	12	5	2540
W1KCS	24	7	1150	W6DNG	9	5	1040
W1RFU	24	7	1120	W6JIF	8	12	800
W1AJR	23	7	1130	W6ZLL	5	3	1400
W1MMN	21	7	1090	K6GTG	4	2	800
W1HDD	22	6	1020	W6MTU	3	2	950
W1IYZ	20	7	1180				
K1CRQ	19	6	800	W7JRG	13	4	1040
W1ARO	19	6	920	K7HKD	11	5	950
K1AFL	17	5	450	W7CJH	11	5	870
				W7LHJ	4	2	1050
W2NTY	37	8	1390	W7JJP	4	2	900
W2GNY	37	8	1360	W7JU	4	2	253
W2ORL	37	8	1320				
K2GOL	33	8	1200	W8KAY	38	8	1020
W2AZL	29	8	1050	W8HJF	37	8	1220
K2EJF	27	8	1060	W8PT	37	9	1260
W2BLV	30	8	1020	W8JLX	35	8	980
W2AMJ	25	6	960	W8LOF	33	8	1060
W2DUJ	23	6	860	W8SFG	34	8	1040
K2HOD	23	6	950	W8RMH	32	6	910
W2PAU	23	6	753	W8GGH	32	8	1180
W2LAR	23	7	960	W8SVI	30	8	1080
W2RXG	23	8	1200	W8EHW	29	8	860
W2SMX	23	7	1090	W8LPD	29	8	850
K2CRH	23	6	940	W8WRN	28	8	680
K2LNG	24	8	1160	W8WAN	32	8	960
W2LWJ	21	6	700	K8AXU	29	8	1050
K2KIB	21	5	900	W8NOH	26	8	975
W2ESX	20	6	750	W8DX	26	8	720
W2WZR	19	7	1040	W8LJC	25	8	800
W2LTH	19	7	800	W8JWV	25	8	940
W2RGV	19	6	720	W8GFN	23	8	540
K2RLG	17	6	980	W8LCV	23	7	680
				W8BLN	21	7	610
W3RUE	33	8	1100	W8GTC	17	7	550
W3GKP	31	8	1180	W8NRM	17	7	550
W3SQA	30	8	1070				
W3TFD	30	8	1125	W9KLR	41	9	1160
W3KCA	28	8	1110	W9WOK	40	9	1170
W3SQA	31	7	700	W9GAB	34	9	1075
W3EPH	22	8	1000	W9AAG	33	8	1050
W3RHF	23	8	1070	W9ELM	31	8	850
W3LNA	21	7	720	W9ZIH	30	8	830
W3NKI	20	7	730	K9AAJ	29	8	1070
W3LZD	20	7	650	W9LYC	27	8	950
				W9FQC	27	8	820
W4ELQ	38	8	1150	W9PRP	27	8	820
W4HKA	37	8	1280	W9QFC	25	8	910
W4ZAJ	36	8	950	W9ZHL	25	8	700
W4LTU	34	8	1160	W9BPV	25	7	1030
W4AO	30	8	1120	K9AQF	24	7	900
W4MIK	33	8	1149	W8LFF	22	7	825
W4UMF	28	8	1110	W9KPS	21	7	690
W4WLA	26	8	1000	W9CUU	21	7	800
W4GOM	25	8	1040	W9OEY	20	7	850
W4VNH	24	8	850	W9PMN	19	6	800
K4EUS	24	6	765	W9ALU	18	7	800
W4JJC	23	6	725	W9BPH	32	9	1180
W4WVE	22	6	720	W9SMJ	29	9	1075
W4RMU	20	6	1040	W9HFD	31	8	1030
W4TLV	20	7	1000	W9LFE	28	7	1050
W4IKZ	20	6	720	W9QDH	24	9	1300
W401K	20	6	720	W9RUF	23	7	900
W4AIB	22	7	880	W9JNT	21	6	830
W4CPZ	18	6	650	W9KGC	21	7	870
W4RFR	18	7	820	W9RYG	20	8	925
W4MDA	17	6	750	W9WIC	19	7	1245
K4YTX	18	8	830	W9MDX	19	6	1150
W4LNG	18	7	1080	W9JAS	18	6	1130
				W9AZT	17	6	1100
W5RCI	35	9	1215	K9AAJ	16	6	1120
W5AJD	30	9	1360	W9IFS	16	6	1100
W5JDF	23	9	1300				
W5LPG	25	7	1000	VE3DIR	30	8	1330
W5PZ	27	8	1300	VE3AIB	28	8	1340
W5FYZ	26	9	1160	VE3PON	19	7	790
W5KTD	23	8	1200	VE3DPR	17	8	1340
W5JWL	29	7	1150	VE3AOG	18	8	1300
W5ML	16	5	700	VE3HW	15	7	1350
W5FSC	12	5	1390	VE2AOK	13	5	550
W5HPZ	12	5	1250	VE3BPR	14	6	715
W5CVW	11	5	1180	VE2ABE	9	4	580
W5NDE	11	5	625	VE7FJ	2	1	365
W5VY	10	3	1200				
W5WV	10	3	600	KH6UK	11	2	2540
W5NH	6	3	1200				
W5YYO	4	3	1330				

(mess size) to Thomas A. McKee, K4ZAD, 508 Oakridge Blvd., Lynchburg, Virginia. Information for issue III should be sent to K4ZAD no later than March 10.

144 Mc.

The tremendous solar flare of November 12, 13, has been reported as the largest disturbance in the past ten years. The aurora session on 144 Mc. which occurred as a result of this solar flare was certainly one of the best we have had in the past few years. W8PT, for instance, reported twenty-one states in all call areas except W8 and managed the first W8-to-Wyoming contact with K7HKD. He also worked a few odd ones like W9AZT, K9AQJ, W8MOX, W5PZ, W5JSB, KILSY, W1ET; Jack provided the first Michigan contact for all the above. K7HKD managed to catch the last half of the aurora on November 13, providing W9QXP with the first Illinois-Wyoming two-meter QSO as well as W8PT and W5JSB, Wyoming to Oklahoma contact. Wyoming stations worked column now stands at eleven states with five call areas and 950 miles. W4FWH records this aurora session as the strongest ever at his location in Georgia. He was receiving signals from New Jersey, Pennsylvania, Virginia, North Carolina, South Carolina, Kentucky, Ohio, Illinois, Indiana, Missouri, and Michigan and North Dakota. W4FWH observed evidences of aurora on 220 Mc., but was unable to contact anyone. (Spent too much time on 144 Mc.) K4EUS observed signals from Is, 8s, VE1s, VE2s, VE3s, W2s, W9s, but feels that the actual intensity of the aurora at his location was not as strong as should have been expected from such a strong solar flare. VE1LT, St. Stephen, N. B., managed to contact Maine, Massachusetts, New Hampshire, New Jersey and Connecticut, as well as two provinces in Canada, New Brunswick and Nova Scotia. VE1CL, who has been making an all-out effort to increase the 144-Mc. activity in his area, was unfortunately not on the air during this aurora. Clayton advises that he copied W4AIB and K4EUS during this opening but was unable to make contact. K9AAJ observes that auroral signals appear to be getting better from the west. This quite likely is due to increased activity in that area. Lee contacted W8MOX and W9AZT on the November 12 aurora and managed a tropo contact with W4AIB in South Carolina. Lee deplores the lack of information about the operating habits of the West Coast gang. I don't see any reason why they could not be worked on aurora, at least those north of San Francisco, if we knew what frequencies they were operating in that area. Any of you W6s or 7s willing to make schedules please contact us with your frequency of operation and I am sure that many of the active stations in the west and midwest will be glad to accommodate you. As Lee points out, it has been my experience that the best DX is always just barely above the noise level and many times just below the noise level and tuning across the 144-Mc. band looking for weak DX is an absolute impossibility. Some pre-knowledge of the frequency is absolutely essential. Hank, W8IFX, raised his total to 35 states in 3 call areas which leaves him two states behind W8SDJ who managed to pick up W8MOX and W9AZT during the aurora. Just goes to prove you can't go away during an aurora if you want to work more states. Not so much on the DX side but still during the aurora, KILSY in Sudbury, Massachusetts, managed a fine s.s.b. contact with W2WZR in Syracuse, New York. People looking for aurora s.s.b. contacts can find W2WZR on 144.175. KILSY can usually be found on 144.093. Any other sidebanders interested in scheduling for aurora or meteor-scatter work, please send in your operating frequencies for dissemination among the enlightened. W4MIK managed to contact W9RYG in Nebraska on the aurora. This brings Bill up to 33 states from Kentucky. W8MOX sends in the following frequencies for your erudition: W8MOX, 144.080; W8IC, 144.103; W9AZT, 144.062; W9IUF, 144.200. K9AAJ reports his frequency as 144.036.8 kc., and W9LFE who caught the aurora for two new states with KILSY and W8MOX, giving him a total of 28 from Missouri. Ed has been operating 141.250 the majority of the time. However, in view of the many receivers which do not tune above 144.2 he is planning to operate a portion of the time on 144.182.

Meteor Scatter from the Geminids

Rex, W5RCI, boosted his states to 36 when he contacted W1JDF during the Geminids Meteor Shower on the 12th of December. The Geminids, usually not very productive,

The contacts may be on any single band or any mixture of bands, 50 Mc. and above. A Delaware station will count as only one contact, even though the station may be contacted a second time on a different band.

The Delaware Six Meter Emergency Net meets every Tuesday evening, 2100 EST, at 50.40 Mc. Net contacts may be counted, but specify upon checking in that Certificate Contacts are being sought. All net members are running respectable power and are quite active, so no difficulty should be encountered in making the required contacts. (In Delaware!)

The "Lynchburg Amateur Radio Club" has issued the second issue of the *Directory of Wide-Band FM Nets*. Anyone interested in obtaining a copy of the complete directory should send a stamped, self-addressed envelope (busi-

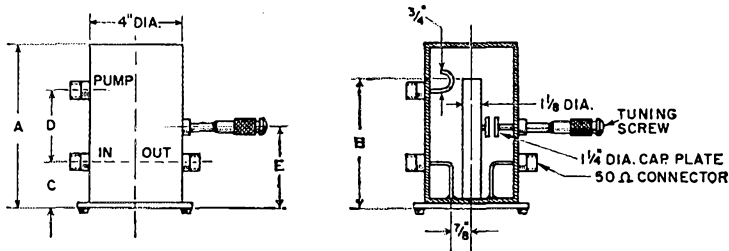


Fig. 1—Sketch showing construction of a coaxial filter. Dimensions should be as shown at the right:

	Frequency (Mc.)		
	144	220	430
A	16½	10¾	7¾
B	15½	8	5
C	4¼	3¼	1¾
D	6½	3	3¾
E	8	5¼	3¾

appear to be quite useable this year, W6LIT/Ø in Nebraska managed a contact with Mel, W6WSQ, on meteor scatter. Meanwhile, WØLUF contacted W5RCI, K5TQP, nice contacts with W5FYZ, WØENC; contacts were made in the period from December 12 to 14. Consensus appeared to give the 13th and 14th the edge. W8PT slipped up to 37 states with a Georgia contact with W4LNG. This contact occurred on the 12th of December and added Rudy's state, #19, to his list. Rudy also ran skeds with WØENC but did not receive full information for a contact. W3BYF was also active and managed a contact with W4RMU on 13th of December. However, skeds with W5FYZ produced nothing. W5FYZ operating 144.150 managed contacts with WØIC on the 12th, K5TQP New Mexico, WØLUF Colorado, W3BYF Pennsylvania, but received no encouragement to the northeast, missing out on New Hampshire, Massachusetts and Rhode Island. Ernie feels that the shower peaked on the 12th, as all three completed QSOs were made during that period from 10:00 p.m. 'til 12:00 p.m. CST. Maximum distance was about 800 miles.

144 Mc. Record in Europe

On December 13, 1960, OH1NL and HB9RG (of 6-meter renown) made a two-way meteor-scatter contact on 144 Mc. The distance between Nakkila, near the city Pori in western Finland, and Zurich, Switzerland, is 1800 kilometers or 1120 miles. Full call signs and reports were exchanged. On the 14th Lenna, OH1NL, also contacted G3HBW, a distance of 1730 kilometers. The transmitter at OH1NL is a 200-watt affair with two 826s in push-pull. He has recently received special permission to use 800-watts input and the new rig should be ready in the near future. Antenna is a 13-element yagi.

220 Mc. and Up

Must be the winter weather that slows down activity on 220 Mc. and up. No meteor shower attempts, no aurora contacts, but lots of rebuilding.

Ben, W9OVL, points out that the loss at 220 Mc. per 100 feet of RG17/U is 1.25 db., RG8/U is 3.4 db. (56% power loss), ¾" gas filled heliax line has 1.34 db. and ¾" air coax has 0.63 db. loss. Good quality open wire 300-ohm feedline loss is 0.26 db. per hundred feet. (Federal KT-200 feedline is measured at 0.8 db per hundred at 400 Mc.) Data on Federal line is not always easy to come by, but if you are interested you might drop a line to Vern Robinson, WIEGE. Vern doesn't have anything to do with Federal but he does know how to get data on their feedlines.

Southwestern Michigan 220 Mc. net now has five stations reporting in regularly at 2030 EST, on Monday, Wednesday and Friday. W8GOV, W8KSZ, K8JZR, W8CVQ and W8PT are the regulars with W8PYQ calling in occasionally.

The number of inquiries about "coaxial filters" has prompted us to publish the dimensions for filters to be used on 144 Mc., 220 Mc., and 432 Mc. (See Fig. 1.) I hasten to point out that the use of a micrometer for tuning is an unnecessary refinement. A 10-32 screw with a locking nut is

entirely satisfactory. The wall thickness is of no importance as long as the structure is mechanically rigid. Material can be copper, brass, aluminum or solid gold, as the spirit moves. Silver plating is a nice touch but doesn't contribute measurably to the performance.

The dimensions for injecting power are shown, in case you are contemplating using the filter as a parametric amplifier in the future. Dimensions for six meters are not included the large physical size involved. If you must make one this way for 50 Mc., you can multiply the 144-Mc. dimensions by 3. The results on 50 Mc. will be quite satisfactory but could be obtained in a somewhat smaller structure. A suggested installation is shown in Fig. 2.

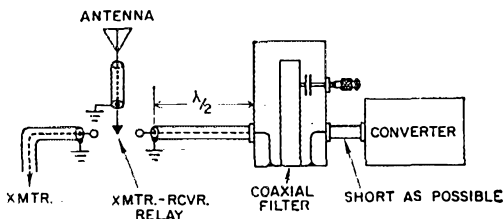


Fig. 2—Showing connections between the coaxial filter, converter, and antenna.

TE Propagation Test

On or about February 1, transmissions on 32.7, 39.2, 48.5, 74.5 and 87.4 Mc. will originate from Salisbury, Southern Rhodesia, for the purpose of studying transequatorial (TE) propagation. Though monitoring equipment is being set up at various points as part of the project, interested amateurs, particularly those in Europe and Africa, are invited to participate.

Operation will be around the clock, but the five transmitters will run in sequences of 12 minutes each, beginning with the lowest frequency and working up. Each of the transmitters will thus have a 12-minute period each hour. The emission will be amplitude modulation, with a 2000-cycle tone, and time markers and identification will be sent during the first and last minutes of each 12-minute transmission. Power output will be several hundred watts, and the period of the project is expected to be about 6 months.

Further information may be obtained from Dr. P. H. Licastro, W3PKE, c/o HRB—Singer, Inc., State College, Pa.

O.E.S. Notes

- K5UYF — Going on active duty until March of '61.
- W4CIM — Constructing 144-Mc. transmitter.
- K4FJZ — Putting a pair of 4X150s on 50 Mc.
- K9RRS — Working on s.s.b. mixer for 50 Mc.

220- and 420-Mc. STANDINGS

220 MC

W1AJR.....	11	4	480	W9EQC.....	11	5	740
W1AZK.....	9	3	412	W9JCS.....	5	2	340
W1HDQ.....	11	5	450	W9JFP.....	9	4	540
W1OHF.....	12	4	400	W9OVL.....	6	3	475
W1RFU.....	15	5	480	W9UFD.....	4	4	605
W1UHE.....	11	4	385	W9ZIH.....	10	5	500
W2AOC.....	13	5	450	K6DCU.....	5	3	425
K2ANQ.....	8	3	230	K9ITL.....	3	3	515
K2CIA.....	10	4	325	KH6TK.....	1	1	2540
K2DIG.....	4	3	140	VE3AIR.....	7	4	450
W2DWJ.....	15	6	740				
W2DZA.....	12	5	410				
K2KIB.....	12	4	300				
W2LRJ.....	10	4	250	W1HLDQ.....	8	3	210
W2NTY.....	12	5	300	W1MFT.....	8	3	170
K2PPZ.....	11	4	190	W1RFU.....	7	4	410
W2LWI.....	11	4	400	W1OOP.....	10	3	390
K2QOJ.....	13	5	540	W1AJR.....	8	3	230
W2SEU.....	4	2	150	W1UHE.....	6	4	430
W3AHQ.....	4	3	180	W2AOD.....	6	4	290
W3FEY.....	9	5	450	W2PLV.....	12	5	360
W3JYL.....	8	4	180	K29DV.....	10	3	196
W3JZL.....	4	3	250	K2CBA.....	5	3	225
W3KKN.....	10	4	255	W2IDZ.....	5	3	130
W3LCC.....	8	5	300	W2NTY.....	3	2	100
W3LZD.....	15	5	425	W2OFA.....	9	3	200
W3RUE.....	9	5	450	K2UDR.....	7	3	175
W3UJG.....	13	5	400	W2RIB.....	4	2	100
W3ZRF.....	5	4	112	K3BOF.....	6	3	250
K4TFU.....	8	4	400	W3FEY.....	7	2	225
W4UYB.....	7	5	320	W3RUE.....	2	2	96
W4UMF.....	11	5	420	W4HHK.....	5	4	350
W5AJC.....	3	2	1050	W4VVE.....	6	4	410
W5RCL.....	8	5	700	W5HTZ.....	3	2	400
W6NLZ.....	3	2	2540	W6GTG.....	1	1	180
K6GTG.....	2	1	240	W5RCI.....	9	3	600
W6MMU.....	2	2	225	W7LHL.....	2	1	180
K7ICW.....	1	1	250	W8HCC.....	3	3	355
K8AKU.....	10	5	1050	W8HRC.....	3	2	250
W8JLJ.....	9	5	475	W8JLQ.....	4	2	275
W8LPD.....	6	4	480	W8NRM.....	3	2	390
W8NRM.....	8	4	390	W8RQI.....	4	2	270
W8PT.....	10	5	660	W8PT.....	4	3	310
W8SVL.....	6	4	220	W8TBY.....	7	4	580
W8AAG.....	9	4	600	W9GAB.....	9	6	600
				W9AAG.....	5	3	375

420 MC

W0IUF — Suggest replacing 6BQ7 with 6922 in Tapeton converter for best noise figure. Running skeds with W0ENC.

WA2DAC — Transmits c.w. on 50.1 Mc. between 1900 and 2100.

K7BBO — Has new 6-meter rig finished, running 500 watts to a 4250A in final.

W2SEU — Has 100-watt final working on 220 Mc.; working on 432 tripler using 6360.

K6GTC — Has finished 6CW4 nvistor preamplifier for 144 Mc. Still keeping skeds with W0ENC. Operating s.s.b. on 144 Mc. with kw. input.

K6SIX — Observed 50-Mc. band opening to Washington, Oregon and South Dakota on November 15 from 0400 to 0645 GMT.



Wonder if K3HRF's operating position is always this neat! Bet almost anything that he cleaned up for the photographer.

K4KYL — Keeping nightly skeds on 145.015 at 2100 EST.

W7MAH — Stacking two Spiralray antennas at 11-foot spacing. Is working on 5894 exciter for two meters.

K0GIC — Observed 50-Mc. band opening to Mexico on November 14.

K0RWC — Working on 50-Mc. transmitter.

W3RVT — Getting married December 31.

WA2BAH — Working on 417A preamp for 220 Mc.

W1EXZ — Constructing 144-Mc. transmitter.

K1CXX — Finished constructing heterodyne v.f.o. for 50 Mc.

K2LMG — Maintaining nightly skeds with W2WZR, W4LTU and K2PQI on 144 Mc.

K0LCB — Observed Voice of America station at 51.8 Mc. Anyone else copy it?

K9SRW — Constructed 6-meter 50-Mc. transmitter using 2N5885B transistor. Drop him a line for details.

K8SUJ — Working on two-meter transmitter using 2E26 in final. Active on 6 meters.

K1MUN — Working on two-meter transmitter.

K1JML — Active on 50 Mc. Constructing 10-meter converter.

W1NKA — Working on two-meter transmitter.

K1CXX — Working on six-meter transmitter. Active on 144.

W4FNT — Building s.s.b. rig for 50-Mc. operation.

K8SUJ — Has added r.f. stages to his FCV-1 converter. K3ADS — Working on 700-watt s.s.b. rig for 50 Mc.

W1FVV — Active on 50 Mc. Heard Ohio and N. Carolina on aurora but could not raise them.

W6PBC — Working on transistorized equipment for six and two meters.

W1ZPV — Experimenting with 432 Mc. antenna. Working on 144-Mc. s.s.b. transmitter.

K6QXY — Working on 50 Mc. s.s.b. exciter.

W1FOM — Working on 5600-Mc. transceiver as in August QST.

W4FWH — Converting ANTRC19 for 220 Mc. Working out details for remotely-operated two-meter relaying stations on top of Bold Mountain, elevation, 4784 feet. Working on new final for 220 Mc.

W4HJK — Working on 432-Mc. converter using 416B r.f. Has new 144-Mc. amplifier using a pair of 4CX300As in push-pull.

K3APL — Would like information on klystron circuit design and slow scan TV systems. Just received his General. Congratulations!

K9IXD — Has tinkered toy cubicle quad for portable use. Drop her a line for details.

K9TFJ — Working on new two-meter rig using parallel 6146s.

W8PBA — Constructed coaxial switch for switching converters and finals. Working on 40-kMc. transmitter. Has available drawings of 32-element beam and 416B preamplifier.

K8NEY — Working on two-meter nvistor amplifier. Active on 50 and 144 Mc.

W8PT — Working on push-pull 7D34 final for 220 Mc. K8BCZ — Constructing 2- and 6-meter s.s.b. transmitters. Suggestions welcome.

W8NOH — Building 432-Mc. r.f. amplifier using 6L6299.

K3BYD — Working on transistor rig for 144 Mc.

K3MDL — Working on new type modulation system. (Good grief!) Also working on 5800-Mc. parabola. If interested, write for details.

K3HDW — Installed carrier-controlled modulator on two meters. Looking for meteor-scatter schedules with anyone interested on 144 Mc.

K3KHN — Modifying DX40 for six meters. Write for details.

K3ADS — Converting ARC-3 for 144 Mc.

W3JYL — Working on 50-Mc. peanut-whistle transmitter and high power using 7270 in final. Constructing 4X150 linear for 220 Mc. Also converting APX6 for 1215 Mc.

W3ZRR — Has completed two-meter transmitter, looking for schedules.

K3LKR — Has completed six-meter mobile meter unit, drop line for details. Now working on ARC-5 v.f.o. for 6 meters.

K3BFA — Has d.s.b. final operating on two meters. Drop line for details on converting the Globe Hi-bander.

K3JHE — Working on high-power final for six meters.

How's DX?

CONDUCTED BY ROD NEWKIRK, * W9BRD

When:

It's here! *What's* here? Amateur radio's grand prize, the annual ARRL International DX Competition, comes off this month and next (full details in the previous issue of *QST*). Whether you're a full-blooded DX hound, a pedigreed 28-Mc. roundtable addict, or an audacious 160-meter rag-chew fan, you'll surely sense the stirring DXcitement set to saturate all high-frequency ham bands on the first and third week ends of February and March.

ARRL's Communications Department has gone all out to alert and encourage the overseas gang for this one. They'll be there in juicy concert. Don't miss this golden opportunity to let your scrappy little 807 or brutal 4-1000A flex its long-haul muscles in the most spectacular operating activity in The Game. The *most*, the living end, OM!

W8WT just converted his "DXCC²" touchdown, the 35th on record, into the only all-phone filing received by Jeeves & Co. since we first inquired as to whether anyone had worked ARRL DX Century Club members in 100 or more countries (p. 59, April 1957 *QST*). In fact, Les figures he has contacted phone-DXCC fellers in no less than 106 countries since early '57. And now comes along OT K6EC with free-style "DXCC²" No. 36, moving us to break out the entire roster of master DX men who managed to meet the modest stipulations originally specified. They are, in order of entry,

DL4ZC, W4LVV, CE3DZ, W6GPB, HB9J, W5KC, W7ENW, W9KXX, W8UMR, T2HP, OH3RA, W6TPJ, W2YTH, W3ARK, W9YSX, W3GAU, VE2WW, W6TXL, DL1BO, K2PIC, VE3HB, G8JR, W4QCW, W1NLM, W2EMW, W3SOH, W1EQ, F9LL, DL1QT, OK1KI, W8NJC, ex-11KN, W9SFR, W4BQY, W8WT and K6EC.

Mind you this is no "certificate award" except insofar as you produce your own certification with a camera. By the way, DL1QT's feat of "WAS-DXCC" — a photo of QSLs for contacts with DXCC members in all United States — still remains unequaled.

What:

While the possibility of ill-timed transitory propagation disturbances is always with us, high-frequency conditions appear generally favorably for the 27th ARRL International DX Competition. Dependable 20 is warming up now for temporary improvement in its nighttime coverage, the m.u.f. still hasn't forsaken 28 and 21 Mc., and

40 c.w. is really rockin' and rollin'. "How's" reporters K1s JFF AOD, K4TEA, KN5ERQ, K6s CJF LAE, W7s DJU LZE, W8YR, W9JJN, K9UKM, ISWL, NCDXC, WGDXC and KV4CI find the low edge of 7 Mc. chock full of BV3HPT, CEs IJW (7006 kc.) 2¹/₂ hours GMT, 2DZ (3) 6, CM5HM, CN8MB, CO2PY, CX1FC (15) 7, EL4A (21) 6, FARJR, FF8BF (7) 2, FY7YF, GC2FZC (15) 8, HCV2T, HZ1AB (50) 23, IS1MM, IT1AGA, KG4s AG AP, KM6BV, KR6AZ (10) 15, KV4CI,

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

LA1NG/p of J.M., LA6CF/mm, MP4BCV, OD5CT (20) 5, PY7LJ (15) 20 of Fernando de Noronha fame, SP8CK, ST2AR (15) 3, SV9s WF WZ WQ all (10) 21, TF2WFF, T2WA, UAAs 1DH (15) 4, 1DZ 1KBA 22-23, 9ES 9KEC #AG #AU #KAE #KAN (8) 21, #KID #KSB, UC2AD (6) 19, UI8BI (20) 21, UL7s AA HB (10) 18, UM8s KAA (25) 23-0, KAB (25) 1-2, UJ8KAA, UR2KAW, UW3AC, VE8ER 6, VKs 9YK 0WH (88) 16, VPs 2LA 2SL 7BP (30) 4, 7BZ 7NT (30) 3, 8EH (12) 3, 8FQ 4 of Grahamland, 9AK 9BO (30) 4, VOs 2CC 4YT 4EV 4GQ, VR2DK (8) 7-8, VS1s AP (6) 15, DK KQ KW (38) 15, VSs 6EC 90A (40) 21, VU2XG (20) 20, W2GAC/KP4 14, YO9HC, YV5s AGD (35) 7, ASP GO, many Zs and ZLs, ZC4BG, ZD2s GUP (10) 21, IJS (20) 23, ZK1BS (12) 7, ZP9AY, 3V8CA (18) 23, 4X4s DH (3) 15, II (10) 21, JI JO MS, 7G1A (10) 5 and this batch of breakfasttime Japanese 7-Mc. buffs: JA1s AEA BOA BTH CID CJF CQR CRB CSZ DNL DSI EFC GV YL, JA2s AJJ AJP BGH BP BR TH, JA3s AIS ASU BCL BDO BGF IC, JA4s APS YJ, JA5s FQ MZ, JA6s ACZ AKU APE, JA7WI, JA8s AE AEP FC LN MS PO, JA9FB and JA8OZ.

40 phone offers CNs 8CS 8HX 9CD, IT1TAI, LU3EF, LZ1s KDP FSP, PZ1AX, TF5TP, UAAs 1DZ 3KWA 4KYA 6WB, UB5s FJ KBB KKK KCF KEF WF (s.s.b.), WN, UC20M, UD6KAB, UG6KAA, UO5KAA, UR2s AO AT BU KAA KAE KAN KCA, VPs 2AE 2GS 2KG, 4LP, VS9OC, XE1LA, YOs 2BB 9CN 9HC, YVs IAC 5APJ 5CX 6CN, ZB2AD, ZC4s AK KV, 4X4s AN AU FV and GB to ISWL's astute kilocycle-combers.

20 phone enables K2s TDI* UYG, WA2EFN, W4s LJV PLL, KSSUS*, K6LAE, K8s BHM JPL, DL9LL, KN8VIX (tuning), listeners D, Edger, R, Kemp and C. Morrow to capture CE2AN, CN8CS, COs 7AA* 8OK*, CRs 6CA* 9AH*, CXs 6AS 8BA* EA8 8BA* (325) 13, 8CC (195) 1, 8CT* (305) 23, 9AC* FPIAD* (307) 12, EO5X*, FF8CW* 0-1, F57RT*, HH9s D1* GR*, HPIs CN 13, ME* HRs 1KC* 1NX* 2DB*, HV1CN*, HZ1AB*, KA2MM* 0, KC6AQ* (280) 1, KM6DO*, KR6AF*, MP4BBW*, OD5CC* OE1RZ*, P3JAL, PZ1PB*, TF2WEZ*, T2EH* UAAs 3DR* 4F* UB5WF* UP2CG*, VK6PM (160) 14, VPs 2AB* 2DA 2DQ 5BK* 5BL 5VI 13, 6WD 6PV 9L 15, VOs 5FS* 9TED* 9HB (110) 14, VR3L*, VS1JV*, VU2s CQ* NR*, W8OLJ/PK* (320) 12, YN1s CI* NW*, Ys 1MS* 10* 2AM*, YV5ALK, ZB2A*, ZD2s JKO PJB*, ZEs 5JU (140) 15, 8JJ (100) 14, 8JZ (180) 14, ZS2MI (160) 17 of Marion Isle, 3V8CA*, 4X4s DK* of Palestine, IX* 6O1QA*, 9G1BQ*, 9K2AM* (275), 9M2s BD* GA* (285) 12, 9N1s CJ* MD* MM (150) 13, SM* and 9Q5US*, the asterisks (*) going for single-sideband status.



20 c.w. is a happy hunting ground for W1OPB, K1s IMP JFF (87/73 countries worked/confirmed), MOD (52/20), W2GVZ (268/264), K2s TDI UYG, WA2s KFN KMY (108/81), W1PLL (265/263), K4s KYB TEA (158/141), YEP, K5s MHG VTA (54/32), W6RCV, K6s C/JF (121/109), CNB LAE (184/173), ROU (111/60), W7POU (75/56), W8s KML KX (210/190), YGR, K8s NHC (78/46), PFY (48/13), QEX, W9s ACS CLR, K9s GDF (58/39), UCR UHH (112/75), K8s BHM JPL OSV OSW V XU (21), DLs 5DU 9L1, H1ER, KP4KD (269/259), auditors A. Rugg and KN8VIX who draw an r.f. bead on the likes of AC8PN (60) 12-13, BV3HT, BY1PK, CE8 9AS 9AR 8AD (50) 6, CNs 2BK 8JR (24) 20, 8MB 9CK, COs 2AP 2CT 2QR 7AH 7HQ 7PG, CP3CN (70) 11, CRs 4AX (60) 22, 4AY (65) 21, 5AE (20) 16 now in CPT-land, 7C1 7LU (70) 4, 9AH (50) 12, DU7SV, EA8 8BF 8BW 8CG (50) 15-23, 9AP, EL4s, EP5X, ET3AZ, FAs 2VC 3LO 9VJ (70) 21, FF8s CE (58) 18, CJ (37) 20-2, CW (50) 20, XX (40) 2, FF8s CR (14) 2, HP (20) 16, CW (72) 0, FG7X (10) 18, FK8AH, FQ8HP, FR7ZD (40) 14, FV7s YF YF, HA8 1KSA (34) 17, 5KDQ 5KFR (38) 16, 5TA 7PZ, HC8 1JU 2IU 2CS (40) 4, 7PZ (29) 3, HKs 1HV (45) 14, IQQ (10) 12, 3AL 4JC 6AL, HH2s LD OV, HP1L, HRs 2FC (25) 23, 6AD, HZ1AB, HS1DL, IT1AL, JAs 40R 5FQ 7ZU/mm, JZ8PO, K21JL, KB6BH, KCs 4AB 4AP 1FD 6AKA 6AGZ (20) 21, KM6s BI BV, KV4AA, (80) 2-22, KW6DG, LU6 5ZL 6AW, LZ2KSK, MP4s BDD (50) 22, BDE (30) 12, BC 1L (30) 1, TAC TA1 (53) 4, OAR (57) 18, OA4FN, OD5s AI CT LK (20) 5, OH9NZ, OR4s AX (50) 3, TZ (0) 22, OX3s DLN K (20) 21, UD (60) 13, OYs 1R 7ML, P1s 2ME 3AD 3AE 3AK (75) 18, PJs 1BSF/7, 4ZG 7LJ (40) 21, PZ1AP (3) 23, AY, SL3BZ of Sweden, SM5s KV 905 BUG/905 (15) 19, ST2AR (94), TF3AB, T1s CAH (50) 2, 2PZ ERE, UA9s BF CM BD DN FZ KAB KAG, KDA KQP MIC WF UA6s BF BP (25) 0, 1K KAE (75) 14, KAR of Dickson issue, KID KJA KKB KQA KYA, UA6ALE/UP2, UB5s KBU KCV VT (25) 5, WF (37) 17, UC2s AX KCG, UD6BB (40) 11, UF6KAF 12-14, UG6s AA AW (23) 22, UH8s DA KAA (80) 11, UI8KAA, UI8s AG (30) 15, KAA, UL7KAA, UM87F, UN1AE (35), UO5s AL BAL KAA (80) 15, UP2AC, UR2KAE, VKs 2FR (55) 5 of Lord Howe island, 9XK 6JM 6PM (78) 6, VP8 2AR 21, 2DQ (58) 0, 2LD (50) 0, 2MB 3YG (40) 11, 6AP (40) 23, 6PJ 7NT (90) 14, 7NQ 8DS 8EZ (16) 0, 9BX 9CX 9EP (35) 23, 9EU, 9O5 2EW (55) 23, 3HV 4DT (40) 23, 4GT 4HT 8BC 21, 8BAI, VRs 1B 2DK (45), VSs 1JW (30) 11, 9AAC (10) 3, 9ARP (65) 15, 9OA (55) 12-16, VU2s AZ NR (90) 11, PJ RJ, WSDTA/VO2, XEs 1H 2AY 3LA, XZ2TH, YQ3KAA, YVs 1DT 5AEZ 5AK (30) 14, 5ANI 5BJ, ZA2BAK, ZBs 1FA 1HC (85) 18, 2A 2AD 21 2J, 2C4s AK SS (30) 15, ZDs 1CM 1RO 2JM 2PB 61NT (65) 22, ZKs 1AK 1AR 1BS (15) 2, 2AD, ZL3VH/3 of Chatham, ZPs 5ND 5OG 9AY (15) 23, ZSs 3AZ 3HX 3K (60), 7M (75) 16, 7P 7R (60) 16, ZS9M, 3V8CA, 4X4s KK KM MB (70), 5As 3TR (53) 19-20, 4TK 5TA (50) 21, 6Os 1MT 2AB, 7G1A (20) 18, 9G1BQ, 9Q5s SR SR and 9U5MC (75) 21.

10 phone's supporting cast takes advantage of every megarail opening. K1IMP, W2FGD (89/42 on 28-Mc. voice), K2TDI*, WA2EFN, W4LJV, K4s TEA YEP, K5s SUS* VTA KGCJF, WA6NDM, W9VBV, K6JPL, listening KN8VIX, Messrs. Edger, Kemp and Morrow specify signals from CE4FE, CN8HX, COs 2IK 8JK, CRs 4AX 6AT 6CZ (430) 18, 7CH 7CK 7CR, CXs 2BT (400), 3LL (550) 19, 4BJ (520) 23, 4CS 15, 5BR 7AR 21, DM3ZWD, EAs 8CK 0AC*, ELs 2U 14, 4A 3E 17, 8D 19, FA2TW 16, FF7AG, FG7XH (650) 20, FM7WQ, GBs 2SM 3PBS, GC2AAO, GD3UB, HCs 1FO 1KA 2AF, HHs 2RS 2RV 2V 5LA 5MV 14, HI8DGH (485), HK1XT (490) 22, HP1s AP GA 23, HRs 1HP 2HA 2MC, ITISOL, JAs 1ANA (380), 1BZL (450), 2KB 2KX 4PE 6NP (430), KGs 4AB 4AF 4AT 16-18 4AO 6FAE (680), KM6BU, KR6DO, KV4BT, LA8LF/mm 19, LX1DC, OAs 1W 4EP 23, OE1RZ*, PJs 2AL 14, 3AD (490) 22, 3AJ 3-4, PJs 7LJ 8MA 16, PZ1s AB AY 17, BF 19-20, SL6BA, SV0WJ, TG9GP, T1s 2ACA 2J 2OE 5RV 19, UAs 1AB 1AEK 3UQ 0LBQ (540) 0-1, UB5s AJL ATS BPG 4F HS KA, UN1AT, UP2s KAB MAE NCH 13, UQ2AN 13, VE8RX 0, VK3GG, VPs 21U 2GAQ 2GU 14, 3EFG 16, 3YG, 4LF 4MM 16, 5BB 5BL 0-1, 6AM 6RG

6JK 15-16, 7BM 8EM 23, VO8 2FC 19, 2HR 14, 2SB 2VZ 3PB 4AB (652), 4DT 4HX 8AV, VU2PS 13, XEs 1IX 23, 2SO, YN4CD 21, YU3JN, YVs 3CS (550) 23, 3EJ 5APX 19, ZBs 1HC 2AD, ZDs 1CM 2AMS 15, 2ATU 2FNK, ZEs 1JA 1JN 2JA 3JU 16, 6JL 17, ZP500, ZSs 3HT 16, 3O 3R 3Z 7L 8I 17, 4X4s AU FR GB JU, 5As 31W 5TA (690) 16, 5TF, 6O2GM, 9G1DP, 9Q5s BK DQ, 9U5s DM 18, KU PD 18 and VS, asterisks, as usual, indicating s.a.b. efforts.

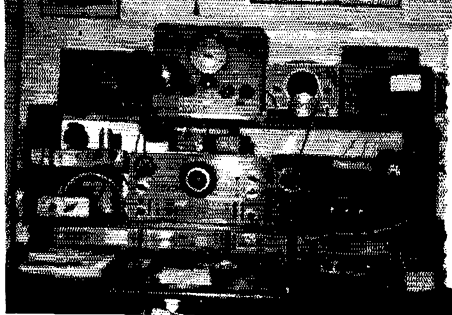
10 c.w.'s holdouts — namely KIIMP, WA2KMY, K3s CUI HTJ, K4s TEA YEP, K5VTA, W6RCV, K6-CJF, WA6NDM, W8YGR, W9VBV, K9GDF, K8s BHM JPL OSV OSW, 11ER and monitor Rugg — enjoy the companionship of CE1AD 19, CXs 2BT 7CO 9AJ, EL4A (20) 16, FY7YI 20, GD3UB, HKs 1HV (50), 3AH 7ZT, JAs 1AAT 1BK 1BLC 1BRA 1BTH 1BJA 1BWA 1BZW 1CBZ 1CE 1CG 1CGM 1CPM 1EM 1GV 1YL 2AAT 2AEY 2AIT 2CG 2DZK 2YL 2XW 3APY 3AVD 3EK 3KM 4DZ 4OK/7 5HD 6PA 7JU 7OJ 8FY 8MP 9CQ 9CE 9KA (most of these thanks to K6CJF), K6GAJT (50), KM6BQ (80) 0, KR6JM (85), KW6DG (70) 23, LU5DEL (80), OA4ED, OX3NK, PIINTE, VKG2V 23, VP7NT (80), UC2AA 15, XEs 1H PJ (70), YO3LM (95) 14, ZBs 1FA (58) 13, 2AD, ZD2JKO, ZS7M (90) 19, 9As 1TN and 5TA.

15 phone delights KIIMP, K2TDI*, WA2CLO, W4-LJV, K4TEA, K5s SUS* VTA, K6LAE, W6AVD, K8TJW, K9ORC, K8BHM, DL9LI, VE3PV, tuners Edger, Kemp, Morrow and KN8VIX with the signals of COs 2NK (300) 13, 8ES 22, CRs 4AD (150) 23, 4AX (230) 21, 7CK 19, EA8CT* ELs 1D (240) 21, 2F 2Q 2U (400), FF8AU 23, HC1s GE KA*, HKs ICN 3TS 0, 4EH 4KZ, HP1s AJ LB, HR1DL, HV1CN*, HZ1AB* 18, K8UTK/KM6, K4AUSB (447), KR6KF, OAs 3I 22, 4GP, OD5CT* 17, PJs 2AMC* 3AD 17, PZ1s AR 23, AY, T1s 2LT 5RW, UR2s AO* KAE, VPs 2AR 13, 2LY (245) 21, 2SI* 3EFG 0, 3FM 3MC 3YG (170) 22, 4LE 5WF 6AM 6BG 21, VOARF* VR3L 3V, XEs 1YL 2RE 2SJ, YVs 1MW (447), 1TAT* 4CD, YVs 1DH 3EJ 5AIP 15, 6CN, ZK1AR, ZP6BB*, ZS3HT, 6O1TUF 20, 9G1CC 15, 9Q5EC and 9U5JH.

15 c.w. performs impressively for K1s IMP JFF MOD, W1OPB, W2GVZ, K2TDI, WA2s CLO (67/25), KMY, W4PLL, K4s MZU TEA YEP, K5s MHG VTA, W6RCV, K6s C/JF CNB ROU, WA6NDM, W7s DJU POU, W8s KX YGR, K8s NHC PFY (45/13), T1W, K9s ORC UKM, K9s OSV OSV, DL9LI, 11ER, KP4KD and VE3PV in pursuit of CE8 1AD 3AG 3DV, CR6BK (78) 22, CXs 1FB 6CB 6FB 7CO 9AW (45), DM3NM, EA6AM, EL4A (25) 8-20, FAs 3CT (40) 18-19, 9UO (15) 15, FFs 7AD (100) 18, 8BF 8CW (70) 13-16, FO8AC (62) 19, HA5KFR, HC1JU, HK3AH, HR1s JZ NX, HK3AH, KA2s JL RB, KM6s BI BV (22) 19-15, KR6LI, KV4AA, KW6s 1F DG (40) 2, LX3AH, LZ1s KBQ (95) 13, KNB (40) 17, K8Z, OA3D (50), OD5CT (60) 13, OR4TZ 21, PJs 7LJ (50) 20, 8YP (20) 23, PZ1AY, T1s DL (28) 16, 2HGA 2VA (80) 21, UAs 1CK (55) 16, 1QC (20) 21, 9BT (50) 13, 9DN 0BF 0GF, UB5s FJ (45) 12, KAB (42) 17, KKA UC (45) 15, WF (29) 14, UC2s CB (60) 14, KAB (95) 14, UD6KAB (50) 13, UR2AO (40) 12, VPs 7BP 7BT (43) 22, 8EH (95) 2, 8F1 (60) 20, VO8 2CZ 4CC 4DT 8AM (45) 19, WL7DNE, XEs 1AX (39) 23, 1H 1NH 1PJ 2SS (10) 9, YNICRU, YOTDL, YU7LAA, YV1DE ZB2AD (40) 20, ZCs 4AK (20) 17, PC (20) 15, SC, ZDZGUP, ZEs 1JN 4JS, ZK1BS (40) 23, ZPs 5OG (35) 12, 5LP 9AY (40) 19, ZSs 3HT 7L (75) 19, 7G1A (60) 13 and 9Q5UX.

15 Novice stouthearts WV2NXP (8/3), KN5s ERQ ETA FLA and KN9VIC smash through to CE3AG 3, DL6VN 20, G6PR 12, KM6BI, KW6DF, KZ5TD 7, ON4s LC 21, PX 21, VO2AV 15, one VR6AD, WL7s DNK DQF 21, YN1s CRU and ES when the fadeouts aren't looking.

80 c.w. has KV4CI and ISWL diggers probing for LX3AH 3, OY2E (5) 0, UAs 4KYA 6KAE 9DN 1, 9KEA, UN1AP, UO5KAA, ZB1FA (10) 1 and multibandman ZC4AK 4, JAICOL (7) 10-11 has been squeaking through at times. — On 75 phone GB3RS, KP4AAQ, TF5TP, UA1DZ, UBSWF, UO2AN, UR2s 2GA and KAE are recommended by ISWL's static-stabbers.



CT3AV is well worked on 20 c.w. with 60 watts and a long-wire radiator. Fernando's next DX objective is a Madeira single-sideband surge. (Photo via W3KVVQ)



UA6LI is a familiar fixture on the north Atlantic path. Oleg is adept at c.w. or phone on several bands. (Photo via K3CUI)

160 c.w. midseasonal highlights include much transpacific fun along with the usual transatlantic crossings. K7HDB reports KH6s DVD and DVG rezing Sixes and Sevens when the bounce is right. ZC4AK panics the G crowd with a fine 1.8-Mc. signal from time to time. In addition to the ARRL Test periods this month, the regularly scheduled World-Wide and Transatlantic Tests sponsored by W1BB & Co. will concentrate on the 5th and 19th between 0500 and 0730 GMT. Dig you there?

Where:

Asia — Ex-VS9ARF writes W1NS, "I'm now QRT in Aden and I don't think there will be much more activity from there. I have quite a few QSLs left and will be only too pleased to send cards to those who have not received theirs from me. I wonder what's going on these days with the mail; I've sent off hundreds of cards but, judging by the amount of second requests, I doubt if many of them are getting through. A couple of International Reply Coupons and QSO details to me at G3MJH will start another VS9ARF QSL on its way." "Be advised that I now handle QSL chores for VS9AAC," informs W3KVQ. "The usual self-addressed stamped envelopes are required from W/Ks."

"CROAH is supplying his own cards," says W7ZAS, undertaking to assist John's Stateside QSL emanations. "S.a.s.e. is a must for fast service." AP2M tells K2JUA he's keeping his eyes and ears open for a lead on elusive but persistent AP4M. No luck so far. ZC4AK (G3MBS) writes NCDXC: "QSLs are a problem for us; even the shabby ones printed locally are quite expensive. We find that a thousand cards will disappear in no time. Several U.S. amateurs have offered to 'manage' our QSL matters but we don't think that's a good idea for club-type stations." WGDXC learns that ex-HS1E, on duty in D. C., can be reached through his mother for QSL purposes (see following roster). Besides KARL HQ, stations HM9A and HM9HQ, there now are a dozen IIM1s and HM5AH ticketed for DX action.

Africa — ZD2JM apprises QSL aide K9EAB: "The Nigeria call block is 5NA-50Z as of January 1st. All amateurs change to 5N2, retaining the suffixes used with their old ZD2 prefix; e.g., I become 5N2JM." "I have the complete log transcript for ZD1AW's fourteen months in Sierra Leone," states W3KVQ, "and will answer QSL requests while the supply of cards holds out." S.a.s.e., to be sure. Ex-FL8AB tells WGDXC he's standing by at FBUD for further QSL inquiries. W8TMA observes via W1WPO: "I have 9Q5YM's logs for the period August 1 through September 14, 1960. Cards have gone out 100 per cent direct or via bureaus depending on whether s.a.s.e. were received." "I am not QSL manager for ET2US," declares W4YWX. "Former chief operator Chuck of that station is a personal friend of mine. Since distributing a few cards for him I've been buried under ET2US-destined QSLs I can regretfully do nothing about. But Chuck advises me that the ET2US club recently appointed a member to handle incoming cards, so perhaps QSL exchange with that station no longer will be such a problem." W4YWX

does, however, act as Stateside QSL agent for 3V8CA (not W8UTQ/3V8), VS1GZ and VU2JA. "U. S. amateurs who did not receive deserved confirmations from OQ5RH should write me at [the address to follow]," suggests ex-OQ5RH. "I insist on 100 per cent QSL response to all cards received."

Oceania — ZC5AE (GM3LQZ-VS6EF) returns to England via Hongkong and asserts, "I've QSLd 100 per cent all W/K QSOs from Labuan. Thanks to all the gang for their cooperation and patience." The pleasure was mainly ours, OM, the patience yours. KW6DG reports loss of QSL shipments from the printers, a development that slowed verification of early QSOs with both KW6s DF and DG. K3CUI is assured that all cards will flourish in due course. "I do QSL 100 per cent," emphasizes VS5JS, "which cannot be said by some overseas American stations, particularly KAs and KR6s. I've sent dozens of cards to APO addresses and only KA2BF has replied." Via NCDXC: "VK5BP/8 (VK5BP plus VK5NQ) who dished out 903 Australian N.T. contacts to lums in 63 countries early last September, reports all QSLs now out via bureaus or direct." ZL2GX is one chap to check with concerning info on ZL5s and ex-ZL5s.

Europe — SV8WV cautions NCDXC, "Don't QSL Rhodes SVs via the Greece bureau. For myself, s.a.s.e. and postage are not necessary but, since I work so many W/Ks, I QSL only on receipt." Larry expects to be with USCGC Courier at Rhodes for several years more. E19U stresses the new Eire bureau address: Irish Radio Transmitters Society QSL Bureau, 24 Wicklow St., Dublin. O77ML iterates that only W6NJU is authorized to handle his W/K QSL exchange. Non-W/Ks should address M. Haasen, Box 184, Torshavn, Faeroes Islands. DL8CX sends us the calls of a flock of Statesiders who apparently shirk QSL obligations. We recognize a few on the list as indignant grippers when their own QSLs go unanswered. "I wouldn't mind so much if I did not need their cards for valuable diplomats," bemoans Heinz. "I know no amateur is compelled to QSL, but I think that the confirmation of a QSO is a matter of honor as much as of courtesy." SM3BIZ hungers for a lead on the VP5ER who was active on Grand Turk three years ago. "No IRCs or s.a.s.e. are necessary from those who want my QSLs," enlightens DL5DU (K4OMR). Note that DL5 now serves as a supplementary prefix for the DL4 type.

