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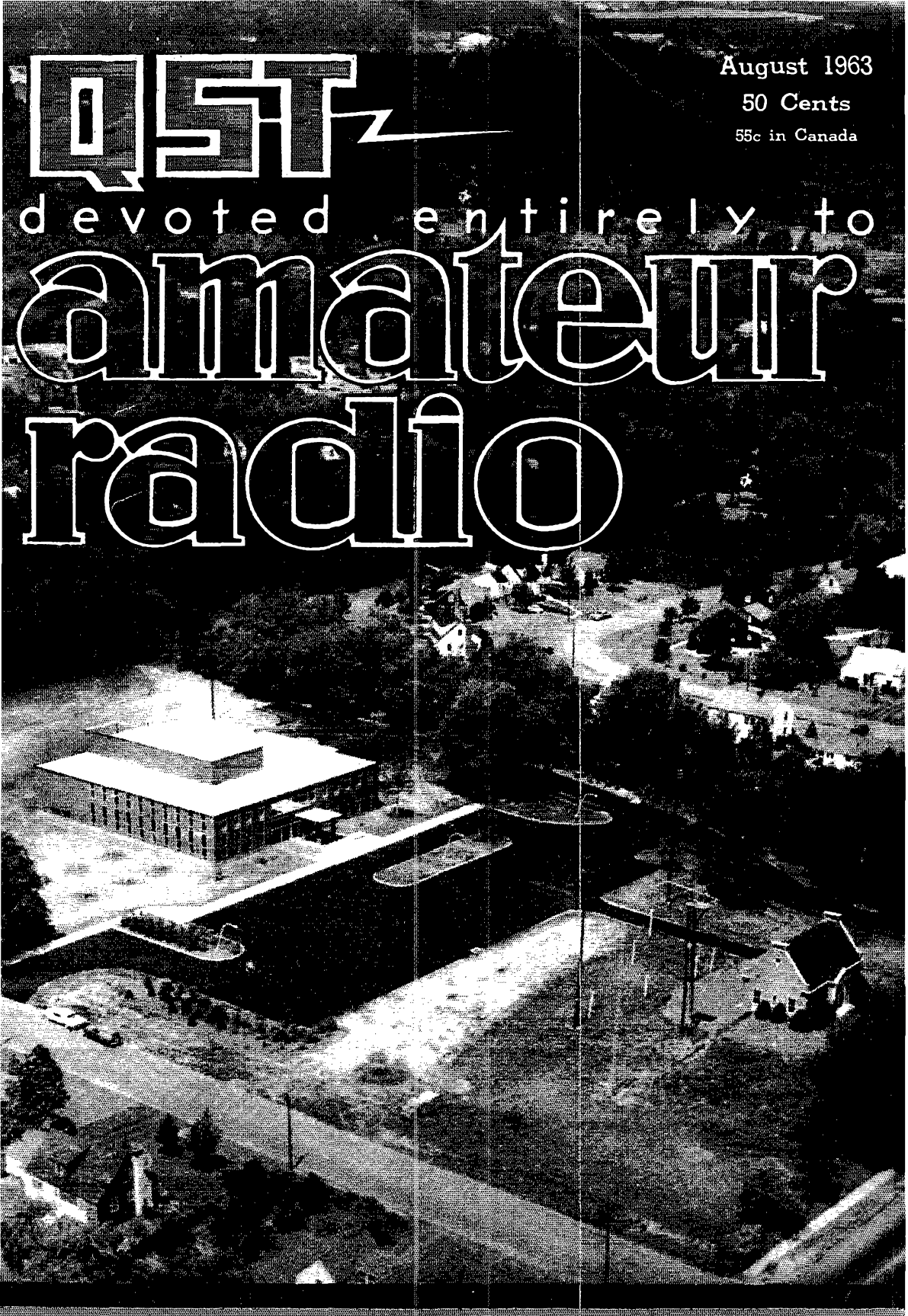

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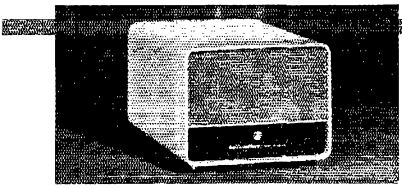
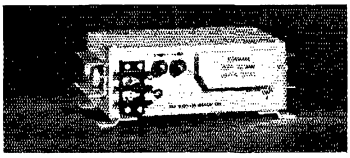
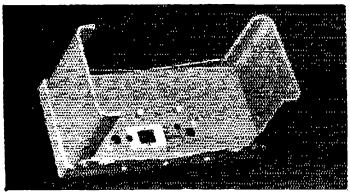
- AALC. Hallicrafters' new, exclusive AALC (amplified automatic level control).
- 1650 kc crystal filter.

*Pat. applied for







SPECIFICATIONS

Frequency coverage: Eight-band capability — full coverage provided for 80, 40, 20, 15 meters plus one segment of 10M (add'tl. crystals may be added). Available for operation on non-amateur frequencies by special order.

Front panel controls: Tuning; Band Selector; Final Tuning; R.F. Level; Mic. Gain; Pre-Selector; R.I.T.; Rec. RF Gain; AF Gain; Operation (Off/Standby/MOX/VOX.); Function (CW/USB/LSB); Cal.

General: Dial cal., 5 kc; 100 kc crystal cal.; VFO tunes 500 kc; 18 tubes plus volt. reg., 10 diodes, one varicap. Rugged, lightweight aluminum construction (only 17½ lb.); size — 6½" x 15" x 13".

Transmitter Section
(2) 12DQ6B output tubes. Fixed, 50-ohm Pi network. Power input — 150W P.E.P. SSB; 125W CW. Carrier and unwanted SSB suppression 50 db; distortion prod., 30 db. Audio: 400-2800 c.p.s. @ 3 db.

Receiver Section
Sensitivity less than 1 μv for 20 db. signal-to-noise ratio. Audio output 2W; overall gain, 1 uv for ½ W output. 6.0 - 6.5 1st I.F. (tunes with VFO). 1650 kc 2nd I.F.

AC or DC Power Supplies

P-150 AC Styled to match SR-150 Transceiver. Five silicon diode rectifiers, 4" x 6". PM speaker. 22 lb. Size: 6¼" x 7½" x 10". $99.50

P-150 DC Five silicon diode rectifiers, four transistors. Weighs only 5½ lb. Size: 3¾" x 10" x 6¼". $109.50

Complete Mobile Mount

MR-150 Adaptable to transmission hump or floor. Quick release design—all connections made simultaneously. Access holes for VOX controls. $39.95.

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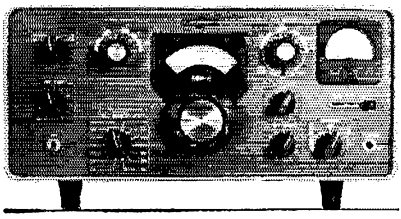
OLDTIMER!

An oldtimer? Yes. Still the most modern? Yes! ☐ In this day and age, four years is a long time for a product to maintain a status quo. No design changes. Few component changes. No spec changes. Yet that's exactly what's happened to the KWM-2 Transceiver. ☐ How come? When we introduced the KWM-2 four years ago, it included 19 "first-in-the-industry exclusive" features. Today that figure has been reduced because many of the original Collins KWM-2 exclusive features have been incorporated as standard in all amateur equipment. The fact remains, however, that Collins KWM-2 is still the only transceiver available which offers you all those 19 features in one unit. This is the major reason hams still prefer the KWM-2 over all other transceivers on the market. ☐ And here's something else which accounts for the KWM-2's popularity. Ask your Collins distributor how much a used, four-year-old KWM-2 is worth today. His answer will give you a clear picture of how little it really costs to own the finest. See your Collins distributor and get all the facts on KWM-2 features, performance and price.



COLLINS

QST

AUGUST 1963

VOLUME XLVII • NUMBER 8

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—CONTENTS—

How the TV picture is being stretched

Nearly half of the people in the U.S. watching TV can receive only one or two stations. This is true even in one-third of the 150 largest metropolitan areas. ■ The TV audience is there. But the stations aren't. Existing stations have filled the regular VHF-TV band nearly to the limit. Some 500 of our approximately 600 stations are crowded into the 12 VHF channels. ■ What's the answer? 70 valuable UHF channels lie ready to provide space for needed new service. ■ Slow at first, UHF television has now begun to grow. Relief seems to be in sight from the economic limitations. How about the technical limits? Dependable transmission at UHF by and large requires more power than it takes to deliver comparable television on the 12 VHF television channels. And to satisfy broadcasters, the power must not only be higher; it must also be reliable, easily produced and cheaper by the kilowatt-hour. ■ One company has already anticipated the needs of broadcasters and the resurgence of UHF-TV in this country with a series of advanced power klystrons for UHF transmitters that will provide a new low in cost per kilowatt hour of operation and a new high in reliability. That company is Eitel-McCullough. ■ About two years ago, Eimac asked its engineers, "With your experience how would you make the most nearly optimum klystrons possible for UHF-TV?" Their enthusiastic answer was a new third-generation series of ingenious UHF-TV klystrons. They are simple in design and easy to operate. And they are capable of delivering from twice to ten times the power previously available.[1] ■ There's good reason for Eimac's leadership. Eimac has had a gigantic field laboratory in which to develop its UHF power klystrons: UHF troposcatter communication networks—more than 90% Eimac-powered.[2] Hundreds and hundreds of Eimac power klystrons have racked up phenomenal life and reliability records in this service with around-the-clock operation. Tubes still in sockets have reached the 50,000 hour mark—and are still going strong. It hasn't hurt, either that Eimac klystrons are used in more than 80% of all klystron-powered European UHF-TV transmitters. ■ These new klystrons mean UHF-TV coverage can be stretched to new viewers. For broadcasters, another economic and technical problem has been relieved. For Eimac: another example of the way it meets tomorrow's tube needs today.

1. *Want to know more of the technical details? Write for the Eimac information packet on klystron power for UHF-TV. It contains a reprint of the I.R.E. paper, "Experience in Europe with American UHF-TV Klystrons," and full details on the Eimac electron power tubes ready to stretch UHF-TV coverage.*

2. *Like to know more about how Eimac has shrunk the earth? Write for a free copy of its brochure, "The Universe is One Big Puddle."*

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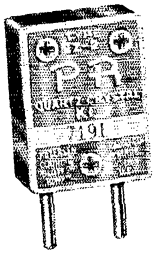

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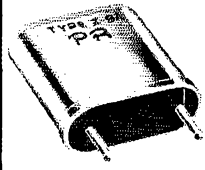

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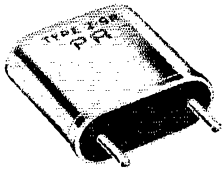

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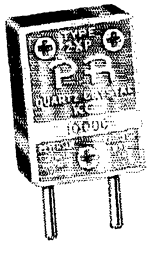

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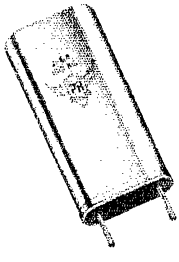

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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports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

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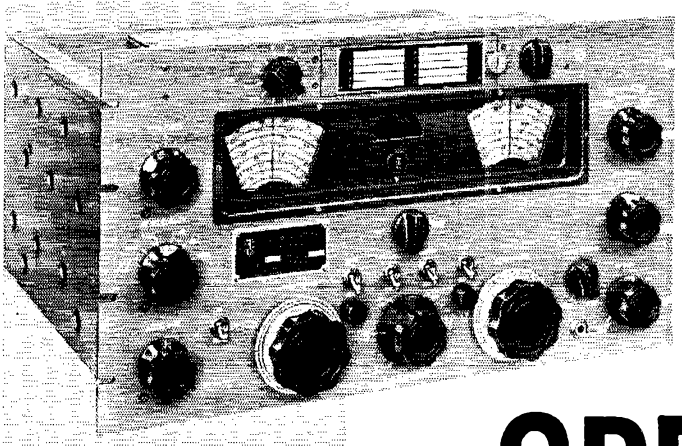
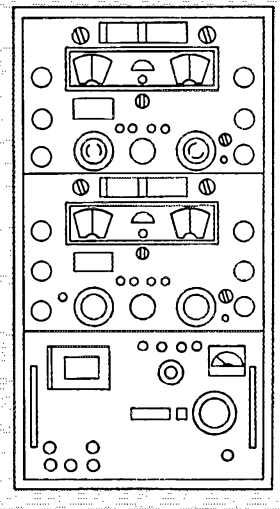
15 KC BANDPASS



OVER THE
.54 TO 31.5 MC
FREQUENCY RANGE

IN THE *New*

GPR-91 RXD
COMMUNICATIONS RECEIVER



This new GPR-91RXD Communications Receiver has all of the features — selectivity, sensitivity and reliability — of our GPR-90RXD receiver.

AND IN ADDITION has **15 kc** bandpass for ISB reception of four discrete voice channels or up to 64 teletypewriter channels, when used with our Model SBC-2, Sideband Converter.

Two of these receivers, with common oscillators, such as TMC Model VOX-5, (see line illustration at left) make one of the finest diversity receivers available on the market today.

Our engineering department will be happy to discuss ancillary equipment in our general catalog that may be used with this receiver to fill any of your requirements.

Request TB 3009

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THE AMERICAN RADIO RELAY LEAGUE, INC.,

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

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

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

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

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1011 Fairmount Ave., St. Paul 5, Minn.

Vice-Director: Martha J. Shirley . . . . . WØZWL
Box 78, Black Hawk, S. D.

Delta Division

FLOYD C. TEETSON W5MUG
2469 Paden, Jackson 4, Miss.

Vice-Director: Graham H. Hicks W5THP
100 Magnolia Place, Natchez, Miss.

Great Lakes Division

DANA E. CARTWRIGHT W8UPB
2979 Observatory Ave., Cincinnati 8, Ohio

Vice-Director: Robert B. Cooper W8AQA
132 Guild St., N.E., Grand Rapids 5, Mich.

Hudson Division

MORTON B. KAHN W2KR
22 Birch Hill Rd., Great Neck, N. Y.

Vice-Director: Harry J. Dannals W2TUK
RFD 1, Arbor Lane, Dix Hills, Huntington, L. I.

Midwest Division

ROBERT W. DENNISTON . . . . . WØNWX
Box 631, Newton, Iowa

Vice-Director: Sumner H. Foster . . . . . WØGQ
2315 Linden Dr., S.E., Cedar Rapids, Iowa

New England Division

MILTON E. CHAFFEE W1EFW
28 Reussner Rd., Southington, Conn.

Vice-Director: Bigelow Green W1EAE
236 Marlboro St., Boston 16, Mass.

Northwestern Division

R. REX ROBERTS W7CPY
837 Park Hill Drive, Billings, Mont.

Vice-Director: Robert B. Thurston W7PGY
7700 31st Ave., N.E., Seattle 15, Wash.

Pacific Divisions

HARRY M. ENGWICHT W6HC
770 Chapman, San Jose 26, Calif.

Vice-Director: Ronald G. Martin W6ZF
1573 Baywood Lane, Napa, Calif.

Roanoke Division

P. LANIER ANDERSON, JR. W4MWH
428 Maple Lane, Danville, Va.

Vice-Director: Joseph F. Abernethy W4AKC
764 Colonial Drive, Rock Hill, S. C.

Rocky Mountain Division

CARL L. SMITH . . . . . WØBWJ
1070 Locust St., Denver 20, Colo.

Vice-Director: John B. Sampson, Jr. W7OGX
3618 Mount Ogden Drive, Ogden, Utah

Southeastern Division

JAMES P. BORN, JR. W4ZD
25 First Ave., N.E., Atlanta 17, Ga.

Vice-Director: Thomas M. Moss W4HYW
P.O. Box 20644, Municipal Airport Branch,
Atlanta 20, Ga.

Southwestern Division

RAYMOND E. MEYERS W6MLZ
Box R, San Gabriel, Calif.

Vice-Director: Virgil Talbott W6GTE
1175 Longill Way, Monterey Park, Calif.

West Gulf Division

ROEMER O. BEST W5QKF
P.O. Box 1656, Corpus Christi, Texas

Vice-Director: Ray K. Bryan W5UYQ
2117 S.W. 61st Terrace, Oklahoma City 19, Okla.

"It Seems to Us..."

We Move

An address known throughout the amateur world for the past thirty-two years has passed into oblivion — 38 LaSalle Road, West Hartford 7, Connecticut, is no more, so far as hams are concerned.

On June 27 the staff, after a general housecleaning, emptied the contents of desk drawers, bookcases, etc., into sturdy cardboard cartons and taped shut their file cabinets. The first of a caravan of moving vans pulled up to the doors of old 38, started loading tons of office equipment and machinery, and the two-day move was on.

Back in May, a strike of carpenters had threatened to postpone the big switch in QTH, but three weeks later it was settled, and the shiny new headquarters building was finished only a bit behind schedule.

Not a pretentious structure, the new headquarters is more aptly described as neat, pleasant or handsome than as plush or ornate. Within its red-brick walls are 24,000 square feet of usable floor space, enough to handle today's and tomorrow's needs without crowding. The interior is painted with soft tans and greens, with occasional accents of wood panelling. Spots of contrast appear here and there in charcoal and orange chairs. Drapes are being hung in the new offices, in preference to Venetian blinds or shades. Outside, there is a paved parking lot with space for more than forty cars. Around it, attractive shrubbery and trees will lessen the impact of a building this size on the surrounding residential neighborhood.

The Museum of Amateur Radio is being reassembled in the entrance lobby under the expert supervision of an old, old timer, Roland B. Bourne, W1ANA, an associate of our late founder-president, Hiram Percy Maxim. Glass cases and spotlights will make it a joy to browse vicariously through the early days of amateur radio by way of the spark gaps, coherers, oscillation transformers, two-slide tuners and cat's-whisker detectors on display.

To addicts of the one-eyed monster, amateur antennas may be blots on the horizon, but to hams they are things of beauty and joys forever. We suspect the architect may have yearnings toward hamdom: there's a large picture window in the center of the building around the main entrance which looks directly out to the W1AW antenna farm! The station remains in its original building between the new headquarters and Main Street, Newington; its refurbishing is scheduled later in the year.

As the staff more efficiently goes about its work in air-conditioned comfort, despite the humidity associated with August in Connecticut, and in quarters adequate for the first time in many years, we can't help but express our appreciation again to the League members who have pitched in to build the new edifice. And to those who will be traveling this way, we extend a hearty invitation to drop in, any weekday from 8:30 to 4:30; no advance notice is required. Groups of ten or more who wish to visit the building evenings or on weekends may be able to make special arrangements in advance.

W1AW and the new headquarters are located at 225 Main Street, on Conn. Route 176-A, about a mile north of Newington Center. Route 176 intersects with Conn. Route 15, the Wilbur Cross-Merritt Parkway system a few miles southwest of Hartford.

And for those who won't be journeying eastward on vacations this year, we'll present in a forthcoming issue a complete picture story of the building, its equipment and office operations, so that you may better know your new service headquarters. QST

Effective July 1, 1963, our new address is

The American Radio Relay League, Inc.
225 Main Street
Newington 11, Connecticut

COMING A.R.R.L. CONVENTIONS

Aug. 31 and Sept. 1 — Atlantic Division, Washington, D. C.

September 14 — Kentucky State, Lexington

September 14–15 — Dakota Division, Sioux Falls, South Dakota

September 28 — Ontario Province, Hamilton

October 11–13 — Southwestern Division, San Diego, Calif.

October 26–27 — Midwest Division, Wichita, Kansas

November 29–30 and December 1 — Delta Division, Lafayette, Louisiana

ATLANTIC DIVISION CONVENTION

Washington, D. C. — August 31 and September 1

The ARRL Atlantic Division Convention will be held in the Sheraton Park Hotel, Washington, D. C., the weekend of August 31, sponsored by the Foundation for Amateur Radio, Inc. This is your chance to bring the family to one of the world's most famous cities and let them see the sights while you enjoy yourself seeing and hearing all about the interesting facets of amateur radio.

Activities start promptly at 9 A.M. Saturday, with Col. Van Deusen, W3ECP, in charge of an amateur/military session (MARS). This will be followed by concurrent sessions on DX (W3GRF, chairman); sideband (W3HN); and v.h.f. (W3OTV). Luncheon will feature an informal panel of experts from government and amateur ranks, a presentation to the Smithsonian Institution of the Oscar I backup gear and the awarding of the Foundation scholarship.

Saturday afternoon will be devoted to technical talks by Harold Vance (Application of Power Tubes in Amateur Equipment), James Rush, Jr. (Planar Ceramic Tubes in Amateur Applications), Ozzie Jaeger (Semiconductors in Amateur Transmitters), George Jacobs (Propagation Outlook for 1963-1964), Fred Muccion (Printed Circuits Made Easy), Maynard Briggs (Unique Frequency Synthesizer for Amateurs), Frank White (Radio-teletype) and Towns and Orr (The Oscar Program). A cocktail party precedes the convention banquet, which may be the surprise amateur radio banquet of all time! Later, the Washington chapter of QCWA will stage a Wouff-Hong initiation.

Mobile activities will kick off the Sunday program, while a space communications program featuring NASA personnel is taking place. An OM/YL luncheon will be followed by a communications department session covering traffic handling and emergency nets; and then Director Crossley, W3YA, will preside at a general League open forum.

Exhibits of latest amateur equipment will occupy a large section of the floor space. In addition, the Antique Wireless Association will show you what ham gear looked like "way back when" — for the youngsters, educational: for the oldsters, sentimental. Various contests, including code speed and QSL design, are under the direction of W3AIR.

K4LMB and W4TVT have given much thought and effort to an outstanding ladies' program, which includes a White House tour, boat trip to Mt. Vernon, a luncheon and a Sunday morning breakfast. YLRL will operate a hospitality suite with nurses and babysitters.

Package registration, including two luncheons and the banquet, is $20. Individually, registration is $5; Saturday division luncheon $5; banquet $10; Sunday OM/YL luncheon $5. Send advance registrations to V. E. Kruger, W3FWP, 10510 Parkwood Drive, Kensington, Md. Make hotel reservations directly with the Sheraton Park, mentioning the convention. For early convention arrivals, the registration desk will open at 7:30 P.M. Friday and again 7:30 A.M. Saturday.

See page 51.

August 1938

. . . On the cover was a photo of the Maxim Memorial Station, home of W1AW, which was just then nearing completion.

. . . W1DF described "A Three-Tube Super for Portable or Emergency Work" that offered superhet performance with regenerative receiver economy.

. . . A 250-watt output crystal-controlled 28- and 56-Mc. transmitter was described by W2KPX, applying low-frequency techniques to ultra-high frequencies.

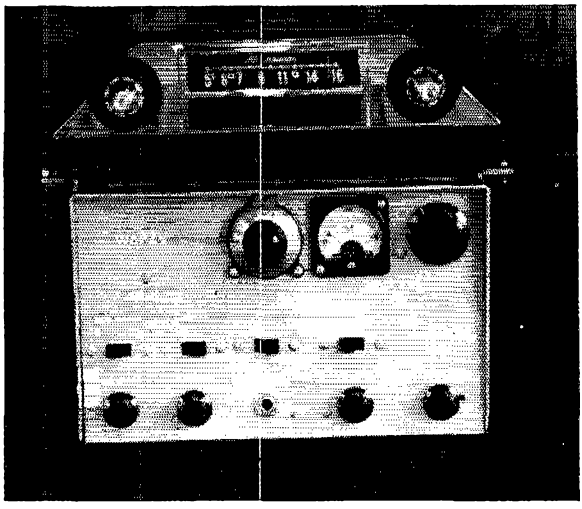
. . . The results of the first ARRL QSO Party, held in January, were announced, with W1JTD, W1EZ, and W8OFN coming in one, two, three.

. . . Factors influencing the choice of directive antenna arrangements were pointed out by W2NB.

. . . Other technical articles included a four-band, 75-watt output phone-c.w. transmitter, and Hints & Kinks covering a simple modulation indicator, a device for obtaining proper capacity ranges on different bands, and plug and jacks for changing from band-spread to general coverage. QST

Strays

Does anyone care to claim the record for the longest 40-meter phone QSO ever? K8VLZ plans to better it. Reply to K8VLZ, 29 West College Avenue, Westerville, Ohio.



The transceiver installed in the author's car. The VXO and final-amplifier tuning controls flank the meter near the top of the panel. The slide switches, left to right, are for upper/lower sideband, carrier on/off, VXO frequency range, and meter. Controls along the bottom are for modulator balance, receive r.f. gain, receive audio gain, and final-amplifier drive. The microphone jack is at the center in this row. Some idea of the size of the unit can be gained by comparing it with the car broadcast receiver above.

A 7-Mc. Mobile S.S.B. Transceiver

Single-Band Unit

with 60 Watts P.E.P. Output

BY JOHN ISAACS,* W6PZV

As the author points out, both transceiver operation and s.s.b. are naturals for mobile work. The s.s.b. mode provides more effective power output, while the dual-function arrangement not only conserves space, but simplifies tuning adjustments as well.

By now there doesn't seem to be much doubt that s.s.b. is *the* way to go for mobile operation. A check of the ads in this magazine will show which way the manufacturers are betting. The author tried mobile s.s.b. operation on 75 meters about six years ago, but the results were disappointing — not enough stations to talk to during daylight hours, and a separate transmitter and receiver to tune while trying to drive at the same time. Also, the receiver wasn't very stable. So . . . back to a.m.

The contemplated purchase of a new car finally triggered the decision to get going on a new mobile sideband rig. It didn't make sense to install the old a.m. rig in a new car with the knowledge that a change would probably be made in a relatively short time. At least at that time, the only manufactured rigs that I felt were reasonably priced were also larger than the available space would accommodate. (It is becoming increasingly difficult to think up good reasons for building instead of buying.)

With size the main consideration, a number of other things were automatically resolved. The new rig would have to be a transceiver and it would have to operate on one band only. Also, it might be necessary to compromise on carrier suppression, unwanted-sideband suppression and power output. However, there could be no compromise on frequency stability.

After trying mobile s.s.b. operation with a separate transmitter and receiver, anything but a transceiver was out. Also, after operating mobile for over 15 years, it was found that although multiband operation has been available at all times, my operation has been confined to one band about 99 per cent of the time. It wasn't difficult to settle for operation on 40 meters. Daytime operation on 75 meters is still somewhat of a problem, and 20 meters is in and out. A number of articles had been published covering mobile s.s.b. transceivers.[1,2,3] One which looked very interesting was by W6JAT.[3] His rig used a McCoy 9-Mc. crystal filter and a VXO. I had just completed a multiband exciter[4] using the McCoy filter, and the VXO looked like a good

* 1300 California Ave., Compton, California.

[1] Vester, "Mobile S.S.B. Transceiver," *QST*, June, 1959.
[2] Taylor, "A 75-Meter S.S.B. Transceiver," *QST*, April, 1961.
[3] Barton, "Kilowatt Sideband Transceiver," *73*, January, 1962.
[4] Isaacs, "Filter-Type Sidebander," *QST*, November, 1962.

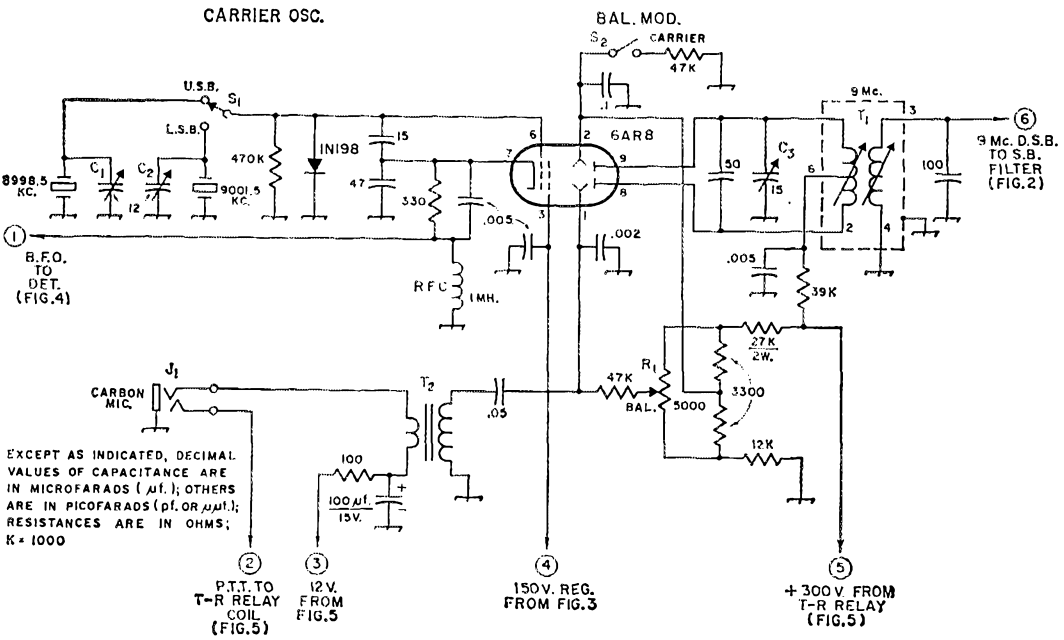


Fig. 1—Carrier-oscillator and balanced-modulator circuits. Fixed capacitors of decimal value are ceramic; others are silver mica, except polarity marking indicates electrolytic. Unless otherwise specified, resistors are ½-watt composition. See Fig. 5 for heater connections.

C_1, C_2—3–12-pf. ceramic, zero temp. coefficient (Centralab 822-FZ).

C_3—Air trimmer (Johnson 160-107, or similar).

J_1—Three-circuit jack.

R_1—Linear control.

S_1—S.p.d.t. slide switch (Carling S60B or equivalent).

S_2—S.p.s.t., or same as S_1.

T_1—10.7-Mc. f.m. discriminator transformer; see text (Meissner 17-3494).

T_2—Microphone transformer, 200 to 500K (UTC "Ouncer" O-14).

way to get needed stability in a small space. Using some of W6JAT's ideas, and scrounging the rest from other sources, the complete circuit finally emerged. Every consideration was given to keeping the number of tubes to a minimum. Multipurpose tubes helped, but 10 tubes plus two VR tubes were finally needed to do the job.

Circuit Functions

Before going into detail, it might be well to describe the over-all scheme of the transceiver. Referring first to Fig. 1, a 6AR8 is used as a combination 9-Mc. crystal-controlled carrier oscillator and balanced modulator. The 6AR8 is similar to the 7360 but is less expensive. The 9-Mc. signal is fed to the No. 1 grid, while audio is fed to one of the deflectors. On transmit, the 9-Mc. d.s.b. signal from the balanced modulator is fed to the crystal filter of Fig. 2, which suppresses the unwanted sideband and also contributes further suppression of the carrier. The s.s.b. signal from the filter is amplified in the first of two 9-Mc. amplifiers and then fed to the 6BA7 transmitter mixer. Here the 9-Mc. signal is mixed with the 16.2-Mc. signal from the VXO to produce 7.2-Mc. output. This 7.2-Mc. output is fed to the 12BY7 driver of Fig. 3 and thence to the 6DQ5 final amplifier.

On receive, an incoming 7.2-Mc. signal is amplified in the pentode section of a 6AX8 (Fig. 2), and then mixed in the triode section of the same tube with the 16.2-Mc. signal from the VXO. The resulting 9-Mc. output signal from the receiver mixer is fed through the crystal filter and the following two 9-Mc. amplifiers to the detector and audio system of Fig. 4. The balanced modulator is disabled on receive, but the carrier oscillator remains in operation to furnish a b.f.o. signal to the detector. In either mode, inactive stages are disabled by removing plate voltage. The transmit-receive switch takes care of this.

Carrier Oscillator and Balanced Modulator

Returning to Fig. 1, two crystals are used in the crystal oscillator so that the carrier may be shifted to place either upper or lower sideband in the passband of the filter. These crystals are normally supplied with the McCoy filter as a package. The two frequencies may be trimmed to the proper spot in relation to the slope of the filter characteristic by means of the trimmer capacitors (C_1 and C_2) shunting the crystals.

The balancing and output-coupling circuits of the balanced modulator are slightly different, and the values used also deviate somewhat from those normally shown for the 6AR8 or 7360 in this application. More trouble was encountered

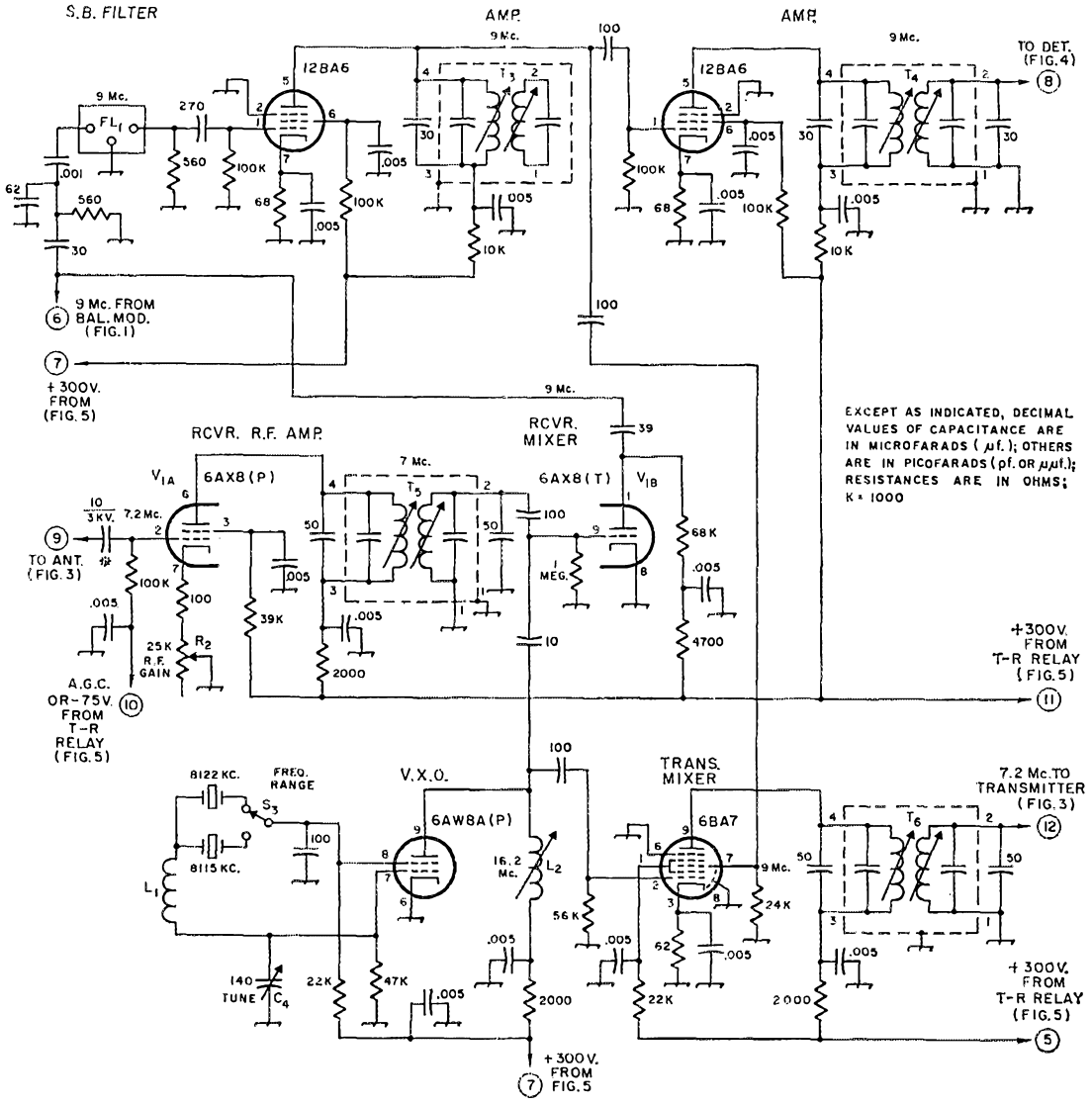


Fig. 2—I.f. and frequency-conversion circuits. Fixed capacitors of decimal value are ceramic; others are silver mica, except * indicates ceramic. Resistors are ½-watt composition. See Fig. 5 for heater connections.

C_4—Air-trimmer variable (Hammarlund APC-140-B).
FL_1—9 Mc. crystal filter (McCoy 32B1).
L_1—20 μh.—Approx. 45 turns No. 30 enam., close-wound on form taken from National R-33 100 μh. r.f. choke. See text.
L_2—18 turns No. 22 enam., close-wound on ⅜-inch iron-slug form.
R_2—Linear control.
S_3—Same as S_1.
T_3, T_4, T_5, T_6—10.7-Mc. i.f. transformer (Miller 1463).

in this portion of the circuit than in any other. Transformer T_1 was originally a standard 10.7-Mc. i.f. transformer. The plates of the 6ARS were shunt-fed through 68K resistors, and the plates coupled to the primary of T_1 through 0.001-μf. capacitors. With this arrangement, the output from the crystal filter was very low, and the carrier suppression was poor. (The transformer was never designed for this application, so it can't be blamed.) A 10.7-Mc. discriminator transformer was substituted. The secondary is bifilar-wound, which is one point in its favor. All internal capacitors were removed, and the secondary was used as the center-tapped primary. With this revision, the results were much improved. The carrier suppression was better, and the output from the crystal filter was more than adequate. An r.f. probe, connected to the output of the 12BY7 driver, was used to measure the carrier suppression. The measured suppression is about 40 db. below the peak output. The minimum reading apparently is limited by the various beats produced in the 6BA7 mixer. At any rate, the effective suppression is better than 40 db.

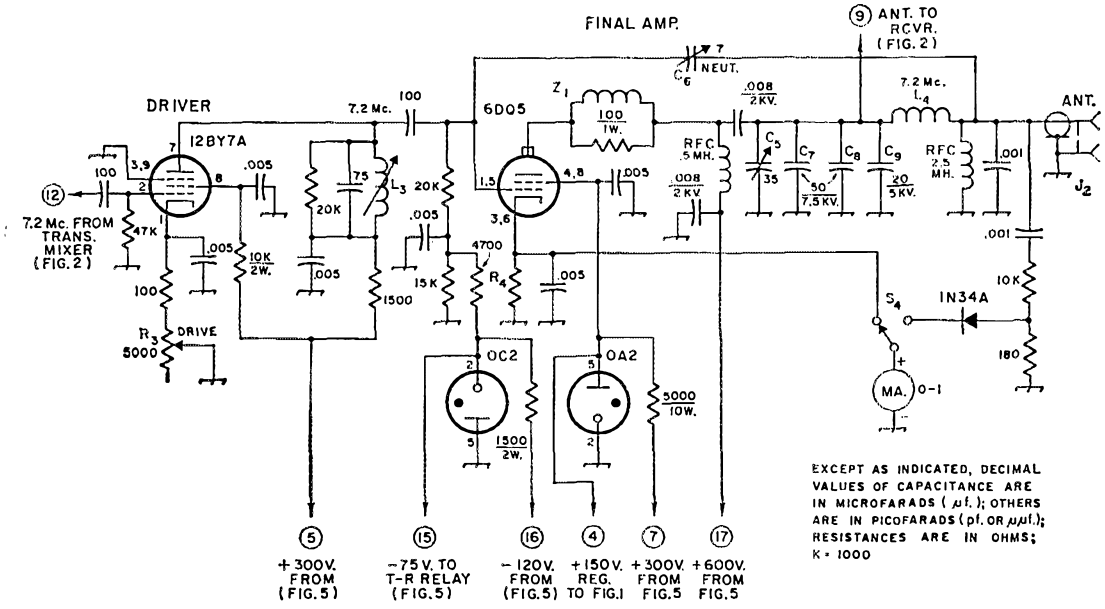


Fig. 3 — Transmitting driver and final-amplifier circuits. Antenna connection to receiving r.f. amplifier is taken from the input side of the transmitting pi network. On transmit, the t.r. relay (K_1 Fig. 5) applies −75 volts bias to the receiving r.f. amplifier to protect it from the transmitter signal. Capacitors of decimal value are ceramic; others are silver mica.

C_5—Double-spaced midget variable (Hammarlund MC-35-SX or similar).

C_6—NP0 ceramic trimmer, 1.5–7 pf. (Centralab 822-EZ).

C_7, C_8—7500-volt ceramic (Centralab 850S-50Z).

C_9—5000-volt ceramic (Centralab 853-20Z).

J_2—Coaxial plug-in connector (UG1051/U).

L_3—24 turns No. 26 enam. on ⅜-inch iron-slug form.

L_4—18 turns No. 20, 1½ inches long on ceramic form 1⅛ inches in diam.

R_3—Wire-wound control.

R_4—200 times meter shunt.

S_4—Same as S_1.

Z_1—5 turns No. 18 wound on associated 100-ohm resistor.

judging from the ratio of maximum to minimum readings on a field-strength meter. I am inclined to believe that the formula sometimes used to calculate carrier suppression of sideband rigs is the same one frequently employed in determining gas mileage.

Modulation is accomplished by applying audio voltage to one of the 6AR8 deflectors. The required a.c. voltage is something less than 10 volts, and this is easily obtained by using a carbon microphone and an input transformer. The voltage for the microphone is taken from the 12-volt circuit through an *RC* filter. I have always favored the carbon microphone for mobile operation. The cost is low and output is high enough to eliminate a preamplifier. There is never any r.f. feedback as is frequently encountered with low-output microphones and high-gain preamplifiers. In addition, the frequency response is designed for voice operation, and it doesn't make much sense to use a microphone which is flat from 100 cycles to over 10,000 cycles and then pass the output through a filter which limits the response to 300–3000 cycles.

Crystal Filter

The circuit diagram supplied with the filter shows variable capacitors connected across the input and output. These are to be adjusted for maximum output with the modulator unbalanced and using the 9001.5-kc. crystal. However, it was found that any capacitance added to either the input or the output of the filter caused the output signal to decrease. This is probably caused by the fact that the 62-pf. capacitor of the filter input impedance-matching network is connected across the input of the filter.

The VXO

The tuning of the transceiver is accomplished through the use of a VXO, or variable crystal oscillator. Securing stability in a mobile v.f.o. is no easy task. It must be built like a battleship with all voltages carefully regulated. W6JAT[3] came up with the answer in his design. Use a VXO and cover only about 30-40 kc. at the low end of the 40-meter phone band. The circuit used (Fig. 2) was originally described by W3BWK,[5] and has appeared in numerous sideband applications. His original circuit used a split-stator tuning capacitor. Experiment showed that by making one section fixed, about 80 per cent of the frequency shift could still be obtained with a single-section variable capacitor in place of the dual-section capacitor. Crystals at 8 Mc. are used, with the shift limited to about 9 kc. The output of the pentode section of the 6AW8 is tuned to 16.2 Mc.

[5] Shall, "*VXO* — A Variable Crystal Oscillator," *QST*, January, 1958.

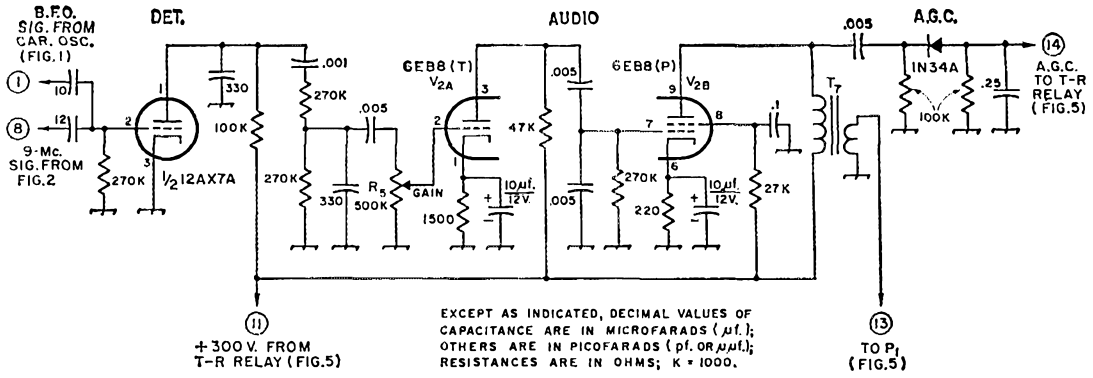


Fig. 4—Detector and receiving audio circuits. The b.f.o. signal is obtained from the carrier oscillator. Rectified audio supplies a.g.c. for the receiver r.f. stage. Capacitors of decimal value are ceramic or paper; others are mica, except polarity markings indicate electrolytic. Fixed resistors are ½-watt composition. See Fig. 5 for heater connections.

R_5—Audio taper control.

T_7—Output transformer, 10,000 ohms to 7 ohms (Thordarson 24S52).

At this frequency, the shift is double, or about 18 kc.

Two crystals are used in overlapping ranges to cover from 7200 kc. to 7235 kc. The crystals used are regular ham-type units manufactured by the American Crystal Company in Kansas City, Missouri. They are mounted in the small CR6U metal cans. The value of L_1 must be determined experimentally, and may vary depending on the crystal being used, although both of the crystals that I used provide about the same shift with the same coil. Connecting the inductance L_1 in series with the crystal causes its series-resonant frequency to be lowered. This means that the marked frequency of a crystal must be higher than the required highest output frequency. It was determined experimentally, using some crystals near 8 Mc., that the crystals should be ordered with a frequency about 6 to 7 kc. on the high side. Two crystals were then ordered, one at 8122 kc. and a second at 8115 kc. Using the circuit shown, these crystals actually cover 7202 to 7221 kc. and 7217 to 7235 kc. after mixing with the 9.0-Mc. signal. Nothing is guaranteed with respect to the crystals which you order. You're on your own.

L_1 is made by taking a 100-μh. r.f. choke and first removing all of the wire. The core is then rewound with approximately 45 turns of No. 30 enameled wire. The actual number of turns is adjusted until the desired frequency shift is obtained. Using a grid-dip meter and a standard capacitor, the inductance was found to be approximately 20 μh.

The frequency stability of the transceiver is excellent and the bandspread is very good, thus making tuning slow and easy.

Final Amplifier

A 6DQ5 is used in the final amplifier (Fig. 3). A pi network is used in the output and the tube is neutralized. The neutralizing circuit is a little unusual and is employed because of the physical problem of connecting a capacitor from the plate of the 6DQ5 to the bottom of the tank circuit of the 12BY7. The value of the output capacitor of the pi network is determined experimentally, and then the capacitor is soldered permanently into the circuit. This saves a separate loading capacitor and makes it possible to use the bridge neutralization circuit shown. This circuit would not work very well with a multiband amplifier, or one in which the output capacitor is variable.

The combination of C_5, C_7, C_8 and C_9 was chosen on the basis of compactness and availability. If space permits, the combination may be replaced by a single 150-pf. variable, or by other combinations of fixed and variable that will give an equivalent total. Any fixed capacitors used should be capable of carrying 3 or 4 amperes of r.f., such as high-voltage mica types or the 850S ceramic types mentioned.

Drive may be adjusted by means of R_3 in the cathode circuit of the 12BY7 driver.

The 6DQ5 screen voltage is regulated by an 0A2. This regulator also controls the No. 2 grid voltage of the carrier oscillator. The 0C2, operating from a −120-volt source, provides regulated −75 volts. A voltage divider in the grid-biasing circuit of the 6DQ5 reduces this to about −56 volts.

The metering system consists of a single 0–1-ma. meter which may be switched either across a multiplier resistor (R_4) to read final-amplifier cathode current, or to an output-indicating circuit sampling the r.f. output from the pi network.

Receiver Details

To avoid the need for an antenna-transfer relay or switch, input to the receiving r.f. stage (Fig. 2) is coupled through a small high-voltage capacitor permanently connected to the hot end of the transmitter output pi network. To offset the effect of the rather high r.f. voltage that appears at the signal grid of the 6AX8 pentode when transmitting, the t.r. switch applies a

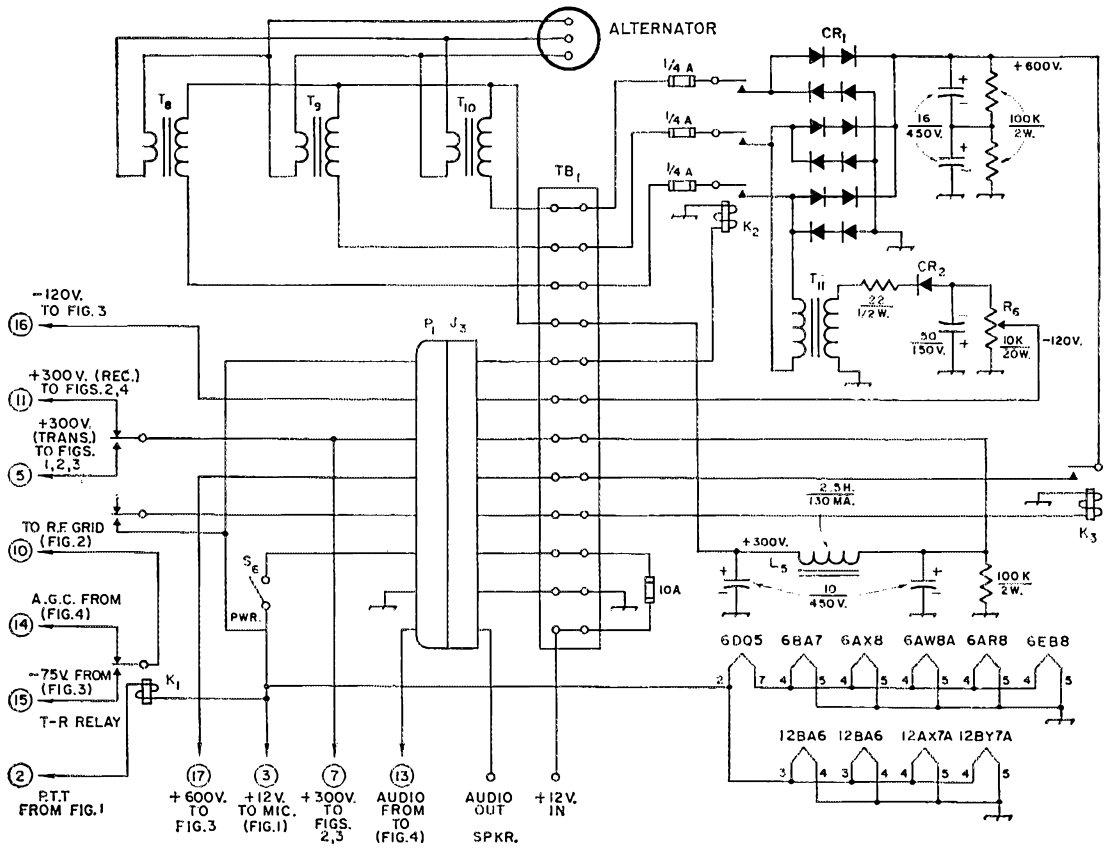


Fig. 5—Power and control circuits. Capacitances are in μf., and resistances in ohms. Capacitors are electrolytic.

CR_1—12 silicon units, 400 p.i.v., 750 ma. each unit.
CR_2—Silicon rectifier, 400 p.i.v., 750 ma.
J_3—Octal socket.
K_1—Subminiature 12-volt 3-pole double-throw d.c. relay (Potter & Brumfield MG17D, one pole not used).
K_2—12-volt 3-pole double-throw d.c. relay (Potter & Brumfield KA14DY).
K_3—12-volt s.p.d.t. d.c. relay (Potter & Brumfield KA5DY).
L_5—Filter choke (Stancor C2303 or equivalent).
P_1—Male octal plug.
R_6—Slider adjustable.
S_6—S.p.s.t. attached to R_5, Fig. 4.
T_8, T_9, T_{10}—See text.
T_{11}—230-volt 40-ma. power transformer, 115-volt primary used as secondary, center tap on 230-volt winding not used (Triad R-29A or similar).
TB_1—Terminal board.

negative bias of 75 volts to this grid. This negative voltage is taken from the 0C2 in Fig. 3.

I am very sorry to report that this transceiver does not use a product detector. A 6BA7 and 6AR8 were tried as product detectors, but both proved to be very microphonic. I cannot explain this difficulty, since everybody else seems to use them with success. Perhaps the physical layout had something to do with it. However, the 12AX7 grid-leak detector shown in Fig. 4 works fine. Since the b.f.o. frequency from the carrier oscillator is always the same as the frequency used on transmit, the sideband relationship is the same for both modes. That is, when S_1 is set for l.s.b., the lower sideband will be transmitted and received. On receive, the transceiver is tuned until the received voice signal sounds natural. The transmitting frequency will then be very close to that of the received signal.

Output from the audio amplifier which follows the detector is adequate for mobile operation. I have a switch mounted under the dash which transfers the speaker from the broadcast receiver to the transceiver.

A.g.c. voltage is obtained by rectifying the audio drop across a resistor shunting the output-amplifier load. The rectified voltage appears across a 100K resistor shunted by a 0.25-μf. capacitor. A larger capacitor at this point would provide smoother operation, but I did not have space for it. A.g.c. is applied to the r.f. stage (Fig. 2) only, but it is effective and eliminates the necessity for reaching for the manual gain control when a strong signal hits the front end.

Power Supply

Fig. 5 shows the circuit of the power supply and control system. The power-supply is a little

unusual, and should be of interest to anyone contemplating a mobile sideband transceiver. W8DLD and W8WFH[6] describe the use of an alternator for supplying the power for a high-powered mobile transmitter. In their case, they used a special high-output unit capable of supplying over 750 watts. I use the alternator which is standard equipment in my car. It is rated at 30 amp., or about 400 watts. This is still plenty for a transceiver rated at a peak input of about 100 watts.

Automobile alternators have three-phase output. They are Y-connected, but the neutral is not used, although it is brought to a terminal on some makes. The alternator contains six silicon diodes which convert the three-phase a.c. to d.c. When the alternator is operating at normal output, the a.c. voltage, line to line, is close to 10 volts. Measuring from line to neutral, it would be close to 6 volts. I opened my alternator and soldered three No. 10 wires to the a.c. output, ahead of the rectifiers. The rectifier connections were not disturbed, so the alternator functions in a normal manner as far as the d.c. output is concerned.

The next step was to raise the low a.c. output to a higher a.c. voltage. I found three surplus filament transformers with 10-volt, 10-ampere secondaries. The primary of each is tapped at 200, 220 and 240 volts. The 10-volt secondaries were connected in the delta configuration and then connected to the three wires from the alternator. The 220-volt taps are used and the primaries are connected in Y. Using the neutral, this stepped-up a.c. is applied to a three-phase rectifier consisting of 12 silicon diodes, 2 diodes per leg. The resulting d.c. output is approximately 600 volts and 300 volts. Because the ripple is low with the three-phase connection, very little filter is needed. A small step-down transformer is connected across one of the larger transformers and produces 110 volts a.c. which is rectified and filtered to produce the bias voltage.

The surplus transformers work very well. Actually, a rating of 10 volts at 5 amp. would be sufficient. Transformers rated at 6.3 volts, 10 amp. with 220-volt primaries could also be used by bringing out a neutral connection from the alternator and connecting the 6.3-volt windings from line to neutral. The 220-volt primaries would be connected in Y. However, probably neither 6.3- or 10-volt transformers with 220-volt primaries are a drug on the market. Control transformers rated at 12 volts 8 amp. are regular catalog items. These may be substituted for the 10-volt transformers mentioned at a sacrifice of 15 to 20% in output voltage.

The efficiency of this arrangement, with reasonably good transformers, is better than that of a good transistor power supply. To gain some idea as to the performance in this installation, look at the accompanying chart. The worst condition is with the engine idling and the headlights turned on. Here, at maximum output, the plate voltage is 490 volts and the plate current is 135 ma. for an input of 65 watts. The best condition is with the engine operating at driving speed and the headlights off. Here, at maximum output, the plate voltage is 630 volts and the plate current is 160 ma. for an input of 101 watts. Using transformers designed for operation over a wide frequency range, the regulation and efficiency would be even better.

TABLE I

Engine	*Mode*	*Lights*	*Low*	*High*	*Final*
Idle	Rec.	Off	265 v.		
Idle	Rec.	On	255 v.		
Idle	Trans.	Off		500 v.	135 ma.
Idle	Trans.	On		490 v.	135 ma.
Driving	Rec.	Off	320 v.		
Driving	Rec.	On	310 v.		
Driving	Trans.	Off		630 v.	160 ma.
Driving	Trans.	On		600 v.	155 ma.

Driving speed equivalent to 40 m.p.h.
Engine idle speed: 580 r.p.m.
Generator regulator set at 14.2 volts.
Final plate current values shown were taken with maximum sustained modulation.
Minimum final plate current: 35 to 40 ma.

Control Circuit

Referring to Fig. 5, S_6 is the main power switch. This switch turns on all heaters, sets up the 12-volt circuits for the relays and microphone, and operates K_2 which turns on the high-voltage and bias supplies. In this condition, those transceiver stages which are used for both transmit and receive are supplied with 300 volts directly, while those used on receive only are similarly supplied through a back contact of K_1. At the same time, the a.g.c. circuit from the audio amplifier is connected to the receiver input stage.

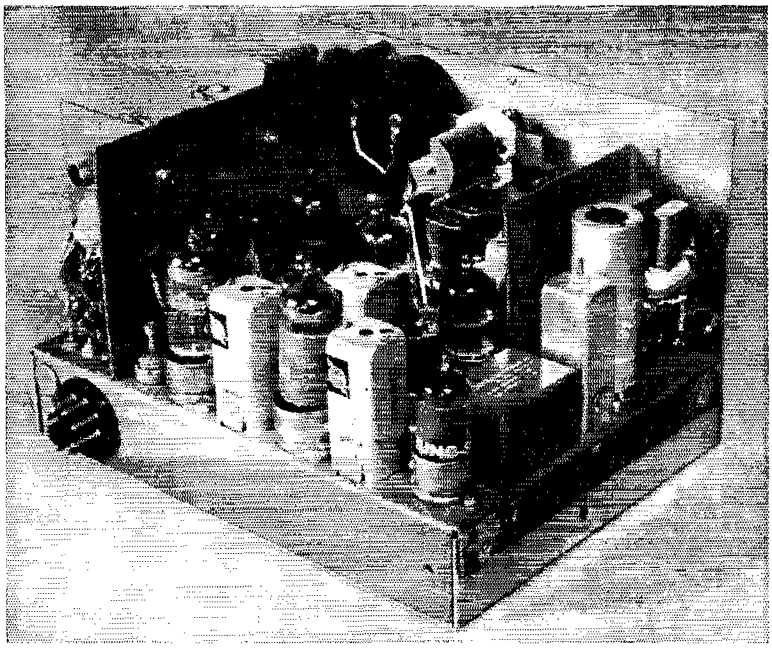
Switching from receive to transmit is controlled by a d.p.s.t. toggle switch (or p.t.t. switch) at the microphone. This switch closes the microphone circuit and simultaneously operates K_1. K_1 shifts the 300-volt line from stages which operate on receive only to stages which operate on transmit only, and simultaneously operates K_3 which switches the 600-volt supply to the final amplifier. At the same time, K_1 switches the grid return of the receiver r.f. amplifier from a.g.c. to a fixed bias of -75 volts to protect the amplifier tube as described earlier. Since K_1 cuts off the plate supply to the audio amplifier, the speaker is muted.

Construction

The transceiver is small in size. In fact, it is too small. There is not enough room to work in easily and not enough metal surface and ventilation to adequately dissipate the heat generated by the tubes. The cabinet should have been a few inches deeper. I solved the heat problem by installing a small 12-volt blower directly behind the transceiver. This blows on the low-level part of the chassis.

The cabinet is an LMB type W-1C. It measures 8½ inches long by 6⅛ inches wide by 6 inches

[6] Prescott, Louden, "Mobile Power Supply Ideas," *G-E Ham News*, Aug.-Sept., 1960.



Proceeding from right to left around the outer edge of the chassis, the sideband crystals are close to the panel, followed by the 6AR8, T_1, the sideband filter, the first 12BA6, T_3, the 6BA7 transmitter mixer, T_6, the 12BY7A driver, and L_3. To the left of the sideband filter are the second 12BA6 and the 6AX8, with T_4 still farther to the left, and T_5 just visible to the right. The VXO range crystals are below the VXO tuning capacitor. The detector and receive audio section occupies the space to the rear of the meter.

high. Large holes were cut in the top and sides, and then pieces of perforated metal were riveted over the holes. This helps considerably with the ventilation. The photographs show the parts layout. It took a lot of planning to get all of the necessary parts into the small space. The balanced modulator and crystal oscillator are shielded from the rest of the circuit. The receiver front end is also shielded from the 9-Mc. amplifier strip. The 6DQ5 is shielded from the balance of the circuit. No difficulty was experienced which was traced to a lack of isolation or shielding, so the precautions were probably worth the effort.

There isn't much space available for the final amplifier. The 6DQ5 is mounted horizontally with the tank coil and capacitor above it. The tank coil is wound on a surplus ceramic form and is not affected by the heat. The fixed capacitors consist of three high-voltage ceramic capacitors mounted inside the coil form. These also are not bothered by the heat. Air-wound coils, using plastic strips for insulation, would not be suitable for this rig, although they work fine where there is adequate ventilation.

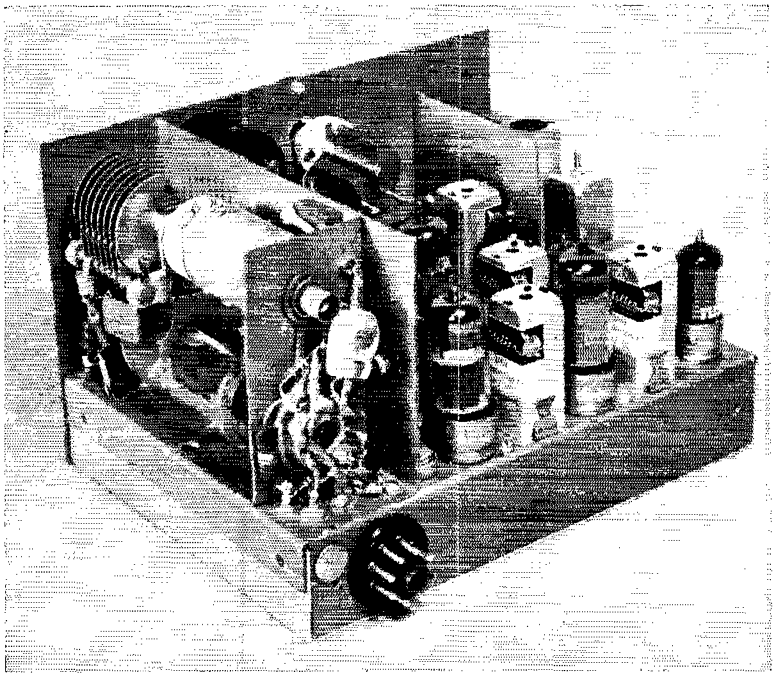
The cabinet, which included the chassis, was purchased in the unpainted condition. All of the holes were cut and the ventilating grilles riveted on, and then all of the metal pieces were painted with hammer-tone paint from an aerosol can. It is not difficult to get a good-looking paint job this way, and there is no worry about scratching the paint while the holes are being cut.

Alignment

A signal generator is not required for tune-up since there is already a built-in oscillator. Only two pieces of test equipment are required. The first is a vacuum-tube voltmeter with an r.f. probe attachment. The second is a grid-dip meter with reasonably accurate calibration.

The use of the commercially-made r.f. transformers saves a lot of time and trouble. They are small, well-shielded, and do not take up much space below the chassis. Using the additional external capacitors shown in the circuit diagram, they will tune to the required frequency with no time-consuming cutting and trying.

The first thing to adjust is the balanced modulator. The 9.0-Mc. oscillator must be working, and this can be checked by measuring the r.f. voltage at the cathode of the 6AR8. No voltage, no oscillation. The VXO should be disabled to avoid any possible stray pickup from it during the null adjustments to follow. Initially, capacitor C_3 is disconnected. The carrier switch, S_2, is closed. This produces just enough carrier to facilitate tuning the transmitter with the aid of a field-strength meter, and makes it possible to tune the rig without danger of exceeding the dissipation rating of the 6DQ5. Connect the r.f. probe across the secondary of T_1, and peak the tuning slugs for maximum output. Move the r.f. probe to the grid of the 6BA7 transmitter mixer, and peak the primary of T_3 (the secondary of T_3 is not used). Now repeak the primary and secondary of T_1. Set the trimmer (C_1) across the 8998.5-kc. crystal to about half capacitance and switch this crystal into the circuit. The precise setting of C_1 requires a frequency meter like an LM or BC-221. It is possible to get additional carrier suppression by increasing the capacitance of the trimmer. There will be some sacrifice in audio quality if the frequency is set more than 10 db. down on the slope of the crystal-filter passband. This same adjustment will be required in C_2 with the 9001.5-kc. crystal switched in, but in this case the ca-



This view shows the final-amplifier assembly. The 6DQ5 and pi-network coil are mounted horizontally from a bracket. The trimmer capacitor is for neutralizing.

pacitance is increased to move the frequency up the slope of the filter and thereby provide less attenuation of the carrier. The 8998.5-kc. crystal will be used most of the time, since this is the one required to generate the lower sideband. After the transceiver is in operation, a check with a local station will be helpful in setting the crystal trimmers. Move the carrier frequencies as far down the slope of the filter as possible while still retaining acceptable quality. The local station will be able to tell you when you have gone too far.

Now open S_2. Adjust the balance control, R_1, for minimum output. Before making further adjustments, whistle directly into the microphone and note the reading on the v.t.v.m. All subsequent adjustments of the balanced modulator should not affect this maximum reading more than about 10 per cent. Now connect trimmer C_3 to one of the plates of the 6AR8. Start with a minimum setting and increase the capacitance. If the output does not decrease, try connecting the capacitor to the other plate. In all of these final adjustments of the balanced modulator, remember that a null is desired, not just reduced output; that is, adjusting C_3, R_1, or the coil slugs in one direction should cause the output first to decrease and then to increase. The null is the minimum reading. Don't make the mistake of assuming that any decrease in output is an improvement in the null reading. Readjustment of the primary and secondary slugs of T_1 may improve the null. Just be sure that you are getting a null and not just decreasing the output by detuning the circuit. All of the null adjustments interact to some degree, so keep making adjustments until there is no further improvement.

Now get the VXO operating. Assuming that the circuit oscillates, and the value of L_1 is set as described earlier, the only adjustment to make is in L_2. With the power off, use the grid dip meter to set the frequency of L_2 to approximately 16 Mc. Turn on the VXO, connect the r.f. probe to Pin 2 of the 6BA7 and adjust L_6 for maximum output. Connect the r.f. probe to the No. 2 grid (Pin 8) of the 12BY7 driver. Close S_2 and peak the primary and secondary of T_6 for maximum indication. Be careful that these circuits are not being tuned to 8.2 Mc. instead of 7.2 Mc. Check by turning off the carrier switch. The meter reading should fall to a very low value. Re-adjust L_2 for a maximum reading also.

Move the r.f. probe to the input grid of the 6DQ5. During all of these initial adjustments, remove the plate and screen voltage from this tube. Adjust L_3 for maximum indication and readjust the primary and secondary of T_6.

The final plate tank circuit is next. Check the tuning range of this circuit with the grid-dip oscillator. Set the neutralizing capacitor, C_6, at minimum value. Connect a 52-ohm dummy load to the antenna terminal. With the 6DQ5 filament on, but all other voltages removed, apply excitation to its input grid. Connect the r.f. probe to the plate. Adjust the tuning capacitor C_5 for maximum reading. If this occurs with C_5 set at maximum or minimum capacitance, the output circuit is not tuned to the correct frequency. Now adjust the neutralizing capacitor for a minimum reading. After the antenna is connected and the rig is on the air, some additional adjustment of the neutralizing capacitor may be necessary since a change in the output capacitance will unbalance the bridge neutralizating circuit. Some adjustment of the output capacitor may be required to

suit a particular installation. Try 820, 1000 and 1200 pf., and see how much difference they make. The author found that a 0.6-μh. coil connected from the bottom of the whip antenna to ground made a noticeable improvement in the output.

The remaining adjustments are for the receiver section. A modulated signal generator would help. Just peak T_4 and T_5 for maximum output on a received signal. No further adjustment of the receiver is necessary. All of the tuned circuits operate at 7 Mc. or higher, so there is no need to adjust them in normal operation since the VXO covers a range of only 35 kc.

Without going into excruciating detail, that's about it as far as the alignment and adjustments are concerned. The assumption is made that all bugs have been removed before the final alignment is attempted. Anyone who has enough experience to start the construction of a single-sideband transceiver should know what to do when he runs into trouble. If not, he'd better not start.

Afterthoughts

My transceiver is installed in the car and is being used daily. Results have been very good, although not any better than commercial equipment having the same power rating, of course. It is a very pleasant surprise to find that you can regularly contact stations who would normally be beyond your range for a.m. It also works the other way. The sideband stations will come through local noise which would ordinarily make a.m. reception difficult, if not impossible.

I had the usual amount of troubles before the transceiver was operating in a satisfactory manner. Some design changes had to be made and the circuit shown in this article is not the same one used at the start of the project. There may be some concern about the unused triode sections of the 6AW8 and the 12AX7. The fact is that they just aren't used. Original plans included the full use of all tubes. It's better to have room for tubes you don't need than to have need for tubes for which you don't have room. Or something like that.

A drawing giving the chassis layout has been purposely omitted. Benefit by my experience. Use a larger chassis and cabinet. Use parts on hand where you can. You aren't going to be able to find some of the exact parts which I used. I have a larger junk box than you do. QST

Strays

VE3DUU tells us that the "Two-Band Station for the V.h.f. Beginner," which has long since sold out all back issues of *QST* for July through October, 1961, is popular in Canada, too. He has a design for the transmitter, modulator, power supply, standing-wave bridge and control circuits, modified for Canadian components, and intended for one-chassis mounting. A print of the layout, and top and bottom photographs, will be supplied to interested Canadian amateurs for $1.00 per set. Address Albert Jensen, VE3DUU, 1076 Glengrove Ave., Toronto 19, Ontario. The reprint of the four *QST* articles, together with matching templates, is still available from ARRL at 50¢.