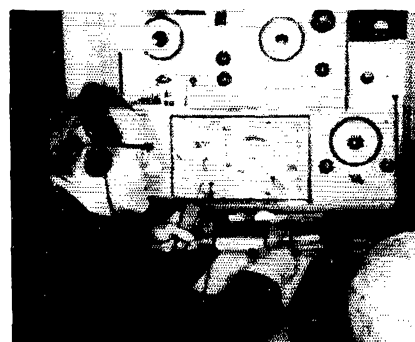
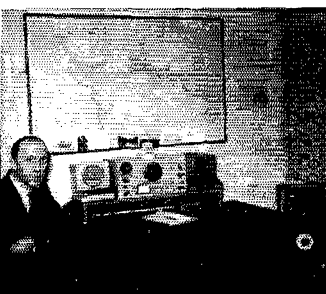
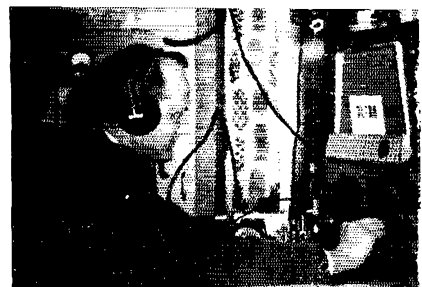
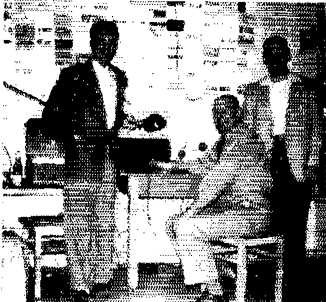
South America — PZ1s AX BR and VP8AI join the expansive QSL-agency clientele of W2CTN, s.a.s.e. mandatory. By the way, Jack reports favorable but belated developments on the FG7XF QSL front. Hint-hints: Listener A. Ruzg finds PY4AVM an avid matchbook-cover collector, while LU5DDF hunts U.S. and Canadian stamps for his junior op. K4TEA is having an awful time confirming his KC4USV contact (K1NAP couldn't help), and W9VTV has just about exhausted all channels toward KC4USW QSO verification. Divided QSL responsibilities in multioperator DX stations often are vulnerable this way.

Hereabouts — "I am now QSL manager for VP6AM," announces K1IMP, "s.a.s.e. required." "I finally had to give up my efforts to serve as QSL manager for FM7WQ," laments K1DRN. "I received only one brief log sheet from him and no QSLs. I wrote him on many occasions offering to print and ship cards for FM7WQ at my own expense." Vernon forwarded all accumulated mail for FM7WQ, hoping he will eventually come through for the gang on his own. According to W2QHH, VP2DA accepts and distributes cards for Dominica VP2s only, no others.

K1GDD, recently shifted from Redstone Arsenal to the National War College in D.C., desires QSL hints on PY7AFN and VS9AC worked in 1958. CE9AH in '59, and VP5FP last year. "I have taken over QSL chores for HH2OT," states K0GZN. "When he returns Stateside in about a year he will be at this QTH and can then carry on for himself." "K4CDZ/VE8 will be home soon," confirms K2JXX, "and Wayne will answer all QSLs at that time. Meanwhile, use his K4CDZ address." Ks IEMEM and 9UCR volunteer as QSL chargés for worthy overseas DXers requiring such assistance.

Along with ample information on Russian DX operating certifications, K6BX's *Directory of Certificates* includes a complete breakdown on U.S.S.R. prefix-suffix and oblast (regional) geographical designations. In your behalf we're grateful to W1s NS OPB WDD WPO, W2s GVZ QHH, K2s JXX TDI UYG, W3KVQ, K3CUI, W4-PLL, K4YEP, K5LSH, K6s CJF LAE, W7UVR, W8s PEM KX YGR, K8NHC, K9s ORC UHH, K0JPL, VE3PV, KP4KD, DL9LL, O77ML, s.w.l.s R. Kemp, C. Morrow and A. Ruzg, Hamfesters (Chicago) Radio Club, International Short Wave League, Japan DX Radio Club, Kanawha (W. Va.) Radio Club, Newark News Radio Club, Northern California DX Club, Universal Radio DX Club, VERON (Netherlands) *D'Ypres* and West Gulf DX Club for the global glossary that follows:

BV3HPT, P.O. Box 115, Sintien, Taiwan
 BY1PK, Box 427, Peking, China
 CE2AN, O. Correa, Box 522, Valparaiso, Chile
 CE9AR, P.O. Box 66, Punta Arenas, Chile (or via RCC)
 CN8MB, D. Minton, Navy 214, Box 16 FPO, New York, N.Y.



German radio amateurs are deservedly noted for their collective operating skill and technical excellence. We're off to the land of *senders und sauerbraten* this month for a visit with representative DJ/DL DXers. Across these facing pages (top row, left to right) are DJ1XD (left) and visitors, DL1EM, DL7AH, DL3VZ, DJ5IH, DL9s PX with VY; (bottom) DL9NA,

- CO2EV, Av. 23 No. 2618, Marianao, Havana, Cuba
 GO8ES, E. Sanchez, 570 Belgrum Av., Santiago, Cuba
 GR7ES, A. da Silva, Malvernia, Mozambique
 GR9AH (via W7ZAS)
 GX5BH, Box 966, Montevideo, Uruguay
 GX6AS (via RCU)
 DL4BM, SP/5 M. Auclair, 181st USASA Co., APO 108, New York, N.Y.
 DU6IV, I. Vito, P.O. Box 392, Iloilo City, P.I.
 BP2AT, R. Lefert, Box 951, Tehran, Iran
 FB8CO (via FB8CI)
 FB8CW, Box 152, Diego Suarez, Madagascar
 FF4AK, P.O. Box 1813, Abidjan, Ivory Coast Republic
 FF7AD (formerly FF8AD)
 FF8CW (via W2VCZ or DL9KR)
 FL8ZA (W3ZA; to OD5CT)
 FL9 (via W4TO)
 FM7WN (via FME)
 FM7WZ, R. Martinon, PTT-TSF, Fort-de-France, Martinique
 FO8AC (via W4KWC)
 FO8AN (via W8EWS)
 FO8AD, C. Mayeux, Box 2253, Brazzaville, Gabon Republic
 FO8s HY HZ, c/o Rossimol, 2 e. CTOM, Brazzaville, R.C. ex-FY7YC (to FM7WZ)
 HC2VI, Box 1315, Guayaquil, Ecuador
 HH2OF (via K9CZM)
 HK3TS, H. Rieucros, P.O. Box 519, Bogota, Colombia
 HK6IC (via LCR4)
 HK0HA (via K8ONV)
 HK0TU (via K9DVF)
 HM1s AA AB, P.O. Box 1288, Seoul, Korea (or via W1-MQV)
 ex-HSIE, Box 23, Pinedale, Calif.
 HS1JN, Naval Electronics Division, Thomburi, Thailand
 HS2A, D. A. J. M., Kohorat, Thailand
 K4CZJ/VE8 (to K4CZD)
 K6QV/KS6, P. Hodges, P.O. Box 11, Pago Pago, Samoa
 ex-K0SLD/KW6 (to KW6DG)
 KA5MC, MARS Radio, 1st Maw, FPO, San Francisco, Calif.
 ex-KC6JC, Fr. Cavanagh, S.J., Woodstock College, Woodstock, Md.
 ex-KH6JEM/KJ6 (to W6GJY)
 KV4CI, P. Miller, Box 1853, St. Thomas, V.I.
 KW6DC, L. LaBaume, Box 68, Wake Island
 LA1BD/p (via NRRL)
 LA2NG/p, c/o Norwegian Embassy, Reykjavik, Iceland (or via NRRL)
 LU6AW, J. de Velasco, 1008, Buenos Aires, Argentina
 LX3AH (to DL7AH)
 LX3KS (to DJEKS)
 MP4BBF, N. Wilkinson, P.O. Box 655, Awali, Bahrein, Persian Gulf
 MP4BDD (to OD5CT)
 OA3I, G. Lovatelli, P.O. Box 85, Tingo-Maria, Peru
 OK3EA Dr. H. Cincura, Drotarska 383, Bratislava, Czechoslovakia
 ex-OQ5RII, R. Houssa, 442 Av. de la Couronne, Brussels

- 5, Belgium
 OR4TZ (via UBA)
 OY8RJ, J. Jensen, Box 184, Torshavn, Faeroes Islands
 PZ1s AX BR (via W2CTN)
 SV1AO, M. Caloyannides, Leophoros Syngrou 50, Athens, Greece
 ex-SV0WY (to K2RYP)
 TF2WFK, 1971st AACB, P.O. Box 226, Airport, Keflavik, Iceland
 TG5HC (via K5GOT)
 UA1AEP, H. Bogdanow, 23 Rentzena St., Leningrad, U.S.S.R.
 UA1HE, V. Vaganov, Radio Club, Leningrad, U.S.S.R.
 UA9s FM KEE, Radio Club, Perm, Asiatic Russian S.F.R., U.S.S.R.
 UB5FY, A. Revcov, 2-b Bodanovskaja Str., Dnepropetrovsk, Ukrainian S.S.R., U.S.S.R.
 UP2s KNP NL, E. Laurubonis, Kaunas Politechnical Institute, Kaunas, Lithuanian S.S.R., U.S.S.R.
 UP2KTA, Secondary School No. 1, Taurage, Lithuanian S.S.R., U.S.S.R.
 UQ2KAA, Radio Club, Riga, Latvian S.S.R., U.S.S.R.
 VK0IT (via VK3KB)



W2GT has an interesting QSL display of all the "suffix cousins" he has worked since 1945. Ed writes, "Hardest one to snag was K2GT on 14 Mc; a G lined me up. I've heard VK3GT and EA4GT, and know G5GT to be active." Any challenge for W2GT in this department?



DJ3NF, DJ3OE, DJ2BW, DJ1PK and DJ2LK. For this gallery we're indebted to "How's" collaborators W1s BB TUW WPO ZDP, K1LVW, W2UMB, K3CUI, W7DJU, W9s CLC VFM, DU7SV and G3FNF.

VP3EFG, E. Goveia, P.O. Box 331, Georgetown, Br. Guiana
 VP5BK (to VE2BK)
 VP6AM (via KIIMP)
 VP6LT, E. Glascock, P.O. Box 272, Barbados, W.I.
 VP8AI (via W2CTN)
 VQ1A (via W4TO)
 VQ2JV, P.O. Box 498, Mufilira, No. Rhodesia
 VQ5FS, T. Tierney, P.O. Box 920, Jinja, Uganda
 VQ8BFC (to VQ9HB)
 VQ9HB, H. Brain, Mahé, Seychelles
 VR1B (via VK2EG)
 VR6TC (via W3TAJ)
 VS5JS, J. Sietsma, Brunei Shell Petroleum Co., Seria, Brunei, Borneo
 VS9AAC (via W3KVQ)
 ex-VS9ARF, R. Ford, G3MJJ, 87 Weston Av., Leighton Buzzard, Bedfordshire, England
 WV4CJ (to KV4CI)
 XE1EV, P.O. Box 214, Toluca, Mexico, Mexico
 YS1BD (via W9NWV)
 YV1DH, P.O. Box 1019, Maracaibo, Venezuela
 YV5AVS (via RCV)
 YV5EX, P.O. Box 6269, Caracas, Venezuela
 ZB2AD (via ZB2A)
 ZD2DFT, D. Taylor, P&T Training Center, Pvt. Mail Bay 2603, Lagos, Nigeria
 ZD2IND, D. Boyles, c/o G. B. Ollivant (Nigeria) Ltd., P.O. Box 114, Lagos, Nigeria
 ZD2JAH, A. Hewitt, 1st Comm. Officer, c/o Nigeria Police Hq., Lagos, Nigeria
 ZD2KHP, K. Perrin, c/o Glyndova (Nigeria) Ltd., Pvt. Mail Bay 2904, Lagos, Nigeria
 ZD2LES, L. Hamnett, P.O. Box 558, Lagos, Nigeria
 ZD2PJB, G. Brisbar, Box 556, Port Harcourt, Nigeria
 ZE1AA, J. Lynn, Box 8061, Causeway, So. Rhodesia
 ZE4JN (via W5RHW)
 ZS3K, Box 297, Windhoek, Southwest Africa
 5A3TN, M/Sgt. L. Birbeck, 1950th AACs Sqdn., APO 231, New York, N.Y.
 6O1AA (via W4TO)
 9O5YM (via W8TMA)

NOTE: The preceding individual recommendations are neither necessarily accurate nor "official" — just keep your feeders crossed and hope for the best.

Whence:

Oceania — "VS5GS and myself are the only two Brunei stations now active," writes VS5JS. "This is a tough break for us. As soon as we go on the air when conditions are right there is a pile-up a mile long. Incidentally, the Okinawa g.s.b. boys are about sixty kilocycles wide at my location." . . . VK8TF gives VE3PV Northern Territory lowdown: "VK8NE likes 20- and 15-meter phone, VK8OW works phone on 10, 15 and 20, VK8PL prefers voice on 20 and 10, and VK8TF sticks to 20-meter c.w. between 0600 and 1100 GMT." . . . "I am evidently the only Nevada station to work ZL4IF of the Campbells," chuckles K7CMI. "This gave him his 50th state for WAS — boy, was he

happy!" . . . "Foul weather put the run to F08AN (VP2VB/mm) and *Yasme III* after 774 Clipperton QSOs," says W8YGR. . . . "The MARC fellows issue a mighty fine certification for QSOs with five Guam KG6s. . . . W6RCV, quite pleased with his own diploma . . . K3CUI reports an HT-32A, HT-33, Hly-Gain 4-el. spinner, HQ-170 and various homebrew outboard gadgets going strong for the KW6DF-KW6DG DX factory. Oceania addenda thanks to NCDXC and VERON: VK6-ANB (VK2ANB, ex-VR3A) expects to keep Norfolk island QSOable for a couple of years, 14-Mc. phone preferred. . . . VK2FR's new Lord Howe island Vec aims Statesward on Mondays, 0430-0630 GMT, mostly near 14,055 kc.

Asia — We salute Hongkong Amateur Radio Transmitting Society on its 30th birthday. The HARTS November *News Letter* states, "There could not be a great number of amateur radio societies which were formed before [ours] and credit must be due to the keenness of those who have kept the Society so much to the fore for so many years." Other Hongkong commentary: VS6EC and new XYL (ex-DL1OV) are back in the Colony, VS6s EN EO and EP are newly franchised, and VS6EJ assists VS6s BJ DS and EJ in editing the HARTS monthly organ. . . . JA1TD tells W4NO he yearns mightily for a VO2 or northeastern VE8 QSL for certificational purposes. . . . Ex-KN3IJP visited enjoyably with Tokyo's Waseda University ham gang at the frat's annual November wingding. JA1CMN was in operation on the scene. . . . "BY1PK seems to be getting a little more liberal with QSOs," notes K2UYG. "Even a few Gs and W/Ks now have QSLs from him." . . . The length of AC5PN's 14,065-kc. QSOs disturbs K2UYG and others around 1230-1300 GMT but Chhawnna has many old friends to swap pleasantries with. "Too many eager beavers emit the usual blind calls to louse things up, causing AC5PN to QRT after two or three contacts." . . . K0GJX departs for Korea with high hopes of hamming on the juicy end, but W5UNF finds the QSO outlook dismal in Turkey. . . . 9M2EF is boning up on various ARRL publications thanks to WIBDL. He's particularly intrigued by emergency-preparedness work in his area. . . . Other Asian jottings courtesy NCDXC and VERON: ZC4s AB (P IP JB KV and WR are located in independent Republic of Cyprus jurisdiction, ZC4s AK and SC radiate from Akrotiri base, while ZC4s GT PC SJ and SS inhabit Britain's Dhekelia military compound. . . . YA1BW often is workable on 14,080 or 21,075 kc., 1700 and 1330 GMT respectively. . . . Remember that Laos hopped back onto the pesky ITU/FCC Ban List, so no more XW8 QSOs for W/K licensees till further notice and clarification.

Africa — ZS6IF/9's late-1960 nine-day DXpeditionary effort netted 1740 QSOs with 80 countries on 7, 14 and 21 Mc. W9RKP has it that 1140 contacts were with W/K pursuers. . . . K2UYG hears ZD2JKO will return from U.K. leave in May. ZD2JM tells friend K9EAB that K2DCA, Ws 4F1J 2BZG 2WNC and 98FR were his first customers in that order under his new Republic of Nigeria status. . . . Seek ye out ZS1s AB ACD BF JD MW NE OA RJ RZ TP TZ YK and VM for QSOs that can qualify you for the Lion's Head Radio Club "WLHRC" certification. Contacts with any three members will do the trick; check with ZS1ACD

for the finer points British troops now vacate Somaliland, and 602AB writes W1WPO that he expects to become an MP4T-type this month, W8KX relays more from 602GM: "602RS is not active, 602GB was a short-term visitor (operated only 12 hours), 602NG left in October to follow VQ6s LQ and ST, and I remain the only active 602 among several 601 stations. Had a nice eyeball QSO with VS9AZ (ex-VP5SC-VQ4SGC-ZD8SC) when I dropped into Aden to purchase some equipment last October." Don expects to fire up a new Apache and SB-10 one of these days NCDXC, NNRC, VERON and WGDXC chorus these additional Africa items: PD4BD and FF8BQ each represent Togoland and Mali single-handedly. Volta, Dahomey and Niger? Drop in, OM, and be forever famous. Woe! K4LJV, ensconced on delectable Ascension island, finds it impossible to obtain transmitting authorization. VQ9TED still is determined to break the Aldabras jinx. CR4AX left for Portugal in December. Hmm — Italian ham tourists operating in the Pelegians and Pantellerias actually can claim to be working from Africa.



UA3GM obviously is a man of many moods. This histrionic gamut adorns the back of a QSL sent to W1TS. When not thus emoting, Georgi directs the performance of a 40-watter, 14-tube superhet and 66-foot wire on c.w. DX bands.

Europe — HB9JJ reminisces to W8KX concerning his long Liechtenstein DXpeditionary career. "My first visit was in 1948, c.w. only, then the following year on c.w. and phone. Oh, boy, the first phone station in HE-land! My QTH there is always the same, a hotel 5000 feet a.s.l., using long-wires, W8JK beams, etc. Best results seem to come from Vee beams. My next trip to Liechtenstein (150 miles from my home location) will come this spring as soon as I can get my car up the mountains." Karl's call-styling for Liechtenstein DXpeditionary work has gone through such phases as HE1JJ, HB1JJ/HE and HB1JJ/A, but he hopes that future visits will employ a clear-cut HB0 prefix. Too many DXers take "H" to indicate portable operation in French Somaliland. SV0WY should be back at K2RYP by now after eighteen DXish months on Crete. Jim expects to hit DX bands heavily from Elmira, N.Y., and would appreciate hearing from DX clubs in that area and adjacent New England. SV1AX joins the Greek-nationals contingent with a neat homebrew 813 c.w.-n.f.m. exhaler, Marconi CR-100 receiver and 14-Mc. dipole. K3CUI reports receipt of Russian W/100-U award No. 876 and wonders how many other W/Ks have this one stashed away. K2UYG understands that DL0PF is arranging an operational Corsica sojourn for July. W2UMB loans us word from UA1KBB staffer Paul: "The station has seven operators including UA1FE and two YLs, has worked 128 countries with 97 confirmed, and is active almost daily from 1300 to 1600 GMT. Our 200-watt home-

built transmitter, ground-plane antenna and long-wire are located at the Electrotechnical Institute, Leningrad." DL5DU (K4OMR) settles down with his Valiant, HQ-170 and 14-Mc. beam for a two-year c.w. career over yonder. Neighbor DL9LI gets his DX kicks from a Ranger, a 15-tube super and 7-Mc. Zepp. K800K is another DL5-to-be. "OZ8RJ is back at OY8RJ after a year in Denmark," announces OY7ML. On the 11th and 12th of next month RSGB holds its annual British Empire Radio Union DX test. Plenty of petrifying prefixes always show up in this one, but W/Ks are urged not to horn in on those CQ-BERUs — please!

South America — HK0TU & Co. should be on or near Malpelo island location as you read this, according to W9EVI. Hang around for the ARRL Test, fellers! OA3I describes a rugged jungle environment to VE3PV, his first 15-meter phone contact after an introductory session on 40. Giacomo has a DX-100B, SX-99 and Mosley beam perking about 350 miles northeast of Lima. VE3PV also observes VP3EFG doing large business on 15 A3 with his DX-40, while PZ1AR rakes the 21-Mc. ether with a potent 20-watt homespun sender, NC-57 and one-clement rotory. K9UBK marvels at the stout K2LTX/mm signal reported rolling in from the Caribbean by KN9VIC. The fellow floats only half a watt on 7152 kc. HC8VB (VP2VB/mm) and Yasme salts salted away some 3200 Galapagos contacts with 62 countries in late October.

Hereabouts — K2AAC anticipates Sint Maarten 15- and 20-meter c.w. developments when he and the XYL visit Phillipsburg later this month. Jack may manage some FS7 QSOs by the same token. W3NTH joyously manipulated VP9EP to the tune of 300 QSOs in mid-November. K4TUA, back under headphones after a thirty-year layoff (!), offers to assist overseas WAS-hunters in schedules with the rarer states. John haunts 20 c.w. most week days from 2300 to 0300 GMT. K2JXX helps roll up a dandy DX score at W3MGE, Philadelphia's Drexel Institute of Technology. We regrettably acknowledge via VP1JH word of VP1HA's passing. Another Silent Key is KP4KD, whose passing is a great loss to amateur radio. He had been one of our most faithful contributors. K6s RMO and CNB are proxy and secretary of the DX-Ploeters, a long-haul outfit whose membership is limited to a 25-mile radius of the West Covina, Calif., city hall. KL7KG (W6KG) brings the K6BX Certificate Hunters Club roster to a healthy 115. KP4KD had QSO'd 41 CHC members, 27 confirmed, and Ev also had worked 509 KP4 neighbors. W8KX carefully rates 20 meters on an Excellent-Good-Fair-Poor-Dead logging scale. In daily observations between 0000 and 0400 GMT last November for instance, there were five stone-dead days, sixteen poor, seven fair — no good ones and not a single excellent. Parity, of course, is the good old days of sunspot maxima. "What's a DX man going to do these days to keep out of trouble when the band is dead?" worries Walt. Preparations go forward for the gala Nevada field day scheduled by the Eimac Radio Club for April 22nd-24th. W6AY7 is the label. WGDXC notes K4s QLL and VUR seeking encouragement in tentative summertime Navassa plans. In a communique to NNRC, KZ5TD reports only one c.w.-type s.w.l. card ever received from the U.S.A. in contrast to dozens and dozens from Europe. Gosh, we can recall what a world of fun it was to raise our code proficiency to the magic 15-15-w.p.m. level by hunting c.w. DX on ham bands. Can someone possibly have found a more interesting and honorable way to practice code?

Ten Years Ago in "How's DX" — The opener for February, 1951, bucks the trend in "How To" literature with hints on how *not* to enjoy DXing. W1BB booms the 160-meter market by working EA6AF, FY8AC, and several GZs. Eighty rolls along with EA6AF, FY8AC, ZB2I and ZK2AB in starring roles. Forty is fraught with FY8AA, curious MX1AF, PK4DA, VP5s B, FH, VSs ZCH and 7NG. Twenty c.w.'s best are AC3SQ, EQ3B, KT9X, FD3RG, HS1VE, KX6AA, MF2ABE, OQ5s BQ, NK, P15OK, Pks 1TM, 7MG, TA3AA, VKJs RB, RF, VQ9FD, VSs 2CP, 7MG, W50EU/KW6, Y13s BPS DYN, YK1AB, ZSs 2MI of Marion Island, and 8M1. Twenty phone is a crackling target range for AR8BU, PQ3FM, FN8AD, VR1s E and two's W4ENA/JA8. Ten phone hangs on gamely with the assistance of KJ6AJ, MD2GC, MB2XX and WA1KC/KW6. "Tibbits" teases the readership with hints of impending Andorra, Monaco, St. Pierre and Vatican City activity. Leaves goes way out of focus this month, and there are photos of 11PL, HB9EU and PK4KS to provide picturesque DX atmosphere. [57]

Strays

K8WUX is looking for Lyle, a W7 telegraph operator in Sun Valley, Idaho, who helped him with the code.



Correspondence From Members -

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

FFCC'S 25TH

On behalf of the entire Commission, I wish to extend our sincere appreciation for the Resolution adopted by your Board of Directors honoring the Federal Communications Commission on the occasion of its Twenty-fifth Anniversary.

It is heartening for us to receive recognition for our efforts from an organization such as yours which has rendered invaluable assistance to the Commission in the growth and development of the Amateur Radio Service. We are grateful for this honor. — *Frederick W. Ford, Chairman, Federal Communications Commission.*

REBUTTAL

On page 100 of the December, 1960, *QST*, column two, is the statement, "All amateurs are aware of the fact that s.s.b. and a.m. are not compatible."

It must be that I am not an amateur as I did not know this "fact." [FFCC doesn't either — *Ed.*] We of the Sidney Amateur Radio Club often operate s.s.b. and a.m. in complete compatibility. — *Harry Brinson, W2CYV, Sidney, New York.*

POSTSCRIPTS TO HC1WB

Thanks for the article "Those Crowded W1AW code practice frequencies," by William F. Bennett. HC1WB. My experience parallels that of HC1WB, not only from W1AW, but from all code practice stations, including K6U8N.

Tonight, I warmed up the receiver on 3590 kc., same spot I usually copy K6USN fairly well, and waited for W6OWP to give the qualifying run. I had high hopes that tonight would be the night, and sure enough, he cleared the QRM by the time he got through 15 w.p.m., but just as he started 20 w.p.m. a W8 started calling CQ, and a W9 answered him. I could squeeze out that W8 enough to copy at the 25 w.p.m. speed, but each time I came close to a full minute of 25 w.p.m., the W9 would break in.

These lids really don't know they are interfering. Since they evidently do not read *QST*, letters like this will do no good, but perhaps if we mention during our QSOs that we try to listen to certain code practice sessions, on certain frequencies, at certain times, maybe the word will get around. Who knows? Maybe someday the code practice sessions will become free of QRM. — *Dayton L. Plifer, W0VEA, North Platte, Neb.*

William F. Bennett, HC1WB, is absolutely right about this deplorable situation . . .

As an old-time commercial operator aboard ship and at marine radiotelegraph coastal stations, I hereby respectfully suggest that more of us simply sit down with a cold transmitter and a hot receiver, avoiding any unnecessary transmission which may cause interference and saturation. Let's be more considerate and helpful, striving for better communications. — *William Stager, W7IN, Portland, Oregon.*

. . . Even here in Calif. the ham-made QRM on W1AW's code practice frequencies is impossible. They usually let W1AW get started before blasting its signal clear out. — *Wm. C. Young, W6MJH, Bakersfield, Calif.*

Thanks for item concerning the code practice frequencies. Unfortunately, the offenders will never see it. League members know about it, the offenders don't care! I suffered through 140 months of it, too. — *Clarence E. Berry, K9TAT, Canton, Illinois.*

The article by HC1WB was the first I have seen on what appears to be a major problem. I have heard deliberate attempts at knocking W1AW right off the air. I know those

code practice runs have helped me as well as many other hams. In my humble opinion, I think a solution would be to assign to W1AW frequencies which are outside the regular amateur bands. — *John C. Shroad, K3IAM, Levittown, Penna.*

TOO MUCH RTTY?

. . . *QST* just doesn't seem to be for the average amateur. It seems to be aimed at the Extra Class ham who has everything money can buy, and who probably hires a technician to build the projects the *QST* articles describe. Take the "Radioteletype Reception by Tone Conversion" article by McCoy in the December 1960 issue for example. In the years I have been around amateur radio I have never talked with or QSOed an amateur who uses radioteletype (to my knowledge), yet here is a project costing in excess of \$100 and for a type of man I don't even know exists . . . Is this type of article worthwhile? When I see it I am discouraged. . . . Yes, this is critical. But these are some of the reasons [OM Gregory also took us to task for electronic keys, Field Day, and Sweepstakes. — *Ed.*] I am leaving ARRL. You have lost my interest, not in radio but in *QST* . . . — *Park E. Gregory, W8ROE, Belleville, Mich.*

MORE RTTY?

I have been a member of the ARRL for two years. During this time I have learned much about a.m., c.w. and s.s.b. modes of transmission. I am dismayed by your neglect of one of the most intriguing forms of amateur operation, radioteletype. As *QST* is devoted to all amateurs, I think more articles should be devoted to it.

During the two years I have been a member, I can only recall two articles on the subject. If more space is devoted to RTTY, I think that more amateurs will be inspired to join the ranks of the RTTYers. — *John Kuzmic, K8MFV, Euclid, Ohio.*

[*Editor's Note:* . . . And if the RTTY gang will submit more articles on the subject, *QST* will use more of them.]

QGT INTERPRETATION

Regarding remarks made in November, *QST*, by W9RA, on the GMT discussion, I am of the opinion that what he says about adopting a single time designation does make sense, but what's really wrong with just plain GMT? This seems to be about as simple and unconfusing as it could be.

The Q signal that Mr. Morgan gives, QGT, already has an official interpretation. This is shown in the July 1953 edition of ACP 131, "Communication Instructions, Operating Signals." The meaning as shown is; "Fly for . . . minutes on a heading that will enable you to maintain a track reciprocal to your present one."

This book is used by the Armed Forces and is carried in SA-16 rescue aircraft of the 305th Air Rescue Squadron based at Selfridge Air Force Base, Michigan. In looking through the book there are some Q and Z signals that have no listed meaning. Two of these that are QMT and ZGT, although Z signals are for military use only. — *Paul E. Selter, sr., KN8WPH, Roseville, Michigan.*

SS AFTERMATH

If you were to step out to your front door some morning and see a bunch of people running madly up and down the road past each other shouting "Hello-Good Bye" all day and all night, what would your reaction be? I cannot believe that the Board of the ARRL are at the back of this insanity of SS contests. Possibly pressure from your advertisers insists on such imbecility to boost sales of burned out equipment. Heard one amateur at last evening on 3602 kc. calling

(Continued on page 126)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, WIDGL, Ass't. Comm. Mgr., C.W.

ROBERT L. WHITE, WIWFO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, WIYYM, Ass't. Comm. Mgr., Phone

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Praise for "Donna" Operations. We're proud to present this month in *QST*, the story of amateur operations in hurricane Donna. To all amateurs who assisted in communications, the thanks and congratulations of the League and fellow amateurs for so well upholding the traditions of ARRL in the field of emergency and public service work! To record praiseworthy results, let us repeat W4MLE's comment: "It was a magnificent job within the limitations imposed . . . and there was widespread public recognition for the amateur."

The January *CD Bulletin* spelled out some of the *lessons from Donna*. Needed are (1) wider advance knowledge of net-frequency and net operation; (2) earmarkings of even more emergency power sources for key-point communication needs; (3) more complete plans for organized use of nets in all our modes, including RTTY; and (4) more self-training before emergencies by fuller amateur participation in traffic handling and AREC. Florida SECs, W4HYT and W4MLE already have their heads together to establish new plans for nets, each to specialize in the several kinds of emergency traffic. For even higher volume and efficiency in the event of another "big blow," e. w., a. m. and s. s. b. nets would be teamed up with key stations at all strategic spots for smoothest possible functioning by all modes.

The Novice Roundup, DX Contest, and FMT. The NR is an annual get-acquainted party for all active operators, but primarily a 15-day station test for all Novices. Novices work other Novices or any amateurs. CQ NR is the general call. Page 6 of *QST* is used as a list to check off ARRL sections worked. See the rules and full information and announcement on page 76, January *QST*. Add a few Novice QSOs each day Jan. 28th through Feb. 12th; see how many you can work, and send in your log. Leading Novices in each Section get certificates!

The 27th International DX Competition has two phone sections: February 3-5 and March 3-5. The c.w. DX contest is scheduled for February 17-19 and March 17-19. The complete rules are on page 77, January *QST*. U. S.-Canada hams can work new countries for DXCC as well as try for the Section Certificate. Overseas DXers

will in many cases be looking for *new states* to advance their WAS standing. We appeal especially to amateurs in our rarer states to be active in the test to meet this demand. It will be a chance to extend your own DX worked list and to re-work old DX friends overseas. Good hunting!

In mid-month, February 15th, W1AW schedules one of the League's periodic *Frequency Measuring Tests*, open to all amateurs. If you have special frequency measuring gear, BC221's, LM's, 100 kc. crystals, or multivibrators and frequency dividers, here is your chance to give this gear a work-out. Official Observers each time brush up on their individual proficiency. It's a test under operating rather than laboratory conditions. Confirm instrument calibrations against WWV (see page 518 of *The Radio Amateur's Handbook*). The approximate FMT frequencies are listed on page 75. We want to invite all who have special equipment to take advantage of this test. Can you measure precisely or does your means of frequency check require you to stay several full kilocycles inside the band?

The Amateur is Balanced. A many sided amateur radio such as ours has to leave to individual conscience just where to draw the line in dedicating personal time to objectives within the hobby that are helpful to others and lend strength to our institution. Also there's a dividing line between the too ardent and the too-casual in any hobby. The following commentary by Owen Blankenship, W3BNU, on Point 5 of The Amateur's Code is a condensation of his thought provoking remarks on this subject in December *Auto-Call*.

"The President of the USA cries for a balanced budget. We are urged to balance our diet; banks require our checking account to be in balance. But how often do we apply this word *balanced* to our Amateur Radio? Paul Segal of ARRL probably first brought the word before amateurs in his Amateur's Code. The fifth point of the Code reads THE AMATEUR IS BALANCED. But are we? — and how balanced should we be? We might properly consider in our personal conduct of Amateur Radio 'balance' as between one's self and responsibilities to family, occupation, community and God.

"A balance does not necessarily imply that one must have a capability within his station for each mode of emission

authorized to the Amateur Service. However, I cannot help but feel that the word balanced when used in this light must imply a requirement for a great degree of tolerance toward our friend's pet mode of emission regardless of our own. Countless hours of degradation of, say, s.s.b. or RTTY or phone, on any amateur band serves only one purpose — and that is to point out how unbalanced the individual is *who is doing the yakking*.

"Without going to a great deal of trouble can't you think of an individual who has become so unbalanced that he refuses to go to radio club meetings simply because they aren't discussing grounded loop rhombic antennas which happens to be his only purpose in life?"

"It would appear then, for an amateur to be balanced, he should devote only that time to his hobby not fairly required by his occupational duties, responsibilities to his family, and his civic and religious responsibilities. A balance must be struck between the time spent with his radio hobby and that devoted to maintaining harmonious relations in his larger community of interest. Amateur Radio — or any other hobby — considered other than as a hobby could become a ruthless slave driver if permitted to predominate and distort other interests required for balance.

"To this end, each must live according to the dictates of his own requirements."

Suggestions to Eliminate Harmonics. "Almost every day I hear an inexcusable number of Novice stations with c.w. harmonics popping up around 14.34 Mc. among the s.s.b. signals. These are most annoying. Some are beyond our band edge, and I would like to write the operators a card calling attention to it, but most of the calls are not in the latest call book I have . . ." So writes Les Downs, W9YSZ (Wisconsin).

Novices below 7150 kc. in frequency are inviting FCC citations for being off frequency *as well as for radiating their second harmonic*. W9YSZ backs up his letter with calls, dates and times. We hope every Novice who reads these columns will re-check his transmitter to keep out of FCC difficulty, whether he uses 3.7-3.75 or 7.15-7.2 Mc.

Procedure to follow:

(1) Listen, or have a nearby amateur listen, for your harmonics.

(2) Be *sure* the transmitter is tuned to the amateur-band output, *not* to an unauthorized harmonic.

(3) For correctives in the suppression or elimination of harmonics, see ARRL publications.

The above precautions to avoid FCC citations and trouble are all included in the Commission's Form 1096, sent to all new amateur licensees. W9YSZ's report is brought to the attention of ARRL's OOs, to call for renewed activity by Observers. One such observer comments on 50 hours recently spent by him carefully tuning the 7 Mc. c.w. band.

DX Courtesy. Most traffic and casual operators customarily listen on a frequency, to see that it is clear, before making any call. This same consideration is important likewise to the DX operator. His general plea is one for the cooperation of other amateurs to leave local QSOs in these DX bands to times when no DX is coming through. K2UTC, Dick Ebeling, writes as follows in amplification of these matters: ". . . Additional courtesy should be shown on the low end of the a.m. phone bands. On 15 meters the other

evening three stations from one call area were talking among themselves 4 kc. inside the band. While legal, I think to use the band for local chats is less than courteous to others listening for DX, having to tune through these strong signals while the DX is coming in. There is also the operator who calls CQ DX and then without tuning the band replies to a *local!* In two hours of listening, 21.25 to 21.4 Mc., I have noted that the stateside contacts in progress between 21.25 and 21.29 Mc. outnumbered these going on between 21.35 and 21.4 Mc. This is hardly right when Europeans, Africans, and Central and South Americans are coming through. The principle of listening before one transmits also should be very strictly observed."

—F. E. H.

FREQUENCY MEASURING TEST FEBRUARY 15

ARRL invites every amateur to try his hand at frequency measuring when W1AW transmits signals for this purpose starting at 2130 EST (0230 GMT, Feb. 16) Wednesday, February 15. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3666, 7009 and 14,050 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 2136. It is suggested that frequencies be measured *in the order listed*. Transmission will be found within 5 or 10 kc. of the suggested frequencies.

At 0030 EST, February 16 (0530 GMT, February 16), W1AW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies will be 3636, 7045 and 14,135 kc.

Individual reports on results will be sent to all amateurs who take part and submit entries. When the average accuracy reported shows error of less than 71.43 parts per million, or falls between 71.43 and 357.15 parts per million, participants will become eligible for appointment by SCMs as Class I or Class II OOs respectively.

This ARRL Frequency Measuring Test will be used to aid qualification of ARRL members as Class I and Class II observers. Present observers not demonstrating the requisite average accuracy will be reclassified appropriately until they demonstrate the above-stated minimum required accuracy. Class I and Class II OOs must participate in at least two FMTs each year to hold appointments. SCMs (see listing, page 6) invite applications for Class III and IV observer posts, good receiving equipment being the main requirement. All observers must make use of cooperative notices, reporting activity monthly through SCMs, to warrant continued holding of appointment.

Any amateur may submit measurements on one or all frequencies listed above. No entry consisting of a single measurement will be eligible for QST listing of top results. Listing will be based on over-all average accuracy, as compared with readings made by a professional lab.

BRIEFS

The following corrections are concerned with the Field Day results as reported in December QST. The Delmont Radio Club call is K3BHQ/3, not K2BHQ/3 as reported. Class E station WA6AKF was incorrectly listed as WA6AKE. W0MAO/0 is the Lincoln MARS Club. Class B station W7LVU was incorrectly listed as K7LVW. Apologies to those concerned.

— . . . —

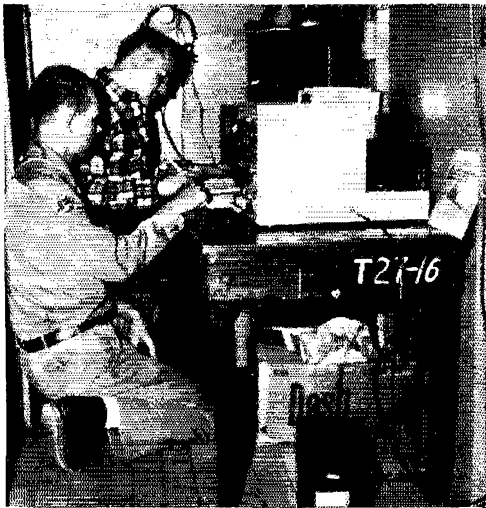
The following are corrections to the Sept. VIII QSO Party as reported in December QST. East Florida's K4RCX score is 140-70-2-AB; K4RNG, therefore, is the certificate winner for East Florida. Ohio winner K8SCI was incorrectly listed as K8KCI. K1KRP/1 was inadvertently listed as K1KRR. And WA2CLE of N.Y.C.-L.I. was a multiple-operator entry with WA2BWQ, WA2OEG, and WV2-PRA operators. Sorry for the errors.



It has been pointed out to us that the AREC has been doing a poor job of competing with RACES, MARS and some other government-sponsored amateur groups in the matter of offering insignia, posters, decals, placards and identification cards to its members — not to mention the business of making available various pieces of equipment, swank operating facilities, quasi or fully official status, publicity galore, etc.

Well, we don't know that we've ever been particularly inclined to compete with them. Whatever they offer to the amateur as an inducement to participate in their program is all to the good, the way we look at it — as long as they remain *amateurs* and don't open the door to encroachment by outside interests on amateur frequencies. But let's take a look at just what we do have in our own AREC program that makes participation rewarding in a material way.

First of all is the basic AREC registration card, which each AREC member can carry in his wallet. In some places this is recognized, in some places not — depending pretty much on local performance backing it up. The Official Mobile Unit identification card is issued by ECs to those AREC registrants having mobile equipment in their cars or other vehicles. Emergency Radio Unit placards are available, also through the ECs, to mobiles and other portable equipments and AREC stations while engaged in public service work. Standard publicity releases are mailed out to local newspapers announcing EC appointments and explaining what they are for. Emergency Manuals outlining the principles of amateur emergency communications are distributed to all AREC members — and this is supplemented by a slide collection on AREC Organization available to affiliated clubs. An Operating Aid in card form outlines points to be followed before, during and after emergencies. A sizable section of the Operating Booklet is devoted to AREC organization. The quarterly *CD* (Communications Department) *Bulletin* usually contains some emergency operating items, and once a year the *Emergency and Traffic Bulletin* contains a detailed analysis of the status of the AREC and other material devoted to emergency organization.



This communications trailer was built by Boy Scouts of Troop 27, Danville, Ky., and was used on the camporee, Oct. 21-22, near Perryville, Ky. W4CDA, Asst. SCM and past SCM of Kentucky (checkered shirt) is operating while a scout executive looks on. Al built the transmitter.

A 3.5-kw. generator supplied power.

We think this is a pretty good list, and it keeps the headquarters personnel concerned with this work pretty busy. Naturally, like you, we would prefer seeing the list bigger, more extensive. We'd like to have decals for windshields, bigger and better placards, shoulder patches, sweaters and shirts containing an AREC emblem, arm bands, helmets, more universal recognition of our AREC identification cards by high officials — yes, even equipment obtained through various sources for distribution among deserving AREC groups. We'd like to sponsor elaborate publicity spreads on AREC activities, things like radio and TV programs, films, newspaper and magazine articles. All these things have been suggested, considered, investigated — and most of them shelved because of money or personnel considerations.

Yes, that's the big problem: money and/or personnel. The AREC is part of the ARRL's overall program of service to amateurs, and through amateurs to the public. Limited League funds are available for various phases of its operation, but these funds are woefully inadequate for the job we would like to be doing. For this job, the AREC has no Great White Father who can magnanimously dole out benefits if the cause be worthy enough. A great part of the money and the effort and even the initiative must come from the grass roots. This requires a slight revision of the oft-used phrase "Why doesn't the League . . . ?" to "Why don't we . . . ?" Because *you* are the League and the AREC and the source of everything it is or isn't.

On Oct. 4, 1960, at 1645 an explosion at a Kingsport, Tenn., industrial company destroyed a plant and started a fire which burned out of control for five hours. Telephone toll lines were closed to all but official and emergency calls, so the amateurs assisted by handling personal inquiries from people with relatives at the plant. A "personal inquiry" net was formed with W4KRX and W4BEV as net control stations. Amateurs serving in the net were W4s PHQ PAH IKU TYV UTO and CHK. Over a hundred inquiries were handled during the hours 1830 to 2330.

On Nov. 4 at 1530, KH6DEH mobile was driving home from Honolulu to Wahiawa in a round table with KH6s IW EE CHK on 40-meter phone when he came upon an overturned car with several persons trapped inside. He immediately asked KH6CHK to call police and an ambulance. Thanks to the assistance of the amateurs, help arrived within ten minutes. — KH6ARL.

On Nov. 5 at 1809, W6QCE, EC for the San Fernando Valley, Los Angeles Section, received a telephone call from K6LYK, the operator on duty at the K6MYK repeater station, that there was an emergency call for him on the repeater station. It developed that the fire department wanted the assistance of the amateurs in locating the body of a 14-year-old boy who had fallen into the Los Angeles River flood control channel and had been washed down the river. Assistant EC WA6KLLQ was notified and W6MIEP, owner of the repeater station took over the repeater controls to release K6LYK and K6JJK. W6QCE and WA6-DWT got under way in the communications van, operating under club call W6JM. The van acted as mobile control station for the operation. WA6KLA also checked in. All units met at the L.A. River location specified by the fire departments and lights were played on the river to light up the whole area. Operations were suspended at 2000, with no sign of the body, which was found the following day in the Sepulveda Dam area. — W6QCE, EC San Fernando Valley.

On Nov. 14, after a transmitter hunt, members of the El Paso Ten Meter Emergency Net observed a series of blinding flashes and discovered that a car had knuckled down a utility pole, blocking the street with high tension wires and injuring the occupant of the car. The net went into action, summoning ambulance and police and blocking the street so that other cars would not cross the fallen power line. After the police and power line crews arrived and the injured man was safely removed, the net was secured. Amateurs taking part included K5s HCD DGGZ HTR, W5s AYE KOK, W9VFP, W8LIM/5. — K5HTR.

A 14-inch snowfall in the Puyallup, Wash., area took out power and telephone lines on Nov. 20. The emergency frequency was alerted at 1017 by EC W7OIV and declared an emergency frequency at 1515. A total of 32 amateurs

A.R.R.L. ACTIVITIES CALENDAR

Jan. 28—Feb. 12: Novice Roundup
 Feb. 1: CP Qualifying Run — W6OWP
 Feb. 3-5: DX Competition (phone)
 Feb. 11: CP Qualifying Run — W1AW
 Feb. 15: Frequency Measuring Test
 Feb. 17-19: DX Competition (c.w.)
 Mar. 2: CP Qualifying Run — W6OWP
 Mar. 3-5: DX Competition (phone)
 Mar. 17-19: DX Competition (c.w.)
 Mar. 20: CP Qualifying Run — W1AW
 June 10-11: V.I.F. QSO Party
 June 24-25: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Feb. 25-26: YL-OM Phone Contest, YLRL (p. 75, last month).
 Mar. 11-12: YL-OM C.W. Contest, YLRL (p. 75, last month).

joined operations to supply needed emergency communications for the area. SEC W7HMQ operated 15½ hours on emergency power, and many other amateur stations were similarly without commercial power. Stations taking part were K7s CZA DQV DQW BCL D1YL DWT AFU IGW CEZ BKK, W7s OIV SLB CMQ PUA SCQ MPH RDL NUN ZMG CZQ JJK OJY YOU EVW RMI TOU ZTG GIP GD WIV HMQ SGJ. — W7HMQ, SEC Wash.

Wind, snow, rain, falling temperatures and icing conditions brought an emergency condition to all of South Dakota except the extreme southeast corner on Nov. 27-28. Roads were blocked or iced up, power and communications lines were down, travelers stranded, motorists stalled, and even commercial radio circuits were out.

As the So. Dak. Weather Net approached closing time at 0830 CST, the first emergency traffic was listed with NCS W0ZWL, but this was only the beginning. When the net closed, W0VQC took charge and later relinquished control to K0BMQ. Other controls throughout the two-day operation included K0s LXF SZJ KYK and W0SCT. Approximately 12 hours was spent in emergency operation on each of the two days. Some 90 calls were recorded, including stations from N. Dak., Minn., Iowa and Nebr. as well as S. Dak. Several stations operated from emergency power plants, and two were mobile. Cooperation and assistance from other communications mediums were excellent. A total of 110 messages were handled informally, with 35 others in radiogram form. Much of the time the traffic backlog was great. Skip was short in daylight, becoming longer with QRM problems at night. Traffic handled consisted of weather reports and forecasts, FAA reports, telephone company damage surveys and aid in coordinating repairs, bus schedules, airport conditions, REA survey of damage and assistance available, coordinating Corps of Engineers and Bureau of Reclamation switching of lines to re-route power into outage areas, public service announcements to broadcast stations, funeral and death notices, supplies requests, stranded travelers, furnace outages, railroad information, and fuel orders. The following list of calls indicates those known to have participated: K0s QLE BMM BMP BMQ CMP CRD DHA DPD DUR ELQ ESP Ewj GGB HRR HSW ITP KOY LXE LXF MHF MZV PDI QBI RQY RRL SEJ SZJ TAM TNM TPF TUH TVJ TWB TWT TYY TZT ULI VIZ VYV VXY/B YDS YNR ZMA, K0s ACG BJV BTK CLS CMJ CRF CTZ DIY DNV DSK DVB FKE GCP GQH GWA HVY IGG ILL DFC LFJ LSB LXM MMQ OXC PAV PRZ QDU QVY SCT SDP TLU UFL URD UVA VHB VMV/m VQC WBH YEI YMM YQR YVF ZWL ZWY, K1JYX/B. — W0SCT, SEC South Dakota.

On the morning of Nov. 23, amidst strong winds and drifting snow in Pembina County, N. Dak., RACES RO W0HNV in Pembina and Pembina County EC K0HOZ in Drayton, established contact and proceeded to monitor 1990 kc., the Pembina County Emergency Net frequency, for possible emergency calls. At 1530 that afternoon K0HOZ/mobile accompanied a food truck out six miles south of Pembina to check road conditions. The truck driver decided to go on to Drayton, his last stop, and promised to contact W0HNV upon arrival, but by 1730 he had not yet arrived, so at 1900 a 4-wheel-drive truck led the way to look for the missing truck, with K0HOZ/mobile and RACES unit K0HOZ-2 bringing up the rear. Visibility was extremely poor. At 2000 the truck was found jack-knifed into a ditch, but no sign of the driver. K0HOZ continued to look around the truck, while Unit 2 went down the road. The driver was found inside the trailer of the truck, unhurt but mighty cold, and Unit 2 was called back. Perishables from the truck were loaded onto the three vehicles and transported safely to Drayton. — K0HOZ, EC Pembina County, N. Dak.