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A 64-page cumulative index to *QST* is available for 25¢ postpaid, covering the years 1950–1962. Request your copy from ARRL Hq., 225 Main St., Newington, Conn.

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KN3VVG is interested in forming a Novice Net on 3745 kc. Check in at 2400 GMT Fridays.

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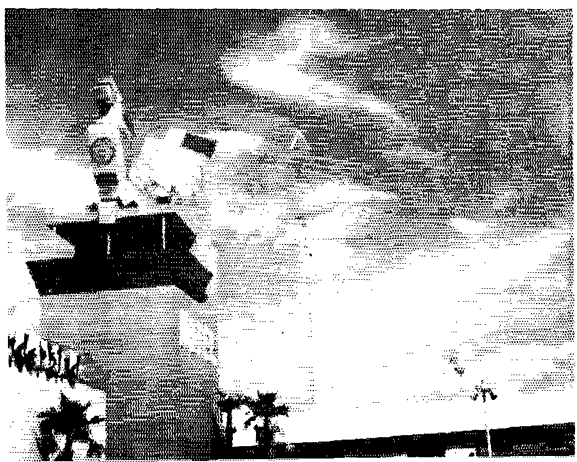
WA2EJJ, WA2ANU, and K2TDH went on an unscheduled hidden transmitter hunt recently, trying to locate the source of an unmodulated carrier which had been on 3900 kc. for more than five hours. They finally located the offending station, awakened the tired operator, and the dead carrier left the air. The ham had operated all night the night before and had fallen asleep.

The club station of the Las Vegas (Nevada) Radio Amateur Club is located in the fabulous Thunderbird Hotel, which provided complete facilities, equipment and antenna. Amateurs who are guests at the hotel may operate the station under the jurisdiction of an authorized club member. At left is a view of the multi-element, multi-band rotatable antenna array atop the hotel. At right Mel North, W7FJN, station trustee, has a go at operating from the temporary console. That's W7PBV, Nevada SCM, in the mirror.



DXCC 500

BY JOHN G. TROSTER,* W6ISQ

AH, honorable Jocko, unworthy arms dropping off from turning honorable generator."

"Easy, Suki, old boy, where's your old zip?"

"Senor, I no can hold theese wire up mucho longerrr — zee islan', she be seenking queeker now. Ze waves she break over my hade."

"Easy, Pedro, won't be long now. Don't let the wire dangle in the water."

"Bitte, Herr Ditten-Dotten Macher, frappen zie der key, der lava is kommen sehr schneller und closer . . . ist geroasting mein gerunter."

"All stout fellows, aren't they? Volunteers, too! Hold on a minute, fellas, I'll tell these people about our terrible troubles.

"Ya see, it all began when this little volcano erupted right here out in the middle of the ocean! One day there was nothin'. Next day, bang, here's a new little island. This little island was put under UN suzerainty. Didn't think I'd know that word, huh — well, it's a word meaning — nuts, you look it up. I gotta get going here.

"Anyway, some fellas decided that this territory, this new baby island, oughta be operated by the United Nations for the world of science. They wanted to study how life would start up, ya know from absolutely nothin' on a new island.

"So they got a real good zoologist to hunt up all the zoology stuff around here. That's Pedro. He's the guy out there in the waves holding up that end of the antenna.

"Then they got Herman, the guy up there on the side of the volcano. Yeah, right there in front of that wall of lava. Herm's a real good vulcanologist — looks down volcanos, ya know.

"Then they had to have a biologist to look around for all the biologicals on the new little island here, so they got Suki here. Yeah, he's the fella here in the rowboat grinding the generator.

"Well, like ya know, it wasn't long before the DXCC committee up at old ARRL got tangled up in the act — is the new island is, or is it ain't a new country? Well, they agreed to make this baby island a new country. Made 'er number 500, *but* they also said she's the last DXCC country! That's right — no more new countries, ever. This is the last in a long line of DXCC countries! If ya don't work this little bitty volcano, well . . ."

"Herr Jocko, der wall von lava ist sehrrr hotter."

"Righto, Herm, keepen zie on der shirt.

"See how fast ya pick up the language when ya work around these science guys!

"Oh me, how did I get here? Well, ya know Gus and Danny was pretty busy. So the League begged me to come out here and handle this one. Yah, the League said I was 'expendable' — but I told 'em, 'nah, save your money, put it in the Headquarters Building Fund. I'll do this one as me civic duty.

"Well, anyway, we got so carried away in our studies here we forgot about the radio. That is, until the island began to erupt again, and then began to sink! Well, I can't let the fellas down out there in radio land. Ya know, give some of 'em a call for their 500th DXCC. After all, like I said, 'this is the last of a long line.'

"So here I am trying to make contact . . .

"Herman, don't let go, a little lava never hurt nobody — not since Pompeii, I guess.

"Hey, Pedro . . . stout fella . . . hold on a bit more. Oooops, somebody throw him a life preserver. Keep the wire out of the water, Pedro.

"OK, boys, all systems go. CQ CQ CQ de W6ISQ/UNV (oh yeah, that's for United Nations Volcano).

"Turn Suki, turn. Can just barely make out . . . uppen zie der antenna, Herman . . . gut.

"Ah yes, there's W6GPB . . . W1FH . . . PY2CK . . . KV4AA . . . W2QHH . . . my gosh, I'll bet we're running more power than he is. All there. All DXCC 499 boys too . . . W9BRD . . . he must be lost 'er sumpin."

"Pronto call someheeng, Senor Jocko. I theenk I see ze beeg shark comeeng up queek . . ."

"There's W8JIN . . . W4KFC . . . W9IOP . . . Gee, maybe this is Sweepstakes weekend."

"Schnellll, Herr Jocko — der lava ist geroasting der sitzer . . ."

"Who shall I call? Only time now for one QSO. Whoever I call will be the only station ever to get DXCC 500. Never have another chance to work this island. It's going down fast now. Ya gotta pick one. Make it right. Boy, this water is cold!"

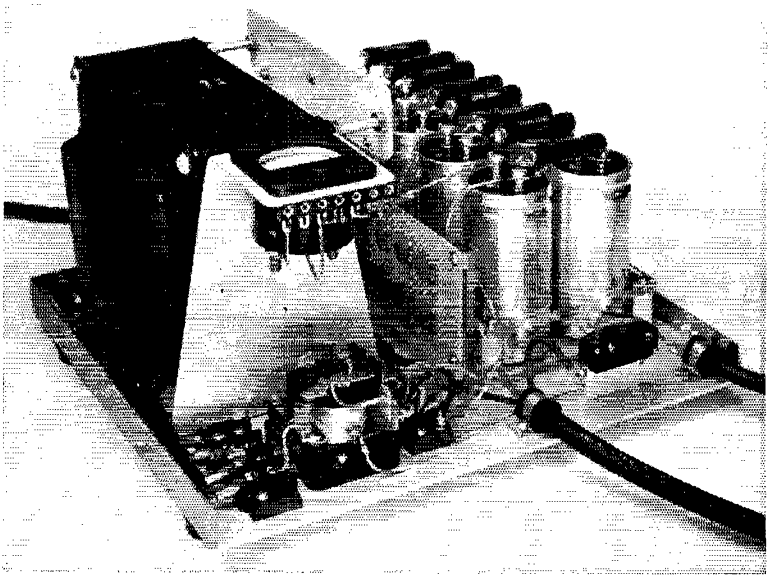
"Senor, you'm better call ze stashun queek pronto. Thees beeg shark makeeng ooogles at meee!"

"Wie callen zie, Jocko? Wie machen zie nummer 500?"

"Well, here's one. OK, fellas, OK . . . I'm gonna call . . .

(*Continued on page 138*)

* 45 Laurel Street, Atherton, Calif.



The semiconductor power supply uses a string of silicon diodes and a bank of 450-volt electrolytic capacitors. The diodes are mounted on the pre-punched terminal board mounted between the transformer and the capacitors; in this view only the equalizing capacitors and resistors can be seen. The small switch at the right foreground is the interlock.

Inexpensive Power Supply for a Kilowatt Linear

Using Silicon Diodes in a Voltage-Doubling Circuit

BY BYRON GOODMAN*, W1DX

Anyone brought up on mercury-vapor rectifiers and swinging-choke power-supply filters is likely to take one look at a semiconductor kilowatt power supply and say, "Stand back! It will blow up if anyone turns it on!"

The rectifiers are too small. There is no swinging choke. (In fact, there is no choke at all.) There is no rectifier filament transformer, with 10,000-volt insulation and the attendant bulk, not to mention the insulation problems and the tube sockets. If you're nostalgic, you will miss the blue flash of the murky-vapor rectifiers, but if you're practical you'll love the compactness and economy of a semiconductor supply.

The power supply shown in the photographs does a beautiful job of supplying the necessary plate power for a 3-1000Z grounded-grid linear amplifier (3000 volts at 330 ma. indicated peaks, 600 ma. or so actual). The power supply could have been built with a couple of silicon rectifier units rated at 4000 volts p.i.v. (and costing $18 each), but instead it was built with 16 500-p.i.v. units costing 84 cents each (a total of $13.50). That's one of the first lessons you learn with silicon rectifiers: use a mess of inexpensive ones instead of a couple of expensive ones. Of course there are a few considerations when a lot are used, but we'll get to them later.

The rectifier used in the power supply is the 1N1754, rated at 500 p.i.v. (peak inverse voltage) and 500 ma. d.c. up to 75° C. The recurrent peak rating is 5 *amperes*, and the allowable "turn-on" transient of 2 milliseconds duration is *35* amperes; all this in a pig-tailed unit about the size of a 1-watt resistor. The data sheet for the rectifier

* Assistant Technical Editor, *QST*.

The 3-1000Z grounded-grid amplifier in the 1963 *Radio Amateur's Handbook* is a compact little powerhouse just over one cubic foot in volume. The companion power supply, described here, uses silicon-diode rectifiers and is even smaller. Even if you don't run your rig up to the legal limit, you can apply these power-supply principles.

shows the curves of Fig. 1 as "typical characteristics." Note that with a pair of 50-μf. capacitors in the filter the static regulation isn't anything to brag about, but up at 250 μf. it gets to be pretty flat and it isn't too bad at 100 μf.

All very well, you say, but 350 volts isn't 3000. Correct, but it isn't as far away as you might think. Suppose, for example, that we use a transformer with a secondary voltage of 1100. This is 7¼ times 150 and, since 7¼ rectifiers are hard to utilize, we'll go to 8. Eight 1N1764 rectifiers in series will handle 7¼ times what one will, with a little safety factor. (There are other considerations, to be discussed later.) To limit the surge current, we will increase the limiting resistor 7¼ times (7¼ × 6.8 = 50), and for a little thermal safety factor we will use 50 ohms in series with each rectifier string instead of making a single resistor work on both halves of the a.c. cycle.

The "other considerations" mentioned earlier are equalizing resistors, to wash out minor variations in back resistances, and bypass capacitors to protect against voltage spikes.[1] Half-megohm half-watt resistors and 0.01-μf disc ceramic capacitors are connected across each silicon diode.

Filter Capacitors

In the filter department, one more or less takes what he can get. In this case, what one can get is an effective filter of 30 μf., obtained by connecting eight 240-μf. 450-volt electrolytic capacitors in series. This filter is quite adequate for use with a sideband amplifier or c.w. output stage; if used with an a.m. transmitter (on modulator or modulated stage) additional filtering might be required to bring the hum down to an acceptable level. In sideband service the supply with the filter as shown behaves beautifully, and the indicated voltage drops from 3000 at idle (180 ma.) to not less than about 2800 on voice peaks (350 ma.).

[1] Geiser, "Semiconductor Rectifiers", *QST*, July, 1961.

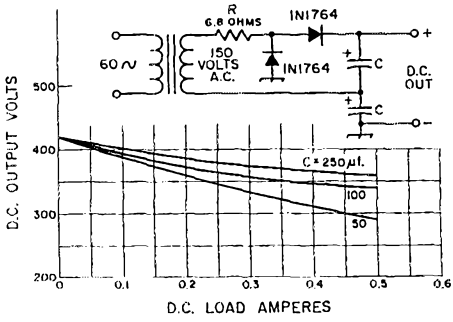
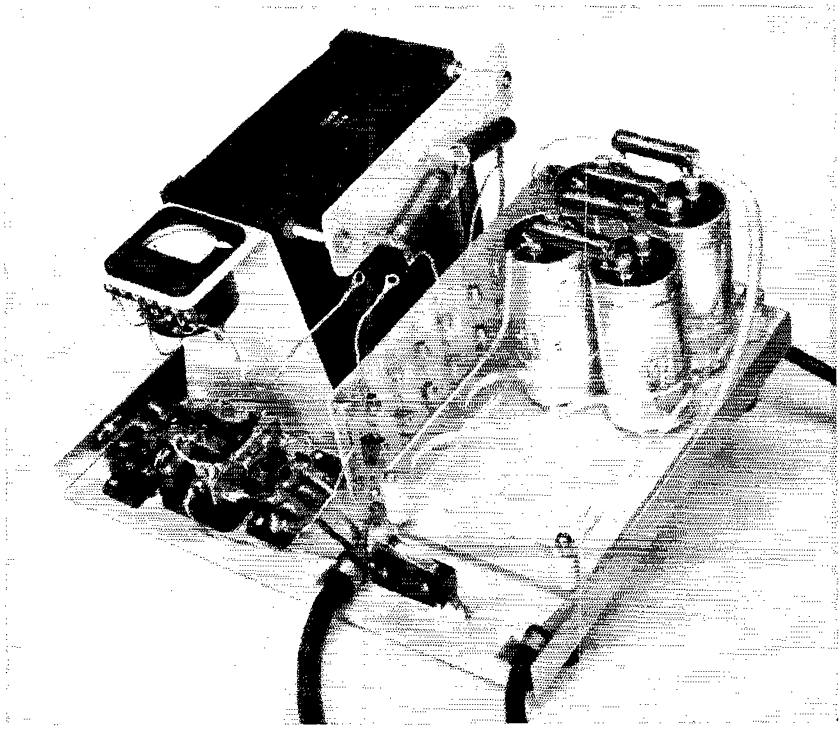


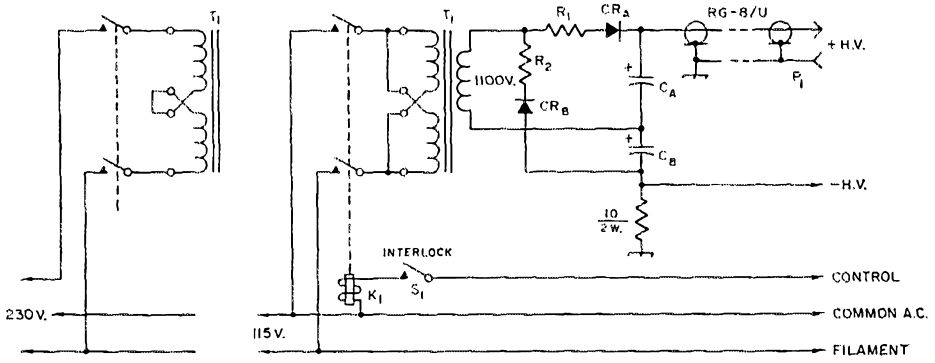
Fig. 1—Manufacturer's curve for the RCA 1N1764 silicon diode in full-wave voltage-doubling circuit.

The Practical Circuit

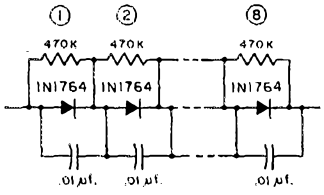
The circuit for the actual power supply is shown in Fig. 2. The transformer is made by the Berkshire Transformer Co., Kent, Conn., and is available directly from them for $50. In service



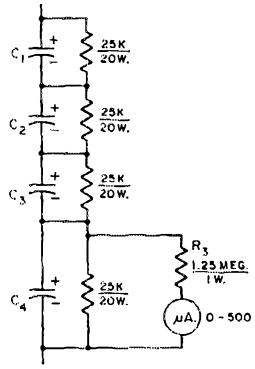
In this view four filter capacitors have been removed to show how the silicon diodes are mounted on the terminal board. The meter mounting bracket is held to the base plate by two of the bolts that run through the feet of the transformer. Normally a perforated metal cover protects the power supply; there is a hole cut for observation of the voltmeter.



(A) SIMPLIFIED SCHEMATIC



(B) CR_A, CR_B DETAIL



(C) C_A, C_B DETAIL. VOLTMETER ON C_B ONLY.

Fig. 2—Schematic diagram of the 3000-volt power supply.

C_1–C_4—240-μf. 450-volt electrolytic (Mallory CG41T45OD1).
K_1—D.p.s.t. relay, 25-ampere contacts (Potter & Brumfield PR7AY, 115-v.a.c. coil).
P_1—Coaxial plug, UG-59B/U (Amphenol 82-804).
R_1, R_2—50-ohm 25-watt wirewound (Ohmite 0200D).
R_3—Selected 0.47- and 0.68-megohm, ½ watt, in series.
S_1—S.p.s.t. miniature switch (Acro BRD2-5L).
T_1—1100-v., 0.3-amp. transformer, dual primary (Berkshire BTC-4905). See text.
25K, 20-watt resistors are Ohmite Brown Devil 1845,
470K resistors are ½-watt, 0.01-μf. capacitors are 1000-volt disk ceramic.

with the 3–1000Z amplifier it is hardly warm to the touch, testifying to its efficiency and conservative ratings. Dual primaries are included, to permit operation from either a 115- or a 230-volt line. The higher voltage is recommended.

The filter capacitors are called "computer grade" capacitors; the 25K resistors across them serve both as the bleeder resistor and the equalizing resistors. In operation, the idling current of the amplifier (180 ma.) further bleeds the supply. The 0–5000 voltmeter is included to comply with the FCC regulations. It is a good idea to get into the habit of watching the voltage decay when the power supply is turned off; in this way you are less likely to get mixed up with a residual charge in the capacitors. An interlock switch in series with the relay makes it necessary to replace the cover before turning on the supply.

The 10-ohm resistor between the negative terminal and chassis allows plate-current metering in the negative lead with no difference in potential between power-supply chassis and amplifier chassis.

Construction

The power supply construction is not critical, of course, and the main considerations are adequate insulation and safety precautions. As can be seen from the photographs, the string of silicon diodes and their associated capacitors and resistors are mounted on a 3 × 9¼-inch strip of pre-punched terminal board (Vector 85G24EP), with push-in terminals (Vector T28) serving as tie points. The rectifiers are mounted on one side of the board, the resistors and capacitors on the other. The strip is mounted on the 12 × 13 × ⅛-inch aluminum base plate with a pair of panel brackets (Raytheon MB-128).[2]

The pair of 50-ohm resistors is mounted on a 7½ × 1¾-inch strip of pre-punched terminal board, supported by two ¼-20 bolts, 5 inches long, that replace two of the original transformer bolts. This strip also serves as a stop to prevent

[2] The Mallory capacitors and the Vector and Raytheon products may not be found in ordinary mail-order catalogs sent to amateurs. They are listed in the Newark Electronics catalog No. 73 and other industrial catalogs.

the cover and the resistors coming in contact.

The bank of eight 240-μf. capacitors is insulated from the base plate by a sheet of 4¾ × 9 × ¼-inch clear plastic (Lucite or Plexiglas). A similar sheet with clearance holes is mounted higher and holds the capacitors in place. The 25K bleeder resistors mount on the capacitor terminals.

The high-voltage cable running to the amplifier is a length of RG-8/U terminated in a high-voltage coaxial plug (UG-59B/U). At the power supply end, the braid is peeled back for about a foot on the insulating material, to provide a suitably long leakage path. Disregard of this small point may result in voltage breakdown along the surface of the insulating material. The shield braid is connected to the base plate, which serves as the chassis ground. Wires to the a.c. line should be No. 14 or heavier (we used a cable marked "14-3 Type SJ 300 V), and No. 16 wire will suffice for the control wiring.

If desired, a precision resistor can be used for R_3, the voltmeter multiplier. However, we merely selected standard 20-percent resistors until we had the value that gave a correct reading.

Initially we had some slight fear that turning on the power supply would result in surge currents that would exceed the ratings of the diode rectifiers. However, measuring the surge current with an oscilloscope indicates that the surge current runs about 12 to 15 amperes, well below the ratings. The 50-ohm resistors and the reactances of the transformer windings do a good job of limiting the surge without causing excessive regulation. The mechanical design and construction of the supply was done by Robert A. Smith, W1LLF, Simsbury, Conn.

Safety Precautions

It should be unnecessary to point out that a 3000-volt power supply with a 30-μf. filter capacitor is a lethal device. There is no such thing as a "slight electrical shock" from a power supply like this one. Make absolutely certain that the voltmeter indication has coasted down to zero before removing the protective cover or touching anything remotely connected to the high-voltage lead. Even then it is a good idea to use a "shorting stick" across the output as a double check.

QST

Strays

A *QST* author and National Bureau of Standards researcher, Dr. Kenneth L. Bowles, K0CIQ, was recently awarded the annual Boulder Scientist Award, given by the Boulder (Colorado) Chapter of the Scientific Research Society of America. Dr. Bowles was cited for his observations concerning the use of high-power radar to observe electron scattering in the ionosphere.

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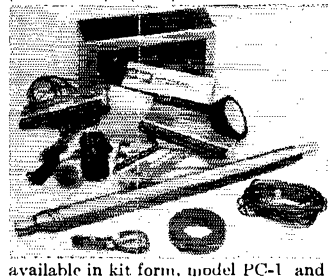
More television exposure of amateur radio—this time from Argentina. LU6DGM, LU5BAC, and LU8ACL are shown in the demonstration booth, on stage at Channel 9 in Buenos Aires. During a five-hour show, the Radio Club Belgrano members who participated were in QSO with numerous LU and OA stations.

• *New Apparatus*

Mobile Power-Supply Kit

The BF Electronics transistorized mobile power supply will deliver 150 watts continuously at temperatures to 130 degrees F. An interesting feature of the kit is that the toroid power transformer is wound by the builder. The photograph shows the kit components, including the punched aluminum chassis, some black electrician's tape and, in the foreground, the articles for winding the toroid.

All of the wire for the toroid is factory measured to length, and the toroid core is already enclosed in a plastic case ready for winding. All that the constructor is required to do is actually wind the wire on the form. The high-voltage secondary winding, consisting of 135 feet of wire, comes wrapped on a 12-inch shuttle which simplifies the winding process. Step-by-step instructions are included in the kit for winding the toroid and for assembling the remainder of the power supply. Check out, trouble shooting, installation instruction, schematic and pictorial drawings are contained in the nine-page instruction pamphlet.



Two models are available in kit form, model PC-1 and PC-2. Specifications of the two models are as follows:

	PC-1	PC-2
Input Voltage	11 to 13.5 v.d.c. neg. ground	11 to 13.5 v.d.c. neg. ground
Input Current	14.5 amp. full load at 12.5 v.	14.5 amp. full load at 12.5 v.
Outputs	500 v.d.c. at 300 ma. or 500 v.d.c. at 200 ma. and 250 v.d.c. at 200 ma.	600 v.d.c. at 250 ma. 600 v.d.c. at 165 ma. 300 v.d.c. at 165 ma.

Efficiency for both models is rated up to 85 per cent at full load. Ripple is less than 1 per cent. Both models measure 2 × 4 × 6 inches and weigh slightly over one pound. The power-supply kits are made by BF Electronics, Box 602, Cardiff, California.—*E. L. C.*

Satisfactory stability with variable-frequency control involves both mechanical and electrical considerations, and the likelihood of trouble increases with the operating frequency of the transmitter. These facts explain why most v.f.o.-controlled v.h.f. rigs sound considerably less than perfect to the critical listener. The design shown here takes the necessary electrical precautions and pays more than the usual attention to mechanical rigidity. The operator will not need to hold his breath to keep this one on frequency.

A V.F.O. for 50-Mc. Transmitters

Electrical and Mechanical Stability at Moderate Cost

BY CHARLES M. MOODY,* W3TXF

If you are looking for a stable v.f.o. for your 6-meter rig, here is one that is not only inexpensive and fairly easy to build, but is also designed to take rough treatment. Good frequency stability goes hand in hand with mechanical stability, and the mechanical aspects were given a lot of thought when this v.f.o. was designed.

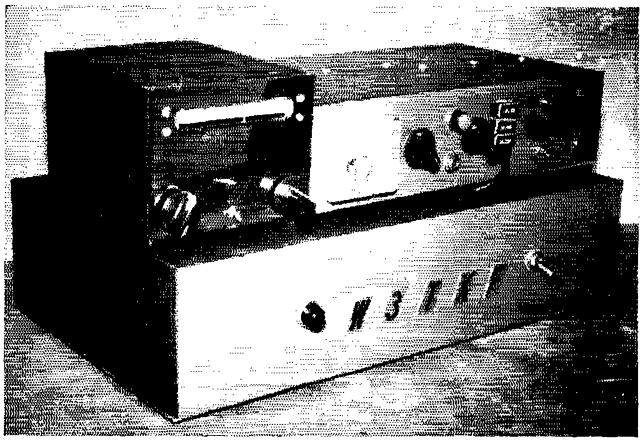
The tuning range is 8.34 to 8.46 Mc., which multiplies to 50.04 to 50.76 Mc. Most operation in the 50-Mc. band is below 50.7 Mc., and it is in the first few hundred kilocycles that the need for flexible coverage is greatest. The tuning range can be increased readily, but smooth tuning and ease of resetting to a precise frequency are lost to some degree with wider coverage. Operation higher in the band can be taken care of with a few crystals, and there is no need to cover every kilocycle. Operators working above 50.5 or so will be tuning around for answers.

Circuitry

The circuit, Fig. 1, is by no means complicated or unusual. A 6AK6 is used as a Colpitts oscillator. The frequency-determining elements are the coil L_1 and the capacitors C_1 through C_6. The coil is made from prepared stock. A fixed minimum circuit capacitance is provided by the silver-mica capacitor C_1. Adjustable padder capacitors C_2 and C_3 are for setting the tuning range. A single variable padder could be used here, but the ceramic types are readily available and they are stable mechanically and electrically. The main tuning capacitor, C_4, is driven by the vernier dial. If a wider tuning range is desired a larger capacitor can be substituted for C_4, and the padder capacitance lowered accordingly. C_5 and C_6 are the tube-shunting capacitors.

The output circuit is nonresonant, so that there can be no reaction on the tuned circuit in the grid, and consequently on the frequency of oscillation, when subsequent circuits are tuned. In nearly every case the first stage of the transmitter to be driven by the v.f.o. will be an oscillator-tripler. This stage serves to provide isolation for the oscillator, and there will be no tuned circuits at the oscillator frequency, other than that in the grid circuit of the v.f.o. Coupling

*912 Shellye Road, Glen Burnie, Md.



The complete 50-Mc. transmitter at W3TXF. The large base unit contains power supplies and audio equipment. The v.f.o. described here is at the upper left. The transmitter proper is a 10-watt r.f. unit for 50 Mc. taken from the *Handbook* of some years back.

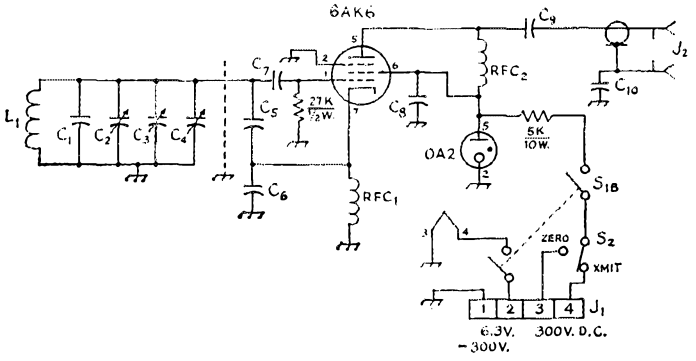


Fig. 1—Schematic diagram and parts information for the 50-Mc. v.f.o.

C_1—220-pf. silver mica.
C_2, C_3—8- to 50-pf. ceramic trimmer (Centralab 822-AN)
C_4—10-pf. variable (Hammarlund HF-15 with 1 stator and 1 rotor plate removed).
C_5—150-pf. silver mica.
C_6—270-pf. silver mica.
C_7—100-pf. silver mica.
C_8—0.001-μf. disk ceramic.
C_9, C_{10}—180-pf. silver mica.
J_1—4-pin power fitting.
J_2—BNC receptacle, ungrounded.
L_1—7 turns No. 20, ¾-inch diam., 7/16 inch long (B & W No. 3011).
RFC_1—2.5-mh. r.f. choke.
RFC_2—7-μh. r.f. choke.
S_1—D.p.s.t. toggle switch.
S_2—S.p.d.t. toggle switch.

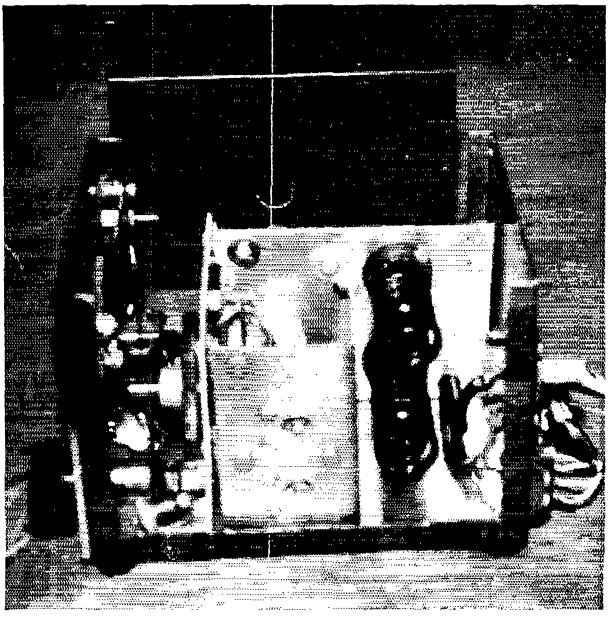
to the transmitter is done through a coaxial fitting (insulated from the chassis), C_9 and C_{10} in the plate circuit, and a short piece of coax. C_{10} is needed only if the transmitter circuit is one in which the low side of the crystal is not grounded. It may be shorted out, and the coax receptacle grounded, otherwise. The leads to the transmitter should be short and direct, though at a frequency of 8 Mc., there is some leeway.

Provision is made for running the v.f.o. whether or not the transmitter is on the air, so that the oscillator can be set to a desired frequency without causing interference to others on the band.

Mechanical Details

The v.f.o. is built in a 4 × 5 × 6-inch Minibox, which is covered with wood-grained adhesive material available in many stores for about 50 cents a yard. It is not necessary, but it is an easy way to give equipment a neat finish, particularly if all cases are treated the same way, as was done with the 50-Mc. gear at W3TXF. It is self-sticking and easy to apply, and it comes in a wide choice of finishes. The front panel is made of ⅛-inch brass, engraved and chrome plated. Here again, the finish is not necessary, and was merely a touch added for appearance. The thick panel is desirable, however, in the interest of mechanical rigidity, and brass is nice to work with.

The slide-rule dial was handmade from miscellaneous parts that may or may not be available to other builders, but a brief description and a drawing are given, for what they may be worth. A rubber drive wheel from a phonograph turntable was attached to the shaft of the tuning capacitor, C_4. A piece of ⅜-inch round plastic rod was turned down to a small diameter at one end and this tip inserted in a hole in the front



Interior of the v.f.o., showing the shield box that encloses the tuned-circuit components, center, and the tubes, in ventilated shields, at the right.

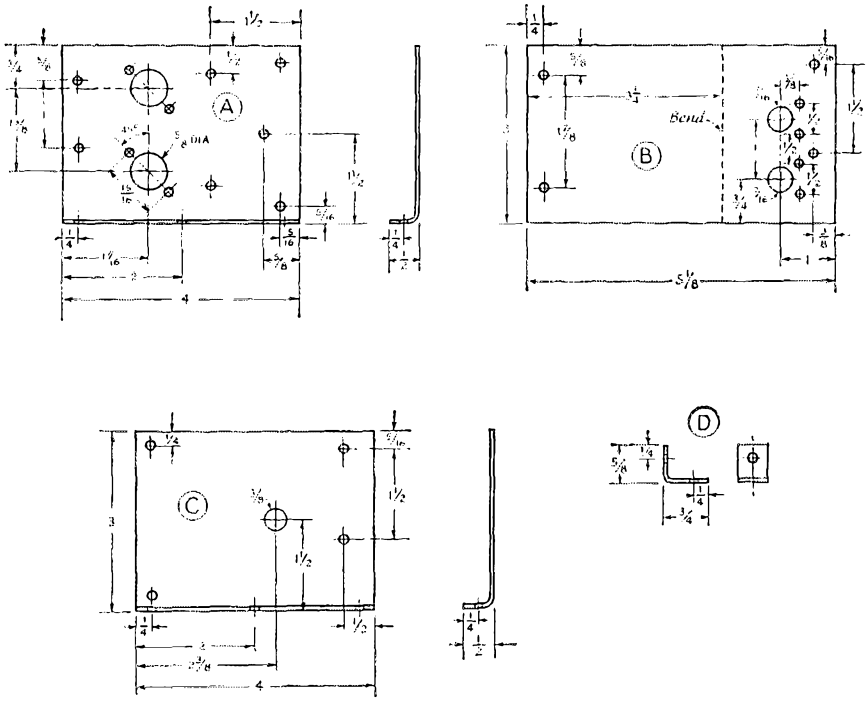
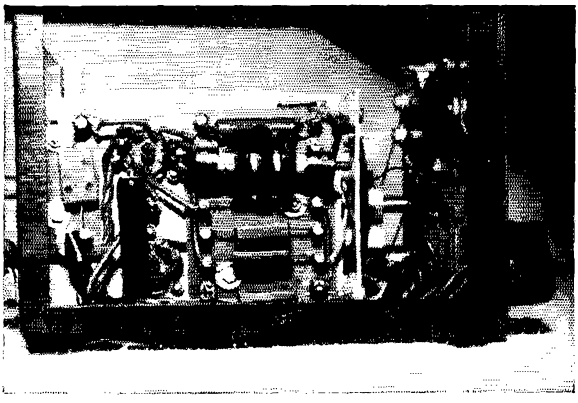


Fig. 2—Details of the various metal parts. These may be of brass or aluminum, 1/16 inch or more thick. All small holes are 5/32 inch unless otherwise specified.

plate of the v.f.o. assembly, in such a position that the rod bears against the drive wheel. The other end of the rod is inserted in a 3/8- to 1/4-inch step-down shaft coupling, which runs in a hole in the front panel. Turning the shaft 2 1/2 times revolves the tuning capacitor 180 degrees. The pointer and dial mechanism are shown in Fig. 3. The dial cord is wrapped around the rod and strung up to two pulleys, one at each end of the dial opening. A pointer attached to the cord rides on a track made of thin sheet aluminum, about 1/8-inch in back of the opening.

Mechanical rigidity and shielding are provided by the assembly shown in Fig. 4. The coil, the tuning capacitor, and the padders are all inside the box-like structure at the center. The oscillator and voltage-regulator tubes are mounted horizontally on the main chassis plate at the left. A terminal board on the outside of this plate carries most of the small parts. Lead lengths within the v.f.o. assembly are not particularly critical, the frequency being in the 8-Mc. region, so rigidity is the main consideration. Most of the wiring can be completed before the parts are finally fastened in place in the Minibox. The two ceramic padders are mounted on the inside right edge of the compartment, and may be adjusted through holes in the side of the case, after the unit is completely assembled.



Opposite side of the v.f.o. Tube sockets are at the left. Near the center of the picture is the terminal board used for most small components.

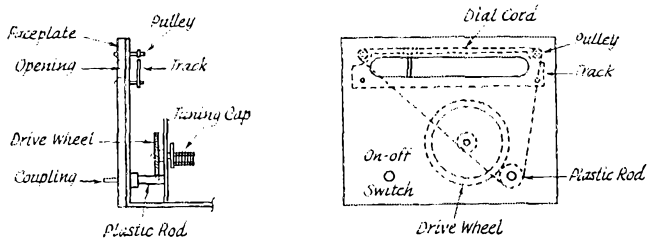


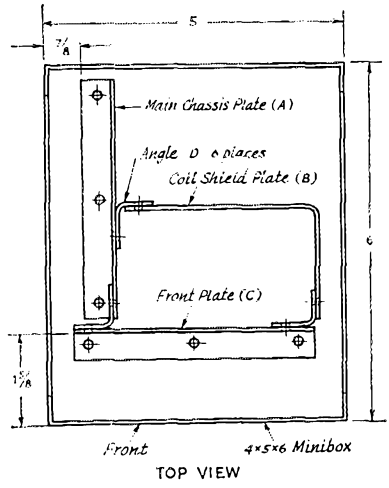
Fig. 3—Mechanical details of the vernier-drive mechanism used by W3TXF in his v.f.o. Friction drive is by means of a plastic rod and a rubber drive wheel from a phonograph turntable.

Adjustment and Use

With power applied and with the switch S_2 in the "zero" position, fully mesh the plates of C_4. Using a frequency meter, or a receiver of known calibration accuracy, adjust the combination of C_2 and C_3 so that the oscillator is *at the low end* of the desired frequency range. It is suggested that you do not go below about 50.05 Mc., unless a constant check is kept on the frequency of operation. When using voice be sure to stay well above 50.1 Mc. Remember, this is a *variable-frequency* oscillator; it is up to *you* to keep it in the band! The output can be varied by changing the value of the coupling capacitor, C_9, in the plate circuit. Use the smallest value that will give the necessary drive.

In operation, the v.f.o. is fed from a 300-volt source also used for the transmitter, and applied to both through a relay. With S_2 in the "xmit" position, the voltage for the v.f.o. comes through the relay, and is thus applied only when the transmitter is on. On the "zero" position, the v.f.o. runs with the transmitter off. The 6th harmonic of the v.f.o. will be found to be plenty strong enough for zeroing purposes, but be sure that your receiver does not give misleading spurious responses before relying on it for frequency indications.

Because the voltage applied to the v.f.o. is maintained constant by the built-in regulator there is no harmful effect from voltage fluctuations caused by the transmitter itself. The v.f.o. may, of course, be operated from a supply made especially for it, or from another source such as that used for the station receiver or converter. Only a few milliamperes of current at 150 volts will be needed. A different zero-xmit arrangement, and possibly a different value of dropping resistor in the voltage regulator circuit, will be required if other than the transmitter supply is used. QST



TOP VIEW

Fig. 4—Top view of the v.f.o. metalwork, showing the chassis plate, A, the coil shield, B, and the front plate, C, in the positions they occupy when the assembly is completed.

Strays

At the invitation of the Sears Roebuck Company, members of Cleveland's Southeast Amateur Radio Club spent a recent weekend (Thursday thru Saturday) showing ham radio to passers-by. SEARC volunteers set up a tent-shack and rigs and operated at a different asphalt QTH each day. Pictures show two of the demonstration locations.

The activity drew wide coverage in local newspapers, largely because of top public relations by the SEARC. Those of you who worked K8EMY/8 are going to receive special commemorative QSLs.

A Trap Collinear Antenna

Simple 3-Band Radiator with In-Phase Elements

BY WESLEY M. BELL,* W7QB

This antenna covers the 15-, 20-, and 80-meter bands. On the two higher-frequency bands the antenna operates with two extended half waves in phase thereby realizing some gain over the dipole operation of a conventional trap antenna.

As your ARRL *Handbook* tells you, broadside gain over a dipole approximately equivalent to doubling transmitting power may be obtained by using a center-fed antenna about 1¼ wavelengths long (extended double Zepp). Advantage of this is taken in the three-band trap antenna shown in Fig. 1. The basic antenna is a dipole for 80 meters. The traps isolate sections of approximately 1¼ wavelengths for 20 and 15 meters. Since the center of a 1¼ wavelength wire is not at a current loop, wire is added in the form of a short open-wire feeder to make the total length about 1½ wavelengths, thereby bringing a current loop at the point where the system is fed by coax line. A balun is used to couple the unbalanced line to the balanced antenna system.

Trap Construction

The coil and capacitor specifications given under Fig. 1 should be adequate for transmitters running at 100 watts input or less. For higher power, the inductance and capacitance values should be the same, but coils should be wound with heavier conductor, and capacitors should be of the transmitting type, such as the Centralab 850SL type. I made my own coils by wrapping a 2¼-inch form with waxed paper and winding the turns with double strands of No. 18 wire, unwinding one strand and cementing the remaining turns with strips of model-airplane glue. When the glue was dry, the completed coil was slipped off the form. At least one full extra turn should be wound to allow for pruning.

As shown in Fig. 2, the capacitor is placed inside the coil, and the terminals of both capacitor and coil soldered to the heads of brass machine screws. These screws serve to hold the assembly central in a plastic waterproof container as shown in Fig. 3. The container is the 1-pint size commonly found filled with chip dip, ice cream, potato salad, oysters and whatnot in grocery stores. The screws are fastened in the top cover and bottom of the container with nuts. The container is suspended from an insulator at the appropriate point in the antenna by short lengths of wire dropped from the insulator to the mounting screws where they are secured by a second set of nuts.

After mounting the traps in the containers, they should be resonated to the designated frequencies by carefully pruning the coils while checking with a grid-dip meter. The strain insulator with its wire wraps must be included, as shown in Fig. 3, since the insulator capacitance is in parallel with the trap capacitor (See ARRL *Handbook*.) As resonance is approached, final adjustment can be made by forming what is left of the last turn into a hairpin, and bending or twisting the hairpin to alter its inductive relationship to the main part of the coil.

*P. O. Box 118, Lewiston, Montana.

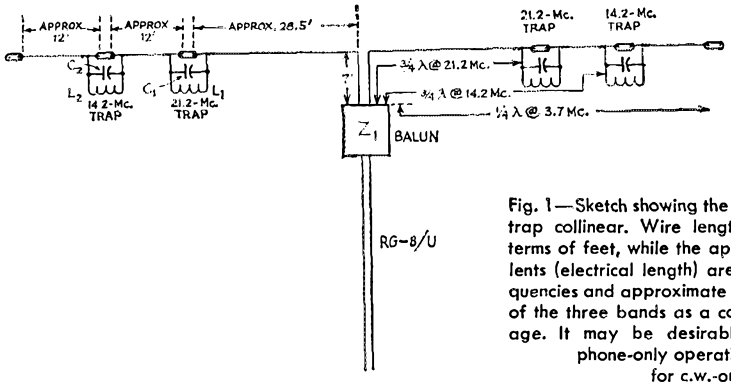


Fig. 1—Sketch showing the approximate dimensions of the trap collinear. Wire lengths shown on left side are in terms of feet, while the approximate wavelength equivalents (electrical length) are shown on the right side. Frequencies and approximate wire lengths are for the centers of the three bands as a compromise for full-band coverage. It may be desirable to increase frequency for phone-only operation or lower frequency for c.w.-only operation.

C_1, C_2—25-pf. 6000-volt disk ceramic (Centralab DD60-250). See text.

L_1—Approx. 2 μh.—4¾ turns No. 18, 2¼-inches diam., ⅜ inch long, or 5 turns No. 18, 2-inch diam., 16 t.p.i. (Airdux 1616). See text.

L_2—Approx. 5 μh.—8 turns No. 18, 2¼-inch dia., ⅝ inch long, or 9 turns No. 18, 2-inch diam. 16 t.p.i. (Airdux 1616). See text.

Z_1—1 to 1 balun (B&W 3975 or similar).

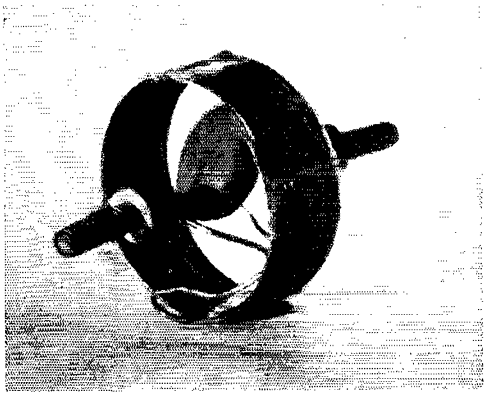


Fig. 2—Trap components ready to be mounted in weather-proof container.

Antenna Adjustment

Antenna resonance can be checked by shorting the ends of the 7-ft. open-wire line and coupling to a grid-dip meter. Initially, the wire lengths should be made a foot or so longer than the lengths shown in Fig. 1. Start out with the 21-Mc. sections only, anchoring the outer end of each wire section to one side of a 21-Mc. trap insulator and connecting it to one side of the trap. An additional insulator should be attached temporarily between the other side of the trap insulator and the antenna-supporting rope. Then gradually shorten the wire until the grid-dip meter shows the desired resonant frequency.

Then add the second sections and traps and adjust similarly for the desired frequency in the 14-Mc. band. The end sections of wire are then added and adjusted to show resonance at the desired frequency in the 3.5-Mc. band.

In making the antenna adjustments, do not adjust the traps after they have once been set with the g.d.o.; change only the lengths of the wire sections. Devote plenty of time and patience to the adjustments. The job just can't be done correctly in a few minutes.

I use a center supporting pole, and the balun is enclosed in a weather proof box mounted at the top of the pole.

Results with this antenna have been good. Using it in "inverted-vee" fashion, with one pole at the center and the ends attached to bushes, fences, clotheslines, or whatever else might be handy, I changed directions by simply walking the ends around to different positions. Without half trying, I worked 44 countries with a DX-60. I'm moving to the country soon where I plan to put up several of these antennas. I hope to add reflectors too. (Well, a guy can dream, can't he?)

QST

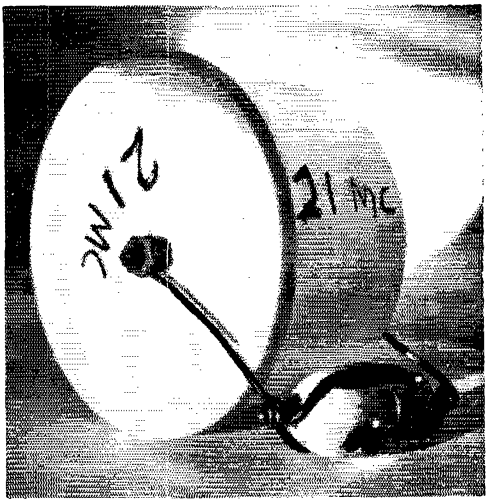


Fig. 3—The completed 21-Mc. trap and its supporting insulator ready for checking with a grid-dip oscillator.

Strays

Jim Sinclair of the Jimsin Company, P.O. Box 238, Franklin, Louisiana, would like information concerning "EKKO" stamps which, he says, Amateur Radio stations in some countries once issued.

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Paul R. Fenner, KH6SL, retired recently as FCC Inspector for Hawaii. Mr. Fenner was honored by the Hawaii Association of Broadcasters at a June 13th banquet honoring his thirty-fifth anniversary of FCC service. Their gift to him was an engraved microphone selected especially for use with his ham rig.

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Like everything in the way of lightweight battery portable gear described in *QST*, the 50-Mc. hand-carried rig in June, 1963, is pulling a lot of mail. Author K4IQU asks us to print answers to the two most frequently-received queries:

Where do you get those sound-powered phone units? Dave ordered his from Olson Electronics, Akron 8, Ohio.

How can I put it on 2 meters? Don't try. Performance of inexpensive transistors is far better on 50 Mc. This problem arises with every such article, and the answer is still the same: much better efficiency and lower power drain are possible on the lower band.

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THIRD PARTY TRAFFIC WITH 4U1ITU

Last month in the "Happenings of the Month" department we reported on a temporary agreement permitting amateurs in the U. S. to exchange unimportant personal messages on behalf of third parties with amateur station 4U1ITU in Geneva, Switzerland. The agreement has now been extended to cover the period July 1 through December 31, 1963.

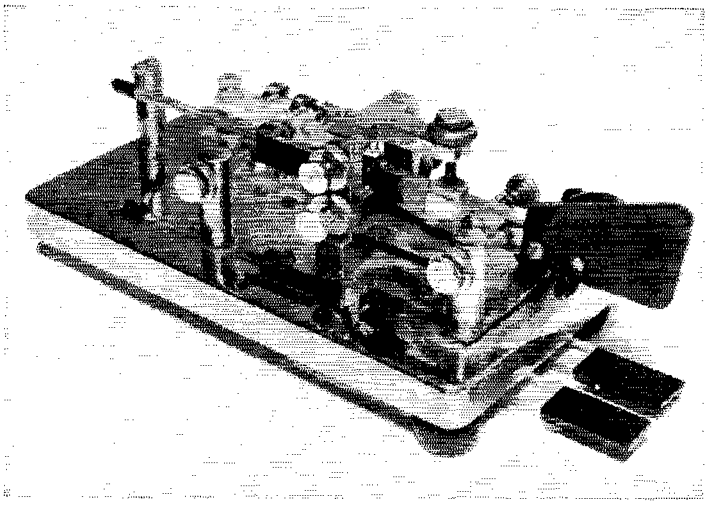


Fig. 1—The finger levers added underneath the bug are inconspicuous, but conveniently located.

Finger Keying Consolidated

BY W. W. JOHLER,* W9UZS

If you have to lay out any cash in making an addition of this kind to your bug key, it's because you're unable to see the possibilities in tin cans, plastic dishes, and other household items. Need we say that the bug itself is not an essential part of this "no-cost" actuator for electronic keyers?

BEFORE ham radio was even dreamed of as a hobby a wise bard wrote, "Be not the first by whom the new are tried, nor yet the last to lay the old aside." [1] Both "finger keying" [2] — as I choose to call the art of sending c.w. with multiple contact points closed by finger pressure — and electronic keyers are not so new that they cannot be unconditionally accepted. However, the same semiautomatic key, or "bug," has been on my operating desk for over a quarter of a century now, and this old friend could not be discarded.

This seeming conflict was solved by mounting two finger keys or levers for the electronic keyer inconspicuously on the bottom side of the base of the bug. Fig. 1 shows the completed job. Basically it consists of two underslung levers, with projecting portions for finger keying. While bugs differ in details of design, all have bases, and with just a little imagination you can do the same with your bug and your scrap box.

* 243 Norwood Place, East Alton, Illinois.

[1] Alexander Pope, *Essay on Criticism*.

[2] "Hints & Kinks," *QST*, October, 1962.

The author's bug, like all bugs, is supported by three feet — two in front and one in the rear center. These gave the base a clearance of $\frac{5}{16}$ inch. More room than this was needed, so $\frac{3}{16}$-inch shims were placed between the feet and the base. For the rear foot this was a $\frac{3}{16}$-inch thick rubber washer. For the front feet it was strips of plastic which have other functions described later.

Some 600-ohm feed-line plastic spreaders (in hibernation since the start of the beam and coax age) were selected for the levers. Their size, $5\frac{1}{2} \times \frac{1}{2} \times \frac{1}{8}$ inches, was not altered, but after the job was completed the exposed ends were covered with black plastic tape to harmonize with the black plastic of the bug.

Each lever was equipped with a contact point, a pivot or fulcrum point, and a spring to return the lever to position after fingering. Fig. 2 shows the assembled lever. The contact point was made by cutting a strip from an ordinary tin can to the dimensions shown in Fig. 3. With the end of the plastic lever on top of section *A*, sections *B* and *C* were carefully bent over the top of the lever, using a screwdriver blade rather than the fingers

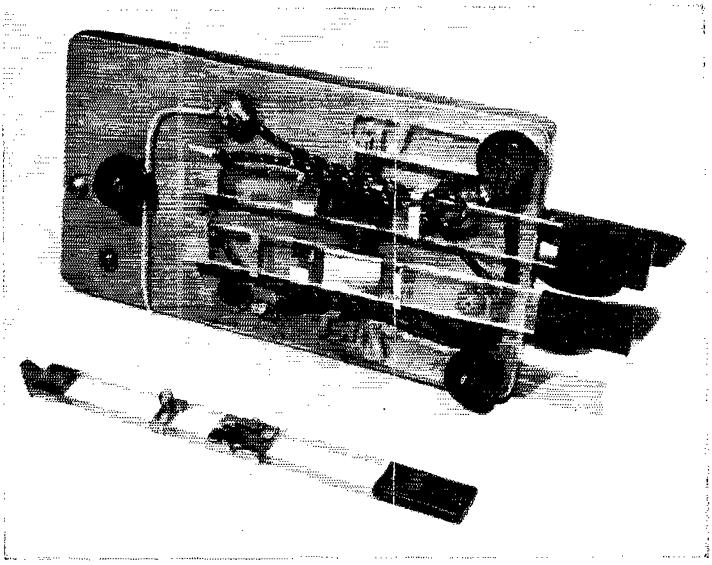


Fig. 2—The two lever assemblies are made from bits of plastic and tin can. On the lever shown separately, the contact (Fig. 3) is at the left and the pivot section (Fig. 4) is at the center. Between these two is the spring and holder. The supports (Fig. 6) are held at one end by the front mounting feet.

to press sections B and C into position. This resulted in a tight and secure fit. Section D was bent upwards on a 45-degree angle and adjusted more carefully after the final assembly.

The pivot section was cut from the same material to the dimensions shown in Fig. 4. The mid-section of the lever was placed on top of section A, and B, B', C, and C' were bent around the lever as shown in Fig. 5. Sections D and E were bent up 90 degrees. The exact location was selected so that the finger levers projected out from the bug base about 1¼ inches.

The spring holder was made from a small piece of the same metal, 1¼ by 3/16 inch, onto which the end of the spring — six turns from a spring from a ball-point pen — was soldered. (The original spring was quite flexible and had 30 turns.) The strip was bent around the lever in the location shown in Fig. 2. This location may be altered in order to adjust the tension to the operator's liking. In the author's assembly the weight of three nickels (no wooden ones) placed on the end of the finger lever will readily cause contact to be made.

Both levers were mounted on a common pivot. A heavy sewing needle 2½ inches long seemed to be the best material available for this (bless the XYL; she has generously contributed tolerance to ham radio and its gadgetry, but this was her first material contribution). Holes were punched in the upright tabs of the pivot as shown in Fig. 5, with centers about the diameter of the needle above the plane of the lever. Care was taken to make the holes a snug fit for the needle. The needle was then inserted and sections D and E folded over to make the pivot more compact.

Supports for the pivot needle were fashioned by sawing some scrap plastic into the shape shown in Fig. 6. These supports also act as shims for the front feet and are held to the base by the same machine screws that hold the feet. Holes to support the needle were bored to a depth of 3/8 inch into the sides of the supports. Spacers between the levers and between the levers and the supports completed this part; these were of the scrap-box variety but could be made from short sections of ¼-inch copper tubing. A convenient space between the finger levers is ¼ inch; anything greater than this results in an uncomfortable spread of the fingers when operating.

The electrical connections were made by soldering flexible insulated wires to the contact points and the appropriate lead or terminal. Thin straps were used to hold the leads in place. The contact points were adjusted by bending so that they hit against the base when the levers were depressed 1/8 inch.

The electrical connections are optional and probably fall into one of the following:

Case 1: The bug is used with an electronic keyer in the "semi" position so that the bug is operated conventionally for dashes but the electronic keyer makes the dots; the bug weight or

(Continued on page 144)

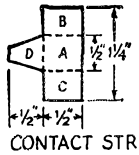


FIG.3 CONTACT STRIP

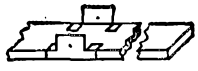


FIG.5 PIVOT MOUNTED

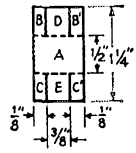


FIG.4 PIVOT SECTION

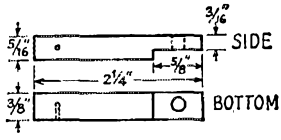
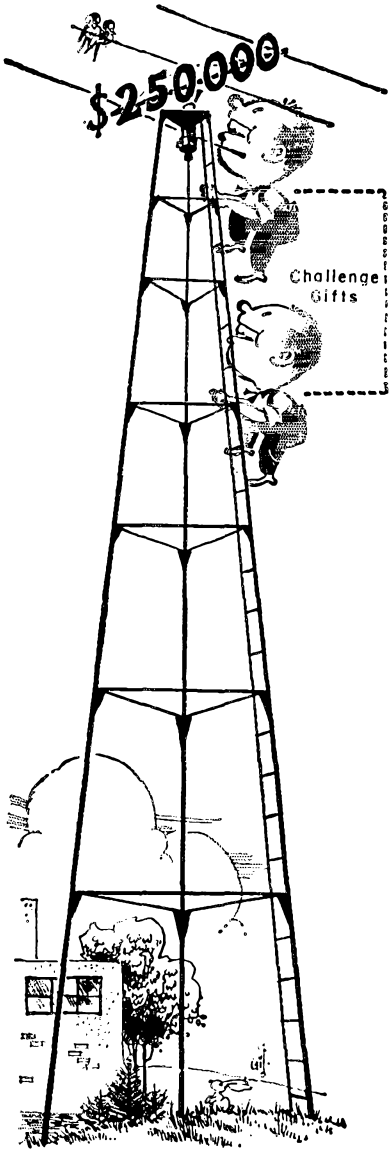


FIG.6 SUPPORT

Figs. 3–6, inclusive—Details of the contacts, pivots and supports.

Building Fund

Progress



The Building Fund campaign continued its steady pace in June, and nearly 10,000 members have now contributed to the fund drive. Some amateurs have expressed concern that the League's recent long-term program proposals would seriously impair the fund's progress; the figures do not justify that fear. Our little man on the tower is climbing steadily, twice as fast per dollar of contribution than before because of the matching fund pledges explained earlier. The fund is now about $170,000, with half of the remainder standing by in matching fund pledges.

Have you yet taken part in the campaign? If not, excerpts below from letters from members with their contributions furnish you with reasons why you should, much more eloquently than any we could contrive. Remember — one dollar still means two for the fund!

—•••—

The headquarters completed its move to the new building at the end of June (see editorial this issue). The former property was sold, and the proceeds used to make up the difference between the cost of the new building and the amount members were asked to contribute.

Our first official visitors, actually on moving day, were the Mt. Airy VHF Club (Pack Rats) of Philadelphia, who came more than 40 strong in a chartered bus. They brought a beautiful model of the new building which they had used as a display in promoting the building fund at various hamfests and meetings, and a second substantial donation to the fund itself.

The disruption of routine affairs by the move has prevented the usual division compilation. We'll have the summary up to date next month.

Members Are Saying

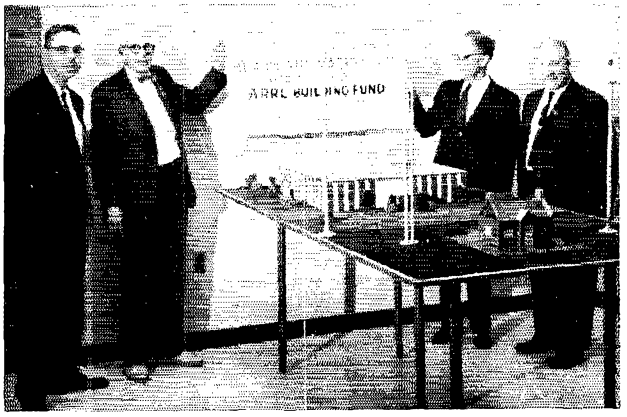
Put this check in the building fund. Sorry I can't afford more. You have more silent backers on your new proposals on rule changes than you think. Keep it up. — *W8PNR*.

My contribution is a token of appreciation and gratitude for ARRL's fight for amateur radio. It has indeed been a great pleasure to participate in the present IARU conference at Malmo and amongst many other old friends to meet Mr. Huntoon and Mr. Eaton. — *OZ2CL*.

Because our club consists of only nine members, we only wish we could further your fine cause with a larger sum. However, our "kitty" is extremely limited and we are proud to help out in any way. Thanks for services rendered to world wide amateurs during the past. — *Winnipeg DX Club (Manitoba)*.

Was going to spend this money on some extra crystals, but I started thinking about all the League has done for me. I'd be lost without *QST* and I like the prompt and excellent service I get when I write you. — *KN1FIN*.

We are one club that have just been "putting it off" as mentioned in President Herbert Hoover, W6ZH's, recent letter. Accept our apologies and our contribution. Don't forget to collect a matching amount from the group of amateurs in industry who



Officials of the Mt. Airy VHF Club present the model of the new ARRL Headquarters used in their successful Building Fund campaign, in ceremonies in the lobby of the Newington building on June 29. Left to right are K3IUV, past president, K3HWZ, president, W1LVQ, ARRL General Manager, and W3CL, director. The Maxim Memorial in the foreground, the new Headquarters, and certain outbuildings in the rear, are engraved with the calls of contributors. The drive, organized and directed by K3HWZ, netted $1000 for the ARRL Building Fund. Presentation was the occasion for a chartered bus trip from Philadelphia by some 42 Pack Rats.

promised this. — *Antietam Radio Association, Inc. (Maryland).*

I was forced to keep my contribution much smaller that I would have liked to give because I am still a high school student, and I only get a small allowance for my personal use. I am sure that if someday in the future the League expands its facilities again I will be able to contribute much more to show my sincere gratitude for all of the help it has given me. — *WAØASC.*

Herewith a check. Only 8,000 members have contributed. If they all only realized how important the ARRL has been to amateur radio throughout the years, I believe most would contribute something. — *W7TCQ-W7KNY.*

While I am not currently very active in ham radio, ARRL has meant too much to the radio amateur fraternity to be forgotten in time of need. I am only sorry that I haven't sent my contribution sooner. — *W4QDA.*

I've been a member on and off for 40 years and feel the League has done and is doing a splendid job. — *K2DNA.*

This contribution is being sent in recognition of a fine job of lobbying, administrating, publishing, coordinating, and more of which I am probably unaware. — *WGEOV/6.*

This contribution is in recognition of the invaluable help the League has been to me in getting started in ham radio, and a desire to help further all of the aims for which the League stands. — *WAØATV.*

The Radio Club of Brooklyn was originally founded in 1917. In 1958, we merged with the Brooklyn Civic Center Amateur Radio Club to form the Radio Club of Brooklyn, Inc. The remaining funds of the old club were kept by two trustees who have decided that the balance should be contributed to the ARRL Building Fund. — *W2PF.*

Enclosed is a small contribution. It is my belief, for a thousand reasons, that ham radio could not exist without the ARRL. — *W2PSE.*

I am sure the new building will be a pleasure to all of those that will work there, and will make an interesting side trip for those of us living far away who may be vacationing near the east coast. The up-coming 1964 World's Fair in New York should bring many visitors your way. Thanks for the chance to do some good in return for the many enjoyable hours of *QST* reading. — *WA6JTG.*

I have enjoyed the amateur radio hobby since 1936; however, most of my funds still go to two harmonics still in high school. Sorry it can't be more. — *W7GDS.*

Enclosed is a check. I note that of late *QST* is being read by more members, as evidenced by their comments in the letter section. Keep up the wonderful job you are doing for all the amateur radio operators. — *WILEL.*

This check is for the building fund. The money was raised by selling parts and equipment to the club members which the members donated. — *Ogden Amateur Radio Club (Utah).*

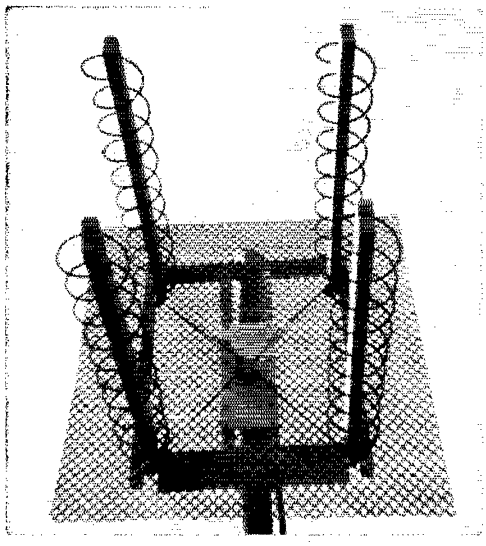
Although I am only an associate member, I am glad to help with a cause such as yours, since I know even though I do not hold a license it will be possible to obtain one with an organization of your type to help me with information for test taking along with a developed code practice arrangement available at the turn of a dial on any short wave receiver. — *Vance Ryder, Bradenton, Fla.*

Sorry I have to make such a tiny contribution, because I am saving up to buy a Ranger from Harrison and I only get 75¢ a week from my dad. So after buying lunches I usually have little left. — *WN2BVU.*

Very happy to contribute to the building fund. It seems to me that with all of the apparent wealth out this way, California kilowatts, etc., the Pacific Division may be dragging their feet, or maybe all just slow getting those contributions in — like myself. — *WGOQO.*

Enclosed is a small token of our appreciation of ARRL's support of the amateur down through the years. Our club is a small one and has been organized for only 12 years but we feel that the privilege of being affiliated with the League has been worth at least $5 a year to each of our membership — *Johnson County Radio Amateurs Club, Inc. (Kansas).*

A Quadhelix Antenna for the 1215-Mc. Band



High Gain and Simple Matching

BY W. O. TROETSCHEL,* K6UQH

Front view of the 4-helix array for 1215 Mc. The coils are terminated at a common junction at the center of the array. The slope of the terminating wires with respect to the ground plane determines the feed impedance. This makes possible the matching of four helices without the use of a coaxial transformer.

IN RECENT years, it would seem that much of the use of the 1215-Mc. band has been carried out with accurate and stable receivers and transmitters, and 10- to 30-foot dishes on alt-azimuth mounts, for moonbounce work. Certainly this is an exciting activity. However, for those who do not have these tools of the trade, a return to earth may be in order. Many readers may be aware of the amazing ranges achieved by L-band radars during certain tropospheric conditions, that permit these radars to "paint" targets to well over 2000 miles. The author submits that these tropospheric conditions exist quite frequently. With these conditions, a parametric amplifier,[1] a good crystal converter,[2] and an antenna of the type to be described should provide many firsts and much excitement, even with moderate transmitter power.

General

The helical antenna has suffered in popularity (but not in performance) because it is not generally well understood. That crazy corkscrew is capable of generating linear, elliptical, or circular polarization, but perhaps because of its attendant problem of matching an odd-ball feed impedance to a standard transmission line, it seems to find little acceptance in amateur circles. It is common in communication with missiles and satellites, however. Since this article is primarily concerned with a method of building a quadhelix, the author refers the technical reader to the source book, *Antennas*, by Dr. J. D. Kraus (W8JK), McGraw-Hill Book Co., Inc., New York, 1950.

* 3411 Forbes Ave., Santa Clara, California.

[1] Troetschel and Heuer, "A Parametric Amplifier for 1296 Mc.," *QST*, January, 1961.

[2] Meyer, "A Crystal-Controlled 1296-Mc. Converter," *QST*, September, 1962.

The helical antenna represents the transition point between linear-element antennas and the loop antenna. It has several modes of operation which are controlled strictly by its geometry. It can radiate in an axial mode, along the axis of the helix, or in a broadside mode, perpendicular to the helix axis. Since the axial mode is of concern in this article, only that mode will be discussed. Once the basic geometry is established for axial-mode radiation, we find that other changes in the geometry can create either of the two linear polarizations, horizontal or vertical. Elliptical polarization, or the case in this article, circular polarization, can also be generated. To make the subject even more interesting, we can also generate either right-hand or left-hand circularity. The u.h.f. men can now spend many pleasant ragchewing hours over the relative merits of right-hand *vs.* left-hand circularity. In fact, some of the subtleties in simply understanding the definition of right- or left-hand circularity could provoke excellent occupancy of the 1215-Mc. band, just to get in on the battles — er — discussions. As a standard to take off from, the author suggests winding the helix turns clockwise. Opposite circularity will result in working only those signals which bounce from perfect reflectors.

The helix is inherently a broadband antenna, which eliminates s.w.r. problems over an amateur u.h.f. band. Bandwidth is on the order of 1.7 to 1 in frequency. Expressed in terms of the helix circumference wavelength, this represents a range of from approximately 0.73 to 1.22 wavelengths. Over this range, the v.s.w.r. varies very little, remaining in the order of 1.15 to 1. Also over this range, the input impedance can be seen to vary on a Smith chart in tight curls from about 120 to 160 ohms, thus the generally

quoted figure of 140 ohms. The pattern of the antenna is a well-defined lobe in both the vertical and horizontal planes over the antenna bandwidth, with pattern breakup occurring at the limits. There is a definite sharpening of the antenna pattern when the helix is used near its upper frequency limit, and this characteristic was utilized to some extent in the design of the quadhelix in this article.

The only difficult part of the helical antenna is the problem of matching the feedline to the impedance of the helix. Several articles have described one- to three-helix arrays,[3] and have described how to build the coaxial matching section required to match the array. There is nothing wrong with the theory, but coaxial sections are tedious to build, they do fill up with moisture, and it takes considerable faith to be sure that the matching section you build is really ¼ or ¾ wavelength, or some other needed value, at these frequencies. The quad described gets around this problem by using simple tapered lines as the matching sections. (See Fig. 1.) Further, if one helix is good, two — properly matched and phased — are approximately 3 db. better. Four helices are another 3 db. better yet — and easy to match by the method described.

Construction

The quadhelix consists of four ten-turn helices formed from No. 10 AWG copper house wire from which the insulation has been stripped. The helices are mounted on booms made from 1 × 2-inch smooth lumber. These booms are attached by wood screws and wood glue to a frame made from the same size lumber. The wooden portion should be painted or stained as a weather preservative. Fastened to the top and bottom of the frame are two 8-inch pieces of 1 × 1 inch angle iron from your favorite hardware store. These angle-iron pieces are drilled to accommodate the U bolts, which will fasten this antenna to the mast.