On Dec. 10 the AREC was asked to supply communications for a search for 7 flyers who jumped out of their B-52 bomber over the Adirondack Mts. in upper New York. Search planes needed communications between Plattsburgh, N.Y., Middlebury, Vt., North Hudson, N.Y., and the many small air fields at which search planes were landing to refuel. AREC nets in N.Y. and Vt. set up units at all required points and operated all day and night Dec. 10 and 11. Long haul work was done on the Vermont Emergency Phone Net frequency while other work was done on two meters, sometimes with relay stations. WA2DAC lists some 32 amateurs as having taken part: K2s UYM HJC HJD VXR, W2s OZY NIZ, W42s GNZ GCH GPY/mobile, G1A MAR JPB CTH DZN JTO LSJ DAC JPM, WV2MPZ, K1s AD DQB CEJ ARP PZL, W1s EIB HFS OJU EIC VSA EOY. The Montreal AREC offered 22 mobiles on two meters, but they were not needed. — WA2DAC.

On Oct. 12, Saskatchewan amateurs took part in a civil defense exercise in which all forms of communications were used. The amateurs handled 11 out of 20 messages. VE5IG was set up at c.d. headquarters in Fort Qu'Appelle and 17 amateurs checked in. The amateurs were a high spot in what might otherwise have been a dreary communications picture. Frequency used was 3780 kc, which was kept clear through the cooperation of other amateurs in the area.

The annual Christmas Parade was held in Cleveland on Nov. 27th, and as usual communications were handled by the AREC, this time on six meters. Over 200,000 spectators made parade control most difficult, but the boys did a bang-up job and received many compliments from parade officials and police. Sixteen amateurs took part. — W8AEU.

Twenty-seven SEC reports were received for the month of October, 1960, representing 11,423 AREC members, an increase of six reports over October of '59, and over 2,000

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,610	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.

AREC members. Sections reporting: E. Mass., Ga., E. Pa., Wis., Maritima, Kans., Okla., N. Texas, San Joaquin Valley, Ore., S. Texas, E. Fla., Wyo., Wash., Ind., Mich., Md.-Del.-D.C., Colo., S. Dak., Minn., Utah, Maine, Santa Clara Valley, E. Bay, Ohio, NYC-LI, Iowa.

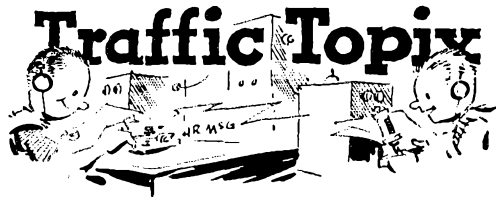
RACES News

We've been asked to say something about Citizen's Band licenses and where they fit into RACES plans. They don't! RACES is an amateur service. I say again, *RACES is an amateur service!* It isn't MARS, it isn't Citizen's Radio, it isn't police or fire or mobile radio, it's *amateur* radio. Citizen's Banders, as such, cannot participate in RACES. However, this does not preclude their participation in civil defense — and in fact, in some places they are being used for c.d. communications to good advantage. This has nothing officially to do with us, any more than c.d. use of any other communications service has.

What worries some of our ROs is that CB's are gradually moving into the c.d. communications picture to the extent that they are, in some places, beginning to supersede the RACES. All we can say to this is that c.d. directors will make use of the service that can do the best job for them, or that they *think* can do the best job for them. RACES is not the only c.d. communications service — not by a long shot. As *RACES* radio officer, you have nothing to do with the Citizen's Band, although as c.d. radio officer for your town, city or county it might be included in your duties, at the discretion of your c.d. director and your own willingness to tackle it.

It irks amateurs (and us too) to have the press continually refer to citizen's banders as "hams." On a number of occasions we have taken pains to point out to them that "hams" are licensed radio amateurs and that this does not include the CB's. However, the press will undoubtedly continue to commit this error and it is up to us to continue to correct it as and if possible.

Burlington and Camden County RACES combined forces on Oct. 2 in a large scale communications drill in connection with the National Championship Motorcycle Endurance Run. We have a detailed report from K2CMN on this event which we wish we could reproduce in full because it is evident that a great degree of planning and organization went into it. The 200-mile course contained 20 check points, each of which was supplied with mobile radio. Control stations were set up 19 miles apart and connected by a six-meter link, each control contacting ten of the mobiles at check points. These controls were themselves mobile, one being mounted in a trailer and one in a van. Operations began at 0730 and ended at 1730, during which time 32 operators handled 150 messages. The boys had their troubles, but in general everything went off well and the operation was a pronounced success.



Let's start off this month by considering briefly a number of topics of interest in traffic circles. These are not necessarily in order of importance.

Slow traffic. Yes, there's a lot of it. Phone and c.w. operators share an equal blame of lack of responsibility in getting the traffic to its destination. When a message arrives at a relay point only a hundred miles from its origination after five days, something is wrong. How to improve? We don't know that we *can* improve if we don't try. Let's try, eh?

Garbled traffic. It's getting so that a message delivered in its origination condition is a rarity. Again, phone and c.w. operators are equally to blame, and again there is no specific remedy except to try to do better. The trouble is not ways on the air. As often as not, we can't read our own or

somebody else's writing, or we have to many "sames" in the messages and we get them mixed up.

Book messages. The Christmas season brought out a lot of these, and we must say that the average traffic man is improving in his use of them. The big gripe (and we suppose the reason why books are not used to better advantage) is the counting method, wherein a message sent in book form counts as only one message regardless of the number of parts in the book. Many operators think they are getting around this by using "same" in place of common parts, otherwise sending each as a complete message, but this is just as unauthorized as counting parts of a book as separate messages — more so, because using "same" is not standard procedure and messages sent in that fashion should not be counted at all. It is difficult to devise a system of message counting that is equitable at the same time it is practical. Should a book count more than a single message, and if so, how much more? Should a long message count more than a short one? An important one more than a routine one? Isn't counting already complicated enough, without introducing additional complications? One thing is for sure: it is bad practice for any operator to lengthen the procedure, or shorten it, merely to get additional message count. The message count does not compare, in importance, with getting the messages to their destinations accurately and efficiently.

Separation signs. More than just a few c.w. operators put in procedure signs where they tend to confuse and leave them out where they tend to clarify — operators who should know better, too! Can't we use our heads about this? Use of the signs "TO" and "SIG" are totally unnecessary and may be confusing, so why use them? Use of the signs "AA," "BT," and "AR" are never confusing and are sometimes very necessary, so why not use them?

That's about all we have space for this month, but there are many more topics to discuss.

November net reports.

Net	Sessions	Check-ins	Traffic
N.E. Area Barnyard	26	628	11
Early Bird Transcon	30	—	377
Hudson Traffic	30	167	142
Dixie Early Bird	26	442	286
7290 Traffic	44	1526	733
20 Meter SSB	30	720	2194
Eastern Area Slow	30	229	125
SOCAL 6	22	1146	601

National Traffic System. Old-time NTSers will recall that since the earliest beginnings of the system, we have insisted on a basic principal — that NTS will select the mode to suit the need insofar as practicable and refrain from being either a phone or c.w. traffic system. In those early days, the c.w. traffic man was far more adaptable to traffic net organization than the phone man, and so the system grew up largely around a nucleus of hard-core c.w. traffic men.

But phone traffic net organization has come a long way since then, and today many of our NTS nets operate by phone, mostly a.m. but a few s.s.b. and some even have experimented with RTTY. We make no particular brief for any NTS net, phone or c.w., that cannot do the job it is supposed to do; but by the same token we do not discriminate against any net because of the mode it uses. Our job is to get the traffic handled efficiently by amateur radio in an organized and systematic fashion. Our aim, overall, is to accomplish this by the best means available.

This line of thought has led into some interesting avenues, some of them highly controversial. As we think we have said before, impartiality is a two-edged sword, and it is quite possible to be accused of being prejudiced against something because you are not prejudiced in favor of it, as the accuser is. If you tread the middle path, you are maligned by extremists on both sides.

Well, we're used to being maligned, and have been worked over by experts in the field. But after all the foamy-mouthed shouting dies down, the precepts of logic still prevail, and that logic indicates that the best man in an organization such as NTS is one who has the best combination of versatility, operating ability, signal strength, location and availability.

The proponents of phone traffic handling have long wanted us to set up separate NTS's for phone and c.w., but even if we thought this was a good idea we couldn't do it because it would create too great an administrative prob-

lem. We're already up to our ears with such problems. Besides, in traffic and emergency matters we feel very strongly that c.w. and phone facilities should work together, not separately.

At NTS section level there are now a great many phone nets in operation, and most of them conduct close liaison with section c.w. nets to reach region and area and TCC level. Some of them are good nets, some of them not so good, some lousy — in which respect they have the same gradations as the NTS c.w. section nets. Nevertheless, if such liaison is possible at section level, it ought also to be possible at region and area level. The only question is, is phone operation *practical* at those levels, and can phone-only operators be utilized? Mind you, we're not talking about separate phone and c.w. region (let's stick to this level, for the nonce) nets; we're talking about conducting one or more of the existing region net sessions on phone *instead* of c.w.

In the First Region, this is being tried. It hasn't been easy, but we think we're making progress, and the phone session of 1RN (3830 kc., 2215 GMT) is going along well under the capable guidance of WIDX as assistant 1RN

manager. Two things have been difficult to get across; first, that this is not "1RN Phone," it is just plain 1RN — a phone session that does not parallel a c.w. session, but takes its place; second, that this net has the same functions in every respect as the c.w. sessions at 0030 and 0230 GMT and therefore liaison with c.w. nets is a definite requirement. Such liaison can be conducted only by stations capable of operating *both* modes.

The experiment continues on 1RN, and we have our troubles, but all troubles are educational and we learn best by making mistakes and having differences of opinion. Liaison stations from the phone session to EAN still often report in as "1RN phone" instead of just plain 1RN. There still exists a phone session at 1900 paralleling the c.w. session at 1930, and a great deal of misunderstanding and lack of understanding as to what this is all about. Many of the participants in both phone and c.w. sessions, for example, don't seem capable of thinking along unified lines, and still assume that "1RN phone" and "1RN CW" are two separate nets in two separate traffic systems, and the battle line between the two groups still exists.

We enumerate these problems here and raise the subject not necessarily because we'd like to see phone tried in other regions, but merely to acquaint others with the problems that exist and the obstacles that have to be hurdled and to make it crystal clear that "1RN phone" is not the beginning of a new phone NTS, but an unprecedented experiment in using a mode other than c.w. at region level. If your region net is running satisfactorily on c.w., for heaven's sake leave it that way. If you are having your troubles, it might be well to consider trying a phone session; but if you do this, remember that the phone session must conduct liaison with c.w. sessions (and vice versa) and you will have to have enough stations capable of both to perform the necessary liaison.

November reports:

Net	Ses- sions	Traffic	Rate	Aver- age	Repre- sentation (%)
EAN.....	30	1128	.789	37.6	97.8
CAN.....	30	0023	.817	34.4	100.0
PAN.....	30	1176	.671	39.2	100.0
1RN.....	105	907	.313	8.6	64.8
2RN.....	60	681	.625	11.4	96.3
3RN.....	60	543	.380	9.0	96.7
4RN.....	60	871	.468	11.1	90.6
RN5.....	60	739	.388	12.2	86.9
RN6.....	56	572	.280	10.2	81.3
RN7.....	50	370	.263	7.4	30.8
SRN.....	55	307	.203	5.6	92.1
9RN.....	57	644	.548	11.2	68.9
TEN.....	88	861	.455	9.8	69.4
ECN.....	20	46	.144	2.3	61.7 ¹
TWN.....	30	397	.348	13.2	87.3 ¹
Sections ²	1053	6981			
TCC Eastern.....	100 ³	1092			
TCC Central.....	90 ³	974			
TCC Pacific.....	119 ³	879			

Summary	1844	20191	CAN	9.4	CAN/PAN
Record.....	2025	24014	.931	12.6	100.0

¹ Region net representation based on one session per night. Others are based on two or more sessions per night.

² Section nets reporting: EMN (Mass.); SCN (Calif.); MDDS (Md.-Del.-D.C.); BEN, WSSN & WIN (Wis.); BUN (Utah); NEB (Nebr.); ILN (Ill.); QKS (Kans.); AENP Morn, AENP, AENB & AENT (Ala.); S.D. 75 Phone, SDN & NJQ (S. Dak.); WSN (Wash.) QMN (2 Mich. nets) Tenn. CW; Gator, FN, FMTN, FPTN, & TPTN (Fla.); VSN & VFN (Va.); NHN & GSPN (N.H.); HNN & CCW (Colo.); CPN & CN (Conn.); MSN, MJN, MSPN & MSPN Eve (Minn.); RISPIN (R.I.).

³ TCC functions performed, not counted as net sessions.

Well, our record-breaking spree seems to be over. Of course last November was one of the highest months of the year, and perhaps something happened that made it exceptional, but bad conditions are beginning to cut into our totals and we may expect more and more difficulty beating records from now on.

ITV, bad conditions and light traffic are complaints on CAN; W0DYG has issued CAN certificates to W2MTA/9, K0ORK and W0RDN. K0EDK discusses problems with the PAN gang in his monthly bulletin, W2PHX has issued 2RN certificates to K2ETS and K2UYW and is muttering

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for November Traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL.....	304	2421	1906	463	5004
W0BDR.....	176	917	822	7	1922
W0LGG.....	501	575	532	33	1641
W7BA.....	10	701	671	30	1412
K0ONK.....	140	562	520	18	1240
W0IDA.....	464	383	366	3	1216
K9BT.....	7	562	554	8	1131
W0SCA.....	19	546	540	0	1105
K4AKP.....	39	527	500	27	1093
K6MCA.....	88	450	475	14	1027
W3IVS.....	12	449	491	50	1002
K0UAT.....	347	284	246	29	906
K6RPI.....	88	492	304	98	892
K1CIF.....	388	306	187	7	886
K4SJH.....	197	366	288	24	875
W6GQY.....	257	137	315	82	791
W6GYH.....	186	311	279	10	786
K2UTV.....	130	370	250	20	760
W0PZO.....	14	348	236	145	743
W8UPH.....	6	367	312	52	737
K1LLX.....	2	367	365	2	736
W4PT.....	10	347	325	9	691
W9DYG.....	50	331	254	39	674
W7DX.....	13	323	246	29	606
K1GNR.....	12	304	249	51	616
W6AOAQ.....	26	299	263	24	612
W2EZB.....	11	302	232	64	609
W3VR.....	78	290	231	5	604
K2UYW.....	35	278	263	9	585
W40GG.....	7	282	272	15	582
W8DAF.....	41	279	182	69	571
K0WWD.....	60	256	209	45	570
W0ZWL.....	3	391	21	147	562
K4PGE.....	46	257	254	1	558
W2ACJG.....	20	268	262	6	556
K4RBY.....	213	161	143	25	443
W9D0.....	19	249	231	37	536
K0ORK.....	49	245	210	29	533
K0CLS/6.....	57	252	189	16	514
W18MU.....	8	261	233	4	508
W9TPT.....	23	248	60	174	505
W3EML.....	28	197	196	41	502
W9TUR.....	20	153	270	58	501
Late Report:					
VE2AZI/W1 (Oct.).....	31	982	960	15	1988

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W61AB.....	56	1448	1424	24	2952
W6YDK.....	1126	196	165	31	1518
W6ZJB.....	258	195	186	9	648

BPL for 100 or more *orlatnations-plus-deliveries*

W9GJS.....	224	K4FSS.....	138	W4GJ1.....	106
K0LTJ.....	209	K9IVG.....	131	W6WPF.....	106
K3WBJ.....	205	W9DCA.....	126	K4CNY.....	105
W4J8J/4.....	173	K1FAH.....	122	K6RPT.....	104
K7BEH.....	168	W2EW.....	121	W2RUF.....	103
K2DEI.....	149	WA2CCF.....	120	K9QAE.....	103
K4BSS/5.....	145	W4OOL.....	118	K4FMS.....	102
W7QMU/VE8.....	144	W1WFF/1.....	110	Late Report:	
K0HG1.....	144	WA2BNF.....	106	K2UBG (Sept.).....	222

More-Than-One-Operator Stations

W1AW 141 WIKBN 130

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K2RBY, K2UBG, K4FSS, K6EPT.

The BPL is open to all amateurs in the United States, Canada, Cuba and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more *orlatnations-plus-deliveries* for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

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.

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, Communications Manager

about turning 2RN over to someone else after two years. W3UE exudes optimism about 3RN and says that MDD is getting back into the picture. K4AVU complains about not being able to hear the NCS on EAN and suggests that EAN be divided into northern and southern sections; W4ATA has received his 4RN certificate. PAN is being harrassed by RTTY QRAL. RN7 missed eight late sessions because of bad conditions. W8DAE reports two early and two late sessions blacked out, but commends W8BZX, K8ONQ and W8ZYU for their efforts. W0LCX has been off the air because of rig trouble; he says traffic fell off but representation improved. VE1PM, VE1CD and VE1DB have promised help in representing Maritimes in RCN. K0EDH puts out a fine summary bulletin for TWN each month.

Transcontinental Corps. One never knows, when keeping a TCC sked, whether the propagation path will be open or not. That's why most of the boys have alternate frequencies and times in case the first attempt results in QNP. As can be seen from the chart below, failures increased in November, but most of the traffic is still moving. November reports:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	100	90.0	1625	1092
Central	90	85.6	2146	974
Pacific	119	88.2	1746	879
Summary	309	88.0	5517	2945

The TCC roster: Eastern Area (W1SMU, Dir.) — W7s AW EMG NJM OBR SMU WEF, W2FEB, K2s SSX UFT UYW, W4s APY COO, W3WG, W4PNM, W8UPH, VE2AZ1/W1. Central Area (W0BDK, Dir.) — K4AKP, W9s CXY DYG ZYK, W0s BDR LCX SCA. Pacific Area (W6EOT, Dir.) — K0s DXX GID LVR ZYZ, W6s EOT HC QMO WPF, W4s ATB GKK HZM OAQ, K7NWP, W7s BDU DXZ GNC HHZB, K0s CLS/6 EDH, W0s FEO K2D WME.

HIGH CLAIMED SCORES 1960 A.R.R.L. SWEEPSTAKES

Follows the high claimed scores for the 1960 Sweepstakes. Included are those claimed c.w. scores over 150,000 points, and those claimed phone scores over 100,000. Should your log entry have qualified and is not listed below, drop a card to ARRL so that the difficulty may be ascertained. QST will carry the full Sweepstakes report as soon as checking is completed.

C.W.

W9WNV	273,385	W3VAN	176,568
W9IOP	265,989	W4KFC	173,959
W0VXO	261,973	K6SXA/0	173,375
W5WZQ	237,897	W2DMJ	172,530
W3BES	226,665	W6SBB	171,185
W6ZVQ	224,658	W3GHM	165,892
W0EWH	212,613	W9RQM	164,010
K2DGT	210,337	W8SM	162,750
W3EIS	206,773	W6MIVQ	160,825
W7KEV	205,211	W8EV	160,020
K5QNF	203,488	W3MWC	159,714
W5MCT	203,175	W1EOB	157,534
W3JNQ	200,943	K4PUZ	156,494
W4DQS	198,145	W5BUK	155,855
W3MSR	192,330	K4RAD	155,790
W6YK1	191,625	W8QHW	155,034
K5ESW	190,995	W4HQN	154,504
K6CTV	188,048	W8RSW	154,425
W6UTV	185,760	W2HDW	154,263
W3ALB	183,412	W4YE	154,100
W8OY1	183,143	W1JYH	153,884
K5ABV	182,584	W4CVL	152,753
K5VLN	181,223	W2GGE	151,584
K5RHZ	179,343	W9NPC	151,375
K2UPD	177,500	W2SHM	150,165

PHONE

K6EVR	235,095	K2GXI	119,574
W7BSW	156,366	K5IID	115,776
K4LPW	141,474	W0YQ3	112,058
W5KC	126,210	W5DRI	107,878
K3DVS	121,788	W7IQS/72	102,528

1 W0QHS, opr. 2 Multiple-operator station.

Section	Closing Date	SCM	Present Term Ends
Yukon	Feb. 10, 1961	W. R. Williamson	Mar. 17, 1949
West Indies	Feb. 10, 1961	William Werner	Aug. 10, 1958
Kentucky	Feb. 10, 1961	Robert A. Thomason	Aug. 16, 1960
Idaho	Feb. 10, 1961	Mrs. Helen M. Maillet	Feb. 10, 1961
Michigan	Feb. 10, 1961	Ralph P. Thetreau	Apr. 10, 1961
British Columbia	Feb. 10, 1961	Peter M. McIntyre	Apr. 10, 1961
Oregon	Feb. 10, 1961	Hubert R. McNally	Resigned
Wisconsin	Mar. 10, 1961	George Woida	May 12, 1961
Nebraska	Apr. 10, 1961	Charles E. McNeel	June 10, 1961
Eastern Pennsylvania	Apr. 10, 1961	Allen R. Breiner	June 15, 1961
Iowa	Apr. 10, 1961	Russell B. Marquis	June 16, 1961
South Dakota	May 10, 1961	J. W. Sikorski	July 3, 1961
Hawaii	May 10, 1961	Samuel H. Lewbel	July 14, 1961
New York City & Long Island	May 10, 1961	Harry J. Dannals	July 31, 1961

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.

Connecticut	Henry B. Sprague, Jr., W1CHR	Dec. 9, 1960
Sacramento Valley	George R. Hudson, W6BTH	Feb. 25, 1961
Eastern Florida	Albert L. Hamel, K4SJT	Feb. 27, 1961

In the Arkansas Section of the Delta Division Mr. Daniel B. Patterson, W5SMN, and Mr. John H. Cartwright, K5TYW, were nominated. Mr. Patterson received 85 votes and Mr. Cartwright received 69 votes. Mr. Patterson's term of office began Nov. 22, 1960.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Feb. 11 at 2130 Eastern Standard Time (0230 GMT, Feb. 12). Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Feb. 1 at 2100 PST (0500 GMT, Feb. 2) on 3590 and 7129 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST (0230 GMT). Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To improve your list, hook up your own key and audio oscillator and attempt to send in step with W1AW.

- Date Subject of Practice Text from December QST*
- Feb. 2: *My Salvation*, p. 25
 - Feb. 6: *A Cathode-Ray Transmitter Monitor*, p. 18
 - Feb. 9: *Using the 1360 in the HBR-16*, p. 36
 - Feb. 14: *A Simple Antenna System for the Novice*, p. 46
 - Feb. 16: *For the Command Receiver*, p. 48
 - Feb. 22: *Transistor Converter for Six Meters*, p. 39
 - Feb. 27: *The Congo Story*, p. 76

DX CENTURY CLUB AWARDS

HONOR ROLL

W6AM.....302	W2HUQ.....298	W7GBW.....296
W3GHD.....302	W8RA.....298	W6NRY.....296
PY2CK.....302	W2XXA.....298	G4CF.....295
W8JIN.....302	W9YFV.....298	W5ASG.....294
W9NDA.....301	CE3AG.....298	W8BKP.....294
W3JNN.....301	G3AAM.....298	ZLHYI.....294
KV4AA.....301	W6SYG.....298	W4TM.....294
ZL2CG.....300	W4BPD.....297	W7AMX.....294
W1FH.....300	W5ADZ.....297	W8UAS.....294
W2AGW.....300	W7GUV.....297	W6ADP.....294
W4DQH.....300	W6BEG.....297	W9LNM.....294
W8HGW.....299	W1GKX.....297	G2PL.....293
W6CUQ.....299	W8KT.....297	Z56BW.....293
W9RBI.....299	W1ME.....296	W2HML.....293
W8DMD.....299		W3BES.....293

Radiotelephone

W8KML.....291	W8HWG.....288
W8BF.....295	W7PHO.....288
W3JNN.....295	W8PQQ.....287
W8GZ.....294	ZLHYI.....287
Z56BW.....293	W9NDA.....286
VQ4EHR.....293	W6AM.....289
W9RBI.....293	W4DQH.....283

From November 1, to December 1, 1960 DXCC Certificates and endorsements based on postwar contacts with 100+ more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

W2AZX.....201	W44PA.....106	W48SU.....101
W2BHM.....177	W02E.....106	KL7BA.....101
W2DEO.....152	W1C0I.....105	W8UGL.....101
W3AZQ.....131	W2BLQ.....105	DJ4HR.....101
KA2CB.....130	W8KMD.....104	DL9MZ.....101
W4CWW.....127	PA0KZ.....104	SM3VE.....101
OE6RS.....123	K2GD.....103	W42CU.....100
W4YYL.....116	K5HTM.....103	W3LOS.....100
K6T8Q/.....116	K8ONV.....103	W5CAN.....100
KG6.....116	W0DRL.....103	K5IYF.....100
UA9KJA.....116	SV0VI.....103	K6CJF.....100
ON4TZ.....113	K4JLD.....102	K9IFB.....100
OH2MB.....112	K8GPE.....102	K9KJD.....100
W6HHQ.....109	DJ2QV.....102	VE3AHU.....100
11ZYM.....109	W1OCV.....101	KA3CY.....100
G3ADE.....108	K3AMC.....101	602AB.....100
	K4BVD.....101	

Radiotelephone

I1THR.....125	G2DYV.....109	K9CRS.....101
K1EJO.....116	KA2CB.....107	K9TJ.....101
W8GMF.....116	W6LLW.....105	W1ICP.....100
W20DO.....111	VE5VZ.....103	W2JXH.....100
SM5AQR.....111	VO1RD.....102	W3QLC.....100
	W5EFA.....101	

ENDORSEMENTS

W8KML.....293	W2FXN.....261	K6AYA.....240
W6PGB.....291	W2GVZ.....260	W0BSK.....240
W6YY.....291	W4OM.....260	W3LMO.....238
W6T8.....290	W4VPD.....260	W5DA.....235
W9Y8X.....283	W6VGB.....260	W9CFP.....234
W6QNA.....280	W1NLL.....251	K6RWQ.....232
W8KPI.....276	W5AWT.....251	OH2NB.....232
W2AJY.....274	W7EJD.....251	W8DUS.....230
W6UJ.....271	K2CPR.....250	W1HGT.....230
W5PQA.....270	W4DHZ.....250	W2RJD.....230
GA3EST.....263	W5LGG.....250	W8WT.....230
W50LG.....270	W1GHH.....245	KP4T.....230
W2UVE.....265	W8QC.....245	EA1BC.....227
W2ESO.....262	W5PM.....244	W8RZS.....226
W2NUT.....262	W8VDJ.....243	VE6JR.....222
W3OCU.....262	W1EQ.....241	PY4OD.....221

W2FXA.....220	W8AYS.....181	W8VVD.....150
W5VTR.....220	KNLSG.....181	V22DK.....150
W4AUL.....215	W4CKB.....180	OE8KI.....148
ZL2APZ.....214	K4YCW.....180	K9HOL.....145
W3MWC.....212	W7ABO.....180	W8OHW.....144
W0LBB.....212	W1HWL.....180	W3THQ.....141
W100A.....210	K4GSS.....179	K4TEA.....141
W5P8B.....210	VK5QR.....179	W1GJK.....140
ON4MS.....204	OZ7CG.....175	K1TFE.....140
W80GQ.....203	XZ2TH.....175	L155ARL.....140
G7HDL.....174	W3JGJ.....139	W3GCG.....139
VQ4KRL.....203	V83DCI.....172	W7LVR.....133
W1NS.....202	K6LAE.....171	W1GZP.....131
W1ICW.....201	W2LNB.....170	W2JVK.....131
W1VAN.....201	W4FYI.....170	W6ZMW.....131
W1YPK.....201	PA2CR.....170	K7GGM.....131
VE9RS.....170	W1HRS.....170	W3GGL.....130
LU5AQ.....201	VE7QL.....168	W3GGT.....130
W1FOA.....200	K2UPD.....166	W3INH.....130
W1OHA.....200	W1RCQ.....165	W7JVE.....130
K4LTA.....200	K2JFV.....162	T12CMF.....130
W8BFX.....200	SM5AQR.....161	ZL1ARY.....126
W8LY.....200	W1IKR.....160	W4NYF.....123
KH6BLX.....200	WQ2DY.....160	W6ABA.....122
W8SCU.....199	K5BDO.....160	W6ZMW.....121
W0TJ.....199	W6AMZ.....160	G3BQX.....121
DL9RK.....198	W9TKD.....160	G8D.....121
K2UKQ.....192	W6PNS.....160	W3JGJ.....120
K2VUI.....192	CN8DJ.....160	K3ANH.....120
W7CMO.....192	G3KAA.....156	W4HHG.....120
K1JDN.....191	W6AUT.....155	W2HUG.....115
K2QHL.....191	W2GZZ.....154	SM7CAB.....115
W6MUM.....190	U85DW.....154	W7DH.....114
W7NRB.....190	K9RAL.....152	W3AZQ.....114
K9IYV.....190	W4ZI.....151	W2CBB.....113
DU78V.....190	ZF3JO.....151	K4JEY.....113
VE7CE.....190	Z86ASW.....151	K1DXW.....110
W0DSP.....183	W1UQP.....150	W1WSN.....110
VE2BV.....183	W32DIG.....150	K2AYO.....110
W4JLL.....182	W48NR.....150	O48K.....110
	K5ESV.....150	

Radiotelephone

W9Y8X.....274	ON4MS.....176	W5DA.....131
W2ZX.....271	1BRF.....175	W7LVR.....131
W6GVM.....270	W2HQL.....171	W9JFJ.....131
W3KT.....253	W8S2L.....171	OZ5JT.....131
PY4CB.....250	P21AX.....171	W2VZ.....130
W8VJ.....243	W1BHL.....170	W3AZQ.....130
OZ7FG.....243	W1VAN.....170	VE3BTI.....130
W8JIN.....241	SM5RY.....169	ZS1DC.....124
W4EEE.....232	K2FW.....165	W2HNG.....122
W2WZ.....230	K9KYF.....160	W4DLG.....122
W1FZ.....224	W7ZAS.....155	VE1VL.....122
W0QVZ.....224	K58C.....154	W1DGL.....121
W8WT.....220	K8RTW.....152	W2VAP.....121
W2BQM.....210	W2YBO.....150	VE3BKL.....120
W5ERY.....201	W0LBB.....143	K4LTA.....116
W0CPM.....201	K1IXG.....141	H89RB.....116
G3BID.....192	W4ZKM.....141	W0BHW.....111
ON4PI.....190	K18N.....140	W9YZQ.....111
W2FXN.....181	W2CPI.....138	XV5EF.....110
	W0TJ.....138	

U.S.-Canada Call Area and Continental Leaders

KH6CD.....261	VO1DX.....241	VE6NX.....256
KL7PI.....231	VE2WW.....276	VE7ZM.....285
W0ELA.....291	VE3DFP.....260	VE5AW.....195
VE1PQ.....252	W4XQ.....200	4X4DK.....292
	VE5RU.....209	

Radiotelephone

W2BXA.....281	VE1PQ.....151	VE4RP.....102
W5BGP.....260	VO1DX.....129	VE5RU.....192
KH6OR.....259	VE2WW.....220	VE6TF.....172
KL7AFR.....190	VE3QA.....241	VE7ZM.....267
W0A1W.....270		G2PL.....266

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Freiner, W3ZRQ—K3JHT is now a General Class operator and is active on the PPN Net. K3KFD is on 6 and 2 meters with a Viking 6N2. The new appointments are STL as OPS, BNU as OBS, K3KFD as OES, BNR/6 was temporarily QRT while moving into his new house trailer. Aside from traffic-handling, HNK managed to snag his first Prince Edward Island QSO, AXA and I'KE, both experiencing big trouble for the past few months, again are QRL on EPA. K3IPK won the SS club award of the Oxford Circle RC. GHD added the W-Conn. Award to his collection of wallpaper. Among the unfortunates were EU, losing quite a bit of gear during a freak lightning storm. K3GAY has been plagued with a power leak from the local power company's line giving off 40 db. over S9 QRN. EML found time for the SS Test yet managed to make the BPL, HZZ, K3ACD and K3HTZ, learning the "3 R's," find their school grades up and their traffic count down. The Lancaster Radio Transmitting Society held a dinner Jan. 14 with DYT as A.C. The Adams County Amateur Radio Society received and proudly displays its new League charter. The Berks County V.H.F. Society, a newly-formed club, has acquired a site on a 1200-foot mountain. K3HXC is building a portable rig for his summer months' operation. ELI reports a complete "zero" for the month; he claims his XYL had too many ideas for home improvement. The Frankford RC officers for '61 are HHK, pres.; KVV, vice-pres.; KDF, secy.; and MQC, treas. Because of band conditions CUL had a rough month but is looking for a good holiday season of traffic. The short Skip RC is sponsoring a project called "3x4x5." It evolves around minibox gadgets. K3KNL has given up crystal control and gone v.f.o. and works all low-frequency bands. K3KNP swiped his XYL's washer timer; he says it makes an FB QSO timer. CUK moved his shack 12 miles, ZRQ moved his 12 feet. With the cold and winter season upon us, now is the time to evaluate our clubs' preparedness for the coming Field Day. Traffic: (Nov.) W3CUL 5094, IVS 1002, VR 604, EML 502, HNK 267, YVJ 259, K3GSU 116, JLW 104, W3AXA 92, K3BHU 79, CRU 71, CAH 67, HEN 44, W3KMD 38, ZRQ 29, UUU 26, W3DUI 24, K3JSX 21, W3WHK 24, ITI 22, FAF 20,>NNL 20, NF 19, K3JHT 18, W3EAN 14, K3IPK 13, W3BUR 11, OY 9, K3MVO 7, W3FKE 6, GYP 3, K3HTZ 3, CNN 1, W3-HZZ 1, STL 1. (Oct.) W3CUL 6399.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—SEC: CVE. MDD Traffic Net meets on 3650 kc. Mon.-Sat. at 0015Z; MEPN (phone) on 3820 kc. Mon., Wed. and Fri. at 2300Z, Sat. and Sun. at 1800Z; MDD AREC Nets every Wed. at 0100Z on 3521 and 7042 kc., also 6 and 2 meters. New appointments: K3LFD and IZU/6 as ORSs; SPL as OO; GQF, K3KHK and HVE as OBSs; K3LUQ as OES. JFR is the new EC for Kent County, Del. CVE's new MDD AREC Bulletin is providing a new means of cementing section emergency services. MDD net certificates this month go to K3JYZ and K3WAG. The FSARC now publishes a lively News-letter. Congratulations! K3ADS is converting an ARC-3 for 2 meters. AHQ still leads the section in OO activity. BUD reports that an AREC planning committee is being formed in St. Marys County. K3BYD devotes time to ratchewing. CDQ enjoyed the SS Contest. Old-timer CQS is back on 10-meter c.w. after 20 years. K3CRF is helping K3JDN to organize AREC nets in Sussex County, Del. The WRC enjoyed 4NF. Chief Forecaster of the USWB, as speaker at its Nov. 4th meeting. K3DCP is busy publishing *The Modulator* for the HARC. Vice-Director ECP reports that K3NKC kept club station PZA on during the SS. EQK is busy representing Baltimore at Foundation meetings. EIS has received many letters of appreciation for his OO reports of out-of-band operation. NNM is building converters for 2 and 6 meters. K3IYT is plowing through an electronics course. MAZ had a meeting of the Baltimore AREC for the formulation of a new emergency plan. The Annual MEPN Picnic will be held July 23, 1961. K3GJD is helping as NCS for 3RN and MDD. K3CKF is the first Delaware amateur to qualify for the W-Conn. Award. K3GMD and KLA are in the hospital. K3IIS reports for GQF. Johns Hopkins ARC station. HC reports the Del. Emer. Phone Net is active on 3905 kc. K3HDW has a new carrier-controlled modulator. K3-HJD is working on the antenna. HKS is busy as ORS.

K3HTE reports that TN spoke on traffic-handling at the B-CC H.S. ARC meeting. IWJ liked the 2-meter aurora opening. K3IZM was locked out of the shack with the transmitter going! K3JET reports 6 new countries. K3-JIQ advises that K3MCC is a new General Class licensee. Your SCM and SEC CVE attended the Nov. 14 meeting of the Chesapeake ARC. JME reports on AREC activities in Baltimore County. JSL enjoyed his first CD Party. K3JTE, of satellite signal fame, is now operating ABT at the U. of Pa. JVN turns in a good traffic count. K3JYZ likes traffic-handling. JZY is preparing for the winter season. K3KHK is now WAS. K3KHN is converting his DX-40 to 6 meters. K3KPS has a new TA-32. K3LFD is busy with AREC nets. KN3LLR has his antenna problem solved. K3LNE used 6-meter mobile during a Wisconsin trip. LUL reports that the RCARC has a Novice transmitter-building contest. ZCVW reports for K3WAG. MCG likes the new 70-footer. K3MIDL received CP-15. K3MLY is getting Polytron 6-2. KN3NFJ has a new DX-20. K3NKX built a new field-strength meter. UE is busy with 3RN activity. YTW reports from Eastern Shore. YVQ is a Baltimore outlet for MDD. ZAQ reports the Gunpowder ARS is being formed at Army Chem. Center. ZNW is looking for AREC recruits. Traffic: K3WBJ 229, W3UE 203, K3JIQ 119, W3MCG 79, K3LFD 77, KPZ 71, JYZ 62, W3AHQ 52, BKE 40, ECP 38, ZNW 38, TN 34, K3WAG 23, MIDL 21, GJD 15, BUD 14, K3LUQ 12, W3QCS 11, EQK 9, K3DCP 8, HTE 8, W3IWJ 8, YVQ 5, K3HDW 3, KN3NFJ 1, W3YTW 1. (Oct.) W3JWN 158, IWJ 42, K3WAG 11, W3JSL 7, JME 3.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. RMs: W2L 7J, W2EDW and W2ZL, K2JGU, Glassboro, is a new ORS. K2DEI, Maple Shade, has made BPL for each of the last 12 months. George now has a new linear. W2RG, Merchantville, reports a CDNJ c.w. slow-speed net each Sun. at 1045 EST. W2RG is NCS, W2ZJ, Trenton, has returned from a vacation to the West Indies aboard the M/S *Bergensfjord*. He visited KV4AA and VP2DJ. N. J. Phone Net totals for Nov.: 30 sessions, attendance 498 and traffic 125. K2SNK has been fixing antennas and rigs for the coming DX season. W2BEL, Audubon, has been on the sick list. The Bridgeton Area Radio Club elected W2MAS, pres.; WA2EOY, vice-pres., WA2DID, secy.; WA2BZQ, treas. The SJRA elected K2KCI, pres.; K2YIB, vice-pres., WA2EYI, rec. secy.; K2UWH, corr. secy.; and K2BG, treas. The Levittown (N.J.) Radio Club elected K2YBN, pres., WA2JLD, vice-pres.; Norwood Kien, treas.; WV2JXD, rec. secy.; and WV2KCR, corr. secy. K2ECY, Burlington Co. EC, has appointed WA2NDK as Asst. EC. K2ECY has organized the following AREC nets: Levittown AREC Net, 7175 kc.; Burlington Co. 10-meter AREC Net, 29,580 kc.; Burlington Co. AREC Net, 51 Mc. K2ARY, Salem Co. EC at Carneys Point, reports a marked increase in AREC activities, with many new members and increased net participation. The nets are well organized and are performing many useful services in the community. A marked increase in SJRA SS scores indicate an all-time high for the club. K2YIB was club chairman. We regret the passing of W2PWV Scotty, of Oceanport. He was well known in Southern New Jersey. We wish W2VX a speedy recovery from a recent illness. WA2BLV keeps the SJRA informed with current aurora and tropo news printed monthly in *Harmonics*. Traffic: K2DEI 230, W2RG 120, K2RNB 102, W2BZJ 87, W2ZJ 28, K2SNK 17, K2SOX 10, W2BEI 8, K2JJC 4, WA2AR 1.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF and W2-ZRC. 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 and 3992 kc. at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900. IPN on 3980 kc. at 1600. W2EZB, WA2CIG and W2RUF share HPL honors. We regret to report that K2GUY has joined Silent Keys. He was the husband of K2IYP. W2IEP reports that the Sidney ARC has sponsored a junior radio club under the guidance of W2GJG. The ARATS elected WA2-JXS, pres., K2EQB, vice-pres. and treas.; and K2RTQ, secy. W2VCI was season winner in the club's six transmitter hunts. The Radions Club at Lancaster elected K2RDD, pres.; WA2KRC, 6m. secy.; W2EBE, tech. advisor; and W2UXV and WA2EYT, trustees. W2WS has been endorsed as ORS. WA2BPE and K2UOQ have been appointed as OES. W2LXE had a baby girl. K2IUK

spoke on the AREC at the Niagara Falls Radio Club. Don't forget the New York State Convention sponsored by this group in Sept. '61. WA2CEP left for Navy Electronics School. K2HWI completed a 6G 813 linear also the QST 25-watt 2-meter transmitter and 5-over-5 antenna. WA2LSJ made the Plattsburgh papers with his bicycle mobile rig. K2DWR received CP-30 and Westchester County awards. WA2CJL takes over the 6-Meter Mobile Net for Monroe Co. C.D. The RARA had an FB radio control program at a recent meeting. The local RC group demonstrated planes, boats and even a toy tank. The WNY Hamiest at Rochester is scheduled for May 6 at Doud Post. Don't miss it. WA2CJL is offering a reward for the return of 6-meter Communicator serial B256. WA2IWH has made WAS and WAC. WV2PLK has a 1X-40. K2AQO has a new NC-300. K2MIP has a new TA-33 beam. The RAWNY had a guided tour through a steam generating plant (2,000,000 kw.) and got a look at the microwave control system. W2LXE and K2DGG assisted 2JPE, who arranged for the tour. Appointees are reminded that monthly written reports are a condition of appointment. Form 1 report post cards can be obtained free from ARRL. Appointments must be renewed each year. Traffic (Nov.) W2E2B 609, WA2CIG 556, W2RUF 413, WA2IYB 222, W0CE 215, K2PSX 121, K2IYP 92, K2QDT 76, K2BBJ 60, W2FEB 58, W2TPV 49, K2RTQ 42, WA2CRH 38, K2OFV 36, W2OQK 34, K2JRX 33, K2TDG 28, W2RQF 18, W2PVI 17, K2DWR 16, W2CXM 15, K2EE 14, K2JLY 12, WA2HEC 11, W2RQF 9, K2MPE 7, W2WF 6, W2BLO 4, K2RTE 4, K2UJZ 4, WA2ETM 3. (Oct.) K2MPE 12, K2DWR 7, WA2HTW 3.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC, OMA. RMs: KUN, GEG and NUG. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. New appointments: K3HSE as OBS and K3KMO as ORS. A slow-speed traffic net will be operating on 3585 kc. on week nights at 1830 to 1900 EST under the net call WPS. Anyone interested is welcome to participate. This net will be under the jurisdiction of the regular WPA Traffic Net. NUG has a new 75S-1. UGV is going on 2 meters soon. K3AKR will have the QX-6 rig on 1290 Mc. soon. The Nittany ARC reports via QST de K3HKK: POP got his WAS and WAC phone. NUG will be leaving for a tour of duty in Germany. K3KMO has completed his 80-10-meter vertical. The club used mobiles in their "Get out the Vote" Campaign. WRE has completed her script for the new Antique Wireless Assn. Show. The Etina RC reports via *Oscillator*. EXV is celebrating its fifth birthday. TOC has been hospitalized. K3MED is attending Allegheny College. The Steel City ARC, through *Kilovatt Harmonics*, reports: K3WH won two gold cups in the recent 6- and 10-meter ground-wave contest. LOR has a Globe Champion. NDH has a Heath "Fener in his car. K3IVM is very active on 10 meters; the SCARC has been remodeled. The Horsehoe RC, via *Hamateur News*: The HRC 6-Meter C.D. and AREC Phone Net meets every evening except Sun. at 1800 EST; the club edited a W3ROA Memorial Paper. The Huntington County ARC has changed its club location: WTV has a new HT-32A. The Cumberland Valley ARC Emergency Net meets on 29.4 Mc. every Sunday at 2200 EST. Up Erie way: WDK is busy getting a communications set-up at the new C.D. Hq. BFR moved to Virginia; K3KUW is a new haul. K3JZJ and WBA are busy making mini-prod beams and antennas. Traffic: W3WRE 184, KUN 150, K3GHH 118, W3MFB 103, K3-HVL 97, W3LSS 77, UHN 21, KNQ 10, UGV 9, K3KMO 5, COT 4.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP, RM: CSR, PAM: RYU. EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. The Central Division Convention, which will be held in Springfield, Ill., Aug. 26 and 27 at the St. Nicholas Hotel, will be one of the finest held in the Division, according to the committee which is hard at work planning this late summer event. K9CNE is being heard by the gang from Germany via DL4TNS. K9QON has a new four-element beam and a 1X-40. K9IVG is DXing on 2 meters. The Vermillion County Amateur Radio Assn., Inc., is issuing a certificate which can be obtained by working ten members of the club. The father-and-son team of K9IHW and GCE has put up a Mosley TA-36. LOH recently acquired the "Colonial America Award." A new Novice heard was KN9BNX. A new General heard was AXV. PNY is working the contests with a new TH4 Tribander. The Bloomington RACES has erected an 80-ft. tower for its 6-meter operational antennas. Our sympathy goes to the family and friends of ONZ, who recently passed away. Two new club calls have been added to the Rockford Area. AXD and AYS. The Ottawa Radio Club station is now finished and is operating on all frequencies 160 through 2 meters. It is

located in the Ottawa City Hall Building. VOK, TV, JLO, ABE, SEV, K9APE, K9JAW and EU participated in the Boy Scout Pilgrimage and also the Halloween patrol in the Ottawa Area. The Northside RACES (Chicago) participated with nine mobiles in mileage checks on the new Northwest expressway from O'Hare Field to Chicago Loop. K9SRW is using a new holo for 6-meter operation. The Joliet Amateur Radio Society members took part in a surprise test of Joliet's Silver Cross Hospital disaster preparedness program and assisted the local officials with a simulated boiler explosion. CN has gone sideband with an HT-37 and a GSB-101. BBR and NSA are sporting new beams and report they are having no trouble working real DX. K9QYW reports that the North Central Phone Net handled 198 messages during November and K9IVG reports also that the No Name Phone Net's formal traffic for the same period was 360. IDA, K9BTE, DO, K9IVG and K9QAE made the BPL Traffic: (Nov.) W9IDA 1216, K9BTE 1131, W9DO 536, K9UGY 201, W9JNV 195, K9IVG 190, QAE 138, UOV 121, W9FAW 85, SXL 44, IAN 33, K9JJD 33, UJT 21, QYW 19, W9MAK 18, K9OEV 18, LXG 11, W9PRN 10, K9QJL 8, BIV 6, ILA 6, OCU 4, OAV 3, RHU 3, W9WPC 2. (Oct.) K9OZAI 83, CIL 32.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ, PAMS: K9-AOM, BKJ, RVM and UKX. RMs: DGA, TT and VAY. Net skeds: IFN 0900 daily and 1830 Mon.-Fri. on 3910 kc.; ISN (s.s.b.) 1930 daily on 3920 kc.; QIN (training) 1800 Mon.-Wed.-Fri. on 3745 kc.; CAEN (160 meters) daily at 1900 on 1850 kc.; QIN 1900 daily and RFN 0700 Sun. on 3656 kc. New appointments: BDG as OBS on 50 Mc. and K9PNP as OBS. The Fort Wayne ARC observed its 40th anniversary with a Banquet Dinner held on Nov. 12. The honored guest was GPI. Guest speaker was HTB. New memorial call, ATG, has been received by the Hancock ARC. CYZ has returned to 147.3 Mc. with a 110V conversion of the Motorola 30D. K9GEL has a new HT-37. The Michiana ARC held its 11th Annual Banquet Dinner Nov. 19 with an attendance of over 100. The Shelbyville High School RC soon will be on 6 meters with a "Sixer" that is being assembled by KFK. Watch the traffic really move now that ZYK has retired and expects to spend most of his time on the nets. A new station on 40 and 80 meters is KN9ZFP, who is a student at Indiana School for the Blind. The rig is a SX-101 and a Viking Challenger. *Amateur radio exists as a hobby because of the service it renders.* November net reports: IFN 403, ISN 264, QIN 313, RFN 74, QIN Training 34 and CAEN not reported. Those making BPL: TT, GJS and DGA. Traffic: (Nov.) W9IT 505, GJS 333, ZYK 330, MM 263, VAY 175, JOZ 170, DGA 153, K9UBK 138, W9SVL 70, SWD 67, K9RMQ 65, W9-EHZ 60, K9OFT 54, W9RVM 53, K9AOM 45, W9QY 40, UOU 3E, CC 31, FWH 28, DOC 19, K9VIC 19, W9-RTH 18, EJW 15, K9GBB 15, IXD 14, MEK 14, KN9-WET 14, K9KRN 13, ILK 12, W9IMU 10, NZZ 10, K9-DU 9, W9YYX 9, K9OLE 8, W9AOJ 7, BDP 7, K9GEL 7, MAN 7, BSU 5, W9BDG 4, K9IHG/9 3. (Oct.) K9LZN 25, TFJ 1.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH. PAMs: NGT and NRP. RMs: VHP and VIK. New appointees: VZK as OBS; K9HMQ as OO Class I. New officers of the Rock River Club of Beaver Dam include K9OGT, pres.; ONT, vice-pres.; K9OPE, secy.-treas. Activity is at a high level with the Badger Amateur Radio Society at the U. of Wis. A bulletin is being issued to the members and their station. YT, is active on the traffic nets. A talk with films by ZB on his trip around the world by seaplane was well received by the Milwaukee Radio Amateur Club. A-1 Operator Club certificates were received by UNJ and YZG. The WIN welcomed K9EEQ as a very reliable upstate outlet. OO K9-GDF received his WPRC certificate. CCO reports that the Whitewater Club is very active and KN9BOH is a new Novice with the club. K9UTN is using a new HRO-50T and a three-element beam. ADM now is with the U. S. Weather Bureau and is stationed at Antarctica for a year. K9RRS has a new push-pull 811 final on 6 meters. Christmas trees made by members of the Sun Prairie Club were sold for the purpose of acquiring equipment for the club. After years of managing the Badger Emergency Phone Net, NRP is enjoying c.w. contacts again. KZZ finished the SS with smoke signals from his rig fire. The La Crosse Club held a banquet to formally accept the club call, PJ, from the grandson of the former holder of the call, Mr. S. Mateske. Traffic reports from stations handling traffic but not reporting monthly, are solicited. Our section is in need of OBSS for both the phone and c.w. portions of the 80-meter band. Traffic: W9DYG 874, CXY 421, K9GDF 187, JQA 126, W9KQB 96, W9MTA/9 55, W9HHX 53, YZG 52, VHP 50, K9DTR 37, W9APB 32, OTL 30, K9QEG 23, W9VIK 28, CBE 27, KKM 26, NRP 25, K9DOL 23, W9YT 23, MWQ 19, K9GSC 18, W9SIZ 18, LFK 17, WJH 17, CCO 13, ONI 6, ZB 6, KN9YTJ 1.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHYA
 —SEC: KØKBV, PAM: KØKJR, RM: KTZ. The North Dakota Weather Net has resumed operations, meeting at 7:30 A.M. CST every week day. The 73-Meter Phone Net reports for November: 19 sessions, total check-ins 401, maximum check-ins 31, minimum 0; 53 pieces of formal traffic, 52 informal and 12 relays. The Larimore State High School Radio Club has a code and theory class on Fri. at 4 P.M. The current class finished at the end of the year but further classes are planned. If interested, contact Dennis Olson, Larimore State High School. A new call is KNØEOP, Park Hoover, Moffit. EC appointments renewed: KØGRM and KØATK. New appointment: KØIVQ as EC for Grand Forks County. Appointment cancelled: KØADI. KØIVQ has received his TEN certificate. Traffic: KØITP 76, IVQ 54, TTY 18, GGI 14, GRM 14, WØDNJ 10, KØKJR 10, VTP 10, MPH 7, WØPHC 6, KØRLF 6, WØAYJ/O 5, BHT 4, AQR 3, KØKBV 3, PVH 3, TPK 3, AJW 1, TVI 1.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRN—
 SEC: SCT. Ninety stations in the Dakotas, Minnesota, Nebraska, Iowa and Oregon handled emergency traffic for isolated towns during the blizzard at the end of November. BSW, Madison, has a new Valiant, and ALU, Sioux Falls, a new Valiant and Drake receiver. New calls in Sioux Falls: KNØEEZ and KNØESC. The Research Radio Club, Inc., of Brookings received the club call WØBXO. The club operates local emergency on 50.490 Mc. and has started publishing a monthly club bulletin with BRC as editor. Most club members are operating on 2 and 6 meters. The club meets the 1st and 3rd Thurs. of each month in the City Hall. The Black Hills ARC's officers are AZW pres.; KØWYC, secy.; and NPV, treas. The BHARC conducts weekly transmitter hunts, if weather permits. ZWL made BPL in November. Traffic: WØZWL 552, SCT 416, BAIQ 180, KØYNR 46, KØWJT 18, KØVIZ 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Rollin O. Hall, ØLST. SEC: TUS. Asst. SEC: KØEWC, PAMs: OPX and KØEPT. RMs: RIQ, PET and KØIZD. Director BUO, accompanied by XYL KMP, spoke at radio clubs in Redwood Falls, No. Dak., and Rapid City, Lead, Deadwood and Custer, So. Dak. The Minneapolis Radio Club's election results are as follows: PRT, pres.; GLU, vice-pres., MXC, secy.; KØYQC, treas.; SSM, HPV and KØUWC, directors. OOs LST and WMA listed a total of 14 violations. KNØs AKI and DZE are new members of the RARC. AGL put up a full-size 20-meter Telrex beam. KØJXB and his XYL have a new jr. operator. High school sophomore KØOTH has designed the E-Z lever. KØPSI has the NC-270 receiver. CQY, THY and KØPML put up a new antenna for the St. Paul Red Cross emergency station. ELA reported on his DX tour to Europe at the MRC. KØRHO has worked 194 countries with a 50-watt rig. KØGQG has a four-element beam on a 60-ft. tower on 10 meters. KØYEF wired an Apache and built a 10-15-meter quad antenna. KØSBB remodeled his shack and covered the operating desk tops with vinyl. MGI states that the Minn. Railfans' Assn. has extended an invitation to all Minn. hams to operate railroad mobile on one of their train excursions next summer. KNØCRP has a DX-40 and an SX-99 on the air. KØRDF wants 6-meter skeds on week ends. KØQEK is in the radar unit in the Air Force stationed at Keesler AFB, Miss. KØWOA, a Minnesota resident for 14 years, is a deputy sheriff in the Grand Marais Area. KØSNG put grid-block keying in his Viking II. KØRDP is all s.s.b., has a new HT-33A and for antennas has a Thunderbird beam, a cubical quad, verticals and a rhombic. KØHUA, HZI and VSP did wiring and building at the REA e.d. station. ISJ purchased a new SX-111 receiver. KNØDQO is KØTXB's XYL. Director BUO and your SCM appeared before the St. Cloud and Litchfield Radio Clubs. Congress to BPL winners KØORK and TUS. A reminder, did you fill, detach and mail the blue card that was in your copy of Dec. QST? Traffic: (Nov.) KØORK 533, WØTUS 501, KJZ 292, KØSNC 146, WØLST 98, KØQBI 97, WØPET 90, KØUKU 79, WØVPO 77, RIQ 53, HEN 52, KLG 49, KYG 47, KØSNG 46, RDP 43, PML 33, WØUMX 33, WMA 30, OPX 29, BUO 25, NYM 16, KØMGT 15, SBB 15, WØALW 13, KNØAKM 12, WØFGP 12, KØIKU 12, JYJ 12, KYK 11, QLM 10, WØTHY 10, KØLWK 9, WØMXC 8, DYC 7, WYT 7, KØVPJ 6, RHN 5, VXW 4, WYV 4, OBP 3, KNØCIB 2, KØMAH 1.