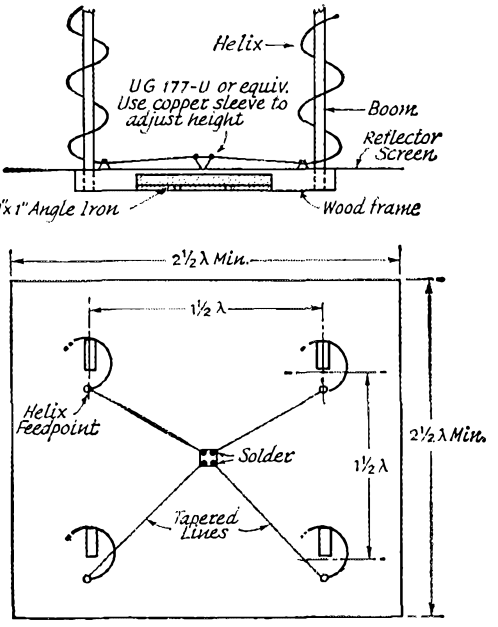
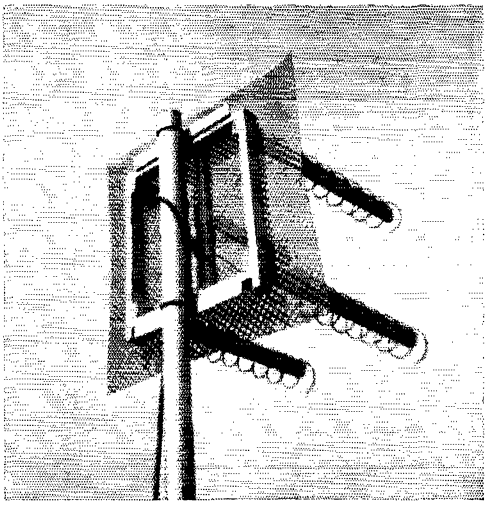


Fig. 1—Top and front views of the quadhelix array. The termination at the center is a UG-177/U coax hood. This connects to the center pin of an N-type coaxial fitting which projects through the ground plane to provide a point of connection for the transmission line. Height of the junction may be varied to achieve an impedance match.

[3] Scott and Banta, "Using the Helical antenna at 1215 Mc.," *QST*, July, 1962.



Rear view of the helical array at K6UQH, showing the wooden frame and angle irons used for mounting the frame to the vertical support.

The sheet reflector is made from perforated aluminum. This also forms the ground plane for the matching lines. From the photograph it can be seen that a small piece of sheet aluminum was used to stiffen the ground plane at its center, where the coax connector is attached. Mounted on the antenna side of the ground plane are tapered lines, which make up the matching section. These lines connect together at the coax feed point, and the other ends provide the feed to the individual helices. The tapered lines are of such a geometry as to transfer the approximately 140-ohm impedance of the helices to a 200-ohm point at the coaxial fitting. Strapping all four of the 200-ohm points together provides the 50-ohm feed point required for RG-8, -9, -14, or -17 coaxial cable. The tapered lines are also made from No. 10 AWG wire.

If you desire to vary the impedance ratios because of a different feed-line impedance, the following calculation is typical: For a single wire near a ground:

$$Z_o = 138 \log_{10} \frac{4h}{d}$$

Where h is the height to the conductor center, and d is the wire diameter.

In order to reduce any interaction of the fields between the helices and the tapered phasing lines, it is important to keep the tapered lines as close to the ground plane as practical. This condition can be met by using No. 10 wire for the tapered lines. The diameter of this size wire is 0.1019 inch. Then, assuming that the impedance at a helix feed point is 138 ohms,

$$\log_{10} \frac{4h}{d} = \frac{138}{138} = 1$$

$$\frac{4h}{d} = 10$$

$$h = \frac{10 \times 0.1019}{4} = 0.254 \text{ in.}$$

This is the height at the feed-point end of each helix. At the coax end where the four tapered lines join,

$$\log_{10} \frac{4h}{d} = \frac{200}{138} = 1.45$$

$$\frac{4h}{d} = 28.2$$

$$h = \frac{10 \times 0.1019}{4} = 0.717 \text{ in.}$$

Slight discrepancies here are nearly meaningless as the v.s.w.r. is between the four tapered lines in parallel and the 52-ohm coax line. For other conditions, just plug in the appropriate numbers. The important point is to keep the matching lines as close to the ground plane as possible.

The helices are mounted (center to center) on a square whose sides are 1.5 wavelength, or 13.7 inches. The tapered lines will then be approximately one wavelength long. In any case, keep the tapered line lengths equal. The aluminum reflector screen should be 2.5 wavelengths (minimum) on a side. The antenna described has a reflector screen which is 2 by 2 feet. The details of the individual helices are shown in Fig. 2. The over-all layout can be seen in the photographs. Mounting of the helix turns on the wooden booms was accomplished by using small metal horseshoe brads. A more elegant method would be to mount the turns on small standoff insulators. Care should be taken when adjusting the position of the helix coils on the boom to assure that the pitch angle (spacing between the turns) is the same for each turn of the helix. You should visually check to be sure that the helix circumference remains constant along the helix axis.

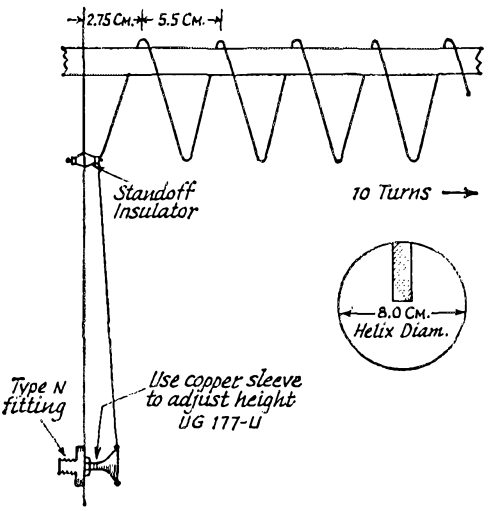


Fig. 2—Principal details of the individual helices and the termination.

Conclusions

Use of the quadhelix in the San Francisco Bay Area on various 1296-Mc. signals such as the gang up at Eimac and WA6JZN has thoroughly demonstrated its "searchlight" capability. It has a sharp beam pattern, and requires careful pointing. This antenna has a conservative 20-db. gain capability, and as such is not too far from a moonbounce antenna by itself. Several of these quads could be stacked for additional gain.

One caution: When this antenna is mounted on your mast, park your car in the driveway, not in the street. This corkscrew has a dangerous fascination for passing hams. Several near misses between parked cars and passing hams are on record near my home location! QST

Strays

FEEDBACK

In the description of the 50-Mc. transistor receiver in July *QST*, the first line at the top of page 27 is superfluous. The second line should read: "next resonate L_6C_2 to about 24.5 Mc."

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A feature of the Coca-Cola Company exhibit at next year's World's Fair in New York will be a special three-position amateur station to be operated by members of the American Radio Relay League. Equipment will be provided by Hallicrafters. According to present plans, any amateur visiting the Fair will be invited to operate the special rigs — provided he has his ticket with him.

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When W6GTE, ARRL's Southwestern Division Vice-Director, checked into the Hollywood Presbyterian Hospital for an operation, he found that his roommate was W6WR. The surgeon was W6KOS. A receiver in the room kept them all informed about amateur goings-on, and W1AW was copied at least once a day.

How To Read Circuit Diagrams—Part I

The beginner with no previous experience of radio beyond turning the knobs of a broadcast or TV receiver finds himself with a few hurdles to clear before he can begin to assimilate principles. One is recognizing components by name; another is recognizing them in the "sign language" of circuit diagrams. Here's an introduction to circuit reading—associating the components with the diagram, and determining how they are connected together.

WHEN you see a radio circuit diagram for the first time it is likely to be about as comprehensible as something written in a foreign language you've never learned. However, compared with the effort you'd have to put into learning to read, say, German or French, learning to read circuit diagrams is a snap. A circuit diagram merely makes use of some standardized symbols that represent various radio and electrical components or devices. It is much easier to draw these symbols than it is to draw pictures of components. Furthermore, the actual components will differ in details of appearance, even though they may have exactly the same electrical function. In practice, therefore, the symbol is much more useful than a picture; the *function* doesn't change even though the construction styles *do* change.

The symbols are the "words" of circuit language. The "sentences" describe the way in which the components are connected together electrically. These are formed by drawing lines, representing wires or other kinds of conductors, between the appropriate connection points on the symbols. This is a much more compact form of representation than a picture diagram or "pictorial," as Fig. 1 shows. Here we have the same circuit, that of a simple wavemeter and indicator, drawn in both styles. The "schematic" at the left can be understood at a glance by anyone having a little familiarity with the sign language of circuit diagrams. The "pictorial" at the right would require some study before one could be sure just what the collection of parts is supposed to do, even when the reader is fairly experienced. Its virtue is that someone with no electrical background whatsoever could assemble and wire it. Unfortunately, blind copying of this kind adds nothing to one's fund of knowledge.

In this simplification and reduction to essentials, something has to be sacrificed. The circuit diagram sacrifices any attempt at pictorial representation. *The circuit does not show where parts are physically located in the equipment, nor does it try to show which leads must be short and which may be long.* This information must be obtained from supplementary material, such as photographs and the written text of an article. Together, these will give a reasonably-experienced reader all he needs to know to produce a workable piece of equipment. It can be done in a relatively small space—compare an ordinary "construction" article with the "wire from A to B" method used for a similar piece of equipment in a set of kit instructions! It also permits accenting the really important features without cluttering up the landscape with minor details that could be handled in half a dozen different ways without the slighest effect on the equipment performance.

The language of circuit diagrams has to be standardized if all readers are to interpret it in the same way, just as the spelling of words has to meet some agreed-upon standards. Such standards do exist for many circuit symbols.[1] There will probably never be a "final" set of standards, for the obvious reason that the art keeps expanding and new devices, requiring new symbols, are constantly being developed. The currently-published standards, for example, include almost no symbols for semiconductor devices. These,

[1] American Standard Y32.2-1954, *Graphical Symbols for Electrical Diagrams*, American Standards Association, 70 East 45th St., New York 17, N. Y.

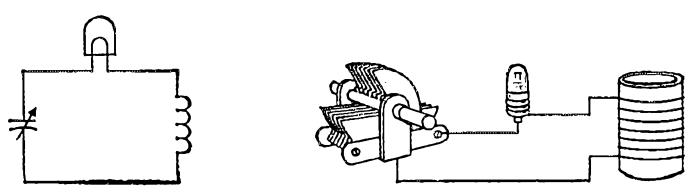


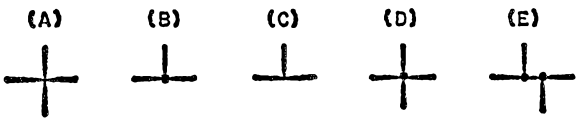
Fig. 1

it is hoped, will be added to the standardized list in the near future. However, most of the symbols we use in amateur work are covered, and in this article we will confine ourselves to those symbols you are most likely to meet in diagrams of amateur equipment.

Wiring

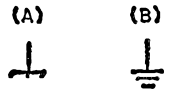
A line between two symbols, or parts of symbols, represents an electrical connection. If it is a simple line, no particular type of wire or other conductor is implied. In the actual piece of equipment, one terminal of one component might be soldered directly to a terminal on the other component. Alternatively, the two might be separated by several inches, or feet, and connected by wire, metal strip, or tubing. In most actual construction, of course, the wiring will be done with either leads furnished on the component (e.g., small resistors and capacitors) or with "hook-up" wire which may range in size from No. 12 to No. 22 gauge, depending on the current to be carried.

Once this nonspecific nature of the connection line is understood, there is only one point that needs to be clarified. There are times when it is impossible to avoid having one connection line cross over another in the drawing. When it must be done it is simply done as shown at A below, although in nearly all other cases a line touching



a symbol means that there is electrical contact. Here *no* contact is indicated. If a connection is to be made between two wires in a diagram it is usually shown by a dot, as at B. (However, the dot is not actually *required* in such a case; the connection can be shown as at C.) A "four-way" connection preferably should *not* be drawn as in D, because of the similarity to a plain cross-over; confusion is avoided by showing such a connection as in E.

We have intimated above that not all connections in a circuit are made with actual wires. Nearly every circuit has an array of "common" connections; examples are the connections to one side (usually the negative side) of the plate-supply source used for the various vacuum-tube circuits in a multitube arrangement. These common connections usually are made to the metal chassis, as a matter of convenience and sometimes as a matter of specific design. In drawing circuits it is customary to show such "chassis ground" connections by the chassis symbol shown at A at top of next column. When you see a collection of such symbols in a diagram you appreciate immediately that all of them are actually one multiple electrical connection. Using the chassis symbol in this way invariably makes the diagram easier to read, because without

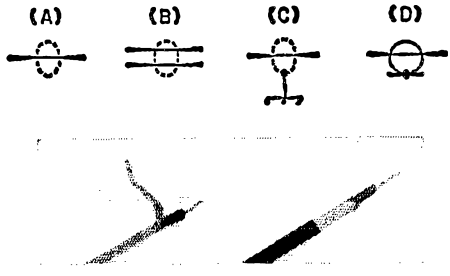


the symbol it would be necessary to show line connections between all those same points.

Usually, the chassis symbol also indicates a part of the circuit that could be connected directly to earth without any effect on the circuit's operation. If an actual earth connection is called for, the "ground" symbol shown at B will be used. In some diagrams you will find this symbol used as an alternative for the chassis symbol, to indicate a connection to chassis without reference to an actual earth connection. In other words, the two symbols are more-or-less interchangeable, although in *QST* diagrams we prefer to use the chassis symbol for an actual chassis connection.

Special cases in wiring occasionally come up. Sometimes a shielded wire or cable is called for. Such wire consists of one or more insulated conductors inside a metal tube usually made by braiding fine bare wire so the whole assembly will be flexible. When grounded, this tube shields the conductors from electrical fields which otherwise might induce unwanted currents in them. The presence of the shield is indicated by a broken, somewhat-elliptical symbol around the wire, as in A and B below. Usually the shield will be grounded or connected to the chassis, in which case the symbol for this is added as in C. Coaxial cable, which is basically shielded wire but is used where r.f. current is to be carried, has a special symbol of its own, shown at D. Here, too, the shield symbol usually will be shown grounded.

Finally, although it is not a part of the actual wiring, you should recognize the symbol for a shield or shielding. It is simply a dashed line, often formed in the shape of a rectangle, around the symbol for a component, or set of components, which actually are enclosed in a shielding container. (An intermediate-frequency transformer is a typical example of a shielded device of this type.)

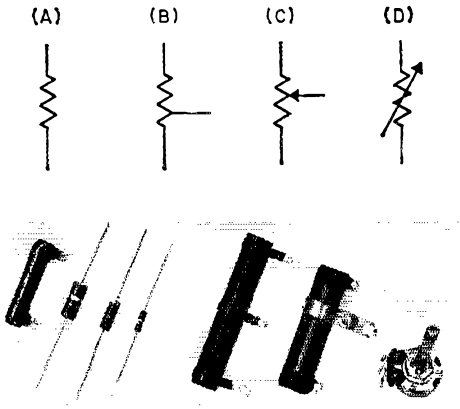


Examples of shielded wire and coaxial cable. The wire (left) is the type with a single inner conductor. Multi-wire cable of similar construction is often used. The coaxial cable shown (right) is a small type (RG-58/U). Cable of this general construction is available in several different diameters, for handling various power levels.

With the "hooking up" out of the way, we can now get down to the component symbols themselves.

Resistors

You rarely meet a circuit that doesn't have at least one resistor in it. While resistors come in a wide variety of sizes and shapes, the same basic symbol, shown below at A, is used for all of them. In its plain form, this symbol represents a "fixed" resistor — one having just a single value. If the resistor is "tapped," having a connection made



Commonly used types of resistors. The resistors grouped at the left have fixed values. In general, the larger the resistor the higher its power rating. The four types shown in this group include a 10-watt wire-wound, and 2-watt, 1-watt, and ½-watt composition resistors. A tapped wire-wound resistor is in the center, with a slider-type (adjustable) wire-wound at its right. On the far right is a composition "control," or variable resistor.

somewhere in its body that permits another value of resistance to be secured from the same resistor, the presence of the tap is indicated as shown in B. More than one tap, when needed, may be added to the basic symbol.

The solid arrowhead in the symbol at C indicates that the resistance is adjustable in value. Other than this, it does not give any indication of the physical construction of the resistor. The adjustment might be by means of a slider on a wire-wound resistor, for example. Or it might mean the moving contact on a wire-wound or composition "control." Note that with this symbol there are three terminals, the adjustable tap and the two outside ends of the resistor, so this symbol can be used for an adjustable voltage divider or "potentiometer." On the other hand, the symbol at D, with the arrow drawn through the basic resistor symbol, simply indicates that the total resistance is continuously variable. This symbol has only two terminals, although the actual component frequently will have three; one end connection is left unused in that case.

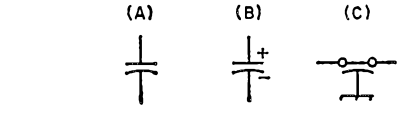
Capacitors

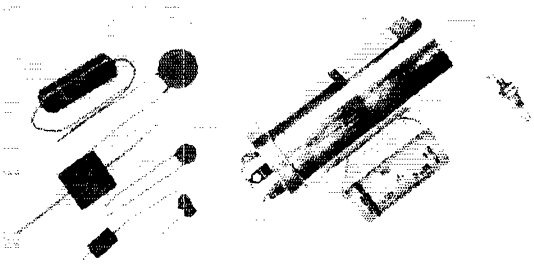
The basic capacitor symbol is shown at A below, and just as in the case of the resistor, this symbol as it stands implies that the capacitor is "fixed" — that is, it has just a single value of capacitance. Again, the symbol stands for all sorts of fixed capacitors, from tiny ceramic disks to bulky potted high-voltage types, with dielectrics ranging from vacuum to oil-filled paper.

Electrolytic capacitors are "polarized" — that is, in d.c. circuits one terminal must be connected to the positive side of the voltage source and the other to the negative side. The proper polarity is frequently shown on the circuit diagram by putting a + sign near the side of the capacitor that should be connected to the positive side. Frequently, also, the other side is labeled −. Note, however, that these + and − signs are not a *required* part of the symbol, although it is *QST* practice to use them.

A special type of fixed-capacitor symbol is shown at C. This is the "feedthrough" capacitor, used particularly in high-frequency radio circuits for bypassing. In this type the circuit being bypassed goes into one terminal, indicated by one of the small circles, and out the second terminal. The r.f. bypassing takes place internally to the curved capacitor "plate," which is always grounded to the chassis. This type of capacitor is especially useful where the circuit goes through the chassis, or other metallic sheet, from one side to the other.

Two common types of continuously-adjustable or "variable" capacitors used for tuning r.f.



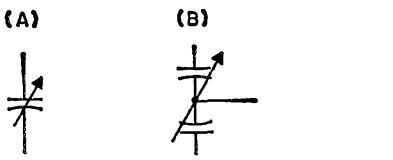


Fixed capacitors come in various shapes, sizes, and types of construction. At the left are a paper tubular capacitor, two sizes of molded mica capacitors, and three types of ceramic capacitors (two sizes of disks, and a tubular with axial leads). The large metal can is an electrolytic filter capacitor (in this case, several capacitors in one can, which is a common connection for all units). Beside it is a small electrolytic with wire leads. The small capacitor at the far right is a feed-through type useful at v.h.f.

circuits are shown symbolically at A and B below. The first symbol may stand for any of several physically-different types. One of these is the "air" type, which has a set of metal plates on a rotatable shaft, interleaving with a similar set of stationary or fixed plates. A second is the the "compression" type, in which the spacing between two sets of leaf-spring plates is changed by screw adjustment. The two sets of plates are insulated from each other by thin mica wafers. A third is the "piston" type, in which a metal cylinder is moved in or out of a conducting tube by screw adjustment. The cylinder and tube are insulated from each other. Small capacitors are often used as "trimmers" — that is, set to a desired capacitance value experimentally in the equipment and thereafter left alone. A capacitor used for this purpose may be (but does not *have* to be) so indicated by putting a small T alongside the straight line representing the fixed plate.

When the arrow is added to the basic capacitor symbol to show that the capacitor is variable the curved line represents the movable plates.

The "split-stator" capacitor symbol is shown at B. This is an "air"-type capacitor having two sets of rotor plates and two sets of stator plates. The former are mounted on the same shaft; in



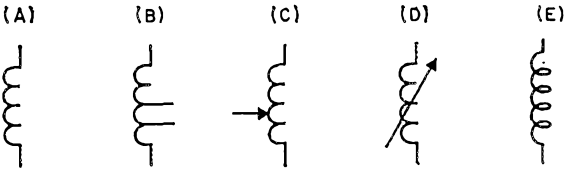
A few samples of variable capacitors; there are innumerable styles of these, and only a few are shown here. From left to right, a mica compression trimmer, a tubular trimmer, a single-section variable, and a dual-section or "split-stator" variable. The latter can be used either as a balanced capacitor or as two separate sections driven by a single control shaft.

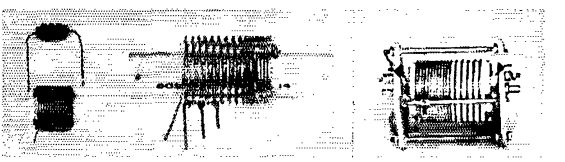
effect, there are two identical variable capacitors operating together. Capacitors of this type are used in "balanced" or "push-pull" circuits.

Whatever the capacitor symbol, it is customary to use the curved line to indicate the side of the capacitor that goes to the grounded or lower-potential side of the circuit. An apparent exception is the electrolytic capacitor, in which case the curved line usually indicates the side connected to negative d.c. voltage.

Inductors and Transformers

The basic inductor symbol, like the ones for resistors and capacitors, gives no information about the *type* of inductor. It is shown at A below. It represents an inductance of fixed value in this form, and it can stand for a simple r.f. coil wound on a form, for a multi-layer coil, a universal-wound coil, or even for one wound on an iron core. Like the resistor symbol, it can be

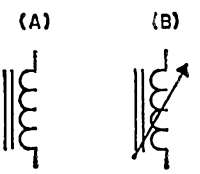


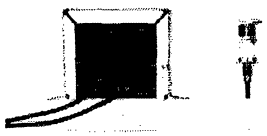


Typical inductances used at radio frequencies. Left, a multisection "pie"-wound r.f. choke, and a small "air-wound" coil. Next to these is a tapped coil such as is used in small transmitters. The inductor at the right is continuously variable; a roller makes contact with the wire as the form is rotated by the control knob.

shown tapped (B), or adjustable (C and D). C is used for inductors having a moving contact; an example is the "roller" type which has a traveling contact on a bare-wire coil, the contact position being changed as the coil is rotated. This symbol also would be used for a coil having a movable spring clip to make contact with any part of the bare-wire winding. Incidentally, there are two fundamental types of inductor symbol, one having open loops as shown at A, B, C and D, and one having closed loops as shown at E. The open loop type is the preferred one and is used in *QST* diagrams. However, most older diagrams of the pre-standards period used the closed-loop inductor symbol, and you may run across it now and then in books and periodicals.

If the inductor has an iron core or slug it may be indicated by two straight lines placed alongside the inductor symbol, as in A below. This particular symbol would be used for an iron-core choke in a power-supply filter, for example. B shows a continuously-variable iron-core inductor such as a slug-tuned r.f. coil. However, the iron-core symbol is not a *required* part of the inductance symbol. It simply represents a little addi-





Iron-core inductances. Left, an inductor of the type used in power-supply filters (filter choke). Right, an adjustable inductor for radio frequencies. Adjustment of inductance is made by moving a small cylindrical powdered-iron core in and out of the coil, which is wound on the form.

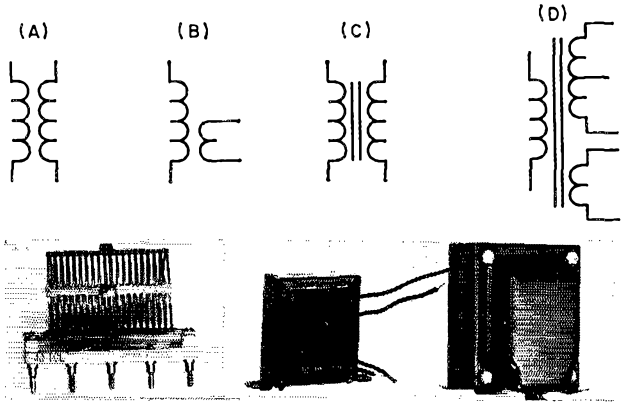
tional information about the inductor when the person who draws the circuit wishes to supply it. The practice in *QST* drawings is to use the iron-core symbol only for inductors intended for working at power-supply or audio frequencies, or on direct current; the core is not shown in inductors operating at radio frequencies.

There is no hard-and-fast rule covering the number of loops in the inductor symbol. Four are used in most cases, but sometimes it is necessary to use more. For example, in the symbol for an inductor with two fixed taps shown earlier, four loops are used. But if a large number of taps has to be accommodated the number of loops can be expanded as necessary.

A transformer is essentially two (or more) inductors magnetically coupled, and the basic symbol for it is shown at A below. If the transformer has an iron core it can be shown as at C. In *QST* drawings the iron-core symbol is used only for transformers working at power-supply and audio frequencies. The core is omitted from the symbols for transformers operating at radio frequencies even though the actual transformer may have an iron core. This helps make it easier to differentiate between the two classes of transformers in glancing over a diagram.

As in the case of simple inductors, the number of loops in a transformer symbol may be increased if necessary. You will also frequently see transformer symbols in *QST* in which one or more windings will be shown by only *two* loops. These are used to indicate low-impedance or low-voltage windings. Thus the symbol at B would stand for an r.f. transformer with an output "link," while the one at D would be typical of a power transformer having a high-voltage center-tapped secondary (four loops with a tap) and a low-voltage filament secondary (two loops).

(To be continued) QST



Transformers. The r.f. coil at the left is typical of the tank coils used in transmitters, and has a low-impedance output winding or "link." A transformer for audio-frequency amplifiers is shown in the center. The unit at the right is representative of power-supply transformer construction.

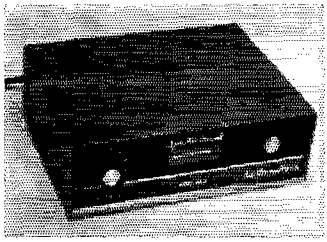
Strays

Colonel R. D. Curtis (right), W4JWV, receives the ARRL "QST Cover Plate Award" plaque voted him by ARRL Directors for his article "The W4JWV S.S.B. Exciter," which appeared in January, 1963, *QST*. The award was presented by Atlantic Division Vice-Director Col. E. S. Van Deusen, W3ECP, at the quarterly meeting of the Foundation for Amateur Radio in Washington, D. C.

• Recent Equipment —

Hallicrafters HA-8

Modulation Indicator



THE Hallicrafters HA-8 "Splatter Guard" is a phone transmitter accessory which gives a visual indication of the relative r.f. voltage present on the antenna transmission line. When once calibrated for a particular transmitter and mode, it can be used to monitor the output signal level and to operate the transmitter near its peak-power handling capability without overdriving the transmitter (or amplifier) into "flat topping" and distortion. The device is certainly appropriate these days, what with the ever-increasing s.s.b. population and the "clean signal crusade" of the ARRL.[1]

The Splatter Guard has several components: a display and control box, a detector barrel, a coaxial "T" connector, and a connecting cord that goes between the detector and display units. A schematic diagram for the monitor is shown in Fig. 1.

The coaxial "T" fitting, which mates with the UHF series of connectors, is inserted in series with the 50-ohm transmission line, between the transmitter and antenna, or between the transmitter and antenna coupler if one is used. Since the device is designed for 50-ohm transmission lines only, an antenna coupler must be used between the transmitter and antenna for other than 50-ohm line impedance. Insertion of the connector and detector unit in the transmission line will not change the s.w.r. over the frequency range of 3 to 30 Mc. At frequencies higher than 30 Mc. an increase in s.w.r. may be noted. The device is not recommended for operation at frequencies higher than 148 Mc.

The "T" fitting also connects directly to jack J_3 in Fig. 1, the input to the detector unit. Through a capacitive divider, C_1 and C_2, the r.f. voltage is then rectified by CR_2, CR_3. Output from the detector terminates at the phono connector J_2. Since the "T" connector and detector unit are located at the transmission line, a connecting cable (of any convenient length, since it carries only d.c. and audio) is run from the detector unit (at J_2) to the display box (at J_1) which can be placed at a convenient spot where it can be viewed easily. A six-foot cable is furnished with the Splatter Guard package.

The display unit consists of a transformer-powered power supply and the display tube, an EM84/6FG6. The 6FG6 is different from the old familiar 6E5 and other "green eye" types in that the display consists of a rectangular "light bar" which closes in from the ends. The fluorescent light of the 6FG6 is bluish-white in color.

A SENSITIVITY control, R_1, is used for calibrating the monitor. It adjusts the d.c. bias from the detector unit to the triode amplifier.

To use the Splatter Guard with an s.s.b. transmitting system, the transmitter or linear amplifier is adjusted with carrier inserted until the flattening point is reached. (The article by W1DF in *QST*, November 1962, "How to Run Your Linear," is an excellent reference for information on amplifier operation and on how to determine when you've reached the flattening point.) Next, the SENSITIVITY control on the display unit is adjusted until the side-by-side light shafts just meet and produce a bright line at the center of the display window. The carrier is removed, and the audio gain of the transmitter is increased so that with speech the illuminated shafts of light will be brightest at either side and taper off in intensity toward the center with an occasional bright line showing at the center when the transmitter reaches peak output. Overdriving of the transmitter or amplifier will be indicated by a constant brightness all the way across the win-

[1] "It Seems to Us. . .", *QST*, Sept., 1962.

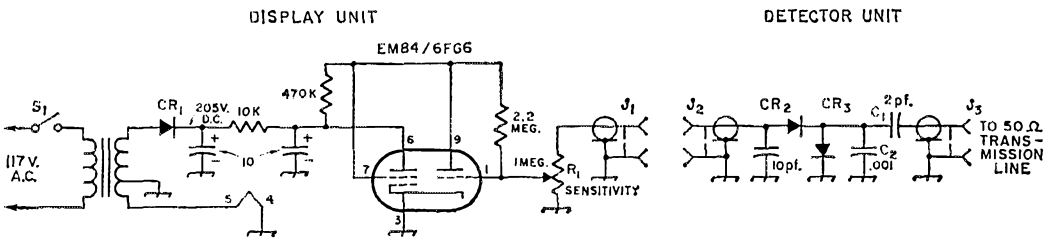
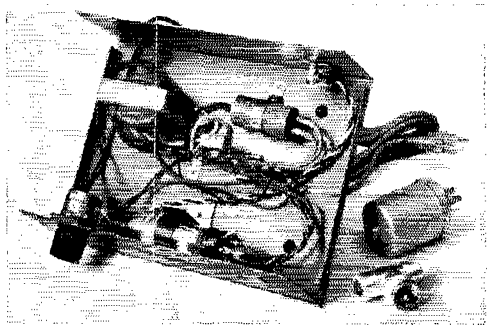


Fig. 1—Diagram of the HA-8 Modulation Indicator. Resistances are in ohms, resistors are ½-watt. Unless specified otherwise, capacitances are in microfarads.

Hallicrafter HA-8 Modulation Indicator

	Display Unit	Detector Unit
Height:	2⅝ inches	1½ inches
Width:	7½ inches	1½ inches
Depth:	5¾ inches	2⅝ inches
Weight:	2½ pounds	3 ounces

Power requirements: 125 volts, 60 cycles, 3 watts.
Price class: $25.00
Manufacturer: Hallicrafters Co., Chicago, Ill.



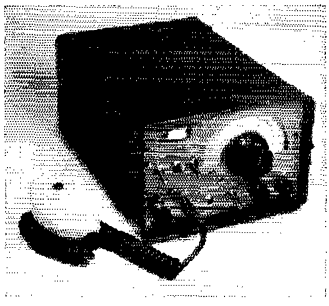
Bottom view of the HA-8 Splatter Guard. The "T" connector, detector unit and connecting cable are at the right of the photograph.

dow, with a very bright light showing at the exact center. Instructions and diagrams are included in the HA-8 manual for setting up the monitor for a.m. transmission using linear amplifier systems and for high level a.m. modulation.

Power-handling capacity of the Monitor is 1000 watts if the s.w.r. is kept below 2 to 1. It has a minimum r.f. power requirement of 40 watts. It can be used between 3 and 30 Mc. at power levels below 40 watts, down to as low as 10 watts, if the 2-pf. capacitor, C_1, in the voltage divider in the detector unit is increased to 4 pf.

The Splatter Guard is finished in light gray with a black and gray panel. The display window measures 1¼ × 5/32 inches.

— *E.L.C.*

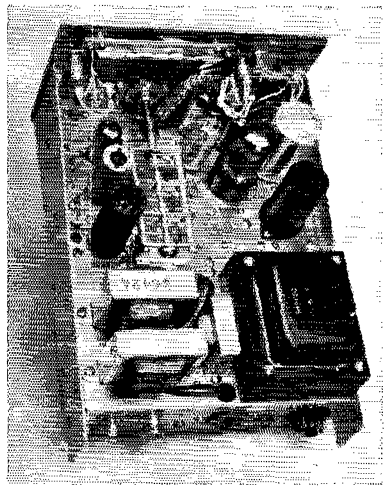


Whippany Laboratories

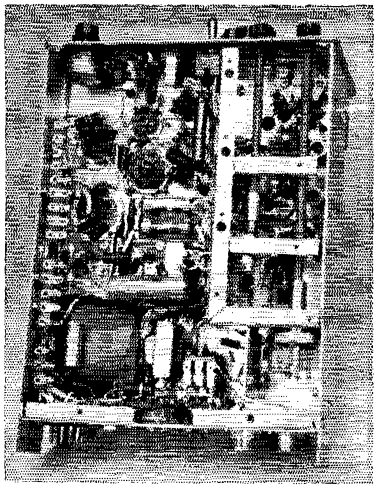
"Li'l Lulu" 50-Mc. Transmitter

SIX-METER men of Northern New Jersey know "Li'l Lulu" well. A complete phone-c.w. transmitter of proven qualities, it was designed by Ed Ladd, W2IDZ. Early versions of the rig were worked out when 6-meter activity was all but at a standstill in this, the most populous of the early Channel 2 TV areas. When the transmitter first made its appearance one had to take every precaution to be sure that a 50-Mc. station was "clean." W2IDZ took those precautions with Li'l Lulu, and so made an important contribution to the winning of this tough TVI battle, demonstrating that operation on 50 Mc. *is* possible in competition with Channel 2.

The transmitter passed other rigorous tests. It went on DXpeditions to rare western states, and accompanied W2IDZ on a highly successful trip to the far North in the days of worldwide F_2DX on 50 Mc. Variations and copies of it were made for numerous 6-meter operators of the New Jersey area, which at that time was a very rough place for this breed of ham. Li'l Lulu survived the TVI struggle, and now it is available in manufactured form: a complete package with gang-tuned v.f.o., modulator, power supply and low-pass filter.



Interior view of Li'l Lulu, a complete 50-Mc. transmitter. The v.f.o., buffer and amplifier tubes are at the top left of the picture and the ganged tuning capacitor adjacent to them. Audio and power components are at the right.



Bottom view of the 50-Mc. transmitter. R.f. circuits are at the top.

One common cause of TVI, radiation of unwanted oscillator or exciter harmonics that fall in the low TV channels, is eliminated by designing the 6BH6 v.f.o. so that it can operate stably with its grid circuit on 25 to 27 Mc., instead of the lower frequencies generally used. The high-C oscillator circuit is temperature-stabilized and both the heater and plate-screen voltages are regulated. The oscillator plate circuit is on 50 Mc. The following 6BH6 buffer also operates from the same regulated heater and plate-screen sources The oscillator plate circuit is self-resonant, so that no retuning is required across the band.

The final stage is a 12DQ7 amplifier. Its plate circuit and the buffer tuning are ganged to the v.f.o. control. Once the amplifier plate padder and the output loading capacitor are adjusted for the middle of the part of the band you normally expect to use, no adjustment other than turning the v.f.o. to the desired frequency setting is needed as you move around.

Whippany Laboratories Li'l Lulu 50 Mc. Transmitter

Height: 5⅜ inches.
Width: 8 inches.
Depth: 11⅜ inches.
Weight: 16.5 pounds.
Power Requirements: 115 volts a.c., 67 watts; 12.6 volts d.c., 6.9 amp.
Price Class: $225.00
Manufacturer: Whippany Laboratories, Inc., 1275 Bloomfield Ave., West Caldwell, N.J.

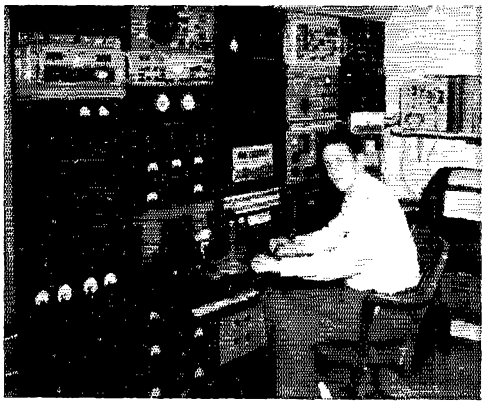
A class-A modulator is provided, with speech amplification sufficient for crystal or high-output dynamic microphones. Provision is made for carbon microphone as well. The microphone input circuit is wired for push-to-talk, but the operator is not limited to this mode. There is a front-panel send-receive control for those who prefer it. W2IDZ is an old hand at 50-Mc. DX work, so his brainchild has provision for c.w. It is not merely a cathode jack; there is a built-in keying filter and a mode switch that sets up the transmitter properly for c.w. There is a v.f.o.-spot switch, so the operator has no excuse for swishing around the band with the signal on the air.

Mechanical stability is assured by the use of heavy-gage metal and plenty of bracing. The case is steel of solid wrap-around design. The r.f. portions of the transmitter are completely shielded when the unit is in the case.

The built-in power supply is transistorized, with provision for 12-volt d.c. or 115-volt a.c. power. Either positive or negative ground may be used in mobile work. The supply is set up to handle a companion receiver and there is a built-in antenna relay, so to put Li'l Lulu on the air one merely connects the antenna, a patch cord to the receiver, and a microphone and key.

—*E. P. T.*

Strays



Talk about a well-equipped shack—look at this one! It's the property of Jay O'Brien, W6GDO (shown at the operating position) and his XYL, Jan, K6HHD. Jay's primary interests are s.s.b. and c.w. on two meters, but anyone can see that he's able to go on any band at any time . . . The 2-meter rig runs a cool 2 kw. p.e.p. and a kw. on a.m. and c.w. Also shown in the picture are the all-band kw. rig and receiving and monitoring equipment. Jay is a Class I Official Observer.

Hints and Kinks For the Experimenter

RESIN CLEANER

QUITE often a good soldering job is left unfinished because of residue from the resin contained in the solder. I found that liquid type-cleaner which contains trichlorethane will dissolve the excess resin very easily. The solution is noninflammable, non-corrosive and dries instantly. A four-ounce bottle can be purchased in almost any office-supply store for less than a dollar. The perfect applicator is a cotton swab, such as a "Q-Tip," usually found in the medicine cabinet. — *Vincent A. Clarida, K4CSI*

BUG HOLD DOWN

MANY methods have been proposed for keeping a "bug" from walking around the operating table, particularly when you're trying for a little speed. Minnesota Mining and Manufacturing Co. has the answer: Scotch Double Stick Tape. This is a product that is sticky on both sides. Just put a ½-inch square piece on each of the rubber feet of the bug and set the bug down on the desk. It won't move. — *R. B. Jeffrey, W8GDC/WA8FWF*

OUTBOARD KEYING TERMINALS

THE photograph in Fig. 1 shows how I attached additional keyed terminals to my hand key. These terminals are electrically independent from the circuit keyed by the conventional contacts, and they can be used to key a monitor or other external circuit. A standard surplus J-38 key is mounted on a suitable base. One of the contact arms is attached to the key armature by securing between the knob and the armature. An oversized hole is used in the contact arm, which is then sandwiched between the insulated knob and a fibre washer or the like, and then attached to the armature. Make sure the contact arm does not touch the armature when the knob is tightened. The other contact arm is mounted on the key base. By placing this terminal between two nuts, it can be positioned up and down for optimum keying. Ideally, the two contacts will make contact at the same instant as the regular key contacts. — *Frank O'Neil, W1HRR*

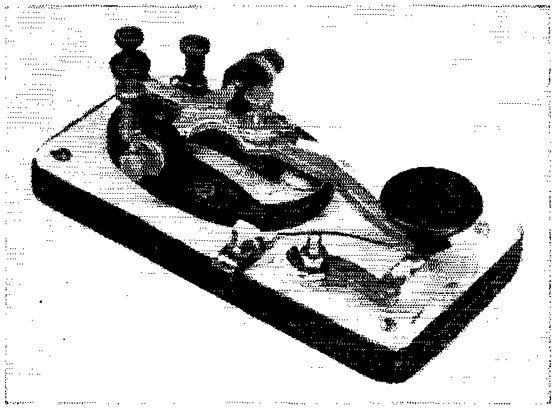


Fig. 1—Outboard keying terminals provide switching for an external circuit.

SOLDERING RESISTANCE WIRE

SINCE resistance wire contains nickel and chrome, it is difficult to tin the wire with ordinary solder. Silver solder may be used on heavy resistance wire, but most ham work with resistance wire is for meter shunts, etc., and involves the use of delicate resistance wire.

My method of soldering involves first cleaning the wire with the finest Carborundum available. If the wire is covered with fabric, push the fabric back about one inch and hold it there with wax or cement. Next, gold solder is heated on an asbestos or carbon block under a flux, such as borax, until the solder just melts. Be careful not to overheat and use only a small amount of the gold solder; the size of an okra seed (¼ penny weight) will do. Dip the end of the resistance wire into some soldering flux, remove the flame from the melted gold solder and thrust the end of the resistance wire into the molten solder and then remove it. A thin coating of gold should adhere to the end of the resistance wire. The gold-plated wire end is cleaned and can now be tinned easily with conventional solder.

The gold solder can be purchased from a dental-supply house or dental laboratory, and the cost for the amount used here should be no more than half a dollar. Melting point for the gold solder is about 1200 to 1400 degrees F. A gas torch or Bunsen burner will work well for this.

One note about using the completed wire: if a precision shunt is to be made, the tinned sections of the wire should be neglected in the measurement. Only the wire between the plated ends is now resistance wire!

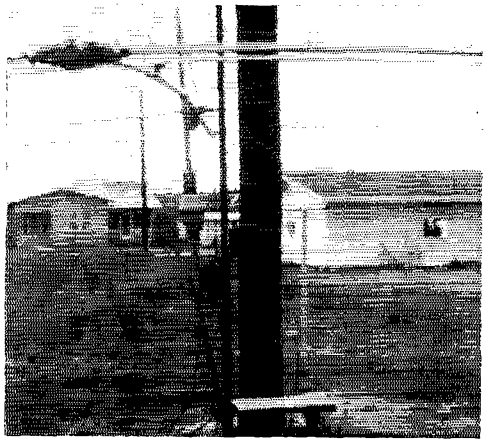
— *Dr. Roy R. Campbell, W4DFR*

THIRD HAND GADGET

A THIRD-HAND device for holding small assemblies, circuit boards, etc. can be made by mounting Vise-Grip Pliers on a board with angle brackets. Leather or sponge rubber padding on the jaws will minimize the danger of scoring or damaging the work being gripped. The device is especially useful for soldering operations. — *F. H. Western, VE2QO*

Beam Hoist for a Wood Pole

RONALD SMALLWOOD,* K5GJI



Antenna and "carrier" at ground level, ready to be cranked up.

Various mechanical arrangements have been devised for lowering a beam antenna for repairs or in case of a violent storm. Most schemes involve telescoping or tilting the supporting tower — a pretty difficult thing to do with a telephone-pole mast. But K5GJI has solved the problem quite ingeniously.

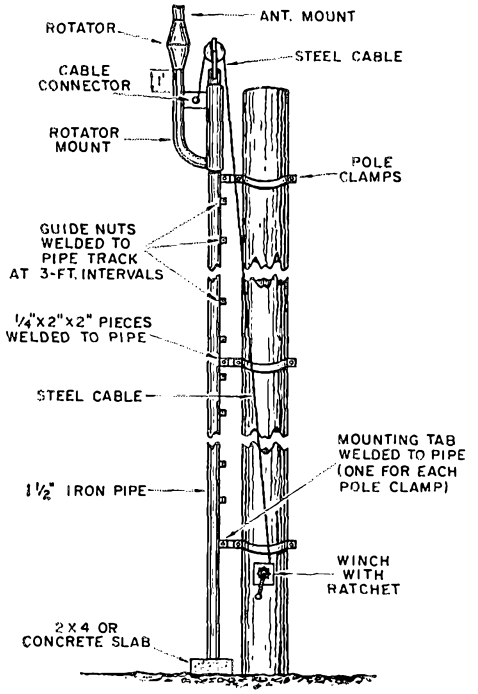


Fig. 1—The antenna "carrier" at the top slides up and down a pipe track attached to the pole.

My XYL's objections to a mess of guy wires cluttering up the back yard of our new home drove me to the design of a system for raising and lowering my new Hy-Gain Duobander on a utility pole. I discarded the idea of attaching an angle-iron track to the pole, because the uneven taper of a pole invariably makes the binding effect of such a track a practical obstacle. A local welder discouraged the track suggestion and came up with the idea of a comparatively inexpensive rigging. My good friend Malcolm Saulsbury, K5JRF, came down from Dallas on a visit and together we worked out the details with my welder and went to work. The arrangement shown in Fig. 1 is the result.

First, an inexpensive 50-foot pole was bought from the electric co-op and installed in an 8-foot hole. Next, two 20-foot sections of 1½-inch iron pipe were obtained from the local iron works. Then the welder went to work. A six-inch steel dowel was driven three inches into the top end of the bottom section and a pulley assembly with hood was welded to the end of the top section, as shown in Fig. 3. Twelve square iron nuts, each ¼ x 1-inch, were welded to the pipes edge-on, in a line along the length of the pipe. Three sets of pole clamps were then built according to the drawing of Fig. 2. Mounting tabs (see Fig. 2) were welded to the pipe at the levels where the clamps were to be attached. The clamp-halves were connected at one end by a short, sturdy chain with a threaded bolt welded to one end. The taper of the pole makes the curvature of the clamps difficult to estimate, but the use of the chain permits tight adjustment, with enough tolerance to insure perfect fit. The clamps connect to the pipe by means of a 1¼ x 2 x 6-inch iron bar. To fix the exact vertical position of the pipe, three adjustment holes are drilled in the end of the bar which fits into the clamp ends. The radius of each clamp must be estimated

*Box 1081, Karnes City, Texas

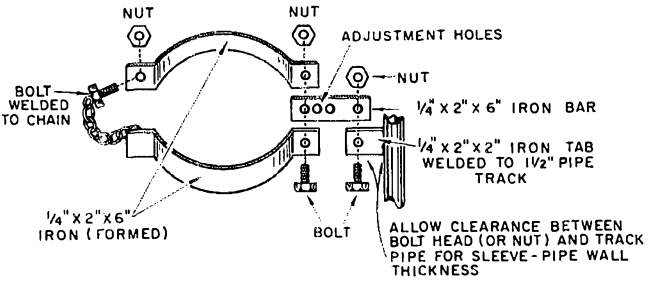


Fig. 2—Detail sketch of pole clamps and track-mounting assembly.

from the graduated diameters of each individual pole.

The trick of this arrangement is the 4-foot length of 2-inch pipe which slides up and down on the 1½-inch track pipe. A welding torch is used to cut a ½-inch slot along the length of this sleeve. The slot clears the nuts welded to the pipe-track, which keep the sleeve from rotating around the track. The guide nuts are spaced so that one or more is always in the slot. Curving the sides of the slot at the top and bottom of the sleeve assures smooth entry into the slot of each succeeding guide nut. The complete rotator-mounting assembly is shown in Fig. 4.

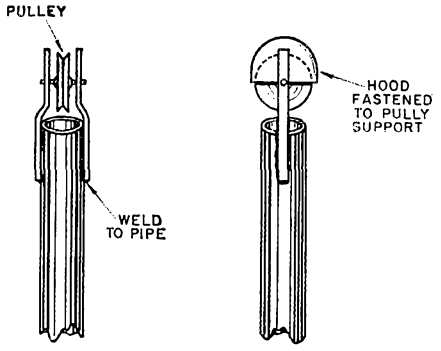


Fig. 3—Sketch of pulley mounting. The sheet-metal hood should fit the pulley rather closely, to discourage the cable from jumping its groove.

A length of 1½-inch pipe is welded to the bottom of the sleeve, curved as shown, and brought upward, parallel to the slot. A heavy piece of flat ½ x 6-inch iron plate is welded between the sleeve and the pipe to form a brace for the pipe. The rotator is mounted on top. The mast extends upward from the rotator and is connected to the boom. The length of pipe used here, added to the rotator and mast lengths, bring my boom up to about four feet above the top of the pole. The length is, of course, optional with each individual. All beam manufacturers recommend that mast lengths be kept as short as possible, since the strength of the pipe determines the amount of stress that can be withstood from strong winds. I drove a wooden dowel into the top of the curved pipe for greater strength.

Now to complete the installation. This step-by-step procedure, gleaned from sad experience, will avoid trouble.

First: the completely-assembled beam, with the mast and rotator installed and connected to the sleeve, is leaned upright against the pole, the bottom of the sleeve resting on the ground. The first 20-foot length of pipe is slipped into the

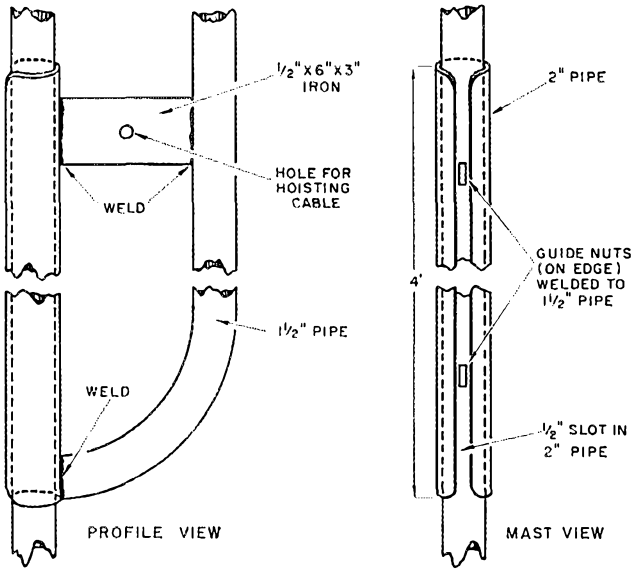
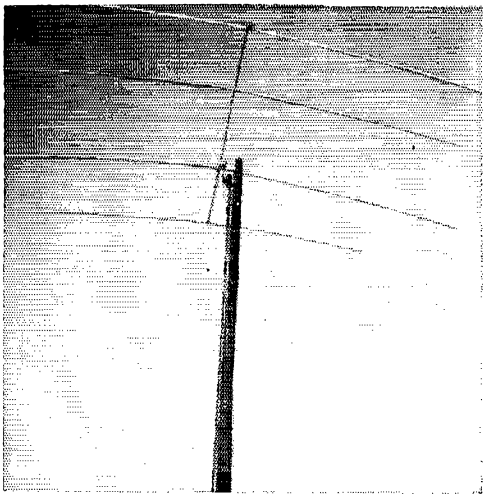


Fig. 4—Sketch of the "carrier" assembly. A slot in the sleeve of the "carrier" engages a row of guides which prevent it from turning on the track pipe.

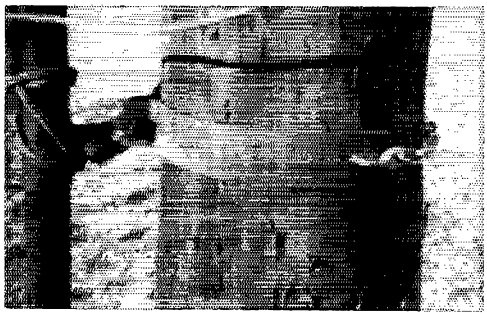


Only a minute or two is needed to raise this antenna to the top of the pole, or lower it.

sleeve. A pole-climber up about 20 feet holds the top of the pipe steady while a worker on the ground loosely fastens the first clamp around the pole, about 3 feet from the bottom, and attaches it to the bottom tab on the pipe track. The nuts should be loosely tightened.

Second: the climber goes up to the 40-foot level, carrying the second clamp assembly with him. He also hauls up the second section of pipe with the pulley on top, holding it by the top. He lowers the bottom of this pipe section over the iron dowel extending from the top of the first section. After visually aligning the second section vertically, he attaches the clamp to the pole near the top of the second pipe section and fastens it to the tab as he did the first section.

Third: the third clamp is loosely fastened just above the junction of the two pipe sections.



Close-up view of the bottom pole clamp. The chain section provides a tight fit regardless of the pole contour.

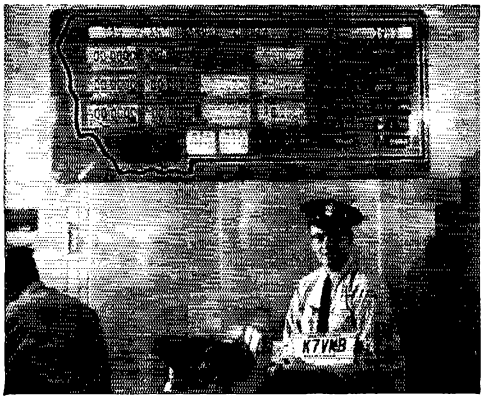
True vertical alignment of the three pipe sections may then be made, moving the clamps as necessary and using the proper holes in the connector pieces. Tighten all nuts and bolts.

Fourth: run steel cable through the pulley and down the pole, connecting the end at the hole in the support plate by means of a cable connector. (Warning: if the cable is connected to the support plate by running it through a hole with rough edges, it may fray and snap. Cable connectors and thimbles are available at most hardware stores). Attach the other end of the cable to a heavy crank-and-rachet assembly mounted on the base of the pole with spikes.

You are now in business. Lubricating the forty feet of pipe with heavy grease will make raising the beam much easier. Any longer pole may be used in the same manner by using additional 1½-inch pipe and pole clamps.

At my installation, I ran the coax transmission line and control cable to the base of the pole in underground conduit. Pull an extra length of coax through the conduit before you bury it if there is a chance that you might ever want to stack another beam over the first. QST

Strays



Here's "Mac" Mc Crossin, K7VMB. He's the only ham, as far as we know, who makes his own call-letter license plates. Mac is the supervisor of the auto tag plant at Montana State Prison.

Calling all mobileers — the Champion Spark Plug Company has published an interesting manual concerning automotive radio techniques and hints for better operation. Sidney Shanbar, KN1YWW, who told us about the booklet, says that Champion will send one to hams who write them at P.O. Box 910, Toledo, Ohio. Mention the pamphlet entitled "Giving Two-way Radio Its Voice."

—...—

When visiting a local radio supply store in Toronto recently, VE3AZA had been fooling with little luck with a new electronic keyer. After a moment or so, his Junior Op, Jimmy, grasped the keyer and sent a perfect CQ at about 35 w.p.m. followed by a string of nothing understandable. The nearby hams and sales people looked on in surprise, and proud papa said "Yes, and he's not quite 4 years old yet!" How's that for a chip off the old c.w. block?

Hamfest Calendar

Alabama — The North Alabama Hamfest will be held in Decatur Ala., Aug. 18, at the Decatur High School. For more info contact Paul Burks, K4UEC, P. O. Box 9, Decatur, Ala.

Delaware — The 2nd Annual Delaware Hamfest will be held at the Dover Air Force Base picnic grounds on August 18 (rain date Aug. 25). Registration $1.00 in advance, $1.50 at the gate. Contact George Rambo, W3LQE, 17 N. Avon Dr., Wilmington 3, Del.

Indiana — The Tri-State College ARC will sponsor the 4th Annual Wide-Band F.M. Picnic on Sunday, August 4, 10:00 A.M. to 6:00 P.M., EST, at the Steuben County 4-H Park on Crooked Lake, 2½ miles north of Angola on U. S. 27, then 1½ miles west. There will be mobile check-ins on 52.525, 146.94, 147.3 Mc. f.m., and 50.25 Mc. a.m. Admission is by donation — $1 in advance or $1.50 at the door. Reservations for the chicken dinner must be received in advance — adults $1.35, children under 12, $.80. Advance registration and dinner reservations must be received by July 31, 1963.

Indiana — The 11th Annual "Big Bull" hamfest, sponsored by the Kokomo ARC, will be held Sunday, Aug. 11, from 10:00 A.M. to 4:00 P.M., in Highland Park, Kokomo. Program includes bingo for the ladies, rides for the children, eyeball QSOs for the OMs, and a 6-meter hidden transmitter hunt. Registration $1.50. Bring your picnic basket and the whole family for a full day of entertainment. For further info contact Roger Weaver, K9SXM, P. O. Box 200, Kokomo, Ind.

Illinois — The Hamfesters RC will hold its 29th annual hamfest on Sunday, Aug. 11, at Santa Fe Park, near Chicago. Tickets $1.00 in advance or $1.55 at the gate. Contact Tom Campana, K9DYW, 1209 W. 74th St., Chicago 36, Ill. for further info.

Kansas — The Kansas-Nebraska RC hamfest will be held Sunday, Aug. 11 at the Concordia, Kans. National Guard Armory, Concordia. Program includes a hidden transmitter hunt, bingo games, contests, and surplus gear auction. For further info contact C. Wilbur Naylor, WØWXY, P. O. Box 157, Concordia, Kans.

Michigan — The Copper Country RAA will sponsor the annual Upper Peninsula Hamfest at Laurium Airport, on August 3 and 4. Registration begins at 8:00 A.M., Aug. 3. Saturday's program includes contests, banquet, and a dance, and on Sunday there will be business meetings and guest speakers. Contact Gail Englund, K8VDT, 511-5 St., Calumet, Mich., for further info.

Missouri — The Southwest Missouri ARC will hold its annual picnic Aug. 25, at Fassnight Park in Springfield, Mo., registration beginning at 9:00 A.M. There will be an area MARS meeting held in conjunction with the hamfest. For further info contact W. Wallace Hutchison, 2441 South Lone Pine Road, Springfield, Mo.

Mississippi — The annual hamfest of the Jackson ARC will be held Sunday, July 28, at Legion Lake, Jackson, Miss.

Maryland — The Maryland Emergency Phone Net is having a hamfest on Sunday, July 28, in Braddock Heights, Md. For more info contact Marianne E. Bushong, W3LQY, 412 Audrey Ave., Baltimore 25, Md.

New Jersey — The Gloucester County ARC is holding its annual hamfest Sunday, Aug. 4, at Crystal Birch Lake, Chapel Heights, N. J. Contact Bernhard Cohen, K2OJX, 510 Page St., Woodbury, N. J. for further info.

New Mexico — The Alamogordo Radio Club will sponsor a hamfest at Cloudcroft, on Aug. 18. Sorry, no other info at hand.

Ohio — The Warren Amateur Radio Association is holding its 6th annual hamfest on Sunday, August 25, at the Newton Falls Community Center, Newton Falls, Ohio — 2 miles from Ohio Turnpike Interchange #14. Time — 12 noon to 5:00 P.M. There will be a swap shop, talk-in for mobiles, and there is plenty of picnic and playground equipment available. Registration $1.50. Contact Imogene Kalman, 112 Shirley Lane N.W., Warren, Ohio, for further info.

Pennsylvania — The "Pack Rats" (Mt. Airy V.H.F. RC) are holding their 8th Annual Family Day Picnic at Fort Washington State Park, Flourtown, Pa., on Sunday, Aug. 11 (rain date Aug. 18). Games and an old-fashioned family picnic are being planned for more than 500. Bring your own lunch, soft drinks furnished by the club. Time — 10:00 A.M. Registration — $1.00 per family. Talk-in frequencies 50.2 and 144.2, call W3CCX. For further info contact Francis Brick, 829 W. Fishers Ave., Philadelphia 41, Pa.

Pennsylvania — The 26th annual hamfest of the South Hills Brass Pounders & Modulators of Pittsburgh will be held Sunday, Aug. 11, from noon until dusk at Totem Pole and Spreading Oaks Lodges, South Park, about 8 miles south of Pittsburgh on Rte. 88. Plenty of picnic space for the family. Mobiles check in to W3PIQ on 10 and 6 meters. Registration $1.50 in advance or $2.00 at the door. For more info or pre-registration, contact Dave Imhoff, W3HND, 2283 Spokane Ave., Pittsburgh 10, Pa.

Pennsylvania — The Knuckelheads will hold their annual picnic Aug. 11 at Coopersburg. No other info available.

Pennsylvania — The Delaware-Lehigh ARC, together with the Lehigh Valley ARC, will hold a hamfest on Aug. 18. For further info contact Robert R. Rothrock, K3MAZ, 1719 Callone Ave., Bethlehem, Pa.

Pennsylvania — The Susquehanna Valley Amateur Radio Club will sponsor the Susquehanna Valley Hamfest at Rolling Green Park, Hummels Wharf, Pa., on Sunday, Aug. 4. The date has been designated "Amateur Radio Day" by park officials and all facilities of the park are at the club's disposal. Indoor activities, all to be held in the Rainbow Dance Hall, include talks by ARRL and FCC officials, new equipment displays, a swap shop and the evening meal. Outdoor events include a mobile rig contest and a six meter transmitter hunt. Talk-in on 75 and 6 meters. For more info contact James Hill, K3ACH, Box 85, Northumberland, Pa.

South Carolina — The Charleston Hamfest, sponsored by the Low Country ARC, will be held Aug. 10 and 11, at the National Guard Armory in North Charleston, S. C. Games for the children and the XYLs. Tickets are $3.00 for adults, and $1.50 for children. Program includes contests for mobiles, homebrew installation, dinner and dance Saturday night, and breakfast Sunday morning. Contact M. Harold Baumrind, P.O. Box 2305, Charleston, S. C. for more info.

Tennessee — The Cedar of Lebanon annual ham picnic will be held on Sunday, August 25. There will be a pot-luck dinner — bring enough food for your group. All amateurs welcome. For further information contact R. C. Brown, W4VJW, 585 Nashville Pike, Gallatin, Tenn.

Tennessee — The Bristol Amateur Radio Club will again sponsor the annual Lonesome Pine Hamfest. It will be held this year on August 17 and 18 at the Southwest Virginia 4-H Club Center, 2½ miles east of Abingdon, Va. Contact R. W. Vrska, W4NSL, P.O. Box 3162, Bristol, Tennessee.

Tennessee — The Delta Radio Club is holding its annual hamfest Aug. 3 and 4, at Harbin's Pavilion, White Haven, Tenn. For further info contact Harmon T. Sharp, K4WWQ, P.O. Box 11013, White Haven, Tenn.

Texas — The Dallas ARC is planning a super hamfest to be held sometime in August. No other info at hand.

Texas — The South Texas Emergency Net Convention will be held on Aug. 16-18, at Kerrville, Tex.

Wisconsin — The annual picnic of the Green Bay Mike and Key Club will be held at Murphy Park, Green Bay, Wisconsin on August 11. For more information, contact Mert Nielsen, K9CZC, 937 Ninth Street, Green Bay.

Wyoming — The annual Wyoming Hamfest will be held Aug. 10 and 11, in the Big Horn National Forest recreation area, 15 miles west of Buffalo, Wyo., on U. S. 16. The banquet will be held Saturday evening at the Pines Lodge. Talk-in on 3920 kc. Camping and cabin facilities available. For more info, registration, or reservations, contact Wyoming Hamfest Chairman, Box 141, Sheridan, Wyo.

Canada — The O.K. Valley International hamfest Association of Okanagan Falls, British Columbia, will hold a hamfest on July 27 and 28, at Okanagan Falls (on

(Continued on page 138)

• *Beginner and Novice*

A Bandswitching Absorption Wavemeter

A "Must" Instrument for The Novice Shack

BY LEWIS G. McCOY,* W1ICP

ONE piece of equipment that is almost a "must" around the ham shack is an absorption-type wavemeter. This instrument is very useful to all hams but particularly so to a beginner. The absorption-type wavemeter is simply a coil and variable capacitor combination. When this circuit is brought into a field of r.f. energy and the combination tuned to the same general frequency as the r.f. field, power will be absorbed from the field to the combination. If a milliameter and rectifier are added to the circuit, the r.f. can be converted to d.c. and the meter will read, providing a visual indication. In turn, if the capacitor tuning is calibrated, the wavemeter will show what the general frequency of the field is. Note that we say "general frequency." The absortion-type wavemeter is *not* a frequency meter in the sense that it will tell *exactly* what frequency the r.f. field happens to be. However, the wavemeter will have enough accuracy to tell an amateur what band his transmitter is tuned to.

This article describes the construction of a bandswitching wavemeter and includes a metering circuit. The unit is all contained in one small chassis. However, before describing construction let's point out some of the many uses of the instrument.

Uses for an Absorption Wavemeter

Probably the first and most important use of the wavemeter is determining what band either a buffer or multiplier circuit or the final amplifier itself is tuned to. For example, suppose you build a multistage transmitter. The wavemeter can be coupled to the oscillator stage to see if it is oscillating and also if the output of the oscillator is on the correct band. If you like to build gear, this makes the instrument a very useful tool. It tells you if a stage is working and also if it is working correctly.

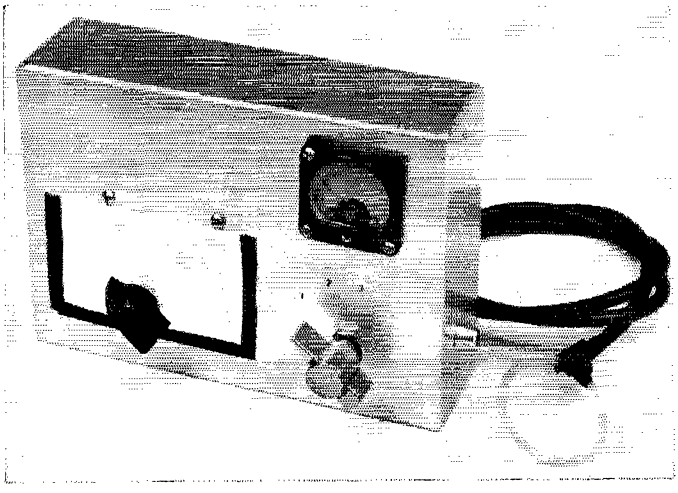
In many instances it is quite possible to tune up a transmitter on the wrong band. This holds true for some commercial transmitters as well as home-built gear. Many Novices find themselves in trouble by tuning up on what they think is 80 meters but actually the transmitter is putting out on 40, or rather just outside the high end of 40 meters. By coupling the wavemeter to the final tank circuit you can quickly be sure that you are on the right band.

Still another important use of the wavemeter is an output indicator. Here again the unit is extremely useful. One problem that many beginners have is actually getting a signal out of their transmitters and into the antenna. They don't tune up properly, or have shorted feed lines or connections and they have no way of being sure that there actually is a signal on the air. Several pages of calls in the log book without answers can be very discouraging. The wavemeter can be coupled to the feed line or placed near the antenna and will actually show if r.f. is reaching the antenna. These are just a few of the uses for the instrument.

Circuit Details

Fig. 1 is the circuit of the bandswitching wavemeter. The entire unit is self-contained with the

*Technical Assistant, *QST*.



Here is the completed bandswitching wavemeter ready for use. The jack for connecting the pickup loop is visible at the right hand side of the chassis.

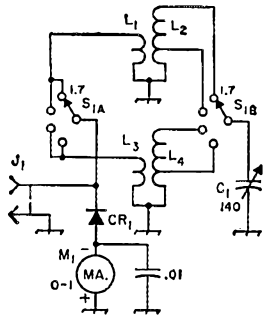


Fig. 1—Circuit diagram of the bandswitching wavemeter.
C_1—140-pf. variable (Hammerlund HF-140).
CR_1—1N34A diode.
J_1—Phono jack.
M_1—0–1 milliammeter.
L_1, L_2, L_3, L_4—See Fig. 2.
S_1—Ceramic rotary, 1 section, 2-poles, 4 positions (Centralab PA-2003, Mallory 3226J).

exception of a pickup loop. The pickup loop (shown in the photograph) is plugged into J_1. When the loop is coupled to an r.f. field, r.f. is fed into the link circuit. When the combination of C_1 and L_2 or L_4 is resonated to the same frequency as the r.f. field sufficient coupling is achieved between the link circuit and the C_1L_2 or C_1L_4 circuit so that a rectified voltage is applied to M_1. The r.f. is rectified by CR_1, a 1N34A crystal diode. The L_1L_2 combination provides coverage of 1.7 Mc. to 4.5 Mc. in the first position of S_1 and 3.5 to 7 Mc. in the second position. The next switch position puts L_3L_4 into use and the coverage is from 7 to 20 Mc. The last position covers 20 to 80 Mc.

Construction Details

The wavemeter is built in a $2 \times 5 \times 7$ inch aluminum chassis. A phono jack is mounted on one side of the chassis for the pickup loop connection. Two pieces of B&W Miniductor stock are used for the coils. See Fig. 2 for details on making the coils.

Terminal strips are used to mount the coil assemblies and the coils are supported by their own leads. Mount C_1 so that its shaft is 1¼ inches from the bottom of the chassis and 2 inches from the side. This will give you enough panel space for the dial. The dial is made from a piece of stiff white paper and held in place on the chassis with electrical tape.

The pickup-loop cable is 4 feet long. The cable can be made from either RG-58/U or RG-59/U. Skin back the insulation about 4 inches from the end and then cut off the braid to within about ½ inch of the outer covering that has been removed. Solder the end of the inner conductor to the outer braid and form a single loop. Tape the soldered connection.

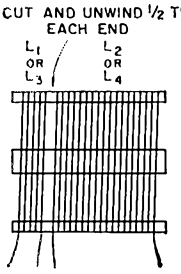


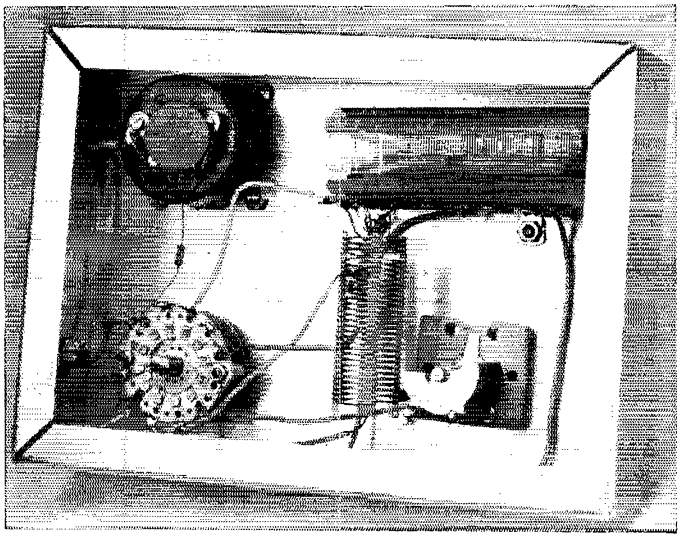
Fig. 2—Details of coil construction.

L_1 and L_2 are made from a single length of B. & W. Miniductor coil stock, type 3016, 32 turns per inch, 1 inch diam., No. 24 wire. L_1 has 11 turns, L_2 80 turns. The entire L_2 section is used for the lowest frequency range. A portion of L_2 is shorted out for the next highest range. The shorting tap on L_2 is 24 turns from the junction of L_1,L_2.

The L_3L_4 combination uses Miniductor type 3007, 16 turns per inch, ⅝ inch diam., No. 20 wire. L_3 has 3 turns and L_4 25 turns. The tap on L_4 is 4 turns from the junction of L_3L_4.

Calibrating the Unit

There are a couple of methods for calibrating the unit. One way to do the job is with your re-



The meter is mounted in the upper left corner and S_1 is just below it. At the top right is the low-frequency coil assembly which is mounted on a terminal strip. Just below this coil are C_1 and the high-frequency coil.

ceiver. Disconnect the regular antenna from the receiver and in its place connect a wire about one foot long. Connect the free end of the wire to the stator of C_1. Turn the a.g.c. off and using the short antenna, tune in a signal near 3.5 Mc. Set S_1 to the lowest range and then carefully tune C_1 through its range. At one point in the tuning you'll notice that the signal will disappear or drop considerably in strength. Make a note of this setting on your dial (wavemeter dial) and then find another signal about 1.8 Mc. and repeat the procedure.

You can go through the entire range of the coils getting markers in this fashion.

Another system is excellent if you can borrow a grid-dip meter. Merely couple the grid-dip meter coils to the coupling loop, and starting off with the lowest coil range, tune the grid-dip meter to the point where M_1 shows an indication or peak. Mark your dial and change the setting of C_1 and proceed to another marker point. It only takes a short time to calibrate the unit.

Using The Wavemeter

For checking transmitter stages all you need do is hold the pickup loop close to the coil of the circuit being checked. Tune C_1 through its range looking for a meter deflection on M_1. Where you get the meter "kick" is the frequency of the circuit. If a stage has a particularly strong harmonic you may get two readings. The stronger one, or the one that gives the largest meter deflection for the same coupling of the pickup loop, is the correct frequency of the stage.

To check if the rig is actually putting out power you can couple the pickup loop to the feed line, tuning the wavemeter to the same frequency as the transmitter. Another way to check is to make up a dipole antenna with a short feed line, a few feet long, that can be plugged into J_1. You don't have to make the dipole the same length as your regular antenna as it will pick up enough power even though it is considerably short for the frequencies involved. A dipole 10 feet long should be enough for all the bands that the wavemeter will cover. String the dipole up near your regular antenna and turn the rig on. Tune the wavemeter to the same frequency as the transmitter and you can quickly see from the meter if power is actually reaching the antenna. QST

Strays

The Boy Scouts' World Bureau of Ottawa, Canada, has announced their Sixth Annual Jamboree-on-the-Air. It will be held Saturday and Sunday, October 19–20, GMT. Participation this year is expected to exceed the 63 countries involved last time. The World Bureau station, VE3WSB, will again operate at least two complete stations for the entire forty-eight hour Jamboree period. The frequencies and times in the box on the right are meant to be a guide and may not be exact. Band conditions may necessitate slight changes. Send activity reports to 77 Metcalfe Street, Ottawa 4, Canada.

—···—

Proposed operating frequencies for VE3WSB's operation during the Sixth World Jamboree-on-the-Air, October 19 and 20 (GMT):

15 meters — 21, 195 and 21,350 kc.

20 meters — 14,130 and 14,310 kc. (s.s.b.)
14,195 and 14,210 kc. (a.m. and c.w.)

40 meters — 7,190 and 7,290 kc.

80 meters — 3,790 and 3,850 kc. (s.s.b.)
3,760 and 3805 kc. (a.m.)

In addition, excursions will be made into the U. S. Novice band, on 3175 kc. In view of conditions on the ten-meter band, reports VE3WSB, no activity is planned there this year.

Pictured are four of the Canadian hams who kept VE3WSB on the air during the last Jamboree. Left-to-right, they are VE3EWE (standing), VE3DQM, VE3FS, and VE3AHU. All amateurs are invited to call CQ Boy Scouts between 0001 GMT, October 19, and 2359 GMT, October 20th. Special certificates for participation will be sent to all stations who report activity during the Jamboree-on-the-Air. Reporting operators need not be scouts.

A Day at the FCC Laurel Monitoring Station

BY HOBART W. JOHNSON,* W3JNM

MAYDAY Mayday this is — — We are aground somewhere off the coast of Maryland and taking water." This distress message was heard on one of the monitoring receivers as the day staff entered the station one recent morning. The men who had been on duty through the long night hours were busy taking direction finder bearings and putting brief observation reports on our teletype circuit to Monitoring Control Center at the Field Engineering Bureau, Washington, D. C. With such bearings our control was plotting their bearings and those of other monitoring stations which had been alerted. The "fix" thus obtained was then transmitted to the U.S. Coast Guard and help was promptly sent to assist the boat. Our men continued to stand by taking bearings and observing the distress frequency until rescue was completed.

Thus a new working day began for a part of the staff at Laurel. But through the evening and night hours of the previous day and, as a matter of fact, all the days of the year, other staff members had been a part of the many and various assignments, all concentrating their efforts as the "eyes and ears" of the Federal Communications Commission.

The monitoring arm of the Field Engineering Bureau has a network of 10 primary and 8 secondary stations in 17 states extending from Maine to Florida and west to Hawaii and Alaska. Our Laurel Primary Monitoring Station is located approximately midway between Washington, D. C., and Baltimore, Maryland.

Laurel has constant intercommunication with our other stations so that a subject of observation can be quickly coordinated for action. This provides a flexible network for all location, identification, measurement, enforcement or other activity.

Most of our stations are equipped with sufficient rhombic and specialized antennas to satisfy the most ardent DXer. Since we must quickly be able to monitor any direction and many frequencies simultaneously, these antennas are arranged for rapid selection by the operating personnel.

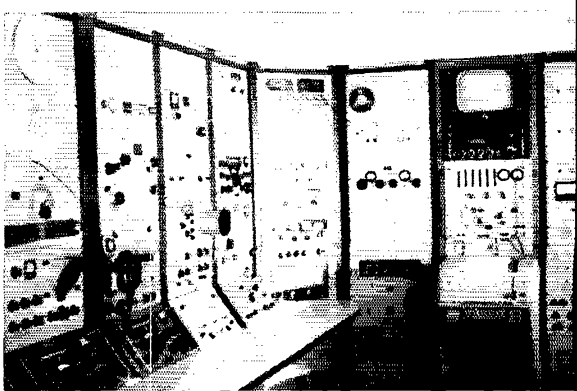
Site Selection

The best direction finder performance requires that when a monitoring site is selected, we be concerned about such things as ground conductivity, uniform elevation, remoteness from obstructions, and noise sources. Therefore, a good many of the features of the ideal ham shack location are essentials for the site of a monitoring station. All of our stations are equipped with one or more types of direction finders — the rotating dipole Adcock type being used for h.f. bearings. These are remotely controlled and operated, and were designed and constructed by FCC personnel. Laurel also has an experimental low-cost wide-aperture direction finder which is being tested for comparison with earlier models. Entirely aside from the special network activities, there are certain areas that receive attention each day and which have grown to be an important part of the service we can offer as a Government monitoring station.

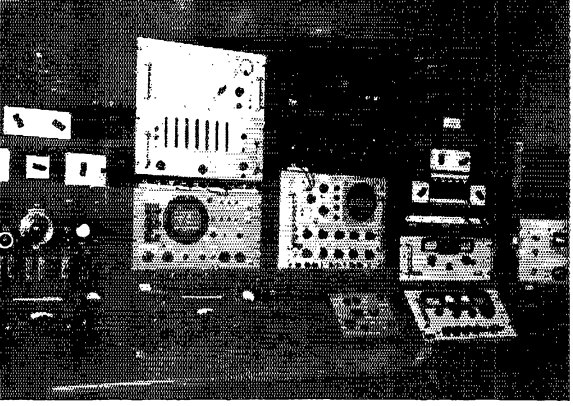
There is scarcely a segment of the usable radio spectrum that does not at one time or another encounter interference problems. Certainly, the amateur has daily first-hand awareness of interference. He also has several remedies of which he can make use, possibly shifting to another frequency, rotating the beam in another direction, changing emission or operating band, etc. Commercial radio services do not have this privilege. Their limited frequencies and operating demands make interference a severe problem. Therefore, an increasing part of our service is directed to assisting in identifying sources of interference for a variety of government and commercial radio users. In a normal day we may receive several such interference complaints. Resolving these complaints requires our action in a number of ways. An accurate frequency measurement is required in each of these cases. It may consist of a single frequency or it may require measuring signal sub-components, separation between components, multiple-shift components, or possibly average frequencies for frequency modulation emissions. It is evident that these measurements are somewhat more detailed than the amateur makes when he is trying to determine if he can safely move another kilocycle closer to the edge of the band for that rare DX.

Several types of equipment must be used for these measurements but all of them are made by comparison to the output of our local frequency standard, which is constantly being checked with basic standard frequency stations and is maintained to the order of a few parts in ten billion. If compared to the measurement of the diameter of the earth, this would be to an accuracy of tenths of an inch. In addition to the frequency standard signals, comparison oscillators and frequency counters are used as appropriate.

*Engineer in Charge, Laurel Monitoring Station, Field Engineering Bureau, FCC, Laurel, Maryland



This is one of the FCC's Laurel, Maryland, monitoring positions. There are several such posts in each of the 18 monitoring stations. No wonder the FCC knows exactly what's going on over most of the radio frequency spectrum.



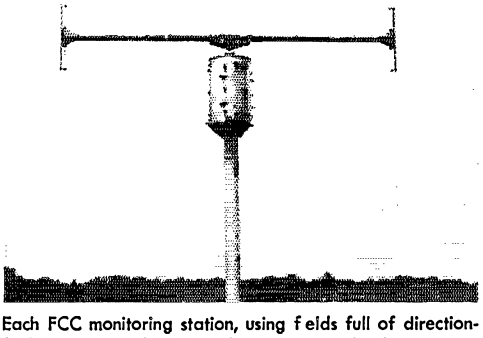
A monitoring position at the Allegan, Michigan, station. Cameras and tape recorders are available on a moment's notice to record any transmission or scope pattern for future reference. The FCC trains operators for other governments on equipment just like this.

With the constant need to accommodate more and more stations in the limited expanse of spectrum available, it has been necessary to very carefully consider station bandwidths in all interference solutions. A regular portion of the interference observation includes measurement of bandwidths of both the interfering emission and the one receiving interference.

Because of the importance of bandwidth measurements in interference solution and because most classes of stations other than amateurs now have either specifically assigned bandwidths or have bandwidth limitations in the rules under which they operate, the second step in resolving interference is the completion of the bandwidth measurements.

Upon confirmation of the details of the interference, the applicable data in the form of reports or citations may go to the station causing interference or may be subject to relay to appropriate international agencies for further attention. Over 32,000 interference complaints were processed by our organization last year.

Another daily staff operation is the continuous survey of the various frequency bands to confirm the origin and authenticity of the active stations in these bands. Frequency assignments throughout the world are published in a series of books by frequency segments. These can be used to verify the registration of a particular country on a given frequency using an indicated call with a bandwidth and power as listed. As a contribution to data on currently active stations of the world, our monitoring station, during the identification surveys, makes up record slips of stations received. These are centralized in our Washington headquarters and are forwarded to the International Frequency Registration Board for publishing. In 1962, 29,625 of these observations were submitted.



Each FCC monitoring station, using fields full of direction-finding antennas like this Adcock rotating-dipole type, can monitor many frequencies simultaneously. The Laurel station is currently testing a new low-cost, wide-aperture type in comparison with earlier models.

Aside from the available file material, and — of even more importance — the experience background of the observers, various types of identification tools are used. These include automatic printers of several types, telegraph tape printers, variable speed tape recorders, and automatic band-sweep write out recording instruments.

The ingenuity of the observer also has led to the development of many techniques which are applied in areas of the specialized work in identification. Necessarily, the approach to the identification of authorized stations and detection of unauthorized or illegal stations cannot be a series of procedures which are easily detailed as a sequence of operations. Here the capability and "know-how" of the monitoring group, together with suitable specialized equipment, must fit together to accomplish the objective. Such a combination is bound to be pretty much successful — for example, a total of 529 unlicensed radio operations were uncovered in 1962.

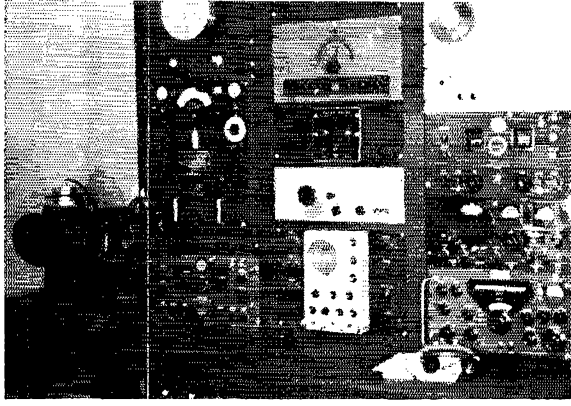
Another basic function which we provide is in the enforcement of the radio laws. This includes international regulations as well as FCC Rules and Regulations which apply more directly to the various classes of stations that are licensed by the FCC.

It is in this enforcement area that the classic "pink ticket" had its application. We no longer issue colored notices, however; as may be observed the "white" variety is equally effective! In fact, several types of notices are now issued to licensees appropriate to the circumstances where a particular rule or regulation is not being complied with. In the case of the amateur this may be in one of several areas under part 12 of the rules. We are particularly appreciative, however, of the cooperation the amateur group extends to us in its "self-policing" policy. Beyond that, our first concern with respect to the amateur violations must of necessity be with those emissions which fall outside the amateur bands and which therefore interfere with other essential services.

It should be borne in mind, however, that our engineers are regularly observing all of the amateur bands.

As I visit with amateurs at various club meetings and dinners, the question is often asked "Does the FCC really check the amateurs?" The FCC does much more than merely "check" the amateur bands. We measure amateur bandwidths and photograph those we wish to make a matter of record. We observe all types of amateur signals for evidences of poor adjustment. This reveals overmodulation of a.m. transmitters or "flat topping" in s.s.b. transmissions. C.w. waveforms which generate key clicks are also inspected. Again we keep a loaded camera to photograph anything we wish of what we see on our oscilloscopes.

Several of our observers at various stations have language abilities which assist us to identify the few amateurs who consider it easier to move on the DX station frequency, out of the voice band, and use only the DX station's language. We have tape re-



A monitoring position used for training of new operators at Laurel, Maryland.

corders available for instant use to record this or any other type of intercepted transmission we wish to retain.

While surveying the amateur bands, we are alert to the various types of spurious emissions that occasionally occur from amateur transmissions. Often these can be easily identified, while at other times two or more receivers are used to synchronize the unwanted components with the originating signal.

We give positive attention to band-edge emissions and to those which are out of the amateur bands. It is, of course, the amateur's responsibility to confine his emissions within these band limits. Many services of a vital nature can be disrupted by such unwanted emissions. We take prompt action, usually by collect telephone call directly to the amateur, requesting him to remove the offending transmitter until repairs are made.

In one such recent case of interference to the United States Air Force by an amateur, we made the collect call and noted the interference was removed. In a few days a letter was received from the amateur. He took no chances — he reported that he had a home-built transmitter and that he was dismantling it completely.

However, factory equipment doesn't always escape. In a recent case of interference to the United States Coast Guard by an amateur, we completed the usual preliminaries and confirmed that the transmitter in use was factory-built and that it had been to the factory for repairs and had been on the air for only 30 minutes after the repairs when our phone call confirmed the need for still more effective attention.

In another instance of interference by an amateur, we learned in the reply letter that the transmitter was in good order but the amateur's adjustment of it was not. He reported that he was learning to tune it up. Unfortunately, he failed to practice his technique before using an antenna and interference resulted. He promised to obtain assistance from a more experienced amateur before he tried again.

Removing interference is nowhere less urgent than on the aircraft frequencies. There have been many instances of interference of this sort. A phone call from our Baltimore Office recently alerted us with word of interference to our local airport by an amateur being heard on about 120 Mc. The call sign was checked out and found not listed. We made immediate preparations with Baltimore to coordinate with them in their investigative car while they tracked down the interfering station. A short time later we received further information from our complainant. This time the call was verified as phonetically related but slightly different than before. The files produced a positive result and Baltimore placed a call to the offending station. We were later informed that the amateur had been on 120 and 145 Mc. simultaneously. The transmitter was removed from the air and we returned to our other duties.

These are just a few of the recent Laurel experiences with out-of-the-band amateur radiations. In these and in the replies to our notices to amateurs, it is evident that very often transmitters are operated by amateurs who would not have violated the rules if they had informed themselves about how harmonics are generated, how unwanted and spurious emissions can be detected and eliminated, or just what effect certain transmitter adjustments actually produce on the radiated signal.

You can see the FCC really does "check" amateur transmissions. We would like to encourage all amateurs to be sure their knowledge of their transmitters meets the responsibility that goes with their communication.

This worthwhile objective can be met in two different ways; one by the individual himself through an effective maintenance program as well as adopting a professional operational practice augmented by and through his wholehearted support and cooperation with your League's "Official Observer" service.

Obviously, our responsibilities also extend to many other classes of radio stations. An engineer in a given day may be measuring the frequencies of u.h.f. television stations, checking the modulation of a broadcast station, verifying the bandwidth of a mobile service station checking for harmonics or other spurious radiation products, or possibly verifying proper operation on a distress frequency. At an adjoining position an engineer may be taking bearings by means of the Adcock direction finder. In the course thereof, it may be decided that an observation by means of the d.f. net should be obtained. In this event, the monitoring station prints a request on our connecting teletype loop circuit. This includes details of call and emission as well as frequency. Our network can be divided by operating symbols so only those stations most likely to be able to hear the station are included. For example, the net can be broken down into an eastern observation unit which would extend east of Nebraska and a western unit which would include our stations west of Nebraska. Still other teletype automatic routing symbols can be transmitted to bring together the entire network of stations, including those in Hawaii and Alaska.

After the network is alerted, the originating station prints a portion of the wanted station's transmissions so that all participating stations instantly know what to look for. It might be mentioned that our monitor receivers are direct-reading to a kilocycle or less and this simplifies the search for the wanted station.

Direction finder bearings are taken on these requests and classified for stability of arrival path during the observation. This classification assists in the evaluation that is required for a "fix." After the bearing has been taken, each station in turn prints its bearing, following a definite sequence. Subsequently our central control will plot the bearings and announce its findings. When an emergency is under way, continuous bearings are taken. These are quickly reported and often a fix is determined in a few minutes. The fix then is used in various ways to provide the appropriate answer to the problem at hand.

(Continued on page 142)

Election Notice
League Opposes License Fees, Hobby Class Proposal
FCC Bandwidth Standards

ELECTION NOTICE

To All Full Members of The American Radio Relay League Residing in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions:

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1964–1965 terms. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Articles of Association and By-Laws will be mailed to any member upon request.

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

Executive Committee
The American Radio Relay League
Newington 11, Conn.

We, the undersigned Full Members of the ARRL residing in the.....Division hereby nominate.....of..... as a candidate for director; and we also nominate..... .....of.....as a candidate for vice-director; from this division for the 1953–1954 term.

(Name Call City Date)

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

All such petitions must be filed at the headquarters office of the League in Newington 11, Conn. by noon EDST of the 20th day of September, 1963. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

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

Voting by ballots mailed to each Full Member will take place between October 1 and November 20, except that if on September 20 only one eligible candidate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are: *Atlantic:* Gilbert L. Crossley, W3YA and Edwin S. Van Deusen, W3ECP. *Canadian:* Noel B. Eaton, VE3CJ and Colin C. Dumbrille, VE2BK. *Dakota:* Charles G. Compton, WØBUO and Martha J. Shirley, WØZWL. *Delta:* Floyd C. Teetson, W5MUG and Graham H. Hicks, W5IHP. *Great Lakes:* Dana E. Cartwright, W8UPB and Robert B. Cooper, W8AQA. *Midwest:* Robert W. Denniston, WØNWX and Sumner H. Foster, WØGQ. *Pacific:* Harry M. Engwicht, W6HC and Ronald G. Martin, W6ZF. *Southeastern:* James P. Born, Jr., W4ZD and Thomas M. Moss, W4HYW.

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

For the Board of Directors:

July 1, 1963

JOHN HUNTOON
Secretary

BANDWIDTH STANDARDS

There have been a number of discussions by amateurs as to what constitutes "good amateur practice" for the bandwidth of an amateur radiotelephone transmitter. Extracts of a recent FCC letter may be helpful in this connection:

"Section 12.133 of the Amateur Radio Service Rules states that ' . . . a spurious radiation is any radiation from a transmitter which is outside the frequency band of emission normal for the type of transmission employed. . . .' Also applicable to the question is Section 12.151 which provides that 'In all respects not specifically covered by these regulations each amateur station shall be operated in accordance with good engineering and good amateur practice.'

"The Commission has not found it desirable to include specific attenuation ratios in connection with

bandwidth requirements in the amateur rules for several reasons. As a practical example, we believe most amateur licensees would not be able to afford the test equipment necessary to measure bandwidth in terms of specific attenuation ratios. Since the amateur rules are, among other things, designed to encourage experimentation toward advancement of the radio art, the technical requirements are intended to provide as much latitude as is practicable consistent with the prevention of undue interference between amateur stations and the prevention of interference to other radio services.

"Section 2.202 does not in itself limit the bandwidth of the emissions of amateur stations. It serves as a guide as to what is considered to be a necessary bandwidth for various types of emission. Also, Section 5.103 does not govern amateur transmission bandwidth. Therefore, the above Part 2 and Part 5 rules sections and rules governing other services regarding emission bandwidth, are significant only in that they may be helpful in considering what is 'normal' and 'good engineering and good amateur practice' with respect to Sections 12.133 and 12.151.

"It is widely accepted that 3000 cycles is the highest audio frequency necessary to be transmitted for good speech intelligibility and we believe it to be a reasonable figure for amateur speech transmissions. This determines the 'necessary bandwidth' which is designated in other services by 6A3 for double sideband and 3A3A for single sideband. The corresponding bandwidths which may be 'occupied' (containing 99% of the radiated power) are 8.0 and 4.0 kc/s respectively.

"Our monitoring observations indicate that, in the absence of equipment malfunction, over-modulation, overdriving linear amplifiers, and other careless or deliberate excesses, the above criteria are more than ample with regard to 'normal' 'good engineering and good amateur practice.' However, because a specific unwanted sideband suppression ratio is not required in the Amateur Service, the 4 kc/s bandwidth should not be considered as a maximum for single sideband transmissions. We do feel that single sideband transmission of a bandwidth greater than the above 8-kc/s double sideband criteria is excessive and therefore may be subject to a notice of violation of Section 12.133. — *Ben F. Waple, Secretary.*"

CANADIAN LICENSE FIGURES

Through the courtesy of Canadian Director Noel Eaton, we have the following figures on Canadian licenses in force as of March 31, 1963:

Regional Office	*Licenses Issued*
Vancouver	1415
Edmonton	986
Winnipeg	1193
Toronto	3742
Montreal	1773
Moncton	1073
	10,182

In addition, there were 26 VEØs in force, or a total of 10,208. This compares with 9,347 as of a year ago, an increase of 861.

ANOTHER AMATEUR RADIO WEEK

In proclaiming Amateur Radio Week in Michigan June 16 to June 23, Governor George Romney said, in part:

"Standing by in Michigan to aid and assist

Gov. John M. Dalton of Missouri proclaiming Amateur Radio Week, which began June 23, coinciding with ARRL Field Day. With him is State Representative Alfred A. Speer, WØBOA, who encouraged the issuance of the proclamation.

government and law enforcement units in case of natural and enemy disaster is an unsung band of radio enthusiasts who do more than listen to their radios for pleasure . . . They donate their precious time and equipment and educate themselves in the fascinating art of radio electronics, and at the same time devote themselves to the protection of the general public . . . In recognition of the demonstrated initiative and resourcefulness of these many radio operators [I] do hereby proclaim . . . Amateur Radio Week in Michigan and do urge all citizens to give proper attention and credit to the men and women engaged in this important and essential secondary line of defense."

SUSPENSION SUSTAINED

In the April 1962 issue, we reported on a case wherein a General Class licensee had taken the General Class test in the name of a Technician Class licensee, I. P. Gillenson, WA6KCI. The final result was that the licenses of both amateurs were suspended for the remainder of the license terms. In December 1962, Mr. Gillenson asked the Commission to rescind the suspension, feeling that the period of suspension already suffered had been of great effect, that he was truly contrite and that he fully recognized the seriousness of the violation. In a Memorandum Opinion and Order released June 7, the Commission denied the petition, stating that Mr. Gillenson had earlier passed up his legal opportunities to petition for rehearing or to appeal to the courts, that he has displayed a very serious lack of candor in his dealings with the Commission, that he does not now deny committing the violations nor does he now furnish any additional facts, and accordingly the Commission is unable to find

any circumstances which would warrant any amendment or modification of their decision. The license, therefore, remains under suspension until its normal expiration date, July 7, 1965.

ANOTHER SUSPENSION

The Commission has suspended the General Class license of Richard J. Paille, K7LQG, for six months after finding that he had willfully damaged or permitted to be damaged the apparatus of a licensed radio station, had transmitted a call not assigned to the station he was operating and had failed to transmit the call of the station he was operating. The suspension was not contested, and went into effect on June 13, 1963. [*Section 303 of the Communications Act; Sections 12.161, 12.158 and 12.82 of the amateur regulations.*]

MANITOBA GETS CALL LETTER PLATES

Cooperative efforts by the amateur radio clubs of Manitoba over an eleven-year period have finally resulted in victory: starting in January, 1964, call letter license plates will be available to VE4s. Processing will be done by a committee of the newly-formed Manitoba Association of Amateur Radio Clubs, Box 352, Winnipeg; applications accompanied by the $5 fee were due at Association headquarters on June 30. The fee is assessed only when new license plates are issued (currently, every six years). It is not necessary that the car be equipped with mobile gear, but only private passenger vehicles are eligible. If the special license plates are lost, or the amateur forfeits his license, regular license plates will be issued instead. One unique feature: a car registered in the name of a parent whose amateur son or daughter has equipped the car for mobile operation may bear the amateur's call. Otherwise, the car must be registered in the name of the amateur whose call it will carry.

Our thanks to the Winnipeg Amateur Radio Association, its license plate committee and chairman VE4HW for this report.

REHEARING ASKED ON FEES

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

In the Matter of Establishment of fees for the Commission's licensing and regulatory activities	DOCKET NO. 14507

PETITION FOR REHEARING

The American Radio Relay League, Incorporated, a nonprofit corporation organized under the laws of the State of Connecticut and having as voting members more than 84,000 amateur radio operators licensed by the Federal Communications Commission, pursuant to Section 405 of the Communications Act of 1934, as amended, respectfully requests rehearing and reconsideration of that portion of the Report and Order released May 8, 1963 (FCC 63-414) which established a schedule of fees for applications in the Amateur Radio Service.

In support whereof, the following is submitted:

The League greatly appreciates the careful consideration given by the Commission to its Opposition to the proposal to establish a schedule of fees which was filed on May 16, 1962, and to the reduction of some and elimination of other proposed fees. In the year since the submission of the League's comments and opposition, however, there have been a number of significant developments which, in the League's opinion, warrant further consideration of the wisdom and long-range effect of establishing fees for the Amateur Radio Service.

Adverse Impact Upon The Continued Growth And Improvement Of The Amateur Radio Service

For many years prior to and immediately after World War II, the Commission followed the policy of encouraging and upgrading the Amateur Radio Service by the use of incentive licensing. Portions of the high frequency (h.f.) bands most widely used by amateurs were available only to holders of the highest grade of operator's license. To qualify for such a license, the applicant was required to have held a lower grade of amateur license for a period of one year and to demonstrate a high degree of technical knowledge. Amateurs worked so hard to increase their knowledge and proficiency that approximately forty percent earned the higher grade of license and the added operating privileges. The end result was a continuing increase in the many contributions of the amateur radio body to technological advances and service to the public and the Nation.

In 1951, after an extensive rule-making proceeding in Docket No. 9295, the Commission adopted major changes in the amateur structure which became effective early in 1952. Three new classes of licenses were established, the Amateur Extra, the Technician, and the Novice Classes. The former Class A, B and C grades were replaced by the Advanced, the General, and the Conditional Classes, and the different requirements and special operating privileges between these classes were eliminated. Minimal code proficiency was required for the Technician and Novice Classes, and minimal technical knowledge was required for the Novice Class. The license for the Novice Class was for only one year and was non-renewable. Although special operating or other privileges for the Amateur Extra Class were contemplated, none have been adopted as yet.

In the eleven years following the changes in the amateur structure, the number of amateur licenses outstanding at any one time has grown from approximately 110,000 to almost 250,000. Similar growth of amateur radio has occurred in many other countries throughout the world. In spite of significant technological developments, the most notable being single sideband suppressed carrier (s.s.b.) radio telephony, occupancy and utilization of the high frequency (h.f.) amateur bands has reached the point where a reexamination of present licensing policies and practices is urgently required if the basic purposes and objectives of amateur radio are to continue to be achieved in the immediate as well as the distant future.

A year ago, the League embarked upon a long-range program having as its objectives the more efficient utilization of the amateur bands and the continued growth and public service of amateur radio. It was soon apparent that the long-range solution lies in a return to a form of incentive licensing along the lines of the policies and procedures abandoned in 1952. After extensive study, including consideration of comments of many hundreds of amateurs, the League's Board of Directors, on May 3, 1963, unanimously adopted the following resolution:

> "The Board of Directors of the American Radio Relay League, Inc., in meeting assembled at Hartford, Connecticut, on May 3, 1963, considering that frequencies now assigned and essential to the amateur radio service will continue to be allocated by international conferences and treaties; in further recognition of the growing demand by other services for more frequency space; in the belief that even more efficient utilization of amateur frequencies is essential; after an extensive examination of the technical advances and growth of the United States amateur radio body in the last ten years, after carefully considering the many comments and suggestions from the membership, and after extensive deliberation; hereby establishes the following objectives as one of several major policies of the League to promote the continued existence and growth of amateur radio.
>
> "1. Extension of the existing incentive-licensing structure by re-establishment in the United States of an advanced class of amateur license requiring (a) holding of an amateur license of Conditional or

General Class for a period of at least one year immediately preceding application therefor, and (b) a new written examination covering advanced amateur practice as applicable to modern amateur techniques. Further code examinations for then existing Amateur Extra and General and present Advanced Classes of licensees shall not be required. The effective date shall be such as to afford all existing amateurs ample opportunity to qualify for this new class of license.

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

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

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

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

To further implement the long range program, the Board adopted the following additional resolutions:

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

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

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

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

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

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

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

Implementation of the League's long range program to up-grade the amateur radio service will be severely handicapped and jeopardized by the schedule of fees adopted by the Commission. Although it is not clear either from the Report and Order or from newly adopted Section 1.622 of the Rules just when a $2.00 fee and when a $4.00 fee is to be imposed, the effect of either will be to decrease the number of amateurs seeking to advance to a higher class.

One of the incentives suggested from time to time is the assignment of distinctive or special call signs, such as a two-letter suffix, particularly to the present incentiveless Amateur Extra Class and possibly to any new Advanced Class licensee. A fee of $20.00 for such requests, as provided by the Report and Order, will effectively eliminate many requests and thereby impede the establishment of an effective program.

The Commission long has followed the policy of making special call signs available to special activities such as amateur stations operated at Boy Scout Jamborees, fairs and expositions, schools and universities, and military establishments, to name a few. The imposition of any fee, and particularly a $20.00 fee, for such requests would effectively eliminate many requests and reduce the over-all effectiveness and growth of the amateur service.

In imposing the $20.00 fee for special call sign requests, instead of a $5.00 fee as originally proposed, the Commission stated that "this service is costly, as it involves research, and is of no significance to anyone except to the amateur concerned." As shown above, the assignment of a special call sign, particularly if part of an incentive licensing program, will benefit the amateur body and the over-all public and not merely the amateur concerned. When the new automatic data processing equipment (a.d.p.) being installed by the Commission is placed in service, the amount of time required for "research" to determine the availability of a requested call sign will be slight as compared to the present manual and time-consuming procedure.

It is respectfully submitted that the impact of fees upon the basic purposes and objectives and the continued improvement and growth of the Amateur Radio Service should be reexamined in light of the developments of the last year, particularly the need for an effective incentive licensing program.

The Exemptions Do Not Remove
The Adverse Impact Upon The Public Interest

One of the most important services of amateur radio is the supplying of communications in time of emergency. This the Commission recognized when it stated as follows in paragraph 20 of its *Report and Order:*

"Exemptions have also been provided for applicants in the Radio Amateur Civil Emergency Service (RACES) and in the Disaster Communications Service. Licensees in RACES are Amateurs who participate voluntarily in emergency communications networks for the purpose of providing communications during natural disasters and other emergencies. *We agree with the argument that the payment of a fee would discourage participation in these worthwhile activities.*" [Emphasis supplied]

The Commission has erroneously assumed that a substantial percentage of amateur radio emergency activities have been, and will continue to be, conducted under the RACES program and the Disaster Communications Service. Actually, the opposite is correct. Under Section 12.200 of the Commission's Rules,

"The Radio Amateur Civil Emergency Service provides a *temporary phase* of amateur radio for *Civil Defense communications purposes only*, and the rules are limited in their force and effect to the period of the present *national emergency*, including any emergency which may necessitate invoking of the President's War Emergency Powers under the provisions of section 606 of the Communications Act of 1934, as amended." [Emphasis supplied]

The basic amateur service is the service intended to supply, and which actually supplies, emergency communications in the event of natural disaster, rather than the specialized part of the amateur service known as RACES. This fact is recognized by Sections 12.0(a) and (d), 12.101,

Nashville and Davidson County, Tennessee, observed Amateur Radio Week June 17–23. Mayor Beverly Briley, WA4CBK, of the Mayor's staff, and W4WHN, president of the Radio Amateur Transmitting Society, hold the proclamation.

12.106(a), and 12.156 of the Commission's Rules. In other words, RACES is only one formalized segment of amateur emergency communications work.

Moreover, RACES is not a separate radio service. The "licenses" issued in RACES are not licenses but authorizations to already licensed amateur stations to carry on certain Civil Defense communications.

The relief provided in the Report and Order for RACES personnel will actually affect only a small portion of the amateurs involved in the program. Under Section 12.225 of the Commission's Rules, one amateur station licensee may obtain a station authorization in RACES which could cover all RACES units for an entire city, county or even, at least in theory, an entire state. No operator authorization is issued by the Commission in RACES: such authorizations are issued by local civil defense authority to those already possessing an amateur license (or, in controlled conditions, a restricted radiotelephone operator permit) who meet the authorities' requirements for loyalty and general reliability. Thus, under the Commission's Order, amateur operators will be paying for the only federal authorization, the basic amateur license, needed to operate RACES stations. The Commission's own recognition, in Paragraph 20, that the payment of a fee would discourage participation in these worthwhile activities applies to the amateur service as a whole.

With the frequent and unsettling changes in the Civil Defense structure, and the wide variance in the degree of local, county and state support of the program, many communities are without any RACES service. Mighty few are completely devoid of amateur stations, however, who stand ready to serve in natural disasters. Additional persons should be encouraged, especially in rural areas, to seek amateur licenses so that they may enhance the coverage of such completely voluntary organizations as the Amateur Radio Emergency Corps sponsored by the League. The filing fee would do nothing to encourage, and actually would discourage, potential additions to the ranks.

Few amateurs have received licenses to operate in the Disaster Communication Service. The comments with respect to RACES are applicable generally to the Disaster Service.

Emergency communications are so essential to the public safety, health and welfare that nothing should be done to impair and hinder the service now available from the amateur body. The imposition of fees most assuredly will adversely affect the establishment and maintenance of such communications facilities.

As noted in the League's Opposition of May 16, 1962, Section 303(g) of the Communications Act directs the Commission, as the "public convenience, interest or necessity requires, "to study new uses for radio, provide for experimental uses of frequencies, and generally encourage the larger and more effective use of radio in the public interest." The Opposition then discussed the fact that "a very high percentage of applicants for original authorization in the amateur radio service are of high school and college age" and the fact that many others are handicapped persons and shut-ins with limited financial resources.

In deciding not to impose fees for Novice applications, the Commission stated that "No fee will be charged to those who apply for Novice Licenses since such licenses are for a one-year term and the applicants for such licenses are often young people who are starting in a new hobby." The Commission apparently erroneously assumed that most young persons enter amateur radio through the Novice Class license. Although no absolute statistics are available, the League's records and attendance at local and regional amateur radio meetings indicate that a high percentage of young persons skip the Novice Class and are first licensed in the Technical, Conditional or General Class. Because of the one-year limitation upon Novice Class licensees, the exemption only of the Novice Class merely postpones the impact for a year.

The League is very concerned about the impact of fees upon the physically handicapped and shut-ins, which are believed to number more than 5,000. Many are permanently hospitalized. Few have any sources of income, and many use amateur equipment lent or donated by other more fortunate amateurs and philanthropic organizations. The imposition of fees most certainly will have an adverse impact upon this most important segment of the amateur fraternity.

Amateur Radio Is Exempt From The Imposition of Fees

As noted in the League's Opposition filed May 16, 1962, Section 140 of the Independent Appropriation Act of 1952, 5 USC §140, specifically exempts "those engaged in the transaction of official business of the Government." In its opposition, the League called attention to the fact that amateurs render many and most valuable services for, on behalf of, and at no cost to the Commission, which otherwise would be provided at most substantial expense to the Government. The conduct of examinations, the operation of interference (TVI) committees, self-policing, and emergency communications services were discussed at length. Although the Commission reconsidered and exempted the Disaster Communications Service and RACES, there is no indication in the Report and Order that the Commission considered and ruled upon the basic argument that the entire Amateur Radio Service is exempt under Section 140. Once again, the League respectfully submits that Congress intended that the Amateur Radio Service be exempt from the imposition of fees.

All Non-Commercial Services Except Amateur Radio Have Been Exempt

Section 140 of Title 5 directs the Commission to consider the "value to the recipient, public policy or interest service, and other pertinent facts." As noted in the League's Opposition of May 16, 1962, the vast majority of licensees are engaged in commercial business and, because of limitations upon the number of licenses, many licenses have substantial value. In the amateur service, however, a licensee may not engage in any business activity and the license has no intrinsic "value to the recipient." The value of an amateur license is to the public through the public service which may and will be contributed by the amateur.

The first sentence of Section 140 refers to "things of value or utility." When considered with the requirement that the Commission shall consider the "value to the recipient," it is clear that Congress intended that fees be imposed only upon commercial activities and enterprises and commercial applications. This interpretation is fully supported by the fact that the Amateur Radio Service is the only strictly noncommercial service upon which the Commission has imposed fees. In exempting all other strictly noncommercial services, the Commission recognized that Congress clearly intended that fees not be imposed upon noncommercial services, including amateur, and should be imposed only upon commercial applications.

Conclusions

The amateur radio service is unique in many ways. As the Commission has stated in its annual reports, "Public Service is the keynote of amateur radio operation. The policy of the United States Government, both domestically and internationally, always has been to encourage and support amateur radio. The Commission's imposition of fees upon amateur radio is the first action ever voluntarily taken by an agency of the United States Government to discourage and retard the growth of amateur radio. For these reasons, and in light of developments of the last year, the Commission is respectfully requested to reconsider and set aside that portion of its Report and Order which imposed fees upon the Amateur Radio Service.

Respectfully submitted,

THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED
By ROBERT M. BOOTH, JR.
Its General Counsel

1735 DeSales Street, N.W.
Washington 6, D. C.
June 7, 1963

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

In the Matter of	
Petition to Add a New Class of License to the Amateur Radio Service	RM-406

OPPOSITION TO PETITION FOR RULE MAKING

The American Radio Relay League, Incorporated, a nonprofit corporation organized under the laws of the State of Connecticut and having as voting members more than 84,000 amateur radio operators licensed by the Federal Communications Commission, respectfully requests that the

(Continued on page 146)

High School Radio Club Exhibit

BY WILBUR W. OLSON,* W6TQU

MEMBERS of the Inglewood, California, High School Radio Club put on a week-long show recently, and were able to present amateur radio to tens of thousands of visitors.

It all started when Pacific Ocean Park in Santa Monica invited the club to present a display in connection with a vacation-week "Spring Thing" celebration. The Park offered a midway booth seventy-five feet long and eight feet deep. The club collected members' and club equipment ranging from converted surplus and homebrew to commercial units. They found they had enough to fill the huge booth and put the club station, W6RBU, on the air on all bands.

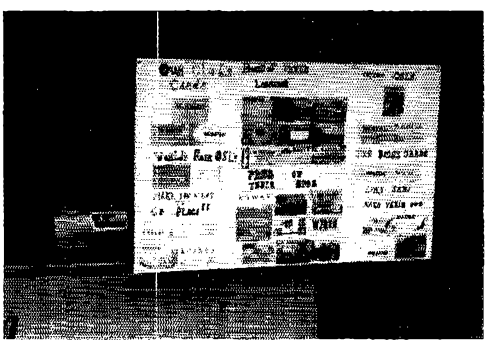
Individuals and groups worked on pictorial displays, posters, literature for display and free handout information. Permission was obtained from the ARRL to use excerpts from the *Handbook* for a brief story on hamming. The School's Commercial Department mimeographed the resulting one-page story to provide copies which could be handed out to visitors to the show. A YL English teacher was persuaded to record the story on tape. The print shop produced special QSLs for the exhibit, along with reprints of another article on amateur radio, adding to the free literature available. The Art Department made a number of signs for the display.

The actual station operation was the highlight of the exhibit. Club members had erected dipoles for 40 and 20 meters, a six-meter ground plane and a two-meter J antenna prior to the Friday night opening.

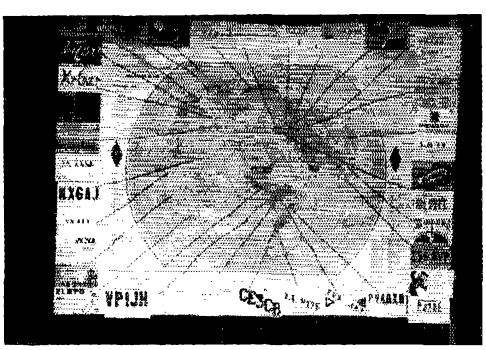
Came spring vacation and thousands of Los Angeles students and their families were on their way to the "Spring Thing." As they passed the IHSRC booth, they donned earphones on the counter and heard a pleasant feminine voice describing amateur radio as a hobby. Then the visitors watched and listened to contacts being made by operators WA6WWX, WA6SWR, WN6CCP, WA6LNZ, WA6YSF, WB6AQU, WA6ZIZ, and the club's advisor, Wilbur Olson, W6TQU.

The ten-mile distance from Inglewood to Pacific Ocean Park posed transportation problems, but the dedicated operators pooled their rides in a way which kept the exhibit fully staffed at all times. Hours were from ten to ten daily, and ten to midnight on Fridays and Saturdays. QST

*13715 Cordary Ave., Hawthorne, California



The pictures tell the story of the Inglewood High School Radio Club exhibit. Beneath the roller coaster, flanked by giant totem poles, the booth stretches 75 feet down the midway. Behind one of the QSL displays is the tape recorder with which amateur radio's story was continuously narrated. The ARRL world map is bordered with QSLs from around the world. Two twelve-foot signs and a poster featuring the club call, W6RBU, stretch across the back wall.



CONDUCTED BY JEAN PEACOR,* K1IJV

School Days

Time was when the teachings of the little red schoolhouse sufficed. The three Rs were well learned, but extracurricular activities were learned outside the school walls, for the most part. As times have progressed, schools have become proof that the more you learn, the greater your potential — until now, when present-day schools appear to offer an education relative to about any subject you might care to name.

As an example, high school radio club stations have become very popular in recent years, and many teenage students are being given the opportunity to learn about and participate in our hobby, who might never otherwise learn of radio's wonders.

Club stations get their starts in many different ways. Eagerness and enthusiasm are fine basic ingredients. This is amply illustrated in the case of the Oak Hill School club station, K1QCK, in Hartford, Conn.

Two students, Barbara and Betsey Lombardi of Shelton, Conn., used to listen with admiration to their uncle's amateur radio station, W1VGP. As their interest grew, he aided them greatly in becoming K1EIR and K1EIC, respectively, in 1958 when they were only 12 years old. Barbara and Betsey, sightless twins, have become fine operators, excellent rag chewers, and very adept traffic handlers. Betsey does an outstanding job as NCS on Conn. State Phone Net quite often, and Barb is an excellent c.w. traffic gal, participating in the Conn. C.W. Net, and is often heard on First Regional Net.

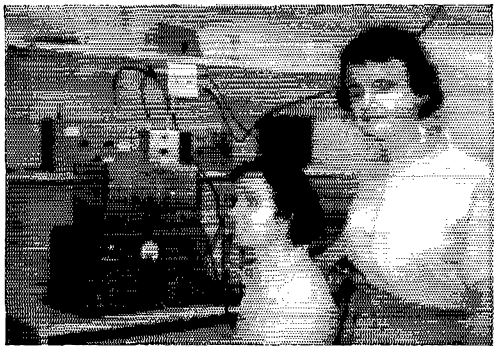
Remarkable indeed are the twins' accomplishments, the latest of which is Betsey's fine showing in a national high school typing contest in which she placed first in the country among sightless contestants, and fifth in the N.E. Region among all contestants.

Their splendid enthusiasm for amateur radio was carried back to fellow classmates at Oak Hill School for the Blind in Hartford. An entirely new world opened up for many of the students when a radio club was formed in 1960. With the help of Dr. Andrew Peterson of Newington, Conn., an honorary member of the club, K1QCK, the school station, became active on the air in 1961, using a DX20 and HRO receiver. Lt. William Eckert of the Hartford Police Force, K1BNO, became the club advisor.

Since 1961, many students have taken advantage of the club's opportunities, and many fine new amateurs have been the result. There are presently 6 members. Barbara, K1EIR; Betsey, K1EIC; Cheryl Brinkman of Oakville, Conn., K1UWO, (newly-elected president); Anne Marie Knickerbocker of Taconic, Conn., K1STM; Carol Esposito of Hartford, Conn., former KN1STL (awaiting news of an exam taken recently); Jeanne Devin of Thompsonville, Conn., former KN1UWM (also awaiting news of her new license).

All are teenagers whom we can be very proud to have as fellow hams. School closed June 21

*YL Editor, *QST:* Please send all news notes to K1IJV's home address: 139 Cooley St., Springfield, Mass.



(left) Members of K1QCK, Oak Hill School Club Station. Front row, l. to r.: Barbara, K1EIR; Cheryl, K1UWO; Betsey, K1EIC; Top row, l. to r.: Anne Marie, K1STM; Carol, ex-KN1STL; Jeanne, ex-KN1UWM; William Eckert, K1BNO, advisor. (right) Barbara and Betsey, K1EIR and K1EIC, whose enthusiasm led to the club's organization.

for summer vacation, and K1QCK will be inactive until fall — but their home stations will be activated and for a really nice QSO, finer CQs couldn't be answered.

First PJ5 YL

Two years ago during a one-day stopover at Curacao, Dr. Kirk and Ginny Bush of Harper, Kansas, KØGZN and KØGZO, promised themselves a return trip some day when they would be able to spend their entire vacation on the island — just hamming.

Hope became reality when the Bushes sailed from New Orleans, La. the end of March, 1962, and spent four wonderful weeks on the island.

Six months before setting sail, negotiations were made for calls to be used during their visit, and Kirk became PJ5CG, and Ginny, PJ5CH (the 5 denoting a non-citizen call). When the calls were confirmed, a Hornet beam was promptly sent ahead to Curacao.

Max, PJ2CE, greeted the Dutch freighter and escorted the new PJ5s to their cottage for the month which, with Max's help, was already decked with the beam. In ten minutes, the Swan and power supply were ready for government inspection (a rule of the island) and for operation.

The "people from the states with that big 'TV' antenna" created quite a stir. Most days brought interested visitors to the radio shack who were especially delighted by PAØ contacts.

Kirk and Ginny hoped also to spend part of their time operating from Bonaire to give as many hams as possible contacts for the ABC islands' certificate — Aruba, Bonaire and Curacao. This did not materialize, but there are 2481 hams who are happier for having contacted either PJ5CG or PJ5CH during their Curacao visit.

The interesting island, many friends, enjoyable visit with Monique and Jean Pierre, FG7XL, from Guadaloupe who arrived for a visit, all made the necessary departure a reluctant one.

Already, Kirk and Ginny plan on a similar vacation next year. As they say in Kansas, "the good Lord willin' and the creek don't rise, they just might make it."

Attention: Delaware County, Pa. YLs

Any licensed YL in Delaware County, Pa. who is anxious to help the community in time of emergency through amateur radio, contact Mrs. Margaret S. Crompton, W3YIR, 511 Yale Avenue, Swarthmore, Pa., phone Kingswood 4-1826 after 5 P.M.

Certificate Changes

Lad 'N' Lassie Certificate — Endorsements are not issued for additional contacts.

Floridora Certificate — Endorsements are now given for each additional 10 members worked. Holders of certificates dated before May 1, 1962 send original list of 10 QSLs plus 10 more for the endorsement — *or* a list of 20 QSLs. No restriction on date of contacts.

Club News

Los Angeles Young Ladies Radio Club — New officers are Pres., W6VDP; V. Pres., W6QYL; Rec. Secy, WA6BJB; Corr. Secy, WA6PQI; and Treas., K6ELO.

San Diego Young Ladies Radio Club — New officers are Pres., W6WDL; V. Pres., K6YGJ; Cor. Secy, WA6EAI; Treas., WA6CQS; Pub., K6UTO; Cert. Custodian, W6GGX

An active brass pounder at Oak Hill School Club Station, Anne Marie, K1STM.

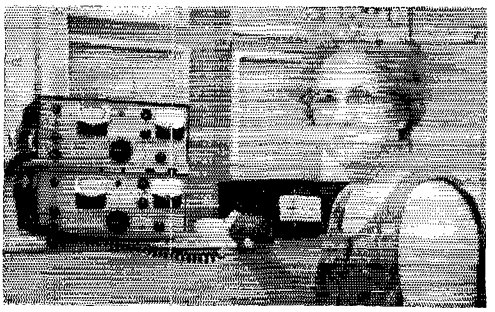
Coming Events

International YLRL 25th Anniversary Convention — June 19 to 21, *1964*, at Nationwide Inn, Columbus, Ohio. Because of the fine reservation response, this is a change in place from the original plans.

ARRL Atlantic Div. Conv. — Aug. 30–Sept. 1. See July column.

Silent Key

With deep regret we note the passing of June Brown Hengels, W9RBP, wife of W9RTY, on May 19, 1963. A member of the Chicago Amateur Radio Club, licensed since 1934, she was well known to many — particularly for pre-war operating on 160 meters. QST



Ginny, KØGZO, at PJ5CH radio shack.

Max, PJ2CE; Monique, FG7XL; Ginny, KØGZO/PJ5CH; and Kirk, KØGZN/PJ5CG.

Correspondence From Members-

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

BEST *QST*?

¶ Congratulations on your June issue. I have been a League member for a little over a year and I believe that it is the best issue I have read so far. It is the kind of issue that has a little for everybody, and makes it enjoyable for all. I would like to see more issues like it in the future. — *Jesse D. Shriwald, WB2CAV, Long Beach, New York.*

¶ The June 1963 issue of *QST* is one of your best issues. I thought the summary of the ARRL program on page 10 makes everything clear and should get the complete backing of every ham. Those who disagree with your program lack your foresight. — *Vin MacIlvain, K1YMD, Westport, Connecticut.*

SCOTSMAN'S DELIGHT

¶ Congratulations on the article, "The Scotsman's Delight —A 15-Meter Beam for Less Than $5," in June *QST*. Information of that sort not only makes amateur radio more enjoyable for those of us who cannot spend a great deal of money on our hobby but also, because of its relative simplicity, encourages building by the ham who is able to buy everything he needs. — *Mike Belton, WA4JBR, Mt. Olive, Alabama.*

¶ In reference to Mr. McKay's (W7QBR) letter in May, 1963, p. 89, I would like to indicate that *QST* seems to me to contain a good choice of material. Although it is the official organ of the amateur fraternity and so probably reaches more amateurs than any other publication, the fraternity is blessed with two other substantial monthly publications whose fare is basically construction articles at a level for everyday use. Sure, *QST* is getting a reputation of being the "Proceedings" of amateur radio (as the level of the Proc. of the IEEE). But if it were to drop the calibre of the technical articles, it could only result in a lowering of the over-all level of amateur radio.

As we have it now, amateur radio is blessed with a high-level technical journal having timely operating news as well; a purely do-it-yourself-in-the-workshop, no monthly column and chit-chat type publication; and one that seems to have placed itself about midway. What more could a hobby group want? The *QST* comes as a bonus to our League membership, so we can't even consider the "subscription" price. So, for 2½¢ a day we have access to a perfectly well-rounded diet of technical and practical know-how of amateur radio. Gosh, we spend more than that for coffee and cigarettes every day! — *James E. Cooper, W2BVK/WB2ENY, Maywood, New Jersey.*

WARNING!

¶ A word of warning to ARRL members may be timely in connection with the ever-increasing number of "awards" or "certificates" publicized by various groups and individuals.

No doubt many of these are authentic but my own experiences have been unfortunate. Some sponsors require QSL cards be mailed to them for verification. Cards I have forwarded have never been returned, nor has any certificate been received even though I enclosed a stamped addressed envelope. Some sponsors demand a fee, usually one buck. Money I have sent has been retained but no certificate has ever been received.

I hope that the rackets are not invading amateur ranks and that my experiences have been the exception rather than the rule. — *C. L. Countryman, W4JA, Charleston, South Carolina.*

EXCHANGE CLUB?

¶ It has been my observation that a number of hams own tape recorders.

I would like to suggest that you have a special "Tape Exchanges" column in *QST* listing hams by call letters and by "*quarter track*" and "*half track*" or "*four track*" and "*two track*" so hams who own tape recorders may contact other hams and discuss at length their ham set-ups, activities, etc. This would cut down the amount of time taken in QSOs and give everybody more time on the air where immediate contacts are necessary. — *John C. Bobbett, Memphis, Tennessee.*

UAR BASIC—

¶ Congratulations on your new book *Understanding Amateur Radio*. It provides the link between *How to Become a Radio Amateur* and the *Radio Amateur's Handbook*. Keep up the FB work. — *Richard Zeiter, WN2FCB, Wantagh, New York.*

¶ I have just about finished reading your *Understanding Amateur Radio* and I feel that after fifty or more years of reading technical items, this is the first time that a full comprehensive explanation of a subject has been presented, so that even a woodenhead like mine can savvy it.

It is the best thing that I have ever gotten my hands on and I would not let go of it for all the "tea in China." — *Ed Dugan, W2IY, Jersey City, New Jersey.*

OR TOO BASIC?

¶ What is becoming of amateur radio that the ARRL has to rewrite the already elucidative *Handbook* in kindergarten form and place it under the title of "Basics for Beginners" or *Understanding Amateur Radio*?

This spoon feeding is proof positive that today's operator is qualitatively on the wane and quantitatively on the up. Amateur radio is indigent of a new reform policy and many of us know it. What do we say that the wiser of the gang do something about pushing for stiffer exams and less commercialization, especially for the novices. The time to act (ARRL) is now.

Perhaps the last haven for the amateur who truly knows anything is the u.h.f. spectrum. Heaven help him when the first commercial gear goes up there, bringing with it all the playboys of the h.f. bands,

(*Continued on page 140*)

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

The June QSO Party

As is usual in the June VHF Contest the mountain-top expeditions provided choice sections for almost anyone in the country who was operating the contest. All the rare ones on the east coast were represented, although we were saddened by the lack of activity in the West Virginia section. One of the many "firsts" of which we are aware at this early date was the first 10,000-Mc. c.w. work done by the King Phillip Amateur Radio Society of Sudbury, Massachusetts. Operating under the call W1FRR/1 from Mount Greylock in northwestern Massachusetts, these boys provided complete two-way set-ups on 10,000 Mc. using crystal-controlled transmitters and converters on both ends of the circuit. Due to considerable alacrity on the part of the mobile end of this link, four sections were worked from the top of Mt. Greylock. The farthest contact was in excess of sixty miles airline and signals at this point were running S5 to S6 in their stable microwave set-ups. Heartened by their phenomenal success in the first effort on this type of communication, the King Phillip boys promise some astounding efforts for the September contest. While all the east coast area mourned the lack of activity from perennial club winner W1MHL, the score turned in by the boys on Mt. Greylock lacked very little of being a new contact record. Putting together almost 600 contact points on 50 Mc. with a tremendous effort on all bands from there to 10,000 Mc. the King Phillip Amateur Radio Club will be turning in a score in excess of 90,000 points. Not quite enough to top W1MHL's last year's score of 101,000 but a real tremendous effort from a small (ten members), enthusiastic radio society. The R.S.V.H.F. Society operating from their home location in the Rhododendron Swamps managed to amass a total slightly in excess of 70,000 points. All frequencies from 50 to 10,000 Mc. were also utilized at the Rhododendron Swamp VHF Society. W1IPJ, the club station of the Honeywell Radio Club, operating portable from Mt. Ascutney in Vermont provided contacts for all and sundry on 50, 144, 220 and 432 Mc. Their just-under-10,000 score should easily carry the Vermont section for these hard workers (see photograph). In the New York, New Jersey, Philadelphia area, the only score available at this time was from W2PEZ operating from Bearfort Mountain. Their efforts included all bands up to and including 1215 Mc. and their score of slightly under 50,000 looks good for the Northern New Jersey section. All the above scores are "early claimed scores" and are not necessarily the exact figures which will be turned in by the aforementioned stations. A complete write-up of the contest will as usual appear in the appropriate issue and we're only sorry that more early scores are not available at this time while the contest is still relatively fresh in our minds. It would be greatly appreciated if after the next contest a quick summary of your claimed score could be post-carded to my address at the earliest possible moment so that fewer people would have to champ at the bit to find out who won.

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

144-Mc. Trans-Atlantic Test

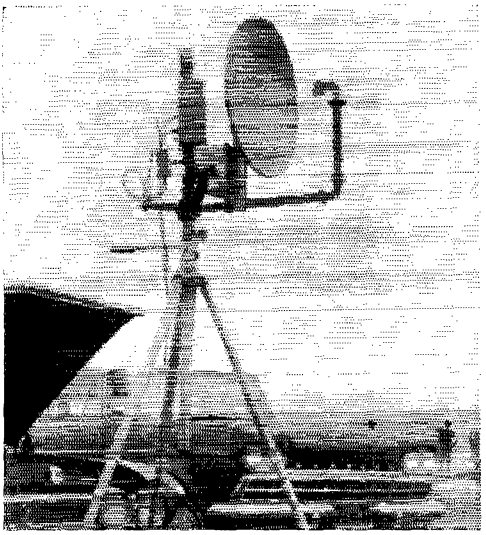
EI6X, Bryan Fogarty, sends information concerning a proposed attempt by the members of the Irish Radio Society to span the Atlantic on 144 Mc. The club has received permission to use 1 kw. input and have selected a transmitting site which is favorable for propagation toward the northeast coast of North America. Tests are proposed to commence on September 7 and continue on following weekends. Full details are not available but liaison work is proposed on 14 Mc. and further information will be available through ARRL bulletins. Interested parties should contact W1HDQ, E. P. Tilton, at ARRL Headquarters.

Proposed operations from St. Pierre Island (FP8) off the coast of Canada: Hal Tingey, W1DDF and WA2AWB/FP8CB will be operating for three weeks during July. Frequencies used will be 50.094, 144.018 and liaison on 7095.

144 Mc. and Up

In general we don't believe in quoting entire letters but in some cases it does seem the best thing to do. We're sure all will enjoy the following from Norm Hawkins, VE6HO. "Thought it was about time to let you know what's going on in VE6-land on two meters. I have been going real strong keeping skeds this past winter with W8PT, WØENC, W7LHL, etc. So far in skeds with WØENC we have had some terrific exchanges of information but never completed a contact. Back in December, skeds with W7LHL over a 410-mile path with the Rocky Moun-

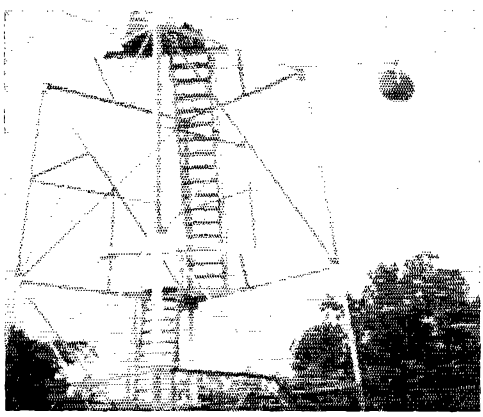
W1IPJ/1, Honeywell Radio Club, setting up for the June Contest. Photo courtesy of W1QBA.



10-kMc. base station atop Mt. Greylock in northeastern Massachusetts, produced by the King Phillip Radio Society and operated under the call of W1FRR/1. Transmitter and receiver both crystal controlled and all solid-state. Power output 10 milliwatts, best DX 60 miles.

tains in between netted a little. I heard Ernie four times and he heard me once over a two-week sked period. So far this spring I have been working over the equipment. Right now running mostly home-brew gear using the same W2AZL converter which sure does a terrific job. The antenna is getting a complete revamping and I hope to change the final before the Perseids rolls around. Have just received a new tower and rotator and expect to be using a 32-element collinear on this. I also have a code wheel and thirty-second timer for automatic operation of the transmitter.

"Before closing I have real gripe for you. (For *me!*) On June 4 at 1830 MST I copied 3 W0s on phone in a roundtable on 144.180. (I wasn't there!) Having a crystal on this frequency I tried to break on c.w., but these fellows never listened long enough to hear me. I kept trying for fifteen minutes before the band went out. I also heard two other weaker signals down the band on phone, but not strong enough to copy. C.w. would have been a snap! Why don't those fellows listen a little more and try c.w.? These W0s lost a good VE6 contact which is pretty rare on two meters, but what makes me mad is that I lost a new state." Our sympathies are with you, Norm, but a lot of good that will do. Guess there are just "those who do" and again "those who don't," but I'll bet that "those who don't" will be sick when they read your comments.



29-inch dish and tower for 1215 Mc. atop Bearfort Mountain. Part of the W2PEZ/2 effort.

WA2VKK in New York City mentions that he is doing a lot of m.c.w. work on two meters, and hopes to see more activity of that kind. Other active m.c.w. stations in the area are WA2KRN, WA2HXR, WN2DFP and WN2GWU. And — from Brooklyn, New York — Jay Kohn tells us that on May 24 two meters was fairly good when he worked stations in Pennsylvania and Delaware. May 28 was also pretty good to Jay when he worked W3BDK in Maryland. June 1, however, seemed to be the best of all. Connecticut, Rhode Island, Massachusetts, Maine and Canada were all coming through to Brooklyn. Jay is using a Gonset II and a 6-element beam 80 feet high, and has eight states worked and confirmed on 144 Mc.

Our inquiry concerning W1JSM's states-worked status on 144 Mc. paid off when we received a letter from Don telling us that his latest DX on this band was with John, K4IXC in Florida, a distance of 1215 miles, and that this contact brought his score up to 20 states worked on 2 meters. Don is now looking for meteor-scatter skeds in Tennessee, Kentucky, Illinois and points west and south. Those interested drop Don a note. During the opening on two meters on May 27, Don worked three VE1s and a number of stations in Maine. W1JSM is also on 220 Mc. with six states and 200 miles confirmed to date, and just arrived on 432 Mc. with 50 watts and a 32-element collinear. K1JBL and W1JSM both have APX6 rigs on 1215 Mc. and have worked each other a number of times. In Connecticut, K1RTS commented on the June 1 and 2 opening on two meters and also mentioned the terrific signal that K4EUS was putting into his QTH on May 26. K4YYJ in North Carolina sez that activity on two meters seems to be picking up and that very good conditions were noted on the band on May 4. Signals that had been running at S4 came up to 20 over 9 at about 0800 GMT.

An interesting note from W4AWS in Orlando, Florida, tells us that on June 2 W4MNT completed a QSO with K4SJF in Atlanta and then called a short CQ on c.w. He heard W4LOJ in Tennessee calling him and returned to him but W4LOJ had faded out. He then heard W9UNN/0 calling CQ on a.m., but he was heard only for about 20 seconds. W9UNN/0 was in Wichita, Kansas.

A new entry in the two-meter "States Worked" box is W5UKQ of Baton Rouge, Louisiana. John has confirmed 9 states in three call areas and longest distance is 750 miles. He sez that in his area tropo openings to the northwest are "usual in the mornings." A letter received from K6DBZ, WA6AWS, WA6NUL and WA6STB (all engineering students at California State Polytechnic College) sez that while these boys don't have the time to operate that they'd like to have, they grab each opportunity possible to take generator, antenna and other gear and drive up to a mountain top to operate 144 Mc. They are negotiating for the use of some land where they can construct a shack and have better equipment to use for their propo ed future operation on two meters. Major interest is DXing on the band and they'll be operating the low end of two meters (mostly on week ends). Watch for them, 'cause they'll be watching for you. Out in Las Vegas, K7ICW tells us that s.s.b. tests were begun with

W6CDB on May 29. W6CDB is always readable in Las Vegas on s.s.b. but as Al sez, "it's now up to us to provide him with readable copy on s.s.b. although c.w. gets through anytime from here." Jack Woodruff, W8PT in Benton Harbor, Michigan, sez that on May 4 a schedule was kept with K4IXV and the contact was completed within three minutes. The burst was so long that they "ran out of things to talk about." Signals received in Benton Harbor from W5UKQ were good but he was having trouble with the 417A and a power leak. The boys exchanged reports but did not get acknowledgements. Jack (W8PT) sez that he is still keeping all skeds on 432 Mc. but has given up on 220 Mc.

Quite a number of the gang are interested in 420-Mc. TV. Among this group is K3ADS, who recently acquired a surplus ATJ camera. Larry is now equipped for slides, film, live and network TV. He and K3KFL will shortly be conducting tests on the air. At a recent Reading Radio Club meeting, K3MNI demonstrated amateur TV on 400 Mc. to the group. K4QIF in Salisbury, North Carolina now has a TV camera and 432-Mc. gear under construction; and in Flushing, New York, WA2GFP sez that he's working on a 432-Mc. live TV ATJ-ATK camera and AXT-2 transmitter. K4MHS and W4MKT in South Carolina have had a number of good QSOs on 432 Mc. and John has had one contact with W4VHH also. However, attempts to contact W4TLC in South Carolina have not paid off as yet. In Burlington, Washington, K7VIL is working on 420 Mc. gear and hopes to be on the air soon. And in California W6IEY and W6BLK had a cross-band contact on 432 and 1240 Mc., Dick using an SPR-2 and W6BLK using an APX-6 with 4-foot dishes at each end.

W2SEU tells us that he has finished the 432-Mc. transmitter using two 5894's and is on the air with it, along with newly constructed converter using 6CW4s. Beam is an 11-element affair up 40 feet. Fred is now building an s.s.b. rig with hopes of having s.s.b. on 6, 2, 220 and 432 Mc. W2WOF recently put up a 44-element quad for 220 Mc. and says that 220-Mc. activity is on the rise again around the Hudson River Valley area. W1NOC is on 220.060 Mc. almost every evening around 2100 calling CQ in all directions. Frequency at W2SEU is 220.050 Mc. In Tennessee, K4VVN, WA4DXZ and W4HFA are interested and building for 220 Mc. W4HFA is experimenting with a small 220-Mc. transmitter and TV-tuner converter. And in Marion, Ohio WA8DON is looking for 220-Mc. contacts. K2UUR hopes to be back on 1296 Mc. soon and sez that thanks to W1BU during the contest he worked state number six on 220 Mc., the only DX he heard or worked on 220 or 420 Mc. during the contest. Out in Santa Clara, California, K6HEP sez that his APX-6 for 1215 Mc. is partially tested and working and a helical antenna for 1215 is under construction. Steve Coles, K7CZT, in Tacoma, Washington is wondering who is on 1215, 2300, 3500, and 10,000 Mc. in the Seattle-Tacoma area.