DELTA DIVISION

ARKANSAS—Retiring SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR. PAM: DYL. RM: K5TYW. As your retiring SCM I wanted to write the article this month in order to be able to introduce and congratulate

your new SCM, Dan Patterson, SMN. In my opinion, you have elected one of the best men in the section for this office. I feel that I can say that Dan has the ability and will find the time to fill this office in a very effective manner. His success will depend to a large degree on you and me. He needs letters from ARRL members each month giving news items and traffic reports from us. He needs our opinions on building better traffic nets and a bigger, better and more efficient AREC. He needs a larger League membership in this section. And above all, he needs your appointment certificate once each year on its date for endorsement. Can we not give Dan these things he needs that he might give us his best as our new SCM? Traffic: K5USE 226, W5SZJ 47, K5IPS 30, TYW 22, W5ZZY 4.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO
 —GKT has accepted the job of PAM for the Louisiana section. He is very active on 75 and 40 meters, a.m. and s.s.b. He also is net control on the Delta 75 Net, which meets each Sun. at 7:30 A.M. CST on 3905 kc. Phone Net managers should report activities through GKT for the SCM. Bouncing around the State, your SCM had eyeball QSOs with BSR, BV, ML, CEW, SUM, GKT, DGB, KC, AXD, CIT, HBY and K5CTR. NUH reports that traffic activity on the Dixie Early Bird Net is picking up. The net meets on 7235 kc. at 0630 CST daily. K5USO is net director. K5QXV is active at Ville Platte. New officers of the New Orleans ARC are K5BIB, pres.; QOK, vice-pres.; K5PME, rec. secy.; UOC, cur. secy.; QPS, treas. K5USX is active on MARS and the LCE Net. UQR worked Colorado and Kansas on 50 Mc. and openings were noted on Nov. 14, 17, 27 and 29. He is using an eleven-element Yagi and the final is an 829 running 100 watts. K5AGJ is back to normal again. CEZ acquired an ART-13 for use as a stand-by rig. K5UYL is active on RN5 and LAN. 4LDM/5, with five nets to report into, had a fair traffic count for a sweep. Loyola University ARC, LJE, was active in the Sweepstakes Contest and figured a total of 33,040 points for 250 contracts. One of the members brought along an SE exciter with linear amplifier. The code machine is back in operation and the members are getting their code speed up. The New Iberia Club sent in a note to say that club meetings are held at the Community Center on the 2nd Tue. of the month at 7:30 P.M. Traffic: (Nov.) W5CEZ 401, K5AGJ 136, W5NUH 130, MXQ 112, W4DLM/5 99, W5NUH 61, (Oct.) K5USX 50, UYL 40, QXV 5.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—
 I met in a meeting recently with Delta Division Director 4RRV and the SCMs of Louisiana and Tennessee and the SEC of Arkansas. In the meeting we discussed some of the League's past activity and some of the activities that are to come. One big point of interest is the Delta Division Convention to be held in Chattanooga next April. We are also anticipating a division convention some time in 1962. If you have questions concerning League activity, please contact me. Also I need more reports. K5ZLZ reports from Pulaski that he is on the air with a DX-35 and an HQ-110. K5WSY, from Corinth, is on the air with a Viking Challenger. KN5FNU, from Laurel, is on the air with a converted ARC-5 and an SX-100. K5SQS reports that the Magnolia Net had 756 to check in for November. NHH is on from his new QTH. Club bulletins from the Biloxi and Meridian Clubs have been received. In both cases they are titled QRM. Both are very good publications. Traffic: W5EWE 55, K5SQS 11.

TENNESSEE—SCM, R. W. Ingraham, W4UIO
 SEC: K4OUK. RM: FX. PAMs: UCT and PAH. K4OUK is on 6 meters with 20 watts and a ground-plane; he says K4CNU also is on 6. TZG reports a net on 50.4 Mc. which meets Tue. and Fri. and that there are four 6-meter mobiles in LaFollette. PL reports that his XYL's illness is worse and that he may have to give up his skeds. WBK says that nothing has interfered with the 10-meter hunts in Memphis and reports new officers of the Mid-South V.H.F. Club are K4SHJ, EGX, IHL, FZJ and BSR. YRM has a new Globe Scout and a 6-2 v.f.o. IVP reports consistent 145-Mc. phone contacts with ZBQ and K4KYL and is looking for others in the evenings. UVU is building 420-Mc. TV. New appointments: K4OUK, as SEC; ZJY, as ORS. Reports: Net—UOT, PAH and FX; OFS—K4KYI; O—RSU and RIN; OBS—K4AKP. Traffic: K4AKP 1093, W4PL 691, OGG 582, ZJY 264, FX 79, K4AMC 61, W4PQP 48, W4VJ 46, K4RKG 32, W4IUV 32, K4FNR 28, W4UIO 26, TZG 15, DFR 12, K4OUK 12, W4PAH 10, HPN 9, VNU 9, UVL 7, YRM 6, UVU 2.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—
 Asst. SCM: W. C. Alcock, 4CDA. SEC: BAZ. RM: (Continued on page 88)

BALLROOM, OR JUNGLE?

IN EVEN A NOISY, crowded ballroom, hundreds of different individual and group conversations can be successfully carried on simultaneously. Concentrating upon the desired voice, the ear can reject most if not all of the other conversations. But, if each person had brought along a parakeet, a canary, and a chattering chimpanzee, the ensuing bedlam would make conversation almost impossible. It would sound something like 20 or 75 on a week end, with about the same chances of 100% QSO's!

IT'S THE HETERODYNING whistles and screeches and the monkey chatter that break up most of the phone QSO's. Eliminate them, and we can have ballroom conditions on the band.

HOW TO BANISH THE BIRDIES AND BEASTIES

A 4 KC SEPARATION between carriers (and SSB reference frequencies) would put all resultant heterodynes above the pass band of any modern receiver. No QRM! But, 24 (AM) to 49 (upper and lower SSB) QSO's per 100 Kc wouldn't go very far among all the hams who want to operate at one time!

FIRING UP an additional transmitter on any frequency in between the 4 Kc spots would cause heterodyne or monkey chatter QRM to both those frequencies, and in turn would encounter QRM from them both. However, zeroing in on any spot frequency would cause *no heterodyne or chatter QRM* on that frequency, only clear voice interference. The ballroom, not the jungle!

FOR LESS QRM, USE THESE "BALLROOM" SPOTS

F IRE UP THE RIG as precisely as possible on any authorized phone frequency ending in these exact KC's:	03	23	43	63	83
	07	27	47	67	87
	11	31	51	71	91
	15	35	55	75	95
	19	39	59	79	99

Make a list of these numbers for handy reference →

IF YOU CAN'T find one that seems to be unoccupied at the time, zero into a promising QSO in progress and join the gang. Or, if you want to go it alone, pick the spot with the weakest signals (with your beam pointing in the direction you desire) and send a short CQ. (If all the spots are occupied, you are going to QRM someone, NO MATTER WHAT FREQUENCY YOU USE. You might as well spare them the jungle sound effects, simply by using one of the spots listed above. And, by the law of reciprocity, your voice interference might be the least to those stations you hear the weakest.)

RESIST any temptation to drop into what appears to be an opening in between these spots. The odds will be 2 to 1 against your having a QRM-free QSO. You will bring the jungle to both adjacent spots, and *you will get it back two-fold!*

LET'S TRY OUT THIS GOLDEN RULE ON SUNDAYS:

"QRM others as you would have them QRM you — without the jungle!"

AS AN entirely voluntary test of the practicability of this plan, let's try using it every Sunday, starting now, on all crowded bands. If as few as 20% of the stations in any part of a band use these spot frequencies, there should be a substantial and noticeable decrease in unintelligible QRM to the cooperating stations. Then, as the word is spread, the plan should snowball because stations not on these spot frequencies will find they are getting double QRM, from *both* sides.

THIS APPROACH to a possibly more efficient utilization of our bands has been the subject of study by technically proficient amateurs. A leading proponent, Dana Griffin, W2AOE, has set forth on page 50 of the May, and page 49 of the November, issues of *QST* a full explanation of the fundamentals and the advantages of this plan. He would be interested in your comments.

THE END RESULT might be a greater number of successful and pleasant QSO's for more and more amateurs, and a lot more operating fun.

Experimentation is the basis for progress. Let's try this one, to see how it works.

— BIL HARRISON, W2AVA
(Guest Editor)

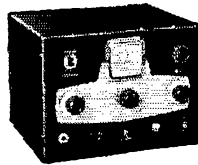
Buel Ballgwin Jr.

W. J. Healy W9AC

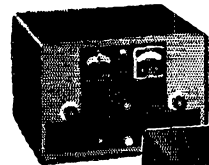
hallicrafters

Pick your
features and
power from
the popular

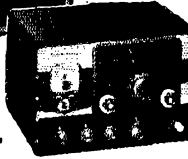
Viking TRANSMITTER LINE



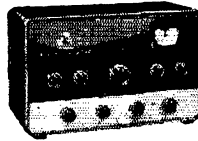
"ADVENTURER"



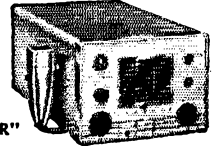
"CHALLENGER"



"NAVIGATOR"



"6N2"



"10-METER
"MESSENGER"

"ADVENTURER" TRANSMITTER

Self-contained . . . 50 watts CW input . . . rugged 807 transmitting tube . . . instant bandswitching 80 through 10 meters. Crystal or external VFO control—wide range pi-network output—timed sequence keying. With tubes, less crystals.

Cat. No. 240-181-1 . . . Kit Amateur Net \$54.95

"CHALLENGER" TRANSMITTER

70 watts phone input 80 through 6; 120 watts CW input 80 through 10 . . . 85 watts CW on 6 meters. Two 6DQ6A final amplifier tubes. Crystal or external VFO control—TVI suppressed—wide range pi-network output. With tubes, less crystals.

Cat. No. 240-182-1 . . . Kit Amateur Net \$114.75

Cat. No. 240-182-2 . . . Wired Amateur Net \$154.75

"NAVIGATOR" TRANSMITTER/EXCITER

40 watts CW input . . . also serves as a flexible VFO Exciter. 6146 final amplifier tube—bandswitching 160 through 10 meters. Built-in VFO or crystal control. With tubes, less crystals.

Cat. No. 240-126-1 . . . Kit Amateur Net \$149.50

Cat. No. 240-126-2 . . . Wired Amateur Net \$199.50

"6N2" TRANSMITTER

Rated 150 watts CW and 100 watts phone—offers instant bandswitching coverage of both 6 and 2 meters. Fully TVI suppressed—may be used with the Viking I, II, "Ranger", "Valiant" or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 mc. output. With tubes, less crystals.

Cat. No. 240-201-1 . . . Kit Amateur Net \$129.50

Cat. No. 240-201-2 . . . Wired Amateur Net \$169.50

10-METER "MESSENGER" TRANSCEIVER

Complete 10-tube (including rectifier) crystal-controlled transceiver. 10 watts input—pre-tuned for 29.4 to 29.7 mcs—covers any 5 frequencies within a 300 kc segment of 10-meter band. Excellent receiver sensitivity and selectivity. ANL, AVC, and positive-acting Squelch. With tubes, push-to-talk microphone, and crystals for national calling and emergency frequency (29,640 kc).

Cat. No. 242-201 . . . 115 V only Amateur Net \$129.75

Cat. No. 242-202 . . . 115 V and 6 V Amateur Net \$139.75

Cat. No. 242-203 . . . 115 V and 12 V Amateur Net \$139.75



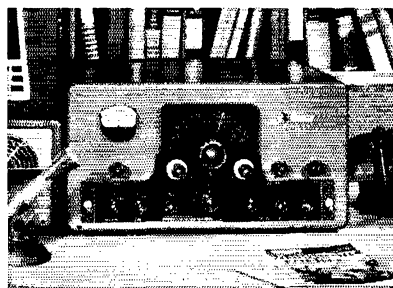
"RANGER" TRANSMITTER/EXCITER

This popular 75 watt CW or 65 watt phone transmitter will also serve as an RF/audio exciter for high power equipment. Completely self-contained—instant bandswitching 160 through 10 meters! Operates by built-in VFO or crystal control. High gain audio—timed sequence keying TVI suppressed. Pi-network antenna load matching from 50 to 500 ohms. With tubes, less crystals.

Cat. No. Amateur Net

240-161-1 . . . Kit \$229.50

240-161-2 . . . Wired and tested . . . \$329.50



"VALIANT" TRANSMITTER

275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) 200 watts phone. Instant bandswitching 160 through 10 meters—built-in VFO or crystal control. Pi-network output matches antenna loads from 50 to 600 ohms. TVI suppressed—timed sequence keying—built-in low pass audio filter—self-contained power supplies. With tubes, less crystals.

Cat. No. Amateur Net

240-104-1 . . . Kit \$349.50

240-104-2 . . . Wired and tested . . . \$439.50



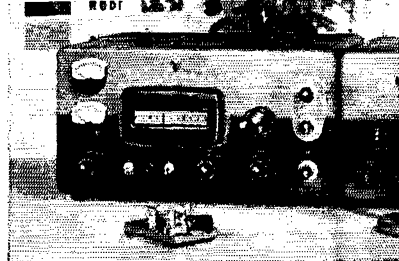
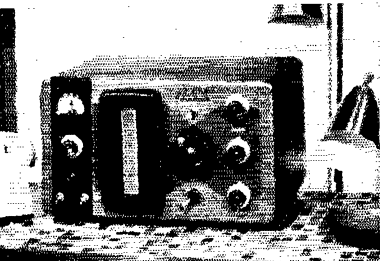
"FIVE HUNDRED" TRANSMITTER

Full 600 watts CW—500 watts phone and SSB. (P.E.P. with auxiliary SSB exciter.) Compact RF unit designed for desk-top operation. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 through 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.

Cat. No. Amateur Net

240-500-1 . . . Kit \$749.50

240-500-2 . . . Wired and tested . . . \$949.50



"COURIER" AMPLIFIER

Rated a solid 500 watts P.E.P. input with auxiliary SSB exciter as a Class B linear amplifier; 500 watts CW or 200 watts AM linear. Self-contained desk-top package—continuous coverage 3.5 to 30 mcs. Drive requirements: 5 to 35 watts depending on mode and frequency desired. TVI suppressed. With tubes and built-in power supply.

Cat. No. **Amateur Net**
240-352-2..Wired and tested...\$289.50

"THUNDERBOLT" AMPLIFIER

The hottest linear amplifier on the market—2000 watts P.E.P. (twice average DC) input SSB; 1000 watts CW; 800 watts AM linear. Continuous coverage 3.5 to 30 mcs.—instant bandswitching. Drive requirements; approx. 10 watts Class A₁ linear, 20 watts Class C continuous wave. With tubes and built-in power supply.

Cat. No. **Amateur Net**
240-353-1..Kit.....\$524.50
240-353-2..Wired and tested...\$589.50

"6N2 THUNDERBOLT" AMPLIFIER

1200 watts (twice average DC) input SSB and DSB, Class A₁; 1000 watts CW, Class C; and 700 watts input AM linear. Continuous band-switched coverage on 6 and 2 meters. TVI suppressed. Drive requirements: approx. 5 watts Class A₁ linear, 6 watts Class C CW. With tubes and built-in power supply.

Cat. No. **Amateur Net**
240-362-1..Kit.....\$524.50
240-362-2..Wired and tested...\$589.50

The world at your fingertips!

VIKING "KILOWATT" AMPLIFIER

The only transmitter that provides maximum legal power in all modes—SSB, CW, and plate modulated AM. Two 4-400A tubes in Class A₂ easily deliver 2000 watts P.E.P. (twice average DC) in SSB mode—1000 watts input AM with two push-pull 810 tubes in Class B modulator service—1000 watts input Class C CW. High efficiency pi-network output circuit. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB. Pedestal contains complete unit. With tubes.

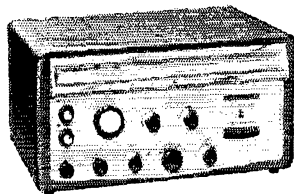
Cat. No. 240-1000..Wired and tested.....Amateur Net \$1595.00

Matching desk-top and three-drawer pedestal.

Cat. No. 251-101-1.....FOB Corry, Pa. \$132.00



The very finest SSB equipment you can buy!



INVADER

The transmitter you've been waiting for—with more exclusive features than any other Transmitter/Exciter on the market today! Instant band-switching 80 through 10 meters—no extra crystals to buy—no retuning necessary. Rated 200 watts CW and SSB input; 90 watts input on AM. Unwanted sideband and carrier suppression is 60 db or better! Wide range pi-network output circuit. Fully TVI suppressed. Self-contained heavy-duty power supply. Wired and tested with tubes and crystals.

Cat. No. **Amateur Net**
240-302-2.....\$619.50

INVADER-2000

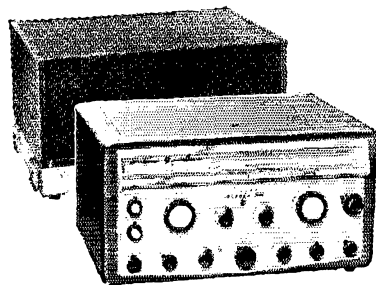
Here are all of the fine features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply. Rated a solid 2000 watts P.E.P. (twice average DC) input on SSB; 1000 watts CW; and 800 watts input AM! Wide range output circuit (40 to 600 ohms adjustable). Final amplifier provides exceptionally uniform "Q". Exclusive "push-pull" cooling system. Heavy-duty multi-section power supply. Wired and tested with power supply, tubes and crystals.

Cat. No. **Amateur Net**
240-304-2.....\$1229.00

HI-POWER CONVERSION

Take the features and performance of your "Invader"... add the power and flexibility of this unique Viking "Hi-Power Conversion" system... and you're "on the air" with the "Invader-2000"—a solid 2000 watts P.E.P. (twice average DC) input SSB, 1000 watts CW and 800 watts input AM. Completely wired and tested—includes everything you need—no soldering necessary—complete the entire conversion in one evening!

Cat. No. 240-303-2..Hi-Power Conversion, complete.....Amateur Net \$619.50



Free Catalog

Write for your free copy of our newest amateur equipment catalog—complete specifications, illustrations and schematics on Viking amateur equipment.



E. F. JOHNSON COMPANY

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Station Activities

(Continued from page 84)

K4CSH, PAMs: SZB and K4OZI, V.H.F. PAM: K4LOA. K4OZI has been appointed PAM and manager of KPN. Doug asks your support in the continued training this net offers in traffic-handling and net controls. K4CC is the new chairman of the Disciples Amateur Radio Fellowship. Missionaries in the Congo have expressed their gratitude for the radio transmitters provided by this group. One missionary explained that amateur radio was a big factor in "our all getting out safely." The Louisville 2- and 6-meter AREC helped with the Annual Shamrock Cross-Country Run held on Bellemine College course Thanksgiving morning. The Louisville 53.6-Mc. F.M. Net is very active with K4CSH monitoring daily. The Louisville hamfest group has incorporated for the next hamfest. A national project engineer on the NC-270 may be available for your club meetings. Contact BAZ. MCC has a new tri-band beam and tower. K4RGL has a new 75-ft. tower. NUQ has a s.s.b. exciter. JUI is teaching a new ham, his 12-year-old son. A new OPS is K4MZW. K4ZBA is planning an s.s.b. rig. QO reports were received from K4ZQR and K4ZRA. K4ZRA, DMU, DLK, and TZP are active at Louisville St. Thomas Seminary. K4NPW, new in Danville, was tutored by CDA. New on the MKPN is K4FHA and TAX. SZB is the new e.d. director for Cumberland County. Traffic: (Nov.) K4PGH 553, W4ZDB 175, K4CSH 142, KWQ 103, MZW 46, W4BAZ 38, SUD 37, CDA 25, K4OLT 21, W4SZB 21, K4QCC 20, W4ADH 14, KJP 14, NUQ 14, K4PXW 14, VDO 13, W4AGN 11, YVJ 9, K4ZBA 9, KIS 6, ZQR 5, DFZ 4, ZRA 3, W4JUI 2, K4MDS 2, W4JVJ 2, WVU 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX, SEC. YAN, RMs: SCW, OCC, QOQ and FWQ, PAMs: AQA, K8CKD, K8JUG and ATB, V.H.F. PAMs: NOH and PT. EC appointment went to CKK and SLV. ORS to AUD. OO Class I to EMD. OBS to K8DQJ. New club officers of the Adrian ARC are KGK, pres.; GWP, vice-pres.; K8EOP, secy.; MQN, treas.; VJT, K8DVV and K8BCT, board of directors. K8NHC made CP-35. FBV has a baby girl. Saginaw Valley has started a training program. SXY gave a good scope talk. CTY is building one. K8GOU built a good frequency standard. JYP retired from AC Spark Plug. Real relaying: K8PNA to K8KIT to State Police, saved one man's life and helped another. WQH now is on QMN. A copy of the Central Michigan ARA bulletin was received by K8BGZ. QO has troubles; he lost part of the big antenna; the 10-meter ground-plane opened up and the 10-meter transceiver burned up. QOQ also says, "6 meters has set public relations back 50 years in Benton Harbor." There was an attendance of 125 at the Annual V.H.F. Conference at WMU, Kazoo, Nov. 19. Good OES reports were received from NOH, PT, K8BGZ, K8NEY and K8PBA. K8GWZ built a pair of 811s in the linear grounded grid and is well pleased. K8PKU is working traffic in the Genesee Co. C.W. Net on 3.7 Mc. at 1430 EST. CQU built a scope monitor. EGI built a 20-meter crystal converter for his SX-11. PT has a 32V-3. K8JED asks for OPS appointment. THZ likes his new 20-A. K8KCO has a new HT-37 and a Thunderbolt. EMD is on 6-meter mobile only now and reports that Kazoo Co. has 12 portables on 2 and 25 mobiles on 6 meters with more coming. ELW is working on a portable transceiver for both 6 and 2 meters, a.m. or f.m. ZZ is NCS for Totem Pole A.M. Net, on 1820 kc. each Thurs. at 2100 EST. No information has been received from the Michigan Six-Meter Club yet. Traffic: (Nov.) W8OCC 232, FWQ 138, K8EMQ 120, W8NOH 90, K8GWZ 85, LZP 78, W8JXK 71, K8EXE 66, W8FDO 60, RTN 57, K8NAW 53, W8FX 47, K8NEY 45, W8QOQ 38, IJY 34, WQH 33, K8GJD 32, DJQ 31, MEG 29, PKU 26, OTJ 25, W8CQU 24, HKT 24, EU 23, K8NHC 21, W8ELW 19, ILP 17, AUD 16, EGI 12, PT 12, OQN 10, SCW 10, YAN 8, DSE 5, K8JED 5, KIT 4, W8TBP 4, THZ 3, K8BGZ 2, KCO 2, W8ZHB 1. (Oct.) W8QOQ 54, K8JED 12, W8IUC 8, K8NHC 3.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE, SEC: HNP, RMs: DAE and VTP, PAM: HZJ. Columbus ARA's *Caracose* tells us the club received a trophy from the Ohio Council of Amateur Radio Clubs for being the highest scoring club in Ohio in the 1959 Sweepstakes. TO/3, the club station, received a plaque for being second highest scorer and top W8 in CO's 1959 V.H.F. Tests. The club's v.h.f. section elected K8JSF, chairman. THV, vice-chairman. K8SSK, secy.; and K8INO, treas. IJV spoke to this group on amateur RTTY. K8WLP is a new Technician. The Lancaster and Fairfield County ARC's *The Rag Chever* states the club held open house in the club room, served cider, donuts and coffee, showed a movie entitled "And

a Voice Shall be Heard" and exhibited the club station along with about ten members' completed stations. The Tusco RC's *New Bulletin* informs us that GAC and MEI are active on 10 meters, EUK and STR have gone s.s.b. K8PXV has a new Globe Chief. KN8WLY has a new Novice in Sugar Creek. DBF has a new DX-40. The Knucklehead Net is active again and the club elected K8RFU, pres.; K8RUU, vice president; BIAI, secy.; GAC, treas.; K8RSN, act. mgr.; and MEI, SBM and STR, directors. New Knucklehead members are APB, UDR, NAL, OYL and K8HTM. Toledo's *Ham Shack* *Gossip* named QP as its Ham of the Month. ARS joined Silent Keys. K8KDT is in the hospital. The St. Lawrence Seaway Net held a banquet and dance. KN8WEP is a new Novice with a Globe Chief. The stork brought K8SEX a baby boy. NBD won the hidden transmitter hunt with K8DRW placing second. Those who made BPL in November were DAE and UPH. Appointments made in November were HBL as EC, K8ERZ as OJ and K8SUJ as OES. K8s RDG and WFM are new amateurs in the Akron Area. The Seneca RC held a family dinner. Canton ARC's *Feedline* tells us that K8MZY received net. YLCO, OYV his YL Alamo and YAB his WAE certificates. K8QHT was home on Naval leave from boot camp. K8ERZ was in the hospital with a broken shoulder. ZWX was home for Thanksgiving; he also holds K3NPV in D.C. QVK joined Silent Keys. K8UJD has his General Class license. The Evendale ARC's 1961 officers are K8BRU, pres.; K8ANN, vice-pres.; Ted Rape, secy.; K8BDM, treas. and VTC trustee. Its club station has the Collins S/Line, a Hy-Gain tri-band beam and conducts a code and theory class. Cuyahoga County AREC furnished communications during Cleveland's Annual Christmas Parade with AEU, BHR, LHX, QPH, XQG, TAI, TFR, K8s BWH, GJW, HVH, JHZ, JSE, KOL, MBW, MME and UFA participating. IBX is singing in the Capital University chapel choir. The Mayhams RC of Cleveland's 1961 officers are K8OCK, pres.; K8UXH, vice-pres.; K8OFI, secy.; K8OBU, treas.; and K8EXL, trustee. Ohio Bell gave a demonstration on TV transmission to the Seneca RC. My plea for news from Dayton, Cincinnati and Cleveland in Dec. QST brought letters from two amateurs in two of these cities stating they have taken action to have their bulletins sent to me. Another thing that will help is to have your appointees include news from your sections of the State, when you send in your reports. Traffic: (Nov.) W8UPH 737, DAE 571, BZX 196, K8ONQ 133, MTI 22, OTO 22, MYG 18, W8AL 16, K8HYT 16, W8WYS 9, K8HTM 4, W8HJZ 4, IBX 2, BEW 2, EEQ 2, TTM 2. (Oct.) K8MTI 24, W8LZE 8.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC, RM: W2PHX, PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; ESS on 3590 kc. at 1800; ENY (emerg.) on 29,490 (Thurs.) and 145.35 Mc. (Fri.) at 2100; MHT (Novice) on 3716 kc. Sat. at 1300. Appointments: W2DLD as EC and W2AKUS as OJ. K2UTV is attending Knox College in Ill. and K2VTW is at Syracuse University. W2SZ, the R.P.I. Club, reports classes in code and theory for Novice and General. Congrats. IUED was speaker at the October New Rochelle Club meeting. The club's November meeting was an auction. W2AJZE and W2OCA are new General Class stations. W2AFCR is a new Technician. K2SJM, W2ZJA and W2AFCR are New Rochelle class instructors. According to W2RHT, secy., the Putnam ARA completed its 2-meter converter project with eight on the air and more under construction. They meet in Carmel, N. Y. W2KGC reports 22 elements on 2 meters 60 feet high. The mast is a vertical on 75 meters and one of the guys, a 10-meter dipole—three in one. Sixty members attended the AREC meeting in Dutchess County. The club has weekly nets on 10 and 6 meters with nightly bulletins on both bands. K2JQB, K2SJM, K2RRZ and W2DST were on the committee of the Hudson Division Convention. K2YNB attended the Syracuse V.H.F. Roundup. W2ZJA has a DX-40 on the air; W2ZJH has a DX-20. W2ADUL is running the New Rochelle RACES nets. While home for the Thanksgiving vacation, K2UTV made BPL. Is your appointment due for endorsement? If so, send it in. Traffic: K2UTV 760, K2MBU 147, W2THE 127, W2PHX 82, W2EFU 58, W2AUC 33, K2RYE 28, K2OZT 27, K2CKG 26, K2HNW 8, W2AKUS 3, K2YZI 3.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO, RM:

(Continued on page 88)

Heathkit® Amateur Gear — tops in quality and economy



**HERE'S A NEW HEATHKIT GROUNDED GRID KW LINEAR AT A
RECORD-SMASHING LOW PRICE . . . JUST \$229⁹⁵**

The new Heathkit "Warrior" is a completely self-contained, desk-top kilowatt linear, loaded with special features, at half the cost of comparable units! Compare feature for feature, quality component for quality component, you'll find no shortcuts . . . only the finest watt-per-dollar value in a linear amplifier on the amateur market today!

Maximum power input: SSB—1000 watts P.E.P., CW—1000 watts, AM—400 watts (500 watts using carrier controlled modulation), RTTY—650 watts. **Driving power required:** 50 to 75 watts—depending on frequency. **Output circuit:** Variable pi-network (50 to 75 ohms). **Input circuit:** Broad banded—requires no tuning. **Input impedance:** Approx. 70 ohms. **Band coverage:** 80, 40, 20, 15, 10 meters. **Panel metering:** Switch-selected, grid current, plate current, high voltage and relative power output for ease of loading. **Tube complement:** 4-811A, 2-866A. **Size:** 19½" W x 11¼" H x 16" D.



This inside view shows the neat circuit layout and husky components that emphasize quality. Note the internal shielding of plate circuit for maximum protection against TVI.

CHECK THESE FEATURES . . .

Completely self-contained . . . HV, Fil. and Bias supplies built in.
Versatile . . . May be driven by any 50 to 125 watt transmitter or exciter—no matching or swamping network required.
Efficient . . . Stable grounded grid circuitry allows most driving power to appear in output for up to 70% efficiency.
Oil-filled capacitor . . . And 5-50 henry swinging-choke provide the excellent dynamic regulation required for high peak power output with low distortion.
Inexpensive tubes . . . 4 paralleled 811A's and 2-866A's, forced-air cooled by silent built-in fan.
Design . . . Special low-capacity filament transformer—requires less driving power—eliminates broad band filament RF choke.
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Neutralized . . . For the last word in stability in conjunction with grounded-grid operation.
Rugged construction . . . 16 gauge steel chassis—¼" aluminum front panel—welded one-piece cabinet.
Easily assembled . . . Average time 8 hours.
Model HA-10 . . . 100 lbs. . . \$23 dn., \$20 mo. \$229.95

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HEATH COMPANY Benton Harbor, Michigan



Model DX-60 **\$82⁹⁵**

- Built-in low pass filter
- Neutralized 6146 final amplifier
- Grid block keying
- Handsome low profile styling

more features, better performance in this new Heathkit transmitter

PHONE AND CW TRANSMITTER KIT (DX-60)

Smart modern styling . . . clean, rugged construction . . . and conservatively rated components all add up to ease of assembly, trouble-free operation and fine performance in the new DX-60 Transmitter. Offering far more than any other unit in its price and power class the DX-60 features a built-in *low pass filter* for harmonic suppression, *neutralized final* for high stability, *grid block keying* for excellent keying characteristics and easy access to crystal sockets on the rear chassis apron. A front panel switch selects any of four crystal positions or external VFO. Modulator and power supply are *built in*. *Single knob bandswitching* for 80 through 10 meters and the *pi-network output* provide complete operating convenience. A tune-operate switch provides protection during tuneup and a *separate drive control* allows adjustment of drive level without detuning driver. *Panel meter* shows final grid or plate current. A fine kit for the beginner as well as general class amateur, the DX-60 may be run at reduced power for novice operation. Operates CW or AM phone with crystal or VFO control. Power input is *90 watts peak*, carrier controlled phone or CW. Construction of the DX-60 is a breeze, with its clean circuit layout, precut and cabled *wiring harness* and the complete, informative instructions furnished. The handsomely-styled finished unit measures only 13 $\frac{3}{4}$ " W x 11 $\frac{1}{2}$ " D x 6 $\frac{1}{2}$ " H. 29 lbs.

Model DX-60 . . . \$8.30 dn., \$8 mo. **\$82.95**

you get twice as much for your budget



Model HW-20 **\$199⁹⁵**

- Tracked VFO & Exciter Stages for single knob tuning
- 10-watt RF output to antenna—6360 final
- Built-in low pass filter
- Built-in 3-way power supply for 117 VAC, 6 VDC, 12 VDC
- Push-to-talk ceramic element microphone

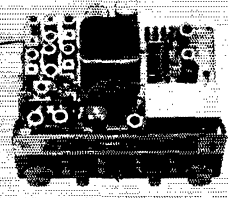
new transceivers for 6 & 2 meter nomads

VHF TRANSCIVER KITS (HW-10 & HW-20)

"Mobile" or "Fixed", the new "Shawnee" 6-meter or "Pawnee" 2-meter transceivers bring you unprecedented performance, for each is a complete AM & CW Transmitter/Receiver combination with features unmatched at this price . . . just connect an antenna and you are in business! Transmitters feature a *built-in VFO* with all frequency determining components mounted on a "heat sink" plate for temperature stability and *four* switch-selected crystal positions for novice, CAP, MARS or net operation. VFO and all exciter stages are tracked for convenient *single knob tuning* over any 500 kc band segment (greater excursions require simple re-peaking of final). A VFO "spotting" switch is provided to "zero in" signals with transmitter off-the-air. The 6360 dual-tetrode final RF amplifier provides 10 watts of power *output* to the antenna and a built-in *low pass filter* is incorporated to suppress harmonics and other spurious radiation. The *dual-purpose modulator* provides a full 10 watts of audio for high level plate modulation of the final RF amplifier or 15 watts of audio for paging or public address use, selectable with push-pull switch. Superheterodyne receivers feature double conversion with first oscillator crystal-controlled. All oscillators are voltage regulated for stability. A large slide-rule dial and vernier tuning provide more than ample bandspread for both receiver and VFO. RF gain, BFO, ANL, Squelch, AVC on/off and transmitter controls are front panel mounted. *Tuning meter* is automatically switched to read signal strength or relative power output. Units come complete with built-in speaker, heavy duty AC & DC power cables, primary fused relay, adjustable mounting bracket and push-to-talk ceramic element microphone with coil cord & mounting clip. 6" H x 12" W x 10" D. 34 lbs. each.

Model HW-20 (2 meters) . . . \$20 dn., \$17 mo. **\$199.95**
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Model HW-10 (6 meters) Coming Soon.



Model
HW-29A
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Model HWM-29-1 1 lb. \$4.95

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- Operate from low-frequency crystals for greater stability
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2, 6 & 10 METER TRANSCEIVER KITS (HW-30, 29A, 19)

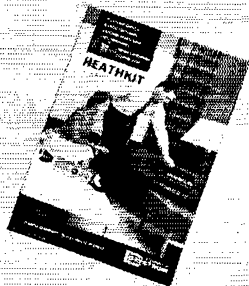
These three outstanding transceiver models bring you top performance at the lowest prices offered in complete amateur facilities. Each model has a crystal controlled transmitter and tunable, superregenerative receiver with RF preamplifier. Receivers pull in signals as low as 1 *uv* and the 5 *watt* transmitters are ideal for emergency work or "local" net operation. Features include push-to-talk transmit/receive switch, metering jack, ceramic element microphone, and two power cables. Less crystal. 10 lbs. each.

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- Model HW-30 (2 meter)... \$4.50 dn., \$5 mo..... **\$44.95**

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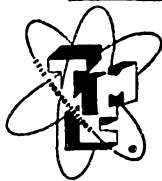
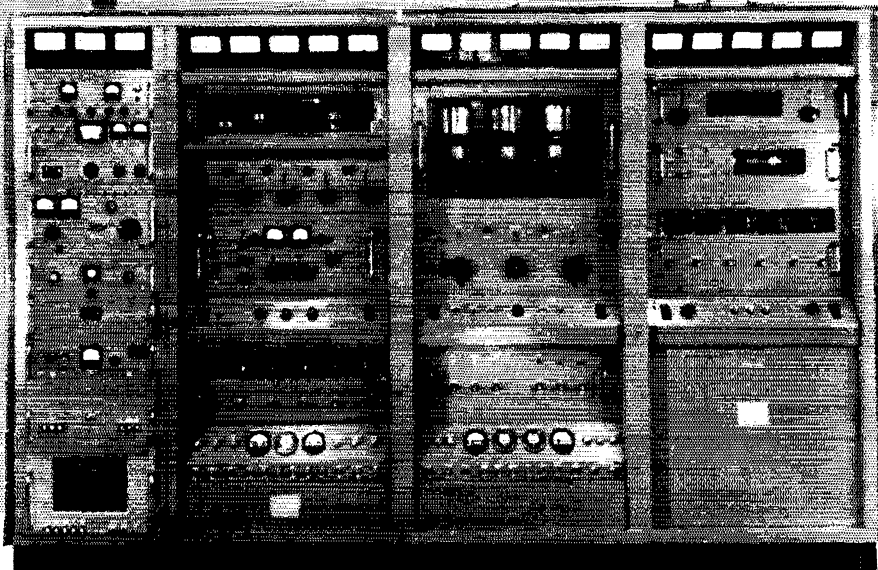
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New STANDARDS OF COMPARISON IN

ONE PART IN 10^8 PER DAY

40,000 WATTS PEP
4 to 28 mc.

GPT-40KE (AN/FRT-40A)

TECHNICAL SPECIFICATIONS

OUTPUT POWER: 40,000 watts PEP, 35 db signal/distortion ratio.*
20,000 watts PEP, 40 db signal/distortion ratio.*
20,000 watts CW or FS.

OUTPUT IMPEDANCE: Nominally 72 ohms unbalanced, (Pi-L network); 600 ohms balanced.

HARMONIC SUPPRESSION: VSWR: 2 to 1 maximum.
Second harmonic at least 50 db from PEP output. Third harmonic at least 65 db from PEP output.

CARRIER INSERTION: At least 55 db down from PEP level.

AUDIO INPUT: Two independent 600 ohm channels, balanced or unbalanced, -20 db level for full RF output.

AUDIO RESPONSE: (Each Sideband)
1. Flat within 3 db, 350 to 7500 cps using CBE-1.
2. Flat within 3 db, 350 to 3300 cps using CBE-2.

PRIMARY POWER REQUIREMENTS: 190/230 volts AC, 50-60 cycles, 3 phase. Approximately 70 Kw. Power factor 0.98.

SIZE: 10½ feet wide x 43½" deep x 84" high.

WEIGHT: Approximately 7000 pounds.

*Relative to one tone of c two tone test

**MULTIMODE OPERATION —
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WITH A STABILITY OF 1
PART IN 10^6 PER DAY AND
AN EMERGENCY STAND-
ARD OF 1 PART IN 10^6 .**

FOR FURTHER INFORMATION WRITE FOR
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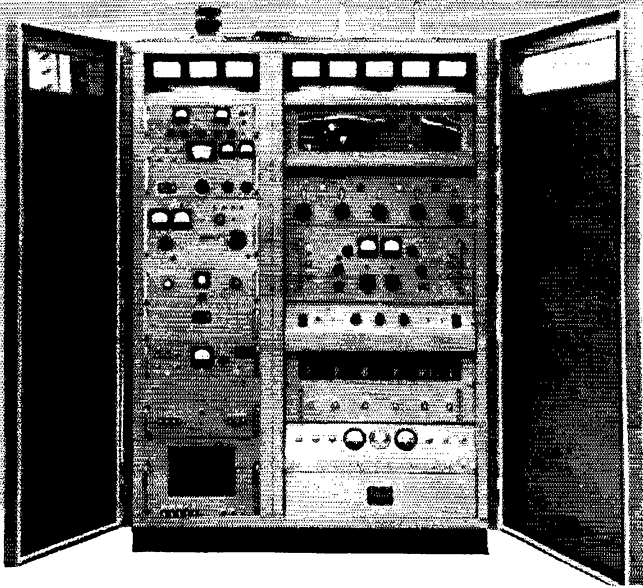
*See you at the SSB Dinner on March 21st!
Statler Hilton, New York City*

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COOLING — SEMI-PRESSURIZED
CABINETS — COMPLETELY SELF-
CONTAINED — LINEAR AMPLI-
FIER STAGES — LARGE SIZE IL-
LUMINATED METERS.

10,000 WATTS PEP
2 to 28 mc.

GPT-10KR (AN/FRT-39B)

TECHNICAL SPECIFICATIONS

OUTPUT POWER: 10,000 watts PEP, 35 db signal/
distortion ratio.*
5,000 watts PEP, 40 db signal/
distortion ratio.*
5,000 watts CW or FS.

OUTPUT IMPEDANCE: Nominally 72 ohms unbalanced,
(Pi-L network): 600 ohms bal-
anced.

HARMONIC SUPPRESSION: VSWR: 2 to 1 maximum.
Second harmonic at least 50 db
from PEP output. Third harmonic
at least 65 db from PEP output.

CARRIER INSERTION: At least 55 db down from PEP
level.

AUDIO INPUT: Two independent 600 ohm chan-
nels, balanced or unbalanced,
—20 db level for full RF output.

AUDIO RESPONSE: (Each Sideband)
1. Flat within 3 db, 350 to 7500
cps using CBE-1.
2. Flat within 3 db, 350 to 3300
cps using CBE-2.

**PRIMARY POWER
REQUIREMENTS:** 190/250 volts AC, 50-60 cycles,
3 phase. Approximately 15 Kw.
Power factor 0.98.

SIZE: 56" wide x 43½" deep x 84"
high.

WEIGHT: Approximately 2800 pounds.

*Relative to one tone of a two tone test.

The TECHNICAL MATERIEL CORPORATION

IN CANADA: TMC (Canada) Ltd., OTTAWA, ONTARIO

MAMARONECK, NEW YORK

AN APPEAL TO INTELLIGENCE

A product that is consistently advertised in *QST* month after month, year after year, has to be good. Over 10,000 GOTHAM antennas have been purchased by *QST* readers. Even the "price-is-no-object" customers choose GOTHAM antennas on the basis of performance and value. Select your needs from this list of 50 antennas:

Airmail Order Today—We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6-10 TWO BANDER.....	<input type="checkbox"/>	\$29.95
10-15 TWO BANDER.....	<input type="checkbox"/>	34.95
10-20 TWO BANDER.....	<input type="checkbox"/>	36.95
15-20 TWO BANDER.....	<input type="checkbox"/>	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is broad banded. It does not have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

<input type="checkbox"/> 6-10-15	\$39.95	<input type="checkbox"/> 10-15-20	\$49.95
----------------------------------	---------	-----------------------------------	---------

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

<input type="checkbox"/> Deluxe 6-Element	9.95	<input type="checkbox"/> 12-El	16.95
---	------	--------------------------------	-------

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

<input type="checkbox"/> Std. 3-El Gamma match	12.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 3-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Std. 4-El Gamma match	16.95	<input type="checkbox"/> T match	19.95
<input type="checkbox"/> Deluxe 4-El Gamma match	25.95	<input type="checkbox"/> T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

<input type="checkbox"/> Std. 2-El Gamma match	11.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 2-El Gamma match	18.95	<input type="checkbox"/> T match	21.95
<input type="checkbox"/> Std. 3-El Gamma match	16.95	<input type="checkbox"/> T match	18.95
<input type="checkbox"/> Deluxe 3-El Gamma match	22.95	<input type="checkbox"/> T match	25.95
<input type="checkbox"/> Std. 4-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 4-El Gamma match	27.95	<input type="checkbox"/> T match	30.95

CITIZENS BAND ANTENNAS • Any of our ten meter beams or the V40 vertical is perfect for the CB operator.

FREE CATALOG 1961

Name.....
Address.....
City.....Zone.....State.....