Late word received from K3ADS sez "by the time this gets in print, I will have begun test transmissions of combined aural-visual TV signal at 440.100 Mc. with standard 4.5-Mc. sound and non-interlaced video. Closed-loop line resolution is about 450 lines and effective radiated power output will be about 175 watts. Antenna is up 81 feet and is rotatable so anyone nearby who wants to look, can." Good luck, Larry. You're doing a fine job.

From Plymouth, Massachusetts, Art Goddard, K1AII writes that he left for Fairbanks, Alaska on June 17 for a two-year stay. He will take along all of his v.h.f. equipment and after reading recent accounts of Alaskan v.h.f. activity, he figures that things won't be too lonely on six and two meters up there. Good luck, Art, and let us know what's doing up that-a-way. According to K3OBU in Delaware, two meters outdid itself during the last week of May. On the 25th, he worked a number of 2s and heard 1s and 4s; on the 29th, although little activity was

2-Meter Standings

W1REZ	32	8	1300	W5YYO	7	4	1330
W1AKZ	28	8	1205	W5UNH	6	3	1200
W1KCS	24	7	1150				
W1RFU	24	7	1120	W6QSQ	15	5	1390
W1AJR	22	7	1130	W6NLZ	12	5	2540
W1AIMN	22	8	1200	W6DNG	9	5	1040
W1HDQ	22	6	1020	W6AJF	6	3	800
W1IZY	20	7	1080	W6ZL	5	3	1400
K1CRQ	19	6	800	K6HMS	4	3	850
W1MEH	18	6	1000	K6GTG	4	2	800
W1AFO	18	6	920	W6MMU	3	2	950
K1AFR	17	5	450				
				W7JRG	17	6	1280
W2NLY	37	8	1300	K7KHD	15	5	1150
W2CXY	37	8	1360	W7LHL	7	3	1050
W2ORI	37	8	1320	W7CJM	5	2	670
W2BLY	36	8	1020	W7JIP	4	2	900
K2GQI	35	8	1365	W7JU	4	2	235
K2LMG	30	8	1290				
W2AZL	29	8	1050	W8PT	39	9	1260
K2IEJ	27	8	1060	W8KAY	38	8	1245
K2UEH	25	8	1200	W8SDJ	37	8	1220
W2AMJ	25	6	960	W8IFX	35	8	980
W2AIR	24	8	1100	W8SFG	34	8	1040
W2RXG	23	8	1200	W8LOE	32	8	1060
W2SMX	23	7	1090	W8GGH	32	8	1180
K2HOD	23	7	950	W8BAX	32	8	960
W2DWJ	23	6	860	W8RMH	32	6	910
W2PAU	23	6	753	W8NOH	31	8	1090
W2LWI	22	6	1050	W8SVI	30	8	1080
K2KIB	21	5	700	K8AXU	30	8	1050
W2ESX	21	6	750	W8EHW	30	8	860
W2UTH	20		880	W8LFO	29	8	850
W2WZR	19	7	1040	W8WRN	28	8	680
W2RGV	19	8	720	W8DX	26	8	720
WA2EMA	19	6	1010	W8ILC	25	8	800
W2RLG	17	6	980	W8JWV	25	8	940
K2JWT	16	6	550	W8WNM	25	8	900
				K1CBQ/8	25	8	690
W3RUE	33	8	1100	W8GFN	23	8	740
W3EPH	33	8	1000	W8LCY	22	7	680
W3SGA	21	8	1070	W8BLN	21	7	610
W3TDF	20	8	1125	W8GTR	17	7	550
W3GKP	20	7	1180	W8NRM	17	7	550
W3KCA	28	8	1110				
W3BYF	28	8	1070	W9KLR	41	9	1160
W3LNA	21	7	720	W9WOK	40	9	1170
W3LST	21	6	800	W9AAG	35	9	1050
W3NKM	20	7	730	W9GAB	34	9	1075
W3LZD	20	7	850	K9AAJ	33	8	1070
K3HDW	12	6	1015	W9REM	31	8	850
				K9UIF	30	9	970
W4HJQ	39	8	1150	W9ZIH	30	8	830
W4HHK	37	9	1280	W9PBP	28	8	820
W4LTU	34	8	1160	W9LVC	27	8	950
W4ZXI	34	8	954	W9OJI	27	9	910
W4WNH	33	9	1050	K9KCD	26	8	1100
W4MJK	34	8	1149	W9ZHL	25	8	700
W4AO	30	8	1120	W9BPV	25	7	1030
W4LVA	28	8	1000	W9CUX	24	7	
K4EUS	26	7	1130	K9AQF	24	7	900
W4EOM	25	8	1040	W9LF	22	7	825
W4AIB	25	8	900	W9KPS	22	7	690
W4TLV	23	7	1000	W9ALU	18	7	800
W4JC	23	6	725	W9WDD	16	5	600
W4VVE	23	6	724				
W4RMU	21	7	1080	W0BFB	39	9	1350
W4IKZ	20	6	720	W0THD	31	8	1030
W4OLK	20	6	720	W0LFE	30	7	970
W4LNG	19	7	1080	W0SMJ	29	9	1075
W4RFR	18	9	820	W0QDG	27	9	1300
K4YUX	18	8	830	W0RUF	23	7	900
W4CPZ	18	6	650	W0MOX	23	6	1150
K4VWH	18	6	590	W0IC	22	7	1360
W4MDA	17	6	757	W0ENC	22	6	1100
				K0ITF	21	6	940
W5RCL	38	9	1280	W0INI	21	6	830
W5FYZ	33	9	1275	W0TGC	21	7	870
W5AJG	32	9	1360	W0RYG	20	8	925
W5IWL	29	7	1150	W0DQY	20	7	700
W5DFU	29	9	1300	W0JAS	19	7	1130
W5PZ	27	8	1300	W0AZT	18	7	1100
W5LPG	25	7	1000	K0AQJ	16	6	1120
W5KTD	23	8	1200	W0IFS	16	6	1100
W5SWV	20		960				
W5ML	16	6	700	VE1CL	8	4	800
W5KFU	13	4	1300	VE3DIR	36	9	1330
W5UGO	13	4	635	VE3AIB	29	8	1340
W5FSC	12	5	1390	VE3BPR	24	7	950
W5HEZ	12	5	1250	VE3BQN	21	7	790
W5CVW	11	5	1180	VE3AQG	18	8	1300
W5NDE	11	5	620	VE3DER	17	8	1340
W5WAX	10	5	735	VE3HW	17	7	1350
W5VY	10	3	1200	VE6HO	1	1	915
W5BEP	9	3	1000	VE7FJ	2	1	365
W5UKQ	9	3	750				
W5EDZ	8	5		KH6UK	2	2	2540

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

noted, Joe heard 2s and 4s once again. On May 31 the band once again was open but little activity (although W2AZL was heard calling K9UIF, and K4WOB and W8UBK/3 were heard on s.s.b.) Joe's two-meter rig is now completed and he's running 100 watts on c.w. and 80 watts on phone and is now looking for skeds over 200 miles. On May 9 an opening was noted in Orlando, Florida that lasted for about four days. The opening was across the Gulf to Alabama and Mississippi and was confined mostly to central and South Florida on that end. During the last two weekends of May the path from Orlando to Atlanta was better. W4AWS tells us that he worked W7JCU/4 in Mobile, Alabama on two consecutive days with signals Q5, S6/7. W7-JCU/4 was a.m. and Art, W4AWS was s.s.b. In Chester, Virginia, K4EUS noted the opening of May 25 on two meters when he worked 3s, 2s and 1s, all on phone. Sam tells us of another signal from Virginia on 144 Mc., and it is W4JUR in Fredericksburg who is using one of the new Collins VHF rigs and a Long John yagi. From Georgia and K4YZE we hear of good band conditions on two meters on May 11 when W4DOD in Shelbyville, Tennessee, K9GAQ in Illinois and WØDQY (both a.m. and s.s.b.) were all getting into Marietta. California has a different story to tell about this band, according to a report received from John, K6KMJ, who sez "until the middle of May, the two meter band was much better than would be expected for this time of year. However, after the middle of the month the two-meter band became quite useless for any sort of operation except local." May 9 was a good day for W8ZGW in Michigan. Ed worked VE3BRI, VE3FJG, VE3BUC, VE3CRH, VE3TN, VE3FBQ and VE3-ENT on that day. W9FBC in Wisconsin noted slight openings on May 6, 13, 30 and 31 on 144 Mc. when he heard and worked stations in Milwaukee and Chicago.

Clubs and Nets

The East Coast VHF Single Sideband Association recently held their quarterly dinner meeting and elected the following officers: WA2CVF, President; K2PXP, Vice President; WA2ONB, Secretary/Treas. Outgoing president of the organization, K2ZBX, has presented an attractive trophy to the Association to be given to the first v.h.f. sidebander who works 48 states. This is the first such award to be offered to the s.s.b. group on v.h.f. and should be a very nice thing to have on your mantel.

Data is being collected for the fifth issue of "FM Nets" which attempts to list all counties with wide-band f.m. nets operating in either the six- or two-meter bands. Information desired is as follows: frequency of net, location of net (list largest city with activity within a given county), number of calls on the frequency in the county, and a liaison station for the county. So that old listings may be corrected also, please list any frequencies which have been used for f.m. operation but which are no longer used for this purpose. One person may report for more than one county if desired, but please list a separate liaison for each county. Send all information to Thomas A. McKee, K4ZAD, 1306 Grove Rd., Lynchburg, Virginia.

50 Mc.

Only one report received from New England and that one was from Jack, K1UHZ, in Massachusetts, who comments that during the June contest he heard 2, 3, 4, 8, 9, and Ø lands, plus VP7CX and FG7XT. Several XE1s also come through during the contest period into 1-land. From New Jersey Tom, WA2PWI, reports that band conditions are far below those of last year but that ground wave is beginning to improve. WA2IRK remarks that six meters was open to 4, 9 and Ø-lands from May 1 to May 10 with strongest openings during the afternoons. Marty also mentions that he heard K2ISA trying to work Nicaragua. (Come on now Paul, why not let *us* in on that?) Poor lonesome New York City has one 50-Mc. operator. Norm Berlat, WA2TQT, tells us that during the first three days of May he heard all but the seventh call area at his QTH. Openings were also observed on May 5, 16, 21, 22 and 24, and during this period VP7CX, VP7AJ and KP4s were heard. W3BKF of Gillett, Pennsylvania tells us that *E* openings during May were into the south and north, with W1s and VE4-land to the north and VP7CX (among others) to the south. Levittown, Pa., and Dave, K3HNP, mention that groundwave has been good on 50 Mc. and VP7CX coming through frequently on skip. Philadelphia comes through this month via K3KPA and K3MLI. John (K3KPA) noted openings on seven out of the first 8 days of the month with thirteen states being heard,

(Continued on page 134)

220- and 420-Mc. STANDINGS

220 Mc.

W1AJR	10	4	480
W1AZK	9	3	412
W1HDQ	11	5	450
K1JIX	10	3	450
W1OOP	1	4	400
W1RFU	15	5	480
W2AOC	13	5	450
K2AXQ	9	3	240
WA2BAH	4	2	167
K2CBA	13	6	650
K2DIG	4	3	140
W2DWJ	15	5	740
W2DZA	12	5	410
K2DZM	12	5	400
K2ITP	10	5	265
K2ITQ	11	5	285
K2JWT	6	3	244
K2KIB	12	4	300
W2LRJ	10	4	250
W2LWI	12	4	400
W2NTY	12	5	300
K2PPZ	11	4	490
K2QJQ	13	5	540
W2SEU	9	3	225
K2UUR	6	3	210
W3AHQ	4	3	180
W3FEY	11	5	350
K3IUV	8	3	310
W3JYY	8	4	295
W3JZI	4	2	250
W3KKN	10	4	255
W3LCC	10	5	300
W3LZD	15	5	425
W3RUE	10	5	480
W3UJG	13	5	400
W3ZRF	5	4	112
K4TFU	8	4	400
W4TLC	5	1	315
W4UYB	7	5	320
W5AJG	0	2	1050
W5RCI	8	5	700
K6GTG	2	1	240
W6MMU	2	2	225
W6NLZ	3	2	2540
K7ICW	1	1	250
K8AXU	10	5	1050
W8IJG	9	5	475
W8LPD	6	4	480
W8RNM	8	4	390
W8PT	10	5	660
W8SVI	6	4	520
W9AAG	9	4	660
W9EQC	11	5	740
W9JCB	6	2	340
W9JEP	9	4	540
W9OWL	6	3	475
W9UED	4	4	605
W9ZIH	10	5	500
KØDGU	5	3	425
KØITF	6	3	515
KH6UK	1	1	2540
VE3A1B	7	4	450
VE3BPR	3	3	300

420 Mc.

W1AJR	11	4	410
W1HDQ	8	3	210
W1MFT	8	3	170
W1OOP	11	3	390
W1QWJ	10	3	
W1RFU	7	4	410
W1UHE	6	4	430
W2AOD	6	4	290
W2BLV	12	5	360
K2CBA	7	4	225
WA2DTZ	6	3	200
W2DWJ	10	4	196
W2DZA	5	3	130
K2DZM	10	4	390
WA2HQE	8	4	280
K2KIB	4	2	100
W2NTY	3	2	100
W2OTA	10	4	300
K2UUR	9	3	280
W2VCG	9	4	280
K3CLK	9	4	
K3EOF	6	3	250
W3FEY	8	4	296
K3IUV	7	3	310
W3LCC	3	2	
W3RUE	3	2	270
W3UJG	2	4	350
W4HHK	8	4	550
W4VVE	7	4	430
W4TLV	4	2	500
W5AJG	5	1	425
W5HTZ	5	3	440
W5RCI	12	3	660
W5SWV	7	3	525
K6GTG	1	1	180
W7LHL	2	1	180
K8AXU	3	3	660
W8HCC	3	2	355
W8HRC	3	2	250
W8JLQ	6	3	275
W8NRM	3	2	390
W8PT	6	3	310
W8RQI	6	3	270
W8TYY	9	5	580
W8UST	3		25
W9AAG	8	4	525
K9AAJ	7	3	425
W9GAB	9	4	608
W9OJI	6	3	330
K9UIF	6	3	240
KØITF	3	2	158

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

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

A couple of anachronistic hams could have been big wheels in the 12th century if they had demonstrated some QRP h.f. mobile gear to Genghis Khan. The Mongol conqueror had to use 40-m.p.h. homing pigeons in relays to get administrative traffic back to the capital of his far-flung domain — just one-way skip. That homing pigeon, a real DX bird, extended its brilliant military communications career all the way through World War I.

Last month we excerpted material from the Boy Scouts of America booklet *Signaling*, and things were really getting interesting when we ran out of space. Let's pick it up again as Part Two of

A Brief History of Signaling (continued)

Three French boys, the Chappe brothers who were still in boarding school at the outbreak of the Revolution, invented the first practical semaphore system. Claude, the eldest, was in a school a mile or so distant from his brothers and they wanted some method of daily communication. Their first semaphore was no more than an upright to which was attached a movable arm, operated by means of levers from the ground. Two more arms were soon added, and before long a code had been devised with 192 different signal positions. They attracted considerable attention, and soon the government had seen the possibilities of this code. Several learned men were assigned to help them simplify their code, so that certain positions of the arms would stand for an entire phrase or a word. The government financed erection of a test line, and in 1794 the first "telegramme" in history creaked over the "windmills" of the Chappe system from Quesnoy to Paris. One station would receive the message, and relay it to the next by duplicating the signals, until it was finally "read" at the last station. The code was more and more simplified until finally the plan of sending merely the letters of the alphabet was settled upon.

Other signal systems sprang up in Great Britain, Denmark, Russia — and in the United States. The first record we have of such a system in this country is that of Jonathan Grout who was in charge of building a series of semaphore relays from Martha's Vineyard to Boston, so that news of the incoming ships observed in Nantucket Sound might reach Boston in time to prepare for their unloading. Many towns along Boston's South Shore still have their Signal Hill.

These signal systems were the wonder of their day, but they were soon forced into the discard by a strange new force. A young American portrait painter, pacing the deck of the packet ship *Sully* as he was returning home from Europe, found the inspiration which set him to sketching the first crude diagrams of the modern telegraph. The young painter was Samuel Morse. An extended European vacation had given him the opportunity of seeing the most advanced of the semaphore systems, and talking with the men who had worked deepest into the mysteries of electricity which had always fascinated him. That night the two were combined into the hastily drawn diagram for the telegraph instrument together with a tentative alphabet of dots and dashes.

It was not quite as simple as that, of course. Just as in any invention there were long centuries of preparation before him, years filled with the story of patient men who thought and struggled with ideas that just wouldn't come right, with crude machine and experimental apparatus that never seemed to work as well in practice as they had in dreams, men like Leyden who captured the infant electricity in a jar, Galvani, Volta, Joseph Henry who invented the magnetic coil, Wheatstone, Daniell and many others. They were all part of the long chain of which Morse was merely the final link. Indeed that chain could well go back to our Old Stone man and his hollow tree . . . but we cannot even hope to touch briefly on the history of electrical invention without which our modern communications system would have been impossible. That fascinating story you must have for yourself.

Morse had hard days ahead, discouraging days, when his friends deserted and his funds ran low. He did enough experimenting while serving as a teacher at the University of the City of New York to know that he was on the right track. He needed money, and tried to persuade the Government to help him, but at first they either scorned or ignored him completely. It was heartbreaking work, talking, demonstrating, praying, but just when it appeared that all hope was gone, the bill was passed in the dying minutes of Congress — and the real work began! A line was built from Washington to Baltimore, forty miles of wire, in a year. On the 24th of May, 1844, before a little group gathered in the Supreme Court room in the Capitol, the first message was sent humming over the wires to Baltimore and within a few moments it had been safely interpreted and sent back to the anxious Morse — "What Hath God Wrought!" The modern communications era had been born.

The telegraph of Morse, which seemed so final, was merely another "first step". We are still in the early chapters of our communications story. More patient men gave more long years to dreams and research. Tonight, still more patient men are dreaming and planning the realities of tomorrow, the instruments which you will accept and use, as your fathers accepted the radio. The telegraph was followed by the telephone, by the ocean cables, by wireless, by radio, by short-wave radio, by telephoto and teleprinter services, and now by television and countless other modern miracles.

What:

There are fewer complaints and more commendations this month so far as DX conditions are concerned. After some entertaining ups and downs the bands steadied for an extremely productive summer run, by golly, all the way from 10 through 80 meters. Which just shows to go you that while

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sunspots come and sunspots go, the true DX chaser just digs a little more deeply and energetically for his QSOs and QSLs. A good example is

10 **phone**, a range sold somewhat short in recent months. W2JMZ, K3SYV, **WAs** 4CXH 5AER and club informants list plenty of activity by **CEs** 3XG 4FH, **CN8HB, COs** 7HQ 8JK, **CTIs** HE KW RJ SE 22 *GMT*, SX, **CXs** 2AAJ 2CB 4AZ, **EAs** 2FE 3NG 4DM 7HZ 7ID 8AH, **EL2F, FG7XT, GW3**IXI, **HC**1DC, **HPs** 1MN 3FL, **IITM, KR6s** CF (s.s.b.), TAB, **KZ5s** CL EL EZ JW PA, LA1OE. **LUs** 2FAO 3ACA 4DM 6ES 7FAG, **OZ1TH, PJ2AL, PYs** 2CEN 3BEI 5DI (s.s.b.) 22, **SL6BH, SM5OV, TI2s** MD WA, **TU2AP, UA6s** CT ND, **UB5s** BLO KSC, **UG6AEK, VPs** 6TR 7NB 9DL 9FE 9L, **VQs** 4JC 4AQ, **XE1s** CCB HD WF, **YNs** 1JK 9BJM, **YVs** 1DJ 2DW 4CL 4GD 6AV/2, ZE2JA, **ZSs** 1AB 1BV 1DM 1O 2DY 2OM, **5As** 1TK 3CW (28,570 kc.) 15, **5B4TJ, 5N2JKO, 5R8AA, 9GI**DM and **9Q5AB.** When Europe broke through to W2JMZ in May it was the first such opening for him in two years. Who says ten is all washed up?

10 **c.w.** makes a nice comeback, too, for **WA4CXH,** DARC and ISWL 28-Mc. hawks thanks to key action by **CR7IZ,** CT1HX, **DM3IGY,** GC2FMV, **GW3FSP, HC**1DC, **HK7BE, 1SIFIC, KP4CC, LAs** 4ZH 9TF, LJ3D, **LUs** 2EN 7AU 8DBX 8DBY, **LZ1KPZ, OD5LX, PY7MV, SM5CZQ, SV1AB, UAs** 3BK 3DD 3RB 3YL 4KAS 6AKV 6NH, **UB5BTX, UG6AEK, UQ2KCA, UT5s** FG XK, UW3NG, **VP8GQ, VQs** 2W 2WR 4IV 8AM, **YU2DI, ZE8JZ. ZB1BX, ZP9AY, ZSs** 1MW 6BL, **5B4TC, 5H3IW, 9G**1DM, **9Q5s** AB and TJ, mainly on week ends when the phone slot clogs up a bit.

15 **phone** is flourishing delightfully for **W1BPM, Ks** 1VWL 9CZV, **WAs** 4CXH 5AER and the European club gang who report ample audibility from **CEs** 2HX 3OB, **CN8s** AD FG HP OM FX* MD, **COs** 2CT 2VE 6FB 7BC 8ES, **CRs** 5SP 6AL 6AR 18, 6CD 6CY 6DO 6DR 6EM 6ES 6FN 18, 6GB 6JA 6JL 6PD 6QS 7BF 19, 7CO 7GJ 7GR 17, 7GU 7GY 7IZ, **CT2AC, EA8s** BS 17, DM 13-14, DR, **ELs** 2S 3A* 4E 5C 18, 0J/mm, **EPs** 2RS 3RO 11, **ET3s** HP USA, **FG7s** XJ XL XT* 22, **FO8BC*, FY7YE, HH2s** M ML, **HI8s** HAIN NOG 22, **HPs** 1MN 17, 2OQ, **HRs** 1AB 3DW, **JAs** 3AK 3CKB 3COX 6CGN 14-15, 6TL 14, **KG4BH, KV4s** BI BY, **KZ5EV, LZ1BZ, MP4CP, OAs** 4GY 4JF 5G*, **OD5LX*** 19, **OX3s** KF KM, **PJ2AP. PY5s** AM* (412) 19, DI*, **PZ1s** AR BA BO, **SVs** 1AI 0WT, **TG9s** MO SL* (425) 0, **TI2s** J* VMB, **TN8s** AA 18, AD 18, BE BR, **TT8s** AA 16, AL 14-15, **TU2s** AC AE AP, **UI8-**KAB, VE0MIN, VK6QL, **VPs** 1TA (240) 23-0, 2KR 3FM 5GE 5LA 6LX 7CT* (434) 0, 7LG 23 7NX 8EM (310) 0, 9AK (240), **VQs** 1IZ 18, 2BA 17, 2BK 2DL 2IE 2JC 4AA*, **VSs** 1GC 1JC 1LQ 1OY 14-15, 4RS 14-15, 9AAA 9AKH 9ART 9AS, **VU2PP,** WA4s GBH/**KP4** LTX/**KJ6***, **XEs** 1NC 2LV, XW8AL* 13-14 (taboo for FCC-licensed and Canadian amateurs), **YNs** 3KM (420) 0, 4CWH 4SH 9WLD, **YVs** 2AA 2CT 3HJ 6AV/2 6AX, **YS1RGM** (300) 22, **ZB1s** JM MO RM VJ, **ZEs** 2KL 4JE* 6JA 7JJ, **ZK1AR** (300) 1, **ZLs** 1AIX* (412) 1, 1HA 2AAG* 2WS*, **ZP5s** CF 15, GO LF, **ZSs** 1AB* 1BV 1MW **3BR** 3R 4KG 4MZ 4OG 6ARP 6BBD 6BEP 16, 6CV* 6OF 17, **9G,** 4U1SU* 15, 4X4s BL FU IK IX* 1O, **5As** 1TK 2TJ 2TS 3CAA 3CW 4CW 15, 4TM* 20, 4TH 5TE 5TO 5TW (255) 16, **5B4s** AK GT GY IP RA TF TJ SS WR WS, **5H3s** HS* HZ, **5N2s** AC EDL UC, **5R8s** AB BX, **5T5AB, 5U7AC, 5X5s** AU IG IU* (420) 21-23, **6O2EU** 10-17, **6W8s** CU 17, DJ, **6YAs** AH EM (300) 23, WF, **7X2REA** 18, **9G1s** AB BF 19, DF DM DP DU DW 18, EE 15-16, GW, **9M2s** AE FK, **9Q5s** AM 18, BR CP DY EP FO HF 18, KC* OB SB 18, **9U5s** BB 16, BH 19, BR CJ IB JH 18 and PC 20. Asterisks indicate single-sideband specimens.

15 **c.w.** is a ball for **W8YGR, Ks** 1VWL 5FTB 9CZV, **WAs** 4CXH 5AER 0BMW and **WB6AGT** who picked up **CEs** 2OF 22, 3AG 20, 3OB 21, 3UT, **CN8s** FE 9, FX (60) 19-20, **CPs** 3CN 22, 5EZ, **CRs** 6CA 6DX 6FY 13, 7IZ 18

YO3AG's compact outfit gives a good DX account of itself from Bucharest. (Photo via S. K. Smith)

EP2RH, ET3JK, FR7ZD, G5RV/**EP2** 12, **HI8AKU** 23-0, **HKs** 3KN 22, 3RQ 7ZT 21, 0AI of San Andres, **HL9KH** 10, **HP1IE, IT1AI** (90) 17, **JAs** 1ITX 11-13, 3CYY 11, 4ACH 7UJ 16-17, **KR6ML, KV4CF, KZ5MQ, OD5s** AX LX 14, **PZ1s** AH 20-21, BW 19, **ST2AR, UAs 9FX 0KIF UL7KBK, UW0IN, VKs** 6RU 9LA, **VPs** 2KR 5GT 22-23, 5RD (85) 13, 8GQ 15, 9FC 21, **VQs** 1IZ 19, 2BA, **VSs** 1GZ 1LJ 15, 1LL (45) 15, 1LV 9M1B (50) 18 of the Maldives, **VU2GG, WP4BLS, YV5BMY** 21, **ZB1RM** (53) 19, **ZD3A** (51) 16-17, **ZEs** 2JS 3JJ 11, 3JO 11, 3JW 20, ZL1AM, **ZSs** 3AH 13, 7M, **5As** 1TW 5TR, **5B4s** FB GT JU RF (51) 21, TC (70) 20-21, SS, **5N2RSB** 18, **5R8s** AB BX 11-13, **6O1ND** 10-11, **6W8DD** 18, **6YAMJ, 9G1s** EI 16, EX 18, **9K2AD** 14, **9M2s** FR 16, GJ 15, UF (53) 14, **9Q5s** AB 14-15, BL BZ CA (41) 20, CB 13, HL JR (55) 15 and TJ 10-14.

15 **Novice** efforts continue, with *E*-skip sessions keeping the lads amused between infrequent DX openings. **WNs** 2DDA and 9FMQ tell about encounters with **CO7AI, G2MR, HP1AR, KZ5AIN,** LA2MA/mm, **PA0AQ, WP4-**BKS and **ZB1BX** when the Generals were looking the other way.

40 **phone's** nighttime DX doings are on the upswing, according to **WA6PDE, WB6DYO** and club reports dealing with **DL6UN, EAs** 7GF 9AZ 7, **FY7YI, GC2FMV** (90) 11, HC1DC, **JA1INJ** (70) 17-18, **KC4s** USB USN, **KH6s** EDD EDR EKZ EVT EYW, **KZ5AF, LA2F*, OAs** 2NW 4NK (85) 4, **PI1BT*** of Holland, **PJ2AA** 6, PY2QT, **PZ1AX,** 8M4CMI/mm, **SP7IIX*, TG9SC, TI2PI, UAs** 1SI 3CR 3MK 4KED **9FC 0BN, UB5s** FJ KAB KKA, **UG6AV** (12) 22, **UL7s** IG JA, UQ2AS, **VKs** 2ACU/m 2ADV 2ALR/m 2AVA (100) 8, 2SA 3BM 3HG 3IT 3MA 3WM 3XM 4RZ 5NN 5QR 8, **VPs** 2KL 7NS (102) 9, **VR3O,** W5JDX/**VP9, XEs** 1AB 1CZ 2PQB 2WH, **YVs** 1IK 4BV (90) 0, 5ANF, **ZK1BS, ZLs** 1AIX 2AAG 2BE 2GX 2WS 3LE (95) 9, **ZSs** 2HI 3E (68) 19, 6AOW 9G* (80) 6, **4X4s** AS CW (72) 19, DK (68) 19-21 and IX, the stars indicating lonely straight-a.m. users. Evidently you've got to pour your juice into one big sideband to cut the 7-Mc. phone mustard these days.

40 **c.w.** continues its bold attack on 20's entrenched DX supremacy. **W7DJU, Ks** 1VWL 1WPG 3MNJ 4BYN 5JVF 7QXG 7SEN 0JPL, **WAs** 4CXH 6PDE and club notations clew us in on the 7-Mc. continuous-waving of **BV1USF, CO2BB** (10) 6, **CR7IZ, CT1KI, CX8** 5AAM (6) 6, 7BY, **DMs** 2AND 2AQI, 2BCN 3JBM 3LMD 3LZN 3XSB, **ET3USA** (15) 23, F2CB/**FC** (15) 6, **FB8s** XX 2, ZZ (15) 16, **FO8AA, GD3FTQ, HAs** 3KGC 6KVK 8KWD, **HC2GRC** (8) 4, **HIs** 3PC (9) 10, 7CAF 8MMN 2, **HKs** 1QQ (8) 3, 3AMA 0, 3LX 4JC (1) 9, 7AJF 7AME 7UL 7ZT 13, 0AI, **HL9s** KH KO KP TG TH, **HMs** 4AQ 5BF 5BG, **HR2FG** 1, IT1AGA, **JAs** 1ACG 1AEA 1ARX 1AYJ 1BNB 1BUI 1CBF 1EFE 1EQM 1EZP 1FHX 1FMK 1FNA 1GKP 1HNP 1HVI 1IHE 1IHT 1ISL 1IZU 1JCE 1JES 1LCS 1LXU 1LYK 1LZA 1MJA 1MML 1YBK 2AGP 2ANS 2BTF 2CEZ 3AQN 3BEA 3BKP 3CAF 3CLS 3DDG 3ECR 3FFD 3FCV 3YAD 4AKL 4PC 4VX/mm in the Pacific, 4YQ 5ACD 5PL 6AK 6AKW 7AXN 7BGT 7SL 9WD 0OP all 13-18, **KA6TN, KC8** 4USN (17) 10, 6BO (2) 4, **KGs** 4AM 6NAA (10) 11, **KV4s** CF CI/CR7 (5) 5 on shipboard, DB 1, **KX6AJ, KZ5s** FC HR 1, LU8ZC, LX1CR (1) 10, **LZ1KSD, MP4BBE** (4) 2, **OAs** 4FM 2, 8NP (14) 2, **OD5AX, OE1GFW, ST2AR, SV0WG** (6) 4, **TF2WAB** 23, **UA0s** AG 1, EQ EW FF KAR (11) 9, KZA MM 18, **UB5s** EY KED KFW XL, **UC2s** CQ LT, **UD6-**KEA, **UF6AU, UI8KAD** 16, **UL7LA** 0, **UM8KAA** 1, UN1BC, **UP2OO, UT5s** CC FE TG, **UW3EH, VKs** 6RU 7SM (11) 12, 0VK of Wilkes base, **VPs** 2AC 2MV 23, 3YG (5) 2, 7AT 0, 8GQ 0, 8HK 23, **VSs** 1LP 1LS 4RS, **VU2GG,** W4WQQ/**VP9** (15) 8, **XEs** 1FN (12) 5, 1IN (7) 5, 1OK 2, 1VT 2, 2BX, **YOs** 8NI 9CN 9EM 9HC, a dozen **YVs, ZB1BX,** many **ZLs** including 4JF (19) 8 of the Campbells, **ZSs** 2HI 2LB 2RM 6KO, **4S7WP, 4X4s** DH (06) 4, MJ OZ, **5X5IG, 6YAXG** (10) 3, **9G1ES** and **9Q5AB** 22. Even WN9FMQ crashed the act with a **WL7FMQ** QSO.

75 **phone** finds a flock of fellows passing up the mess on 40, Europeans in particular go for 3.8 Mc. and lower, as well as Caribbean-area DXers. DARC and ISWL correspondents ignored seasonal QRN to pull through **CN8CG, CT1SQ, EAs** 3GE 9AZ, **EI8P, FG7XT** 0, **FY7YI, G3s** FPQ NFV, **GW5SA, HH2s** RLB P 23, V, HC1DC, **HI8s** XAA (3803 kc.) 0, XAG, **HK4EB, HR3s** AK HH, **HV1CN, HZ1AB** 0, I1CWN, **KP4s** ASK AWH BLC CL 7, DJ PZ, **KZ5s** FP GI OX, **LA1ZE*, OH5TM/0, ON4UN, OY7R, PJ2s** AA AF, **PZ1AX, SM6OE, TI2s** JIC PI, **UAs 2AW** 9KC*, **UB5s** FJ WF WN, **UC2AA** 19, **UL7JA, UP2CG, UR2KAX*. UT5CC*, VKs** 2AVA 3BM, **VE3FFU/SU, VPs 2AB 2SR 3HAG 5BP 7CW 7CZ 7LD 7LG** 4, **9BN 9CP 9L 9OL, VR3O,** W5JDX/**VP9, XE1s** AB CCB CV GJ 4, YO8DD*, **YVs** 1IK 5AGD 5ANS 5APT 5BEN 5BNW, multibandsman **ZB1BX, ZLs** 1AGG 7, 1AIX 3BF 3UC 4FG 4LV 4MD 4OD 7, **3A2CL, 4S7ST, 4U1ITU** 19 and 4X4DK 20, the asterisks meaning non-s.s.b. loners.

80 **c.w.**, still cringing in the wings offstage, reluctantly presented W1SWX/1, W2NKD and K5JVF with occasional shots at such items as **CE3AG, EI9J, HC1DC, HI9KH, JAs** 1CO 1VX 4BNT 6AK 7LK, roving KV4CI, likewise LA7RF/mm, LU1ACF, LX3NF, **PY4GA, ST2AR,**

Hamfests in Tchad generally require long rough rides to a central rendezvous point. At left, above, left to right, TT8AJ, an s.w.l., TT8AC and TT8AJ/2 partake of refreshments at such a meeting, and TT8AM joined the party by long distance, thanks to a portable rig in TT8AC's car. At right, TT8AL enjoys a pile-up or two with homebuilt gear and a Hallicrafters inhaler at Ft. Lamy. (Photos via K2UYG and W2CTN)

UAs 6KAA ØKFG, **UC2s** AD KAR, **UW9**DA, **VKs** 6CE ØVK, **VQ4**IV, W5HCZ/VO2, **ZSs** 1A 5JY and **5B4**BK. WN4NFN joined the fun, too, and is awaiting some wallpaper from **YV5**BFQ for a 3.7-Mc. chat.

With a lot more DX ground to cover this month we'd better pass up our "How's" Bandwagon stop on good old Route **20**. That 14-Mc. range is developing into quite a rag-chewer's paradise, by the way, and it's fashionable to while away the time between DXpeditions by exchanging the latest rumors about the travels of Gus, Dick and Harry. We thank contributors **Ws** 1IKB 2BVN 3GRS 6ISQ 7DJU 7VRO 8YGR, **Ks** 1VPN 1VWL 2UYG 3JHE 3MNJ 6TZX 7QXG 9CZV ØJPL, **WAs** 2ZRR 4CXH 6VAT ØBMW ØBOP, **WB6**AGT, **KG6**AOC, **KL7**FAR (K6KYJ) and **VE7**BBB for their 20-meter c.w. info, and **Ws** 2BVN 6ISQ, **Ks** 2AGJ 2UYG 3JHE 3MNJ 5JTP 9CZV, **KG6**AOC, **KL7s** FAG FAR (K6KYJ) and **VE7**BBB for 14-Mc. phone dispatches. We'll get around to 'em next month and — who knows? — there may be something to report from the 160-meter front, static notwithstanding.

Where:

Asia — "One comment on QSLs," offers KA2CM in FEARL's *News*. "After making contact with your DX station, take the time to make sure he gets your call properly. Many cards arrive here from all over the world, mainly for s.s.b. QSOs, bearing incorrect call signs. Sometimes it's easy to figure out who they're for, but many have to be returned." Careless c.w. work causes a flock of worthless QSLs, too . . . . ARRL Assistant Secretary W1ECH learns that K1LBH's QSL responsibility for 5B4WS contacts dates only from February 22, 1963 . . . . "VU2LNZ has obtained his 'general' license and has dropped the 'Z' from his call," advises W2ODZ. "I will continue to handle QSLs for him. On receipt of Neel's logs cards are sent to all contacts, whether or not a QSL or postage (s.a.s.e.) has been received. I'm sorry to say that returns are poor. I am sure that a QSL from India is appreciated, and Neel needs replies for WAC, DXCC, etc. How about helping us out?" . . . . No chance of confirming QSOs with HMD9A in 1958, according to WGDXC's *DX Bulletin*. W5MAE, who used that call, had to destroy his logs before leaving Iraq . . . . HM9 is Korea's mobile prefix, so HM1AP signs HM9AP when rolling. YL K6QPG handles QSLs for both calls.

Africa — "I've been asked to continue as QSL manager for ex-ZD6HK," states W2ELW. "When Harry becomes a VQ2 I'll do my best to handle his W/K/VE/VO confirmations." . . . . Noting month-by-month revisions in the QTHs of many DX stations, W3HNK wonders which information to employ. We suggest the most recent versions be used, and keep your fingers crossed at all times! As in any "news" type of periodical, this month's data supersedes, modifies or supplements earlier advices . . . . K1EAT, emcee and QSL aide for VE3FFW/SU, tells W1ECH that self-addressed stamped envelopes are just the thing . . . . WØEEE affirms that KØLFY handles U.S. and Canada QSL details for VQ4ERR. S.a.s.e., of course.

Oceania — KM6CX, custodian at KM6BI, communicates: "I have a number of QSLs meant for Midway stations no longer active. They include KM6s AM BA BF BK BO BQ BT BU BW BZ CB CC CG CJ and FAA. If former operators will send me postcards advising their old Midway calls and present addresses I will forward them their QSLs. We also have gone through our KM6BI QSL file, checking it against logs to make sure that replies have been sent out. If we could not establish that a valid QSL had been answered, we dispatched a fresh card via bureau. If you QSLd KM6BI in the past without response, your local bureau should have a card for you now. KM6BI QSLs 100 per cent on receipt. International Reply Coupons, s.a.s.e. and enclosed postage are neither needed nor desired." . . . . W1IKE reminds us that JA1EEB/KG6 Marcus isle confirmations are due for dissemination this month . . . . From the files of W1ECH: "KS6AX offers to try to forward cards destined for any KS6 station although personnel often are rotated elsewhere by the time QSLs arrive Samoa." Clark mentions that mail is received once weekly by air; surface mail may be months in transit . . . . K7GGN desires s.a.s.e. to facilitate his QSL efforts in behalf of FU8-AG/YJ1JG. Non-W/K/VE/VOs should correspond directly with New Hebrides . . . . K5JVF reports rapid results with an s.a.s.e. to KG6NAA for a 7-Mc. contact . . . . W6ZDF/KM6 shut down in May for a two-year term in Japan. Jack writes, "I ran out of QSLs during this year's ARRL DX Contest but will answer all cards received as soon as new blanks arrive. I expect this will mean a three- or four-week delay. Unless s.a.s.e. is supplied, each reply goes via bureau." The home address of W6ZDF continues valid . . . . "QSLs will be sent out upon my return to the States late in September," assures W6FAY/KP6. "S.a.s.e. or IRCs are requested." . . . . NCDXC's *DXer* hears from the Christmas Island Radio Club via VK4SS: "QSL officer Ron Ashley will see that confirmation is 100 per cent, via bureaus. Although VK9DR is the only licensed amateur on our rolls at present, it is probable that we will have more active gams in the near future." Hamwise, it looks like a very merry Christmas . . . . In the LIDXA *DX Bulletin* we see that KJ6BZ has been specifying QSLs via "KH6EGO, APO 915, San Francisco," also that KB6CP wishes airmail s.a.s.e. for fast postal action on his part. VE7BBB has it that anyone who QSLd KJ6BZ using other than Greenwich Mean Time is quite out of luck.

Europe — We still receive inquiries on those Russian UT5 and UW3-9-Ø calls. Same as UB5 and UA3-9-Ø, fellows, so far as the Century Club is concerned. Moreover, UV3s TC TG and others are active in Gorkij oblast to add one more prefix to DXdom's alphabet soup. K3CUI, a dedicated student of U.S.S.R. ham doings, favors us with a breakdown of Russian amateur calls by region (oblasts, krais, S.S.R., etc.) as follows (parenthetic suffixes are club styles): *UA1* A-D F-I L-NN (KA-KD) Leningrad, NO-QK (KE-KH) Arkhangelsk, QL-TI (KI-KL) Vologda, TJ-WG (KM-KP) Novgorod, WH-YE (KQ-KT) Pskov, YF-ZZ (KU-KZ) Murmansk, UA1KED Franz Josef Land, UA1-KAE Antarctica; *UA2* Kaliningrad; *UA3- UV3- UW3* A-EM F-IQ (KA-KD KP KR) Moscow, EO-EZ (KZ) Orlov, IR-JQ (KE) Kalinin, JR-LP (KF) Smolensk, LQ-ML (KG) Lipetsk, MN-NS (KH) Yaroslavl, NT-OM (KI) Kostroma, P (KK) Tula, Q-RJ (KL) Voronezh, RK-SD (KM) Tambov, SE-SZ (KN) Ryazan, T-UI (KO KT) Gorky, UJ-VJ (KQ) Ivanovo, VK-WP (KS) Vladimir, WQ-XK (KU-KV) Kursk, XL-YI (KW) Kaluga, YK-YZ (KY) Bryansk, Z (KX) Belgorod; *UA4* A-B (KA-KB) Volgograd, C-D (KC-KD) Saratov, F-G (KE-KG) Penza, H-J (KH-KJ) Kuibyshev, L-M (KK-KM) Ulyanov, N-O (KN-KO) Kirov, P-R (KP-KR) Tatar, S-T (KS-KT) Mari, U-V (KU-KV) Mordov, W-X (KW-KX) Udmurt, Y-Z (KY-KZ) Chuvash; *UA6* A-B (KA-KB) Krasnodar, F-I (KE-KI) Stavropol, J (KV) North Osetin, L-O (KJ-KO) Rostov, P-R (KP-KR) Chechen-Ingush, U-V (KT-KU) Astrakhan, W (KW) Dagestan, X (KX) Kabardin-Balkar; *UA9- UW9* A-B (KA-KB) Chelyabinsk, C-E (KC-KD) Sverdlovsk, F-G (KE-KG) Perm, H-I (KH-KI) Tomsk, J-L (KJ) Tyumen, M-N (KM-KN) Omsk, O-P (KO-KP) Novosibirsk, Q-R (KQ-KR) Kurgan, S-T (KS-KT) Orenburg, U-V (KU-KV) Kemerovo, W (KW) Bashkir, X (KX) Komi,

Y (KY) Altai; *UAØ-UWØ* A-B W (KA-KB KW) Krasnoyarsk, C-D G (KC-KE KG) Khabarovsk, E-F (KF) Sakhalin, I (KI) Magadan, J (KJ) Amur, L-M (KK) Primorsky, O-P (KO-KP) Buryat, Q-R (KQ) Yakutsk, S-T (KS) Irkutsk, U-V (KU) Chita, Y (KY) Tuvinian, Z (KZ) Kamchatka; *UN1* Karelian. Got 'em all? Note that while UA1KAE is used at Russia's Mirny base, such calls as UA1KAE/1, UA1KAE/2, etc., are sometimes pressed into service at other antarctic points. K3CUI adds, "The Russian callbook compiled by Central Radio Club contains all 10,500 Russian ham calls as of November 1, 1961. Unfortunately, except for small towns and rural areas, the addresses are generally not complete enough to use for direct mailing of QSLs. A typical entry is: 'UA3BW, A.A. Shadsky, Moscow.' I'll be glad to provide names and locations from the book to anyone interested in particular stations. I'll also try to pinpoint specific stations by oblast (there are 172) or zone." When writing Ted don't forget to include self-addressed stamped envelope or postcard for return correspondence . . . . . WGDXC's organ notes that F2CC/FC responds to QSLs bearing s.a.e. with IRCs. Other Corsicans not necessarily so fast with pasteboards are Fs 2CA 2CB 2CS 9JD 9UC 9WJ and 9YP . . . . . Variant Norwegian ham prefixes are defined by ISWL's *Monitor*: LA, normal amateur; LB, portable or alternate location; LC, military; LD, military portable; LE, industrial; LF, experimental; LG, special; LH, school; and LJ, naval. Of possible major DXCC import are certain letters appended to Norwegian call signs — "/p" for Svalbard and "/g" for Antarctica . . . . . Somebody arrogated OY7ML's label in April and May. Martin observes, "I always receive a few QSLs for contacts never made, but this spring more arrived than usual. I cannot confirm these QSOs and haven't time to explain the situation to each QSLer, so please make this known via *QST*." . . . . . TF2WHB's K4MQD goes back to Georgia and tells us that the address in May's "How's" won't work. Reapply to Lee's home QTH . . . . . VE7BBB has official word that there ain't no such thing as a VR7.

South America — "VP1TA guarantees 100-per-cent QSL," comments W1BPM. "Lee emphasizes that some of the writing and addresses on QSLs he receives is difficult to understand. He's disappointed with QSL returns so far, only 60 back for 156 sent out." VP1TA's readability gripe coincides with one of our own pet peeves at QSL printers. *Why* do they so often spread one's QTH in segments all over a card? We mean, say, city and state at the top, street address to lower left, and name somewhere else out of sight. A DX operator not necessarily familiar with our postal procedures is likely to omit an important chunk of an address if he has to chase it all over the pasteboard. He's even less likely to get it in the right order. If you're a DXer who mails out QSLs to get QSLs back, we suggest you insist that your jobber print your full mailing address clearly, concisely, and in the proper sequence on each card . . . . . K5JVF hints, "HC2GRC promises fancy QSLs for QSOs in May commemorating the 40th anniversary of Guayaquil Radio Club." . . . . . KC4USV, where temperatures now are in the nineties (*below*, that is) warns DXCPR *DXer* readers not to expect confirmations before December . . . . . YL VE7-BBB says, "LU7AU wrote that she has quite a backlog of QSLs to answer. She's a fine c.w. operator and is secretary of the awards and QSL bureau committee of Radio Club of Argentina, a job that leaves her very little operating time." Eva strongly recommends W2SAW's foreign-mint postage approach to reluctant QSLers.

FY7YJ is a fresh addition to Radio Club Antilles Guyane personnel, a group responsible for most current French Guiana DX QSOs. Jean is using a Harvey-Wells 50-watt job, National receiver and various skywires, mainly on 20 c.w. (Photo via K2UYG and W1TS)

Hereabouts — A doff of the "How's" hat to the following "QSLers of the Month": COs 2CT 7AI, CPs 1CL 5EZ, CT2AI, DLs 1RK ØKW, EI8P, ET3USA, F8VN, G3EYN, GM3PAE, HC8CA, HH2s JJ V, HKs 1QQ 3EY 3RQ 3VV, HL9s KH TG, I1ZFT, JA7OD, KC6BK, KR6SB, KV4CF, OH2BBM, PJ2AE, PY4AS, SM3CNN, TF2s WHP WHY, TG9s AD DC, UA9FW, VE8MG, VK2AHT, VP1TA, VSs 1LJ 4RS, WØDPH/KP4, XEs 1VT 2JS, YVs 2AA 5ACP 6AV/2, ZS7R, 5B4TC, 5T5AD, 5X5IU, 6YAAH and 9M2UF, this joint commendation sponsored by Ws 1BPM 1TS 5PMK 7VRO 8YGR ØGER, Ks 6TZX 7QXG 9CZV ØJPL, WAs 2IVV 2MIF 6RJJ 6VAT 8AJZ ØBMW and WN2DDA for prompt confirmation of recent QSOs. QSL managers Ws 2CTN 2HMJ 3SOH 9VZP and K1KDP also are mentioned in dispatches from the DX front. W1TS's nomination, HK3VV, was worked at 0330 GMT Friday and his card reached Don by 1430 on Saturday! K7QXG applauds his nominee, KV4CF: "Received his card direct and pronto even though our QSO took place during the ARRL Test. On his card KV4CF states he made more than 2200 contacts in the affair, yet he still sent my QSL direct without IRCs, etc." . . . . . HL9KB (FP8AG) and WØFNO (FP8AL) tell Ws 1AW and 9RTY that their St. Pierre calls have been used spuriously of late . . . . . W7UVR assures W1ECH he does no QSL managing for DX stations despite rumor to the contrary . . . . . FDXC's *DX Report* notes that 8M7ACB, QSL chargé for OX3JV (OZ7JV), gets monthly log transcripts from Greenland . . . . . *Help!* K2KBI hunts a hint on reaching Dick Bales of SVØWT for '62 operations; K4BYN wants info on the FY7YF he worked in '56, curious VR8E '59, any 1957–'58 ZD9 type, and 9U5ZZ; VE7BBB will settle for the mail QTH of USS *Washington* . . . . . WA6VAT offers his services as QSL manager for DX stations in bona-fide need . . . . . And now a few specific suggestions for your salivary pleasure, keeping in view the fact that the following QTH catalog is necessarily neither accurate, complete nor "official":

BY1PK, Box 427, Peking, China
CP5EZ (via W2CTN)
CR7CI, A. de Figueiredo, Aeroporte Deta, Box 2060, Lco. Marques, Mozambique
DU1JC (via W6ZJY)
DUØDM (via DU1CE)
EI9SE (via 1RTS)
ex-FF8CP (to F3KK)
FK8AT (via W2CTN)
FK8AU, R. Thomas, Box 637, Noumea, New Caledonia
FL5A (via W4ECI)
FU8AG, J. Gavarone, Meteo, Santo, New Hebrides (W/K/VE/VOs via K7GGN)
FY7YJ, Radio Club Antilles Guyane, 28 rue Lieutenant Goinet Prolongee, Cayenne, French Guiana
GB3RAF (via G2BVN)
HH2M, P.O. Box 488, Port-au-Prince, Haiti
HI8MMN (via WA5DAJ)
HK2WC, A. Munoz, Box 855, Cucuta, Colombia
HK4AHT, G. Resrepo, Box 4366, Medellin, Colombia
HMs 1AP 9AP (via K6QPG)
HP1AP, A. Venero, Box 940, Panama, R.P.
HP1IE (via W2CTN)
JT1s AD CA, Box 639, Ulan Bator, M.P.R.
JT3BB, Box 34, Tiseian, M.P.R.
KA7TB (via K4SCT)
KG4s AM BX (via W2CTN)
KG6ID (via W9VZP)
KR8AG (via OARC)
KX6BK, E. de Young, Box 1838, Navy 824, FPO, San Francisco, Calif.
KZ5EV, J. Tolliver, Box 401, Balboa, C.Z.
LU4FX, M. Grieder, P.O. Box 72, Santa Fe, S.F., Argentina
LX3CF (to ON4CF)
M1DBK (to I1DBK)
M1QJ (to ON4QJ)
MP4TAO (via DJ1BZ)
OX3JV (via SM7ACB)
OY7ML (W/K/VE/VOs via W6NJU; others via DL6EQ)
ex-PJ2AF, L. McBurney, 1232 W. Queen St., Hampton, Va.
PJ2ME (via W2CTN)
PX1MO (to F2MO)
PX1OX (to DL2OX)
PX1QX (to F2QX)
PY4BEL, Box 93, Barbacena, M.G., Brazil
PZ1AR, W. Hekkenberg, Box 240, Paramaribo, Surinam
SM6UL/mm (via SSA)
ex-TF2WHB (to K4MQD)
TF2WHX, Navy 568, Box 6, FPO, New York, N.Y.
TI9RC (via W4ECI)
UA3CR, Box 82, Moscow, U.S.S.R.
UA3DR, Box 111, Moscow, U.S.S.R.
UA9KCE, Box 92, Sverdlovsk, Siberia, U.S.S.R.

UB5FY, Box 45, Dnepropetrovsk, Ukrainian S.S.R., U.S.S.R.
UB5TW, Box 43, Dnepropetrovsk, Ukrainian S.S.R., U.S.S.R.
UT5EH, Box 44, Dnepropetrovsk, Ukrainian S.S.R., U.S.S.R.
UT5EI, Box 30, Dnepropetrovsk, Ukrainian S.S.R., U.S.S.R.
VE3FFW/SU (via K1EAT)
VK4HG, H. Hicks, 545 Crown St., Surry Hills, N.S.W., Aus.
VK4WV, J. Walker, 8 Dedrick St., Braybrook, Vic., Aus.
ex-VK5NQ (to VK5ZP)
VK5ZP, J. Vale, 29 Calton Rd., Gawler E., S.A., Aus.
VP1TA, P.O. Box 518, Belize, Br. Honduras
VP5LG (to VP7LG)
VP9WB (via KØORII)
VQ8BFA (via G8KS)
VU2LN (via W2ODZ)
W6FAY/KP6, J. Carr, Box 11173, San Diego, Calif.
W6ZDF/KM6 (to W6ZDF)
WA4LTX/KJ6, C. Robinson, Box 100, APO 105, San Francisco, Calif.
XE1IN Box 35, Ocotlan, Jal., Mexico
XF1A, Box 339, Mexico D.F., Mexico
XT2Z (to HB9ZY)
YJ1JB (to VK2QJ)
YJ1JG (see FU8AG)
YN4GJ, Box 769, Managua, Nicaragua
YV1DJ, Dr. A. Manzanilla, P.O. Box 111, Maracaibo, Venezuela
YV1LV, Box 1019, Maracaibo, Venezuela
YV4GD, Box 503, Valencia, Venezuela
YV4ID, Box 2737, LRV, Caracas, Venezuela
YV5BMA, R. Friedman, Box 10089, Caracas, Venezuela
YV7AL/4, Box 2737, LRV, Caracas, Venezuela
ZB1BX (via W2CTN)
ex-ZD6HK, H. Kingsland, P.O. Box 2187, Lusaka, Northern Rhodesia (W/K/VE/VOs via W2ELW)
ZS7R (via W3SOH)
5B4JW, Hq., B.F.C., BFPO 53, Cyprus
5B4TC (via W2CTN)
5B4WS (via K1LBH; see text preceding)
5R8CO, R. Rabaud, Aerodrome Arevorunamo, Malagasy Rep.
ex-5T5AC (to TY2AB)
6N5X-HL5X (via W6ZY)
6YAWW (to VE2WW)
9Q5CP, P.O. Box 1268, Leopoldville, Rep. of Congo
9Q5WH, c/o U.S. Embassy, Leopoldville, Rep. of Congo
9U5IB, P.O. Box 1710, Usumbura, Burundi

Contributors of the preceding tabulation are **Ws** 1BPM 1ECH 1TS 1WPO 1YYM 2BVN 2CVW 4ML 5PMK 7DJU 8YGR 9AKV, **Ks** 2UYG 5JVF 6KYJ 6QPG 6TZX 7QXG 9JPL, **WAs** 4CXH 6RJJ ØBMW ØBOP, **KL7FAR**, **UB5TW**, VE7BBB, American SWL Club *SWL* (6204 E. 109th Ter., Kansas City, Mo.), DARC *DX-MB* (DLs 3RK 9PF), DX Club of Puerto Rico *DXer* (KP4RK), Far East Auxiliary Radio League *News* (KA2EB), Florida DX Club *DX Report* (K4IIF), International Short Wave League *Monitor* (12 Gladwell Rd., London N.8, England), Long Island DX Association *DX Bulletin* (W2MES), Northern California DX Club *DXer* (WA6TGY), Western Washington DX Association *DX Northwest* (W7JPC) and West Gulf DX Club *DX Bulletin* (W5IGJ). Any "Where" info in *your* log to pass along?

Whence:

Asia — Gang, get set for that *long* haul. On the last week end of this month you're cordially invited to participate in the 4th All-Asian DX Contest, an annual affray sponsored by JARL (Japan). It's a c.w.-only deal for solo operators starting at 1000 GMT on the 24th and concluding 1600 the 25th. The password is "CQ AA" and non-Asians will strive to catch Asians from 3.5 through 28 Mc. Serial exchange consists of RST plus your age in years; YLs, however, are gallantly allowed to substitute two zeroes for the revealing statistic. For final score multiply total different Asian stations worked per band by the total number of Asian band-countries collected. (Working JA1YL on three bands, for example, would net nine points.) High scorers in multiband and monoband categories may be eligible for certificate and trophy recognition if log entries are shipped to JARL Contest Committee, P.O. Box 377, Tokyo Central, Japan, postmarked no later than September 30, 1963 . . . . . In the 3rd All-Asian DX Test of a year ago, best U.S.A. score was turned in by W6AFI, K1RTB, W2WZ, K5UYF, K7JCA, W8JIN and W9LIL led their call areas. VE6TP topped Canada, and VE2s NV and AFC copped 7- and 21-Mc. championships. High scorers by continent were 4X4NJ, W6AFI, 5A1TW, UT5AA, LU8FBH and KC6BK. On the home front JA1VX nosed out JA1BK for multiband supremacy, followed closely by JAs 6AK and 3CKI. JAs 2JW 4AO 5FQ 7AD 8LN 9FB and ØQA paced other call areas . . . . . Amateur radio still is unaccepted in Turkey, according to K1EBY's recent report to W1ECH of ARRL Hq. after an 18-month sojourn over there. K3JHE qualifies this view slightly in a letter from APO 133, remarking, "To my knowledge there is only one amateur station in Turkey, TA2BL, and I believe he is a Turkish national. I have an occasional opportunity to listen on the bands here. Europe pours through continually on 14 Mc., and 21 Mc. is regularly good for Africa." . . . . . "VU2LN, formerly VU2LNZ, puts a good signal into the States with but 25 watts," testifies W2ODZ. "His usual operating times are 1230-1300 GMT daily, and 1630-1800 Saturdays on 14 Mc., also 1030-1230 Sundays on 21 Mc." . . . . . There are 3000 different stations among the nearly 10,000 W/K contacts in VU2AJ's log. W5AI-W5VA writes, "We've offered a suitable award for Dutt when he reaches that 10,000th U.S.A. contact, and the spirit he shows in working so hard to complete his aim is the thing that makes amateur radio such a wonderful game. VU2AJ usually can be found on 14,040-kc. c.w. at 0200-0300 GMT." . . . . . Kushal Harvant Singh, 31(774) Upper Museum Rd., Taiping, Perak, Malaya, desires to correspond with an American amateur. He's an avid reader of *QST* and RSGB's *Bulletin* . . . . . W9WNV, whose HL9KH call isn't nearly rare enough to suit him, expects to follow his Parece Vela KG61D doings with another DXpeditionary venture this month or next. Don rang up about 2400 contacts in 33 hours on that one . . . . . W2BVN discovers that Wera of UAØKSS is handy for one's Asian YL collection . . . . . K6KYJ observed HL9KH acting as relay between 9N1s MM and ME on 20 sideband while the latter's unit ascended Everest early this year. K6KYJ has a pretty rare QTH himself, operating KL7FAR on St. Lawrence island in the Bering Sea . . . . . K6QPG says conditions are getting no better fast, for HM1AP's log shows only six Stateside QSOs in the past three months . . . . . W8BF couldn't snare VS1LP on 20 sideband despite hours of stalking. He mentioned this to DU1JC one morning, and VS1LP popped up on frequency for a solid QSO . . . . . K2UYG hears that W4BPD, our orbiting Orangeburger, would like to add the BY prefix to his lengthening DXpeditionary shortsnorter after an AC3-4-5 romp . . . . . More Asia gleanings via aforementioned club sources: YIs 2AP, 14,005-kc. c.w., 2WS also 20 c.w., and 4AC on 14,300-kc. sideband tempt Iraq-hunters. Neighbor YK1AC has plenty of autograph-seekers milling around 14,040 kc. at zero GMT. . . . VS1LP (ex-EP2BK) menaces Indonesia's rarity with occasional visits. So does W9AAC/PK1, 14,349-kc. s.s.b. . . . Channel Two must be taking a beating in Mongolia. JTs 1AC 1AD 1AE 1AG 1CR 1KAA 1KAC 1KAD 2KAA and 3BB all are reported active on 20 . . . . . VS9AAA expects Yemen to become DXpeditionally topical again by October. . . . KAs 2CF (WA5-BUY), 2HA (KØRNW), 2MW (W4WZM), 7BH (K7NQC), 7DR (K1GCX) and 7WK (KØRQA) recently gained or renewed FEARL(M) memberships. . . . Ten Okinawa QSLs can qualify a U.S. amateur for the Okinawa Award issued by OARC; VE/VOs need but five. Consult the KR QSL bureau for full particulars.

Africa — DXdom loses a Nyasaland mainstay with ZD6HK's move to VQ2-land. As W2ELW points out, Harry's high QSO output was coupled with a QSL dependability that earned ZD6HK status as a QSLer of the Month more than once . . . . . 5N2RSB would like to scare up effective portable gear to take with him to Tchad and the Cameroons, according to K3MNJ . . . . . K2UYG observes that VQ9HB made good his Agalegas threat with a leisurely VQ8BFA development in early June . . . . . Africa addenda via club organs: Boomer W4BPD, after a June FL5A flurry, conducted subsequent mopping-up operations in the VS9 and VS9K bailiwicks. F9RS indicates that resident

ZD6HK, a world-wide favorite from Blantyre, closes down this layout in favor of relocation to Northern Rhodesia. Harry soon will reactivate his Viceroy 180-watter, Eddystone receiver and beam as a VQ2. He's a surveyor by trade. (Photo via W2ELW)

YU2DB has a signal familiar to the Stateside DX crowd. Matija's QTH is Yugoslavia's second city, Zagreb. Incidentally, W1TS describes the YU gang as the world's best QSLers. Don has received 58 cards from 61 YUs worked. (Photo via WA2RAU)

amateurs may blossom forth on the Gloriosos, Tromelin and Europa before the year is out. Inspiration from Gus? Meanwhile, better keep those three receivers on 14,034, 14,065 and 14,108 kc. as usual. . . . IT1TAI's 3V8 intentions may carry well into this month.

Oceania — FU8AG/YJ1JG has the gang grabbin' at 20's low edge with a DX-60, 50-ft.-high Windom and BC-348 tuner-inner. W1ECH says Jean's line is meteorology . . . . . KZ5LC reports VR6AC on the mend in the Canal Zone after major surgery. Len keeps Floyd's friends and family informed via nightly skeds . . . . . VK5NQ, weary of being confused with his OM, VK5NO, had his call changed to VK5ZP . . . . . VK4s HG and WV tried a little 7- and 14-Mc. DXing before terminating Willis island assignments in June. 'Twas a rough go, though, as K2UYG verifies: "I heard half the band calling them around 0600–0900 GMT one night but only a VK5 made out on phone. A few lucky W/Ks scored on 7050 kc. at 0900, however." VK2AGH gives cheer: "A new op on Willis should relieve the pressure. Beginning June 13th, a change of personnel took place there. The new man, VK4JQ, is ex-G3DYD-VR3N-JZ0PC-VK2AVU. John has a Swan transceiver for 14-Mc. single-sideband work, and also expects to use c.w. on 3506, 3510, 3520, 7025 and 7050 kc. He hopes to be active DXwise as conditions permit but will be limited by fuel, commercial schedules, weather and radiosonde duties. Willis, a cyclone warning station, receives but one ship per year and is a completely isolated atoll only 300 yards long and 100 yards wide." . . . . . WØHJL learns of ZK2AB's QRT after 16 years on Niue. Charlie probably will resume DX action with a ZL call shortly . . . . . KG6AOC logged a batch of c.w. Europeans on 20 while flying at 3000 feet with the 7th Fleet near the Philippines. "Frustration! Couldn't answer a one." . . . . . W6ZDF/KM6, off to Japan, mentions that Midway amateurs were closed down for a week in May pending completion of the *Faith* 7 orbital space shot, reasons obscure. Jack intends to spend much of his KA2 time designing and constructing a shnazzy c.w. traffic layout for use when he retires from the Navy five years hence. He's a BPL type at heart . . . . . W6FAY/-KP6's Palmyra performance should wind up this month. He may take a swipe at Jarvis before heading home. Jay intended to give 10 through 160 meters a thorough DX workout with his Viking, HQ-145 and s.s.b. gear . . . . . "KJ6BV has a new op, Frank, doing a fine job," declares VE7BBB. "W5BRX/KJ6 also helps keep Johnston on the DX map." . . . . . Further Pacific jottings courtesy the clubs press: VR1N, promulgated by W2GHK & Co., kept Ocean isle on tap through most of June, mainly c.w. . . . . KG6SA offers Saipan on 14,050-kc. c.w., 0700–0800 GMT. . . . Quote from the Christmas VK9DR mob: "We will have the loan of s.s.b. equipment beginning in August, so get the boys ready for DX contacts on 20 and 40 meters from 0400 to 0700 GMT. Our club has about forty enthusiastic members of many races, and the spirit of amateur radio prevails." *That's* the spirit! . . . VK9LA reminds us that December is the deadline for availability of his HT-37, 2A and TH-4 on Cocos-Keeling.

Europe — DARC (Germany) invites amateurs throughout the world to participate in the WAE DX Contest, No. 9 in the series, scheduled for (c.w.) from 0000 GMT August 10th to 2400 the 11th, and (phone) same hours August 17th–18th. Non-European stations will trade RST001, RST002, etc. (omit the "T" on phone, of course) serials with Europeans once per band at one point per QSO (two points per 3.5-Mc. contact). Additional points are yours by sending "QSO reports" (QTC) to European stations at one point per QTC. Each QTC consists of (1) time in GMT, (2) station call, and (3) QSO number of any previous WAE Test contact. For example, W9XYZ raises DJ7JJ and earns a contact point thereby; W9XYZ previously worked G3BS at 1207 GMT for G3BS's 96th Test QSO. So, besides the QSO point for his serial swap with DJ7JJ, another point accrues to W9XYZ if he sends "1207/G3BS/096" to DJ7JJ. W9XYZ can work DJ7JJ again later on the same band, but only for QTC purposes. Over the entire Test period each QTC can be transmitted to Europe by W9XYZ but once, and DJ7JJ can accept no more than 10 QTC per band from W9XYZ. (It thus figures that the more Test QSOs accumulated, the more QTC are available to parlay into additional points. *Scoring:* Multiply combined QSO and QTC points collected on all bands by the combined numbers of multipliers collected on all bands, the latter deriving from DARC'S Worked-All-Europe Countries List — CT1 CT2 DJ/DL/DM EA EA6 EI F FC G GC GD GI GM GW HA HB HE HV I IS IT LA LX LZ M1 OE OH OH0 OK ON OY OZ PA/PI PX SL/SM SV TF UA1-6/UW1-6 UB5/UT5 UC UN UO UP UQ UR YO YU ZA ZB1 ZB2 3A2 GM Shetland, LA/p Jan Mayen, LA/p Bear, LA/p Spitzbergen, SV Crete, SV Rhodes, TA Europe and UA Franz Jose Land. (DARC stresses that UD UF and UG are Asia, not Europe.) Entries go to Dr. H.-G. Todt, DL7EN, Chlodwigstr. 5, 1 Berlin 42, Germany, postmarked no later than October 15, 1963. The highest scorer in each continent and country (or call area in some cases) will earn a certificate of merit; second- and third-place awards also will be considered. As one unstable motor generator said to another, "Good huntin'!" . . . . . DJ3KR forwards results of last August's WAE Test wherein U.S.A. call-area kingpins are K1MEM, WA2WBH, W3AFM, K4BAI, W5WZQ, WA6SBO, W7PQE, W9KXK and KØBPO on c.w. (no Eights applied). VE1ZZ led Canadian code entrants. Continental c.w. leaders are G2DC, WA2WBH, HG1DC, ZS6IW, UA9DN and KH6DVG. DJ3KR took the homeland pumphandle prize. On the phone front we find K1OSY, W2WZ, W3OCU, K4LDR, K5MDX and K8CFU pacing the only U.S. call areas reporting. Voice victors by continent are LX1TJ, OX3AI, PY7CMP, 9G1YL and EP3RO. DJ3KR squeaked past DJ2YA to swing a c.w.-phone grandslam . . . . . Next month comes the annual Scandinavian Activity Contest, 1963's version sponsored by SRAL (Finland). Mark your calendars for (c.w.) September 14th–15th, and (phone) 21st–22nd — participation details next issue . . . . . It's not too early to plan for RSGB's 7-Mc. DX Contest, a 40-meter free-for-all scheduled for (phone) October 19th–20th, and (c.w.) November 2nd–3rd. The world works the British Isles in that one . . . . . Ws 2BBV 2BIB 9IOP, DL9PF, HB9TL and MP4BBW were talent tentatively teamed up for W2GHK's Hammarlund Co. DXpedition of the Month last month, a sideband-c.w. strike at Corsica . . . . . According to K2UYG, OY7ML's landlord is adding another floor, so Martin's beam will get a delayed boost. OY7ML has acquired a tape printer, by the way, and expects to switch to RTTY by winter . . . . . W1ECH of ARRL tells us that G3OQT has a shiny new 160-meter WAC diploma, one of the most DXclusive awards in all amateur radio . . . . . Target period for the s.s.b. Andorra endeavor of F2s MO and QX as PX1s MO and QX is August 31st through September 7th . . . . . From WA2RAU we hear that W8MXY helped to save the life of an injured crewman aboard SS/T *TransHatteras* in the Mediterranean last October. Timely medical advice from Cincinnati . . . . . G3WW, now visiting his sister in Rhodesia, plans a mid-September operational visit to Ely isle. G3WW/p's Viceroy will transmit single-sideband on 14,110 kc. while an HQ-170E monitors 14,280–14,285 kc. . . . . British listener J. F. Gentry wants to hear from Yank s.w.l.s. or amateurs deeply interested in 3650–3800-kc. phone DX. Mail can reach him via T. Duignan, 45 Chelsea, Fairfield, Conn. . . . . European oddments via club journals: EI8SE will be the IRTS (Ireland) multiband contribution to the Dublin Scientific Exhibition in late October. . . . SVØWQ, Rhodes, is sometimes heard working SVØWB Saturdays on 14,035 kc. at 0800 GMT. . . . GC8KS (G8KS) accumulated some 1700 QSOs with sixty countries on a scheduled spring sally.