New! Ruggedized 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

- Beam #R6 (6 Meters, 4-El) . . . \$38.95
- Beam #R10 (10 Meters, 4-El) . . 40.95
- Beam #R15 (15 Meters, 3-El) . . 49.95



15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

- | | | | |
|--|-------|----------------------------------|-------|
| <input type="checkbox"/> Std. 2-El Gamma match | 19.95 | <input type="checkbox"/> T match | 22.95 |
| <input type="checkbox"/> Deluxe 2-El Gamma match | 29.95 | <input type="checkbox"/> T match | 32.95 |
| <input type="checkbox"/> Std. 3-El Gamma match | 26.95 | <input type="checkbox"/> T match | 29.95 |
| <input type="checkbox"/> Deluxe 3-El Gamma match | 36.95 | <input type="checkbox"/> T match | 39.95 |

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

- | | | | |
|--|-------|----------------------------------|-------|
| <input type="checkbox"/> Std. 2-El Gamma match | 21.95 | <input type="checkbox"/> T match | 24.95 |
| <input type="checkbox"/> Deluxe 2-El Gamma match | 31.95 | <input type="checkbox"/> T match | 34.95 |
| <input type="checkbox"/> Std. 3-El Gamma match | 34.95 | <input type="checkbox"/> T match | 37.95 |
| <input type="checkbox"/> Deluxe 3-El Gamma match | 46.95 | <input type="checkbox"/> T match | 49.95 |

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

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-TI2TG)

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 wind-storms.
- 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



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WORK
WONDERS WITH
A
GOTHAM
VERTICAL
ANTENNA!

FILL IN AND SEND TODAY!

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST
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.....

**VHF
NOW
AVAILABLE!**

MOBILETTE 61



MOBILETTE 61, International's new improved all transistor, crystal controlled converter provides a "quick and easy" way to convert your car radio for short wave reception. MOBILETTE 61 units cover a specific band of frequencies providing a ONE MEGACYCLE tuning range. Mobilette units are miniature size and quickly interchangeable.

Check these all New features . . . New and improved circuit for increased gain . . . New internal jumper for positive and negative grounds . . . New RF amplifier, mixer/oscillator . . . New separate input for broadcast and short wave antennas . . . Mounting bracket for under dash installation.

MOBILETTE 61 is available in a wide choice of frequencies covering the Amateur bands 75 through 6 meters, Citizens band, Civil Air Patrol low band frequencies, WWV time and frequency standards. Any frequency in the range 2 MC to 50 MC available on special order.*

CIVIL AIR PATROL

AMATEURS

CITIZEN LICENCEES

... with improved circuit for mobile short wave reception

Write for International's complete catalog of precision radio crystals, and quality electronic equipment—yours for the asking.



18 NORTH LEE • OKLAHOMA CITY, OKLA.

Designed for 12 vdc, MOBILETTE 61 will operate on 6 vdc at reduced output. Power connector plugs into cigarette lighter socket.

Mobilette 61 units cover these short wave frequencies.

Catalog No.	Frequency
630 - 110	6 meters (Amateur) 50 - 51 MC
630 - 111	10 meters (Amateur) 28.5 - 29.5 MC
630 - 112	11 meters (Citizens) 26.9 - 27.3 MC
630 - 113	15 meters (Amateur) 21 - 21.6 MC
630 - 114	20 meters (Amateur) 14 - 14.4 MC 15 MC (WWV)
630 - 115	40 meters (Amateur) 7 - 7.4 MC
630 - 116	75 meters (Amateur) 3.8 - 4.0 MC
630 - 117	10 MC (WWV)
630 - 118	CAP (Low Band)
630 - 119	Special Frequencies 2 MC - 50 MC

MOBILETTE 61 VHF	
VHF frequencies for Aircraft, 108-135 mc; Amateur and Civil Air Patrol, 144-148 mc; Two-Way Communications, 150-170 mc. Special VHF transistors in both RF amplifier and mixer circuits.	
Complete	\$49.50
Cat. No.	
630 - 120	VHF Special 100 to 170 mc
630 - 121	VHF Special 54 to 100 mc

See the Mobilette 61 at your dealer today!

Complete, ready to plug in and operate only \$22.95

**Special frequencies 2 MC -50 MC.....only \$25.95*

Station Activities

(Continued from page 88)

W2GXC, PAM; W2UGF, V.H.F. PAM; W2EW. Section nets, N.L., 3630 kc. nightly at 1930 EST (regular session) and 1815 EST (early session) and Sat. and Sun. at 1915 EST; NYC-LPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST, NYC-LI A.R.C., 3908 kc. Sun. at 1730 EST, V.H.F. Traffic Net, 145.8 Mc. Tue.-Wed.-Thurs. at 2000 EST. BPL cards were earned by K2UAT, K2UYW, K2RBW and W2EIV, the latter on originations plus deliveries. BPL medallions have been earned by K2RBW, K2UAT and K2UBG. Congratulations, fellows, on your fine work. K2CMJ, K2DNY, K2RBW and W2OKU earned net certificates for their attendance on the V.H.F. Traffic Net. W2DHF is on the phone traffic nets with a BC-457 and an 820-R. Steve has been elected president of the Amityville HSRC. The boys at Columbia University, W2AEE, are slowly returning to traffic work. As NCS on the "Swappers Net," on 146.7 Mc. from 2000-2400 on Wed., they invite participation. A Hamker and an RME-4350A are in operation at K21BJ. K2QJQ is using the winter months to prepare his 220- and 432-Mc. gear for summer. WA2OND passed the General class exam. W2RDD added an HT-37 and has now raised his DXCC total to 240. WA2NWX is now mobile on 10 meters with a home brew 20-watt. K2MYW received his WAC certificate. WA2KWZ passed the General Class exam. A beam-raising party at WA2OPT resulted in a miniature hamfest with W2PKJ, K2YSK, WA2DRK, WA2DTY, WA2EXP, WA2FDB, WA2FDY and WA2GBS in attendance. Bea needs only three more states to complete WAS. K2TAQ is now using an RME VHF-128 converter and is building a 100-watt rig for 6 and 2 meters. The Long Island Mobile Association, an organization dedicated to improved mobile operation and enjoyment of this enjoyable phase of our hobby, is in the formative stages. Contact K2JLE or WA2DDH for further information. The Brooklyn Poly RC, W2BXK, lays claim to a new amateur record by establishing successful c.w. communications on 52 Kmc. New officers of the Five Towns RC are K2OGJ, pres.; K2KXJ, vice-pres.; WA2MAIN, secy.; and K2CTK, treas. K4PMN/2 operated from Fire Island during his stay with the Coast Guard. W2DQN moved to West Islip. New officers of the Bayside ARC are K2JUV, pres.; K2JWD, vice-pres.; WA2GXK, secy.; K2OWT, treas.; and WA2EGK, NCS. W2SWQ is sporting the S/Line with a Gonset linear. The Pi-Net RC, a newly formed group, has elected the following officers: K2JQT, chairman; K2SPG, secy.; K2PEV, treas.; and K2UYC, act. mgr. W2EW now has an HQ-150 and is tuning bands other than 2 meters, and 145.8 Mc. in particular. Despite scanning other bands, Hank still earned his eighth BPL on the V.H.F. Traffic Net. W2SEU has now contacted four states on 220 Mc., including Rhode Island. The *Massapequa Amateur* is the weekly bulletin of the Massapequa H. S. Radio Club, 10 licensed amateurs (25 members). Your SCM would appreciate the opportunity to visit your club or group to discuss section activities. Please write to arrange a suitable date for our get-together. Traffic: (Nov.) K2UAT 906, K2UYW 585, K2RBW 549, W2EW 816, WA2FBC 310, K2UTP 271, WA2CZG 228, WA2GPT 189, K2THY 67, W2OKU 65, W2GKZ 63, W2GXC 50, K2DNY 49, K2CMJ 48, W2WKWZ 33, WA2DHF 25, K4PMN/2 22, K2BH 20, W2OBU 20, K2RHG 17, W2EC 9, W2PF 8, K2YQK 8, W2AEE 7, W2SEU 2, K2QBW 1, W2TUK 1. (Oct.) K2SJP 14, K4PMN/2 3. (Sept.) K2UBG 419, W2DUS 32, W2JBG 16, K4PMN/2 13.

NORTHERN NEW JERSEY—SCM, J. Sparks Remeczky, K2MFF—SEC, W2APY, RM: K2VNL, PAM; K2SLG, V.H.F. PAM; K2KRV. Section nets: NJN, daily at 0100 GMT on 3695 kc.; NJFN, daily at 0000 GMT on 3900 kc.; NJ 6 & 2, Mon., Wed. and Sat. at 0400 GMT on 51.15 Mc. and Tue. and Sat. at 0300 GMT on 147.75 Mc. New appointees are WA2EJZ, WA2EQO and WA2JHQ as ORSS; WA2ASM, K2ULB and K2VZJ as OOs. The new officers of the Tri-County RA are W2JIB, pres.; W2AOE, vice-pres.; W2OPE, secy.; W2FCC, treas. The 3rd Annual Dinner and Hamfest sponsored by the East Coast V.H.F. Society will be held Feb. 25. Contact K2BNQ before Feb. 12 for tickets. Your SCM is looking forward to meeting you there. The new officers of the Plainfield HSRC are K2RHC, pres.; WA2ASM, vice-pres.; WA2BSW, secy.; Bill McCally, treas. K2UFM was appointed municipal radio officer for Cliffside Park. K2UKQ received the first HTH certificate. W2GKE, K2LSU and K2OQA report that they and color movies of their recent FP8BM Dx-pedition are available to any club interested. Contact W2GKE. Some new Generals in the section are WA2AINK, WA2KRC and WA2OXT. WA2GQZ was elected president of the Garden State ARA. W2VMQ earned a KZ5-25 certificate. NJ 6 & 2 reports 21 sessions

were held, with an attendance of 203 and traffic of 45. WA2CCF received his WAS, WAC and a BPL card this month. WA2BNF also earned a BPL card. K2QMS gave his XYL, K2UXW, an SX-101 and now she forgets to get chow ready. WA2ASM received his WAC certificate. W2BVE reports that the Rutgers Univ. ARC has 40 members but still no club station. K2VVL added a Heath GC-1A to his station. W2TKZ and WA2IDM are only QSLs away from DXCC. K2UCY reports that K2KJI and K2RVH (YL) are a nice cozy two-some all by themselves on 432 Mc. NJN reports 30 sessions were held, with an attendance of 630 and traffic of 424. The Raritan Bay RA held a highly successful auction. WA2AGI is faced with the familiar problem, study or flunk! Stevens Tech. RC has a new Trihandler and a new twenty-element 2-meter beam. K2AGJ is giving code practice on 2 meters during the day. W2ANG is instructing prospective Novices in Newark. Traffic: (Nov.) K2UCY 322, WA2GQZ 307, WA2APY 224, WA2COO 224, WA2EJZ 181, K2VNL 178, WA2CCF 169, WA2BNF 106, K2ETS 101, K2VVL 86, W2QNL 85, W2RXL 78, WA2MNK 77, K2MFF 55, W2EBG 54, WA2JHQ 48, W2DRV 45, WA2RKH 42, W2BVE 41, K2PVH 39, K2MFX 34, WA2DE 31, WA2EQO 28, K2QGD 27, WA2GQI 23, W2BSC 22, WA2CNY 22, WA2EDG 21, K2AGJ 17, K2SLG 17, K2OBJ 14, K2BWW 10, WA2AKM 9, W2CFB 7, W2CVV 3, K2RHN 3, W2TKZ 2, W2VW 2, W2EWZ 1, K2RJ 1. (Oct.) W2BSC 27, WA2EQO 14.

MIDWEST DIVISION

IOWA—SCM, Russell B. Maronis, W0BDR—Asst. SCM; Walter G. Porter, 0UJC, SEC; K0EXN, PAM; K0MFX, RM; PZO. The 75-Meter Phone Net reports 26 sessions with 1195 QNS and 161 messages handled. The TLCN reports 26 sessions with 261 QNS and 506 messages. The 160-Meter Net reports 31 sessions with 630 QNS and 42 messages. New appointments: SFK, VQX, K0CRC and VBM as ECs; MKD as OO. Renewals: EEG, NWX and K0EAA as ECs. The Story County A.R.C. is going to form a club. The Council Bluffs Club used 12 mobile units and 27 operators and a net control station to assist the local police in patrolling the city on Halloween to help keep vandalism down. Base station was located at the home of SEE. NTB has a new Mosley Tri-Band beam. K0AUU is operating from a newly-decorated shack. LCS has a new antenna system after the wind blew down his old one. BTX is vacationing in the South. K6SXA is operating portable at Grinnell. K0RTF reports that the Decorah A.R.C. ran a test with mobiles on 6 meters. PTL operated an amateur radio booth at a church convention in Louisville, Ky. K0MPO left for military service. K0AGJ no longer will transmit. Official Bulletins on 3700 kc. Traffic: W0BDR 1922, LGG 1641, SCA 1105, PZO 743, LXC 378, DUA 314, K5KDA/0 163, K0AGJ 132, K5KA/0 99, K0HBD 88, YLN 30, KAQ 18, W0QVA 17, LWF 16, K0RTL 16, W0WVF 16, BTX 14, K0AUU 13, MFX 13, SEW 12, W0YDW 12, PTL 11, UHO 7, K0WBK 7, WUR 6, BRE 5, W0QG 5, K0EJN 4, W0EEG 3, K0VSV 3, RTF 2, VDY 2.

KANSAS—SCM, Raymond E. Baker, W0FNS—SEC; VZM, Asst. SEC; LOW, RM, OGG, PAM; ONF, V.H.F. PAM; HAJ. Section nets: KPN, 3920 kc. Mon., Wed., Fri. at 0645, Sun. at 0800, NCSs K0QKS, EFL, IZM and AMJ, QKS, 3610 kc. daily at 1830, NCSs SAF, TOL and K0BFX, Area Net HBN, 7280 kc. Mon. through Fri. at 1200. K0HGI Mar. New appointments: K0UNE as EC Zone 12, K0OUS EC Zone 22 Laurence, FHT as EC Zone 17. The JCAR Club Mission, elected LPA, pres.; MNR, vice-pres.; WYK, secy.; GUP, treas.; K0MTO, activities; W0DEL, technical; K0LMZ, publicity. The KB Club, Manhattan, elected TOL, pres.; CVB, vice-pres.; K0RKC, programs; K0RKR, secy. AMJ is leaving Salina for his final out-State service and will be stationed in Alaska. Hope all of you will watch for him and we wish to thank him for his hard work on the Kansas Phone Net. The WREN Net Wichita, is doing well with K0SMQ handling. The WARC, Wichita, with the assistance of K0JWS and EMF, gave a very able demonstration of RTTY at the November meeting. K0GIA and GIC are now settled in a new ham shack. K0TNP gave a demonstration of amateur radio to 17 Camp Fire Girls, made a contact with W0WBH and each girl talked to "Lory." Traffic: K0HGI 350, W0SAF 218, FNS 138, ABJ 92, OGG 74, K0HVG 64, BKF 51, W0AMJ 45, K0SMQ 21, W0ONF 20, TOL 20, K0QKS 16, W0BBO 13, ORB 12, K0TNP 10, GHY 8, GIG 7, EFL 6, W0IFR 5, K0JID 5, W0-

(Continued on page 100)



WHEN WINTER COMES... G-76

When there's a chill in the air... when thoughts of sunny summer's mobile operations are crowded out by less pleasant, but highly pertinent considerations of anti-freeze—and windshield wipers that haven't yet been fixed. This is exactly the time to consider the addition of a new Gonset G-76 100 watt, 6 band transceiver to your worldly goods! A most pleasant traveling companion when your activities trend toward mobile, G-76 is also right at home... when winter comes.

There's real pleasure in store for you in home operation of equipment with the versatility of G-76. Just connect this powerful little gem to your available antennas—

load up—operate! Have you tried 75 lately? Or 40? It may also come as a pleasant surprise to find that your G-76 will give the same lively performance on 6 meters as on the other five widely used 10, 15, 20, 40 and 80 meter bands. Like to keep your hand in with a little CW? G-76 has good clean keying characteristics, a stable BFO in its receiver.

Handsome too. Functional, industrial-designer styling, blending, subdued-tone finishes. These are some of the many features that make G-76 as welcome in your fine living room as it is in your new car.

G-76.....Model #3338.....**376.25**
less power supplies

117V AC power supply in combination with speaker in matching cabinet.....Model #3349.....**145.00**
Compact 12V DC transistorized power supply for mobile operation. (Negative ground only)....Model #3350.....**145.00**

Dual conversion receiver • BFO for SSB and CW reception • Automatic Noise Limiter • Excellent sensitivity: 1 uv for 6 db S+ N/N ratio • Excellent selectivity: 3 to 3.5 kc bandwidth at 6 db down; 14 kc or less at 60 db down • Transmitter and receiver oscillators temperature controlled, have VR tubes... have low drift even with wide variation in both plate and filament voltages • Transmitter has highly stable VFO for all bands except 50 mc*... crystal control may also be used • Transmitter power input 100 watts AM phone; 120 watts CW • 6DQ5 Final Amplifier operates into pi-network matching system • Push-to-talk control, or by T-R switch on panel • Tuning meter on panel • Compact... only 12 $\frac{3}{4}$ "W, 5 $\frac{1}{8}$ "H, 11 $\frac{1}{2}$ "D.
* crystal control

GONSET

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A T R I B A N D B E E M A T 6 0 F T - N O G U Y S

DESIGN

STRENGTH

DEPENDABILITY

**THREE REASONS WHY
YOUR BEST BUY IS...**

**E-Z WAY
Satellite "60"**

E-Z WAY AERO-DYNAMIC design decreases wind load and provides telescoping action that permits raising and lowering of tower sections. **CRANK UP TO 60 FEET, DOWN TO 25 FEET and TILTS OVER FOR ACCESS TO ROTOR OR BEAM.**

STRENGTH is built-in to every E-Z Way Tower...Heavy wall steel tubing legs, continuous diagonal bracing of solid steel rod and electrically welded throughout...no loose bolts or nuts here. E-Z Way design and strength are your assurance of **DEPENDABILITY** that you can count on year after year. See your nearest distributor today or write for free literature.

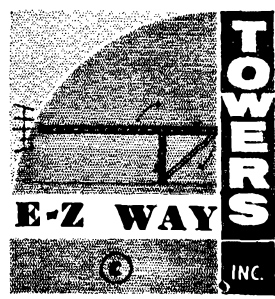
The SATELLITE

Model RBX-60-3P (Painted) \$335.00
Model RBX-60-3G (Galvanized) \$410.00

MOUNTING KITS:

GPK X60-3 (Ground Post) \$125.00
BAK X (Wall Bracket) \$17.00

Freight Prepaid anywhere in (48) U.S.A.



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100

VZM 5, WFD 5, KSY 4, KØLHF 4, WØFDJ 3, FHU 3, LOW 2, KØUER 2, QØB 1, WUD 1. (Oct.) KØBNF 122, LHF 21, TNW 21, HVD 20.

MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØLTP, RMs: OUD and KØONK. PAMs: HVL and OVV. Net reports: MEN (3885 kc., 2400 GMT Mon.-Wed.-Fri.) 13 sessions; QNI 412; QTC 223; NCSSs, OVV 6, KØONK 6, KØRPH 1, MSN (3715 kc. 2215 GMT Mon.-Fri.) 22 sessions; QNI 154; QTC 106; NCSS, KØONK 8, KØVAY 6, KØVPH 5, KØBNF 2, KØBHM 1, MON (3580 kc. 0100 GMT Mon.-Fri.) 26 sessions; QNI 180; QTC 136; NCSSs: OUD 13, EEE and KIK 3, KØLGZ and KØQCQ 3, RTW 1, SMN (3580 kc. 2200 GMT Sun.) 4 sessions; QNI 14; QTC 4. Please note that all net meeting times are now given in GMT. Welcome to the section is extended to KØICB (ex-K5JSN), now located at Carl Junction, and to K5OGE, now at Carthage. Announcement is made of a "ham wedding" in which the principals as well as many guests were members of the fraternity; namely that of KØYWK and KØSBJ. In attendance were KØTEG, KØRAX, KØONG, and KØJPG. OVV is the newly-appointed PAM-Mgr. MEN. All members are requested to give him their fullest cooperation. KIK reports that YHO, an old-timer, has resumed activity on 7. 14 and 50 Mc. with excellent results. PUS has been appointed chairman of a TVI group in the section. KØQCQ reports only 8 hours activity on the SS, enough to win the Mid-Mo. ARC certificate. KØIHY reports ideal conditions for operation on 50 and 144 Mc. with "no QRM"—reason, rigs on both, but no receivers. GBJ has been unable to operate consistently because of very high line noise at his QTH. NAQ had a "post-hole" digging party with KØEJB, KØZFS, PCY and BER doing the digging. Correction: KØAKK, not KØLGZ, is publisher of the *MOV-Kep*. Traffic: (Nov.) KØONK 1240, LTJ 400, MNR 139, WØMKJ 128, KØQCQ 117, KBD 103, WØANT 95, KIK 79, OUD 78, BVL 76, ZLN 73, OMM 63, KØVAY 61, VPH 61, WØVY 50, PXE 46, KØICB 45, WBD 45, WØBUL 38, RTW 30, WAP 23, KØWNZ 22, LGZ 22, PCK 10, WØGBJ 9, AYB 8, KØMAU 7, RPH 6, OJC 2.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTUS, The West Nebraska Emergency Net, KØRRL as NC, reports QNI 533, QTC 365. The West-ern Nebraska Net, NIK as NC, reports QNI 512, QTC 412, 100 per cent check-in KØALE, DVB, PZH and KØTUH. RIH is a new member. The Morning Nebraska Phone net, KØDGW as NC, reports QNI 701, QTC 175. The Nebraska Section C.W. Net, NYU as NC, reports 27 sessions, QNI 219, QTC 97. The Nebraska Emergency Phone Net, ZOU as NC, reports QNI 422, QTC 51. For the purpose of discussing Nebraska section activities and problems in traffic, emergencies, etc., I would suggest that all Nebraska League Officials, AREC members and all stations interested in the promotion of activity in the Nebraska section meet on the 1st and 15th of each month on 3960 kc. at 1930 CST. The meetings will be conducted similar to the ARRL LO Parties and for the same purpose. Mark your schedule calendar for the 1st and 15th and call in Traffic: (Nov.) WØNIK 442, KØTCH 414, KIJY/O 345, WØZJF 149, KØRRL 146, DGW 145, IJW 141, KJP 90, WØNYU 76, GGP 75, DDT 62, KØMZV 60, WØPZH 56, KØKTZ 53, WØRDN 45, KØWEP 39, WØOKO 32, KØQFK 32, WØBQO 30, KØDFO 29, WØLFJ 17, QNE 17, KØMSS 16, WØVEA 14, KØELU 13, RQE 10, WØVZJ 10, KØYDS 9, WØPDJ 8, HOP 7, YFR 6, GEQ 5, HTA 4, KDW 2.

NEW ENGLAND DIVISION

CONNECTICUT—Acting SCM, Henry B. Sprague jr., WICHR—SEC: EOR, RAI, KYQ, H.F. PAM; YBH, V.H.F. PAM; FHP. Traffic nets: CPN, Mon.-Sat. at 1800, Sun. at 1000 on 3600 kc.; CN, daily at 1845 and 2200 on 3640 kc.; CVN, Mon., Wed. and Fri. at 2030 on 145.98 Mc.; CTN, Sun. at 0900 on 3640 kc. BDI nailed 70 sections with 360 contacts in the SS. NWE is working 50-Mc.c.w. Congrats to EFV on his reelection as New England Division Director. KILAH and AW made the BPL again on originations plus deliveries. K11VR built a 2-meter ground-plane. PRT and the Bloomfield AREC ran a float during the town Halloween Parade. KILQD is installing time sequence keying in ROX's DX-100. He is using a DX-20 in the meantime. ADW, K1HKH and CSB helped TYQ take his beams down. The CARA had a going away party for Vic and gave him a pen and pencil set. KQY is organizing an RTTY traffic net. The Southington ARA is taking on *Nutmeg News* with GVT, GVZ and EFW handling details. FHP reports the CVN held 13 sessions with 57 stations and handled 19 messages. AXV went on a three-week hunting trip and operated 40-meter portable, u.m. and o.w.,

(Continued on page 103)

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- ★ SSB, DSB, CW, FM, FSK for RTTY plus 40 cps identification keyed shift.
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- ★ AND POWER THAT COUNTS—OUTPUT POWER OF 100 Watts P.E.P.; 100 watts CW; 25 watts AM; 100 watts FM; 100 watts FSK.

See it at your dealer, or—write for complete technical details...

It doesn't take long to *hear* the superiority of the HX-500 SSB Transmitter as any owner will tell you. He'll tell you about the true TALK-POWER first—resulting from the restricted speech range... then he'll get into the details about operational features such as separate dial scales for each band, the fact that all crystals are included at no extra cost, and all about the built-in antenna changeover relay. Most of all, he'll brag about the solid contacts he's made with his HX-500. In fact, if you don't change the subject, you'll never get away from him.

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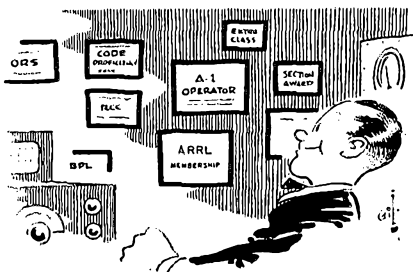


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A HAM'S HISTORY



IOE HAM put away the box of thumb-tacks, leaned back in his chair and gazed at his latest "wall-paper". A brand-new Extra Class license certificate hung next to the A-1 Operator sheepskin that had arrived only the week before. Many others adorned the wall — their brightly colored faces telling the whole of this ham's history.

FIRST on the wall was his ARRL Associate Member certificate, later flanked by several marked "Full Member". Then came the ten-word code proficiency award now festooned with silver stickers; RCC; Novice Roundup Section Award; Section Net certificate and then ORS; and finally BPL and the Public Service Award, both earned during the Hurricane, when Joe handled 534 messages in less than a week.

IOE HAM has come from the ranks of the newcomers to the status of a crack operator in a few short years. All along, he has helped organized amateur radio — and it has helped him — through full participation in League activities. How about you?

QST and ARRL Membership
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from a cabin site, WJF now is at Rocky Neck and got on the air the day after moving in. DCM revamped his receiver. The Norwich section of the TCARC equipped a blind Novice with receiver and transmitter including controls. OPZ has a second WASYL and now is after WACYL, needing only Asia. The CN handled 523 messages including 93 on the second session for an average per session of 17.4 and attendance of 12.3. High QNI were BBC, RFJ and K5OEA/L. In spite of bad conditions no sessions were missed. OBR is getting equipped for 2-meter work. QV's lecture to the TCARC on antenna couplers created much interest and many questions. Ex-K1MLJ now is W5DPI of Borger, Tex. K1JHX likes DX and hopes to have DXCC soon. K1GGG's turkey business is keeping him busy. YBH advises that the CPN held 30 sessions, handled 283 messages (average of 9 per session) with an average daily attendance of 25. High QNI were YBH, K1BSB, FHP, DAV, VQH, K1AQE and LWV. CPN now liaisons with 1RN phone. The CARA elected K1GDW, pres.; LCG vice-pres.; DDJ, treas.; and K1BKH, secy. Reports received: OO from NWE, K1GUD, K1KSH, K1IVR, and K1HTV; OES from FVV. Appointments renewed: VV as OO; VW and ADW as ORS; PRT and ADW as EC; FHP as V.H.F. PAM, Traffic; (Nov.) W1OBR 442, AW 365, KYQ 318, K5OEA/1 282, W1EFW 242, YBH 155, K1LAH 151, W1ULZ 132, FHP 95, K1GGG 93, W1BDI 89, NJM 62, CHR 45, K1AQE 37, LQD 26, W1BNB 19, K1BSB 15, W1HJG 14, IZA 8, CUH 4, K1IVR 4, W1CWF 2, (Oct.) WINWE 2.

MAINE—SCM, Jeffrey I. Weinstein, W1JMN—I recently conducted a survey which was employed to assist me in analyzing the cause of the current trend in Maine toward the abandonment of club-type organizations as useful, active, operating bodies. By compiling the information provided me by correspondents within the State with that obtained from miscellaneous external sources and ARRL, and from my own personal itinerant to clubs throughout the New England Area, I have found that a complex of reasons exist which might or might not affect the success of a group program: Does a well organized code and theory committee subsist in your club? Are newcomers warmly received and encouraged to join? Are post cards mailed or telephone calls made to members announcing each important (or business) meeting? Do you have a regularly published club bulletin? Is a club rig on the air? Are you affiliated with ARRL? If the answers to any or all of the preceding questions is no, chances are that your club has opportunity for improvement. If all members seriously make an effort to solve their club's problems, it is my anticipation that clubs will again function as active integral units of the State of Maine section. Traffic: K1KSG 150, M1N 116, M1ZB 79, W1GRG 48, K1MBM 47, W1FV 32, J1N 12, OTQ 12, K1DYG 7, GVQ 4, KN1OJH 2, W1EFR 1.

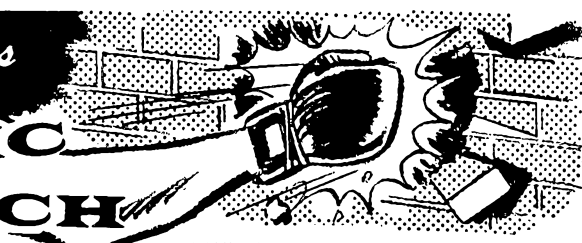
EASTERN MASSACHUSETTS—SCM, Frank J. Baker, jr., W1ALP—SEC: AOG, K1MEM is a new OBS and ORS, K1JUR is busy at college. NF is working DX. YHY, our Fall River EC, says he hopes to have more equipment for c.d. work. BGW is chasing DX on 20 meters. K1BBI has a new HQ-170 and a Seneca transmitter. New officers of KBN, Div. B Radio Club, are K1NCS, pres.; FJJ, vice-pres.; K1MHC, treas.; K1GXE, secy. K1MEM has a homebrew electronic keyer. K1LJK has a mobile transceiver on 10 meters and worked YU5HUV on 40-meter c.w. The NEST Net had 29 sessions, 276 stations, 563 traffic, reports K1G, NR net manager. Our E. Mass. 2-Meter Net had 21 sessions, 294 stations, 391 traffic, reports ZSS. K1ABD has an NC-300 and a DX-100 on all bands. K1s KND, JKV and CKK are on 75 meters. The Framingham Club held a "Fixit Night" by ZTJ. The Cape Cod and Islands ARA held its annual meeting. KBN is working on a rig for 220 Mc. K1BJZ has her General Class license. The Wellesley ARS held a meeting. Winthrop's Annual Netfest was held at BB's QTH. SPL gave a talk on "Signal Corps." K1OJQ, Quincy, is on 2 meters. K1BYV operates some at KBN. The Lincoln-Sudbury Reg. High School, K1NUB, elected K1KTH, pres.; K1PMS, vice-pres.; K1N1PUR, secy.; K1N1PJU, treas. The Framingham Radio Club held its Christmas Party at K1HTK's QTH. Another fine copy of the Yankee Radio Club Ham News was received. Congrats to EAF on being elected as Vice-Director of the ARRL New England Division. ALP wants to thank everyone for the cards, visits and phone calls during his stay in the hospital and while recuperating at home. It makes one feel that this is a great hobby and a swell group of people. The King Philip ARS Net meets Tue. at 2000 on 147.2 Mc. K1MVN is working on a rig for 2 meters. K1JML has a new converter for 10 meters designed by his brother, K1JYU. NKA is building a rig for 2 meters. K1ALI says he hears 4KDH coming in on 6 meters.

(Continued on page 104)

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UNWANTED SIDEBAND SUPPRESSION 50 DB.

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HARMONICS down in excess of 50 DB.

Third order DISTORTION PRODUCTS down in excess of 40 DB.

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GET THE MOST OUT OF YOUR HAM STATION

SHORTWAVE PROPAGATION by Stanley Leinwoll (Radio Frequency & Propagation Mgr.—Radio Free Europe). Of special interest to those concerned with radiocommunications. This review in QST (May 1960) sums up the book's vital interest to all amateurs:

"... written at just the right level for the amateur interested in ionospheric propagation..... There is... background material—necessary for an understanding of the subject—on the ionosphere, on radio waves, on sunspots and the sunspot cycle, all treated in language that is easy to follow. The section on ionosphere measurements introduces the ideas that are important to the detailed understanding of ionospheric propagation, leading to the use of ionospheric charts and predictions for the determination of maximum usable frequencies and optimum working frequencies. The calculation procedure for distances shorter than the maximum one-hop, generally neglected in amateur literature, is also included.

Of special interest to QST readers are chapters on amateur contributions to knowledge of wave propagation and a forecast—advanced with admitted caution!—of probable amateur-band conditions during the coming sunspot cycle. Throughout the book the reader is introduced to various interesting aspects of propagation: one-way skip, for example, scatter, meteors, auroral effects—all the things that hams continually encounter in everyday operation. It would be hard to find a question about propagation in the 3-30 Mc. region—at least the type of question that an amateur would ask—that isn't covered somewhere in this book, even if only (of necessity) by the statement that the answer hasn't yet been discovered." #281, \$3.90.

RIDER GLOBAL TIME CONVERSION SIMPLIFIER by Lt. Col. John G. Daiger (Ret'd). What time is it in Oslo? In New Delhi? In San Francisco? In Rio de Janeiro? No matter where you are located you can tell at a glance what time it is anywhere in the world with the greatest of ease. It lists small towns and large cities around the world; large cities and small towns in the United States. It is color-keyed to tell you immediately the correct day. Corrects for areas that have Daylight Savings Time. Has conversion tables for those who use 24-hour calculated system. Ideal for communications personnel, airlines, banks, and travellers. Colorful chart and map and makes it usable to anyone. #238, \$1.

HOW TO USE GRID-DIP OSCILLATORS by Rufus P. Turner K6AI. The first book ever devoted entirely to grid-dip oscillators tells you how to construct and use this very versatile instrument with best possible results. It is applicable to all kinds of radio receivers and transmitters, also to television receivers. The grid-dip oscillator is a troubleshooting device—an adjusting device—a frequency measuring device—applicable to circuits and components in circuits—to antennas; also a signal source of variable frequency. #245, \$2.50.

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6th EDITION

on Sun. a.m. and has a new power supply for the 1-kw. rig on 6 and 2 meters on the way. NKA says So. Americans are coming through on 6 meters. The Concord c.d. group helped out with Sled Dog Races in Carlisle. CTW has a 32-element collinear for 220 Mc. and is on 6 meters from IQD in New Hampshire. K1s LLX and GNR made the BPL JSS is a new OO. HIL is very busy getting on the air. EGZ is EC for Brewster. Appointments endorsed: K1LJK as OO and OBS. CTW and KBN as OESS. JNV and WK as OBS. ALP as OBS. MX has kw. rigs on 40, 20 and 15 meters, a.m. and c.w., 150 on 80-meter c.w., 75 watts on 6 and 10 meters and sends high-speed code practice Mon. at 2030 on 7000 kc., 35 to 55 w.p.m., reports 4ADU/1. WAJ has been endorsed as OO. JQA is now a Silent Key. Traffic: (Nov.) K1LLX 736. GNR 616, W1PEX 495, HGN 343, EMG 279, ZSS 241, K1BBH 214, W1EAE 159, OFK 154, KBN 140, K1MEM 102, W1VVS 60, K1MHM 55, BGK 52, DTJ 50, DIO 49, W1EJJ 46, K1NPL 27, W1RQL 25, SIV 24, K1GVR 22, CMS 17, GTX 16, W1TWG 15, K1LCO 12, W4ADU/1 12, K1AII 10, JKR 9, LJK 9, W1MX 7, AUQ 5, K1BYV 4, OJQ 4. (Oct.) K1GYM 9, MHC 2, MVN 2.

WESTERN MASSACHUSETTS—SCM. Percy C. Noble, W1BVR—SEC: BYH/K1APR, RM: K1JIV, PAM: DXS, Net Manager of Slow Speed Net; K1LBB. All schedules and frequencies of various West. Mass. nets are the same as reported previously. JYH's oldest boy, Dave, is now K1QIFC. K1GCV has a new Gonset G-76 transceiver. ZPB has installed a low-pass filter and has dipoles for 15 and 20 meters. K1LRB now has WAC and 85 countries worked. JYH's total is now 294 confirmed on c.w. and 206 on phone. K1PZR and K1N1WA are doing a good job on W1NN. The Slow Speed Net, on 3560 kc. Tue. and Thurs. at 6:30 p.m. under K1LBB, has the following active stations: K1JJU, K1IQZ, K1CPG, K1MEB and K1LRB, plus a few occasionally from out of the State. The regular West. Mass. c.w. Net handled 134 messages during November. The Mass. Phone Net handled 194 messages in 26 sessions, averaging 42 minutes per session. K1KBS has a portable generator and beam atop Mt. Wachusett this winter. K1QFM has a new v.f.o. and modulator. VBS is getting a 6-meter converter for his Mohawk receiver. K1DVI is building a 100-watt 6-meter job. BNO is on 10-meter s.s.b. K1K had a get-together with former buddies who were Signal Corps operators in the late 30's. G1KK, New England Division QST, Manager, told of his activities at a meeting of the Pittsfield Radio Club. From *Random Scatter* (Berkshire County Amateur Radio Assn.): "The ARRL nets sure would be something if all the boys who show up for SS contests went in for net c.w." Amen, and hallelujah! HFI spent three weeks in Florida. DGT has now worked all zones. G1KK has worked 305 countries with 302 confirmed! With regret we report the passing of VFA in Pittsfield. Traffic: K1JIV 145, W1BVR 139, K1LBB 128, W1YK 118, DXS 111, ZPB 28, K1MEB 20, IQZ 19, LRB 6, W1DVV 5, K1PZR 5.

NEW HAMPSHIRE—SCM. Ellis F. Miller, W1IQ—SEC: K1IQK, RM: K1CIF, PAM: KVG, GSPN meets Mon. through Fri. at 1900 and Sun. at 0930 on 3842 kc. NHN (c.w.) meets Mon. through Sat. at 1830 on 3685 kc. CNEN meets Mon. through Sat. at 0645 on 3842 kc. Endorsements: K1BCS as ORS; JB, AJJ and KVG as OPS. RM K1CIF made BPL and is trying to build up NHN. Results already look good. K1APQ made DXCC phone. Congratulations, fellows. The finishing touches are now being put on the Contoocook Valley RC club house. It will make a fine memorial to K1BKE. K1IEH is now on the air with a 5100B. RMH has completed a 2-meter 4X25B amplifier and hopes to be using it on s.s.b. H1Q is planning 2-meter activity and soon will be looking for contacts. Glad to see K1BCS back with us. The AREC is getting some real support from the Manchester gang on 6 meters. YMJ has a new QTH in Rye and a new s.s.b. rig to go with it. Nice going, Frank. Traffic: K1CIF 886, W1CUE 114, K1ITS 100, W1TA 77, K1HK 28, W1IQK 28, ZUS 18, PFU 13, KVG 12, EVN 9, K1BCS 8, NBN 8, CFX 6, MID 4, FEH 3.

RHODE ISLAND—SCM. John E. Johnson, K1AAV—SEC: PAZ, RM: SMU, PAM: TXL. The PAM has requested assistance for the IRN on 80 meters. If you are interested in handling traffic, contact the PAM or the SCM. Net report for RISP/N: 30 sessions, 271 QNT, 147 traffic and time 1720 min. Endorsement: TGD as EC for Barrington. Reports received: OBS—TXL, SMU and WED; OES—K1JNJ, K1PNI and K1LSA. The Providence Public Library now has a 12" LP code course available because of the fine work of WED. K1JYO now has a new four-element beam for 6 meters. TXL now has a new RME-6900 receiver and reports he can hear all the difficult signals with no trouble. The NCRG will hold a QSO party on Feb. 26 from Sat. midnight to Sun. midnight. The Roger Williams V.H.F. Society and the

(Continued on page 108)

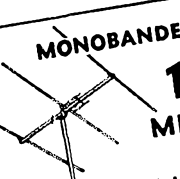
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10 M

MONOBANDER FOR 10 METERS

Model 103B



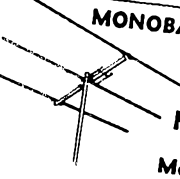
Weighing only 18 lbs., this Antenna is small enough to be rotated by any TV rotator. Elements are adjustable for maximum gain over the entire 10 meter band. Easy to assemble with no further adjustments. Boom is 104" in length; longest element, 17' 10".

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15 M

MONOBANDER FOR 15 METERS

Model 153B



Small enough to be rotated with the heavy duty TV rotators, this ruggedly built antenna is adjustable over the entire 15 meter band. Simple Rugged Boom/Mast clamp also used to support the elements. Wt: 30 lbs. Boom length 142"; longest element, 23' 10".

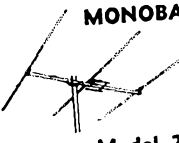
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Hy-Gain Beta Match system factory pretuned for SWR 1.5:1 or less, but adjustable for site variations. 52 ohm coax fed, allows tuning for maximum Forward Gain and F/B. Grounded for lightning protection.

20 M

MONOBANDER FOR 20 METERS

Model 203B



This heavy duty, full-sized twenty meter array is built to take it. The elements are adjustable over the entire 20 meter band, and they are telescoped three times to minimize element sag. Approximate net weight is 45 lbs. Boom length is 212"; longest element measures 35' 9".

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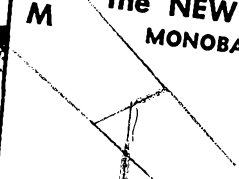
W 20

Any combination of these famous Hy-Gain Monobanders may be stacked in the conventional manner. Instructions available on request.

40 M

the NEW "hy-seven" MONOBANDER FOR 40 METERS


NO COILS!



This 2-element beam develops excellent forward gain and front-to-back ratio in a reduced size without the use of lossy loading coils. Reduction in element length accomplished by the new concept of linear loading. Factory pre-tuned for quick assembly. Tops in mechanical construction. One year guarantee.

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Herman Middleton, W7TPG, welcomes all amateurs to Fabulous Phoenix for the Southwest Division, A R R L Convention to be held at the Westward Ho Hotel, May 26-29.

A Word from Ward . . .



WE DO HEREBY RESOLVE . . .

When I was a boy no New Year celebration was complete unless it wound up with the posting of a list of "resolutions" which, do or die, we young bloods would try to uphold during the coming year.

We didn't always succeed. But even when we failed, those "resolutions" served a healthy purpose in that they often helped firm up a course that "zagged" when it should have "zigged"!

As with individuals—so with companies. If our trusty little firm were to draw up a few resolutions to observe in 1961—here's how they might look:

We, at Adirondack Radio, resolve to remember that the vast majority of people who do business with us are friends, first; hams, second; and buyers, third—in that order.

At Adirondack, there is no such thing as a "concluded transaction." After the sale is made—that's when the service begins.

We will never forget that a letter in our mailbox is just as important as a customer at our counter; each will get immediate attention.

We will not "gimmick up" our sales methods in the year ahead—any more than we did in the year that passed.

In this business, hams buy equipment from us—and we buy from hams. We hope to act toward our ham friends—when they're buying—as we'd like them to act toward us—when we're buying!

Here's wishing you the best for '61!

Ward J. Hinkle W2FEU

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Ward J. Hinkle, Owner

R.I. Mobilers held a Bean Supper which your SCM attended. There was lots of fine food and good entertainment and KIPNI headed the committee. PNI also provided a little entertainment after the affair by accidentally locking himself out of his car. The boys came to his rescue with a screwdriver and bailed him out. New officers of DDD: KILZW, pres.; KIJLD, vice-pres.; KIKEE, secy.; KILIN, corr. secy.; KIDYK, treas.; KIORM, act. mgr.; AUT. ZEZ and KIEJH, board of governors. Traffic: (Nov.) WISMU 506, WFZ 138, TXL 126, KIGRC 102, DZX 87, BBK 74, WIBS 47, KIPNI 44, WIJFF 18, KIJYO 9, GÖX 8, AAV 7, WIWED 6, (Oct.) KIGOX 5.

VERMONT—SCM, Miss Harriet Proctor. WIEIB—SEC: KIDQB. PAM: HRG. RM: KRV. ETE has rigs installed in his new ham shack. IYD and K1AEY have a portable AC unit at Wolcott Camp with 2- and 10-meter beams. K1NLW is working 20 and 80 meters from his Chester QTH. KIGGX, of Burlington, is moving to a new QTH in the New Haven, Conn., Area. Art Peterson is a new Hennington call heard on 40, 20, 10 and 6 meters. EXZ has his 49th country via 10 meters. It's Mozambique. The Central Vt. Radio Club has voted to have a 2-meter transceiver project. The Middlebury Mike & Key Club has set up a contest to see which members can get the most states confirmed from contacts made from Jan. 1-Mar. 31. KRV is Route Manager and wants to know how many Vermonters dare to check into the c.w. net on 3520 kc. at 1830. Traffic: (Nov.) W1HRG 25, EIB 19, KJG 9, (Oct.) VE2AZI/W1 1988.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—A few requests have been received for an Idaho QSO Party during the '63 Centennial. Support of the entire State is needed. Pledge your loyalty to your SCM now! The District 2 C.D. Net got underway this month meeting Fri. on 3910 kc. at 1930 with GDA as net control. The Pocatello Amateur Radio Club gained recognition in QST on the ARRL Affiliated Club Honor Roll. New officers of the Lewiston-Clarkston Club are RWV, prexy.; PSL, Veep; and K7ASE, secy.-treas. Moving to new homes for Christmas are K7CLK, Jerome; K7HIDW, McCall, CDA and XYL, K7GCE, Pocatello. NGA has a new son. TYG is recuperating from a serious eye infection. KN7MUT and K7BAS are operating 7 from Utah. GGV was awarded WAS-YL certificate No. 47. K7ETK is adding "come see me in '63 . . . Idaho Centennial" to QSLs. K7CXG is putting up the Hornet Beam he won at the W1MU Hamfest. FARM Net traffic: 35. Traffic: W7VQC 25, EEQ 20, GGV 19, K7BWV 17, W7DWE 5.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ. PAM: YHS. RM: K7AEZ. MPN meets Mon.-Wed.-Fri. at 1800 on 3910 kc. TSN meets Mon. through Fri. at 1200 on 7230 kc. MSN meets Tue.-Thurs.-Sat. at 1830 on 3530 kc. We hear that TPE is going to school. CPY is back in Arizona, also AYG. K7AJQ is heard on his new 100V. ENO tangled with a moose and got him. UPR went to California for a few weeks. K7BON went to Helena for some school work. Montana has a ham in the legislature, FTD. JVN is the new president of the Great Falls Radio Club. EWR is heard on the air again. The Missoula gang had an "Operation Goblin" mobile Halloween night. JRB made a visit to Oregon to see INM. ED, Montana's oldest licensed ham, has been hospitalized, and his friends wish him a speedy recovery. WYG is the new president of the Electric City Radio Club. The Montana Civil Defense RACES Network has an increasing roll call. BOZ is putting up a new rotating beam. CMI made 82,650 points in the Oct. C.W. CD Party and 2800 in the Phone Party. BOZ built a 20-meter straight beam from a Tribandler and overhauled the emergency generator. Traffic: K7BKH 259, DCI 160, DCH 46, W7BOZ 12, W9IKY/7 10, K7BYC 8, IOA 8, CMI 3, W7FIS 3.

OREGON—SCM, Hubert R. McNally, W7JDX—By the time most of you read this there may be another SCM. After four years I feel the job should pass along to someone else. Besides, there are many other things interfering with my handling of the job at the present time. So, thanks to all of you for the very swell reports and stuff. I'll be around on the air from time to time and will be talking with most of you. We also will have a new SEC as UQI will have too much on tap next year to handle the job. WKP has been appointed as SEC and is already on the job. I know all of you AREC members will give Jesse the same support you have given Red. We also have a new OPS, K7KBK from down Winston way in Douglas County. A nice letter was received from VE8ADJ, likewise from K5GOU, who is a Tektronix representative in New Mexico. K7KBK says

(Continued on page 108)

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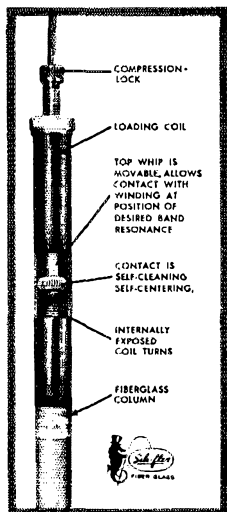
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he may have to have another operation on his leg and LT says he is going into the hospital for surgery. DTT is putting up a new Tribander. DIC's Ranger is in the garage for repairs. A nice report on new Grants Pass hams was received from DEAL, who says they handed election returns for the paper again this year. Traffic: K7AXF 192, W7BDU 189, ZFH 143, DEM 29, MTW 26, K7KKB 25, W7LT 25, DTT 20, DIC 13, K7JQS 9, W7GUH 5.

WASHINGTON—SCM, Robert B. Thurston, W7PGY
—SEC: HMQ, RM: AIB, PAMs: LFA and PGY. The sudden snowfall that fell on the Pierce County, Tacoma, Sumner and Puyallup Areas on Nov. 20 created an emergency that saw the amateurs in that area swing into operation under the AREC program. Thirty-two operators participated along with the SEC. CZQ is moving to a new QTH soon. The VARC was number one in the nation on its Field Day score. Congratulations, fellows, on an FB job. YB1/7 is now stationed at McChord AFB and holds regular skeeds with 6A1B on 15 meters for Northwest traffic. FLQ and SUQ joined the ranks of Silent Keys. COG is using his new linear. K7IYR is putting up a new 50-ft. tower. K7JOA has a new vertical. K7DCC is installing a new mobile rig. AXT is NCS on the QCWA net on 7220 kc. EBU is in a new ham shack. New officers of the Apple City Radio Club are K7BVZ, pres.; K7APJ, vice-pres.; ETO, secy.-treas. The Lower Yakima Valley Amateurs had a hamfest on Nov. 1 with 60 amateurs in attendance. The Washington Amateur Radio Traffic System (WARTS) had 26 sessions, 1500 check-ins and handled 194 pieces of traffic in October. IEU lost his 80- and 40-meter antenna in a big blow. ACA has a new SX-111. K7CWO/7 is installing antennas at the new QTH. JC is fighting gremlins in his v.f.o. Twelve members of the Totem Emergency Net recently won an "Award of Merit" for their participation in the Seattle Seafair Parade. K7JAL has moved to W6-Land. AYD won a new 24-hour clock recently. AZS has the Model 15 RTTY about ready to go. K7CFC is running code classes each Tue. at 2000 PST. EM has a new vertical. K7EHY is working on a new power supply for the Ranger. OEX is using a new Thunderbolt on a loan basis. K7GEX has a new kw. and Thunderbird antenna. K7DPO has a new Apache. ZXMM has a new 100-V. 1ST is QRL college. JFY is active on RN7 and WSN. HMQ, NUN and RDL held a meeting of King County AREC at the SCM's QTH Nov. 25. DZX is very QRL traffic on the NTS. Traffic: (Nov.) W7BA 1412, DZX 673, K7HIL 439, W7APS 88, AMC 81, KZ 69, GYF 56, ACA 33, HTB 21, 1ST 20, EHH 18, USO 17, VPV 17, AIB 14, JEY 13, IEU 10, OMO 9, K7CWO/7 8, DDQ 6, CHH 4, BBO 2, W7EVV 2, JC 2. (Oct.) W7QLH 309, GIP 63, IEU 20, 1ST 16.

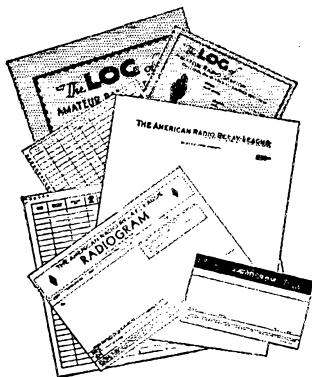
PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—YRY has moved to Henderson. HJ, TKV, BVZ and JU are all active on 2 meters. JU has a 417A front end and 500 watts and is looking for scatter skeeds on the low end of 2 meters. We need ECs badly in Las Vegas, Winnemucca, Fallon, Caron City, Ely and Elko. MAH has finished up the 5894 exciter for 2 meters. JKV, in Reno, is interested in a section c.w. net. Anyone want to help out? K7CJZ is checking into the California Net. Traffic: W7VIU 2.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Ed. Turner, W6NVO, has accepted an appointment as Asst. SCM for the section. As former SEC and president of the CCRC, his experience and acquaintance will be of great value. Palo Alto ARA officers for the coming year are K6PDL, pres.; W6IUE, vice-pres.; W6STY, secy.; K6EJL, treas. The Santa Cruz County RC is now affiliated with ARRL. Seventeen new members of RACES were sworn in at Redwood City Hall on Nov. 28. New officers of the SCCARA for the coming year are W6JDP, pres.; K6SRG, vice-pres.; K6DEZ, secy.; K6YKG, treas. The Foothills ARC is planning its 2nd Annual Dinner Meeting for Jan. 27. W6ASH organized a MARS 2-meter hunt Nov. 5. They had 6 consecutive hunts in a 3-hour period. W6RSY has been having a long siege with a virus cold. He also is converting to sequential keying of the rig. W6A6HRS has a new 50 WAS and needs only Alpine County for WACC. W6YBV is sporting a new antenna and tuner. K6ZCR is the proud holder of a 30-w.p.m. CP award. New appointees are W6SHK as OES and W6A6AQ as ORS and OPS. The latter has prevailed upon the Army to install a well-equipped amateur station at the Presidio of Monterey with the call W6ORC. If you sometimes wonder whatever happened to W6BPT, former TCC Dir. Pacific, W6YHM says he plays golf with him almost weekly. Traffic: W6A6AQ 612, K6ZCR 453, K6DYX 197, W6RSY 193, W6DEF 124, W6YBV 107, W6A6HZM 101, W6AUC 86, W6FON 63, W6OII 55.

(Continued on page 110)

FOR THE ACTIVE AMATEUR



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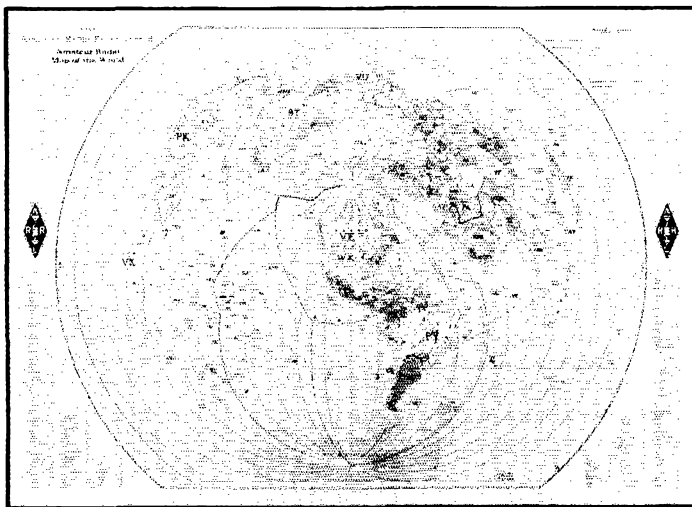
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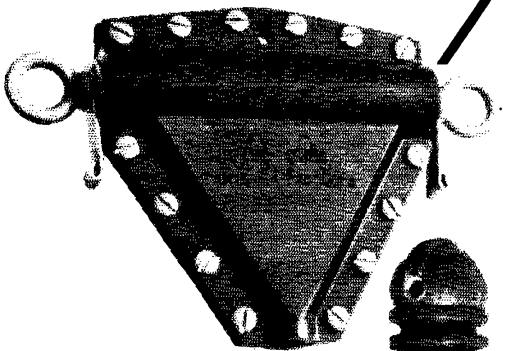
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K6LRN 51, W6AIT 46, W6HC 46, K6GZ 27, W6YHM 25, W6AUC 24, W6ASH 19, K6VQK 15, WA6HRS 5, K6EQE 4.

EAST BAY—SCM. B. W. Southwell, W6OJW, K6ZYZ is QRL the swing shift, and has a new G.G. linear on c.w. and s.s.b. with a pair of 813s. W6ZF is putting up a new 80-ft. skyhook. K6GK says traffic is picking up on the UTL Net. W6JOH is back on the air with a Collins 310B and a vertical antenna. Tech. Class WA6FLD is now General Class and is having a ball chasing DX and the rest of the states for WAS. The EBRC held its November meeting at John Hinkle Park. W6MAV is a new Novice at Travis Air Force Base and got his feet wet in the Sweepstakes. The Southern Calif. 75 Phone Net is folding because of lack of interest, but the 6-meter net has 15 or more check-ins each Thurs. night. WA6HSQ, the newest YL General in the MDARC has a new KWM-2. K6DQM got his NYL. WA6HYU, a new HQ-180 for Christmas. The Oakland Radio Club held an Old Timers Night on November 4. The Oakland Radio Club meets at 906 Fallon Street, Oakland. W6LGV, W6EFI, K6DQM and WA6HYU attended the CCRC meeting at Anpex Corporation. K6DQM is nominee for vice-pres. of the CCRC for 1961. W6OCY is a new Novice in Walnut Creek. The Richmond Amateur Radio Club heard a talk on Digital Computers by W6URH at its November meeting. W6HBF and K6OSO operated W6IPZ during the CD Party. The Radio Electronics Television School in Oakland has received the call WA6ORE, and K6ESZ is the instructor. FCC Inspector Jim Landy was guest speaker at the HARC meeting. K6LFH, K6FWK, K6VXJ and K6HWL attended the Mobile Breakfast in Hayward. The Livermore Amateur Radio Club was issued the call WA6ODP, and W6LZL is trustee. K6TYI has a new home for his Morrow twins—a brand-new Mercury. W6LGE is up and around again after a lengthy illness. W3WAU/6 has a new Gonet G-77. W6IPY has been QRL work. WA6BBJ has a new TB-600 Triband beam on a 50-ft. stick and a DX-100 pusher. K6JZN has a new 40-ft. pole in his yard. I wish to extend my thanks for all the help in sending in the news for this column. All club newspapers are doing a fine job, but they cannot report your traffic, etc. ARRL station activity report forms are available for the asking from your SCM. There are openings in all categories of appointments in the section. A postal will bring full information by return mail. All letters are answered within 24 hours. Let's hear from you all every month and from clubs in the section that have not yet sent the SCM a copy of the club bulletin. Traffic: (Nov.) K6GK 240, W6JOH 36, K6DQM 32, (Oct.) K6DQM 46, W6ZF 15.

SAN FRANCISCO—SCM, Leonard R. Galdi, K6ANP --The Northern California Net (NCN) meets on 3635 kc: Mon. through Sat. at 1900 PST. All c.w. stations interested in handling traffic for the San Francisco section are invited to check in. W6GQY, of Fortuna, is Route Manager for this section and would be happy to furnish you with information. Besides being Route Manager, Joe also is Assistant Director of the Pacific Division. His activities include participation in TXN, NCN, RN6, RN7, PAN and TCC. W6OKR reports that 2-meter activity is increasing as the Technicians move up in frequency. Welcome to a new ham in Larkspur, W6OFE. W6NZV and W6OKR are building an 8-foot parabolic antenna. The Tamalpais Radio Club is conducting code and theory classes for beginners and Novices. The club now has its own certificate, "WAM" for "Worked All Marin." Five contacts in Marin County are necessary; three of these must be with a member of either the Marin RC or the Tamalpais RC. Amateurs from the Tamalpais RC and the Marin RC, plus several others from the Bay Area, cooperated with the Civil Air Patrol in a search for a plane missing for a week. The amateurs provided communications and search parties in the Marin and Sonoma County Areas. All operation was mobile, which enabled them to keep in contact with the base station set up at the Petaluma Airport. A call for mobile stations was put out at 10 A.M. on a Sun. morning, and within three hours a complete base station and 30 mobiles were checking out their assigned areas. Those participating from Marin County were K6JSJ, K6LCE, W6ZQK, K9OVQ/6, K6MBK, W6OPL, W5AOP/6, W7JPI/6 and W6PVI. Chalk up another fine public service by our fraternity. We welcome to San Francisco WA6HJL, Les Finston, who was licensed in 1920 as W7AEM. Les's calls include W6QQU, KH6QQU, K6BGX and K6NCX. He is retired from the Navy after 30 years in radio and is now having a ball on 40-meter phone. K6JFY is checking into NCN from San Francisco. Traffic: (Nov.) W6GQY 791, W6QMO 89, K6ANP 2, K6EKC 1.

(Continued on page 112)

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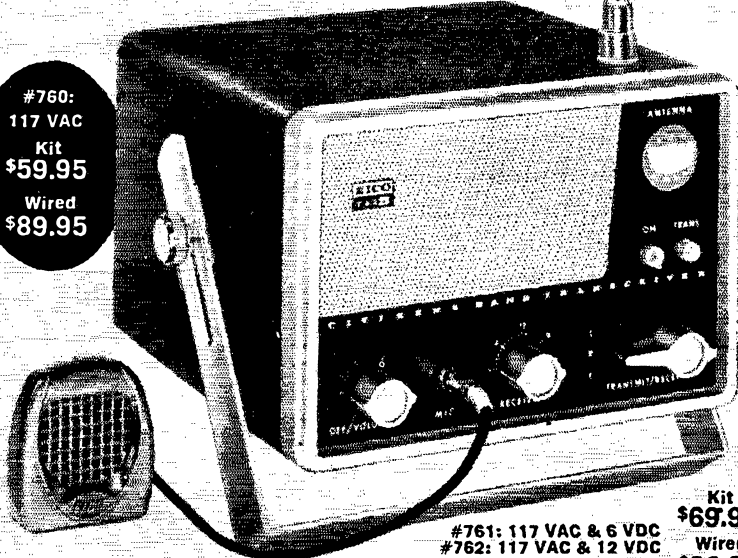
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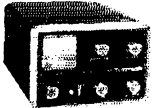


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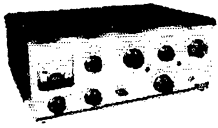
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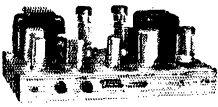
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SACRAMENTO VALLEY—SCM, Jon J. O'Brien, W6GDO—Your outgoing SCM (W6GDO) reported, for November, receiving no activity cards, and wishes the gang best success. A petition naming George R. Hudson, W6BTY, has been checked out, for ARRL membership and FCC license and in accordance with the League rules and in the absence of other candidates has been named SCM for the next two-year term. Give him your reports, support and applications for appointment.

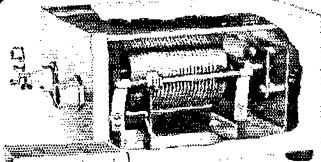
SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Fresno Amateur Radio Club held its annual installation Dinner Dec. 8, 1960. The new officers for 1961 are W6NKZ, pres.; K6OER, vice-pres.; W6FNV, secy.; and K6CBB, treas. K6ZCD put up a heavy-duty rotor for his Tri-Band beam. K6JGH planted a 40-ft. pole in his yard assisted by a party consisting of W6SUV, W6QOS, W6NKZ, K6ZCD, K6LRQ and W6OUX. Ex-W6AKK returned from a 30-day jaunt to Europe. W6PXP is being heard on 40-meter phone a.m. K6QOK solved his clamper tube problems—bad meter. W6BAN is building a 1625 mobile special. A field strength measuring test was held in Fresno Nov. 20, 1960, with a good turnout and W6NKZ won all honors, with W6QON coming in second. W6JCD is located in Leamore on 75-meter s.s.b. W6MIQ is on 75-meter s.s.b. Totals for the month of October for the SJVN are: 457 check-ins, 23 traffic, 6 QSTs and 2 bulletins. For November: 334 check-ins and a traffic total of 60. The annual picnic of the SJVN is to be held the 2nd Sun. in August and will be held in Mloney's Grove, Visalia. K6KCB is moving to San Jose. W6EFB is installing an A-34 mobile. K6ROU has the WBE award confirmed. K6OZL made 74,500 in the SS. W6FBL has a new Gonset G-76. W6OVR has a new Gonset IV. K6REX has a Heath Sixer mobile. K6HMK is working 432 Mc. W6RRN has a Heath CB converted to 6 meters. W6HCO has an NC-300. W6LLA has a 2-meter antenna 70 feet high. K6OZI is on 2 meters with a Heath Tower. Traffic: K6ROU 98, K6KCB 97, W6EFB 12, K6OZL 7, W6ARE 3.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: DRC. V.H.F. PAM: ACY. RM: PNM. Based on reports reaching me the nets in the section are in good shape. Each month we have additional local nets on 2 and 6 meters. Fellows, this makes for good communications. Local nets on v.h.f. are tied to state nets on 80 and 75 meters. Your town, city, county or several counties are urged to make an effort to get some v.h.f.-u.h.f. equipment and give it a try. RVH reports that eighteen members of North Carolina MARS Net Number One have received eighteen additional teletype machines. Two of these machines are Model 19 and sixteen machines are Model 15. The members are busy getting converters built so that they may copy at an early date. With the issue of these machines it brings the total for District One to 22. Four of the machines are privately owned and are Model 26. This gives Western North Carolina excellent coverage via this media. Traffic was light during November. Each one of you is urged to supply the SCM with information relative to activity in your area. From time to time some ham will give me the old one-two about this article. I reply that I need information, and would be happy to use same, but he never sends anything. I just do the best I can with the information I have or can hear.

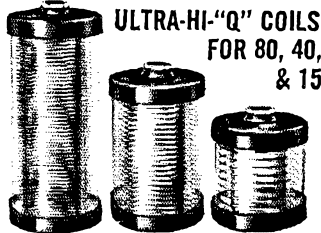
SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. PAM: K4IE. RM: PED. The Camden DX ARC boasts an elaborate new club house at the Airport which was obtained through c.d. and RACES activity. New officers are K4KAX, pres.; HMR, vice-pres.; K4JPT, secy.-treas. New officers of the Rock Hill ARC are UMW, pres.; NDH, vice-pres.; K4WOI, secy.; K4YFK, treas.; K4WPF, custodian; K4OLD, editor of SCARAB; UNP, business manager. ANK and K4GAT are active again on SCN after being off for several months. VIW is having trouble finding space for his mobile rig in his new T-Bird. The Mike and Key Club of Greenville now meets at the local c.d. office, is active on 2 meters and listening on 144.44 Mc. The newest member is KN4NFS. K4YYR is now in Summerville. 9QNI/4 is active while at Shaw AFB. OFB fills a much-needed phone contact in the Orangeburg Area. AKC has been re-elected Vice-Director of the Roanoke, Division by a nice majority. Richland County has 12 c.d. 2-meter stations with a well-organized net. All new club secretaries, please send your SCM your list of new officers and monthly activity report. Traffic: W4KNI 191, K4ZHV 168, W4AKC 90, FFH 72, K4AYU 70, DOF 55, W4CHD 20, K4KIT 15, W4VIW 12, W9QNI/4 6.

(Continued on page 114)



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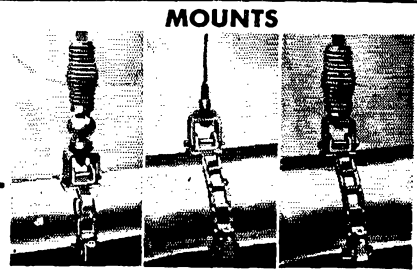
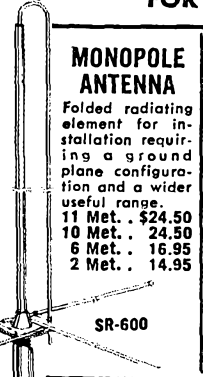
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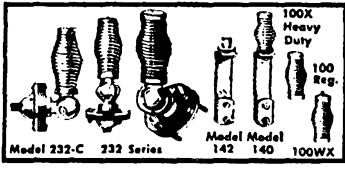
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MM531 Deluxe Sgl. SS. 11.95
MM520 Dbl. St-Cad. Pl. 7.95
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MASTER-MAGIC WAND

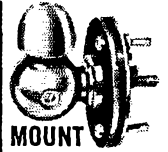
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VIRGINIA—SCM, Robert L. Follmar, W4QDY—SEC; QDY, PAM; W4BCF, RM'S; K4QER, K4KNP, K4MXF and QDY. One of our new traffickers is high man this month, and made BPL besides. Congrats to JSJ/4. Others making BPL for the first time are OOL and K4FMS. K4FSS made BPL again and is in line for the medallion. DVT, one of our old reliable ORSS, has left the Virginia section and 3RN gains a stalwart. K4QIX is back in business with a nice traffic total. LA is back in harness as Friday NCS on VY. Richmond is well represented these days with the following stations making reports: K4AL, 4LK, BZE, JJJ and K4TFL. Thanks for your participation and interest. BCF completed his course at Wm & Mary College and may be leaving this area. The VFN members deserve much credit for their persistence in moving traffic. K4FMJ reports that his rig on 15 and 20 meters is interfering with the State Police. One of our iron men traffickers, W4SHJ, has gone to the Philippines for 6 months. AAD has a new 100V on the air. K4LPR reports working 72 sections—all but Hawaii—in the recent SS Contest. The TMRC furnished the following mobile units for the Veterans Day Parade: YJL, GSK, K4RPT, LLV, BGP, WINVC/4 and K4LPR. The TMRC recently made its 86th hidden transmitter hunt in 19 months. Can anyone beat this record? Some of our appointees who have been away to school are now helping out with the holiday traffic. Traffic: (Nov.) W4JST/4 307, K4LRL 218, W4OOL 222, QDY 156, K9CVJ/4 154, K4FSS 153, W4DV7 123, K4QIX 120, FMS 106, PQY 75, W4IA 63, K4AL 44, W4LK 43, BGP 33, BZE 36, OWV 36, RHA 25, K4FMJ 21, W4JUI 21, SEJ 21, KN 20, K4TUF 8, W4AAD 6, K4LHB 5, LPR 4, BU1 2, (Oct.) K4YDU 135, W4CFV 13, K4TFL 10, W4PNK 8, (Sept.) K4YDU 92.

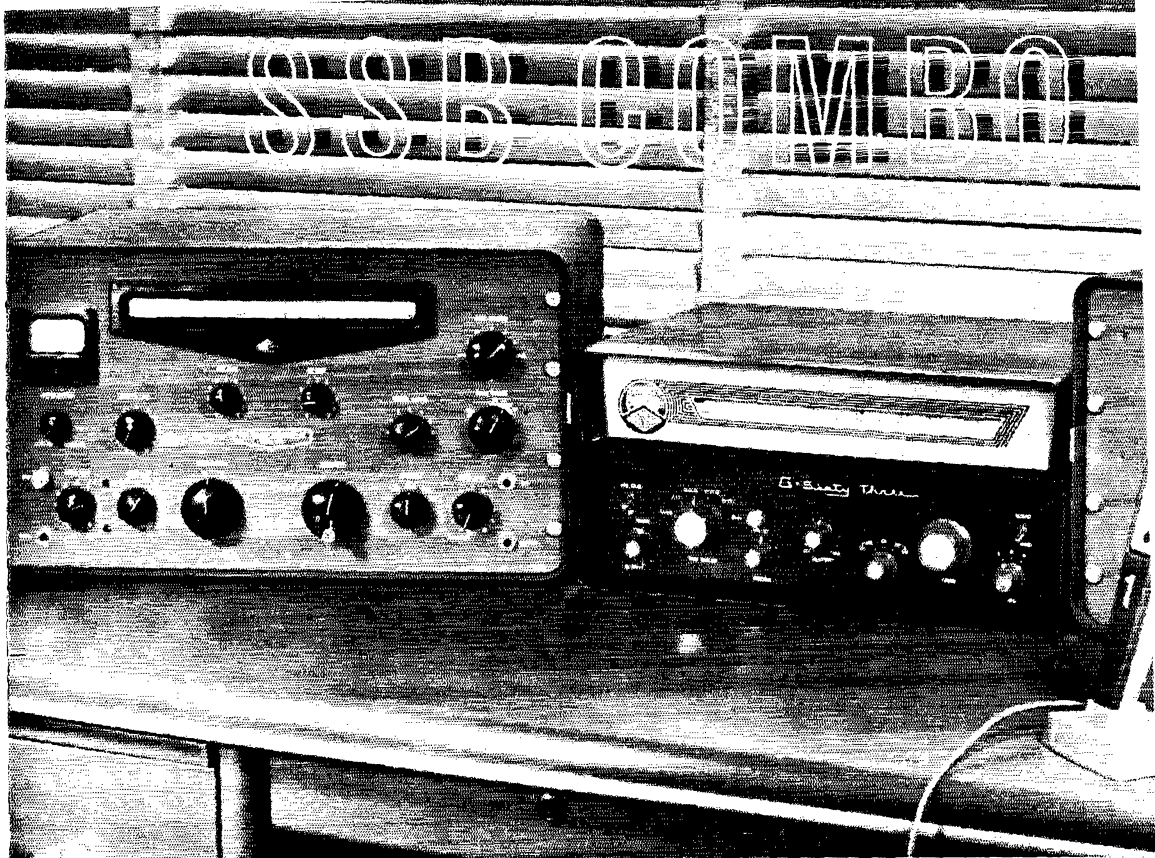
WEST VIRGINIA—SCM, Donald B. Morris, W8JM—The West Virginia State Radio Council has been formed and the following attended the first meeting in Charleston: K8HID, GQE, SSA, IBF, FNI, TAP, K8QAZ, K8GAG, K8DZU, WUB and JM. Each active radio club is entitled to representation on the Council. All amateurs, not members of a club, with suggestions or ideas should submit proposals to the SCM. The next meeting will be held in Parkersburg in February. IBI has rigs on 220, 420 and 1215 Mc. SNP, TAP, VHI, DYA, HNC, HRO, RFD and K8GEP are active on s.s.b. around 3905 kc. The West Va. S.S.B. Net will be operating soon. NCSs on the c.w. net are K8OEQ, K8HID, KXD, PBO, GIU and K8JYR. Serving on 8RN are K8QXS, K8HTD, JUE, K8LOU, CCR and K8JLF. The 6-Meter EC Net in Kanawha Valley meets Wed. at 2100 on 50.250 Mc. VQ2EJ now lives near Parkersburg and works with K8DXU. New Novices are KN8VIX, KN8TSB and KN8TZY of Charleston; KN8UMN of Nitro; KN8VIZ of Dunbar. The Braxton Memorial ARC meets the 1st Mon. in each month at Laurel Court in Sutton. Traffic: W8PBO 159, K8JLF 76, HID 72, CNB 67, QXS 56, W8FNI 51, NYH 42, ELX 35, CCR 22, K8CSG 16, W8JM 11, GAD 5, K8MMZ 4.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, W0BWJ—Asst. SCM: Howard S. Eldridge, K0DCW. SEC: NIT, RM's: MYB and WME. PAM: CXW and LJR. OBSS: K0DCC and K0EPP. Special attention is called to the new Official Bulletin Station for the Denver Area. Russ has scheduled four transmissions each week: 3890 kc. Mon. and Wed. at 1930 and 7240 kc. Tue. and Thurs. at 1600. K0QMH/0, with the high Field Day score for the 0 call area, has proved the Montrose group has just about the hottest club in Colorado (even if they did import the master operator, BDR). FEO has a new Apache TX-1 to help cover his skeds on CCW, TWN and PAN. V.h.f. operators interested in skeds for major meteor showers, especially Perseids, should contact IUF. Tom added Iowa and Illinois as new states on 2 meters. By the time this report is printed, a new SCM will have been elected. It has been my pleasure to visit with some of the radio clubs. As Director of the Rocky Mountain Division I hope to visit with those I missed as SCM to determine the wishes, needs and best interests of all amateurs and ARRL. Your comments, suggestions and criticisms are sincerely requested. Congratulations to K0WWD on making the BPL with 105 originations and deliveries as well as a traffic total of 570. Traffic: K0WWD 570, EDH 393, W0FEO 292, K0EDK 279, DCW 169, W0MYB 103, BKQ 88, K0QAN 85, W0CBI 50, ENA 46, K0EVB 42, W0ACD 22.

UTAH—SCM, Thomas H. Miller, W7QWE—Asst. SCM: John H. Sampson, 70CX. RM: OCX, V.H.F. PAM: SP. Because of inactivity and lack of monthly reports many appointments have been cancelled. FVD/7, OCX, and K7NWP are now checking into TWN regu-

(Continued on page 118)



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First, GSB-100, SSB transmitter/exciter... then GSB-101, the powerful 1000 watt P.E.P. linear amplifier. Now... to complete the SSB combo... *G-63 a communications receiver of exceptional value!*

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larly. With two additional stations, OCX is somewhat relieved of a big load. John has been checking into TWN nearly 100 per cent for about two years. ARCC and c.d. have been combined in Salt Lake City. Nets meet on Tue. nights at 2000 MST on 28.7 and 145.4 Mc. K7IMB, in Pocatello, Idaho, K7BDX, OCX and QWH received BRAT awards for November. BDX has qualified for the Master Traffic Handlers certificate. The group on 2 meters in Salt Lake is rapidly expanding with 20 to 30 stations on the air. OCX has been elected vice-director and has received the Grand Master Traffic Handlers certificate. Traffic: W7OCX 208, W0FVD/7 149, W7QWH 23.

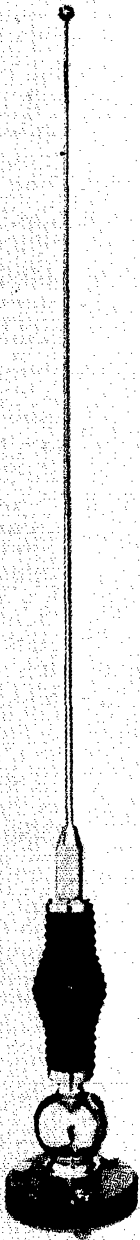
NEW MEXICO—SCM, Newell F. Greene, K5IQL—Asst. SCM: Carl W. Franz, 5ZHN, PAM: ZU, 10-meter PAM: LQM, V.H.F. PAM: FPB, RM: ZHN, The New Mexico Breakfast Club meets Mon. through Sat. at 0700 MST on 3838 kc. NAEIPN meets Sun. at 0730, Tue. and Thurs. at 1800, on the same frequency. TWN meets daily at 2000 MST on 3570 kc. The Brass Pounders, with ranks somewhat thinned by illness and absences, are scheduled Mon., Wed. and Fri. at 1900. Many New Mexicans trekked to Brownfield, Tex., for the Annual Hamfest. Brownfield is in the Tex-Mex "Lapland." K5UYF is off on active duty until March. GRI reports he bagged his first turkey—but not on 2 meters. We feel that all New Mexico would join in a word of tribute to 1BUD, whose retirement took effect December 31, 1960. Traffic: W5ZHN 267, UBW 63, VC 4, K5SCE 2, GYF 2.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: K7IAY. The Pony Express Net meets Sun. at 0830 MST on 3920 kc. The Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. K7IAY was appointed SEC effective Dec. 8. CQL resigned. BHH is RM and ORS, as well as alternate control station for civil defense radio communications and has been active with it. CQL is manager of the Pony Express Net. High winds took down quite a number of ham beam and quad antennas. The Cheyenne Club is preparing to issue a monthly bulletin. BXS has a new HT-37 transmitter with a Drake receiver. DTD, Sheridan, is getting an HT-37 transmitter and Drake receiver. 2 meters is getting a good start in Cheyenne. Sheridan and Casper. Wyoming clubs and stations are now listed with the U. S. Flood Control engineers in Omaha, Nebr. Traffic: W7HH 227, DXV 186, AXG 61, BHH 39, K7IAY 26, W7YWW 23, AMU 14, GZG 13, AEC 2, K7AHO 2, CQX 2, CSW 2, IHO/7 2, W7BKI 1, K7MAT 1.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4A0Z—SEC: JDA, RM: RLG, PAMs: PHH, BTO and JXJ. New appointments: EJZ as ORS, K4ZXX as OPS, RLG, RM, sends congrats to MAM, K4YUD and YER on receiving AENB certificates and also reports Alabama was 100 per cent on RN5 in November. Welcome back to AENB, K4ZXX, K4HAL, IWI and CWO are doing excellent OO work. WHW, Mobile County EC, is cooperating with U. S. Engineers for emergency communications. Congrats to K4AWN, the new manager of AENI. Congrats to K4UMD on being awarded an ARRL Public Service Award for Powderly train wreck communications. K4RLL reports a Muscle Shoals ARC auction and swap session to stimulate interest. K4QMN has a new DX-100B. K4MEQ is active on 10 and 6 meters. K4GXS says, "As a new operator, will say that the Alabama nets are the best, have listened to others. Hope all members will make it even better and keep it formal." K4ZXX reports increased participation and decreased interference on the new AENT frequency, 3965 kc. He reports a fine group of young operators are checking in and invites all to join them at 1630 CST daily. K4ODU has a new SX-101A. DS has the DX bug. PKA reports the Decatur club had Santa Claus on 6 meters talking to club members' children. CWO was active in the recent Sweepstakes. *Six Meter News:* K4FJZ now has 500 watts with two 4X150s. Congrats to K4UMD, the new manager of AENO: he has a new NC-300. Contrats to K4TYI, the new manager of AENX. CIN is running 100 watts input on 6-meter s.s.b. EFF reports AENX participation for November as 77 per cent with a fine training program in progress. K4INO has a new homebrew 6-meter linear amplifier. EFF has a new Gonset G76 working all bands. The 6-meter gang enjoyed a gala Christmas Party hosted by EFF and K4OIV. BAIM reports Cullman members were active on 6 and 2. LIIG is active on 144 Mc. JXJ reports: CJA has a new eight-element beam and puts out a booming signal with a 6N2. AUP is on 6 meters with a new beam. FSW and HOW are putting out good signals

(Continued on page 118)



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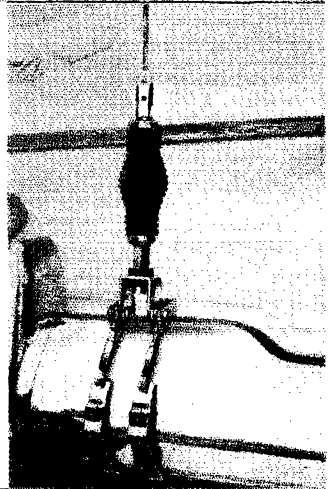
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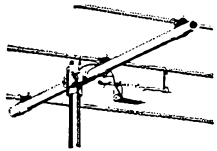
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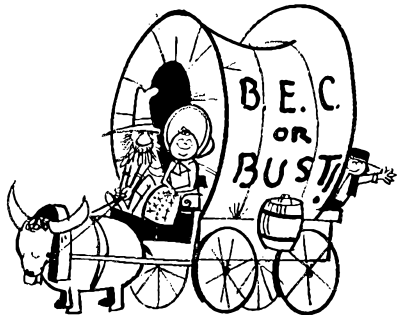


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from their retreat on the Coosa River. OYK is on 8-meter d.s.b. with a DSB-100 and a kw. linear. K4KAM is organizing a RACES unit in Clanton. Traffic: (Nov.) K4ZXX 211, W4RIG 132, K4AOZ 43, PHH 35, W4PVG 28, DS 24, MI 24, K4JDA 22, GXS 20, W4YER 13, K4BTO 12, TDJ 12, ZNI 12, GOW 11, W4WHW 11, K4AAU 10, RCA 10, W4OKQ 9, K4HAL 8, ODU 6, RSB 6, W4USM 6, K4UMD 5, DJR 4, HFX 4, HJM 4, KQN 4, W4RTQ 4, K4ISZ 3, OVE 2, W4TOI 2, ZSF 2, K4HVN 1, W4JXX 1. (Oct.) K4GOW 29, W4CEF 7, K4UMD 4, MEQ 1.

EASTERN FLORIDA—SCM. John F. Porter, W4KQJ—SEC; IYT, RM: K4SJH, PAMs: SDR and K4LCF, V.H.F. PAM: RMU. Our section nets are: FPTN 3945 kc. Mon. through Sat.; FMTN, 7230 kc. Mon. through Sat. at 12 noon; TPTN, 3945 kc. daily at 1730; GN, 7115 kc. Mon. through Sat. at 0830; QFN, 3850 kc. daily at 1830 kc.; FEPN, 3910 kc. Tue. at 1830. Other nets are the Fast Net on 3910 kc. daily at 1930; the Florida Sidebanders at 1700 Sun. on 3940 kc. The Floridians now have 86 members. New officers of the Hillsborough Amateur Radio Society, a new club in the Tampa Area are BNE, pres.; UIIF, vice-pres.; K4SMV, secy.; K4IAL, treas.; EFK, MIG, LPB, K4NQX, EHZ, QNX, OUD, EDZ and LUC, directors. The QFN, our All-Florida C.W. Net was our year old in November. K4UBR and ATA have done an outstanding job keeping this joint section net on its feet. New officers of the Broward ARC are K4SJH, pres.; K4YON, vice-pres.; K4EHE, secy.; and K4LJS, treas. K4SJH, as you know, is our very popular Route Manager. NGR received good publicity around Lake Mary for his "Operation Quick Freeze." He used his emergency power unit to keep most of the freezers and cold storage boxes in service after the power went off during Hurricane Donna. New officers of the newly-organized Winter Park Amateur RC are K4JZQ, pres.; K4JZJ, vice-pres.; K4EXU, secy.-treas.; and ZQL, trustee. The St. WFP won the prize hands down. TOD is convention chairman for the Southeastern Convention to be held Apr. 8 and 9 in Orlando. Traffic: (Nov.) K4SHI 875, EHY 213, LCF 210, HY 176, W4TRS 173, GJI 168, K4LCD 161, KDN 132, ILB 112, COO 104, W4IYT 92, PE 85, K4LVE 70, W4NGR 68, LDF 60, K4BLM 57, ENW 53, W4CNZ 50, K4RNS 48, MTP 47, AKQ 46, W4LSA 46, K4YQO 44, BHL 42, W8LDU/4 42, K4DBT 38, BOO 31, W4EAT 29, SMK 29, LMT 27, BKC 19, SGY 15, DQS 9, DSH 8, K4JZJ 8, OSQ 7, DAD 6, AHW 2. (Oct.) W4EHW 13, RUO 6.

WESTERN FLORIDA—SCM. Frank M. Butler, jr., W4RKH—SEC; MLE, PAM: K4RZF, RM: K4UBR. Tallahassee: MLE has been appointed Section Emergency Coordinator. Anyone interested in appointment as EC, contact him or your SCM. It is hoped to have a state-wide coordinated emergency communications plan in effect soon. Monticello: K4BDA has joined the W. Fla. Phone Net and will provide much-needed contact with this area. SIU is Asst. EC for Dixie County. He and SIT, in Port St. Joe, are both FHP troopers. K4QDN reports several Novice prospects in Quincy. LXX visited in Ft. Walton recently; he promises to be on WFPN as soon as he finds some 75-meter coils for the rig! Managers K4VND and WEB report both A.M. and P.M. sessions of WFPN are doing fine. QFN is now one year old and still going strong, thanks to UBR. A new directory of hams in Okaloosa County is available from RKH. MLE has prepared a similar list for Leon County. K4ZMV built an electronic key and is up to 93/87 on DXCC. PARC sponsored a Project Alert program in Pensacola. 10-meter bunny hunts are the rage in Ft. Walton. 2-meter activity is increasing, with K4FTI, K4YVJ, UUF and MS on in Pensacola and 10-15-meter stations on 145.2 Mc. around Ft. Walton. AXP represents W. Fla. in LO Parties. New appointments: ROM as OO, WEB as OPS. More applications are invited. Traffic: (Nov.) K4CNY 330, VND 36, QAC 26, W4WEB 10. (Oct.) K4CNY 256, UBR 256.

GEORGIA—SCM. William F. Kennedy, W4CFJ—SEC; PMJ, PAMs: LXE and ACH, RM: DDD, GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 EST Sun. GSN meets Mon. through Sun. on 3595 kc. at 1900 EST with DDD as NC. The 75-Meter Mobile Net meets each Sun. on 3995 kc. at 1330 kc. with K4YID as NC. The GPYL Net meets each Thurs. on 7260 kc. at 0900 EST with K4ZZS as NC. The Atl. Ten-Meter Phone Net meets each Sun. on 29.6 Mc. at 2200 EST with BGE as Net Mgr. The Georgia S.S.B. Net meets Mon. through Fri. on 3970 kc. at 2000 EST with K4RHB as Net Mgr. The Atlanta Radio Club net meets at 2100 EST on 21.360 kc. each Sunday night with DOC as NC. This is a social net for the club. K4BVD has his DXCC certificate. K4TEA got VQ9A and FI.9, also ZS6IF/9 for 160. K4PKK reports there was not much

(Continued on page 120)

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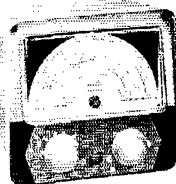


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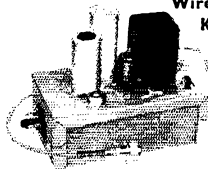
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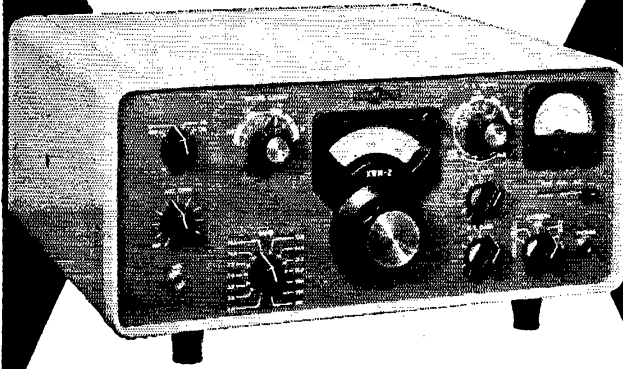
activity on the high frequencies in November. LNG has finished writing the chapter for *Aerospace Telemetry* and hopes to get back to some OES projects. FW11 read five Bulletins in November on 2 meters. Sure glad to hear that DDD is getting along better. New officers of the Atlanta Radio Club are BNS, pres.; K4YID, vice-pres.; K4TEF, treas.; K4BZE, secy.; K4TTM, act. mgr.; K4DNL, editor of the *Atlanta Ham*. We appreciate the fine information from Betty, K4BZE, who is chief engineer for BNS. We are sorry to learn of the passing away of HVA, of Columbus, on Nov. 23, 1960. K4BAI reports that their Field Day efforts took first place in Georgia in Class A 2 transmitters. For those of you who would like to drop him a line, John is now in Mercer U. Box 883, Macon, Ga. K4TUA, in Warner Robins, has returned to the air after 31 years' absence. His 1920 call was 9DDZ. Thanks for the dope, John. Traffic: W4EAW 175, K4BYD 36, TEA 10, PKK 2.

CANAL ZONE—SCM. Thomas B. DeMeis, KZ5TD —Results of the Crossroads Amateur Radio Club elections: AD pres., MM vice-pres., OB secy.-treas., and GM act. mgr. DF now is on s.a.b. BG is in the States. RR is going to the States for discharge from the USAF and will be operating from San Diego with the call K6ARN. BF moved to Los Rios, SJ will move to Rousseau after joining the FAA. RJ soon will put up his new quad after difficulties. JC returned from a State-side vacation. Several KZ5s were active on c.w. in the SS Contest. The last few weeks we have seen skip conditions changing, with 20 meters even dropping out to the U. S. in the evenings. But for the DX hounds 20-meter c.w. has proved interesting but quiet when the W and K stations are gone. MQ is working on a 20-meter quad and is active around 14,050 kc. in the afternoons. The Canal Zone '61 automobile license plates with call signs have arrived and we soon will be using them. The 40-meter Sunday morning Army MARS Net has shown an increase in activity with excellent results to all the Canal Zone areas. 40-meter c.w. in the evening has been surprisingly good to Europe, somewhat like 20 meters was at this time last year. Traffic: KZ5KQ 96, JW 78, VR 56, UR 33, TD 29, CD 27, OB 27, AD 13, OA 3.

SOUTHWESTERN DIVISION


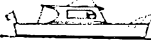

LOS ANGELES—SCM. Albert F. Hill, jr., W6JQB—SEC: W6LIP, PAMs: W6BUB and W6ORS, RM: W6BHG. The following stations earned RPL in November: K6MCA, W6GYH, W6ZJB, K6CLS/6, W6WPF and K6EPT. Congrats, fellows! W6AHY, who is blind and keeps his log in Braille, received his Extra Class license! Congrats, Tom! New officers of the 50 Club of California are W6ORS, pres.; W6ZPM, secy.; W6SBC, treas.; W6AGK, sgt. at arms, K6RMO has a new HQ-170 and a 50-ft. crank-up tower. The SoCal 6 Net has elected W6DJB as Metro Div. Control and W6CDV as his assistant. The Valley Div. Control is W6GAG and W6BSC is his assistant. W6VOZ is back with his ZL skeds after the "Blackout"! K6COP received the MM certificate and Koonstad award. Congrats, Howard! W6SRE still is traveling in W7-Land most of the time. K6OZJ has raised the power on 2 and 6 meters. K6MSL rebuilt his station in the closet and is getting the antenna farm planted! W7FB has finished a 1/2-kw. rotary spark rig! W6AM is keeping in touch with W6BPD while Gus is DXpeditioning. We welcome W6ORJ to the section; his former call was W6HAW! New officers of the DX-Plotters Club are K6RMO, pres.; and K6CNB, secy. K6RIR is now a student member of the I.R.E. New officers of the L.A. Chapter of the QCWA are K6HF, chmn.; K6HY, vice-chmn.; W6PIF, secy.; W6SXW, treas. W6GHW is now on 1215 Mc.! K6SIX reports conditions on 6 meters are not too good. K6GTG is running scatter tests with W6ENC in South Dakota. Support your section nets! On c.w. the Southern California meeting on 3600 kc. at 0300 GMT, only on phone, the SoCal 6 Net meeting on 50.4 Mc. at 0300 GMT daily. Traffic: (Nov.) K6MCA 1027, W6GYH 786, W6ZJB 648, K6CLS/6 514, W6WPF 470, K6EPT 417, K6LYR 406, K6OZJ 325, W6BHG 155, K6SHZ 140, W6CKR 102, W6MAP 96, K6BAY 85, W6DWP 77, W6BCZ 76, W6USY 54, K6JSD 49, W6JOC 28, K6SLX 26, W6FB 16, W6CK 14, W6VOZ 13, W6RTR 10, W6HUO 7, W6SRE 4, K6GTG 2, K6CDW 1. (Oct.) K6JSD 53, K6PZM 46, W6JOC 15, W6OIV 10, W6CTS 5, W6SRE 2.

ARIZONA—SCM. Kenneth P. Cole, W7QZH—PAM: OIF. The Copper State Net meets at 1930 MST Mon. through Fri., the Grand Canyon Net Sun. at 0800 on 7210; the Catalina Emergency Net Wed. at 2000 on 29.627 and 145.8 Mc.; the Tucson AREC Net Wed. at 1900 on 3880 kc. The Casa Grande Ham Picnic, attended by approximately 200 Arizona amateurs, is over but will (Continued on page 122)



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be long remembered. Among those present were 61QL, Brawley, Calif.; MES, Sierra Vista; BFA, Prescott; and OZS, Ajo. Highlight of the afternoon was the baseball game between Phoenix and Tucson. It was a pitching duel all the way. MAE, the Phoenix twirler, finally broke under the terrific strain and was relieved of his duties. The Tucson team, taking immediate advantage of theiring pitcher, piled up enough runs to win by the tight score of 32-26. A masterful job of umpiring was done by SMZ, Tucson. Our thanks to KHM, Casa Grande, our genial host. A meeting of the ARRL Convention Committee was held at the Westward Ho. It was announced that the grand prize at the convention will be a Viking KW, complete with desk and Viking Ranger. The equipment will be set up and working at the convention station. The amateurs of Arizona extend their sympathy to LSK, who was in an automobile accident in which his wife lost her leg. Our sympathy is also extended to DUJ, a winter visitor from Colorado, whose wife recently passed away. Congratulations to K7JYX, who received her General Class license, News from Tucson: The Catalina Radio Club provided communications for the Pacific Coast Sports Car Races held in Tucson. The net, controlled by SQX, worked on 2 meters. Traffic: W7LND 23.

SAN DIEGO—SCM, Don Stanister, W6LRU—K6BHM was home during the Christmas season on leave from Coast Guard duty in Alaska, and is now stationed in Long Beach. K6BX now has 110 members in the Certificate Hunters' Club since last June. W6IEY, OES in La Mesa, now has a nine-element Yagi for 220 Mc. and a new 4X250M final on that band. The call for the Newport Amateur Radio Club is WA6OSM. K6STZ made WAC, then burned up his power transformer during the Sweepstakes. W6SRA again is active after a 30-day vacation in Mexico. Your SCM had the pleasure of working 30 stations on c.w. during the Sweepstakes Contest, of which 16 had WA calls. Many of the WA6 stations completed their WAS during the Sweepstakes. W6BKZ spoke at a recent Helix Club meeting. K6RPD now has his new 813 final on the air with a potent signal. The December meeting of the San Diego DX Club was held at the home of W6CAE. On a recent week end over 35 pounds of QSL cards were mailed to W/K/WA6 stations by the DX Club members, who handle the chores as QSL Manager for this district. K6RWM is now mobile only, as his gear is stored after a recent move to Oceanside. Traffic: W6IAB 2952, W6YDK 1518, K6BPI 892, W6EOT 448, K6LKD 171, WA6ATB 139, WA6CDD 102, W6ELQ 81, W6HU 4, K6RCK 4.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—As I write this I am also keeping an ear tuned to the 7290 traffic net attempting to pass traffic through the very strong carrier of some one testing on frequency. I wonder what has become of the old-time ham who used to test his transmitter coupled to a light globe or some other form of a dummy load. There is an old saying, "the squeaking wheel gets the grease," so it seems that it is necessary that I start squeaking as I am not getting much news from the section. NFO reports that the Brownfield Annual Free Swapfest went over with a bang, as usual. More than 450 were in attendance. Because of working conditions I was not able to attend. It seems that land-line communications must go on regardless of ham radio activities. It is a settled fact that the West Gulf Convention will be held in Kerrville this year and it is not too early for you to start making arrangements to attend. K5MZV is the new EC for Tarrant County. ANK is the new EC for Taylor County. K5KZA is the new EC for Harrison County. MSG is a new OO. Judging from the results of the recent Frequency Measuring Test there is more eligible material for OO. Welcome to Dallas, ex-W9FSG now W5DNR. He is interested in 6 meters. Congratulations to QKF and UYQ on their election as Director and Vice-Director of the West Gulf Division. Our thanks to ETA and KY for a job well done. Traffic: (Nov.) W5BKH 89, K5PXV 62, W5LR 59, ANK 28, K5HTM 21. (Oct.) W5BKH 342, K5BKH 108, W5LGI 86, K5HTM 48, W5LR 41, K5PXV 28.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—SEC: K5KTW, K5OCX won the Oklahoma QSO Contest. PHM, K5MIG and K5YBQ furnished QSO contacts from the extreme northwestern part of the State. Muskogee won the Field Day Trophy in a contest with Bartlesville. EKA, Bartlesville, father of EJX, has become a Silent Key. Oklahoma City has a new club, the Northwest Classen High School Amateur Radio Club. Officers are: K5YMV, pres.; K5QPO, vice-pres.; K5UKY, secy.-treas. ODO is the new editor of the ACARC club pa-

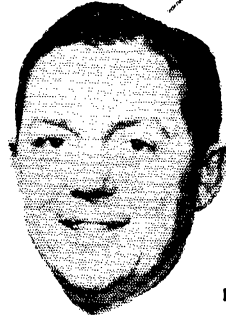
(Continued on page 124)

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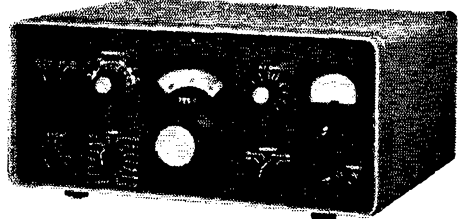
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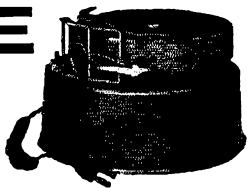
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per. UYQ is our new Vice-Director. K5YFH is a new amateur in Lincoln County. The Chisholm Trail Club has developed a unique plan to aid club members needing new equipment, a neighborly spirit indeed. The Northeast Oklahoma Amateur Radio Club, with the help of amateurs from Miami and Tulsa, furnished communications for the Bartlesville and Tri-State Sports Car Round-up Nov. 27. PAA and BUX have new 75A-4s, PYW, SVG and K5VWQ have new Drake 2-As. EHC snagged Christmas Island for Christmas. K5HQE, Cotton County EC, is organizing an amateur club in that county. K5PDM is the new EC for Seminole County. VCI has a new HT-137. K5BBA is looking for news of early-day amateur activity in Bartlesville. Traffic: K5IBZ 186, W500F 139, K5JGZ 87, W5DRZ 71, FEC 42, K5CAY 36, DLP 35, FLG 33, W5WZJ 29, UYQ 25, WDD 23, K5AUX 21, OVR 16, K5ZEP 16, W5PNG 15, W5MPX 17, K5MYFF 14, W5EHC 11, K5JOA 11, W5ESB 10, K5OOV 10, W5CCK 6, K5INC 6, LYM 6, W5VW 6, WAF 6, K5VNJ 4, HQE 3, CBA 2.