South America — VP1TA apprises W1BPM that he engages in DXtensive radiotelephony on 21,300 or 21,240 kc. almost daily between 2300 and 2400 GMT. Fast chap with a pasteboard, too . . . . . CX5AAM, 40 c.w., contributed K5JVF's first YL-type DX QSO . . . . . WA2WUV's April-May HC8CA Galapagos binge under LIDXA auspices netted more than five kiloQSOs. W2MES wearily but cheerfully bears the QSL brunt, and Virgil scans his atlas for more DXCC worlds to conquer.

Hereabouts — W9EVI, who has generated his share of DXpeditionary excitement, calls your attention to

(*Continued on page 138*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
ROBERT L. WHITE, W1WPO, DXCC Awards
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr.

Incentive Licensing. Operating results, one's knowledge of a communications service given others, earned recognition through appointment or awards, rewards in self-training and advanced know-how whether in technique or operations have tremendous incentive force. But it takes self application to mark each step of progress. Raphael Soifer, K2QBW-K1WXC, says there's a "special kind" of proficiency and enthusiasm for the amateur who evaluates types of signal propagation. A leader in such scatter and satellite reception work himself, he writes, "What then, of the thousands who are not pioneers or would-be adventurers?" His commentary on the subject is, we believe, worth pondering by every FCC or DOT licensee who calls himself a radio amateur.

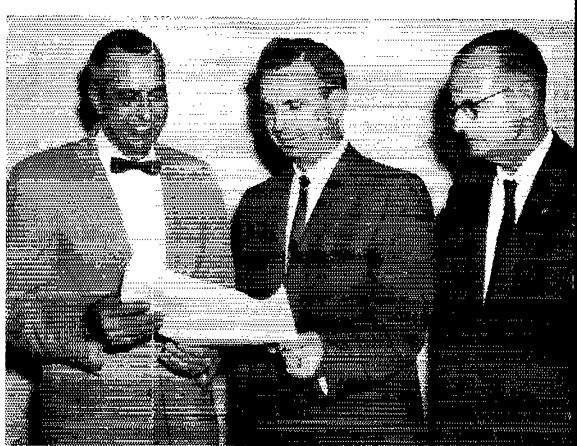
"Some of them indeed handle traffic, some assist in Civil Defense, are part of the Amateur Radio Emergency Corps of ARRL. Others may elect to serve their brother hams as Official Observers and the like, or even as ARRL officials This does not alter the fact that a majority of licensed amateurs are not pulling their weight.

"The ITU and FCC do not foster or allocate frequencies to our amateur radio as a service to the people of the world so the citizenry can relax and enjoy a hobby in the Golden Years. That amateur radio exists as a hobby only because of the service it renders is not just a saying. It is a hard, cruel (?) fact. A test of any legislative proposal is not its effect upon the self-styled rights and prerogatives of the hobbiest, nor on his investment, but solely upon the ability of the amateur service as a whole to accomplish its publicly-charged mission in the public interest, convenience, or necessity.

"Now, public service can take many forms. Not the least of these is development of greater technical and operating (yes, Virginia, there is a c.w. band) competence. It stands to reason the better-trained man has the best chance of making a break-through or modestly increasing the state of the art. This, even if he does not fancy himself an innovator. His quest for that next country, that next piece of wall-paper, even that next percentage point for his net's message-rate column, may drive him forward to achievement — but only if he is qualified. For the poor operator, the dabbler, there is always an easy solution. Simply do what someone else has done. We owe it to ourselves to develop that climate which encourages personal development — the good old American environment of incentives for personal effort.

"Amateur radio's many laurels have been earned through such a system, or were earned by people who themselves had progressed under such a system. A freeloader never accomplished anything. Let us proceed now to stop freeloading and resume earning our keep. By so doing we will be making amateur radio far stronger and richer for all."

Items That Add Interest to Your QSLs. Make certain all essential elements are there. Your call and the call of the station addressed are required. A card must show (1) that it confirms making a two-way contact (2) and it should indicate the frequency, date, time, mode and report for this. (3) The location of your station and the signature of the operator are desirable to make it a true document fully useful for submission for various award purposes. Time, we think should always be shown in GMT. This removes the chance of error or ambiguity across datelines. In designing cards, the modern tendency is to streamline. However, we believe details concerning antennas, transmitter, receiver and the like add much to the presentation. We like to learn more



Delta Division Director Floyd Teetson W5MUG (Center) presents the new charter to the Biloxi Amateur Radio Club's president (left) W5UOO while Mississippi SCM W5EMM looks on.

about our fellow operator. Cards meeting basic requirements can be given added force by mentioning your top SCM appointments, and awards. Slogans can be used, also facts that can be shown pictorially add a lot if presented that way.

"QSL Sure . . . QSP Always." Cards exchanged by hams carry a variety of slogans. We think this is a good combination one. Such expressions emphasize the dependable, useful fraternal exchange of cards and as well, the cooperative working together in handling a message in domestic correspondence or in net operations. The *true spirit* of amateur radio is that in which we freely exchange our station cards and operate cooperatively handling messages, whether contributing to the public interest or for each other in our relaying.

VHF a Natural for Summer Mobiling. This summer should see all records broken for use of 6 and 2 meters. Bob Schoening, WØTKX, tells what fun it can be in a club bulletin presentation. "Here in Minnesota 6-meters is lively but 2-meters needs a shot in the arm. Not so in cities where 6 meter TVI has the hams mainly using 144 Mc. Last summer we drove to Massachusetts and took along a 2-meter rig. Before reaching Chicago we had our first contacts . . . held QSOs with Illinois and Indiana hams all the way through the region. With a WØ call we attracted attention and using v.f.o. had no trouble making contacts! The Novices and Techs were listening mainly in the middle of the band. The old time DXers were around the low end. A Gary, Ind. ham helped us find the right freeway and we headed for Detroit. (We crossed into Canada about 4 A.M. and had no more QSOs till back in the U.S. next day.)

"Crossing the border into Buffalo we put the antenna back up and at once started having QSOs en route to Syracuse and Albany. Most towns along the NY Freeway were *especially* active on two. One could work them nicely for 40 miles or so. Rochester, not large, takes the prize for most activity at all hours! Before hitting the Mass. Turnpike (we didn't go to NYC) we had our last QSO with a W2 operating portable. The story was the same on the way back with plenty of QSOs near cities in daylight and evening hours . . . 'Six' used to be dead if you didn't know when to get on but also has picked up tremendously. We hope 'two' will continue good and recommend the band to everyone, especially the Technicians. Mobiling around here (time limited at home) has resulted in working WØMDL and others almost to St. Cloud and Little Falls."

—*F. E. H.*

VHF SS Corrections

In the June *QST* VHF SS report, the second ranking E. N. Y. score belongs to WA2FYE and the high Novice score in Md.-D. C. was earned by KN3VST.

A.R.R.L. ACTIVITIES CALENDAR

(Dates are shown in GMT)

Aug. 1: CP Qualifying Run — W6OWP
Aug. 16: CP Qualifying Run — W1AW
Sept. 6: CP Qualifying Run — W6OWP
Sept. 12: Frequency Measuring Test
Sept. 14–15: V.H.F. QSO Party
Sept. 21: CP Qualifying Run — W1AW
Oct. 3: CP Qualifying Run — W6OWP
Oct. 5–6: Simulated Emergency Test
Oct. 22: CP Qualifying Run — W1AW
Nov. 9–11, 16–18: Sweepstakes Contest

OTHER ACTIVITIES

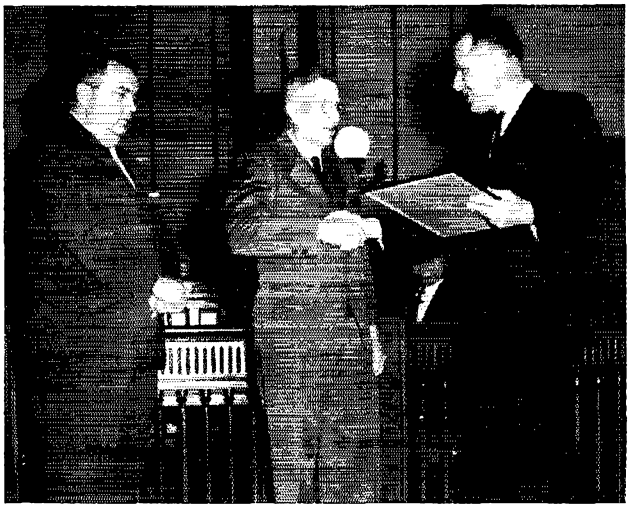
The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Aug. 10–11, 17–18: WAE DX Contest, DARC (p. 76, this issue).

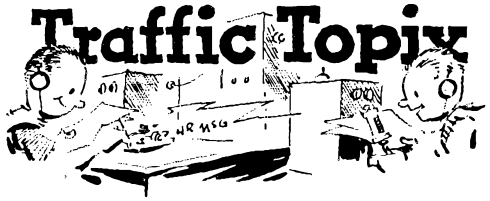
Aug. 24–25: Fourth All Asian DX Contest, Japan Amateur Radio League (p. 75, this issue).

Aug. 24–26: New Jersey QSO Party, GSARA (p. 104, this issue).

Sept. 24–15, 21–22: Scandinavian Activity Contest, EDR (next issue).



Old timer "Uncle" Al Parker, W4BAW of New Bern, S. C., received a citation on April 15 for his past services in local emergencies. It was presented (above) by the mayor of New Bern (Dr. D. T. Millus, right) while R. L. Stallings, Chairman of the Craven County Commissioners, looked on.



As we write, it occurs to us that this will be the last time we will prepare copy for this column at this desk at 38 La Salle Road. The next one will be written under a completely different environment, at a new desk in a new building with some elbow room. Nevertheless, we expect to experience an occasional twinge of nostalgia in our new quarters. You don't leave a home of some 25 years without such feelings. But it's an old story — out with the old, in with the new, an inexorable corollary to progress.

This has nothing to do with traffic handling, but there *is* an analogy. Some of our traffic people, especially the old ones, are unwilling to accept progress, especially if it appears to be in a form which may have the effect of decreasing their stature. Nothing unnatural about this. We're familiar with their feelings, we share their fond reminiscences and, like them, often think that the "good old days" had a lot to recommend them that today's operating definitely lacks. This does not alter the fact that in a rapidly changing amateur radio (for the better or worse is a matter of opinion) we operate under rapidly changing circumstances and it is necessary to adopt a few new habits. To the minority who are too old and "set" to change their ways, we can only say regretfully that we respect your right to operate as you please and wish you joy in doing so, provided only that you grant the majority a similar right. And if in the course of events you should decide that new methods being introduced, in spite of having the stigma of newness, have certain advantages over the old methods, you old timers are the ones who will be called upon to provide the leadership we need for putting amateur radio in the forefront of public service. — *W1NJM.*

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May Net Reports. All ARRL Official Bulletins are aired on the 75 Meter Interstate S.S.B. Net, according to Net Manager W9NWK. The 20 Meter Interstate S.S.B. Net needs net control stations; anyone interested, contact W8TEL.

Net	*Sessions*	*Check-ins*	*Traffic*
20 Meter I.S.S.B.	23	479	1722
75 Meter I.S.S.	31	1208	433
Early Bird Transcon	31	31	49
7290	47	1516	1173
FARM	25	767	50
All Service	4	34	20
Northeast Area Barnyard	—	761	13

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National Traffic System. We don't know why it is, but trouble seems to come to NTS in batches. Everything goes along fine for a few months, then we start getting letters from NTS managers and members complaining about this and that and the other thing. Out of all reports received this month, three of them express doubts that the manager can hang on much longer under present conditions. We wish to assure all concerned that this condition is temporary, that it arises primarily from a cause which NTS was designed to alleviate — too much reliance being placed on a few individuals — and that eventually it will straighten itself out, with or without the individuals concerned. If we cannot get experienced help on our nets who will operate "according to Hoyle," then we will use what help we can get. If we can't get enough c.w. men to conduct a region net in any region, then we'll do it on phone. The NTS is a systematized plan for handling traffic that *will* work if we *make* it work, but it requires fealty of all its parts to the general plan. It has no place for individual idiosyncrasies. It finds the people to work into it, it does not alter itself to suit individual conveniences. This is the way a traffic system works, the *only* way it *can* work. If we keep this in mind, we'll continue to have a National Traffic System we can point to with pride as the tightest, most efficient nationwide service organization in the whole of amateur radio, in which all modes work together toward one common objective — point-to-point record communication combining efficiency with system in the public interest. — *W1NJM.*

May reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN	31	1991	1.100	64.2	100.0
CAN	31	1416	.812	45.6	100.0
PAN	27	1038	.977	38.4	97.8
1RN	59	828	.387	14.0	69.2
2RN	62	770	.502	12.4	99.7
3RN	62	752	.429	12.1	96.2
4RN	62	818	.364	13.2	89.6
RN5	60	1046	.485	17.8	89.7
RN6	51	548	.302	10.7	82.9
RN7	60	460	.250	7.7	74.2
8RN	62	506	.250	8.2	92.5
9RN	31	667	.573	21.5	93.5[1]
TEN	54	528	.363	9.8	68.1
ECN	31	103	.192	3.3	71.0[1]
TWN	24	100	.214	4.2	45.0[1]
Sections[3]	1520	9030			
TCC Eastern	99[2]	889			
TCC Central	31[2]	328			
TCC Pacific	103[2]	953			
Summary	2227	22882	EAN	9.3	EAN/CAN
Record	1951	21774	.909	22.1	100.0
Late Reports:					
3RN (Apr.)	60	617	.296	10.3	96.7
RN7 (Apr.)	60	565	.300	9.4	72.3
TWN (Apr.)	28	256	.302	9.1	72.5

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

[2] TCC functions reported, not counted as net sessions.

[3] Section nets reporting (51): GSPN (N.H.); 50th State (Hawaii); Fla. Phone; QFN, FMTN, TPTN, GN (Fla.); Tenn. SSB; E. Tenn. Phone; Tenn. CW; SGN (Me.); SCS, SCVSN, SCN (Calif.); VN, VSN (VA.); THEN, NCSN, NCN (N.C.); GBN (Ont.); Central Pa. 6M; QMN (2 Mich.); W. Fla. Phone; MDD, MDDS (Md., Del.-D.C.); MSPN Noon, MSN (Minn.); WIN Badger (Wis.); TEX, NTTN (Texas); GEM (Idaho); AENM, AENH, AEND, AENB, AENO, AENP, AENR, AENS, AENT (Ala.); QKS (Kans.); RISPN (R.I.); EPA, KSSN, Susq. Valley 6M (Pa.); NEB (Nebr.); CN (Conn.); GSN (Ga.); BUN (Utah).

Almost as though they had gotten together and decided to do it, the section nets came through with a record-breaking number of reports and were instrumental in breaking monthly records for number of sessions and total traffic.

MEET THE SCMs

Tennessee SCM Dave *Goggio*, W4OGG, has been licensed since '40, previously holding the calls W9GHD and WØGHD. Dave is well known for his RN5 management, public service work, club activity, and contest operation. This neat HT37/HQ129X station puts W4OGG most often on 75 and 80. When time permits, Dave pursues outdoor hobbies which include hunting and skiing.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for May Traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	246	2110	1611	493	4460
K6BPI	94	1940	1719	226	3979
W9JOZ	24	1299	1269	5	2597
K9NBH	2056	24	8	3	2091
K0ONK	174	948	897	42	2061
K6BPT	48	786	510	276	1620
W0SCA	28	763	753	1	1545
W0LGG	373	570	530	34	1507
W6YDK	877	301	241	60	1479
W3EML	22	689	755	4	1471
W9IDA	17	706	648	7	1378
W4ZJY	17	588	558	2	1165
W1PEX	27	507	485	22	1041
W6RSY	44	489	359	117	1009
W2RUF	25	491	359	85	960
W7DZX	10	483	455	11	959
W7BA	3	468	444	21	936
K5QXV	10	479	427	19	935
W6EOT	1	420	421	7	849
WA2GPT	37	398	372	25	832
W3VR	26	397	373	12	808
WA4BMC	69	348	337	48	800
W6GYH	240	280	266	11	797
K9DHN	18	270	223	13	724
W1TXL	71	328	307	11	717
K9KZB	14	351	318	33	716
K4PXY	103	211	200	200	714
W4DLA	20	329	315	11	675
K8YUZ	7	327	315	12	661
WA9AJF	11	318	278	40	647
K5TEY	10	319	306	10	645
K1WKK	20	302	292	17	631
VE7BJV	8	223	390	10	631
W4NTR	14	308	102	206	630
K7IWD	40	312	258	10	620
K3MVO	31	285	261	32	609
WA6NFI	73	244	189	97	603
WB6BBO	72	274	221	26	593
WA2WBA	37	273	260	10	580
W9DYG	31	287	234	15	567
W7GUH	32	241	181	60	564
K6MDD	5	272	261	16	554
WA6WTK	32	270	255	35	553
W9MM	10	267	263	4	544
WA2VLK	8	270	252	13	543
K1ONW	33	255	190	51	529
K1RYT	2	263	256	5	526
WB2CAV	17	253	245	8	523
W1EMG	18	260	213	31	522
W2MTA	16	254	221	30	521
W3IVC	14	235	247	10	506
K3QFG	14	254	155	81	504
W4KIS	4	249	235	14	502
WA2EXP	8	247	235	10	500
Late Report:					
K2UAT (Apr.)	154	214	209	0	577
K4EHY (Apr.)	12	260	241	10	523

More-Than-One-Operator

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB	207	2002	1927	70	4206
WA6ZOW	108	1181	1163	17	2469
K6AIR	120	590	305	405	1420
W4PFC	24	569	490	79	1162
KR6GF	850	115	30	66	1061

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

K6GZ 259	K9IMR 116	WA2UOO 103	
W9NZZ 253	K8GOU 115	K1DQC 102	
K3QOO 207	WA0BYO 109	WA2WSB 102	
WA2TQT 185	WA4JYB 108	W6BB 101	
W2EW 177	WA9BFB 107	WA2CCF 100	
W7APS 161	W9TT 107	W4RHA 100	
WA9CCP 144	K1KSH/4 106	Late Reports:	
K4VFY 133	K3QDD 106	WA4JMP (Apr.)	300
K3APM 128	VE7BHH 106	WA2TQT (Apr.)	102
WN4IXI 116	K4FSS 106	K4MTP (Mar.)	160

More-Than-One-Operator Stations

KR6MD 309		
W8LT 158	W5AC 141	KR6MB 105
	KR6DI 119	

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: WA2EXP, W3IVC, W4DLA, WA4ELB, W4RHA, K4WJI, WA6ZOW, K8GOU, K8YUZ, K9GMZ, K9IMR.

The BPL is open to all amateurs in the United States, Canada, and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL form.

An imposing array of equipment is available at W9RGU, licensed to W9HOA and located in the basement of the American Red Cross building at Rockford, Ill. The station is set up to operate several modes on all bands, 80 thru 2 meters. Shown at operating positions, l. to r., are W9MAP, W9HOA and K9QYY.

while EAN posted a record rate for the month. These are the first records we have broken in some time, but won't be the last if the section nets keep on reporting as they did in May. It would facilitate tabulating if you would report on CD-125, or give us your net name, what section(s) you represent, your total reported sessions, the total traffic handlings completed, *and your NTS liaison*. Without the latter, you may not be included in the summary unless we happen to know you are part of NTS (don't count on it).

EAN certificates have been issued to WA2VAT, W3MFB, W1EMG, K1SSH, K1LOM, K1ONW, K2SBS, K3OOU, W4LWZ, K8HVT/8, W8QFO. W2EZB would like to have a backlog of stations interested in taking NCS of this model net, to act as alternates and substitutes during the summer and to become permanent at some future date; volunteers please contact him. W9DYG reports everything going fine on CAN, with the usual crop of minor complaints. W6RSY reports for PAN that only 27 reports were received although he knows 31 sessions were conducted; WA6ROF is back and will QNG as manager. W1BVR notes with deep regret the passing of W1KYQ, for many years a mainstay in the Conn. traffic organization and the RM for that section. W4SHJ, 4RN manager, visited headquarters in June. RN5 certificates have been issued to WA4AVM, *K5s* ANS IBZ VNJ, *W5s* JDF PPE; Net Manager W4ZJY recognizes WA5AVO for high QNI, WA4AVM as top NCS of the month. K6LKD says GMT messes up his RN6 schedule. Your reporter had a fine personal visit with RN7 Manager K7JHA in Tacoma in May; K7IWD continues to walk off with the BRAT award. When, Bill asks, will Saskatchewan join NTS? W8CHT writes a long letter on the back of his 8RN report, says morale is high on 8RN and certificates are being issued to *W8s* QFO ECB, WA8CPY and K8HVT. QRM from foreign and other stations is bothering TEN, sez WØRYV.

Transcontinental Corps. W3EML is still working hard to fill all functions, but the rapid turnover makes this difficult. Summer is always a difficult time for TCC, anyway. TCC-CAN suffered from poor band conditions, and W9JOZ thinks it will get worse. Your reporter visited with TCC-Pacific Manager W7DZX while in the Northwest in late May-early June, and had some interesting discussions. Plans are in the making for some TCC interchange coast-to-coast by RTTY. Here is the May report summary:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	99	65.3	1766	889
Central	31	22.6	1426	328
Pacific	103	72.6	1904	953
Summary	233	56.3	5096	2170

The TCC roster: Eastern Area (W3EML, Dir.) — *K1s* LOM TSD, *W1s* NJM EMG, K2UAT, W2MTA, *WA2s* VAT BLV, WB2CAV, *K3s* OOU MVO, *W3s* EML IVC, W4DLA, K8TIG, *W8s* CHT ELW BZX. Central Area (W9JOZ, Dir.) — W4ZJY, K9DHN, *W9s* ZYK JOZ DYG CXY VAY, KØZPN, WØSCA. Pacific Area (W7DZX, Dir.) — K6GID, *W6s* EOT HC, WA6ROF, WB6BBO, *W7s* DZX ZB, KØEDK, *WØs* WME KQD.

NET REGISTRATION INFO

Our plan for accelerating the production of the Net Directory is now in effect. The deadline for registrations for the 1963 year-end net directory is **Oct. 1**, and we urge all net managers of public service nets to make sure their nets are properly registered prior to that date.

Take a look at your copy of the 1962 year-end net directory. You will note that column 9 contains the date on which the net was last registered prior to the compilation of the directory information. If this date is prior to Oct. 1, 1962, and no new registration has been made subsequent to that date, your net will *not* appear in the new directory unless it is re-registered prior to Oct. 1, 1963. On the other hand, if the registration date is *after* Oct. 1, 1962, and no changes have been made, it is not necessary to re-register.

During the past year we have notified all nets as their registrations have expired that they were being put on the "inactive" list pending receipt of further information. Net registrations are good for only one year. If you received such a card and have done nothing about it, and your net is still active, better re-register before Oct. 1.

Nets whose last registration date was *after* Oct. 1 will be included in the net directory. If there have been no changes since your last registration, please *do not* re-register. On the other hand, if there *have* been changes, please *do* re-register so the information in the directory will be correct. Use CD-85 or facsimile, or give us the information listed below. Even if you do use CD-85, refer to the data below for explanation of exactly what we need. *Incorrect or sloppy registrations waste both your time and ours and may result in your net appearing incorrectly or not at all.* Only nets rendering a public service are eligible for registration.

1. *Name of Net.* On the top line (two lines if you need them) of CD-85, write the name of your net *exactly* as you wish it to appear in the net directory. Do not write, in this space, anything you do *not* wish to appear in the name. Although two lines are provided, we have found that the best nets are those with short, concise names.

2. *Net designation.* This is optional. Many nets, especially c.w. nets, have designations used in the net call-up that are useful net directory data. If you have one, let us in on it. Examples are QIN for Indiana Net, MTN for Mission Trail Net, etc.

3. *Frequency*, or frequencies, in kc. If your net operates on more than one frequency, be sure to include both or all and correlate them with days and times. Frequency bands or segments are not sufficient.

4. *Days.* Tell us *which* days of the week, not how many or "all." If not properly entered, this may disqualify your net from registration. "Daily" means *every* day, including Sunday. Make sure the days given are in accordance with the time used; that is, don't give the days according to local time, then give the time in GMT. We suspect a great many registrants have done just this.

5. *Call of net manager.* Just his call letters, that's all. If no official with that title, give us the call of the amateur from whom further information on the net may be obtained.

6. *Net starting time*(s) and ending time(s). The former is essential, the latter optional. All nets are registered in *Greenwich Mean Time* (GMT), otherwise known as "zulu" or "zebra" time. If you don't know how to convert (shame on you), use your local time, but be sure to let us know *what time zone* that is. "Local time" means absolutely nothing. If your net operates an hour earlier six months of the year (*i.e.*, "daylight saving" time), put an asterisk after your operating time so this can be included in the net directory.

7. *Direct Coverage.* The coverage area assigned the net (if part of a system) or the coverage provided by *regular* participants. Do *not* include coverage provided through liaison with other nets. Do not put down such meaningless phrases as "50-mile radius" unless you also give us the center of the circle it's a radius of.

8. *Purpose of Net.* Please, not a lecture, just a one or two word description. Does the net fall in the category of an emergency net (E), a traffic net (T), both (ET), or some special purpose (S)? If the latter, be sure to indicate *what* special purpose. Don't say "training" unless you indicate training *in what.*

9. NTS? Indicate whether or not your net is a part of the ARRL National Traffic System. If you don't know, it probably isn't.

10. *Liaisons.* NTS nets indicate their NTS liaison net; other nets may indicate any nets with which they conduct *regular* liaison.

11. *Previously registered?* Give us your latest registration date, if you know it. If not, the year. If you don't know the year, just say yes. Of course, if this is a newly formed net it will save us some searching if you just say no.

12. Give us your call letters. If you have more than one call, give us the one by which you are best known. This makes you responsible for all the information in the registration. Unauthenticated registrations will not be entered.

Don't forget, **October 1** is the deadline. On that date we start compiling the net directory, and we hope to have it in distribution by Nov. 1. This is a month earlier than last year. Next year we hope to move it up still another month, and then we want to *keep* it there, so the net directory becomes available Oct. 1 each year, when it is most needed. How about that? — *W1NJM.*

During the past fifteen years, many things have been said and discussed in this column, some of them several times. It is very difficult to write about something that has never been discussed before, mostly because there is no such thing. But some of the things already said will bear repetition. Few readers will recognize a five-year-old subject as an old one, and to those who do we can only say we hope that the new way of saying it will be sufficiently different to hold their attention.

As far back as 1950, we started talking about "a single strong facility." We have harped on this same theme, off and on, ever since. At first it was a single strong emergency communications facility to serve all agencies, to avoid the division of our people and the partition of our strength into special interest groups. It was a point of pride, an appeal to maturity, a request for unity in presenting the amateur service as a service in its own right instead of an adjunct to this or an auxiliary to that. Do we or do we not, we asked in effect, have the strength, the unity, the leadership and the maturity to stand on our own feet? Or must we have leadership and direction from outside amateur radio in order to perform a useful function? Are we or are we not a public service in our own name? Or must we borrow other names in order to give ourselves stature?

Amateur radio was at one time a vast reservoir of partially-skilled technical and operating personnel, to be trained and called upon as required by whoever required it, at which time they would cease to be amateurs and don a different hat. This type of attitude is still prevalent among most to-be-served agencies and a good many amateurs. But gradually, through the years, operating has increased while technical proficiency has declined. There is more than ever a necessity for performing public service in the operating field as service in the technical field tapers off — for in one way or another, amateur radio must serve the public interest — or die.

Now the sights are set even higher. Having a single strong emergency communications facility is not enough. The more valuable our spectrum space becomes, the harder we must work to preserve it. Political promises to the contrary notwithstanding, there is no Great White Father to bestow gifts; we pay for what we get in sweat or money or (usually) both. The amateur service *must attain* a greater awareness of the need for achievement, for progress, for self-sufficiency if it is to survive. — *W1NJM.*

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On March 23 a farmer from Caribou, Me., landed his small, ski-equipped plane in the wilderness near the Canadian border. It turned out he was arthritic and was suffering from an overdose of medication. K1PWG sent out a call for

help, which was answered by W1OTR of Guilford who contacted a nearby doctor and information on treatment was relayed. Other amateurs assisting in relaying messages were *W1s* YYW EBJ and EPN.

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On March 29, acting as NCS for the Chemung County (N.Y.) AREC Net, WA2STG/mobile spotted an unattended fire. He notified K2DNN, who reported the fire to the sheriff's department. WA2STG stood by until the police car arrived.

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Early in May, W4OQQ/mobile witnessed an accident on the Savannah River bridge involving a truck and a small foreign car in which one person was killed. He immediately contacted an Atlanta station on 75 meters, which in turn alerted the Georgia Highway Patrol. Within minutes, both Georgia and South Carolina patrols were on hand with help.

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On May 12 WA6LCP/mobile came upon a serious accident near Vacaville, Calif., in which several people were killed. His call for help brought a reply from K6DFZ, who happened to be listening on 7220 kc. K6DFZ shifted to 7217 kc. and contacted W6UBU, who notified the state police in Sacramento, and in a short time ambulances arrived at the scene. When WA6LCP asked one of the drivers how they got there so fast, his reply was, "Some ham reported the accident." — *K6DFZ.*

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On May 12, while conducting routine communications for a cub scout father-and-son camp-out in the Alberta Rockies, members of the Calgary Amateur Radio Assn. ran into a lost child situation seven miles from the scout camp, where a five-year-old boy had wandered from his parents, who were with a fishing group. VE6ADL/mobile was on the scene from 1545 to 1600 and tried to call Calgary to notify the R.C.M.P., but skip conditions were prohibitive. He did succeed in contacting VE6WN at Suffield who relayed to VE6KI in Calgary. When the R.C.M.P. sent men and dogs to the scene, VE6ADL/mobile kept them in contact with their Calgary headquarters. A large number of amateurs were monitoring the frequency. The search was called off at dusk, but the boy was found unharmed the next day. — *VE6FK, EC Calgary, Alta.*

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On June 10 a bad wind storm struck Frankfort, Ind., in the early evening, knocking out all power. Mobiles *K9s* DCR DDM and SHO helped police the town for injuries and fallen power lines while W9URS maintained contact with the police station. The chairman of the local Red Cross chapter rode along and assisted. A good impression was made on town officials. — K9DFK

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On Mar. 17, K8UCQ was at the mike of K8AEM's mobile talking with W8NZ when he spied an auto accident which had just occurred. W8NZ notified police and ambulance immediately.

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Redwood City, Calif., AREC/RACES gave an "assist" to the Stanford Rowing Assn., on May 18 by providing communication for the championship "Western Sprints." Huddled around one unit in the cold harbor breeze are (l. to r.) W6DEF, WA6NYK, WA6LCG and WN6DZT.

Members of the Indianapolis Radio Club were alerted on April 22 when homes in northeastern Indianapolis were damaged by high winds. K9DUR and K9MIKU, operating mobile on six meters, penetrated the damaged area and maintained contact with fixed stations W9PTO and WA9EWI, but their services were not required. Several other amateurs stood by to assist if needed.

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On March 3 the West Warwick/Coventry AREC offered its services via a local radio station to anyone wishing transportation to polio clinics. Fifteen AREC members participated, with dispatching being done by amateur radio. — *W1YNE, SEC R.I.*

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On Mar. 28, EC K8AEM of Calhoun County, Mich., called a surprise drill of his AREC group at 2400 GMT. Eight mobiles responded and were in position around the city of Battle Creek and had made contact with the NCS within 37 minutes.

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On April 19 a group of local amateurs in Bathurst, N.B., assisted c.d. officials on maintaining communications at the scene of a simulated accident and at the local hospital. Five amateurs took part. — *VE1WB, SCM Maritime.*

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The Port Arthur (Texas) AREC participated in a Red Cross First Aid Seminar on April 20. Eleven amateurs received disaster problems from outlying areas and made them available, at Red Cross headquarters, for students in training at that point. — *K5RYF, EC Port Arthur.*

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On April 20, AREC groups in Bronx and Westchester Counties, N. Y., were alerted to the need for a certain type of whole blood to prepare for an open heart surgery case. The operation of spreading the word was carried on by Hudson AREC Nets #1, 2 and 3 under Bronx EC WA2QAO, and by the Westchester County AREC groups in Tarrytown and New Rochelle under ECs K2YVE EC K2SJN respectively. Many donors have come forward as a result of the amateurs' work.

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On April 11, R. I. Assistant SEC K1OZI went aloft in a state helicopter carrying portable 6-meter equipment, the purpose: to check communications from various parts of the state on this band. Six amateurs, strategically situated, were used for the test. It was so successful that the two state helicopters are being equipped with six meter equipment for cooperation with the AREC in air searches, forest fires, etc. — *W1YNE, SEC R.I.*

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In connection with Alabama's "Amateur Radio Week," the Huntsville Amateur Radio Club on April 17 and 18 put on a demonstration of amateur radio emergency capabilities. The primary instrument was the emergency communications bus, recently completed as a club project. The bus was displayed at two different locations within the city and this was publicized in advance over local radio stations and the newspaper. Operating positions on the bus were manned on 6, 10 and 75 meters, and the public was invited to inspect the bus and file traffic. The traffic was put on one of the section nets. Activities were taped by a local TV station and shown on their news program.

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The club station of the Providence (R.I.) Radio Association acted as net control on April 21 in an "End Polio Clinic" conducted jointly by the R.I. State Dept. of Health and the R.I. Medical Society. A portable station (W1YNE/1) was set up at the Medical Society building to provide a six-meter link to W1OP, manned by Providence EC K1LPL and assisted by *K1s* HZN and NVS. The net was activated at 0700 on six and ten meters simultaneously, with six mobiles available for duty. Fixed stations reported in to provide links with more distant cities. Mobiles were dispatched to the various storage points to pick up vaccine and deliver it to the clinics. Operation continued for twelve hours, and drew favorable comment from the press and R.I. Congressman Fogarty. — *W1YNE, SEC. R.I.*

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The Huntsville (Ala.) Amateur Radio Club provided communication for a sports car rally on Apr. 21. Both six and ten meters were used to cover all check points, which were spread out over a course in which the farthest check point was 42 miles from the control center. The club's communications bus was used for the control station, with

This is K8YRV, new EC for one of the hottest AREC groups in Michigan, the Oakland County gang.

ten mobiles and one portable station to provide communications for rally officials for eleven hours. The operation was a successful test of the six and ten meter coverage of the area as well as a useful aid to rally officials. A total of 22 amateurs took part, under Madison County EC K4RSB. — *W4NML, SEC Ala.*

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On Apr. 23 the city of Windom, Minn., and Cottonwood County held a county-wide c.d. test, with communications being supplied by the AREC under the supervision of EC KØIKU. Fourteen amateurs took part and much traffic handled in what appeared to be a highly successful exercise. — *KØKKQ, SEC Minn.*

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Forty SEC reports representing 17,510 AREC members were filed for April activities. This is the fewest reports we have received since last November, but it is still seven reports better than April of last year and represents over 4000 more AREC members. Don't tell us that we are past the peak after having achieved only slightly over th halfway mark! Sacramento Valley reports for the first time in 1963, bringing our total sections heard from this year to 49. Other sections reporting: Del., E. Mass., S.N.J., Mich., Alberta, Nevada, NYC-LI, S. Texas, B.C., N. Dak., Ohio, Wash., Kans., Los A., Ind., Maine, S. Car., E. Bay, N. Car., Ore., Utah, Ala., Mont., N. N. J., Ga., Ariz., Miss., S. Dak., W. Pa., Tenn., Iowa, E. Pa., S.C.V., Okla., R. I., N. Texas, E. Fla., New Mex., Minn.

RACES News

A comprehensive RACES drill was conducted in the Port Arthur, Texas, area on May 27, for the purpose of testing facilities for sending information regarding fallout to the county c.d. director's headquarters. Two nets each received 120 messages and relayed them to the control point at the Jefferson County airport, where the information was plotted on maps. Both nets operated on 6 meters. Rigs were located in town halls in the various surrounding communities. The drill lasted two hours with 23 stations participating. — *K5RVF.*

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On May 25, for a period of approximately two hours, the RACES organization of Prince Georges County, Md., conducted a simulated emergency test. The 10, 6 and 2 meter nets were activated in addition to non-amateur facilities. A total of 25 members participated, operating both mobile and fixed stations. Four members operated from the RO's comms center, which is capable of simultaneous operation on all net frequencies. Mobile stations were dispatched to c.d. radiological teams who originated exercise messages for subsequent relay to county headquarters via RACES nets. Additionally, the Hyattsville Red Cross headquarters was served by K3CEZ/3 operating on 10 and 2 meter frequencies. A total of 117 transmissions were exchanged during the drill, which was considered a complete success. — *K3BEQ, Asst. RACES RO, Hyattsville, Md.*

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 received at ARRL on or before 4:30 P.M. on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reasons of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nominating 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*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Vermont	Aug. 9, 1963	Miss Harriet Proctor	Aug. 10, 1962
Hawaii	Aug. 9, 1963	John A. Montagne	July 14, 1963
West Indies	Aug. 9, 1963	William Werner	Aug. 10, 1963
San Francisco	Aug. 9, 1963	Wilbur E. Bachman	Aug. 14, 1963
Wisconsin	Aug. 9, 1963	Kenneth Ebueter	Oct. 10, 1963
Rhode Island	Aug. 9, 1963	John E. Johnson	Oct. 12, 1963
Arkansas	Aug. 9, 1963	Odia L. Musgrove	Oct. 13, 1963
Indiana	Aug. 9, 1963	Donald L. Holt	Oct. 14, 1963
San Diego	Aug. 9, 1963	Don Stansifer	Oct. 15, 1963
Utah	Aug. 9, 1963	Thomas H. Miller	Oct. 28, 1963
Western Florida	Oct. 10, 1963	Frank M. Butler, Jr.	Dec. 15, 1963
Saskatchewan	Oct. 10, 1963	Jack Robinson	Dec. 10, 1963
Illinois	Oct. 10, 1963	Edmond A. Metzger	Dec. 15, 1963
East Bay	Nov. 11, 1963	B. W. Southwell	Jan. 10, 1964

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.

Idaho	Raymond V. Evans, K7HLR	Apr. 10, 1963
Maine	Arthur J. Brymer, W1AHM	May 10, 1963
Canal Zone	Thomas B. DeMeis, KZ5TD	May 10, 1963
NYC-LI	George V. Cooke, Jr., W2OBU	July 31, 1963
Oklahoma	Bill Lund, K5KTW	Aug. 9, 1963
Western Massachusetts	Percy C. Noble, W1BVR	Aug. 11, 1963
Southern New Jersey	Herbert C. Brooks, K2BG	Aug. 26, 1963

In the South Dakota Section of the Dakota Division, Mr. J. W. Sikorski, WØRRN, and Mr. Fred Williams, WØFJZ, were nominated. Mr. Sikorski received 100 votes and Mr. Williams received 54 votes. Mr. Sikorski's term of office began July 3, 1963.

DX CENTURY CLUB AWARDS

Honor Roll

The DXCC Honor Roll consist of the top ten numerical totals in the DXCC. Position in the Honor Roll is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date of receipt. All totals shown represent submissions received from May 1, thru May 31, 1963.

W1FH.....308/329
PY2CK.....308/326
W6CUO.....307/327
W1GKK.....307/327
W2AGW.....307/326
W4DQH.....307/325
W8BRA.....307/325
4X4DK.....307/321
KV4AA.....306/326
W8JIN.....306/326
W8KIA.....306/325
W7PHO.....306/320
W8UAS.....306/322
W8DMD.....305/322
W2HMJ.....305/320
W9YFV.....305/324
W1ME.....305/323
W8BF.....305/321
LU6DJX.....305/324
W9RBI.....305/325
G4CP.....305/324
W3GHD.....304/323
W8ASG.....304/323
W7GUV.....304/323
W9HUZ.....304/319
CE3AG.....304/323
G2PL.....304/322
CX2CO.....304/321
K2GFQ.....304/321
W3KT.....304/323
W6YY.....304/320
W9NDA.....303/322
G3AAM.....303/322
W8BKP.....303/320
W8KML.....303/319
W4QCW.....303/319
WØQVZ.....303/320
W6EBG.....303/323
W5AZD.....303/321
W1CLX.....303/321
W4GD.....303/320
HB9J.....303/322
WØDU.....303/320
W5MMK.....303/319
W1JYH.....303/321
W9LNM.....303/321
W3LMA.....303/320
W6AM.....303/323
W2LPE.....303/319
W6GPB.....302/319
W2BXA.....302/321
W8LKH.....302/318
W2TQC.....302/316
VE7ZM.....302/321
W7GBW.....302/321
W2HUQ.....301/320
W1BIH.....301/320
W8DAW.....301/319
WØAIW.....301/319
W3JNN.....301/320
W3JTG.....300/318
W4TM.....300/318
W8EWS.....300/319
K2DCA.....300/313
W8JBI.....299/314
W2JT.....299/313
W2WZ.....299/318
WØELA.....299/317
W5ABY.....299/312
W2ZX.....299/314

Radiotelephone

PY2CK.....308/326
W3RIS.....306/326
W1FH.....305/321
W8GZ.....305/323
W9RBI.....305/323
4X4DK.....305/319
W8BF.....304/320
W7PHO.....304/318
CX2CO.....304/321
VO4ERR.....303/321
W6YY.....303/319
W8PQO.....302/315
W8KML.....301/317
W4DQH.....301/317
W3JNN.....298/314
W2ZX.....298/313
PY4TK.....297/310
W6AM.....296/315

New Members

From May 1, through May 31, 1963 DXCC Certificates and Endorsements based on contacts with 100-or-more countries have been issued by the ARRL Communications Department to the Amateurs listed below.

WØNFA.....214
DL6PI.....167
K9QIE.....149
K2KBI.....139
W2CZF.....117
JA3JM.....116
11TM.....115
OK1XM.....115
DL3YT.....114
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NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,500	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

SUGGESTED OPERATING FREQUENCIES

RTTY 3620, 7040, 14,090, 21,090 kc.

WIDE BAND FM 52.525 146.9 Mc.

GMT CONVERSION

To convert to local times subtract the following hours: ADST −3, AST −4, EDST −4, EST −5, CDST −5, CST −6, MDST −6, MST −7, PDST −7, PST −8, Hawaii −10, Central Alaska −10.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Aug. 16 at 0130 GMT. Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,700, and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Aug. 1 at 0400 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION:* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0130 GMT Aug. 16 becomes 2130 EDST Aug. 15.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

W1AW conducts code practice daily at 0130 GMT on all frequencies listed above with speeds of 15, 25, 30, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 7½, 10, and 13 w.p.m. on other days. Approximately 10 minutes' practice is given at each speed. To check your copy, the texts used on several transmissions are listed below. The order of words in each line of *QST* text is sometimes reversed. To improve your fist, try to send in step with W1AW.

Date Subject of Practice Text from June *QST*.
Aug. 2: "*It Seems to Us . . .*", p. 9
Aug. 6: *A Solid-State S.S.B. Transceiver*, p. 27
Aug. 15: *Full-Band V.H.F. Coverage . . .*", p. 40
Aug. 21: *A 50-Mc. Hand-Carried Transceiver*, p. 44
Aug. 24: *Criticizing C. W. Signals*, p. 53

Date Subject of Practice Text from *Understanding Amateur Radio*, First Edition
Aug. 12: *Homemade Tables*, p. 8
Aug. 30: *Send-Receive Control*, p. 8

W1AW SCHEDULE

(August 1963)

Operating-Visiting Hours

Monday through Friday: 1 P.M.–1 A.M. EDST.
Saturday: 7 P.M.–2:30 A.M. EDST
Sunday: 3 P.M.–10:30 P.M. EDST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 6 miles south of downtown Hartford. A map showing local street detail will be sent on request.

Operating Frequencies

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800 kc.
Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000, 50,700, 145,800 kc.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes. Amateurs are respectfully requested to refrain from transmitting on the above frequencies during W1AW bulletins and code practice.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time.
C.w.: Monday through Saturday, 0000; Tuesday through Sunday, 0400.
Voice: Monday through Saturday, 0100; Tuesday through Sunday, 0330.

Caution. Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

W1AW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from *any* amateur station in accordance with the following schedule:

Time (GMT)	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0000–0030[1]	.....	14,280	3555[3]	14,100	14,100	7080[3]	14,100
0030–0100	.....	14,280	3555	14,100	14,100	7080	.....
0100–0130[1]	.....	145.8 Mc.	21,330	145.8 Mc.	50.7 Mc.	21,330	.....
0230–0300	.....	.....	.....	1820	.....	1820	.....
0300–0330	.....	.....	.....	3555	.....	3945	.....
0330–0400[1]	.....	.....	3945	7255*	3945	7255*	3945
0400–0500[1]	.....	.....	3555[3]	.....	3945	7080[3]	.....
1700–1800[2]	.....	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	.....
1900–2000	.....	7080	14,100	7255*	14,100	7080	.....
2000–2100	.....	14,280	7080	14,100	14,280	14,100	.....
2200–2300	.....	14,280	14,280	14,280	14,100	7255*	.....
2300–2330	.....	7255*	.....	21,075[3]	.....	14,280	.....
2330–2400	.....	14,100	.....	3555	.....	14,280	.....

[1] Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 0400, on phone at 0100 and 0330.
[2] Operation will be on 21,075, 21,330, 28,080 or 29,000, depending on band and other conditions.
[3] W1AW will listen for Novice Class licensees on the Novice portion of this band before looking for other contacts.
* Operation may be on *s.s.b.* as announced at the beginning of the period.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: W3DUI. RM: W3EML. V.H.F. PAMs: W3SAO, W3SGI. A reorganizational meeting of the Delaware County AREC was held at W3FLP, the ECs QTH. EPA C.W. Net 3610 kc. had 366 QNI and 549 QTC. KN3YEO has curtailed his activity on the air because of Post Office damages. W3FEY is chasing DX on 6 meters. K3JLX is back from Germany and plans to become active in the Pine Grove area. Household projects put the crimp in W3JKX's traffic total. New Gear Dept: A DX-40 to K3RBN, an SR-150 installed in the mobile of W3VR, an eight-element 6-meter beam for W3SGI. K3MDG added an NC-155 and an HE-45B. The new keyer of W3PDJ is teaching him the code over again. We welcome these new licensees: K3QCB, K3UUY, K3TEJ, K3VRJ, K3VRH and KN3VVO. After a lapse of 10 years, W3OY is back on 75-meter phone. The Inalambrico Hispano De Filadelpia ARC is making transmissions in Spanish but will be glad to converse in English. New club officers: University of Penna.—K3JTF, pres.; W3JXS, vice-pres.; W3IZI, secy.-treas. The Keystone ARC—K3HIE, pres.; K3DUC, vice-pres.; W3RCE, treas.; W3PDJ, secy. The ARTICS named K3RTR as "ham of the year" for his efforts and activities. K3HAQ went QRO by the addition of a 6146 to his Heath AT-1. K3VWH, who was ex-HA8S, is now active in the Coplay area. Armed Forces Day helped boost the traffic of W3CUL. Section Net certificates were issued to the following: W3ADE, K3ANU, W3AXA, W3BFF, W3CDT, W3EML, K3HTZ, K3HNP, W3HNK, K3IMR, W3IVS, W3BUR, W3JKX, K3JHF, W3LC, K3KTH, W3MFW, K3MVO, W3OY, K3ONW, K3OWE, W3PDJ, W3QDW, K3QFG, W3RV, K3TLX, W3ZRQ, K3OOU, WA2EXP, K3AIK, K3BHU, K3CAH, W3EQZ, W3EEN, W3GJA, W3ITI, K3JSX, K3KNP and K3QGT. Only traffic nets listed in the League's net register can qualify for these net certificates. ORS, OPS, OES, OO, OBS and EC section appointments require monthly activity reports for annual endorsement. OPS and ORS require additional QNI in some section traffic net. There have been some cancellations because of inactivity and lack of interest. Traffic: W3CUL 4460, W3EML 1471, W3VR 808, K3MVO 609, W3RV 230, K3HNP 208, K3JSX 176, K3MQE 148, W3ELI 105, W3ZRQ 98, K3CAH 96, W3HWC 92, K3WEU 82, K3BHU 53, K3RJX 47, K3OWE 46, K3DCB 44, K3KTH 43, K3JHF 25, W3FLP 22, W3VAP 19, W3OY 16, W3SGI 16, W3BFF 13, W3BUR 12, W3GJA 10, W3JKX 9, K3ARR 8, W3PDJ 7, K3ADS 6, W3BKF 6, K3LTI 5, K3EMA 4, K3NZD 4, W3FAF 3, W3ID 3, W3LXN 2, K3AKN 2, W3EEN 2, W3DUI 1, K3HTZ 1, K3MDG 1.

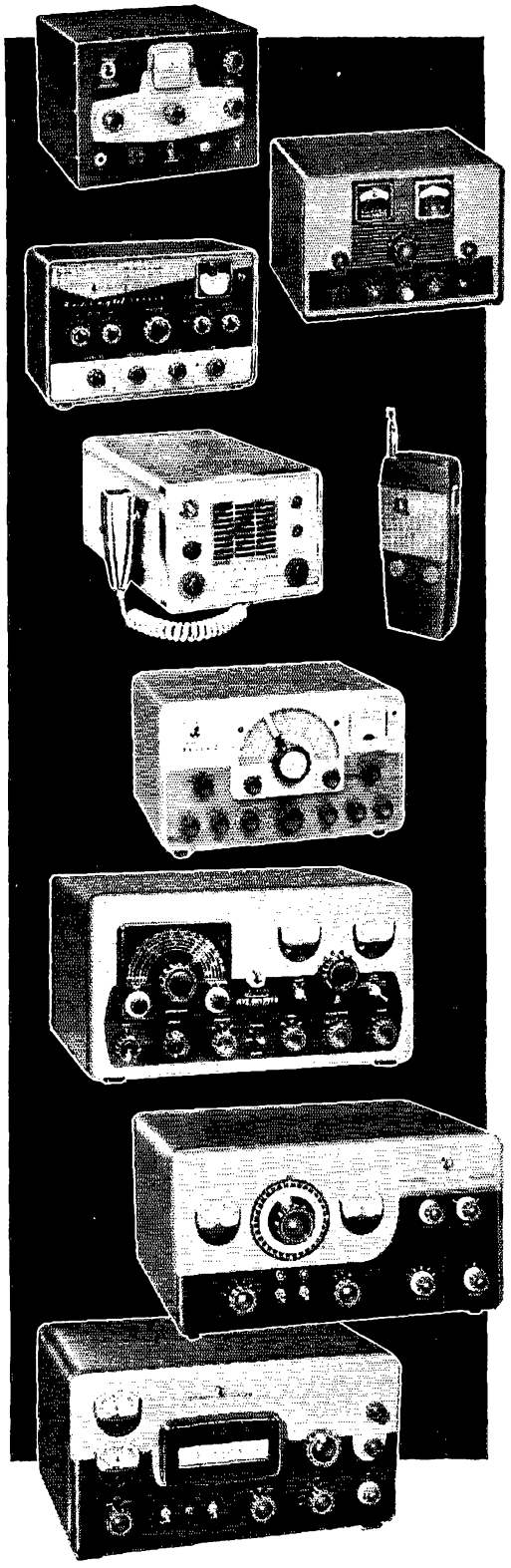
MARYLAND-DISTRICT OF COLUMBIA—SCM, Andrew H. Abraham, W3JZY—SEC: W3CVE. RMs: K3JYZ and W3TN for the MDD Traffic Net which meets on 3649 kc. daily at 0000Z. RM: W3ZNW for the MDDS (slow) Net on 28.1 Mc. and 3649 kc. at 0130Z. PAM: W3EQK. MEPN meets on 3820 kc. M-W-F at 2300Z and Sat. and Sun. at 1800Z. Now is the time to make plans for the big Atlantic Division convention to be held in Washington, D.C., over the Labor Day week end. W3CDQ is leaving for a trip overseas. W4EXM/3 is busy packing up to return to the U.S.A.; Art says that it sure was a wonderful experience hamming in Iran. K3GVE was in charge of Field Day preparations for the Chesapeake Amateur Radio Club. W3CQH has built up a 120-watt mobile rig for the 6-meter band. W3BQE has left the Air Force and is now with the Navy. W3IVC has been awarded the TCC Net certificate and made the BPL. K3LLR gave the Technician Class examination to KN3YRK, who is the proud daddy of a baby girl born on May 12. K3NCM has a stand-by transmitter running 40 watts phone and c.w. K3ORS is located at the U.S. Naval Training Station, Bainbridge, Md. W3PQ is busy putting a Heathkit 6- and 2-meter rig together for summer use. K3PEJ sends in a very fine OES report. K3QDD made the BPL. K3QFG made the BPL the hard way. W3UE is to be congratulated on keeping 3RN on top this year. K3QOO made his 6th straight BPL; John will be operating portable, using W6QEG/3 on Deep Creek Lake, Md., during August and September. W3TN worked NSS; WAR and AIR during the Armed Forces Day exercise. K3APM operated mobile at the Timonium School Fair. The MDD handled traffic from Columbia and Nicaragua destined for Washington, D.C., and Cumberland, Md. The following new stations checked into the MDD: K3URZ, K3SXA, K3OAE and K3SVB. K3OAE is home from MIT where he operated W1MIX. The RCARC operated out of the Howard County Fair Grounds Field Day. K3WBJ is back from his vacation. W3ZNW is busy with the AREC program and with antennas, and is operating mobile on 80, 15 and 10 meters. Radio station WHFS, operating on the f.m. band on 102.3 Mc., has an amateur radio program put together by W3LUL and this program is on the air every Sun. at 5:45 p.m. It contains information for amateurs. The following OESs sent in reports on v.h.f. experiments: K3DNO, K3QOY, K3PEJ, K3PRN and K3LLR. Traffic: W3IVC 506, K3QFG 504, W3TN 338, K3QDD 285, K3QOO 264, K3APM 209, K3ORS 97, W3ATQ 41, K3WBJ 32, K3GZK 29, W3PQ 27, W3HQE 19, K3JYZ 16, K3NCM 6, W3ZNW 6.

DELAWARE—SCM, M. F. Nelson, K3GKF—PAM: K3LEC. RM: W3EEB. DEPN meets on 3905 kc., Sat. at 1830 local time. DSMN meets on 50.4 Mc. Tue. at 2100 local time. Appointments: K3SXA as ORS. The Second Annual Delaware Hamfest will be held at the Dover Air Force Base Recreational Area Sun. Aug. 18. Contact W3LQE for full information. Tickets are available through the radio clubs and local radio stores. K3AZH, K3SXA and K3OBU provided communications for the 4-H Horse Show and the Newark Memorial Day Parade. K3AXW is on 50-Mc. s.s.b. again. W3EEB missed most of the CD Party because of a faulty capacitor in the rig. K3DZG and K3EWK visited cousin K5FSU. K3LEC has a new 62S-1. K3SMN is the new State c.d. radio officer. Traffic: W3EKO 94, K3GKF 56, W3EEB 34, K3AZH 26, K3PZL 18, K3OZM 17, W3HKS 15, K3EWK 14, K3KAJ 4.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. PAM: W2ZI. RM: WA2VAT. Gloucester County EC, K2JKA, has appointed the following assistants: WA2KGD, W2LVW and K2PQD. WA2BLV, Somerdale, has taken on 2 TCC skeds, PAN on Thurs. and CAN on Fri. W2ZQ, DVRA's station, held "Open House" and entertained over 130 visitors. W2BEI, Audubon, boosted his DXCC total to 116. K2JJC, Pitman, has repaired the wind damage to his antennas. N.J. Phone & Tfc. Net May totals: 31 sessions, QNI 411, traffic 65. With regret we report the passing of K2QWN, Camden. The Levittown (N.J.) Radio Club plans to start a training class in Sept. Contact K2YBN for details. All amateurs in Gloucester County are urged to contact K2JKA and sign up in the AREC. The SJRA's Hamfest is planned for Sept. 8 at Molia Farms. Contact K2OYW for details. W2DAJ was top SJRA c.w. operator in the recent DX Contest. K2PZF had the top phone score. WA2GSO, Lawnside, SJRA's *Harmonics* editor, passed the General Class exam and is putting up a tribander. The following worked VP7CX on 50 Mc: WA2EIY, WA2PWI, K3EGP, WA2ONB and WA2GSO. *Cherry Hill High School ARC News* is edited by WA2WLM. W2ZI, N.J. Emerg. Phone & Tfc. Net mgr., has published a net roster showing a membership of 58. All counties in the section are represented. WA2QZQ and his XYL, Moorestown, are vacationing in Ireland. The following, in the Cherry Hill area, received their General Class licenses: WB2BIN, WB2EQI, WB2EVR and WB2GGM. Traffic: WA2BLV 249, W2RG 200, WA2VAT 180, W2ZI 40, WA2WLN 23, W2MMD 16, W2BEI 10, WA2NXV 5, K2JJC 1.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2ICZ. RMs: W2RUF, W2EZB and W2FEB. PAM: W2PVI. NYS C.W. meets on 3670 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3610.5 and 3993 kc. (s.s.b.) at 0900 Sun. and 7102.5 kc. at 1930 Wed., TCPN 2nd call area on 3970 kc. at 1900, IPN on 3980 kc. at 1600, 2RN on 3690 kc. at 0045 and 2345 GMT. BPL for May goes to W2RUF. Congratulations. Appointments: K2KBI as OO, WB2CET as OBS. The following clubs are duly affiliated with ARRL as of May: Genesee Radio Amateurs, Batavia, N.Y.; WA2CTI, secy.; Massena ARC,

(*Continued on page 94*)



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10 METER "PERSONAL MESSENGER"—Two models: 100 milliwatts for short range; 1 watt for extended range—11 transistors and 4 diodes—super-heterodyne receiver with tuned RF amplifier gives excellent sensitivity, two stage transmitter punches signal home. "Quiet" control silences receiver on standby. With battery compartment for penlight cells (less cells). Rechargeable cadmium battery and other accessories available.
Cat. No. 242-103 10 Meter "Personal Messenger", 100 milliwatt, with 29.640 crystal, 8 penlight cell battery case . . . Net $109.50
Cat. No. 242-104 10 Meter "Personal Messenger", 1 watt, with 29.640 crystal, 8 penlight cell battery case ..... **Net $129.50**
Cat. No. 251-806 Leather carrying case and strap . . . . Net $8.50
Cat. No. 250-804 Rechargeable nickel cadmium battery. Plugs into 115 V AC outlet to recharge . . . . . Net $19.95

RANGER II—Now—a new version of the popular 75 watt CW or 65 watt AM "Ranger". The "Ranger II" transmitter also serves as an RF/audio exciter for high power equipment. Completely self-contained instant bandswitching 160 through 6 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. 240-162-1 Kit ..... **Net $249.50**
Cat. No. 240-162-2 Wired, tested ..... **Net $359.50**

FIVE HUNDRED—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. 240-500-2 Wired, tested ..... **Net $1050.00**

"6N2 THUNDERBOLT"—1200 watts (twice average DC) input SSB and DSB, Class AB1; 1000 watts CW, Class C; and 700 watts input AM linear. Continuous bandswitched coverage on 6 and 2 meters. TVI suppressed. Drive requirements; approx. 5 watts Class AB1 linear, 6 watts Class C CW. With tubes and built-in power supply.
Cat. No. 240-362-2 Wired ..... **Net $549.50**

"THUNDERBOLT"—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 AB2 linear, 20 watts Class C continuous wave. With tubes and built-in power supply.
Cat. No. 240-353-2 Wired, tested ..... **Net $659.00**

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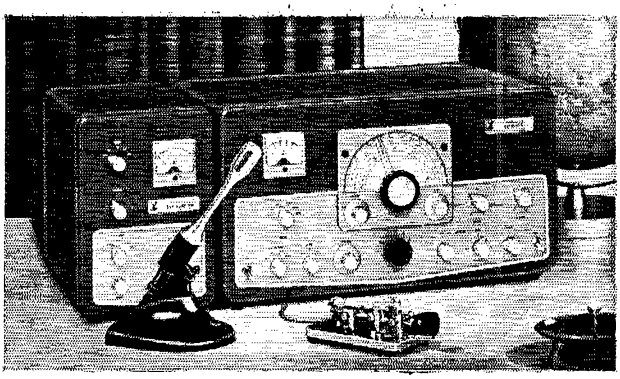

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"SSB ADAPTER"—The new filter-type SSB generator—with bandswitching 80 through 10 meters . . . more than 50 db sideband suppression . . . more than 45 db carrier suppression! When used with the Viking "Valiant" or "Valiant II" it places 275 watts P.E.P. at your command. Two compact units and interconnecting cables . . . RF unit is only 8" wide—may be placed on your operating desk. Power supply unit may be placed in any convenient location. Features built-in multiplier requiring VFO input only—band-pass interstage couplers require no tuning—design and front panel make operating practically foolproof. Superb audio fidelity and balanced audio response; excellent sideband, spurious and carrier suppression. Other features: positive VOX and anti-trip circuits with built-in anti-trip matching transformer and adjustable VOX time delay. With remote power supply, tubes and crystal filter, less microphone.

Cat. No. 240-305-2—Wired, tested.....Net $369.50

INVADER—More exclusive features than any other Transmitter/Exciter on the market today! Specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db sideband suppression—more than 55 db carrier suppression! Instant bandswitching 80 through 10 meters—no extra crystals to buy—no realigning necessary. Delivers a solid 200 watts CW input: 200 watts P.E.P. SSB input: 90 watts input on AM! (25-30 watts output—upper sideband and carrier). Built-in VFO—exclusive RF controlled audio AGC and ALC (limiter type) provide greater average speech VOX and anti-trip circuits. Fully TVI suppressed. Self-contained heavy-duty power supply. With tubes and crystals.

Cat. No. 240-302-2 Wired, tested.....Net $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 at a solid 2000 watts P.E.P. (twice average DC) SSB, 1000 watts CW, and 800 watts AM! (250 to 300 watts output—upper sideband and carrier.) 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. With power supply, tubes and crystals.

Cat. No. 240-304-2 Wired, tested.....Net $1229.00

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Cat. No. 240-303-2.....Net $619.50

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Cat. No. 240-105-1—Kit.....Net $375.00

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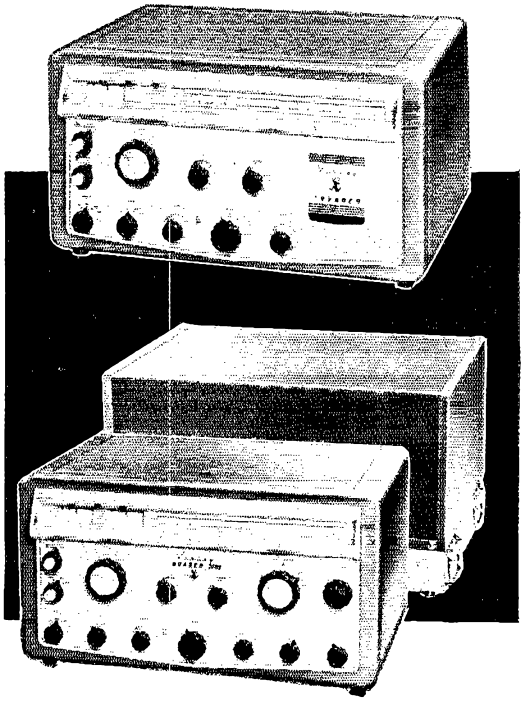

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"I am very delighted with the first V80 and want another for a different location." A. C., California.

CASE HISTORY #159
"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them, too. Will you please send me four more." W. A., Alaska.

CASE HISTORY #248
"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

CASE HISTORY #111
"The V160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when bought it." D. S., New Jersey.

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"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success — i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

CASE HISTORY #483
"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some of the lower bands." J. A., New Mexico.

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"I have had very good luck with mine (my V80) feeding it with a Johnson Adventurer; works fine on all bands." B. I., Nebraska.

CASE HISTORY #555
"Being an owner of your V80 vertical I would like to let you know of the excellent results I am getting with it, both working the DX and the local stations on the lower bands. It certainly is an excellent antenna system." F. H. Jr., New York.

CASE HISTORY #84
"A few months ago I purchased your V40 vertical and have achieved outstanding results on the air." K. G. B., North Carolina.