SOUTHERN TEXAS—SCM. Roy K. Eggleston, W5QEM—SEC: QKF. PAM: ZPD. RM: K5BSZ. QKF is the new West Gulf Division Director. Congratulations, Doc. You have your work cut out for you if you expect to fill the shoes of ETA. I would like to express my appreciation to Grady for the fine job he did during the past four years. He worked for the good of the amateur and the League on all matters that came before the Board. The 7200 Traffic Net had 44 sessions, 1526 station check-in and 733 messages. Anyone interested in a 75-meter phone traffic net for Southern Texas, please contact ZPD or K5WIC. K5MVI and K5JFP are due congratulations on receiving RN5 net certificates for their good work on this net. ETA visited the Corpus Christi Amateur Radio Club. K5VJI has a new HT-37. The South Texas Emergency Net was organized in 1938, and began meeting on 3860 kc. It was reorganized after World War II, still on this frequency. It is reported that a group of individuals is causing interference on their frequency. Traffic: (Nov.) K5WIC 370, MVI 311, K4BSS/5 274, W5AC 124, K5MXO 96, W5ZPD 72, K5ABV 54, W5AIR 47, K5JFP 20. (Oct.) K5WIC 304, ABV 72, W5AIR 45, K5JFP 16.

CANADIAN DIVISION

MARITIME—SCM. D. E. Weeks, VE1WB—Asst. SCMs: A. D. Solomon, VE1OC, and H. C. Hillyard, VO1CZ. SEC: BL. AYL is on the air again. Welcome back, Iris. Newly-elected officers of the Halifax Club are QV, pres.; RJ and MM vice-pres.; AFN, secy.; YQ, treas.; FQ, bulletin editor. PM was the first recipient of the Worked All Nova Scotia Award, closely followed by GA. New calls include RD. Newly-elected officers of the Goose Bay Club are VE1MV/VO2, pres.; MacGinnis, vice-pres.; Bert Betts, secy.-treas. VO2AW has received the Finland OHA DX certificate. IF has moved his shack to the top of a hill and erected a 70-ft. tower. Bob also has installed the TV transmitter which can be remotely operated by AFQ so we hope to hear more on this in the future. PQ and FQ lost their beans in a recent high wind. The writer finds it very difficult to operate from his present location. Interference from a Hydro hi-line running by the shack about 50 feet away is objectionable on even the strong signals. Hydro crews are investigating so here is hoping the situation will improve. Traffic: VE1ADH 14, AEB 14.

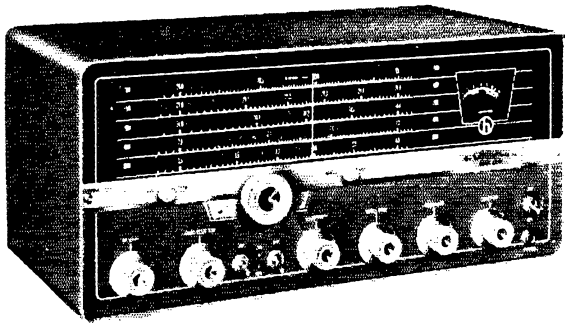
ONTARIO—SCM. Richard W. Roberts, VE3NG—Many thanks to all of you who sent Festive Greetings to DZA and me. The three Ottawa clubs held a successful auction before Christmas. The Northown Old Timers Assn. held its second annual get-together in Toronto. DTO has returned from VE6-Land. VI, ex-VE3DEX, now VE5VI, was in VE3-Land for a visit. The Peterboro Club operated mobiles for the Christmas Parade in Peterboro. GI visited your SCM; AMT and AML likewise. PR is recovering from operations. TX is back on 75 meters. ARF and NG report good deer-hunting. VF, BZU, and RG were skunked. AIL and party also were lucky. Even AMT got his buck. DPO came up with a super Grey-Bruce Christmas paper. The Hamilton ARC held a wonderful dance and buffet at the Yacht Club. Mr. Aveling, R.I. for Hamilton, has retired. Best wishes from all your friends in Hamilton and Toronto. The Northown ARC won the Canadian section of Field Day. Congratulations from your SCM and SEC. Wind-sor hams are organizing a disaster group, a combo of c.d. and AREC. Sudbury is the home of the Laurentian Net, which meets on 3755 kc. Mon. through Sat. at 1830. The Quinte ARC held its club dinner at Picton. DFL will be located in the North for a while. Look for him on 20 meters. Northshore, at Ashawa, held a hidden transmitter hunt. The London ARC held an E/C mobile test. The Niagara Penn. ARC has a new club

(Continued on page 126)

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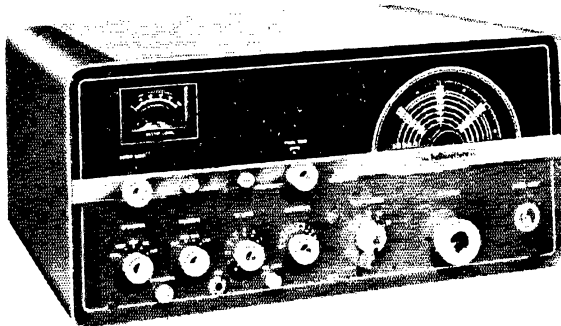
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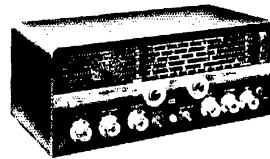


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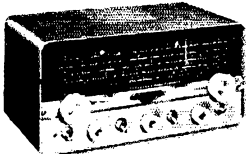


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call, VI. Welcome to the Seaway Valley ARC at Cornwall. It has a very nice bulletin by DJJ. Other clubs note. Some members are as follows: DLJ, 2ATZ, K2VTX/VE3, DHS, DPH, DQC, DPW. Traffic: (Nov.) VE3DPO 168, NG 135, BUR 108, DUM 82, DZA 79, ALL 53, BAQ 51, LK 45, NO 43, DWN 40, KM 30, GHL 28, BD 14, DLC 13, DXZ 13, DH 7. (Oct.) VE3CFR 43.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—AME and BBS are actively connected with the Royal Astronomical Society. AME is trustee of the call RAM; BBS is chairman. UQ, a member, has successfully tracked USSR satellites. RAM is on the air Sat. nights on 3755 kc., connecting with Halifax, Montreal, Toronto and other points. All interested in this important phase of ham radio, please contact AME. AOI is back on the air and "hopes to stay on for a long time." Your SCM visited the Montreal Amateur Mobile Radio Club and discussed AREC participation and matters concerning the ARRL. ATL has joined the C.O.T.C. and now is living at Grosses-Roches (Gaspé Peninsula). He hopes to contact Montreal via RO until settled. EC is a most reliable monthly reporter. TK and ANY are newcomers on 14 Mc. The St. Maurice Valley gang is active on all bands. JE is the new EC for the Laurentian counties. W7QMU/VE8 reports a complete fade-out at Cape Christian for a solid week during November. Welcome back to LO after prolonged business trips to Newfoundland, Greenland and England. CP is off the air while moving to a new QTH in Westmont. *Flash*: CI instigates the Swap Club on 3780 kc. Mon. nights at 9 o'clock. We recommend monitoring the frequency and get rid of old junk and maybe pick up something useful. AZ has big plans for 2 meters. MD expects to be on c.w. shortly. HK signed VP5BK while recuperating at Jamaica and worked many of his friends on s.s.b. on 14 Mc. Traffic: W7QMU/VE8 216, VE2DR 67, BG 40, EC 34, AKJ 19.

MANITOBA—SCM, M. S. Watson, VE4JY—The ARRL elected the following officers at its November meeting: BF, pres.; KF, vice-pres.; JA, secy.; TT, treas.; TJ, chairman program committee; TL is the new EC. The meeting wound up with a successful auction of ham gear. ARRL Canadian Division Director 3CJ is active and plans a trip through the West in May following the annual meeting in California May 9. Join the Prairie C.W. Net, which meets Mon., Wed., Fri. and Sat. on 3685 kc. at 2000 CST. boys and girls. A good old western blizzard Dec. 6 stranded cars but not ham radio. Traffic: VE4JY 19, PE 19, QD 12, AY 7, FX 7, GB 6, RR 6, AN 4, CB 2, RB 1.

SASKATCHEWAN—SCM, H. R. Horn, VE5HR—DR has a new Thunderbird Triband to run DX totals to the 200 mark. JV puts out a nice signal with his HT-37. NQ has his 300-watt rig going now and is having good success with the c.w. net. You are invited to check in on 3685 kc. Mon., Wed., Fri. and Sat. at 1900 MST. DZ is being kept busy with contests and DX. IG sends in a report on SEC activities. LT is heard on 75 meters again after a long absence. GE is building a "scope. GN is kept busy when not on the air driving a horse and cutter around the country trails. Why not go mobile. Doris? The Prince Albert boys are working on this coming year's hamfest. It should be a good affair. The Hamettes, YL and XYLs of the Saskatoon Club gave a Christmas Party for 60 jr. operators. Traffic: VE5LM 18, NX 16, JK 6, DS 5, HQ 4, BF 2, FX 2, IL 2, PJ 2, QC 2.

Correspondence

(Continued from page 73)

"CQ DX" in the bedlam. Immediately another station called him to say: "Hey, you stupid lid, don't you know you can't get DX in a SSB contest?"

Well, if the first lad was stupid, he certainly was in good company. It would be enlightening for you to listen on the bands after any contest, and hear the comments from men who have been with the ARRL since its inception, and left the organization in disgust. These contests prohibit licensed radio amateurs periodically from exercising their right to use the amateur bands by bringing about undue interference which serves no useful purpose . . .

You had better grow up before grown men get mad. — M. J. Cavenry, VE3GG, Willowdale, Ontario.

☞ In previous years, when the annual Sweepstakes mad-house hit the ham bands, I have always pulled the switch on the rig for those two week ends, and spent my time knitting or something. This year, to help the score of a radio club I recently joined, I decided to plunge in, and see what would happen. Well, I didn't roll up any impressive

(Continued on page 128)

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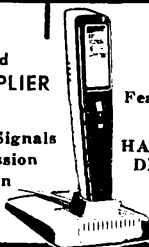
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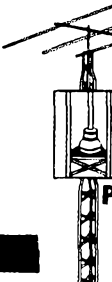
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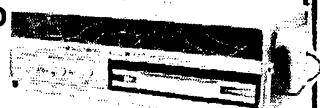
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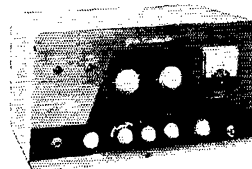
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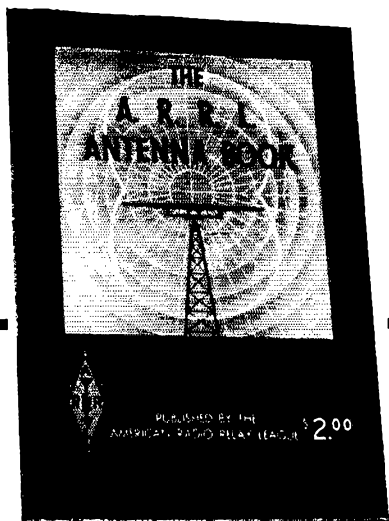
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score, but I had a lot of fun. I also arrived at some conclusions. Sometimes a greenhorn can notice things which the expert has grown so used to that he doesn't observe them any more. The rest of this letter might be called, "Observations From A Newcomer."

1. When an SS contestant calls CQ, and is answered by another station, who should have priority on that frequency when the QSO is finished? Maybe I am ignorant of SS procedure here, but it seems to me that common courtesy would rule that the ham who originally called CQ should be allowed to stay there if he wishes, and the other guy should move off four or five kc. before he blasts out with a call. Maybe someone else who answered the same CQ is waiting for his turn, because he needs that section.

2. What form of mental laziness is it which leads a few hams to use local standard time, instead of GMT? If they can't figure it out as they go along, they could set the old Ingersoll ahead five to eight hours (depending on which time zone they are in), and use that. It really messes things up, especially at that time of day when the date for GMT is a day ahead of the date for local time.

3. Some of these characters who have a bug that runs faster than their brains would accumulate more QSOs if they would take it a little easier. This is a case of the slower the quicker. More communication can be accomplished in a given time at a steady 20 w.p.m., sent once and understood, than at a sloppy 25 w.p.m., with everything sent twice, to be sure the other fellow gets it. Remember, fellows, a mistake may cancel half your score for that QSO, and you are not making such great speed, after all. A courteous and efficient operator will suit his code speed to the sending speed of the other party.

Well, I'm afraid the bug has bit me. I only got in 17 hours this year, but next year . . . — C.R. Aimes, W7IBR, Seattle, Washington.

CANADIAN POSTAGE

☐ Another VE/W Contest has come and gone and still QSLs continue to arrive asking for my card for WAVE (and WPX, whatever that is).

When I was operating under VE2XR I got the same flood of QSLs after each VE/W Contest.

I don't think that you W,K fellows realize that quite a postage bill is handed us VEs who take part in such contests.

At last, though, things are looking up. In the recent contest, two fellows, a W3 and a W8, out of all the other card-senders, sent me return postage! In so doing they guaranteed a return on their QSL by helping with the postage.

I would like to suggest at this point that you would do well to get yourselves a supply of Canadian postage stamps if you find your QSL returns on VEs poor. Just send a money order in Canadian funds in care of the Postmaster in any of our cities, together with a letter listing your requirements. If you want to receive your QSLs by first class mail (in sealed envelopes) the postage rate is 5 cents and is 7 cents for air mail. The postcard rate is 4 cents. Many happy returns! — Floyd G. Gribben, VE7XN, South Burnaby, B.C., Canada.

[Editor's note: VE7XN has a very good point. We should also point out that the ARRL QSL Bureau does not normally handle cards originating in the U. S. or Canada, so active hams in "rare" states and provinces get clobbered for postage after every contest.]

100 MILLIWATTS, S9

☐ An interesting and informative article entitled, "The Decibel", by E. H. Boden, in the October 1960 issue of the *Sylvania Industrial News*, includes a paragraph on the decibel in amateur radio.

Mr. Boden makes the point that a signal strength of 10 db. over S9 means that the transmitting amateur is using 10 db. more power than necessary for the level of perfect reception.

If the transmitter were working at 1 kw., the output power could be reduced to 100 watts and still have a top-level, first-class signal.

How many times have you heard the report, "You're coming in 40 db. over S9, old man"? If that report were really true, the transmitter could be reduced to .0001 of its output and still give an S9 signal! If the transmitter were at 1 kw., it could be turned down to 0.1 watt and still give an S9 report!

We all know how crowded the bands are. We all know
(Continued on page 130)

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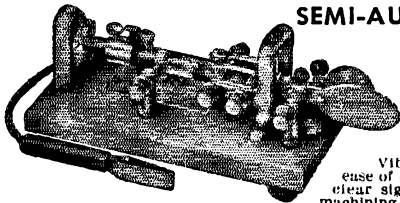
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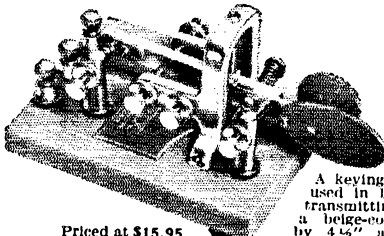
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how much high power interferes with others.

This leads to a suggestion for a new interpretation of the signal report of "X db. above S9". The new interpretation should be, "Reduce your power X db. We'll still have a fine QSO." This interpretation of a signal strength report can become a measure of courtesy amongst amateurs.

QST remains the same fine magazine that I have been reading for twenty years.—William H. Greenbaum, K2BGN, Elmsford, New York.

Ice Island Revisited

(Continued from page 43)

been the previous summer. Too close proximity to the auroral zone may have been responsible, or is it possible that the unusual ionospheric conditions had developed that far south? This W1-W7 work was the first instance on record of v.h.f. propagation beyond about 1400 miles on east-west paths during auroral conditions.

Another phenomenon which had been observed as early as the summer before was the behavior of "sky noise" of cosmic origin during blackout. The noise, which was as much as 6 db. above the receiver threshold on 6 and approximately 3 db. on 2, completely disappeared at the peak of the blackout. Drop-out of v.h.f. signals as well as h.f. is ascribed to ionospheric absorption, which not only prevents the usual reflection of radio signals, but also transmission of cosmic noise through the ionosphere window.²

While our Arctic operations have been temporarily suspended, we have hopes that our work will soon carry us back to the Polar Sea and permit us to carry on further v.h.f. work in the future. At the very least, we hope to have excited some interest in v.h.f. propagation in the Far North among the ham fraternity, and hope that all who find the opportunity for hamming in the higher latitudes may be induced to take part in this fascinating work.

QST

² Anderson, "Solar Particles and Cosmic Rays," *Scientific American*, June, 1960, p. 65.

Backfire Antenna

(Continued from page 50)

Yagi for optimum performance in the forward direction, add a backfire reflector, and sit back and enjoy a 6-db. improvement in the reverse direction. This is borne out by the writer's attempts to get a backfire array really going. It took some playing around with element lengths and spacings beyond that needed to make a Yagi work in the conventional manner.

Spacing of the reflecting plane away from the forward director for maximum gain varied with the element spacing, element length, and number of elements used. Furthermore, we found it difficult to get very much more out of a backfire system than could be obtained with the same number of elements, when the reflecting plane was used to replace the usual parasitic reflector, leaving the array with its normal directivity. Very possibly this indicates that we have not yet hit on the optimum element parameters for a backfire system — we merely mention this in

(Continued on page 132)

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G-63 utilizes double-conversion with 1st IF at 2065 for low image... 2nd IF at 263 with multiple tuned band-pass circuits for steep-shoulder response. Peaking-type "Q" multiplier permits IF response for CW to be varied down to 100 cps. Included are AVC, ANL, "S" meter, provisions for crystal calibrator. Cabinet is attractively finished in gunmetal gray with panel in black with satin aluminum trim.

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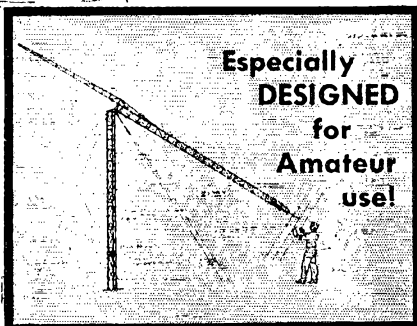
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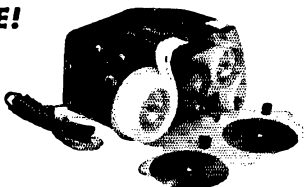
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NEW JERSEY

known amateur tendency to go off the deep end in a burst of enthusiasm over any new antenna idea.

Whether the backfire Yagi is worth the effort involved is something we are not prepared to say at this writing. Possibly come spring, and the urge to work outside again, we might be able to rig up a test setup less fraught with ham traps than our basement Lab, and thus come to some better conclusions about its basic merit. Meanwhile, it's something interesting to play with, and we commend it on that basis to anyone who is intrigued by novel ideas in antenna design.

Ehrenspeck states a belief that the special forte of the backfire Yagi is the gain range around 20 db. For much higher gain, a parabolic reflector may be desirable, and for 10 to 15 db., stacked-Yagi or collinear systems seem to hold the advantage. In favor of the idea it should be pointed out that much of the trouble in large amateur v.h.f. and u.h.f. arrays develops in the phasing systems. If these mechanical and electrical hazards can be avoided by using the backfire reflector to build up the gain of a single Yagi by a respectable amount, it may be worth consideration the next time you set out to revamp your antenna systems for those "coming" frequencies above 420 Mc. — E. P. T. QST

The AM-2

(Continued from page 59)

resistor cases on the side opposite the lugs. R_2 is then mounted on the front panel along with the meter and forward/reflected power switch.

To adjust R_1 , feed the transmitter output through the directional coupler to a matched load. Set R_2 at midposition and turn R_1 until the meter pointer is on "set." All further adjustments are made with R_2 , whose action is smooth and slow enough to permit setting the meter quickly and positively. QST

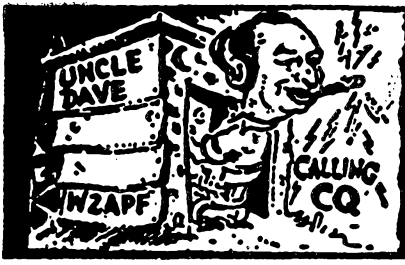
Donna

(Continued from page 54)

operators were K1AQI (EC), K1ONT and W1SCR. In Holbrook, W1SU (EC) and W1JLS held down the fort. In Quincy, RO W1ACB had the support of W1s ACB ALP WFQ WK MBA DOM YJG ILQ and LQ.

The usual complete report comes from EC W1BB of Winthrop, Mass., whose RACES organization was out in full force by 0800 Sept. 12, thanks to an efficient alerting system. RO WIDEL and deputy RO WIDLY immediately manned the control center in the Town Hall and proceeded to activate portable and mobile units at the main Evacuation Center and Community Hospital, plus set up a mobile emergency patrol. These stations reported in at 15-minute or half-hour intervals. Many important official messages were handled as evacuation of 400

(Continued on page 134)



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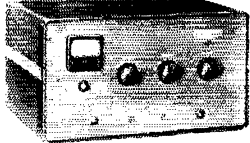
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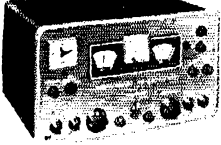


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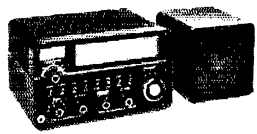
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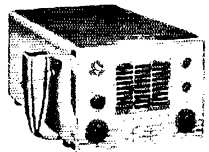
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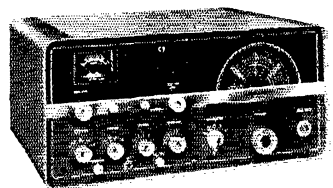
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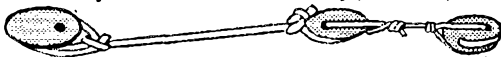
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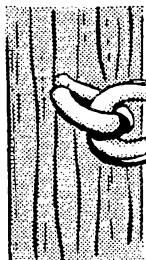
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Donna wasn't quite so rough in the northeast, but W1BB and his crew were able to be useful at the c.d. control center in Winthrop, Mass. Operators shown, left to right, are W1BB (EC & Comms. Dir.), W1DEL, W1DLY and W1JIL.

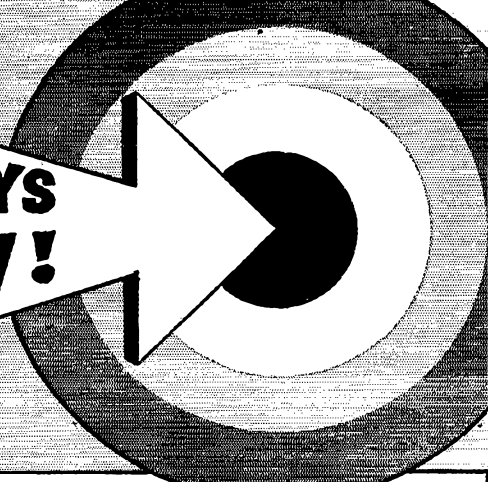
persons in low-lying sections and waterfront areas took place. Constant contact was also maintained with Boston Red Cross and other c.d. groups in the general area. W1BB reports the following amateurs participating, in addition to himself: W1s MQB TEO CMW HFJ BDU DQF UOC VIS OIR VSV IRV QA KAH JIJ IOO DGY JJI, K1s ECD KPD KYN MPB AIQ JIL LWF.

The Massachusetts Radio Emergency Corps was alerted at 0730 Sept. 12 by K1DAA. At 0755, c.d. headquarters in Rutland requested communications for the VA Hospital in that town. A control center was thus established at that point, operating on six and two meters, and maintained contact with c.d. headquarters at Rutland's Town Hall. Contact was also established with units in Worcester, Millbury, Sutton, Paxton, Shrewsbury and Auburn for a complete network, with additional units on standby. Main control was established under K1DAA, Worcester, alternate control at the VA Hospital, K1BRN, and command control units at W1DMI, Rutland c.d. headquarters and K1DAA mobile. Six, ten and 75 meter frequencies were used. Following the passage of Donna, damage reports were submitted by all stations and the net was secured. K1DAA mentions the following additional amateurs as having participated: K1s GKS LPI BAP GOQ KPU LXB MGK HSQ AUB KDP NFP MQF HRO LYD MKB LOA KGZ IQH LNX KEK PIY HUE, W1s AET ZAC M/J BGL BFE QKC JNA LSJ JGX.

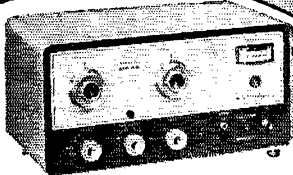
Over 100 Maine amateurs mobilized as Donna's diminished winds and torrential rains made themselves felt in that state. SCM W1JMN reports that at his station, which was AREC headquarters for the operation, direct lines were maintained to local and state police, fire departments, local and state c.d. and the Weather Bureau at Portland to keep up-to-the-minute tabs on the hurricane's progress and damage re-

(Continued on page 136)

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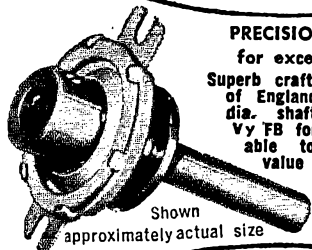


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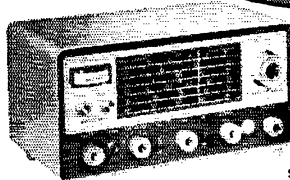
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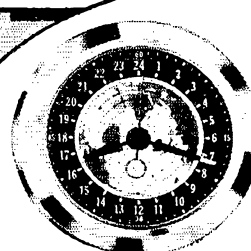


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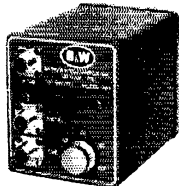
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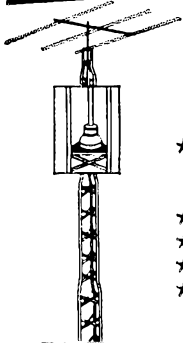
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ports. Most reports were considerably ahead of those being disseminated by commercial news services. Operation was on 3940 kc. Among amateurs doing outstanding work during this emergency were K1s BXI GVQ MJN, W1s QJA QQY and GRG.

The Eastern States Net handled 41 emergency messages during the period 0950 to 2100 on Sept. 12. W1FJJ took the brunt of the NCSing. Those who participated: W1s BXH DQV DTB EPV FJJ KRV NST QGU SMU WQI, K1s ARL JTL NTC, K2s CCF DCR ETS GQO KIR MFF MFW SIL SSX TPZ, W4s COO JXN, W3s GYP JKK NNL UIU WHK WV, K3s BVH IPA IPK, W4s ADD IA, K4TFL, VE2s AZI, W1 BB NT.

* * *

Almost every year, hurricanes come out of the Middle Atlantic to pose threats to Caribbean points and the eastern mainland of U.S.A. They usually follow a westward path until they reach a point somewhere southeast of Florida; then they might go anywhere. Sometimes they turn northeastward while still out at sea, and spend their fury completely over water into the North Atlantic. Sometimes they turn northwest, skip Florida and most of the east coast but sock New England and the Canadian Maritimes. Or, sometimes they don't curve north until they get well into the Gulf of Mexico, then give the Gulf States a pasting. One never knows. If any particular area could count on a hurricane each year, no doubt preparations would be more complete. As it is, this was Florida's first big hurricane in a number of years, and New England's first since Carol in 1954. By the time the next one comes along, we have almost forgotten the lessons learned in the last one. Disaster is very quickly forgotten by those who aren't particularly affected, which includes most of us.

With all her destruction, Donna gave many of us amateurs a refresher course in a great many things that most of us had forgotten — things like emergency-net organization and operation, net discipline, traffic-handling procedures and the like. Since Donna blew herself out in New England last September, amateur groups up and down the East Coast have held numerous critiques, set up new and improved nets, established better procedures, renewed official ties to make our services more efficient and more effective. If we have another Donna (Doris, Dagmar, Dinah, Drusilla?) next year, in the same places, we'll be better prepared. But if the lull between storms is too long. . . Alas, 'tis true, that wisest saying of all: "And this, too, will pass." QST

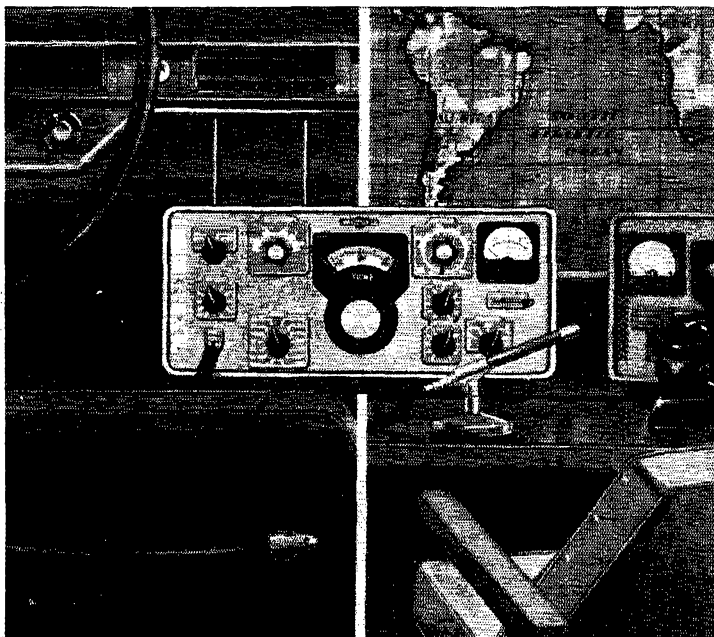
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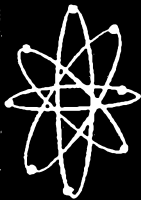
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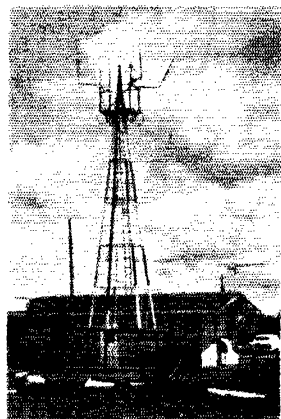
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Project OSCAR

(Continued from page 55)

satellites, and would "if only someone had a missile." Hicks queried Stoner, who countered with a definite proposal and a desire to help implement the program. With this, many more hams were added to the project, and the Association came into being. With the help of these, more detailed plans were formed. With no actual requests made, various electronic component manufacturers have donated enough parts to permit building the prototype beacon at no cost to the Association!

It is impossible to list all of those who have worked on the Project, but the Association now has representatives from five of the Radio Clubs affiliated with manufacturing concerns in the San Francisco Bay area as follows: Harley Gabrielson, W6HEK and Dick Esneault W4JC/6 of Philco; Bill Orr, W6SAI and Howard Hale, W6FYM of Eimac; Tom Lott, VE2AGF/6 and Keith Johnson, Novice-to-be, of Ampex; Stan Benson, K6CBK and Nick Marshall, W6OLO of Lockheed. The Foothills Amateur Radio Society, Inc. also has affiliated with the OSCAR Association, with Dick Schellenbach, W6TKX and Harry Workman, K6JTC as representatives. Milt Custon, W6MISO, a major in the USAF Test Wing that operates the Satellite Test Center at Sunnyvale represents the military amateurs of that organization. Perhaps the hardest worker on the team is Chuck Towns, jr. (K6LFH) Secretary, and the least employed is Bernie Barrick (W6OON) Treasurer! Bill Orr, W6SAI, has been appointed Publications Manager, and will be the official office for release of data from the Association. As the final configuration of the OSCAR transmitter is evolved, information on it and means for tracking will be published in *QST*. In addition, special bulletins will be transmitted over WIAW in order that the latest info will be available to those interested in this project.

What will the future bring to Project OSCAR? It is hoped that the concept of a civilian satellite is sufficiently attractive to merit consideration, and that a design can be conceived that will be a worthy contribution to the state of the art. Regardless of the fate of OSCAR, the official story will be in *QST*. — W6SAI **QST**

Strays

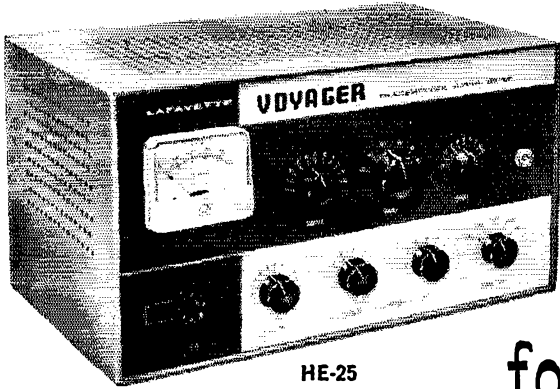
The February schedule for the Air Force MARS Eastern Technical Net, meeting at 1400 EST on Sundays, on 3295, 7540, and 15,715 kc., is as follows:

- Feb. 5 — Titration With H. F. Radiation.
- Feb. 12 — The Electronic-Emission Microscope.
- Feb. 19 — Electronic Test Equipment for the Blind Communicator.
- Feb. 26 — Patriotic Rearmament Through Education.
- Mar. 5 — Physics and Chemistry of Pure Metals.
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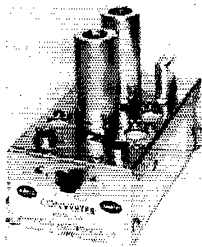
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Project OSCAR—Future

(Continued from page 59)

signal near 144 Mc., which would not interfere with missile separation equipment. This beacon transmitter would be keyed continuously with some form of identifying signal. If arrangements could be made, this "ham satellite" would be fired "piggy-back" on some future space shot.

Phase Two — An Orbital Repeater

The worldwide impact of the establishment of an orbital repeater which can be used by radio amateurs of all nations is something that is difficult to assess in advance, but could be another important step in the determination of the United States to make its space research of benefit to all nations.

At first glance, the establishment of an orbiting repeater seems like an undertaking that would require a considerable expenditure of funds. This need not be the case, for the system to be suggested is so simple in comparison to space vehicle equipment presently being used or under development that its inclusion in a larger system would be, at worst, a minor complication to the over-all system. The technique of adding instruments to existing spacecraft is a common one now, and it is now possible to use the "piggy-back" technique for orbiting several objects from a single injection vehicle.

Thus, the second phase of the OSCAR Program could be to orbit a satellite containing a mobile-relay or repeating type of amateur radio station. The device would be activated by signals within the 144-145-Mc. portion of the band. After amplification and demodulation, the received signal would be used to modulate a transmitter operating in the 147-148-Mc. segment of the two-meter band. The exact frequencies would be pre-determined to preclude the possibility of interference with control and separation equipment.

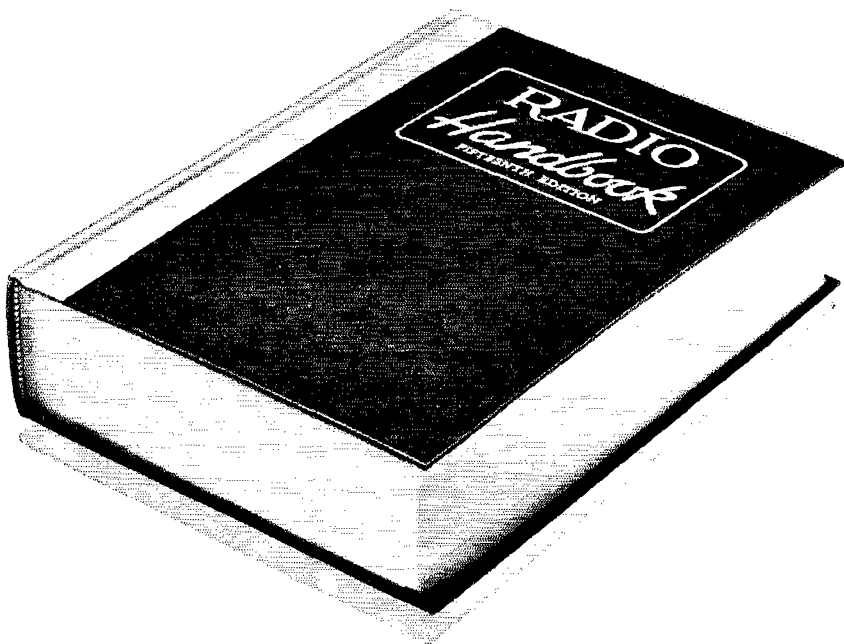
The choice of the amateur frequencies is not a random one. The system performance can be easily predicted on the basis of information learned through 108-Mc. experiments. The receiving and transmitting frequency separation is necessary to minimize cross-modulation and overload problems. The most important reason for the selection of these frequencies is that it permits amateurs in Regions 1 and 3 to operate and participate in the program by utilizing world-wide amateur allocations as set up by the International Telecommunication Union. The use of frequencies between 144 and 145 Mc. to activate the relay would also serve as an incentive for Novice and Technician licensees in the United States to

(Continued on page 142)



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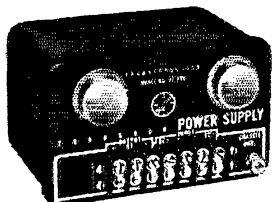
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By using simple control techniques (tone, time sequence, etc.) it is possible that amateurs could have facilities to activate or deactivate the transmitter in the event of unwarranted or improper procedures in operation during orbit. These same control points, by use of tape recorders, would be in a position to gather unlimited data without the need for mountains of reports, which would require tabulation.

The block diagram, shown in Fig. 1 on page 59, is similar to a proposed "phase-two" repeater. The power for this equipment would be a series of rechargeable cells supplying 28 volts at 100 ma. The vehicle body would support many shingles of silicon solar energy conversion cells used to maintain the charge on the batteries during "bright" (sunlight) periods. A decoupling diode is used to disconnect the solar cells during the passage on the dark side of the earth.

The command and intelligence receiver consists of a crystal-controlled front end set up for approximately 144.5 Mc. The converter section feeds a 10.7-Mc. i.f. amplifier with a bandwidth of 50 kilocycles. A second conversion stage heterodynes the input signal to 455 kc. and this amplifier has a bandwidth of 6 kc. Signals in the 10.7-Mc. amplifier channel also continue on through a limiter-discriminator system. The output of this circuit is a d.c. automatic frequency control (a.f.c.) voltage which is fed to the second conversion oscillator to correct for doppler frequency shift.

The detected audio, from the 455-ke. amplifier, drives an audio amplifier and reed-bank in the coding section. The coding reeds are resonant between 200 and 400 cycles and have a bandwidth of approximately 2.8 cycles. Two reeds are series connected and used to trip the controlled rectifier, which in turn applies power to the transmitter and modulator. Thus two discrete audio frequencies are required to energize the transmitter.

Upon application of the correct command signal, 28 volts is applied to the modulator and the 147.5-Mc. transmitter. The transmitter is also shown in Fig. 2 and uses three silicon triple-diffused mesa transistors operating as a 73.75-Mc. oscillator, 147.5-Mc. buffer-doubler, and 147.5-Mc. power amplifier. This transmitter would be capable of delivering 750 milliwatts (0.75 watts) to a 72-ohm antenna.

The 144.5-Mc. signal received by this transponder satellite is also used to modulate the 147.5-Mc. transmitter in addition to providing control functions. At an altitude of 400 miles, the transmitter would be able to cover one-half

(Continued on page 144)



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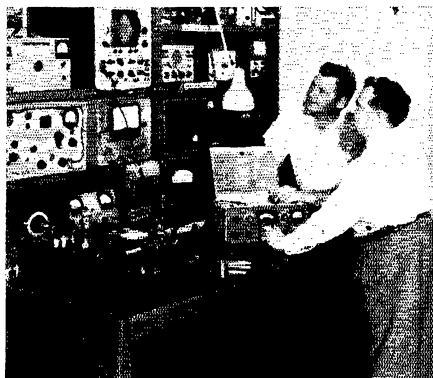
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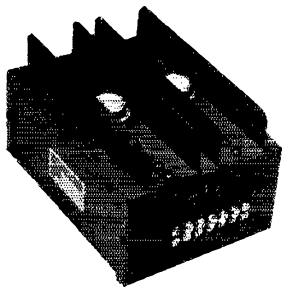


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of the United States. Messages originating on one coast could be retransmitted through the phase-two equipment to the midwest. On the next "pass" OSCAR would again spring to life and relay the message, held by the midwest amateur, on to the other coast. Like the NASA vehicles mentioned earlier, the phase-two equipment might also contain tape equipment for delayed repeating. Just imagine the thrill of hearing the words of an amateur in New Zealand, the Union of South Africa, or Denmark, which had been recorded on the satellite minutes earlier!

OSCAR satellites could also contain provision for 108-Mc. tracking transmitters. Besides indicating when the satellite is within receiving range, the transmitter would provide information to "Minitrack" installations on the altitude, orbit apogee and perigee, plus telemetered data, if desired.

The possibility of a *coherent repeater* has also been suggested. This aspect of repeater systems has not been exploited as yet and it should be an interesting experiment for space communication technology. The development of a medium bandwidth repeater system, which would preserve relative frequency spacing of input signals, would provide the basis for many interesting communications experiments.

A coherent repeater is similar to the phase-two equipment. The input signal, on 144.5 Mc., would be heterodyned to 10.7 Mc. At this point, however, the signal would be shifted to 13.7 Mc. rather than 455 kc. The 13.7-Mc. energy would be heterodyned back up to the two-meter band by a signal supplied by the first conversion oscillator. Thus signals appearing on 144.5 Mc. would be "translated" to 147.5 Mc. In actual practice the system bandwidth would be approximately 100 kc. at the 3 db. points so that signals as far as 50 kc. away from the center frequency would be heterodyned to the high end of the band. Thus many amateurs could use the coherent repeater at the same time.

Although this system is somewhat more complicated than the phase-two equipment described earlier, it is practical and, in fact, has been used for some time. One problem is the increased system bandwidth which tends to decrease the receiver signal-to-noise ratio. In addition, spreading the transmitter power over a band of frequencies results in less energy content for each signal. In effect the signal strength of the translated signal depends on the amount of traffic being handled by the satellite. One other minor difficulty occurs in this system, also. Since the doppler shift will be different for each station, it is not likely that automatic frequency control

(Continued on page 146)

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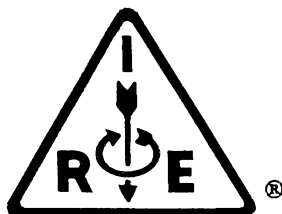
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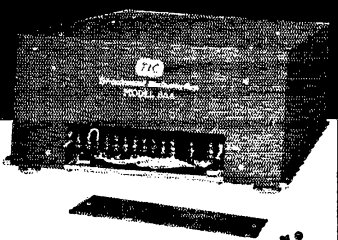
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systems could be incorporated. Thus the ground station would be required to compensate for a "double doppler" effect. What it boils down to is that more sophisticated amateur equipment will be required to communicate via the coherent repeater.

You And OSCAR

There is no other group of 200,000-plus persons with the technical knowledge or the equipment to carry out the OSCAR program. With all available amateurs contributing to the effort, it would be possible to supply the scientific world with volumes of communication data gathered by observing and using the OSCAR satellite.

One of the important initial steps on the part of the amateur fraternity is the construction of OSCAR "beacon transmitters," by individual amateurs or as club projects. It is possible to obtain 20 milliwatts output or more using inexpensive entertainment-type transistors. As pointed out earlier such a transmitter is capable of projecting a 144-Mc. signal for several thousand miles, being limited only by obstacles in the line of sight path. A suitable OSCAR beacon which can be built for less than \$15.00 is to be described by the author in *QST* next month.

These beacons can be powered by dry cells and located on mountain tops. For active experience in tracking and range testing, the OSCAR beacon could be carried aloft by small balloons. The weight of a suitable OSCAR beacon could be reduced to 8 ounces or less, including the batteries. Amateurs who own private planes might be able to place a beacon external to an aircraft. Operating near the service ceiling of the aircraft, such a transmitter would provide valuable tracking experience.

The purpose of these experiments, of course, is to check the reception range of existing equipment and to provide training for the amateur operator. The information gained from such experiments would be helpful in observing and using OSCAR later on.

The author would like to express his thanks, and those of the amateur fraternity as a group, to Mr. Ray Meyers, W6MLZ, and Dr. Henry Richter, jr., W6VZA, without whose help the OSCAR project would never have been realized. Their assistance in preparing this article is also greatly appreciated.

QST

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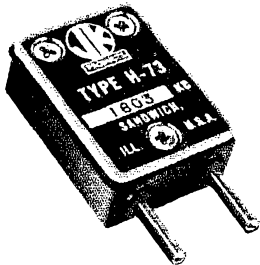
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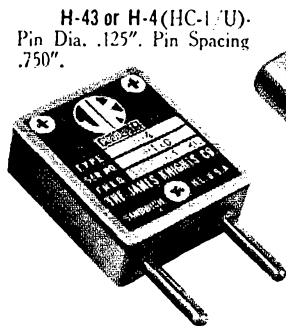
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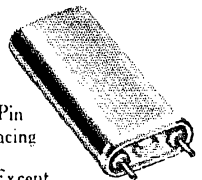
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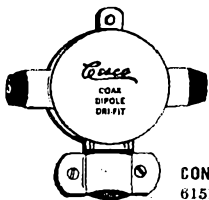
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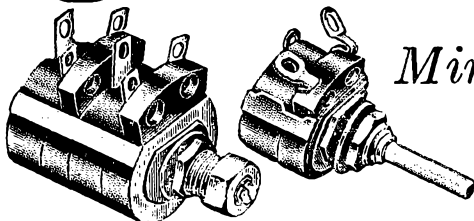
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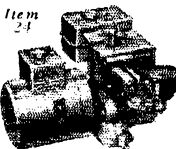
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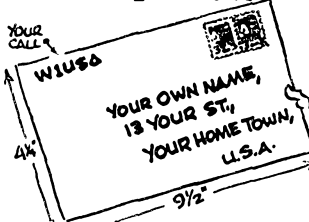
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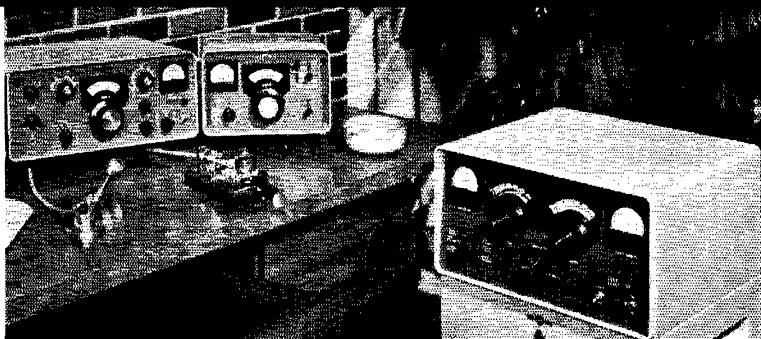
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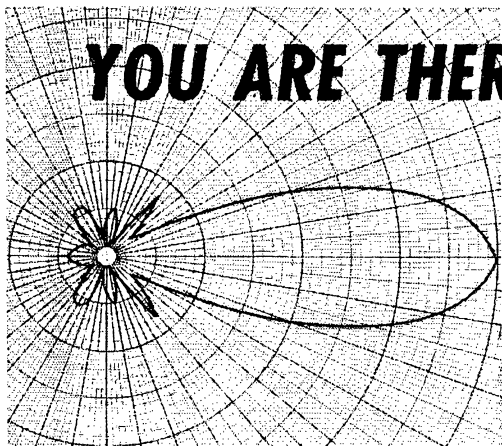
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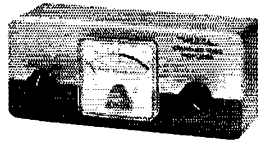
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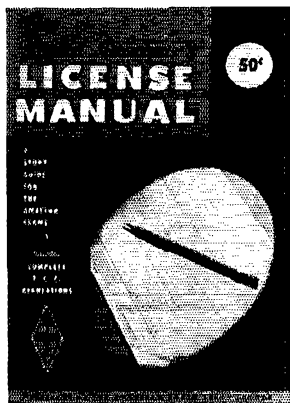
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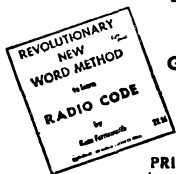
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HAM-ADS

(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 with 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 non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. 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.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

COAXIAL Cable. New surplus RB-54A/U, 58 ohms impedance —30 ft. prepaid, \$1.00. Radio magazines, buy, sell, trade. R. Farmer, 3009 No. Columbia, Plainview, Texas.

WANTED: All types of aircraft or ground rcvrs, xmtrs or test equipment. Also large xmtr or special tubes needed. Ham gear bought and sold. For immediate action for cash write or phone Ted Dames, W2KUW, 308 Hickory St., Arlington, N. J.

MOTOROLA used FM communications equipment bought and sold W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

WANTED: Military or Industrial laboratory test equipment. Electronics, Box 399, Mt. Kisco, N. Y.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, WBRP, Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, WIBYX, Rockville, Conn.

CASH for your gear. We buy, trade or sell. We stock Hammarlund, Hallicrafters, National, Johnson, Gonsel, Globe, 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.

"PIG-IN-A-POKE" Not if you visit Ham Headquarters, USA and see and choose from the hundreds of "like-New" bargains in the world-famous Harrison Trade-in Center. More for your money, because tremendous turnover makes lower overhead! Terms, trades. Send postcard for mouth-watering photograph and price list O-6. For the best in all new and used equipment, it pays to come to "Ham Headquarters, USA" BCNU, 73, Bij Harrison, W2AVA, 225 Greenwich St., New York City, N. Y. KWM1 and a few high plate dissipation tubes wanted, 304T/TH 4-1000A, 4PR60A, etc. Ted Dames, W2KUW, 64 Grand Place, Arlington, Va.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Globe, Gonsel. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halsted St., Chicago Heights, Ill. Tel. SKyline 5-4056.

WANTED: Old time commercially built and unaltered amateur spark transmitting and audiotone receiving equipment. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Authorized factory service station for Collins, Hallicrafters, Hammarlund, National, Harvey-Wetzel. Our twentieth year, Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

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 "Sidebander", to SSBARA, 15 Elm St., Lynnbrook, N. Y.

WANTED: 6 to 12 304T tubes, Callanan, W9AU, P.O. Box 155, Barrington, Ill.

ATTENTION Mobilizers! Lecco-Neville 6 volt 100 amp. system, \$50; 12 volt 50 amp. system, \$50; 12 volt 60 amp. system, \$60; 12 volt 100 amp svst. \$100. Guaranteed no ex-police car units. Herbert A. Zimmermann, Jr. K2PAT, 115 Willow St., Brooklyn 1, N. Y. Tel. Dickens 2-9121 or Jackson 2-2857.

DISTINCTIVE QSLs! Largest variety samples, 25¢ (refundable); Callbooks (Winter), American calls, \$5.00; Foreign calls, \$3.00. Religious QSL samples, 10¢. Rus Sackers, W8DED, Box 218, Holland, Mich.

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. Quality and economy complete samples dime. QSL Printing, 4319 Wuthering Heights, Houston 45, Texas

QSL-SWLS. Reasonable. Samples 10¢. Glenn Print. Ait: M. L. Edmonds, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLs "Brownie." W3C1I, 3110 Lehigh, Allentown, Penna. Samples, 10¢ with catalogue, 25¢.

C. FRITZ for better QSLs! Samples 10¢. P. O. Box 1684, Scottsdale, Ariz.

QSLs-SWLS. Samples 10¢. Malgo Press, 1937 Glensdale Ave., Toledo 14, Ohio.

QSLs. Faster for less. Catalog 25¢ (refundable), samples for stamped envelope. Crawford, K6GJM, Box 607, Whittier, Calif.

QSLs. Economy prices, prompt delivery. Send for samples. W71TZ, Press, Box 183, Springfield, Oregon.

QSL-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

QSLs Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLs. Taprint, Union, Miss.

SUPERIOR QSLs, samples 10¢, Ham Specialties, Box 3023, Bellaire, Texas.

QSLs, 3-color glossy, 100—\$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., New Brunswick, N. J.

PICTURE QSL. Cards of your shack, home, etc., Made from your photograph, 1000, \$13.00. Raums's, 4154 Fifth St., Philadelphia 40, Penna.

QSLs-SWLS, reasonable prices. Samples 10¢. Robert Bull, WIBXT, Arlington, Va.

QSLs-SWLS. That are different, colored, embossed card stock, and "Kromekote." Samples 10¢. Turner, K8A1A Box 953, Hamilton, Ohio.

QSLs, SWLS, XYL-OMs (sample assortment approximately 94¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypical, snazzy, unparagoned cards (Wow!), Rogers, K8AAB, 1200 Marshall Ave., St. Paul 4, Minn.

GLOSSY QSLs, 100, 4 colors, \$3.50. Others less, Samples 10¢. Dick, W8VXK, 7373 No. M-18, Gladwin, Mich.

DELUXE QSLs. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSLs. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLs-SWLS, 100 2-color glossy, \$3.00; OSO file cards, \$1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLs-SWLS. Free Samples. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLs. Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

OUTSTANDING (1 1/2 Call) QSLs. One style; 100, \$2.75; sample free. Garlep, 2624 Kroemer, Fort Wayne, Ind.

QSLs? Stamp, Pearce, 192 Osborne, Danbury, Conn.

RUBBER Stamps for hams, sample impressions, W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

TRI-COLOR QSLs, \$3.50. Dime. Filmcrafters., Box 304, Martins Ferry, Ohio.

QSLA Samples for stamp, M. Peterman, 7627 Stickney, Wauwatosa 13, Wis.

QSLs. Large selection styles including photos. Lowest prices. Fast service. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

RUBBER Stamps, \$1.50, Call and address. W2UDO, 32 Cumberland Ave., Verona, N.J.

QSLs. Attractive, colorful. Variety type styles, backgrounds. Samples 10¢. Jack Crandall, K6QAO Press, 5013 Enfield Ave., Encino, Calif.

QSLs: Cartoons, colors, samples 25¢. Chris, W9PPA, 365 Terra Cotta Ave., Crystal Lake, Ill.

DON'T Buy QSLs until you see my free samples. Bolles, 7701 Finsdale, Austin 5, Texas

QSLs. Samples dime. Printer, Corwith, Iowa.

QSLs, 100 3-color, \$3.00. Sample sheet, 10¢, RBL Print M.R. 12, Phillipsburg, N. J.

QSLs, 300 for \$3.95. Free samples, W9SRR, "George", RR #1, Box 208-A, Ingleside, Ill.

EYECATCHING QSLs—quick! Dollar-saving sample. Dime. Rad'Oprint, Ojai, Calif.

QSLs: Samples 25¢ (refundable), W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

FAST Service! Send stamp for QSL samples. K2 Press, Box 372, Mineola, L. I., N. Y.

MAKE Your own photographic QSL cards. Complete kit of materials. Albertson, W4HUD, Box 322, High Point, N. C.

QSLs: \$1.75 per 100 postpaid U.S. only. Glossy, red and green. All orders mailed within 10 days. Free sample. Hobby Print Shop, Umatilla, Fla.

QSLs. Stamp brings samples. Eddie Scott, W3CSX, Fairplay, Md.

RUBBER Stamps for hams, sample impressions, W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

QSLs you'll like. Samples 10¢. Dupli-Press, 1367 Gary St., Merritt Island, Fla.

TRI-COLOR QSLs. \$3.50. Dime. Filmeratters, Box 304, Martins Ferry, Ohio.

QSLs. SWLS. Rubber Stamps, samples 56. Nicholas & Son Printery, P.O. Box 11184. Phoenix, Ariz.

QUALITY QSLs. Latest designs, samples 10¢. Savory Press, 172 Roosevelt Rd., Weymouth, Mass.

QSLs-SWLS 3-colors 100 \$2.00. Samples dime. Bob Garra, Lehighton, Penna.

QSLs, reasonable, nice designs, samples dime, W2DJH Press, Warrensburg, N. Y.

3-D OSL cards. Excitingly different! \$3.95 first 100. Samples, 25¢. 3 D OSL, 5 Wood End Rd., Springfield, Mass.

CARDS! OSLs-WPE Gag, business, Photo, rubber stamps, Labels, stationery, samples dime, Riestland, Del Mar, Calif.

WANTED: Collins mechanical filter adapter, 353E1 or 454A-1, also filters, 500B-1, 500B-31, 500B-60, Crosby, 67B sideband converter, VE3VG, 47 Parkwood Ave., Toronto 7, Ont., Canada.

CANADIANS! Pacemaker \$350, 75A-4 serial 4065 with 312A-1 loudspeaker control box 31 and 5 filters with instruction books, \$600; Jones MicroMatch Mod, 263, \$50; Shure 700A crystal microphone w/stand \$15. All in like new condx, new special price for the works. VE3EDR, 600 Catherine St., Ft. William, Ontario P., Canada.

WANTED: Back issues of QST from first issue 1915 to December 1929, and January 1960 to July 1960, K3NCU.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N. C.

KWS-1, SC-101 integrated control unit and 75A-4. A complete and superb station in top condition. Package \$2000. W2ADD.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Notice, \$1.50; General, \$1.75; Extra, \$2.00. Way pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

LOWEST Prices! Latest amateur equipment. Factory fresh sealed cartons. Self-addressed, stamped envelope for lowest quotation on your needs. HDH Sales Co., 919 High Ridge Rd., Stamford, Conn.

COMPLETE File of QST for sale: 1915-1951. Landa, R2, Clayton, Ga.

TORRIDS: Unused 88 mhy like new. Dollar each. Five, \$4.00, pp. DaPaul, 101 Starview, San Francisco, Calif. After Sept. 1st our address will be at 309 So. Ashton, Millbrae, Calif.

LONG Island tube headquarters. We stock more than 1000 types of tubes. Surplus and recent production at maximum discounts. Maritime International, 199 Front St., Hempstead, L. I., N. Y., Tel. IV 6-2040.

BEGINNERS: Code memorized in one hour. New method. Used in Armed Services, Ham radio, Scouting. "Ketchum's Hour Code Course", \$1.00 postpaid. Money back guaranteed. O. H. Ketchum, 10125 Flora Vista, Bellflower, Calif.

WANTED: Cash for surplus tech manuals, one or one hundred. State condition and equipment type. W4FXO, Box 2513, Norfolk, Va.

BUY, Sell or Trade, short-wave ham receivers, transmitters, Trigger, W9IVJ, 7361-1/2 W. North Ave., River Forest, Ill., Chicago, Phone TUxedo 9-6429. Monday-Friday, 12 N-9 PM; Sat., 9 AM-5 PM.

SELL: BC348N, \$50; BC314G, \$39; BC455, new, \$10; used, \$6.00; Precision E200-C, \$45.00; DB23, \$35; parts for sale. Stamp for list. M. J. Marshall, 455 Washington Ave., Dumont, N. J.

HT32A, 75A3, quad, \$800. W2MHL.

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.

COLLINS: 32S-1, \$510; 75S-1, \$410; 30S-1, \$1175; 312B-4 console, \$150; 516F-2 AC supply, \$90. K2TXR, 83 Burhans Ave., Yonkers 2, N. Y.

HT33A Hallicrafters Kilowatt Linear: new in Oct. of 1959. Clean, excellent, \$595.00. Need the cash. W2PMR, 433 Abington, Bloomfield, New Jersey.

KWS-1, first come, first served! \$900 you pick it up. Virgil Shaffer, 3165 Grove Court, Cedar Rapids, Iowa.

FOR Collins in Detroit Area, it's Michigan Ham Headquarters, also a large selection of trade-ins on display. M. N. Duffy Ham & Electronics, 2040 Grand River, Detroit 26, Mich. Tel. WO 3-2270.

SELL QST 1936-1959 run, four or more, 25¢ each. W0MCX, Art A. Jablonsky, 1022 N. Rockhill Rd., Rock Hill 19, Mo.

TRANSFORMERS (3) W2EVL Special, \$3.00 PP. Coils E1 thru E7. 3 forms template for "W2EVL Special", \$10.95 PP. Vitalo, W2EVL, Denville, N. J.

WANTED: Panoramic adaptor or similar display device for use with 455 K1F receiver. W8HML, R. J. Steiger, 1953 Lakeview, Trenton, Michigan, Tel. OR: 6-5924.

WILL Trade Collins S Line 32S1 (with noise blander); 30S1, 312B4; MM-2 scope. All for late model car plus cash, if necessary. K7EPD, 3850 E. Elm St., Phoenix, Arizona, CR 9-2824.

HAM License prep, resident courses, Novice and General classes: 3 evenings weekly. Delehanty Institute, 117 East 11th St., New York 3, N. Y., Tel. GR 3-6900.

TOWER: Self-supporting and telescoping. All controls, Boston ratio motor (115/220V) included. Raise antenna from 20 ft. to 55 ft. W6SA design, GO Nov. 54. Cost over \$855. Make an offer. Inquiries and Irwin Tryon, W3WFR, 1245 Earford Drive, Pittsburgh 27, Penna.

WITH "Dip-A-Cap" and your grid dip meter, range 1.7 to 85 mc, measure capacity 3.0 to 7000 micromicrofarads easily and quickly. \$3.50 each. E. M. Shook, W5IT, 227 West Woodin Blvd., Dallas 24, Texas.

TELETYPE Model 36, in perf. condx, \$85. Terminal unit for receiving, \$20.00. W1QPM, 349 Union St., Leominster, Mass.

DX-100, gud condx, modified for SB10, \$160; SB10 A-1 condition, \$90. F. Graening, W9KHS, Tremont, Ill.

FOR Sale: New B-W Mod. 3R1 TR switch; cost \$60; asking \$40. New Elco 60 watt ultra hi-fi amplifier, cost \$72.95. Asking \$50. New Weston Mod. 425 O-3ARF, \$12; used, like-new, Simpson \$21.00; R-303 VTM, cost \$297, asking \$40. New Altec 408A Biflex spkr, \$17.50; used Craftsman 10-watt hi-fi amp, \$20. Slightly used A-1, 4-1000A tubes, \$50 each, two for \$75. Ernest Vordermark, WALF, 1604 Market St., Jacksonville, (1), Fla.

COLLINS: KWM-1, AC supply, \$595; 51J2, \$495; 51J3, \$675; 75A2, \$275; 75S2, \$525; R-390A, HT32A, \$475; Vallant, \$299; Ranger \$21.00; R-303 VTM, cost \$297, asking \$40. Paradox, \$125; BC-610-1, \$295; HRO-60, \$325; HRO-50T1, \$225; Northern Radio VFO, \$125. Want teletype equipment for cash, or trade for new amateur equipment. Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

APACHE (9 mos. old), \$200; HQ-100, \$125, 2-el. 20M Telrex \$118. Enclosed rack, 6 ft., \$20. W2FOR.

FOR Sale: Johnson Vallant, \$300; HRO-50T, w/spkr and 4 coils, \$225; Matchbox, \$30. Or all for \$450.00. F.o.b. All in gud condx. Ed Perkins, W0OHI, 625 Roosevelt Ave., Loveland, Colorado.

ALUMINUM for every ham need! Write to Dick's, 62 Cherry Ave., Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

RME 4303 Transceiver, Ch. 4, no license required, \$65.00. Rt. 1, Box 67, Ritzville, Wash.

KWM-1, D.C. pwr. supply, mount and cables, in mint condx, \$250.00. W2KHV, 80-30 256th St., Floral Park, L.I., Fieldstone 7-4701.

CADILLAC, 1957 Sedan Deville, all powers, with AF67, PMR6A, power supply, dynamotor & whip. Car and rig in perf. condx. Best offer over \$2500. Will sell car or rig separately. M. Maltz, 867 E. 8th St., Brooklyn, N.Y.

HALLICRAFTERS SX88 receiver, \$275.00. F.o.b. Real buy for the enlightened. W3VXE.

SELL Hy-Gain 2-elements Tribander 10-15-20 with Gamma-match, \$30; mike D-104C Astatic, \$10; Gil Vazquez, K2YFO, 522 West 136th St., New York City, Tel. TO 2-6979.

FIRST Certified check or money-order for \$350.00 takes spotless Viking Vallant, Matchbox, low-pass filter, mike w/stand, W9RTB, 1551 Ohio Ave., Whiting, Ind.

FOR Sale: Complete 500W, SSB station: GSB-100, HQ-170, factory-wired linking Courier, 8 mos. old, w/ demo, demonstrate. K2GYF, Philip Margulies, 9 Pine Ct., Westfield, N. J.

DX-100, newly retubed in RF section, including final, time sequence keying, \$145.00, including delivery within 60 miles radius from Grand Rapids. Settergren, 1249 Hope S E, Grand Rapids, Mich.

GENERATOR, Gasoline(Ucep) engine; PE-95G (See Dec. 1960 QST); conservatively rated 10 KW, 120/240V AC, 60 cycles, single phase. Write for details. M. Eisenstark, WA2LAG, 4022 Arvinson Ave., New York City 66.

FOR Sale: DX-40 and VF-1, FB condx. Best offer. K0TQI, Rte. One, Elk River, Minn.

SELL 3-Element Hy-Gain beam, in perf. condx, \$150.00; brand new mounting brackets for Elmac AF68 and PMR8, \$100.00. F.o.b. Roosevelt, N. Y. Dr. Mortimer D. Solomon, K2MYW, 41 West Brook Lane.

HEATH Sideband adapter, SB10, like new condx, wired with cables and connectors; manual. First \$79.50 takes it. W6UCL, 5724 8th Ave., Sacramento 20, Calif.

HALLICRAFTERS SX-101, Mark IIIA, in exc. condx, R-46B matching spkr, \$299.00. G. Garceau, 3 Chatham St., Hudson, N.H.

FREE D104C mike, in perf. condx. Hear it on 20 SSB; HQ170, spkr, clock, \$30; Apache \$250; SB10, \$75; TA33JR, \$50; ARK2, \$25.00; 40 ft. telescoping mast, \$10; will ship everything freight collect for first money order. Nov. 5, \$60.00. Mike is free to purchaser. E. B. Buchanan, K5GWX, 931 E. Park Row, Arlington, Texas.

HQ-110, \$160.00. Globe Hi-Bander, \$85.00. K3EAN.

SELL, 20A, \$225.00; 458 VFO, \$25.00; 600L, \$325.00; 75A3, \$325.00. All guaranteed like new. W9ARI, #1 Flectwood Dr., Muncie, Ind.

COLLINS 32S1, used only a few hours, in box with warranty card; \$499. Will finance. No trades. W3HCG, 3708 Tanlewood Drive, Bethesda, Md.

TCS Receivers, gud, as is, \$18.50; cables \$1.10 ea.; 12V dynamotor supplies (xmtr and rcvr), \$4.00 complete. Bertrand, W6OOS.

POLICE Monitor: BC-603 FM rcvr, Tunes 32.0 to 40.3 Mc 10 adjustable push buttons and continuous tuning, squech, both 12V DC and 110V AC. Excellent. \$45.00. F.o.b. Madison, Wis. K9CPT, 208 Gilman House, Madison 10, Wis.

FOR Sale: QSTs Dec. 1929 through December 1959, best offer. Must sell all or none, sry can't break run; Hallicrafters \$388, \$55.00; Heathkit crystal mike, \$15.00; Channel Master 8 transistor radio, \$59; 2A62 rectifier, \$35; Novice band stals, \$5. Set of Lionel trains inc. including equipment (\$250 value), will trade or buy 3-el. Hy-Gain Thunderbird ant. K3NCU, Thomas Lesher, 25 North Markin, Elizabethville, Penna. Tel. EN 8-8314.

FOR Sale: SX-100 w/spkr, \$165; Viking Pacemaker with mic, TR and 14AV vertical ant., \$250.00; 1.2 Kw pwr. supp., \$50.00; B&W 850A with 2A62 ant. and fil. nrm sockets, chassis, \$40. Both with cabinet: \$80. Thomas Stern, 50 Branford Ave., Groton, Conn.

WANTED: Old-time wireless receivers, xmtrs, etc. Magazines, books, wire prices and description. W5WB, 702B N. Fillmore, Amarillo, Texas.

MOBILE Or fixed AF67, \$110; PMR7, \$105; M1050, \$40; 6, 12 or 110V., all for \$220.00 with plugs and cables made up, and coax ant. relay thrown in. Will ship. K5BPA, W. Stroud, Rt. 2, Box 45, Elton, Louisiana.

FOR Sale: Viking Valiant, factory-wired. Bought new from Federated Purchasers last June. Very little use. \$325.00. K&W, Dick, 228 Jefferson Ave., Scranton, Penna.

CO Discerning individuals. Need college, not DX. Sell: Ranger SX-99. Both operate perfectly. Accessories included. Fairest bid closes transaction. W2VEA, Joseph Friedman, 75 Lenox Rd., Brooklyn, N. Y. Tel. UL 6-5950.

SELL: Hallcrafters SX-99, perfect, \$85.00; Eico sp. generator 320, \$15.00; Electro-Voice mike, 729, \$9.00; Rider Sight-N-Sound Course, Novice, \$5.00. B. Duffe, 93 Michael St., Ileslin, N.J.

SELL: Two selsyn motors. Both \$13.00, postpaid. Andrew Travis, 2002 West 8th, Austin 3, Texas

MUST Sell for college money: Complete AM, CW & SSB station, Lakeshore Phasemaster Deluxe trans, \$80; brand new used, 2 hrs; DC-20, \$30; RME20, revr, \$85; RME D37, 335; Lakeshore signal splitter, \$20; Heath, Q multip., \$7.00; Vibroplex, 8C; xtal mike, \$3.00. Would prefer package deal at \$225.00 but will sell separately if necessary. All letters answered. J. Mohr, K9IAE, Box 564, Haywari, Wis.

SELL: Heathkit GC-1 all transistor rcvr. prof. wired. \$89.50. Carlton Stewart, Brooklyn, Me.

SALE: LM freq. meter, matching pwr. supply, calib. book and xtal, \$60.00; KW P1813 transmitter, El-tronics band-switching VFO, Variac controlled power supply, P811A modulator with separate hi-voltage supply, Moni-match, fully metered TVI suppressed, speaker, amplif., HDV-1 coils, for 80, 100, 150 volt ranges, \$50; M150, \$15; M140, \$10; mikes: Shure 505T, \$15; 102C, \$10; American D4T, \$15; 630, \$15; E-V 205S, \$15; 5 in. scope, \$30. Want: KWM-1, II, K6BNJ, 14979 La Cumbre Dr., Pacific Palisades, Calif.

WANTED: 75S-1 and 32S-2 with 516F-2. Will swap, practically new. Linhof Supertechnika III E 4 x 5. #58218 with Apo-Lanthar 4.5/150 mm; Angulon 6.8/90 mm; Tolomar 5.5/360 mm; optical multifocus viewfinder; 120 film pack adaptor; 4 filters; 1 Polaroid lens; sunshade, heavy-duty tripod; carrying case, etc. H46BJ, 216 Halemaumau St., Honolulu 16, Hawaii. Phone 3-3405.

SELL: NC-98 w/VFO, \$98; TCS-12 xmttr rcvr w/ps, complete, \$75; new TCS-13 w/ps, \$60; xmttr, \$342B, \$55; Johnson mobile VFO, \$30. Want: sp. 90 and APS90, APR1 rcvr, cash or trade. Al Johnson, 67 West 10th St., Hialeah, Fla.

QSTs Wanted: December 1915; January through June, 1916; April 1917; July, August, September 1919; September 1920; January, April, June, July, 1922; April, 1923. Exchange or sell 52 old issues. SASE for list. W4KS1, 15 George St., Littleton, Mass.

WANTED: Copy of December 1954 QST, VE4PR.

MAGNIFICENT HT-32A, no finer condition anywhere. All instructions. Will ship in original carton for \$490.00. 6M Communicator, 111 in perf. condx. All cables, instructions, and new PTT microphone. Will ship in orig. carton for \$180.00. Going to college, no time to use. Ed Senior, K7CLX, Tern Hall 406, Stanford, Calif.

PHASEMASTER II-B, in exc. condx, year old. \$300; Tecraft 2M converter, 14-18 Mc. I.F., \$30.00; Eldico mobile 2M xmttr, \$35.00; pwr. supply, \$15.00, John Birken, K2SFS, 65 Southgate Rd., Valley Stream, L.I., N.Y.

DX-40, w/ VF-1, gud. condx, \$70.00; QF-1, \$7.00; Balun, \$8.00; "Ocean Hopper" wid all coils, \$11.00. KIMEM, Jim Donnc, 35 High Rock St., Westwood, Mass.

SELL: Or Trade: Complete latest and well known radio course for first phone license. Orig. value, \$200, for test equipment or best offer. Ted R. Martin, 16 Grove Ave., Auburn, N.Y.

SELLING Out! Hundreds of ham parts cheap. Send self-addressed stamped envelope for list. W2GKP, Myron Skrzy, St. Apt., 375 Moshulu Pkwy, Bronx 67, N.Y.

MOBILES—Cheyenne and Comanche, Mount kit, cables, HP-10 pwr. supply, UT-1AC pwr. supply; BC-221 freq. meter and LM-18 freq. meter. All in exc. condx. Will sell or trade for fixed AM or SSB w/gud. Jerry, K4ORP.

WANTED: Cardwell PL 8013 or similar variable condenser. R. D. Stimpson, Box 9, APO 63, San Francisco, Calif.

FOR Sale, or trade for 2-6 meter transceiver, inverter brand new, 6V DC input, 117 U 60 cycle output heavy duty and brand new 3-speed microgroove 12" disc recorder, case, amplif. extra, W1VFO, Bob Pavey, 28 Sedawick Rd., East Hartford 8, Conn.

MICHIGAN State Hamfest, Grand Rapids 14th Annual, April 29, 1961. Pantlind Hotel, Write list office, Box 333.

HRO Senior, 100Kc, to 30 Mc. AC and Vibrator supplies: \$75.00; Jones Coupler, 261, indicator 262, new \$26.00; Globes 755 VFO factory, \$33.00; Tubes 4E27, \$4.00; 4-400A, \$23.00; Johnson Signal Sentry, \$15.00; Heath VFO, \$14.50; Globe King, excellent, \$450.00. CWO John L. Gifford, 698th Radar Sqdrn, Thomasville, Ala.

SELL: Hammarlund HQ140-X, recently aligned, with new set of tubes and crystal calibrator; \$165. W1YK, c/o Arthur Goddard, 4 Dean St., Worcester, Mass.

FOR Sale: New Mosley V-46 vertical. Have no installation room. \$20.00; used Hallcrafters revr S-76, in exc. condx, electrically, mechanically, \$90.00. Sidney Levinson, W2OOG, 387 South 4th, Brooklyn 11, N.Y. Tel. EV 4-7564.

FOR Sale or part trade for Ranger 813-KW, \$100. Pwr. supply extra. A beauty! K8KB, 1414 Tiffin, Findlay, Ohio.

WIRING: 15% kit price. Jim, K3GCM.

TRADE Or Sell: Ten Hy-Gain Incu-Traps comp. set with instructions to make 10-15-20 M 3-el. beam. S. J. Cichy, RD #1, Burnt Hills, N.Y.

SELL: 3480 with Q5er-10, 15 converter, 1/4 KW 10, 15 and 1 KW 75, 80 RF unter 300 volt 150 mlms and 1 KW power unit both variac controlled, 6 ft. rack, W1AKC.

GLOBE KING 500A, \$350. Richard Norton, K2PHF, 143 Merrick Road, Lynbrook, L.I., N.Y.

SELL: HRO60T Super DX installation. Standard coils plus broadcast and high sensitivity 10m and 15m coils. NBFM adaptor, xtal calibrator, 60SC2 comb. spkr. and coil storage rack. New price, \$989.00. Good as new, \$459.00. W9ADN, Box 117, Lockport, Ill.

75A-1 and 32V-1 completely TVI suppressed, 10MHZ mike and push-to-talk stand. Like-new condx. \$450.00. G. M. Crook, 8364 Remmet Ave., Canoga Park, California. Tel. Diamond 8-3169.

MUST Sell complete SSB station. 20A, BC458 VFO, 400 watt linear amplifier, SWR bridge, D-104 mike, VFOX, Drake 1-A, Complete rig, \$500.00. The air will speed 40 and 80. Will consider trade. K5BHT, 2315 Alden, Orange, Texas.

SELL: Chippewa linear with KS-1 supply. Used only three months, in perf. condx. \$525. G. K. Hickin, K5OAG, Box 1520, New Orleans, La.

FOR Sale: 32V1, in perf. condx. used less than 10 hrs since complete overhaul. HO129X, gud. condx. Best offer takes either or both. No trades, please! John Minette, St. Thomas Seminary, Kenmore, Washington.

SUPPER-Six \$28.00, 21 Mc Bassett coil \$5.00; D-104 mike, no stand, \$5.00; T-17 mike, \$3.00; 6-volt Mallory vibrator supply 300V at 100 Ma., \$10.00, Drake lo-pass filter, \$3.00. BC-458 new with tubes, \$10. F.o.b. W8FGZ.

HAVE Two stations, must get rid of one! Phasemaster 2B and 2C, 1-A and 200 watt home-brew table-top rig, \$650. K9TIO, Don Pieschke, Highway 62/431, Central City, Ky. Tel. 1020.

COLLINS KWM-1 with A.C. supply in beautiful condx. \$625.00 certified check. Central Electronics 20A with OT-1 and BC-348 with 10 meter coil, all factory-wired, in perf. condx. \$239.00. W4FLC, Harry G. Tumas, Rte. 4, Darwick Rd., Winston-Salem, N.C.

SELL: Communicator III 2M. Want stereo tape deck. K5ZZY, 219 Oakwood Dr., San Antonio, Texas.

SELL: New, never used: 4D32, \$20.00; motor only, commutator hash suppressed from small prop pitch unit, \$5.00. Both shipped cash, shipping collect. W1AH, 93 Main St., Cheshire, Conn.

SELL: HQ-110C rcvr and DX-40 xmttr, in like-new condx. \$275.00. Spkr. incl. D. P. Crocek, K3JUP, 2515 Peach St., Erie, Penna.

FOR Sale or trade for RTTY gear: AF-67 and Morrow 5BRN converter, Charles Vess, K9ZVN, 102 Bahon, New Iberia, La.

MOTOROLA Deluxe 30-watt xmtr, 115V, \$50.00; revr, \$60.00; similar to page 33, July 1960 QST. Wanted: KWM-1 AC and DC supply, mobile tra. with cables. Joe Shank, Jr., W8KBT, Shank's Oil Co., Box 1486, Huntington, W. Va.

FOR Sale: Gonset Communicator III w/xtals and mike, 2 meters, perf., \$200. Gonset 2-meter, 6-volt converter, \$15.00. W20BH, 200 27 46th Ave., BaySide 61, L.I., N.Y.

HEATH Stereo SP-2, PT-1, \$110; W-5M, \$40.00; 25W Cletron Wooter C-12PW, \$25.00. All guaranteed. W8R0PC, 11271 River-edge Dr., Parma 30, Ohio.

APACHE: This immaculate transmitter with all improvements goes with an attractive, home-brew combination antenna tuner (QST, Nov. 1958), modulation meter, and c.w. monitor: \$230. K6LOD, 630 Oak Court, Gilroy, Calif.

NEW Pair 4-400As, sealed cartons. \$35.00 the pair. New 4-65A, \$5.00. Hallcrafters 38RB, like new. \$25.00. All F.o.b. Tucson, W7M01, 4901 East Copper, Tucson, Ariz.

100-V Central Electronics serial #186 orig. crate, perf., \$595; NC-300 with xtal calibrator, \$230.00; add \$20 for National 2-meter converter, complete. No shipping, sry. K2FC, Sid Shore, 101 Parkway Dr., Roslyn Heights, L.I., N.Y.

SELL: Viking Valiant, all new tubes and recently aligned, looks works like new, \$325.00; Telrex 56-99 3-el, 15 meter beam, exc., \$25.00. Val Italo, W2ONO, 89-15 183rd St., Jamaica 23, L.I., N.Y.

HEATHKIT 10-meter transceiver, vibrator power supply, Hell-Whip. A complete station for \$50.00; K2RIS, 716 Knollwood Terrace, Westfield, N.J.

SELL: 14 typing rcvr and 14 td. both perfect sync motors, KH6DFO, 107 Davis, APO 953, SF, Calif.

AR-3 rcvr expertly wired and aligned, with cabinet and all data sheets, \$26.00. New handsets, 5-wire push-button, \$6.00. Brand new hermetically-sealed 500 ma. multi-voltage bias xmtrms (13 lbs.) \$4.00. All postage extra. S. A. Tucker, W2HLT, 510 Little Neck Pkwy., Little Neck 62, N.Y.

WANTED: 1 Bassett 5 band mobile coil originally sealed and filled with helium. State condx and price. Dave De Armond, 226 Hobart, San Mateo, Calif.

WANTED: Crank-up tower, K6EY.

WANTED: Receiver, 15-600 Kc. ranger R.B.L. or R.A.K.; exc. rig or new condx. George E. Lindemulder, 2585 Knapp St., Grand Rapids, Mich.

COMMUNICATOR III, 6m, for sale, with mobile mike, xtals. I don't use it, \$175.00. Bob Fenwick, W7VMO, 1727 Woodland Ave., Palo Alto, Calif.

WANTED: Electronic counter like (HP) mod. 523B. For sale: Heathkit AW-1 wattmeter, \$20.00; RCA WV-84A VT. microammeter, 01-1000 uA, \$60.00; Paco Z-80 signal tracer, \$25.00; Kay electric xtal controlled TV channel marker gun, \$25.00; Triplet 3413-A tube tester, \$20. Sams folders Nos. 157, 227, 237, 257, 264, 296, 344, 389, 399, \$6.00. Robert Ireland, Pleasant Valley, N. Y.

RECONDITIONED! Terms! Full Guarantee! Dynamotors 200 M.A. 400 12V new \$5.95; Carbon Mobile Mic. PTT cc \$6.00; 24 hr. clocks 15" face \$6.95; Heath Comanche \$119.00, slicer \$7.50; HRO-1 \$169.50; HQ129X \$139.50 140X \$179.59 Super Pro 400X \$199.50; NC-173 \$129.50 109 \$129.00; 240D WSP \$139.95 300 \$229.00 57 \$49.95 20-A \$179.50 M44 \$79.50; Model B \$198.50 \$39.95; Viking II \$209.00; Navigator \$129.95; Valiant \$325.00; Adventurer \$29.95; RME 4300 \$149.00; DSB100 \$109.00; Globe King 500A \$395.00 Chief 90 \$49.95 90 \$49.95 90A Kit \$39.95 Scout 680A \$79.00; KWM-1 WPS new \$695.00 75A4 \$595.00 S40 \$79.00 SX71 \$139.00 99 \$99.00; 32V II \$350.00; Gonset 6 meter linear \$89.95 Comm. II 2 meter \$239.95; Lakeshore Band \$69.95; LZ50 600 \$59.00 70 \$49.95; W2CB \$50.00 \$49.95; James C. 1450 \$39.95; PMR 6 \$79.95 7 \$99.95; Knight World Wide receiver w/s meter \$69.50. Ken WZCZN Harold WZVC Ken-Els Radio, 428 Central Ave., Fort Dodge, Iowa.

C.E. 100V brand new, \$595. WA2JRD, Humphreys Ave., Glen- side, Pennsville, N. J.

SELL: DX-100 xmttr, \$150.00; SB10 adaptor, \$85. G. R. Lee, 1050 Crest Dr., Encinitas, Calif.

FOR Sale: 1500 V power-pak, 400 V power-pak, two VFOs, home-built; Heath-scope, Heath VTVM, sig. generator; two regen. revrs. Heath FM-tuner; scores of ham parts for amateur, experimenter and builder. E.o.b. only reasonably cheap. Selling out. Need the space. W2KJH, James C. 1450, Hefling, 552 Rosedale Ave., Apt. 511, New York 72, N. Y.

SALE: 2-ADF revrs HC433F, 110V, unused, \$50.00 each; 2 Dynamotors BD77D, \$10.00 each; 1-Signal Corps field set like new condx. \$60.00. W1SVH, 31 Brookside Drive, Greenwich, Conn.

VALIANT FW, \$350.00; SX-101A, \$320.00; D-104, \$12.00; Vibroplex Lightning Bug, \$12.00; TA-33 JR w/it. A.R. 22, \$75.00. All equipment ten months old. Frank Tomacek, W8WAL, 31180 E. Rutland, Birmingham, Mich.

'59 Model Johnson Valiant transmitter kit, 90% completed, trade for SX-111 rec. (new) or \$250. Bill Rymer, Box 54, Lost Creek, W. Va.

FIRM Sale: Clean Ranger, \$159.00; DX-100, \$139; 6N2, \$90. F.o.b. 6DZM, 1929 King, Santa Rosa, Calif.

SELL: Mobile rig, Johnson Viking Mobile, VFO, Elmac PMR-7, power supplies, mounts, revrs, etc. \$200. Write to W0PSJ, Box 503, Grand Island, Nebr.

FOR Sale: Gonset Communicator III, 6 meter, little used, like-new condx with 5 new xtals and Shure carbon mic. First money-order for \$225 takes it. Hallicrafters SR-34, 6 & 2 M transceiver with 115 volt, 6v, or 12v transistorized power supply, in practically brand new condition, first money order for \$350.00. John S. Niendorf, KS7TZ, 3313 Cornell Ave., Dallas 5, Texas.

WANTED: Collins KWM1. Please airmail details. J. G. MacIver, 21 Hurd Terrace, Morning-side, Brisbane, Queensland, Australia.

SELL: Elenco compression amplifier, new, \$30; Elmac AF67, \$95; Krcuo Dynamotor supply 12V, \$25; PS2V AC supply for AF67, \$30; PMR6A with 12V supply, \$75. W2PLB, 314 East 52nd St., Brooklyn, N. Y.

KILOWAT Antenna tuner, in metal cabinet. Commercial coils, large and small condensers, two meters, in sud condx, thirty dollars. McGee, 58 Campus Dr. No., Buffalo 26, N. Y.

KWS-1, perfect electrically and mechanically, \$1.025 or will take KWM-2 or KWM-1 in trade. R. Matthews, 4246 Woodfield Lane, NE, Cedar Rapids, Iowa.

FOR Sale or trade for transmitter 381; OST 1924 thru 1957. Missing in this run: Feb. 1926, Aug. 1927, Sept. 1929, Mar. 1933; Jan., June, Aug., 1940; July, Aug., Sept., Oct., Nov., Dec., 1941; April, May, Aug., Oct., 1942; Sept., Oct. 1944; July, Aug., Sept. 1949; Oct. 1949; Jan., June, July, Aug. 1950. Also Magazine Radio 1937 thru 1940 or what have you: Ralph Ohle, W3AAT, Hadley, Penna.

NC98: 10 mtrs., Telrex, 4-cl. beam, both in exc. condx. Sell best offer. A. Berger, 71 Bullard, Ft. Leavenworth, Kans.

FOR Sale: SX-101A, latest model, like new condx, \$285; Gonset III, 6 meters with six thin xtals and Saturn Halo, all in new condx, in org. cartons w/instruction booklets; \$180.00. Knight 50 wats xmttr and Knight VFO, new, both for \$50.00. Dr. Herman Slutsky, K9QZN, 1801 N. Natoma Ave., Chicago, Ill.

FOR Sale: Hallicrafters, S38E, in wv sud condx, sud Novice revr, \$40. Richard Eastman, KN10JH, 8 Mechanic St., Dexter, Me.

HAMMARLUND HQ-129X, new condx, \$135; spkr, \$10. Will sell or swap old radio magazines, tubes and parts for old time radio sets and equipment. Laverty, 118 N. Wycombe, Lands-downe, Penna.

WANTED: GE-851 Class A modulator tube. Advise condx and price. WIBB.

"HORSE Trader" Ed Moory, will trade brand new 75S-Is for 75A-4s, even smells new HT-37; new HT-37, \$379; KWM-2, \$850; new 100-Vs, \$569; Drake 2-A, \$219; LA-400B, \$99; like new condx 20-A and VFO, \$199; Jones MicroMatch, \$25.00; 30S-1 linear, used 2 hrs., \$1099; 75A-4, perf., \$575; new Mosley TA-33 beam, \$79; 513, \$595; terms: cash, no trades. Ed Moory Wholesale Radio, Box 506, DeWitt, Ark. Tel. Whitney 6-2820.

BRAND New, never built Healthkit Audio Generator Kit AG-9A, worth \$39.95; sacrifice for \$28.95. Healthkit RF signal generator kit SG-8, worth \$19.50, will sacrifice for \$14.95. Like new condx: Globe Hi-Bander transmitter 6 & 2 meter, factory-wired, worth \$149.50 plus speech booster worth \$16.50. Sacrifice both for \$99. Oct. RA 5-1519. Write K3AOL, 1201 Starwood St., Philadelphia, Penna.

SWAP: 120 bass Crucianelli accordion, black, for one KW linear for my HT32A. W9ECP, 4545 Meadowview West, Brookfield, Wis.

FOR Sale: Heath reflected power meter AM2, \$10; new 7.5 amp variac, \$12; new 4CX300A tubes, \$25 each; 4 mfd, 1000V capacitors, 25¢ ea. Charles Cobb, 3 West Dr., Port Washing-ton, N. Y.

TECHNICIANS. Mobiles, attention! GE 30-50 Mc, 2-way 50W FM rear, easily converted to six or ten meters, 12V operation. Write Electronics, Box 3095A, Hayward, Calif.

COLLINS 75A4 serial 5313, HT32, v/ late model, both like new. Will not sell separately. Price \$950. Joseph Diliberti, K2IQZ, 206 Central Ave., Murray Hill, N. J.

QUICK SALE! Gonset Triband converter, \$15.00; Gonset Super Six converter, \$20; Viking Mobile, in exc. condx, \$75; PE103, \$10; Stancor 25-watt xmttr, \$15. W2MES, Tel. DA 6-3279, 65-33 78 St., Middle Village, 79, N. Y.

WANTED: KWM-2, AC and DC supplies; rack and 312B5. Sell perfect NC-100 w/spkr, \$80; Drake IA, \$180. W8EVD, 16810 Racho Rd., Taylor, Mich.

FOR Sale: Elmac AF67, \$110; Gonset Comm. III, 2 meters, \$200; Gonset G66B with 3-way supply, \$150; Collins 75A2 with xtal cal., \$300. All the above equipment is in a like-new condx. Phil Ittel, K6HHV, 400 Newburgh, Glendora, Calif.

WANTED: 6 Kc and 300 or 800 cycle filter for 75A4 rec. also instrum. mnl. Need Measurements Corp. grid dip meter w/UHF head, Chauncey, K4DZP, PH TU 7-6453; 553 E. 16th St., Hialchal, Fla.

SELL Gonset G-76, Turco, 146-26 No. Hempstead Tpke., Flushing, L. I., N. Y.

NATIONAL Revr. \$98; late model holdover NC-173 gen. cov- erage, all ham bands incl. 6 meters, matching spkr incl., and in A-1 condx. Frank Murphy, W1HWN, 17 Greystone Rd., Nahant, Mass.

WANTED: SX-42. State physical condition and price. Lewis Bryant, 119 Crittenden Lane, Newport News, Va.

VIKING II and VFO for sale, factory-wired, in exc. condx. W2EC, 169 Buckingham Rd., West Hempstead, L. I., N. Y.

POWER Supply for sale, 2500V dc at 1000 Ma. W00MH, 2632 Victoria, Wichita, Kans.

SACRIFICE: Apache transmitter; HQ110 receiver, matching speaker, in exc. condx. First \$350 takes both. WOYIC, T. J. Zuspy, 410 19th Ave., North East Grand Forks, Minn.

COLLINS KWS-1, in exc. condx, serial number in the 1400's: \$1,195; Model B Slicer, \$40. Pick-up dual only, sry. W2JMH, 23 Locust Ave., Eatontown, N. J.

5K20 image Orthicon, Good pictures but sticky. Have two at \$50.00 each. Morris Mann, 6707 223rd Pl., Bayside, L. I., N. Y.

SELLING: TMC GPR-90 revr w/spkr (current catalogue \$595) \$325.00; Collins 32V3 xmttr, \$325; Johnson Viking Ranger xmttr, \$165. All in exc. condx. Joseph Marshall, Jr., 22 Clare Drive, East Northport, L. I., N. Y.

MUST Sell fixed and mobile stations: Fixed: Globe Scout 680-A w/755A VFO (antenna changer) relay, JT-30 mike, xtals, etc.; Hammarlund Super-Pro 7 car. All in exc. shape. Mobile station: Gonset 80-10M convertor, noise clipper, Falco Bantam xmttr (90 wats phone, 160-10M), PE-101 dynamotor, plus all band loading coil. Any reasonable offer accepted. Tony Morris, 1629 Yale Station, New Haven, Conn.

WANTED: Amateur would like a man or couple wishing modern furnished living quarters in country, paying only utilities, own food, to be handyman and assistant to disabled ham, W. M. Hunt, K8AKE, Lake Odessa, Michigan.

SSB 100A P.E.P. 140 wats, exc. condx; \$300. Cost new \$745; matching DLX table top PRK13 with power, looks commercial, \$100; BC453, \$10; two unused RCA 813s, \$8 each; Jackson VOM push-button meter, \$10; four used X-250B, \$2 ea. W0NHP, Mann, 7205 Center Drive, Des Moines, Iowa.

SACRIFICE: Viking 6N2 in mint condx; \$80; NC-303 like new, \$290; MM-1 \$54; 100 watt all band AM-CW plate modu- lated transmitter, \$62. Will ship any of the above. Howard Fruchter, WA2DCM, 589 Barnard Ave., Woodmere, L. I., N. Y.

CRYSTALS Airmailed: SSB, MARS, Novice, Net, etc. Custom finished FT-243 0.1% any kilocycle 3500 to 8600 \$1.49 (10 or more FT-243, 99¢) any quantity, Novice, 99¢; 1700 to 20,000, \$1.95; 20,001 to 30,000, \$2.25. Add 60¢ each for HC-6/v her- metics. OST SSB xtal packages: "Imp. 1959" June 1959 and SSB Handbook, "Phasing" Nov. 1959; "Imp. May 1960", "DCS-500" Feb. 1960; above sets (Five FT-243), \$9.95; her- metics, \$13.95; filter; "Package" seven matched, June 1958, \$7.45; Oct. 1960, \$11.80. Crystals for CO and all magazine projects. Write: Airmailing 9¢ per crystal, regular 5¢. Crystals since 1933. C-W Crystals, Box 20650, El Monte, Calif.

WANTED: Complete ham station maximum power. Will trade 33 ft. twin-screw cruiser, like new, WA6NJC, 6865 Andosal Ave., Van Nuys, Calif.

WANTED: HRO coils long and short wave. W8JDC, 640 Hid- den Lane, Grosse Pointe Woods, Michigan.

AUCTIONFEST: Broward Amateur Radio Club's fifth annual auction and get-together, Saturday, March 11th, Armory, S.W. 4th Ave. and 24th St., Ft. Lauderdale, Fla. Doors open 8 A.M. Auctioning at 10, free lunch at noon.

SELL: NC-300 with xtal calibrator, \$250; DB-23 Preselector, \$35; Viking II with VFO and Johnson lowpass filter, \$170; Johnson Courier, \$189; Johnson TR switch, \$16; JT-30 mike, \$4.00 or all for \$600. Condx of all truly perfect, so are prices. Final. Want KWM-1 with AC supply, W2BAC, 4 Bayard St., Larchmont, N. Y.

COLLINS 75S1, 32S1, 516F2, plus spkr. Like new condx. In org. cartons. Used less than 50 hrs. \$1000 W91PB, 1712 Cres- cent Dr., Pekin, Ill.

BRAND New Hammarlund HX-500 transmitter in factory-sealed carton, with warranty, W9D00, Madison, Wis.

DRAKE I-A receiver, late serial number with xtal calibrator and latest AVC circuit. Very hot, stable and selective. Exc. condx. Will ship, \$187.50. C. Bronner, P.O. Box 261, Mor- ton, Ill.

32S-1, 516F-2, 312B-4, 75S-1 with CW filter and BFO xtal, like new condx with all cables, connectors, etc. in org. cartons, \$1,100; F. S. Eggert, W8FIL, 11833 Wisconsin, Detroit, Mich.

FOR Sale: 12.5 Kw 110-220 volt 3-phase G-E model AB326 generator mounted in 1948 AWD Jeep Universal 17,000 m.p.h. heater, turn signals, roots. New canvas ftop, hood governor, windshield, battery and helper springs. Complete with output cables, 60 cyc. freq. meter and instrux. In many Field Day contests. Unit has operated 30-40 hours at 1.3 gallons gasoline per hr. Ideal for emergency power, Field Day, camping, etc., wherever 110-220V AC is needed. F.o.b. Toledo, \$120. W81ZQ, Bert N. Hayhurst, 1873 Atwood Rd., Toledo 15, Ohio.

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SELL: Drake 2A rcvr, calibrator, 2AO multiplier-speaker, \$250; E-V microphone, #729, \$8.00; Dow-Key 110V, T-R switch, \$8.00; Heathkit citizens transceiver GW-30, \$25; Knight 2-way intercom \$10; semi-automatic Bug (Gap), \$6.00; Fico Multifester #565, \$7; Drake field TV-100-LP, \$3.00. Ralph Ankeny, W9FW, 2023 Bates, Springfield, Ill.

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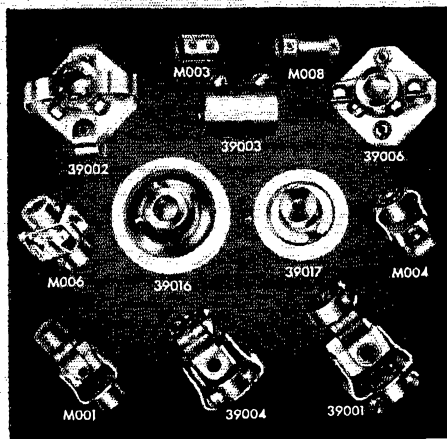
DX-40 Like new, \$45.00; VF-1, \$15; SK-71, tunes all bands including 6 meters, \$125.00; TBY-4 transistor w/AC pwr. supply, 1 watt output on 6 & 10 meter phone and MCW, \$40; Tribander (10-15-20) beam, never used, too large for my QTH, \$40; RCA 122B scope, \$25. Preter local sale. Will deliver. WA2LOT.

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5763	CW AM	17 15	350 300	} 50	175	6.0 (H)
6417	Same as RCA-5763, except for heater voltage					
2E26	CW SSB AM	40 37.5 27	600 500 500	} 125	175	6.3 (H)
2E24	Same as RCA-2E26, but has quick-heating filament					
6893	Same as RCA-2E26, except for heater voltage					12.6 (H)
832-A*	CW AM	50** 36**	750 600	} 200	250	6.3A(H) 12.6(H)
807	CW SSB AM	75 90 60	750 750 600			60
1625	Same as RCA-807, except for heater voltage and use of medium 7-pin base					12.6 (H)
6524*	CW SSB AM	85** 85** 55**	600 600 500	} 100	470	6.3 (H)
6850*	Same as RCA-6524, except for heater voltage					
4604	CW	90	750	60	175	6.3 (F) quick-heating
6146	CW SSB AM	90 85 67.5	750 750 600	} 60	175	6.3 (H)
6883	Same as RCA-6146, except for heater voltage					
829-B*	CW SSB AM	120** 120** 90**	750 750 600	} 200	250	6.3A(H) 12.6(H)
7203/ 4CX250B	CW SSB AM	500 500 300	2000 2000 1500			} 500
7094	CW SSB AM	500 400 335	1500 2000 1200	} 60	175	
813	CW SSB AM	500 450 400	2250 2500 2000			} 30

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