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6 Meters, 4 Element	$25.95
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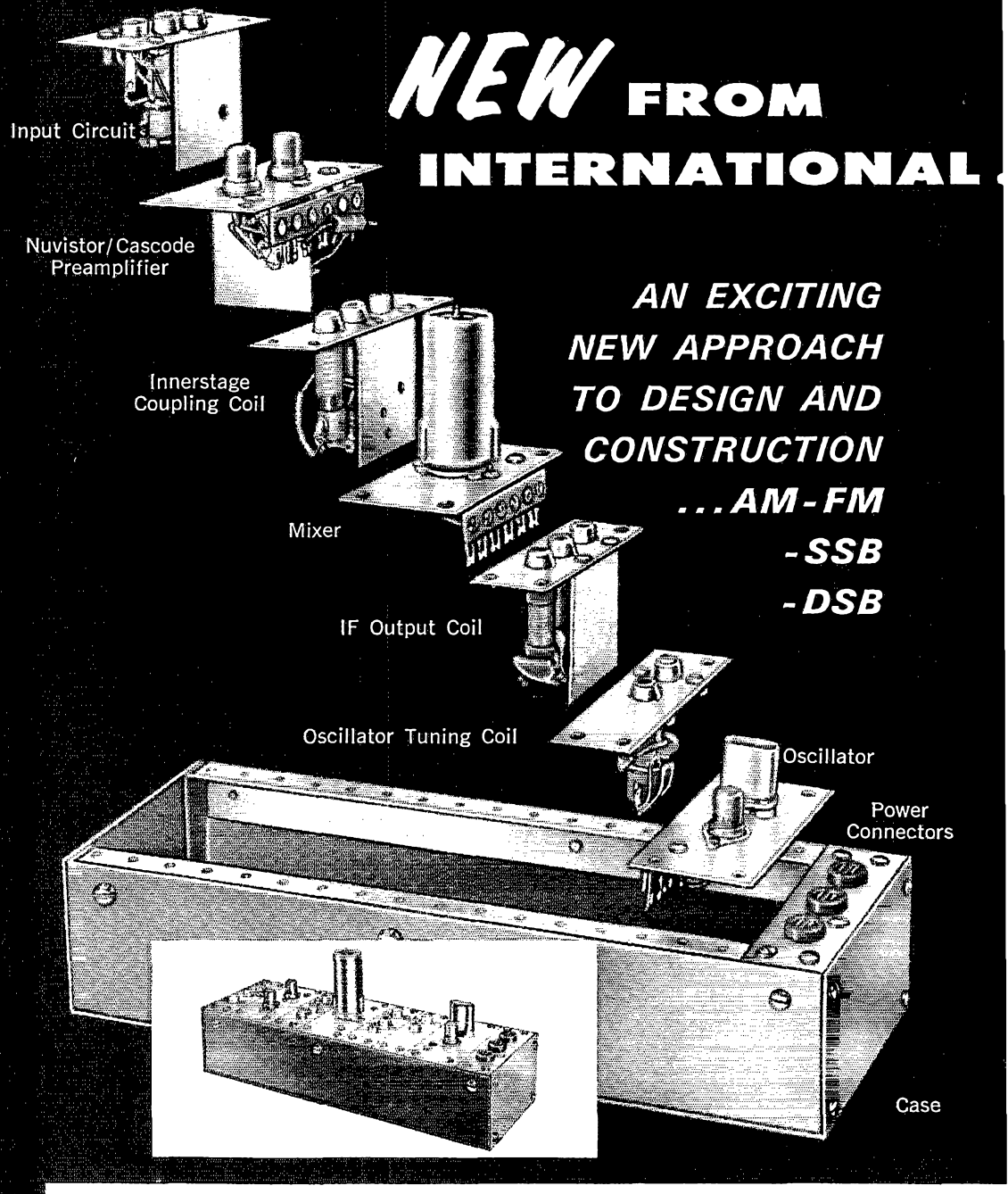

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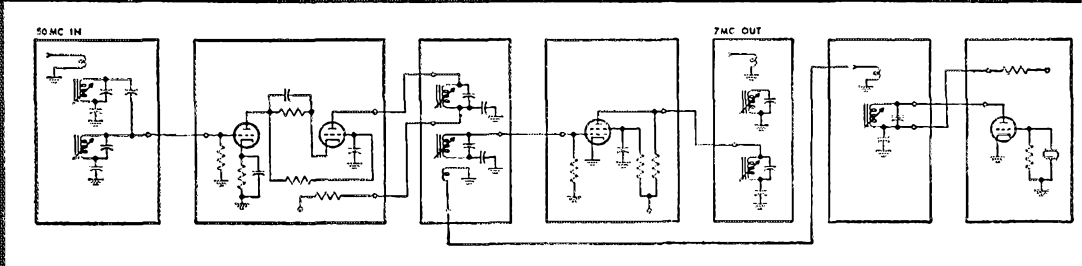

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Station Activities

(*Continued from page 86*)

WB2CET, secy.; Seneca Drums ARC, Geneva, N.Y., WB2DLQ, pres.; and Squaw Island ARC, Palmyra, N.Y., K2ZIP, secy. If your club is interested, write to ARRL for information. Over 500 attended the W.N.Y. Hamfest sponsored by the Rochester ARA. W2ICE was chairman and assistants included WA2IMH, WA2ZWO, WB2FYZ, K2UCI and K2UXF. The code-sending contest was won by W2RKU at 44.5 w.p.m. and runner-up WA2LKW at 30.5 w.p.m. Highlights included a talk by W1DF and presentation of a plaque to Clara, W2RUF, Director of the N.Y.C.W. Net, and to Kelley, W2ICE, Perennial chairman of the Hamfest. WA2MCN won an SX-117. The RARA elected K2UXF, pres.; K2SKO, vice-pres.; K2UCI, treas.; WA2KND, secy. The RDXA elected W2CBA, 1st chmn.; WA2HUV, 2nd chmn.; W2-EDE, secy.-treas. The Rochester V.H.F. group elected VE3DFY/2, chmn.; W2MPM, vice-chmn.; WA2YTK (a YL), secy. On June 2 the Rome Radio Club held its 10th Annual Ham Family day with over 50 in attendance, including W3YA and K2HUK. The weather was perfect and as usual everyone enjoyed the huge platters of steak, fried chicken and corn-on-the-cob. Ex-K2VFX, now KISLJ, is practicing patent law in Massachusetts. Welcome to new Generals WA2s QVL, REU, TCZ and YQR, WB2s ANU, FXK, GJV and FZQ. Other activities included the Penn-York Hamfest Assn. Banquet and Southern Tier Radio Club's Hamfest held in Johnson City. Traffic: W2RUF 960, W2EZB 452, W2OE 402, W2-FEB 192, W2GVH 185, W2RKU 112, K2OFV 60, WA2-LKW 56, W2FCG 39, K2JBX 27, K2IMI 23, W2RQF 10, WA2DAC 7, W2EMW 3, WA2GLA 2, K2TDG 1.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: W3LIV. RMs: W3KUN and W3NUG. The WPA Traffic Net meets Mon. through Fri. at 2400 GMT on 3585 kc. During the summer months WPA also will operate on week ends to take the place of the KSSN Net that is QRT during the summer months. W3MFB let his license expire. A reminder—check the expiration date on your license. It could happen to you. A new ham in Butler is KN3YGV. W3IWT is building a 2-meter rig. W3TIF and K3DGT have "Twoers." The Blair County AREC group participated in a c.d. drill operating under RACES May 19 under the supervision of K3SIQ. The Horseshoe RC reports via *Hamateur News*: K3TRC is home from college; K3QFL is Alternate NCS for the Blair County AREC Net; W3AOL is operating 40-meter phone; K3YKO is on 6 meters. Up Erie way: K3UOC is on 6 with a home-brew rig; K3KZZ graduated from Gannon College; K3-PDA had his first Mass on May 26th at St. Patricks. K3DKH Butler County EC., is now at home recovering from a heart attack. Etna RC reports via *Oscillator*: W3JIZ got a rotator; K3HLS has a new vertical; W3-OVZ has a new SX-117; K3SXL has a new Telrex spiral ray on 6 meters. Coke Center RC reports: K3VXS passed the General Class license; K3LQK operated on 10 meters while recuperating from surgery at the local hospital; K3PPZ has an Apache TX-1. The Breeze-Shooters' Hamfest was well attended. Uniontown ARC's *The Magpie* reports: The Annual Gabfest will be held Sat., Sept. 7; W3BTR, W3WVE, K3OQP, W3CAV and A. Balsley paritcipated in the recent c.d. drill. The Steel City *Kilowatt Harmonics* reports: 6-meter sideband is now a reality at W3KWH; W3NKM is on 6 meters using a nuvister converter and a translator on the HT-32 rig; W3ZGI is working real DX on 6 meters. Traffic: (May) K3OCU 454, W3NEM 314, K3PYS 161, W3YA 146, W3KUN 134, K3SDT 70, W3UHN 32, W3IYI 26, W3-SMV 22, K3EXE 1.3 K3SMB 8, W3OEO 7, K3COT 5, K3PFE 1, K3UTR 1.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, W9GME. SEC: W9RYU. RM: W9USR. PAM: W9VWJ. EC of Cook County: W9HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CDT. Major Graham Kent, W7CZL/9, spoke at the North Shore Amateur Radio Club June 4. The MARS display at Scott Air Force Base on Armed Forces Day was very successful. Over 500 messages were handled by AG3AL/K9AIR. K9GSD is hamming with a new electronic keyer. K9ATB and WA9GMX have been DXing with new vertical antennas. WA9GSM is using his new homebrew linear for the hard-to-work six-meter stations. K9QIZ is working two-meter f.m. on 147.5 Mc. W9SKR is rebuilding his beam to bring in the weak ones. The North Central Phone Net had a traffic count of 561 messages for the month of May and the ILN reported 231 messages also were handled during the same period. W9LNQ has received his QCWA certification. The Hamfesters group of W9AA/9 still holds the national high score in the three transmitter class. K9ZXB has just put a Twoer on the air with a big wheel on top. W9MAK's QTH for the summer will be Hewlett-Packard Co. in Loveland, Col. As this article goes to press, many clubs and individuals are preparing for the Annual Field Day exercise. This year promises to be a bang-up affair according to all the advance notices we have received. WA9APD is back home operating. W9-GDL has a new homebrew transmitter. W9NWK reports that the Interstate Sideband Net had a traffic total of 433, and that all Official Bulletins are aired on the net K9EIV's new QTH is Scott AFB, Ill. The Peoria Amateur Radio Club is getting in FB shape for its Annual Hamfest which will be held Sept. 15 at the same place as last year. This column's sympathy is extended to the family and friends of W8MRZ, who passed away recently. W9QLZ was named foreman of the Westclox Chemical Laboratory in addition to his duties as test equipment engineer. The League's Executive Committee at its latest meeting approved the application of the Quigley, (Ill.S.) Itadio Club of Flossmoor and the Leroy Amateur Radio Klub and made them duly affiliated societies of the League. Our sympathy to W9ARX, whose mother recently passed away. A new OBS appointee is WA9-BFS. K9VQC, newly-elected net manager of the Chicago Area Emergency Net, reports a total traffic of 25 for May. K9NBH, W9IDA, K9KZB, WA9AJF and WA9CCP are recipients of the BPL award. Traffic: (May) K9-NBH 2091, W9IDA 1378, K9KZB 716, WA9AJF 647, WA9-CCP 353, W9AKV 209, W9EET 202, W9USR 135, K9CYZ 128, K9ZQT 112, W9JXV 110, K9LXG 64, WA9DKM 59, K9UGY 46, K9DRS 40, W9OKI 29, W9MAK 25, K9GSD 18, K9LRN 17, W9PRN 12, K9RAS 12, K9CRT 11, W9-SKR 8, W9LNQ 4, K9EIV/9 2. (Apr.) K9UCG 9. (Mar.) K9CYZ 25.

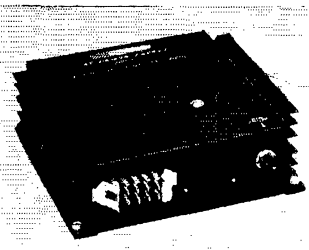
INDIANA—SCM, Donald L. Holt, W9PWH—Asst. SCM: Clifford M. Singer, W9SND. SEC: W9SNQ. PAMs: K9KTL, K9CRS, K9GLL, RMs: W9TT, K9DHN. Net skeds: (all times in GMT): IFN, 1300 daily except Sun. at 1330 and 2300 M-F on 3910 kc. ISN (s.s.b.), 0030 daily on 3920 kc. QIN (training), 0000 M-W-F on 3745 kc. QIN, daily at 0000 and RFN, at 1200 Sun. on 3656 kc. New appointments: K9UHQ as EC of Gibson County and K9KKF as OES. The Indiana State Wide RACES Net meets every Wed. on 3996.5 kc., LSB at 9 P.M. EST or 0200 GMT. New officers of the OARC of Kendallville are K9QAV, pres.; W9BTZ, secy. K9SXE, of Winslow, was awarded a scholarship to Phillips Exeter Academy recently. WA9AXF is the new net manager of the ECI 6-Meter Net. QIN Honor Roll: K9UHY, W9TT, WA9BFB, K9DHN, WA9ELX, K9UXX, K9HYV, K9-KTL, K9JOK. Those making the BPL: W9JOZ, K9DHN, W9MM, W9NZZ, W9TT, WA9BFB. *Amateur Radio exists as a hobby because of the service it renders.* May net reports: IFN 342, ISB 2359, QIN 363, QIN (training) 0, RFN 97, Hoosier V.H.F. 70, 9RN 677. Indiana was represented 100 per cent. Traffic: (May) W9JOZ 2597, K9DHN 724, W9MM 544, K9IVG 427, W9NZZ 416, W9TT 403, W9ZYK 402, W9QLW 238, WA9BFB 190, K9KTL 168, W9VAY 126, W9BUQ 97, K9ZLB 94, K9RWQ 82, K9CRS 79, W9CLY 77, W9PWH 73, K9UXX 70, K9HYV 64, W9QYQ 64, K9MWC 53, K9ILK 51, W9RTH 47, W9-BDG 45, WA9ELY 45, W9OG 45, K9OXA 42, W9SNQ 36, WA9EED 33, W9DOK 32, K9YXK 30, W9CC 29, K9ZLA 20, K9VHY 19, K9BSL 17, W9BTZ 15, K9QUT 13, W9EJW 12, K9WWJ 11, K9FHQ 9, K9GEL 9, K9HMC 9, W9QWI 9, W9YYX 9, K9AUI 7, W9IMU 7, W9ETJ 5, K9WET 5, W9AB 4, K9CIF 3, W9RE 3, W9AQW 2. (Apr.) W9DOK 14, W9AB 9.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC: W9BCC. RM: W9KQB. PAMs: W9NGT, W9NRP, and W9SAA. Nets: WIN on 3535 kc. at 0045Z daily, WSBN on 3985 kc. at 2245Z daily, BEN on 3950 kc. at 2300Z daily. New appointments: W9KQB as RM, replacing W9VHP who has been doing an FB job; WA9AKE as ORS and K9DAF as OES. Renewed appointments: W9EKZ as OES. K9IME made WAS. W9JOT reports WN9GQS and WN9GTP new on 2 meters. The Wisconsin Council of Clubs officers are W9KQB, pres.; W9DMG, vice-pres.; K9GBK, secy.; K9TFZ, treas. DXCCer W9-ZKB became a Silent Key when he fell off his 65-ft. tower. K9LGU has moved to a new QTH. W9VSO leads Wisconsin OOs with 200 notices in May. W9DYG has started his 3rd year as manager of CAN. MRAC officers: W9CJO, pres.; W9ROM, 1st vice-pres.; W9CUS, 2nd vice-pres.; K9KLM, secy.; K9CJP, treas.; W9VQD, W9QYW, W9KJW, W9NGV, W9RKP, W9TKY and K9-JGT. The Milwaukee AREC assisted in the Armed Forces Day and Memorial Day parades and the ALSAC fund drive. The Racine hamfest was a success and enjoyed by all attending. Net reports: BEN, 1235 stations in 31 sessions cleared 574 messages; WSBN, 1150 stations in 31 sessions cleared 627 messages; WIN (Apr.), 198 stations in 25 sessions cleared 107 messages. BPL for May traffic was made by W9DYG and K9IMR. Traffic: (May) W9DYG 567, K9IMR 346, W9AOW 308, W9CXY 192, K9GSC 177, WA9AKE 97, W9KQB 60, W9VHP 34, W9-CBE 33, W9OTL 26, W9NRP 25, W9YT 24, K9BLN 18, W9UEB 13, W9VIK 13, WA9ERI 9, W9HPC 9, K9IME

(*Continued on page 96*)

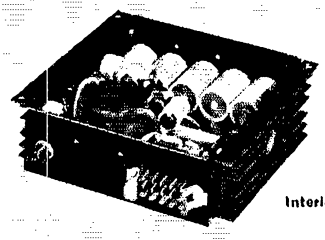
NEW HEATHKIT® SOLID-STATE POWER SUPPLIES

FOR ALL HAM TRANSCEIVERS



HP-13

$59.95

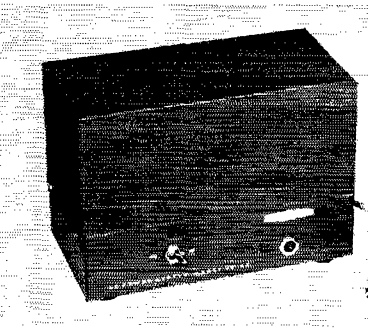


Interior

NEW DC "MOBILE" POWER SUPPLY: Furnishes all power required by Heathkit and other makes of SSB transceivers and mobile gear. Features encapsulated high-efficiency "Deltamax-core" toroidal transformer, power switching transistors, silicon rectifiers, circuit breaker protection, and relay control of primary power. 1500 cps switching frequency for low ripple output, excellent dynamic regulation.

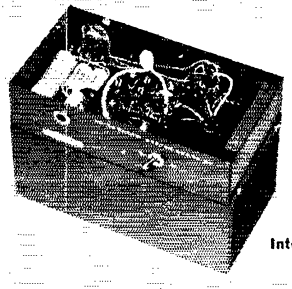
Kit HP-13...7 lbs....no money down...$6 mo.....**$59.95**

SPECIFICATIONS—Input voltage: 12 to 14 volts DC. **Input current:** 25 amperes maximum with full load. **High voltage output:** 800 volts DC, no load; 750 volts DC @ 250 ma. AC ripple, less than 1% @ 250 ma; Duty Cycle, 150 ma continuous; 150 to 300 ma @ 50%. **Low voltage output:** (high tap) 310 volts DC, no load; 300 volts DC @ 150 ma. (low tap) 265 volts DC, no load; 250 volts DC @ 150 ma. AC ripple, less than .05% @ 150 ma. Continuous duty cycle, to 175 ma. **Adjustable bias voltage:** —40 to —130 volts DC @ 20 ma max. Duty cycle, continuous. **Dimensions:** 7⅜" W x 7½" L x 2¾" D. All voltages referenced at 13 VDC input.



HP-23

$39.95



Interior

NEW AC POWER SUPPLY: Converts mobile gear to fixed-station operation in minutes. Furnishes HV, LV, bias, and filament power. Excellent dynamic regulation and extremely low AC ripple for optimum performance. Features long-life silicon rectifiers, provision for remote switching and fused line plug. Complete instructions for use with Heathkit and other SSB gear.

Kit HP-23...18 lbs....no money down, $5 mo.....**$39.95**

SPECIFICATIONS—Power requirements: 120 volts AC, 50-60 cycles, 350 watts maximum. **High voltage output:** 820 volts DC, no load; 700 volts DC @ 250 ma. **AC ripple:** Less than 1% @ 250 ma. **Duty cycle:** 150 ma continuous, 150 ma to 300 ma @ 50%. **Low voltage output:** (High Tap) 350 volts DC, no load; 300 volts DC @ 150 ma. (Low Tap) 275 volts DC, no load; 250 volts DC @ 100 ma. Less than .05% AC ripple @ 150 ma, continuous duty to 175 ma. **Fixed bias:** —130 volts DC, no load; —100 volts DC @ 30 ma. **Adjustable bias:** —40 to —80 volts DC @ 1 ma maximum. Less than .5% AC ripple. Continuous duty to 20 ma. **Filament voltage:** 6.3 V. AC @ 11 amps; 12.6 V. AC @ 5.5 amps. **Dimensions:** 9" L x 4¾" W x 8¼" H.

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- ☐ Enclosed is $39.95 plus postage; please send HP-23 AC Power Supply
- ☐ Enclosed is $59.95 plus postage; please send HP-13 DC Power Supply
- ☐ Please send me free Heathkit catalog.

NAME _____

(Please print)

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Prices & specifications subject to change without notice. Export prices slightly higher.

(Continued from page 94)
8, K9FPM 6, K9UUT 6, K9LGU 5, W9ONI 4. (Apr.) WA9EUA 20, W9SZR 14, K9UUT 12, WA9ERI 7.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: WØCAQ. PAM: KØTYY. A new call in Bismarck is WNØFUY. WAØFDA has his Conditional Class license and is doing a fine job with his Heathkit Twins mobile. All of the old officers in the BARK were reelected. WNØDAR is having a ball with his homebrew 2E26 transmitter. WAØDGQ, in Williston, got his Conditional Class license. KØIVQ blossomed out with a new SX-117 and KØRSA has an SX-115. The North Dakota 75-Meter Phone Net reports 26 sessions with a total of 701 check-ins; a maximum of 35 check-ins and a minimum of 14. There were 53 formal and 85 informal messages handled with 14 relays. Traffic: KØITP 104, WØYCL 20, WØCAQ 15, KØGGI 14, KØTYY 12, WAØALM 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: WØSCT. Thank you for returning me to the SCM office for another term. I received 5 reports for this section for May and not one of any club activity. I've received only two club activity reports this year. Are there any active clubs in the section besides Sioux Falls? KØWEN has returned to Sioux Falls. A new call at Centerville is WNØFZP, the son of WØLXD. The newly-appointed EC for Yankton County is KØYJF. KØBMQ reports his morning phone net started well, with an average of 15 reporting in each of 27 sessions. The Dakota Division Convention will be held at Sioux Falls, Sept. 14-15! Traffic: (May) WØSCT 245, WØDVB 133, KØBMQ 99, WAØAOY 60, KØGSY 38, KØVYY 36, WAØCWX 33, KØYJF 22, KØJTK 12, KØKOY 12, WØZWL 12, KØTXW 7, KØBSW 6, KØZBJ 4, WØZLS 4, WØOFP 3, KØZTV 3, WAØARZ 2, WAØBMG 2, WAØCKH 2, WØRWM 2, KØJGM 1, KØJHJ 1. (Apr.) WØZWL 265.

MINNESOTA—SCM, Mrs. Helen Mejdrich, WØOPX—Asst. SCM: Emerson Mejdrich, WØRIQ. SEC: KØKKQ. RMs: KØZRD, KØIJU. PAMs: WØGCR, WØYHR. MSSB PAM: WØHEN. Appointments issued are KØIJU as RM; WØKJZ, WAØCQG and WØHEN as OBSs; WØAIK as St. Louis Co. EC. At the annual MSN meeting held at the QTH of WØRQJ, KØIJU was selected as RM for the coming year. WØBUO spoke on League affairs. Both PAM, WØYHR and RM KØZRD, report encouraging increases in net activity. Former Duluthian W9DE recently visited here. Now W6HEK, he assisted on the Oscar project. KØPWQ's working model of an electronic microscope took first-place honors at the University of Minnesota State Science Fair. KØAKI took part in the National Science Fair at Albuquerque, New Mexico. The *Rochester Flyer* features an informative letter by KØSBB on ham radio in India. Active Novice WNØFCJ uses an HX-11 and a Knight receiver. 10-year-old WNØDMQ worked 28 states with his homebrewed 50-watter and S-38. WØTJA's shack sports a new NCX-3, and KØVTU's a new Galaxie. OBS WAØCQG installed a new Heath Sixer mobile transmitter. Congratulations to WAØBYO on his fourth consecutive BPL. Traffic: WAØARA 232, WAØBYO 218, KØJFJ 98, KØIHD 95, KØGCJ 66, WØKJZ 64, WØRIQ 56, KØIJU 55, KØZRD 55, WØHEN 46, WAØDGW 42, KØMGT 39, WAØCQG 33, KØJYJ 32, KØMIZ 30, KØVPJ 30, WAØABU 27, WØGCR 27, WØKLG 24, WØBUO 23, KØWWY 22, KØZKK 21, WØOPX 18, KØKJS 14, WØKYG 14, WØUMX 12, KØIIP 10, KØJOA 9, KØFLT 8, KØPIZ 8, WØEQO 6, KØICG 3, WØWMA 2, KØWYV 2.

DELTA DIVISION

ARKANSAS—Acting SCM, Curtis R. Williams, W5-DTR—SEC: W5KRO. PAM: K5SGG. RM: K5TYW. The Arkansas Emergency Fone Net meets on 3885 kc. Mon. through Sat. from 0600 to 0700 CST. During May the AEFN had 1247 check-ins and handled 91 pieces of traffic. The Arkansas C.W. Net (OZK) meets daily on 3790 kc. at 1900 CST. New appointments: K5TCK, K5-KIX, WA5BHW and K5KQD as ECs; K5SGG as PAM and OPS. The CAREN Picnic will be held in Little Rock July 28. The Fort Smith Area ARC has a nice Counties Award for confirmed contact with 75, 50, 25 and 10 counties. For full information write C. E. Peters, W5IKT, 2900 Gary, Fort Smith, and furnish an SASE. W5ABE is back on after a long absence. K5TYW has been working DX on 20-meter c.w. K5VOL is going to the Air Force Academy. The SEARK ARC reports several v.h.f. openings. W5EBE has a new HQ-170A. K5-JXC has moved back to Little Rock and has a DX-100 on the air. K5CIR has resigned as SCM because of limited time. K5AJY has been working DX on 20 meters! K5GKQ reports that Faulkner County has formed RACES nets on 80, 6 and 2 meters with the Control Center in the fallout area of the Court House. K5SGG is the Arkansas state Navy MARS coordinator. Traffic: WA5AVO 118, W5DTR 108, K5SGG 81, W5FPF 16, K5-GTN 16, W5HPL 16, K5UEK 8, WA5BQL 6, K5IPS 6, K5GKQ 5, K5GKN 4, K5ABE 2, WA5AMM 2, W5CUJ 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Shirley, W5DVV, the XYL of W5CME, made the No. 1 score in the U.S.A. in the YL-OM Contest with 918 contacts. Appointments this month include WA5BQA as OPS, W5WQX as OO, K5KQG as OO. K5WWR has been endorsed as EC. The Baton Rouge ARC has started a net on 160 meters. The Long Wire Net meets Sat., at 0900, every night 2000 CST. W5MEE/KØDOA is active on 50, 7 and 14 Mc. from New Orleans. W5JFB wrote your SCM about his antenna that seems out of this world. K5QXV made the BPL again but plans to slow down on the traffic-handling. W5CEZ will be off the air while vacationing away from Maplewood. W5LJY, operated by K5PGS, has been acting NC for the NASSB Net. K5-KMG is now Beauregard Parish EC. Looks like W5EA is going to get his ART-13 going soon. K5OKR has been very active on RN5. K5TJG located a precision 100-kc. unit and plans to build a secondary standard out of it. K5FYI uses a crystal to tune up to make sure he is inside the band, forgets to shift back to the v.f.o. and misses the net. K5BIB is busy installing antennas and equipment at the new QTH; he expects to be on 80- and 40-meter c.w. and teletype, also 6 and 2 meters. K5FQN has had a rash of rig trouble. W5KAT is overhauling a model 14 and reperforator for RTTY. K5VJT says there is not much doing but congratulations to W5BUK and W5KC on the SS wins. Don't forget the Delta Division ARRL Convention at Lafayette Nov. 29-30. Westside ARC had 7 c.w. and 1 phone entries in the SS Contest for a nice score. The Springhill ARC operated 3 transmitters on emergency power on Field Day. K5WOD repaired his power supply and is back on the air. Traffic: K5QXV 935, W5CEZ 294, W5LJY 99, K5KMG 40, W5EA 18, K5OKR 12, K5TJG 8, K5FYI 7, W5MXQ 6, K5MOJ 4.

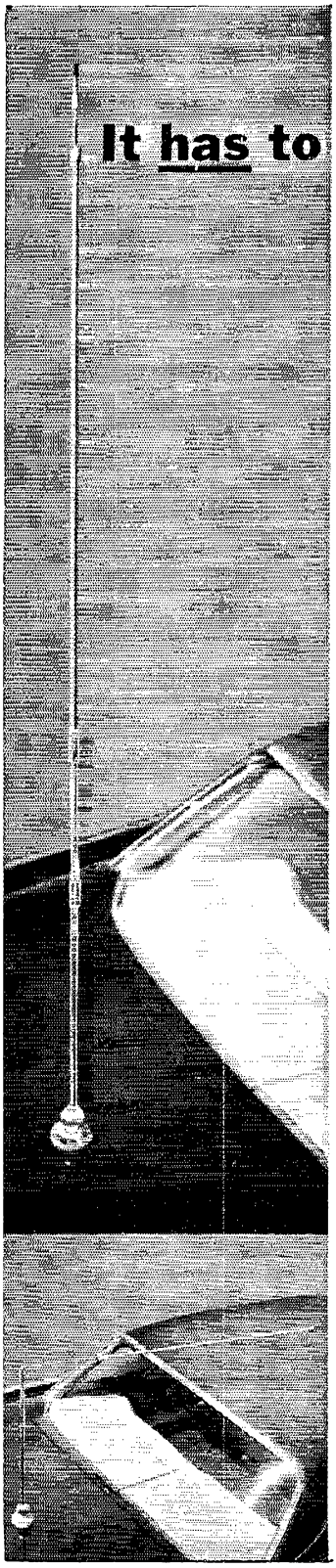
MISSISSIPPI—SCM, S. H. Hairston, W5EMM—SEC: K5SQS. K5RUO still is chasing DX, K5DZE, with a new Swan SW-157 and K5BPR are going s.s.b. Welcome to the Mississippi C.W. Net, WA5BMC. The Aberdeen boys have obtained a portable generator and emergency equipment for 144.150 Mc. W5GWD has retired from the Air Force. Radioteletype activity has picked up in Meridian with K5YGT and K5PYS joining W5CUU. W5OSA is now mobile with a Swan Tribander. W5DIX moved to Picayune. K5YTA did a good job as net manager for the Mississippi Magnolia Emergency Net and is now replaced by K5AFO. We need more ECs so we will have coverage in every county. Remember to send in your station activity reports. Other appointments are available, particularly for stations with OO equipment. Traffic: W5JDF 323, K5YPV 32, K5YTA 26, WA5BMC 21, K5PPI 20, K5RUO 19, K5AFO 15, K5GVV 10, K5IHQ 6, K5-GAD 4, K5MFY 3, K5YD 1.

TENNESSEE—SCM, David C. Goggio, W4OGG—SEC: W4WBK. RMs: W4OQG and W4ZJY. PAM: K4-WWQ. May net reports:

Net	*Freq.*	*Time*	*Days*	*Sessions*	*QTC*	*QNI*	*Average*
ETPN	3980	0640E	M-Fri.	23	63	505	22
TSSN	3980	1900C	M-Sat.	27	84	813	30
TN	3635	1900C	M-Sat.	27	111	185	7

Our Hamilton County EC received a fine write-up in the local paper for his Civitan Club speech. The Oak Ridge ROC sponsors the Crossville picnic and code classes. Congratulations to able club secy. WA4GAX on being the highest scoring section Novice in the SS. K4-JIG had the second highest score for OMs in the YL-OM Contest. With very deep regret we report a Silent Key, K4WRY. Charles was helping a friend put up a mast which fell across power lines. The new mgr. of RN5 is W4ZJY, from Cookeville. Previous manager K4-AKP is leaving the state after a year of being top traffic handler. All OESs report fine 6-meter openings to all states starting late in April. Many DX hunters report working 9N1DD, Mt. Everest Expedition, and Gus Browning from his FH8 location. ARRL bulletin No. 897 gives the FCC ruling on license fees: $4 for renewal and initial, $2 for modification, effective Jan. 1, 1964. No. 899 adds the Dominican Republic to the third-party traffic countries. The MARA had a fine hamfest with 150 amateurs registered. Delta will hold its hamfest Aug. 3-4 at Harbin's Pavilion, Whitehaven. Your SCM and SEC extend thanks and congratulations to all ECs who participated in the 1962 ARRL SET; Tennessee ranked 4th in the nation. See page 70, June *QST*. The annual ARRL Board meeting recommends AREC liaison with the National Traffic System. Traffic: (May) W4-ZJY 1165, W4PQP 329, W4KAT 147, W4OGG 134, W4OQG 67, W4RMJ 64, W4MXF 43, W4WBK 42, K4WWQ 41, K4JXG 40, W4CVG 32, K4FZJ 26, K4EWI 24, WA4AVX 23, W4HPN 22, W4ZAC 21, W4LLJ 18, W4VTS 16, K4-

(Continued on page 98)

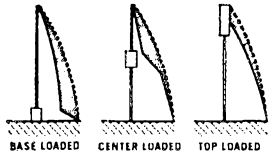


It has to be a hy-gain "TOPPER"

Sleek, Slim, High Performance Mobile Antennas for 10-15-20-40-75 Meters

One glance tells you the difference – no bulky loading coil at the center or base of the antenna – just a Slim-Line tapered whip that defies wind resistance – mounts on a heavy gauge mast that folds for garaging – and is easily removed without tools when you want to work another band.

When it comes to performance, with a Topper, it's like you're "sitting on top of the world." Hy-Gain's unique top loading delivers you energy otherwise lost in the inductive loading and shortening of the antenna. The chart below clearly illustrates how top loading provides less compromise for loading a shortened antenna than do other common methods.



Solid Line: Short Antenna Current Distribution

Dotted Line: Full Size Antenna Current Distribution

Note: Shaded areas represent the relative loss of energy involved as a result of inductive loading and shortening an antenna.

What about Topper construction? Topper whips (capsules) are made of durable ⅜" fiberglas rod with the loading coil permanently encapsulated in polyethylene plastic at the top. Fused to the bottom of each capsule is a stainless steel female "quick-disconnect" which is heavy spring loaded to insure an uninterrupted current flow. One 3' heavy gauge mast with "stable-fold" fitting, male "quick-disconnect" and ⅜" x 24 stud designed to fit any standard mount accommodates all "Topper" capsules.

Oh, yes, in case you didn't notice, there's a stainless steel tuning rod at the top of each Topper that allows you to tune to an exact frequency.

What about dimensions and price?

MODEL	FREQUENCY	MAX. POWER SSB	MAX. POWER AM	HEIGHT	HAM NET
TL-10	10 Meters	1 KW P.E.P.	250 W	Approx. 5'	$7.95
TL-15	15 Meters	1 KW P.E.P.	250 W	Approx. 5'	7.95
TL-20	20 Meters	1 KW P.E.P.	250 W	Approx. 5'	7.95
TL-40	40 Meters	300 W P.E.P.	125 W	Approx. 5'	9.95
TL-75	75 Meters	300 W P.E.P.	125 W	Approx. 6'	11.95

Topper Mast – Model TM-36 – For body or bumper mount – **$7.95** Ham Net

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NRZ 12, WA4AIS 10, WA4GAX 10, K4LPW 10, K4OUK 7, WA4FGB 6, WA4KGX 6, WA4DPJ 5, WA4IRX 5, K4UMW 5, WA4BXH 3, WA4GLS 3, K4PZJ 3, W4BIV 2, W4CZE 2, W4DQK 2, K4ENA 2, W4FYD 2, K4PSH 2, K4RCT 2, K4ZYL 2. (Apr.) K4OUK 14, WA4GAX 3, WA4FHY 2.

GREAT LAKES DIVISION

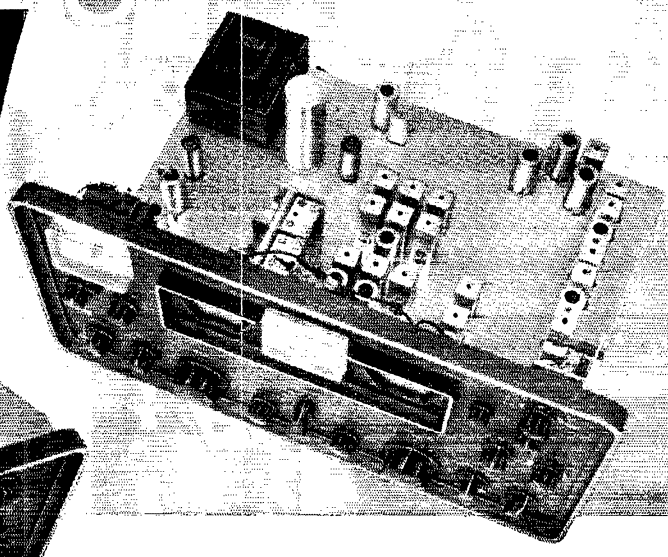
KENTUCKY—SCM, Elmer Leachman, W4BEW —SEC: W4TFK. PAMs: W4SZB, K4ECJ, W4BEJ. V.H.F. PAM: K4LOA. RM: W4CDA. Asst. RM: K4NYO. RM (KNN): WA4APU. The State ARRL Convention will be held in the Phoenix Hotel, Lexington, Ky. in Sept. For information write Charles Brown, K4VLR, 2905 Southview Drive, Lexington, convention chairman. All ARRL appointees: Please send your certificates to the SCM for endorsement at expiration. Ask for Form 1 report cards. The first official meeting of the Kentucky Council of Radio Clubs will be held at the convention in September. Clubs that did not receive copies of the proposed constitution, please contact your SCM. W4JUI made an exact reading of the FMT in February. W4JPV is working on proposals for awards to outstanding amateurs. W4RHZ sends code practice simultaneously on four bands three times weekly. K4VDN is home from school and will be active on the nets. K4ZQQ, WA4AGH and W4USE report that Louisville 6-meter nets are active and growing in membership. WA4CQQ and K4DMU are also NCs. They had thirteen sessions and 240 check-ins in May. K4KWQ is moving to Illinois. Keep reporting in to KYN. The EMKPN reports 23 sessions, 292 QNIs, 23 QTCs and 48 participating stations with 11 states represented. Traffic: W4BYG 275, K4KWQ 152, W4RHZ 74, K4HOE 57, W4CDA 52, W4KJP 51, W4USE 46, K4TQZ 40, WA4ELK 31, K4QIO 31, K4NYO 26, K4ZQQ 23, W4SZB 20, K4VDO 19, W4BEW 16, K4LOA 12, W4EON 5, K4NHY 5, WA4APU 4, WA4ELB 4, WA4ENH 4, W4YYI 4, WA4JQR 2, K4SWL 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: W8LOX. RMs: W8EGI, W8IXJ, W8FWQ and K8KMQ. PAM: W8CQU. V.H.F. PAM: W8PT. Appointments: W8NDM as EC: WA8ASV and W8FDO as ORSs. New officers: Monroe County Radio Commn. Assn.—W8VLW, pres.; K8GUG, vice-pres.; K8LZC, secy.-treas. Oakland County ARA—K8SBP, pres.; W8WWM, vice-pres.; W8NSO, secy.; K8YAK, treas. K8YRV is now Oakland County EC and K8SGL is Acting EC for Wayne County. New officers: Oak Park ARC—K8RQZ, pres.; K8BQK, vice-pres.; K8BPR, secy.; K8JZS, treas.; K8RJC, board. Michigan Six-Meter Club board members are K8BOU, W8MBH, K8ACB, W8MPR, K8JGF, K8LUY, K8QXU and K8TCJ. Huron Valley ARA officers are W8TEZ, pres.; W8WLD, vice-pres.; WA8FGK, secy.; K8PSJ, treas.; K8JDM, trustee; W8ZCJ, historian. W8ELW got a TCC certificate. W8HKT made a slide projector, 35 mm. and tape, on "Understanding Single Sideband" for Michigan section club use. WA8ICK, wants contacts with Saginaw and Grand Rapids from Hawaii, where he is operating as KH6DUV or KM6BI with Collins gear likely on 20 or 15 meters. W8JYJ is tickled with his new "Swan." At the Dayton Convention, K8PBA won 1st prize, a $25 bond, with his home-built automatic scanner. W8RLT was just getting over a serious operation when his XYL, Helen, died. The Metropolitan Ragchewers Club is building a tape library for use in teaching the blind and shut-ins code, theory and FCC regs. At last W8EMD is back on 1.8 through 28 Mc., and on 50 and 144 Mc. at Aurora Acres. K8HNW is in the Hurley Hospital, Flint. W8SWF is going s.s.b. W8IL is back home after a long trip. By the time this is printed, hope to have met again the U.P. gang at Laurium. For 24 hours, during O.T. Night, W8MRM made 612 contacts for "special QSLs". K8KMQ got a nice write-up in the *Flint Journal*, about Governor's traffic. K8GOU made the BPL for the fifth time. Traffic: (May) K8GOU 362, K8NJW 344, W8ELW 216, W8QFO 193, K8WQV 191, K8KMQ 181, WA8ENO 172, K8LNE 114, K8TIG 105, W8DSW 103, W8BEZ 81, W8FWQ 71, K8BYX 65, WA8ASV 64, W8IXJ 54, W8EU 51, K8QLL 46, W8FX 38, K8VDA 38, W8HKT 33, W8AUD 32, VE3CYG/W8 31, W8IUJ 29, W8UFS 21, K8JED 20, WA8BQK 19, K8HLR 19, W8PBO 17, W8RTN 17, W8ZHB 15, W8YAN 14, K8TFE 11, W8DSE 8, W8ZLK 8, WA8DZP 7, K8GJD 7, W8ILP 5, W8SWF 5, K8TJH 5, W8TBP 3, W8IWF 2, WN8IBM 1. (Apr.) K8PYW 22, K8YAY 13, K8LOS 2.

OHIO—SCM, Wilson E. Weckel, W8AI—Asst. SCM: J. C. Erickson, W8DAE. SEC: W8HNP. RMs: W8BZX, W8DAE, W8IEP and K8ONQ. PAMs: W8VZ, K8BAP and K8UBK. Warren ARA's *Q-Match*, tells us the club members saw ARRL movies on radio tube design and made a tour of the American Welding and Manufacturing plant. (Don't forget their hamfest Aug. 25). Seneca RC held a transmitter hunt and was shown films from Ford Motor Co. WA8AJD has a new SX-111. Dayton

(Continued on page 100)

the inside story



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HQ-170A
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CITY..... ZONE.....

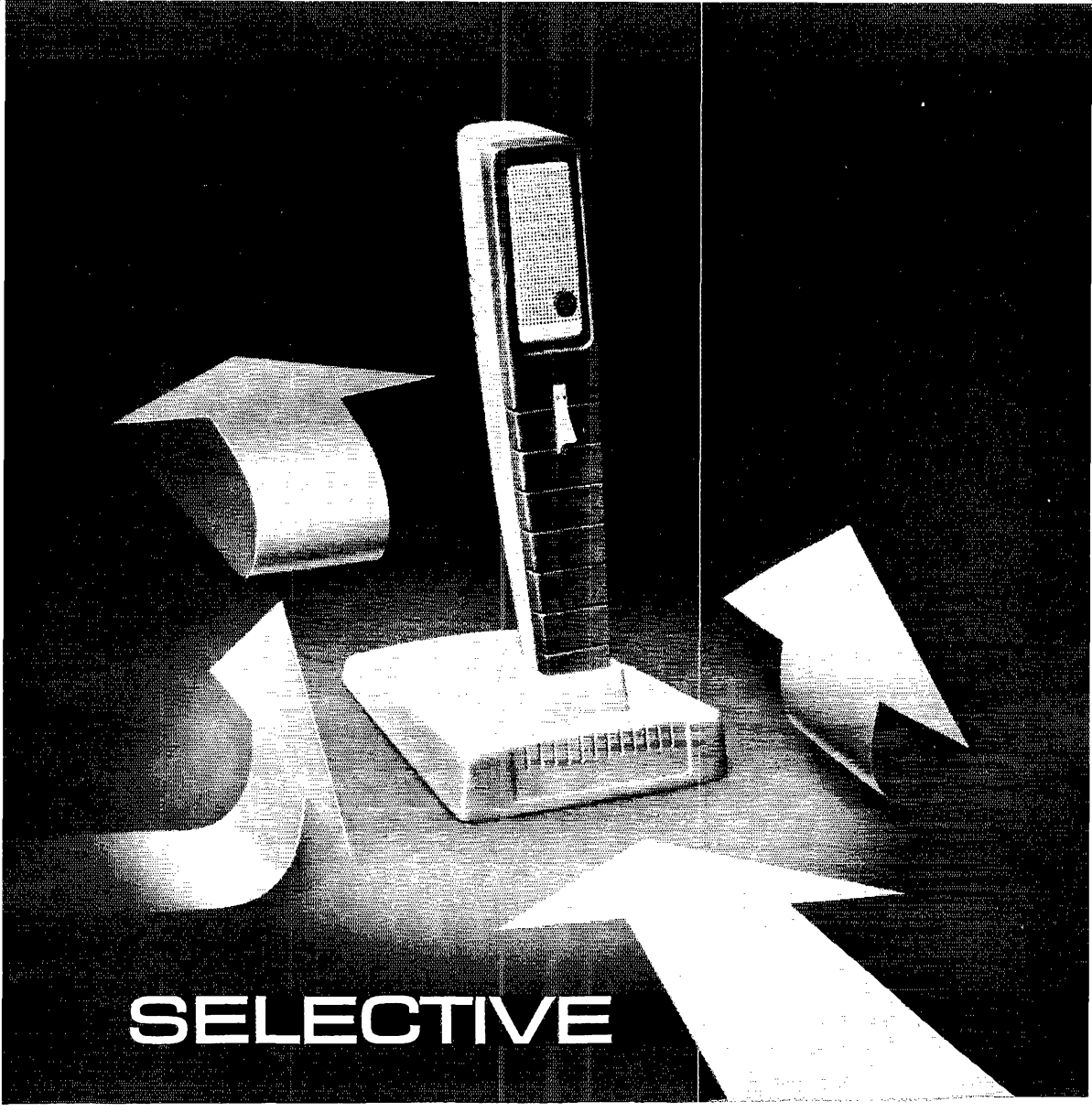
STATE .....

ARA's *R-F Carrier* informs us the club heard K8UZ speak on "Building a Tall Tower" and WA2YDW on "Talk to Yourself off the Moon on 1296 Mc." and W8GQ became a Silent Key. Toledo's *Ham Shack Gossip* names K8DON as its Ham-of-the-Month and informs us that K8RSR was married, K8YKD is home after an emergency operation; K8SEI still is in a cast after an auto accident, and W8HWF and W8YGR received their WAOC certificates. Findlay RC's *W8FT News* says they have started reminding members of license expirations a month in advance. This is something we should all do often—check our license to see when it expires. Your SCM attended the North East Ohio v.h.f. group banquet where 192 attended. 116 of them licensed amateurs. K8NYM has a new Ranger. WA8DKM has a new Drake 2B. K8KTH has a new HE-45 mobile rig. K8SEZ has a new TB-500 antenna. WA8CZR and WA8HXY are new Technicians. Parma RC's *P.R.C. Bulletin* says that W8CZM issued awards to W8s ACV, EPP, OPC, SLM, SUS. K8s BFT, BQY, BUM, DHX, EFB, IIU, JZI, NPH, NXV, PAZ, QPX, PVB, SQX, STC, UQA, WDJ, WOT, YYK, ZBL, ZPK. WA8FYC, WN8ACY and WN8FKR, for their work toward betterment of the club, and they held an auction. The Avco ARA was organized in Cincinnati and elected K8GNJ, pres.; W8JRC, vice-pres.; W8SKK, education; W8QHX, trustee. Logan High School ARC's 1963 officers are WN8FSB, pres.; Bernard Castell, vice-pres.; K8BAP, secy.-treas.; WA8BLZ, act. mgr. W8BZX and W8CHT received TCC certificates in recognition of their fine traffic work. Received the first Indian Hills RC's *Smoke Signal* in a long time and the club elected W8ICS, pres.; W8AEB, vice-pres.; WA8FRF, secy.-treas. Six Meter Nomads' *The Amateur Extra* said it held a transmitter hunt with W8JBS winning. The Babcock & Wilcox ARC heard K8IOH speak on "Basic Amplifier Circuits-Vacuum Tube Fundamentals." The Queen City Emergency Net held a hidden transmitter hunt. Greater Cincinnati ARA's the *Mike and Key* tells us the club toured station WCET-TV. WA8AJD has a new SX-111. K8ONQ was elected 1st vice-chairman and chairman-elect of the Cincinnati section of the American Chemical Society. Appointments made in May were WA8DOM as OES and W8ZRL as EC. K8YUZ and W8LT made the BPL in May. WA8ABC and Wilbur Jameson, ex-8th, joined Silent Keys. The results of the 1963 Ohio QSO Party were: W8NBK-8694, K8HDO-6264, W8BQV-4356, K8RMK-4284, W8CHZ-4180, W8RQ-3880, K8ANA-2870, WA8APS-2595, K8IQB-2414, WA8AJZ-2343, W8CJN-2304, WA8BNH-2088, WA8AWV-2015, W8YGR-1984, W8OQY-1980, W8CXS/8-1456, W8KMF-1416, K8EKG-1127, W8BSP-936, K8WDS-713, W8EG-350, K8RXD-276, K8LGB-160 and W8PS-8. We received scores from K7KOI, W2WL and W2UAP. The Ohio Council of Amateur Radio Clubs 1962 Field Day trophy was won by W8LT/8, and the 1962 Sweepstake was won by the Tusco RC. Traffic: (May) K8YUZ 661, K8LGA 447, WA8AJZ 233, W8BZX 223, K8HVT 199, W8LT 163, K8DIU 134, WA8CXY 90, K8UBK 70, K8ONQ 63, W8ECB 60, K8RXD 56, W8LZE 46, K8BNL 40, WA8AJD 34, K8LGB 34, K8BAP 33, WA8BOV 31, W8QCU 28, WA8AWV 27, W8AL 22, W8AZF 16, W8DIH 14, WA8ARZ 13, W8DAE 11, K8PBE 10, WA8BLZ 6, W8APS 4, W8DQD 4, W8EJZ 4, K8AOP 3. (Apr.) K8BNL 40, W8DHG 20.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAM: W2IJG. Section nets: NYS on 3670 kc. nightly at 0000 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc. nightly at 2300 GMT; MHT (Novice) on 3716 kc. Sat. at 1800 GMT; Inter-club on 28,690 kc. Mon. at 0130 GMT; Emergency Coordinators on 146,550 kc. Fri. at 0015 GMT. Appointment: WA2PUM as ORS. New officers of the Rip Van Winkle ARS include WA2IRK, pres.; WA2VFW, vice-pres.; WA2YAW, secy.-treas. These same hams have been appointed Asst. ECs by Greene County EC W2FQL. The Schenectady Club held "homebrew night" in May. Prizes were awarded for the most attractive, best wiring, most unique design and best from younger members' equipment. Each winner had to describe his equipment to the club. K2ONF is the new Radio Officer for Schenectady County RACES. The Memorial Day Parade in New Rochelle was capably handled by K2SJN, WA2OMT, WA2USM, WA2QMP and WB2FNR. A family member of WA2RQK needed rare type-B positive blood and 12 pints were donated through the efforts of the Westchester AREC and NYC-LI groups. This activity was headed by K2IES, WA2OMT, WN2GMN, WA2FCR, K2YCJ and K2AVP. K2RLY, representing the Heath Co. was speaker at a Westchester ARS meeting. A hidden transmitter hunt on three bands was sponsored by the Westchester and New Rochelle Clubs May 19 in White Plains. W2PKY reports a new 25-w.p.m. sticker on his CPC. W2VP has a new

(*Continued on page 102*)



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Now! A low-cost microphone that offers the enormous advantage of true cardioid directional pickup, plus a virtually indestructible ceramic element! This design, by rejecting surrounding noises from the sides and rear, provides substantially improved voice pickup at greater working distance and with less room-noise pickup.

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You get all this, and more, in the new 729 at a list price of only $24.50, with normal trade discounts applying. For equipment requiring a relay-control switch on the microphone, select the Model 729SR, (illustrated) for only $26.50 list. Either way you get traditional E-V quality, plus a money-back guarantee. Write for full information and list of Electro-Voice microphone specialists.

SPECIFICATIONS: • Polar Pattern: Cardioid • Frequency Response: 60-8,000 cps • Output Level: -55 db • Impedance: Hi-Z • Size: 7-3/4 in. long • Weight: 1 lb. • Cable: 8-1/2 ft. shielded.

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HT-37 with an SX-101. Traffic: (May) K2TXP 295, WA2UZK 281, WA2VYS 216, W2THE 194, K2SJN 104, WB2CPU 41, WA2PUM 40, W2OGH 37, W2EFU 35, W2PKY 35, WA2YHA 30. WA2LJM 25, K2HNW 8, WB2-DQO 3. (Apr.) WA2LJM 31, W2GTC 10.

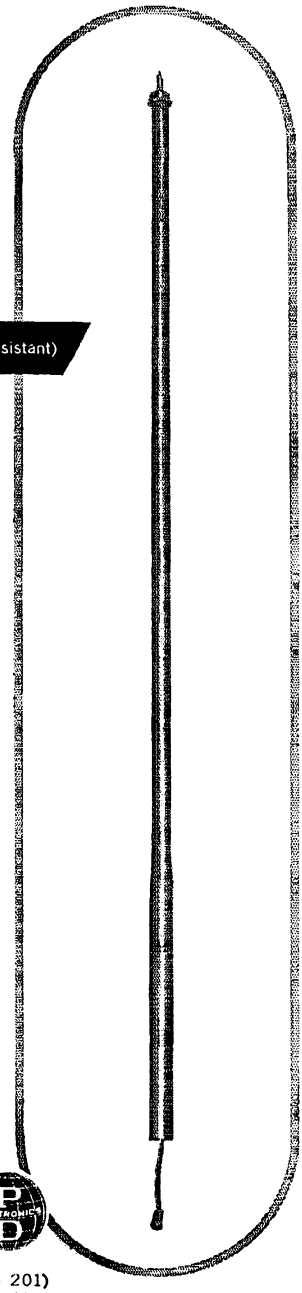
NEW YORK CITY AND LONG ISLAND—SCM, George V. Cooke, jr., W2OBU—SEC: K2OVN. RM: W2WFL. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0015Z nightly; NYCLIPN, 3908 kc. at 2230Z nightly; V.H.F. Net, Tue.-Wed.-Thurs. 145.8 Mc. at 0100Z and Fri. through Mon. 146.25 Mc. at 0000Z; Mike Farad, on 7238 kc. at 1700Z; All Service Net, at 1900Z on 3925 kc.; Q5 Net, on 3935 kc. at 2100Z daily. BPL certificates have been issued to WA2GPT, WA2VLK, WB2CAV, W2MTA, WA2EXP. W2EW and WA2TQT for the month of May in recognition of their exceptional traffic scores. The Rockaway ARC has received the new call K2UHD, which replaces the old WB2BOV and now the station is called "The John F. Grover Memorial station." The station, located in the Peninsula General Hospital, also is the net control station for the Queens 2-Meter AREC Net. The membership of the New York RC in Manhattan elected the following officers to serve for the ensuing year: WA2NLL, pres.; K2YFQ, vice-pres.; W2EEO, treas.; WA2TYU, secy. WA2SAZ received the award for highest world-wide v.h.f. amateur contest score of 241,776 points. WA2PMW has received Worked All Monks Award No. 97 and QRP V.H.F.-10 Award No. 3. K2MUB now is running a kw. on 6 meters and looking for additional scatter skeds. K2DDK announces a new club called "THINK," meaning "Technical Hams Increasing New Knowledge." Part of the program is swapping hour-long tapes on technical subjects with the AR Radio Technical Society of St. Louis. WA2VKK has received an OPS appointment. The Huntington V.H.F. Society now has the call W2AD for its memorial station, according to WA2GGB. W2ZPG and his bride have taken up residence in Great Neck. K2-QCV has been admitted to City College. WA2YKI, the brother of WA2WAO, now is serving in the Army. WB2BKS has received his General Class license. WA2-NIP is now mobile with his new Gonset Twins. K2JMH and WA2EER worked Aero Mobile on 29.0 Mc. from a Cessna 150. K2DIL has joined the s.s.b. boys with 500 watts. The Queens 10-Meter AREC net, W2IAG as EC, drills each Mon. on 29.5 Mc. at 0100Z and invites newcomers to join on an active basis. W2HSB has been appointed Assistant RO for Oyster Bay together with his active duties as EC for Area No. 4, Nassau, and net control for the 29ers. The Manhattan AREC Net meets on 50.4 Mc. at 0100Z the last Thurs. of each month and has grown to a membership of 25 active stations, with WA2TYU the EC and net control. WA2-TRX has a new HE-45A in the mobile. WA2VLK has a new Drake 2B. WA2CGG is the proud pappy of a new YL jr. operator. The summer schedule for the Queens 6-Meter AREC net will be Tue. on 50.25 Mc. at 0130Z. WA2LJT, is developing a special microphone for people who are laryngectomized. K4GG, ex-W2GG, the dad of W2TUK is up from Bradenton for an extended vacation in Dix Hills. Traffic: (May) WA2GPT 832, WA2VLK 543, WB2CAV 523, W2MTA 521, WA2EXP 500, K2UAT 427, W2EW 408, WA2TQT 336, WA2QJU 283, WA2IUQ 153, WA2RUE 135, K2KYS 76, WA2LJS 63, K2UFT 52, K2THY 48, WA2ZXR 46, W2GKZ 45, WA2RMP 44, WA2WAO 31, K2YQK 30, W2HSB 26, W2EC 24, WA2VZN 20, W2GP 14, WA2SAZ 14, WA2-WIH 11, W2IAG 10, WA2VKK 8, WA2EFN 5, WA2IZV 5, W2PF 5, WA2RAQ 5, WA2BIT 4, K4KHK 4, WA2-PMW 3, WN2FCB 2, WA2TYF 1. (Apr.) K2UAT 577, WA2RUE 163, WA2TQT 102, WA2ZXR 69.

NORTHERN NEW JERSEY—Acting SCM, Edward F. Erickson, W2CVW—SEC: K2ZFI. RM: W2-QNL. PAM: K2SLG. V.H.F. PAM: K2VNL. Names, times and frequencies of NNJ NTS nets: NJN, 2300Z, 3695 kc. daily; NJ Phone E&T, 2200Z daily exc. Sun. 1300Z, 3900 kc.; NJ 6&2 Mon., Thurs., Sun., 0300Z 51.15 Mc., Tue., Sat., 2200Z, 146.70 Mc. Sessions, attendance, and traffic for May: NJN, 32-534-468, NJ Phone, 31-411-65, NJ 6&2, 19-125-25. New appointments: WA2QPX as ORS, WA2UOO as ORS, WA2EDG as OES, W2MZR as EC, K2UCY as OPS. K2ZFI and W2QNL arranged AREC-NTS liaison for "Operation Pre-Set." Other participants: WA2SRV, WA2UOM, WA2MYB, WB2-BHC, WA2BNF, WA2UOO, W2COT, W2DMJ, W2CVW, K2VNL, K2ZSA, W2HXP and K2BEV. K2VNL continues his excellent liaison between NJ 6&2, NJ Phone and NJN. We need all these connections between specialty groups for a better Amateur Radio Public Service Corps. New officers of the Garden State Amateur Radio Assn. are WB2BCS, pres.; WA2GQI, vice-pres.; WB2-DXG, secy.; W2GMB, treas.; WA2KHL, asst. treas.; W2MPT, trustee; W2REH, F.D. coordinator. Attention prospective hams on the North Jersey Shore: WA2GQI will hold code and theory classes twice a week; call Art at SH1-5357. The Union County Amateur Radio Assn. meets at 8 P.M. the 2nd and 4th Fri. of each month at

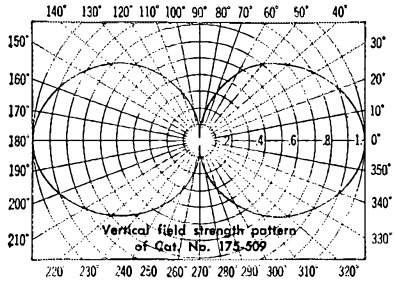
(*Continued on page 104*)

C·P COMMUNICATION ANTENNA SYSTEMS

—mean CERTIFIED PERFORMANCE!



BASE STATION STORM CHAMPION† UNITY-GAIN ANTENNA (Heavy-Duty, Precipitation-Static Resistant)



Vertical field strength pattern of Cat. No. 175-509

Electrical Specifications:

Nominal input impedance	50 ohms
Maximum power input	500 watts
Internal feedline	RG-8A/U
Flexible terminal extension	18" of RG-8A/U
Termination	Type N male with Neoprene housing
VSWR	1.5:1
Bandwidth	±1%
Lightning protection	Direct ground

Mechanical Specifications:

Radiating element	2" dia. red brass tube
Radiating element housing	3" dia. fiberglass tube
Support pipe	4" dia. hot-galvanized steel, 24" length available for mounting
Rated wind velocity	100 MPH with ½" of ice
Lateral thrust at rated wind and ice load	150 lbs. at 30 Mc
Bending moment 6" below top of support tube at rated wind and ice load	1400 ft. lbs. at 30 Mc
Weight	80 lbs. at 30 Mc

Cat. No. 175-509 Frequency Range 30-50 MC*

Cat. No. 175-509 STORM CHAMPION Antenna is designed for service in areas where maximum physical strength and/or resistance to precipitation static is required. The antenna consists of a galvanized steel element support tube running from the grounded antenna base through the entire structure to a lightning arresting device at the extreme top. The shunt-fed coaxial radiating element is mounted on this element support tube and the entire structure inserted into a fiberglass tube which is permanently sealed. This design results in a reduction of precipitation static interference in the order of 20 db. This noise reduction will permit a communication system to render effective service when nearby installations with exposed radiators are completely inoperative.

*Exact frequency must be specified †Formerly STORM/MASTER

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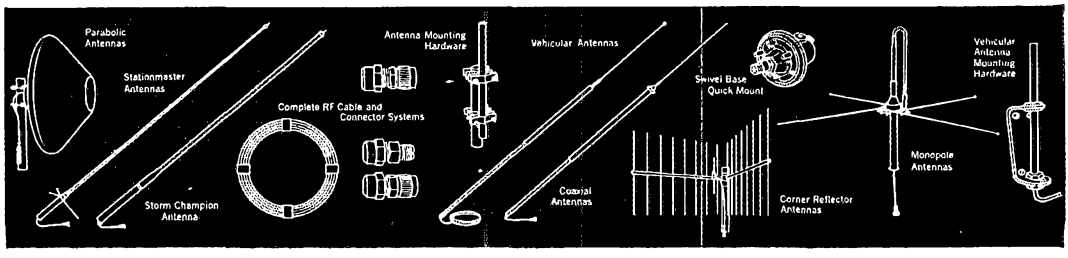

Roselle c.d.; contact WA2ZWY for information. Avenel RC continues code practice transmissions. K2OKA transmits Official Bulletins on 50.4 Mc. on Mon., Wed., Fri., at 2000 and Sat. at 2300. The "Sixteeners" meet on 50.51 Mc. at 2000-2330 EST, WB2AGJ as NCS. WA2UOO's balun coils improved his signal and traffic total. John made his third BPL. WA2WSB operated a traffic booth at Hanover Campus Carnival. Need Idaho for WAS? WB2CJP is operating there this summer, ask WA2QPX for details. K2SBS has a 35-w.p.m. code certificate. WB2DEP scored 14,835 in the CHC QSO Party. WA2MYB joined MARS. WA2ZRR still is DXing on 20-meter c.w. W2FNX was visited by ZS6IR. 14-year-old WA2ZKT is doing a tremendous job in AREC, RACES, traffic and the Boy Scouts. The Five City AREC Net provided communications for the Woodbridge Memorial Day Parade. WB2AWR passed the General Class exam. WA2VUM has a new 20-meter beam. W2NIY has a new bug. K2AGJ continues DXing on 20-meter c.w. W2VMX wants to contact NNJ stamp collectors. WA2EDG is experimenting with light communications. W2DMJ gave a talk on the history of the AREC. I am very sorry that I could not accommodate all of you who sent in news this month as our space is limited. DX reports should list band and mode. Then we can forward them to W9BRD, who will put them in "How's DX?" Traffic: (May) WA2UOO 358, WA2WSB 310, K2UCY 258, K2VNL 190, WA2SRK 170, WA2CCF 130, WA2QPX 93, W2QNL 90, K2SBS 67, WA2GQZ 62, WA2ZKO 55, WB2DEP 48, K2JTU 46, WA2MYB 40, WABNF 27, WA2ZRR 26, WA2LUD 25, WA2SRV 22, W2FNX 20, WA2APY 19, WB2CRS 19, W2DRV 19, WA2WAJ 17, W2ANG 14, WA2ZKT 14, W2EWZ 12, WA2SWP 12, K2ZFI 12, WB2COZ 11, WA2IGQ 11, W2ABL 10, W2CFB 9, K2EQP 9, W2SJB 8, K2SLG 8, WA2VUM 7, WN2DDA 5, WB2HBC 5, K2MFX 4, W2NIY 2, WA2OQP 2, K2AGJ 1, W2BSC 1. (Apr.) W2DRV 17, WA2APY 15, W2BSC 1, W2VMX 1.

FOURTH NEW JERSEY QSO PARTY

August 24-26

The Garden State Amateur Radio Assn. invites all amateurs the world over to take part in the Fourth New Jersey QSO Party.

Rules: 1) The time of the contest is from 2300 GMT August 24 to 0400 GMT August 26. 2) Phone and c.w. are considered the same contest. A station may work another station twice per band, once on phone and once on c.w. The same station may be worked on other bands. New Jersey stations may work other New Jersey stations. 3) General call is "CQ New Jersey." N. J. stations are requested to identify themselves by signing "DE NJ" on c.w., and "New Jersey calling" on phone. Suggested frequencies are 1810, 3530, 3900, 7030, 7250, 14075, 21100 kc 50-51 and 144-146 mc. 4) Exchanges consist of QSO number, RS(T), and QTH (state, province, or country). N. J. stations will send county for QTH. 5) *Scoring:* Outside stations multiply number of complete contacts times number of N. J. counties (maximum of 21). N. J. stations mutiply number of complete contacts times total number of state, provinces, and countries. 6) Certificates will be awarded to the first and second place stations in each section, and lower where deemed necessary. Novice and Technician awards will be issued when two or more logs are received. 7) Logs must also show GMT time, date, band, and emission, and be postmarked no later than September 11, 1963. Logs go to GSARA, Red Cross Building, Broad Street, Shrewsbury, New Jersey.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WØNTB—SEC: KØEXN. RM: WØLGG. PAMs: WØLSF, WØPZO. New EC: KØYUT. The Galva picnic was a credit to KØLXL, his assistants and the public spirited citizens of that town. The 160-Meter Picnic was sponsored by the Webster City ARA. Our Midwest Division Director, Bob Denniston, the Asst. SCM, the SEC, several ECs, 150 hams and their XYLs and harmonics all enjoyed a perfect day together. The grand climax of the season will be the invitational meeting with the Cedar Valley ARC at Hawkeye Downs in Cedar Rapids Sept. 1. WØNWX reports another first on 160 meters. He worked KL7IDU in late April. Congratulations to our fine AREC which nosed out Eastern Florida for first place in the SET last fall. Look over the summary in June

(*Continued on page 106*)

LEADING THE FIELD—THE SWAN SW-240

YOU ARE HEARING THEM ON THE AIR IN EVER-INCREASING NUMBERS. TO THOSE OF YOU WHO HAVE AGAIN CHOSEN SWAN, THANK YOU!

To those of you who have not yet made your decision, may we suggest that you look them over, and see for yourself why Swan is the leading transceiver, manufactured with unequalled performance, reliability, and craftsmanship.

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ONLY $320

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ENGINEERING CO.
Oceanside, California

QST. The Ames Club has participated in one emergency (a drowning) and two public service events so far this season. Our thanks to Prof. Joe Brownell, W2BSI, for his research on Iowa amateurs. Our sympathy to the family of Rev. Wm M. Mager, WØMJH, of Des Moines, who was stricken while at work at his home. The DMRAA has lost a capable and tireless worker. Net reports for May: Iowa 160, QNI 661, QTC 27, sessions 30, 75 meter, QNI 986, QTC 129, sessions 26. Traffic: (May) WØSCA 1545, WØLGG 1507, WØNTB 99, KØQKD 78, KØKAQ 20, KØTDO 15, WØUSL 12, WØYDV 12, WØBTX 11, KØGXP 10, KØOTV 7, WØQVZ 7, WØNWX 6, WØJPJ 4, KØMYU 4. (Apr.) WØNWX 14, WØFMZ 3.

KANSAS—SCM, C. Leland Cheney, WØALA—Asst. SCM: Richard G. Caspari, WØYZB. SEC: KØBXF. PAMs: KØEFL, WØBOR. RAMs: WØQGG, WØPFG. V.H.F. PAMs: WØHAJ, KØVHP. New appointment: KØTCS as EC, Zone 12. May net reports:

Net	*Freq.*	*Time*	*Day*	*Sessions*	*QTC*	*QNI*	*Average*
KPN	3920	1245Z	M-W-F	18	32	196	13
QKS	3610	0030Z	Daily	29	52	115	3.7

Net Control: KØEFL, KØQKS, KØYTA, WØFHU, KØGII, WØBYV, WØCGZ, WØQGG. Currently, the following stations hold appointment: WØHAJ, WØALA, KØTGR, WØIFR, KØLHF, KØBXF as OBSs; WØHAJ, KØVHP, KØJWT, KØRWC, KØGIC and WNØDZI as OESs; WØBYV, WØALA, WØVBK, WØOAQ, WØDEL, WØWYK, KØPIE, WØPFG and WØBMW as OOs. Contact your SCM for appointment to a League official station post. The Wichita Amateur Radio Club, Jayhawk Amateur Radio Society, Lawrence Amateur Radio Club, Neosho Valley Amateur Radio Club and the Air Capitol Amateur Radio Association are to be complimented on their regularity in sending in their club bulletins to your SCM. If your club has a paper, why not send it along each month so that your SCM can be fully aware of section activities. Traffic: WØBYV 122, KØYTA 103, KØGII 24, KØEFL 13, KØLHF 12, KØQKS 10, WØALA 8, WØWFD 4, WØFDJ 3, WØERQ 1, KØVQC 1.

MISSOURI—SCM, Alfred E. Schwaneke, WØTPK—RMs: WØOUD, KØONK. PAMs: WØBUL, WØBVL, WØLFE (v.h.f.), WØOMM, KØONK. KØWNZ has resigned as SEC. Your help has really been appreciated, Dick. Appointments: KØVIQ, WØHVJ, KØYIP, WØCXG, WØAYB as OPSs; WAØFLL, WAØCHD, WAØCHE, WØHHG as OPS; WAØCWV, KØFPC as OBSs; WØOMM as PAM. Renewals: WØOMM, WØBUL as OPSs. Resignations: WØOVV as OPS; KØOLW as EC/OBS. KØONK adds Henry County to EC duties and makes the BPL again. The SB-10 (sideband the hard way) rig is on regularly. Thirty hams and families registered for the annual picnic at Jeff City. Officers for MSM ARC (WØEEE) for the next year are: KØETC, pres.; KØLFY, vice-pres.; KØJZW, treas.; KØVXU, secy.; KØHGW, sta. mgr.; K5YTZ, act. ch. Conception ARC is a newly ARRL affiliated club; KØINY is secy. KØZFS is pres. of HARC (Kansas City). KØVNB received an A-1 Operator certificate. Graduates from high school are KØVPH and KØVMZ; from college KØLGZ. WAØFLL has worked 22 states on 6 meters since May 1! WAØCHD, WAØCHE, KØFPC, WØHHG and KØJWN all report 6 meters hot in May. Net reports: Red Cross—QNI 128, QTC 112; NCS WØAYB 4. PON—QNI 216, QTC 209; NCSs: KØBSW 8, WØHVJ 6, KØONK 5, KØVIQ 3. MON—QNI 124, QTC 179; NCSs KØFPC 9, WØOUD 8, KØVPH 5, WØKIK 4, KØVBT 1. SMN—QNI 11, QTC 3; NCSs WØOUD 3, KØFPC 1. Mo.SSB—QNI 152, QTC 25; NCSs WØECA 5, WØOMM 4. MSN—QNI 159, QTC 127; NCSs WAØCWV 9, KØONK 9, WAØCXG 5, KØFPC 2. MEN—QNI 328, QTC 234; NCSs KØONK 5, WØTPK 4, WØBUL 2, KØVPH 2. Traffic: KØONK 2061, WØAYB 216, KØFPC 196, WØMKJ 192, KØVNB 138, KØBWE 134, KØVPH 109, WØHVJ 96, WØOUD 81, WØKIK 55, WAØCXG 54, KØVIQ 54, KØYIP 52, WØTPK 49, WØRTW 40, WAØCWV 35, WØOMM 20, WØBVL 18, WØBUL 10, WØPXE 8, KØRDJ 5, KØWNZ 5, WØKCG 3, WØGBJ 2.

NEBRASKA—SCM, Frank Allen, WØGGP—Western Nebraska Net, WØNIK, reports QNI 605, QTC 50, 100 per cent check-ins: WAØAES, WØNIK and WØOFP. Nebraska Storm Net, KØJXN, reports QNI 495, QTC 5. Nebraska 75-meter Phone Net, KØDGW, reports QNI 452, QTC 113. Nebr. Emergency Phone Net, WAØBES, reports QNI 817, QTC 64. Nebr. C.W. Net, W6JCF/Ø reports QNI 69, QTC 27. KØJXN reports that the Sun. morning AREC Net is moving to 3982.5 kc. Fifty amateurs and their families attended the annual Pine Ridge Amateur Radio Club Picnic at Chadron June 2. A complete review of appointments is being made and those interested should apply to the SCM. Many thanks to WØEXP, retiring SCM, for his assistance in effecting the change. WØVEA is now on with

(Continued on page 108)

DRAKE 2-B

"The most talked about HAM RECEIVER"

2-B Receiver
$279.95
amateur net

2-BQ
Q-Multiplier/Speaker
$39.95 amateur net

For more information ask your distributor or write us for brochure with complete specifications and schematic.

The Drake 1-A Sideband Receiver was introduced in 1958. The 2-A with improvements for all modes followed in early 1960. The present Model 2-B with improved selectivity for SSB, CW and AM was announced in April 1961.

In this short time the Drake Receiver has become the most popular and talked about receiver on the ham bands. Whether you are a Novice or 60 wpm operator, a beginner AM or experienced SSB'er you will discover the 2-B has been engineered for all your receiver needs.

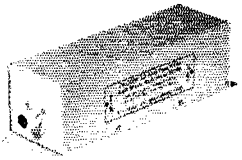
Just ask the ham who owns one.

R. L. DRAKE COMPANY • Miamisburg, Ohio

TVI CAN BE ELIMINATED WITH DRAKE FILTERS

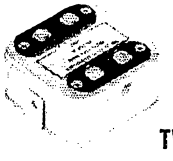
The Drake Amateur Low Pass Filters

have four Pi Sections designed for sharp cut-off between 6 meters and channel 2 and to attenuate all transmitter harmonics falling in any TV channel and the FM band. 52-ohm impedance. Low insertion loss.



TV-1000-LP rated 1000 watts input, 200 watts on 6 meters. SO-239 connectors built-in.
$16.95 amateur net

TV-100-LP rated 100 watts input, 20 watts on 6. Solder it in or use your own SO-239 connectors.
$5.95 amateur net

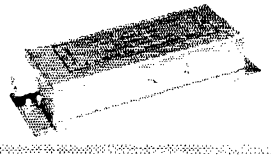


THE DRAKE TV-300-HP

. . . peer of high pass filters, provides more than 40 db attenuation at 52 MC and lower. Protects the TV set from all amateur transmitters 6 thru 160 meters. Three models—TV-300-HP 300-ohm, TV-72-HP 72-ohm, TV-300-HP(RCA) 300-ohm plug-in for RCA sets.
Any model $3.97 amateur net

The Drake TV-CB-LP Citizen Band Low Pass

is a four section filter designed with 43.2 MC cut-off and extremely high attenuation in all TV channels for citizen band and other transmitters 30 MC and lower. Rated 100 watts input. SO-239 connectors built-in.
$6.95 amateur net



$2.55 amateur net

TV-300-FMT 88 to 108 MC Band Rejection Filter.

FM broadcast transmitters are responsible for considerable TV interference being blamed on radio amateurs. The problem has become quite serious due to recent increase in the number and the power of FM broadcast stations. Overload problems and beats between FM and TV stations in TV front ends cause breakup in color pixs and wavy lines in black and white. The Drake TV-300-FMT installed in TV antenna lead and adjusted to frequency of interfering FM station will clear up pix.

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a DX-100, and WAØBYK has a new Swan Tri-Band rig. 6-meter activity is picking up with the warm weather. 2 meters is being worked in the Alliance area for the first time. Traffic: (May) WØLOD 154, W6-JCF/Ø 150, WAØBID 101, WAØBES 58, WØCCD 40, KØZEO 26, WØNIK 24, WØEGQ 20, WØFIG 20, WØ-CRK 17, KØKJP 13, WAØBYK 12, WØCIW 12, KØ-FBD 11, WØVZJ 11, WØBOQ 10, WØYFR 10, WØVEA 9, WAØCDQ 8, WØFMH 8, WØZJF 8, KØMSS 6, WØ-NOW/Ø 6, KØCGM 4, WØKFY 4, WØWKP 4, WØHQZ 3, WØHTA 3, KØYZP 3, WAØDFS 2, WØFBY 2, WØJFN 2, KØJFN 2, KØVTD 2, WAØAES 1, WØAHB 1, WØHOP 1, WØVGP 1. (Mar.-Apr.) WØFXH 21.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Robert J. O'Neil W1FHP —SEC: W1EKJ. RM: K1GGG. H.F. PAM: W1YBH. V.H.F. PAM: W1FPH. Traffic nets: CPN. Mon. through Sat. 1800 hours. Sun. 1000 hours 3880 kc. CN, daily 1845 hours 3640 kc. CVN, Mon., Wed. and Fri. 2030 hours 145.980 Mc. Net control tunes 148 Mc. down to 144 Mc. on all call-ups. K1GGG has been named new RM for CN, replacing W1KYQ, now a Silent Key. A salute goes to K1WKK and K1DQC on making the BPL again for May traffic. Certificate endorsements: W1YBH as PAM; K1GGG as ORS; W1FHP as OBS and EC. W1YBH reports that CPN held 31 sessions in May, with a daily average attendance of 21, average time of net 41 minutes. Conditions were improved with Daylight Saving Time. High QNI in this order: K1OJZ, W1DAV, W1FPH, K1AQE, W1LUH, K1PUG, K1DGK, K1LFW, K1NTR, K1SRF, W1VQH and W1YBH. New stations are K1TGX and K1VIJ. CN report from K1-GGG shows 31 sessions, 380 traffic, average attendance of 9.9 and average messages 12.3 per sessions. High QNI: K1WKK, W1CTI, K1GGG. The CVN reports 10 sessions, 31 stations with 16 traffic. A new station from W2-Land is operating in Connecticut. W2AEE/1 is the operator from Columbia University. Many OOs reported that there are loads of stations operating phone in the c.w. portion of 50. Mc. and plenty of splatter plus or minus 15 kc. Also noted by OESs are good band openings during most of May on 144 and 50 Mc. W1GVJ is on an 8-week trip to Europe. K1LOM is looking around 3522 kc. with a homebrew keyer from 40 to 75 w.p.m. W1QV returned from a trip to Guam and California. K1OJZ is organizing a local AREC net and is looking for more members with 2-meter gear. K1WKK wants more stations on the RATS (Ragchewing and Traffic Society) Net, Sat. at 2200 hours. Traffic: (May) K1WKK 631, K1DQC 237, K1LOM 165, W1AW 159, W1-EFW 155, K1LYL 93, K1PQS 93, K1GGG 73, K1JAD 65, W1MPW 58, W1BDI 57, W1CTI 46, W1FHP 46, W1YBH 46, K1DGK 45, W1LUH 44, W1RFJ 40, K1PLR 35, K1NTR 33, K1EIR 32, W1QV 30, K1PUG 25, K1TGX 16, K1SRF 14, W1BNB 12, K1MBA 9, W1CUH 7, K1-RFV 6, W1OBR 5, K1OJZ 5, (Apr.) K1GGG 56, W1CTI 54, W1RFJ 44, W1OBR 35, K1JAD 23.

MAINE—SCM, Arthur J. Brymer, W1AHM—SEC: K1DYG, PAM: K1ADY, RM: K1MZB. Traffic nets: Phone-Seagull Net, 3940 kc. 1700-1800 EDT daily except Sun. Pine Tree Net, 3596 kc. Mon.-Fri. 1900. First Regional Net, 3605 kc. 1815-1930 daily. Maine State C.C. Net meets Sun. at 1100 on 3993 kc. and Wed. on 3530 kc. at 1900; W1BYK is NCS. Maine State AREC Net meets Sun. on 3940 kc. at 0900 EDT. K1MZB has worked 36 countries and 40 states on 80-meter c.w. Endorsements: K1MZB as RM/ORS/OPS; K1QIG as EC. K1QIG spoke to the Brunswick Rotary Club on ham radio as a hobby and was well received. K1GVQ, a recent M.V.T.I. graduate, is now with the Bell Labs in New Jersey. KN1FGZ is a new Novice in the Portland area. K1RQF obtained his General Class license while at the Swampscott Hamfest. K1MBM also is recuperating nicely after his recent operation. PAWA fall sessions start Oct. 1 for the season. K1KSG is now an electrical engineering major at U. of Maine. K1GUP is a popular net control around Maine; he has one evening on the Seagull Net and one morning on the Barnyard Net as NCS. K1MDM is doing a fine job at the V.A. Hospital in Togus, Maine. All certificate holders are requested to send their certificates to the SCM for endorsement. K1GAX has a new Mosley tower 30 feet high, TA-33 jr. beam, eleven-element Cushcraft beam and homebrew equipment for 2 meters. K1PII (Franklin) is NCS of the Maine Blueberry Weather net. Data from farm observers is relayed to W1QQY for drying-condition (dusting) forecasts. Traffic: K4BSS/1 80, K1-GUP 41, K1GSF 22, K1SZC 19, K1MDM 16, K1MZB 12, K1VEQ 12.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr. W1ALP—W1AOG is our SEC: W1UIR is a new OBS and is getting back into action again. W1AWA was endorsed as PAM for 75 and K1MHC as OES. W1DOM, our new PAM for 2, has made the following appointments: WIs OFK and ZSS as advisors to him,

(Continued on page 110)

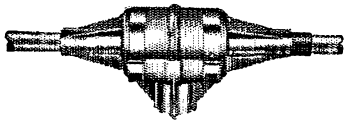
FIRST and ONLY..

remotely tuned ROTATABLE DIPOLE!

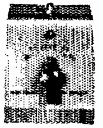
DESIGNED SPECIALLY FOR 40 AND 75 METERS IN LIMITED ANTENNA SPACE

NEW-TRONICS CLIFF-DWELLER™

PAT. PEND.



Housing for motors and gear trains with mounting yoke



Resonance and band switching control

ELECTRICAL FEATURES

- Antenna resonance finger tip controlled from transmitter location in shack.
- VSWR: 1.1 to 1 or less across entire band
- Feed-point variable to compensate for antenna environment
- No traps . . . no baluns . . . no matching devices of any kind
- Feed direct with any length 52 ohm cable
- Power handling capacity — maximum legal limit

The CLIFF-DWELLER is another New-Tronics first. Here's a tuneable dipole ideal for hams who live in apartments or in homes on small lots. The CLIFF DWELLER will give you unbelievable performance even in limited space.

MECHANICAL FEATURES

- Approx. lengths
  28'-6" — 26' 7.0-7.3 mc
  30'-6" — 26' 3.5-4.0 mc
  31'-4" — 26' Two-Bander
- Self supporting, accepts 1¼" threaded pipe for mounting in standard rotators
- Maximum turning radius approx. 15'-8"
- Sturdy aluminum die cast housing for motors and gear trains which drive end sections of dipole
- Heat treated aircraft type, 1¼" heavy wall aluminum tubing
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MODEL NO.	FREQ. MC	WEIGHT	NET PRICE
CD 40	7.0-7.3	Under 20 lbs.	$ 92.50
CD 75	3.5-4.0	Under 20 lbs.	99.50
CD 40-75	Two Bander	Under 20 lbs.	129.50

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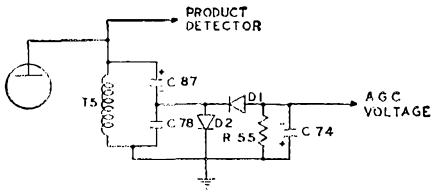
W1PEX as advisor on net procedure. W1LES as net mgr. for our 2-Meter Net. EM2MN: 23 sessions, 251 QNIs, 191 traffic. W1LAV has a new tower and beam. K1FKT, ex-W6CHS, got his license again and is in Framingham. W1WAH has a home-built preselector for 10-15-20 and is working on a ground plane antenna. W1NF is DXing. WA4KXH, ex-W1VUE in Somerville, is on 2. The T-9 Radio Club met at W1ISX's QTH. K1UCT *moved to Hull.* W1YHY *is very busy at B.U.* in Boston. W1HXY is a Silent Key. KN1ZKX, Whitman, is on 2. W1EKG has a beam for 2 now. W1DMD and W1MEG worked AIR, NSS and WAR on Armed Forces Day. W1FLD is in Peabody. The Cape Cod & Islands ARA held its Annual Picnic at Kalmus Park, Hyannis. K1SRZ worked the following States on 6-meter openings: Missouri, Arkansas, Illinois, Tennessee and Kentucky. K1SLZ is now an attorney practicing patent law in Massachusetts. W1AOG received reports from K1s PNB, MBG, ICJ and W1FON. We have 3 new affiliated ARRL clubs: Pepperell AWA, Norwood ARC and TIMAC ARC. Officers of the PAWA are K1TSD, pres.; K1SAW, vice-pres.; K1YTS, secy.; KN1YRC, treas. Meetings are held the 1st and 3rd. Fri. of each month in the Town Hall. Officers of the NARC are W1UAI, pres.; K1QLG, vice-pres.; K1WKT, secy. TIMAC ARC officers are W1LFB, pres.; KN1YBL, vice-pres.; KN1WTO, secy.; K1TBX, treas. HC2JP is in Boston temporarily. W1PEX, W1EMG and K1ONW made the BPL. K1SZG, Whitman, is going to college. W1HKG was auctioneer for the Malden ARA. *TCC certificates* have been issued to W1EMG and K1TSD by W3EML, director of the TCC Eastern Area, for their fine traffic work. KN1ZOS is new in Somerset and on 2. W1AOG spoke at the Townsend ARS. W4VGS spoke at the Wellesley ARS. K1IRC has *an* HE-45A. K1ONW has his 1RN Region Net certificate. K1PNB overhauled his Valiant. K1MTT is mobile. W1NZD has an 813 final. W1HE is back on the air c.w. W1FON has a 2-meter big wheel. KN1ESG has an SX-99 and an Adventurer transmitter on 80 c.w. K1CMS and family are leaving for a trip to VE-Land, VO-Land and Niagara Falls. W1HGT heard lots of DX on 6 on *an* opening and has a Telco 201 and a Drake 2B, K1YBD is General Class. K1VOK has a new outdoor shack. W1AGW (age 80) is back on 10 meters after a long absence. W1DIY says that DX KH6-Land has been good on 80 c.w. K4RNH was the single operator for April C.W. CD at W1MX; he had demonstrations for visitors at an MIT open house. K1SMT has a Meteor SB-175. WØPAN/1 has a new vertical groundplane on 10. Mass. Phone Net had 23 sessions, 359 stations, 178 traffic. *6 Meter Cross Band* net had 23 sessions, 321 stations 144 traffic. Traffic: (May) W1PEX 1041, K1ONW 529, W1EMG 522, W1AWA 259, W1OFK 202, W1LEF 183, W1ZSS 136, K1PNB 127, K1WJD 86, W1EAE 72, W1FON 72, W1DQM 57, KN1-ESG 51, W1AOG 42, K1GKA 37, K1DGI 31, W1SIV 26, W1BKI 24, W1VYS 22, K1CMS 21, K1UAB 21, W1GEK 18, K1BGK 11, W1OJM 10, W1UIR 10, K1OCD 8, W1ZFQ 8, W1HGT 6, WØPAN/1 6, K1TNL 4, (Apr.) W1DIY 12, W1MX 8, K1VLB 6, K1SMT 4, WØPAN/1 2.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: W1BYH, RM: K1IJV, PAM: K1RYT. Massachusetts Phone Net (now consisting of both Eastern and Western Massachusetts) meets on 3842 kc. a.m. and s.s.b. Mon. through Fri. at 1730 EDST. The Western Massachusetts c.w. net is still very active, with K1ZBN tops for attendance during the month. (WMN, 3560 kc. daily except Sunday at 7 P.M. EDST). New officers of the Berkshire County Amateur Radio Association are: K1CVE, pres.; W1GTO, vice-pres.; W1DPY, secy.; K1ZHJ, treas.; W1HRC and K1TRZ, executive committee. The Hampden County Radio Association had an attendance of about 120 at its May auction night. K1LNC is now Radio Officer for c.d. sector 3E. W1ZPB has a new HQ-170A. K1VPN is active on 20-meter c.w. for DX. K1VHO is active on 80 through 10 meters with his favorite activity the Massachusetts Phone Net. The Grafton area group is starting a 2-meter net. K1ZHJ recently dropped the "N" from his call. W1DPY is having excellent results with his new Marauder and is building a husky linear to go with it. K1ZYB is a new ham in North Adams. K1WZS has a new six-element beam and is working DX on 6. K1-RYT has a new Hallicrafters SR-150 s.s.b. transceiver. K1ZBN is using a home-built bug which cost 50 cents. With the aid of the Heath Service Department, W1BVR now has *an operating* HX-20 s.s.b. and c.w. transmitter! Hi. Traffic: (May) K1RYT 526, K1SSH 410, K1LBB 144, W1BVR 107, K1IJV 98, K1LNC 81, K1ZBN 72, W1ZPB 65, W1DVW 39, K1VHO 8, K1JQT 6, KN1ZVJ 6, K1VPN 5, K1TTT 4. (Apr.) K1TTT 4.

NEW HAMPSHIRE—SCM, Albert E. Haworth, W1YHI—SEC: W1TNO, PAM: K1NXV, RM: K1BCS. GSPN meets Mon. through Fri. at 2400Z and Sun. at 1430Z on 3842 kc. Note the change back to 2400Z. NHN (c.w.) meets Mon. through Sat. at 2345Z on 3685 kc. Appointment: W1YHE as EC for Belknap County.

(*Continued on page 112*)



THE NCX-3 SSB transceiver uses a rather novel AGC circuit — one which employs a built-in voltage doubler to increase the amount of AGC voltage available. To our knowledge, the NCX-3 is the first commercial rig using such a circuit (borrowed from our WRR-2 super-stable SSB Navy receiver) to provide an extremely flat, clean AGC characteristic without annoying pops or thumps. In addition, the reserve AGC voltage available contributes to the smooth sound of the NCX-3 receiver section, since sufficient AGC voltage is available to drive the time delay circuits without clipping or limiting of the IF signal feeding the product detector.

AS CAN BE SEEN from the portion of the NCX-3 schematic reproduced above, RF from the last IF transformer T5 is applied to the series-connected capacitor C87 and diode rectifier D2. The positive signal peaks cause DC conduction through C87 and D2 charging C87 in the indicated polarity. The entire IF signal appearing at the anode of diode D2 is *superimposed* on the negative charge already present on C87. The voltage of the negative peaks of the IF signal at this point is therefore equal to the sum of the negative peak *plus* the negative charge. This waveform is in turn applied to the doubling diode D1 causing conduction which charges capacitor C74 to this "sum" voltage — approximately twice the original negative IF peak voltage. Diode D1 also performs a dual function; charging of C74 takes place through the low impedance of D1 and C87 in series, allowing *rapid* charge (fast attack). However, when the signal is removed, diode D1 does not permit C74 to discharge through the previous charging path. Instead, it can only discharge through the large resistor R55, resulting in a *slow* discharge (slow decay). At this point, the time constants of the NCX-3 AGC circuit have been established, and the total AGC voltage available is double what would be otherwise obtained through conventional circuitry.

THE AVAILABILITY of ample AGC voltage provides an additional benefit, in that the AGC voltage doubler may now be fed from a capacitance divider across T5 consisting of C87 and C78, rather than from the top of T5. This divider is employed in order to allow C74 to charge rapidly without drawing undue power from the IF output transformer which also feeds the NCX-3 product detector (considerable power is always required to *rapidly* charge a capacitor, and the power required increases as either the size of the capacitor or the charging rate is increased). The capacitance divider acts as an impedance matching network to prevent a momentary high power drain from limiting the peaks of the IF signal applied to the product detector, which would result in objectionable distortion.

THE NEXT TIME you get your hands on an NCX-3, run the RF gain wide open on the strongest SSB signal you can find — you'll be pleasantly surprised at the way this unusual circuit cuts the big ones down to size — and does it without accompanying sound effects.

FRANK ROBERTS, W1JVG
NATIONAL RADIO COMPANY

With the good AREC activities in this area a fine setup should develop. Welcome back as an OO, W1QHS. BPL certificates were issued to K1TMD for March and April. K1BCS reports an FB visit with K2TXP and WA2UZK. The Annual GSPN Picnic was a great success with all in attendance having a fine time. FD results are coming in with good reports. W1MTX is now at VK6CH and wishes contacts with New Hampshire Stations on 80, 40, 20 c.w. and s.s.b. The results of WANE show W1FZ first in the state with New Hampshire being the first with the highest reports. K1HFW (Apr.) and W1NNL (May) operated the Merrimack County AREC Net. K1DWK is doing an FB job with this net. Look for the Hillsborough County AREC Net real soon. Traffic: W1CUE 27, K1UHE 23, W1SWX/1 22, K1WPM 20, W1ET 3.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: W1YNE. PAM: W1TXL. RM: W1SMU. RISPN report: 31 sessions, 591 QNI, 192 traffic. A RISPN picnic was held at Goddard Park with net members and their families taking part. The annual meeting of the net was held during the picnic with the following officers being elected: K1TPK, net mgr.; K1RRK, asst. net mgr.; K1OZI, act. chairman; Emma Lawton, goodwill fund chairman. The W1AQ Club of Rumford reinstated K1JYN as a member. Field Day captains were K1LDK for c.w., K1RLG for s.s.b., K1THE for v.h.f. Results of the Rhode Island Mobileers elections were: K1MYU, pres.; K1TPK, vice-pres.; K1QEA, secy.-treas.; K1CPL, comm. officer; K1STB, public relations; K1WYO, W1BQH and W1ZRO, board of directors. The NCRC Club of Newport elected to membership W6IQW and KØCSJ. K1PTV was in charge of FD activities. Winners of the Portsmouth AREC and Sub-Sig ARC cosponsored transmitter hunt are: first, K1VEX/M with K1WQW assisting; second, K1LPH/M, and third, K8NHR/M. FD team captains of the W1-DDD Club of Woonsocket were: c.w., W1AUT; phone, W1YRC; v.h.f., K1KEE. The club had three transmitters on the air. Traffic: (May) W1TXL 717, K1TPK 106, W1BTV 37, K1DZX 36, K1STB 36, W1YNE 29. (Apr.) W1YNE 49. (Dec.) K1QDI 102.

VERMONT—Acting SCM, E. Reginald Murray, K1-MPN—The Burlington Hamfest and Luncheon Club hold daily sessions Mon.-Fri. in Battery Park from noon to 1. The Vermont C.W. Net, on 3520 kc. Mon., Wed., Fri. at 2300Z, needs operators. The Burlington and Franklin County Clubs have new club houses. K1YNN, a Vermonter, is now in Germany as DL5AH. Welcome to new KN1 hams FHD, FHE, FHF, FHH and FHI, all in the Newport area, and FIU, in Montpelier. W1MMV worked the *Kearsarge* shortly before Astronaut Cooper's landing. W1KJG is EC for Lamoille County. Your SCM will be glad to endorse other EC certificates if you send them. K2UPD/1 was the undisputed Vermont winner of the Vermont QSO party held last Apr. K1LHB was the out-of-state winner. The CVARC's new officers are: W1PMH, pres.; K1MPN, vice-pres.; K1OMO, treas.; K1OXD, secy. Another QSO Party is being planned for next Feb. How about traffic reports, fellows?

NORTHWESTERN DIVISION

IDAHO—SCM, Raymond V. Evans, K7HLR—Our greatest appreciation to our former SCM, W7GGV, for her fine leadership. We expect to still keep her working. Net schedules:

Net	*Freq.*	*GMT*	*Days*
Ada County Emergency Net	3860	0230	Thurs.
Gem State Net (NTS)	3580	0230	Daily
FARM Net	3935	0200	Mon.-Fri.
Boise Valley Net	145.44	0230	Sun.
Early-bird Contact Net	3905	1400	M.T.Th. F.
Eastern Idaho CD Net	3990	1415	Wed.
Third Emergency Net	3910	1600	Sun.

The 31st W1MU Hamfest will be held at Macks Inn, Aug. 2, 3 and 4. Cabins, trailer and camping facilities will be available. Traffic: K7HLR 33, K7NEY 24, W7GGV 23.

MONTANA—SCM, Walter R. Marten, W7KUH—Asst. SCM/L.F. PAM: Dr. Marvin F. Hash, W7YHS. SEC: K7AEZ. V.H.F. PAM: W7TYN. Appointments: W7FIS as RM, W7WVL as Deerlodge EC. Endorsement: K6CTI as ORS. W7NPV is the first fixed station to earn the Amateur Radio Mobile Society Award from England. KN7TCP left for Sondrestron, Greenland, on a scientific expedition. KN7VXR and K7YBK are new calls in Billings. W7ZAY's XYL presented him with twin sons. K7BGZ got married. K7RGI is Conditional Class in Bozeman. K7KOK left Bozeman for Thailand. W7VOO left Bozeman for Boulder to do ionospheric research for the National Bureau of Standards. New officers of the Montana State College Amateur Radio

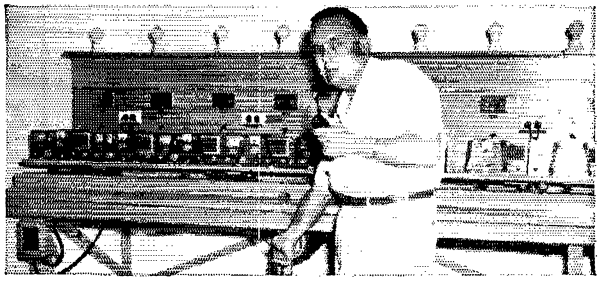
(Continued on page 114)

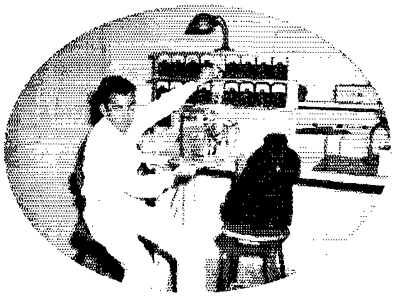
Q.C. at SBE

NEW CONCEPTS IN RELIABILITY AND DEPENDABILITY FOR AMATEUR EQUIPMENT

New space age designs now on the laboratory benches, as well as the history-making SB-33 Transceiver, have resulted in new concepts of production and quality control at SBE. As a result, we at SBE have evolved new ideas in quality, new methods in production, to bring you the most dependable, most reliable, highest quality equipment available today. New production and test equipment has been designed and constructed, new methods for checkout and acceptance have evolved. Acceptance criteria based on standards developed in the space and missile industry have been established.

SHAKE TABLE, shown with Faust R. Gonsett W6VR, is capable of simulating the vibration encountered in mobile operation or in shipment by rail or truck. Each unit is vibrated for one hour without power applied prior to any other checkout or operation. After complete checkout, each unit is operated for one hour at full carrier output while vibration tested.





GONSETT'S OCTOPUS, shown here with Bob Gonsett, WA6QQQ and mascot K9-CINDY, simultaneously makes seventeen resistance measurements to check over 170 individual components prior to power checks. This has eliminated the familiar "60 cycle smoke signal test" and assures that there are no marginal components in the unit.

In addition, each solder connection, each rivet, each bolt and nut, are checked individually in final inspection. All personnel in the checkout and final acceptance departments are active licensed amateurs. Final acceptance is made by staff personnel, responsible to Mr. Gonsett, personally.

Designed with the same components, processes, and care that is used in the space and missile industry — made by hams, checked out by hams, personally accepted and warranted by hams, SBE equipment will continue to lead the field of amateur-commercial radio equipment.

Ask for the QC at SBE brochure at your SBE dealer for the complete story on Quality Control at Sideband Engineers Inc.

SBE SIDEBAND ENGINEERS, INC.
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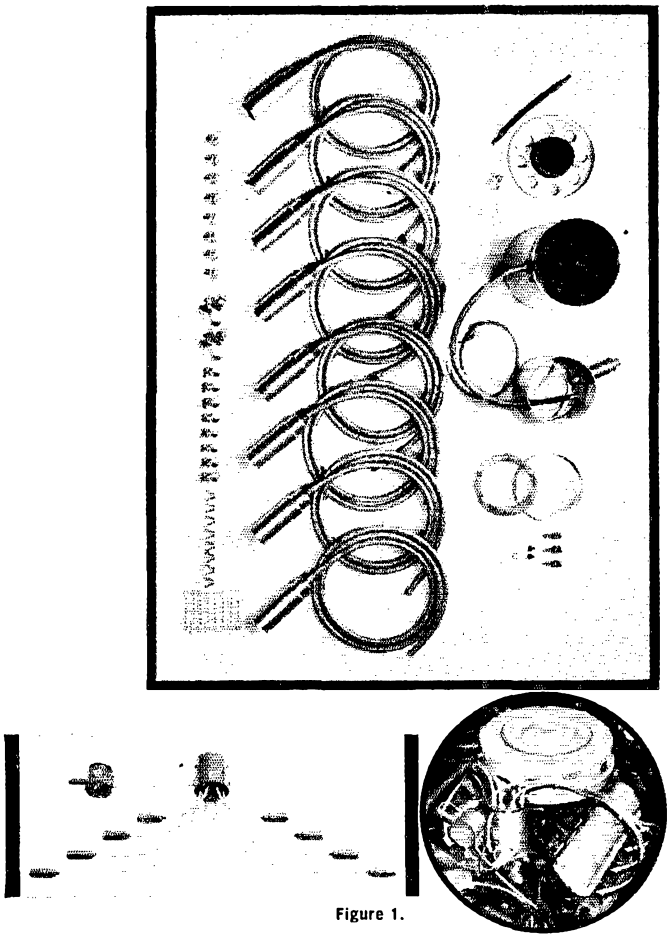
Faust Gonsett, W6VR
President

Club are K7EVS, pres.; W7FFM, vice-pres.; K7NKS, secy.; Ken Dietrich, treas.; K7ABV, act. mgr. 6-meter stations active in Bozeman are W7YB, K7RAU, W7BUT, W7CLB, W7CLC, W7OOY and W7NPV. W7YB worked W7CJN on 6 meters. K7NHV passed the Extra Class exam. K7PGN, K7UPH and K7VSS passed the General Class exam. K7OGF was promoted to chief engineer of KOOK-TV; he copied the Armed Forces Day message on 25 w.p.m. c.w. W7EWR worked VR2-EH. K7EWZ vacationed in Arizona. K7CTI worked 126 stations, 55 countries and 11 new countries in the DX Test. K7AER passed the General Class exam. W7UDV and K7NHV copied the Armed Forces c.w. message. K6BLF, brother of W7YHS is visiting friends in Billings. A regional c.d. drill was held in Billings by K7GHK, W7BMI, K7UPH and W7HLH. K7AEZ supervised the communications set-up during the Shriner-Convention in Billings. W7RJM has a rig set up at Northern Montana College for his classes. W7BQN, W7IDK and W7FIS are regular check-ins into the MARS Net. W7IBV is taking up stamp-collecting. K7-MEG is now working s.s.b. regularly. W7EWR is now a member of the QRP Club No. 449. W7EPY lost his beam in a high wind. W7QYA is back home after a world tour. W7EWR now has WAC, WAS and 70/71 DXCC certificates. K7BYB is busy printing *Hi-Q News*. Anyone interested in the world above 50 Mc. please contact V.H.F. PAM W7TYN. Please give him your type of equipment, what band, what frequency you can work, type of antennas power, etc. W7TYN also would like to put out a directory for v.h.f.ers in Montana and a state net or get-together frequency on 6 and/or 2 meters. W7VNP has had the "flu" bug. W7FL is recuperating from a heart attack. K7CTI has won 12 DC parties in 3 years. K7CTI passed the General Class and 3rd-class commercial exams. K7PKW is on vacation in Canada. W7WIF is the net control station for the FAA Montana Net. Traffic: K7EWZ 76, K7DCI 34, K7OGF 21, K7TYN 15, K7DCH 6, K7NHV 3, W7EWR 1.

OREGON—SCM, Everett H. France, W7AJN—SEC: W7WKP. RM: W7ZFH. Active nets: OSN, 3585 kc. 0230Z Tue.-Sat.; OAREC, 3585 kc. 0330Z Wed.-Thurs.; AREC, 3875 kc. 0300Z Tue.-Sat.; OEN, 3840 kc. 0200Z and 0300Z daily. The Multnomah County-Portland Area AREC held its regular monthly meeting May 11 at c.d. headquarters; the guest speaker of the evening was Richard M. Jeffcott, Radio Dispatcher for Multnomah County Sheriff's Office. A description of Multnomah County Sheriff's office equipment and its operation in both police functions, search and rescue, was given with color slides of the equipment. The group also had a chance to see and hear the mobile unit in operation. W7AZD gave a report on his meeting with the Public Utilities regarding the Columbus Day storm. W7ZFH, OSN mgr., reports: sessions 21; Total attendance 145; traffic 88; BRAT awards to W7BVH, W7ZFH, K7IWD. OAREC net sessions 10; total attendance 38; traffic 7. K7IWD made the BPL again. K7VNU, of Empire, is on 6 meters with 15 watts into a 2E26, feeding a five-element homebrew beam at 35 feet and has worked into California, Arizona, Wyoming and New Mexico. K7GWE is stacking a five-element Hy Gain beam for skip and groundwave observation. K7RWT is stacking two five-element Tel-Rex beams at 50 feet. W7ADR has a tape recorder that switches on and off automatically. W7GUH made the BPL again. Traffic: K7IWD 620, W7GUH 564, W7ZFH 102, W7ZB 81, W7AJN 26, W7BVH 18, W7DEM 12, W7KTG 2.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—Asst. SCM/SEC: Everett E. Young, W7HMQ. RM: W7AIB. PAM: W7LFA. Washington NTS nets are WSN on 3535 kc. and WARTS on 3970 kc. All ORS and OPS appointees are reminded that to hold appointments they must participate in these nets *at least* once a week. The CBN, which meets on 3960 kc. at 0230Z, is assisting the Weather Bureau in obtaining river readings on the Columbia River at the various dam sites; those participating in this activity received certificates from the Dept. of Commerce for the year 1962. W7VLC is taking flight training at San Diego, Calif. Two new hams in the Sumner area are KN7WVA and OM KN7WVB. W7ZMQ is sporting a new mobile. W7FQD has a new QTH on South Hill. K7IAE reports that his inactivity is caused by school and technical difficulties. W7RGL will suspend Official Bulletin transmissions temporarily because of evening courses and a heavy work load. K7TGN has worked 30 countries in Europe. K7PIG reports that his Ranger is now working and he will be a steady check-in on WSN. W7TH reports that stations have very good copy now on nets except for slow fades at times. K7DED has a 3-band SBE squawk box. K7PWM and K7VGI are going to Fairbanks, Alaska, for the summer. K7NIH and his Frau, KN7VGD, attended the Oregon Convention in Eugene. The Northwest Slow Speed Net (NSS) had 31 sessions with 458 QNIs and 136 QTCs, for the month of May. W7AMC is QRL

(*Continued on page 116*)



eliminate ignition system interference

webster band-spanner.

ELECTRO SHIELD KIT

Figure 1.

ELECTRO-SHIELD **prevents radiation**—stops ignition noise at its source —by completely enclosing the entire ignition system, coil, plugs, distributor. **Entirely mechanical**—no phasing, filtering or fussing.

Now in kit form for a substantial saving! Complete as illustrated. New cap and total shield for distributor —coil shield and filter— plug shields and leads. Snap-on plug connections are **swaged**—won't pull out or loosen. Spark plug shields have molded inserts which eliminate spark over, also waterproof plug. All necessary hardware and full instructions included. Kit makes up into the assembly shown in Figure 1. A typical installation is shown in the circle.

Please send information on Electro-shield and Band-spanner antennas and mounts.

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317 ROEBLING ROAD,
SOUTH SAN FRANCISCO, CALIF.

Two kits available for 8 cylinder cars: For '57-'63 Buick, Cadillac, Chevrolet, Corvette, International Harvester, Oldsmobile, Pontiac and Rambler.
MODEL 5500-DR-8

For '57-'63 Ford, Mercury, Lincoln and Thunderbird.
MODEL 5500-F8.

Complete assemblies (Fig. 1) available for most 6 and 8 cyl. cars, also 4 cyl VW's.

kit 49.95 Plus F.E.T.

building a rig for 160 meters. W7AIB is in his 12th year as NCS on WSN. K7JRE has been NCSing WSN with a 5-watt rig. K7PZL will be in Peru, S.A., in July. K7PZQ is waiting for his Knight Kit to arrive. W7JEY is out of the state on vacation during June and July. K7UDG is bound for Europe. K7QZF has his transmitter problem solved. K7TSV dropped the "N" from his call. K7MOK has an Apache. K8JXG, of Spokane, became a Silent Key during May. K7GPG received a Yale scholarship and K7GBW received an appointment to the U.S. Naval Academy. The Radio Club of Tacoma had 65 in attendance for the Mothers' Day Breakfast. Between 75 and 100 were in attendance at the ARRL meeting with George Hart in Tacoma May 30. The Bremerton Hamfest had 237 at the banquet. W7TND, of Seattle, won a Swan 40-meter s.s.b. transceiver, and K7CHD's XYL won a prize. New hams in Kitsap County are Generals K7MXM and K7OOW, Novices KN7VVA, KN7VVB, KN7VVC, KN7VHT, KN7VUU, KN7WOB and KN7WWF. Technician is K7WWN. A new club station located at Edison School has been formed with the following operators attending: W7SCV, W7KHO, W7CCY, K7QKF, K7MMD, K7AEM, K7CEY and K7JZH. They operate from 11:30 to 12:10 P.M. on 20 meters. Traffic: W7DZX 959, W7BA 936, W7APS 211, K7JHA 168, W7OEB 124, K7CTP 88, W7BTB 70, W7AMC 33, W7AIB 32, K7JRE 25, K7PZQ 17, K7JZT 10, W7JC 8, K7PIG 7, W7JEY 1.

PACIFIC DIVISION

HAWAII—SCM, John E. Montague, KH6DVG—Asst. SCM: Mike Fern, KH6ARL. RM: KH6DVD. PAM: KH6EGL. I would like to take this opportunity to thank KH6ARL and all the others who kept the ball rolling while I was away attending college in Virginia. While I was in Virginia I had the opportunity to visit the Virginia SCM. Please note elsewhere in this *QST* the solicitation for nominations for your new SCM. Your new SCM will appreciate whole-hearted support such as you have given me during the last two years. Every Hawaiian ham is urged to support and check in regularly on either our section c.w. or phone net. Our traffic nets, along with AREC and RACES, help justify our existence as hams. Give them your full support.

NEVADA—SCM, Leonard M. Norman, W7PBV—The Nevada Amateur Radio Association of Reno held its annual dinner May 25. K7GQD, W7PC and W7PBV attended the Pacific Division ARRL Convention in Fresno. W7SHY is Navy MARS Coordinator for Nevada. W7DWJ, W7GZT, K7PFX, W7VYC and W7YQW all have new Swan 240s on the air. W7DVJ has a Galaxie 300. K7RSQ is touring the Far East with the U.S. Navy. W7QYK has an SR-150. W7KOI has a 75S-1. W8EAO, ex-W7YNO and harmonic of W7VIU, is attending a Navy school in Maryland. W7NTW reports lots of DX on 20-Meter c.w. K7UKZ is active on 15 meters. K7ICW reports lots of activity on 2 and 6 meters. K7RLX and K7RLW are the proud parents of a 7-lb. girl harmonic. W1NJM and KØHWY were visitors at the LVRAC at the Thunderbird Hotel. W1NJM and his XYL were given a Cook's Tour of Hoover Dam by W7JU. K7QPK is operating s.s.b. Traffic: (May) K7QPK 17, K7GQD 10, W7PBV 4. (Apr.) W7VIU 18.

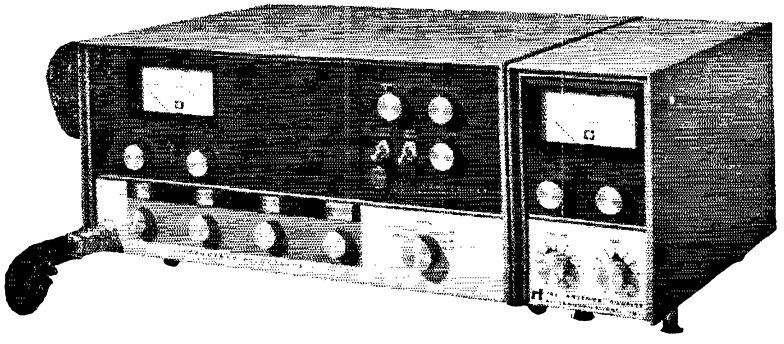
SANTA CLARA VALLEY—SCM, Jean A. Gmelin, W6ZRJ—Asst. SCM: Edward T. Turner, W6NVO. SEC: WA6EIC. RM: K6KCB. PAM: WA6HVN. V.H.F. PAM: WA6RRH. The Santa Clara Valley Section Net reports check-in of 123, traffic of 31 and 23 sessions for May. The Northern California Net meets at 0300Z on 3635 kc. and is the official section net for this section on c.w. The SCVSN meets at 0300Z Tue. through Sat. Zulu on 146.7 Mc. a.m. Stations interested are invited to check into either of these NTS nets. Your SCM's new address is 10835 Willowbrook Way, *Cupertino*, California. Members or interested amateurs, in the section or elsewhere, are invited to drop by and see the new shack. Your SCM and Director W6HC attended a fine special emergency preparedness of Salinas and Monterey County officials and the Monterey Bay Radio Club. The meeting was presided over by K6TEH, MBRC prexy. Your SCM, SEC and director W6HC attended a meeting of the San Mateo Radio Club and made contact with club officials and the EC for San Mateo, K6PJW. Your SCM, SEC and Director W6HC attended the Pacific Division Convention at which Santa Clara Valley was particularly well represented. W6RSY reports that traffic is booming. K6GZ again made the BPL. EC/ORS W6DEF reports that his Redwood City group had a fine turnout and drill for the Stanford Boating Competition. W6PLG is active on NCN and Navy MARS. W6AUC keeps daily skeds with Hawaii and Alaska. W6YHM now has the TD-14 working, thanks to the efforts of K6FL. W6HC now sports a Boehme keyer and perforator for c.w. and W6ZRJ has the perforator and is looking for the keyer. W6PLS reports receiving the Costa Rica Presidential Meeting certificate

(*Continued on page 118*)

SSB COMMUNICATIONS

Announcing

A NEW MULTI-CHANNEL SSB TRANSCEIVER FOR FULL MILITARY APPLICATIONS



The R F Communications Model RF-301 is a Multi-Channel SSB Transceiver for severe military environment. For use in base stations, transportable systems, and in open vehicles and boats. This attractively styled package can withstand wind, sand and driving rain because of its unique splash proof construction.

DIGITAL TUNING—2 to 14.999 Mc in 1 Kilocycle increments using transistorized synthesizer.

VFO CAPABILITY—Continuous tuning available on both receive and transmit with 100 cycle resolution.

POWER OUTPUT—100 Watts, p.e.p. **and** 100 Watts average.

POWER SUPPLY—115/230 volts, 50/60 cycle built-in. Space available on chassis **inside** cabinet for 12 or 24 volt D.C. supply.

MODES—USB, LSB, AM, and CW.

TRANSISTORIZED—All circuits transistorized with exception of P.A. and Receiver RF Amp.

COMPANION ANTENNA COUPLER—To match 50 ohm transceiver output to whip or long wire antenna. Built in VSWR Meter.

SIZE—Measures 17"W x 7¾"H x 14"D and weighs approximately 48 pounds. Coupler adds 4¾" to width.

FOR VEHICULAR MOUNTING—Integral shock-mount and dust filter available.

STABILITY—3 parts in 10^7, —40 to + 65° C.

PRICE—The RF-301 is priced surprisingly low—about half the cost of other transceivers with similar characteristics.

Write or call for details.

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and CP-30. Gene is active as EC in Half Moon Bay and is busy with RACES and AREC plans. WA6UAM is active with the San Jose c.d. Net and SCVSN. W6ZRJ was the speaker at the Santa Clara County Amateur Radio Assn. meeting, presenting the section slide collection. W6CTH is active in Navy MARS as NOUFX. K6MTX is active on K6DYX's RTTY Net as well as the Navy MARS RTTY circuit. K6BDK, Santa Cruz EC, attended the Monterey Bay Radio Club meeting on AREC planning in Salinas. The Lockheed Amateur Radio Club is active working DX as well as with a 2-meter repeater and hosted your SCM at its May meeting. OES W6SHK reports a nightly sked with W6AZN on 220 Mc. W6WX made DXCC. WA6HRS added 16 new ones to his countries list and still found time for OBS schedule. Traffic: (May) W6RSY 1009, K6GJZ 299, W6AIT 101, W6YBV 92, W6DEF 85, W6PLG 78, W6AUC 65, W6YHM 31, W6ZRJ 30, W6PLS 20, WA6UAM 18, W8OCU/6 14, W6CTH 11, K6MTX 5, K6EQE 4, K6TEH 3. (Apr.) W6ASH 9.

EAST BAY—SCM, B. W. Southwell, W6OJW—WA6-KJZ is QRL work. WA6WLE built a modulated light beam rig. WA6UQM sold his vertical and is looking for a triband antenna. WA6ECF has confirmed his DX score of 93. WA6LGE operated at NPG during Armed Forces Day and got Alabama for WAS. WB6EKX is on NCN, and built a new electronic key. WA6UQM cornered 3 new countries for DXCC. W4FOR/6 is on 7-Mc. c.w. in Hayward and is a new ORS/OO. WA6LGD and WA6LGE are transferring to DU Land and in August. W6BB made the BPL. K6SPP is a new OES. The HARC auction held May 10 was a big success. K6ESZ copied the RTTY Armed Forces Day message. K6ZBL, 2816 Delaware Street, Oakland 2, is the new secretary of the NCARTS. WA6MIE made CHC. WN6DFZ is awaiting her General Class ticket. K6ZYZ has a new SR-150 transceiver. WA6PUE has a new Valiant II and Drake 2B. WV6FFO is a new licensee in Hayward. K8SJZ was a visitor at WA6BZA/WA6NEL. WB6CTZ has a new Shawnee mobile. W6YKP is on 7-Mc. c.w. WA6ZXK is a new Tech, gunning for General. WA6FBS is portable/6. Fresno, W6PIR is president of the Soroptimist Club. WA6BMT and WA6RGD are running a code and theory class for the ORC. W6AIR is a Silent Key. W6SS is recovering from an operation on his back. That's it, gang; happy vacation time and drive carefully. Traffic: (May) W6BB 127, WA6MIE 26, WB6EKX 19, W4FOR/6 9. (Apr.) WB6EKX 4.

SAN FRANCISCO—SCM, Wilbur E. Bachman, W6-BIP—EC: W6KZE. K6VDN was guest speaker at the monthly SF Club meeting and spoke on "Propagation." He receives his information on movements of sunspots from Switzerland. WA6CIT, receives speedy recovery wishes. WA6IVM enjoyed the visit of JA3RF and his two friends, Mr. Daigo and Mr. Nishi. JA1YF, a director of the JARL, also stopped for a gabfest and picked up a National SSB transceiver from Dave Bradley before taking off for Tokyo. IVM had to make use of his Japanese when JA1DCY's dad called on him. WA6-IVM reports that the 50-meter Novice band is good for QSOs now out to 1000 with good signal strength. The MARS warehouse closed July 1. The BAYLARC group met at the QTH of WA6OGK for the May meeting. Attendance at recent meetings has been most gratifying. The 2-Meter Net meets Thurs. at 8:30 on approximately 145.8. The 6-Meter Net meets Mon. at 9 P.M. on 50.4 Mc. Check in and meet the girls. The Hayward Radio Club was host to the CCRC in June. The EC says, "Do not wait for an emergency to contact your local disaster officials; plan ahead and coordinate your local net with your Red Cross, civil defense, Highway Patrol, police and fire depts., transportation firms, etc. Keep anyone who may need emergency communications informed of your activities, training and uses in any type of disaster. Then they'll call you when they need you and you won't be in their way by trying to afford your facilities when they are too busy to listen. *Plan ahead! Be ready!*" K6TWK received the Polybase Award as a 1st-year outstanding student of engineering at California Polytech. W6BIP, on an Alaska assignment keeps in daily contact via radio with his family. Traffic: (May) K6AIR 1420, K6TWJ 61, W6PZE 20, WA6ONV 11, WA6OTE 5, W6BIP/KL7 4, W6GGC 2. (Apr.) W6PZE 10, WA6OTE 7, W6FDU 3.

SACRAMENTO VALLEY—SCM, George R. Hudson, W6BTY—Asst. SCM/SEC: Antone F. Buzdas. K6IKV. ECs: WA6ONK, W6LSW, WA6JTO. OBSs: W6WLI, W6AF, K6HHD. K6EIL, WA6CJU. OESs: W6GGW, W6PIV, K6HEZ. OPSs: W6MIW, K6EIL, WA6ONK, WA6PVT, W6WGO. OOs: W6WLI, WA6QWW, K6ER, K6HEZ, W6ZJW, K6EIL, WA6NAU, W6TFH, W6GDO. ORSs: W6CMA, K6ORT, W6CEI, K6YZU. RAI: W6-CMA. New officers of the SARC are W6UCL, prexy; K6-LOE, vice-pres.; WN6BWB, secy.; W6BFN, treas. The busy RAMS held a picnic at Mickie Grove near Sacramento with 120 attending. The RAMS 2-meter Net on 145.00

(*Continued on page 120*)

New from Gonset

A HIGH QUALITY TRANSISTORIZED SSB TRANSCEIVER

that is

ULTRA-COMPACT • LIGHT WEIGHT • low in cost

Gonset has scored a breakthrough with the new "Sidewinder"—a 2 meter SSB, AM and CW transceiver that combines technical excellence with contemporary design and compact, sturdy construction.

The Gonset "Sidewinder" provides coverage of the entire 2 meter band in four segments 1 Mc wide. It has built-in VFO and the receiver is *completely* transistorized. There are a total of 21 transistors, 6 diodes and three tubes in the "Sidewinder," which operates on either SSB, AM or CW.

The power supply is designed for snap-on back or remote installation and is available either as a kit or a wired and tested unit.

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Transceiver: 8¾" wide, 4¾" high, 7" deep.
Weight: 7 lbs.-10 oz. Amateur net price **$349.95**

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Mc. now has 21 members active in transmitter hunts and simulated emergency drills. RAMS mobile units recently aided in fund-raising for the local educational TV station by picking up pledged items for auction. New officers of the Camellia Capitol Chirps are K6HHD, pres.; WB6AOG, vice-pres.; WA6DGH, secy.-treas. The Chirps have started a new net on Thurs. at 10 A.M. on 3920 kc. with K6HHD as NCS. The Sacramento Area 2-meter c.d. 147.12 Mc. Net on each Tue. had 60 check-ins recently. It is with great sorrow that we report the passing of K6MLS and W6MCR. W6AF made 4800 plus in the recent DX contest in spite of bad conditions and had his Official Bulletins heard in G-Land! K6EIL sends Official Bulletins Mon., Wed., and Fri. at 0300Z (1900 PST) on 7060 kc. W6AF has a new homebrew Clapp osc. v.f.o. K6YZU is the new NCS for RN6 on Sat. nights. K6HEZ, up Milford way, is the new OES, and W6CMA, in Sacramento, has been appointed RM and ORS. Yolo County ARC now has 24 members and meets the 2nd. Fri. at 8 P.M. in the West Sacramento Fire Hall in the East Yolo County c.d. radio room. 2-meter activity is growing fast in the Sacramento areas with several u.h.f. people building 1296-Mc. gear. W6VZK, W6MLN, W6PIV and K6HTZ have equipment near completion, using triplers from 432 Mc., and WA6GER reports that 6 stations are active on 220 Mc. in the Sacramento area. The downtown SARC has formed a club/AREC net on 145.65 Mc. (plus or minus) with WA6GMN as NCS; the net meets each Tue. at 9 P.M. local time. The Eldorado County ARC monitors its net frequency of 145.45 Mc. each evening; while the Yolo ARC net, on 2-meters, almost 100 per cent AREC, meets Mon. evenings. K6YZU says the Dunsmur ARC is putting up new antennas, has installed a Viking Ranger and should be active on phone by now. Fellows, write me if you are interested in appointment as OO, OPS, etc. Traffic: K6YZU 262, W6UUN 49, K6HEZ 29.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Fresno Amateur Radio Club held the Pacific Division ARRL Convention in Fresno May 18-19 with approximately 750 in attendance. W6NGN won the NCX-3 transceiver, and WA6TAG won the SBE-33 transceiver. W6JUK is on 2 meters with a 62-S-1. W6NKZ has an SBE-33. K6BKZ is on 75-40-20 meters with an NCX-3. K6OER is on 75 meters with an NCX-3. W6LTO is back on 75 meters after many years of silence. W6HXR has a Galaxie 300. K6QPE has a new Galaxie 300. W6TZN is on s.s.b. with a Heath exciter. K6PPI won a grid-dipper at the convention. W6OWL, XYL, won a 4-1000. WN6BYE is attending Minnesota University. WN6EEE is on 80-40-15 meters with a home-built 75-watt rig. K6AJU is building on to his house; a ham shack no doubt. WA6IKW hopes to be on 6 meters with a kw. WA6TZN is building a 20-meter beam and a 2-meter transceiver. W6BVM has 301 countries confirmed. W6EFV has 306 countries confirmed. W6HT is on 75 meter s.s.b. WA6EDQ is mobile s.s.b. K6UBJ is heard on 75-meter s.s.b. WA6YXJ is on 75-meter s.s.b. W6JPS is mobile on 75-40-20-15-6 meters. The San Joaquin Valley Net had 718 check-ins, 14 traffic, 35 contacts, 3 QST and 7 phone calls. W6CUA has a new NCX-3. W6JXY is mobile on 2 meters f.m. W6TRP is back on the air on s.s.b. with a KWM-2. The Modesto and Turlock Radio Clubs furnished 2-meter communications for the annual boat races for the Modesto Yacht Club with good success. Traffic: WA6ESH 110, WA6YZA 98, W6ARE 7.

ROANOKE DIVISION

NORTH CAROLINA—SCM, Barnett S. Dodd, K4QFV/W4YZH—Asst. SCM: Robert B. Corns, W4FDV. SEC: W4MFK. RM: WA4FJM. PAM: K4ODX. V.H.F. PAM: W4BUZ. THEN held its Annual Directors' Meeting and Family Picnic at White Lake, May 25/26. It was well attended with lots of business transacted and food consumed. Congratulations to WA2WBA/4 on making the BPL in May. Many thanks to W4CH, retiring SCM, for an FB job during the past year. K4MHS, W4VHH and W4MKT made a successful three-way contact between Salisbury, Charlotte and Winston on 432 Mc. K4YYJ reports the Carolina V.H.F. Society's meeting at the Research Triangle, near Durham, was well attended with 15 new members being voted in. K4CDZ is new manager of NCN, and WA2WBA/4 is new asst. manager, replacing K4YCL who is moving to Alabama. Many thanks to W4ACY, retiring V.H.F. PAM, for the fine job of promoting v.h.f. activity during his tenure. K4QIF is now running a half gallon on 2 meters, both c.w. and a.m. The CRML is running a hot membership drive-contest. W4COJ reports the c.d. alert was fairly successful on message handling. WA4FJ, sent in a fine OO report; key klix and chirpy signals seem to be the style these days. Traffic: (May) WA2WBA/4 580, W4LWZ 172, THEN 74, WA4FJM 61, WA4ANH 50, K4CDZ 47, K4MPE 38, K4QFV 35, W4BAW 34, W4COJ 32, K4YCL 31, W4EVN 15, WA4EYA 11, K4IEX 10. (Apr.) WA4FJM 73, K4IEX 25, WA4CAK 12, K4MSG 7, WA4GEU 5.

(*Continued on page 122*)

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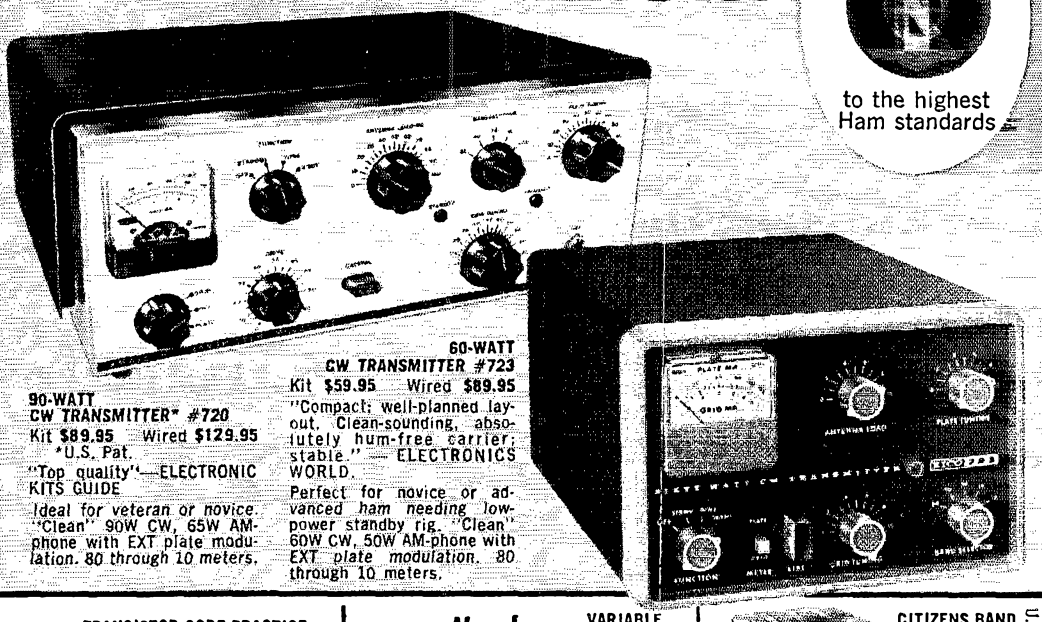

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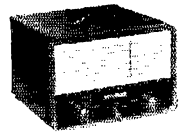

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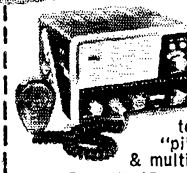

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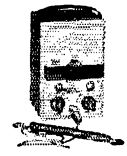

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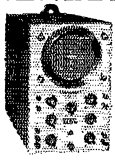

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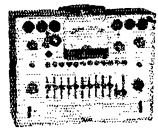

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SOUTH CAROLINA—SCM, Lee F. Worthington, K4HDX—SEC: W4BCZ. RM: W4PED. S.S.B. PAM: K4JOQ. A.M. PAM: K4KCO. Nets: c.w., 2400Z and 0300Z, 3795 kc; s.s.b., 0100Z, 3914 kc; ; a.m., 0100Z, 3930 kc.; AREC, 2400Z, 3914 kc. Wed. The c.w. net held a successful meeting in Columbia May 12. This meeting, called by the RM, brought out many worthwhile ideas for more efficient net operation. We are most happy to see that W4AKC has recovered from his long illness and is on the air again. W4TLC reports many good openings on 6 meters during May, either working or hearing VP7s, VP5s, FG7, as well as W5, WO, W7 and W6. WA4CAW has been appointed ORS for his excellent work on the C.W. Net. The S.S.B. Net sponsored "Operation 22" at Camp Socareda, Cedar Mtn., N.C., July 7-14. The group is to be commended for its work in affording communications for this Crippled Children's Society to their homes. Send your Field Day results to the SCM for "Best SC" award competition. Net traffic: C.W. 119, S.S.B. 60. AREC S.S.B. 7. Traffic: K4WJR 210, K4LND 116, K4VWL 38, WA4AGT 35, W4NTO 35, K4OCU 34, W4WQM 27, K4HDX 18.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM: Harry J. Hopkins, W4SHJ, PAM: W4UFX. RMs: W4LK, K4ITV, W4IA, W4SHJ, W4QDY. W4JUJ continues to collect wallpaper QDA No. 5; he placed 3rd in the North Dakota QSO Party and received the Worked Kansas YLs Award. Family illness caused W4TE to make a trip to Texas for two weeks. W4LK won the prize at the Roanoke Hamfest for being licensed longer than anyone else present. K4WVT and K4YAM will be attending a summer electronics program including two weeks at Ft. Monmouth, New Jersey. WA4DUW has been busy with trips with the school band. WA4GWD is rebuilding his 51J3 receiver, also a 20-meter ZL special. W4DLA reports an enjoyable time and visit with W4LK. He also says that conditions are poor on 4RN and CAN and much traffic is handled on 7 mc. K4PXY is now handling traffic for 48 USN/MM; he received his BPL medallion. W4RHA is putting up a new skyhook all-band with no compromise, he says K4GRZ is learning the classical guitar. K4BAV took his final exams at college. Up Richmond way, WA4HHP got another receiver, a National RAS-1; he is also experiencing transmitter trouble. W4PTR is very busy with net assignments so he has no time for building and changing equipment. Gle, chief operator at W4PFC, bought a Galaxy 300 and will be on the air from his own QTH. K4SGQ's Apache is silent, awaiting two 5R4 rectifies. K4LTK moved to a new QTH in Hopewell. All stations holding appointments are urged to make their agreed-upon station activity reports to the SCM. Three months of consecutive non-reporting is cause for cancellation. Traffic: W4PFC 1162, K4PXY 714, W4DLA 675, W4NTR 630, W4DVT 217, W4RHA 208, K4FSS 157, W4LK 141, K4ITV 102, WA4EUL 80, W4MXU 76, K4WVT 64, WA4GWD 58, W4PTR 58, K4GRZ 49, W4IA 46, W4SHJ 44, W4LRN 42, WA4FCS 37, W4QDY 34, W4BZE 32, K4SDS 22, W4NLC 19, W4JUJ 16, W4OWV 14, W4ZAU 13, W4KK 11, K4AL 10, W4TE 9, K4LTK 6, WA4HHP 2, K4SGQ 2, K4BAV 1, WA4DUW 1.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8SSA. RM: K8HID. PAM: K8CFT. WVN nets: c.w. 3570 kc. at 0000; phone, 3890 kc. at 2330; S.S.B., 3903 kc. at 0100; PON, 3905 kc. at 2215. Congratulations to all the radio clubs and amateurs in West Virginia on staging a most successful convention at Jackson's Mill. It is with deep regret that I report the sudden passing of K8JPW, of Paden City. K8HUK and K8KRW are recovering at home from recent illnesses. W8AJW, of Cleveland, won the West Virginia Centennial Contest and attended the State Radio Convention. K8TPF reports on PON: 366 stations, 74 messages on phone and 73 stations with 27 messages on c.w. For West Virginia Phone: K8CFT reports 20 sessions, 466 stations with 56 messages. WA8CGR attended an MARA meeting. K8BIT has turned over the duties of *Splatter* to K8WMQ. WA8BXW has assumed the role of secretary of the KRC. New members of the Clarksburg Radio Club are WA8EJF, WN8GFX and WN8GPE. Traffic: K8VFK 160, WA8CPY 83, W8CKX 48, K8ELH 47, W8NYH 45, WA8CUZ 44, K8TPF 42, WA8CKN 35, K8CFT 15, K8CNB 11.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald Ray Crumpton, KØTTB—SEC: WØSIN. PAMs: WØCXW, WØLIR WØGNK. RM: KØFDH. OBSs: KØDCC. KØSLD. OOs: W2VQS/Ø, KØIMC. ORSs: WØEIT, WØMYB, CXN WØIA, CCW WØCWD. Hi Noon Net activities have been forced to move from 7240 to 3895 kc. because of skip conditions. Net Manager KØDCW reports that activity is a little slow but with the new frequency change activity should pick up. The AREC Columbine Net is doing a fine job. SEC WØSIN has been quite active in visiting the EC and it looks like our AREC program in the state is developing into quite an active group. The Colorado Weather Net still is the most active, with

(Continued on page 124)

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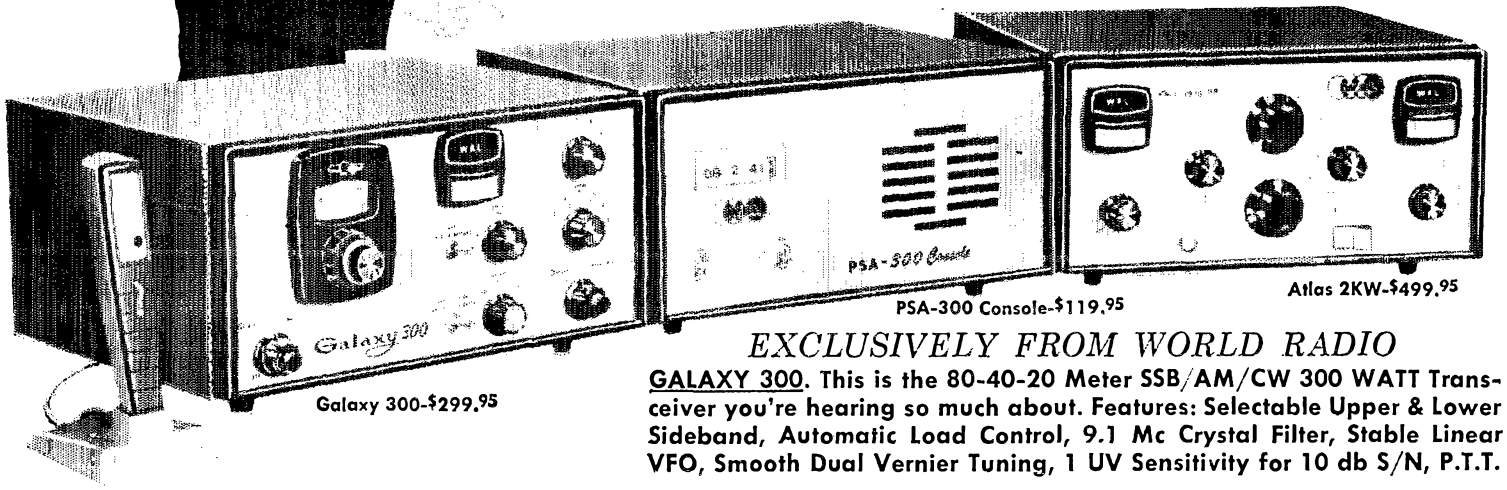

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W0IA at the controls. It will continue to be a leader. KØDCW and KØZSQ have not missed sending in a report for two years. Can anyone top this? Net traffic: Columbine Net 223, HNN 340. Traffic: KØZSQ 173, KØDCW 168, W2VQS/Ø 51, KØWGC 40, WØSIN 10.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, W7OCX. SEC: K7BLR. BRAT awards for April on BUN went to W7QWH, K7MPQ, K7QEQ, W7OCX, K7QGW, and K7QIE. May awards were given to W7QWH, K7MPQ and K7QGW. Thanks to K7QGW for his help with relaying during very trying conditions on the band. W7OCX has just returned from a trip to Japan. W7BAJ is keeping Utah on the map for RTTY hams. K7SDF and K7TEO have been working some skip on 10 meters. 6-meter activity in the Salt Lake Valley is really on the upswing. W7FSC has been selected as the new chairman for the Utah Council of Amateur Radio Clubs. Local 6-meter net frequency is 50.2 mc. Traffic: W7OCX 27, W7QWH 9, W7BAJ 1, K7SDF 1.

NEW MEXICO—SCM, Carl W. Franz, W5ZHN—SEC: K5QIN. V.H.F. PAM: W5FPB. 10-meter PAM: W5WZK. The NMBC meets on 3838 Mon. through Sat. at 1300 GMT. NMEPN on 3838 Sun. at 1400 GMT. Caravan Club on 29.6 Tue. at 0200 GMT. Congratulations to W5WFP and his bride of June 1. The following stations are to be congratulated as all have received Public Service awards for work in previous flash flood evacuation situations under AREC/Red Cross agreements: W5-WNU, W5ZHN, K5s ZCA, CXN, KWU, DQI, DHZ and W8PDP/5. The Albuquerque/Bern County RACES group recently held a successful 2-meter field test covering a 150-mile radius out of Albuquerque. K5WZA has been giving excellent assistance to members of the Yale Amateur Radio Club for the visually handicapped; Irene's work with these folks is greatly appreciated. W5CYZ still is looking for a 2-meter sked out of the Roswell area. The following stations are to be commended for 100 per cent reporting over the past year and a half: K5QIN, W5FBP, W5WZK, K5UYF, W5UBW and W5-CYZ. If it were not for their dedicated efforts, there would be no New Mexico representation for the state's amateurs in this column. My sincere thanks and appreciation to each of you. Traffic: W5UBW 49, W5WZK 7.

WYOMING—SCM, L. D. Branson, W7AMU—W7HH has resigned as SEC. The Pony Express Net meets Sun. at 0800 MST on 3920 kc.; the YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc.; the Wyoming CD Net meets Wed. at 1900 MST on 3537.5 kc.; the TWN Net is a daily net at 2000 MST on 3570 kc. Casper Radio Club members were the guests of the Mountain States Telephone Co. on a tour of the microwave equipment in their building. The tour was enjoyed by about twenty hams. K7CSW and his XYL, K7IVK, are on a visit at their daughters QTH in Minnesota; K7QYG is on a 10-day visit to Illinois; W7LJB is going to the company school of Oklahoma. W7BXS returned from visiting his daughter in Texas. Most Wyoming hams are enjoying a fine fishing season. Traffic: K7QYG 66, W7BHH 31, W7HLA 17, W7AMU 11, W7AEC 4, W7DW 3, W7LKQ 3.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William S. Crafts, K4KJD—SEC: W4NML. RM: W4USM. PAMs: K4BTO, K4TNS, K4WHW and K4DJR (v.h.f.) May report of daily statewide nets (all times GMT).

Net	*Freq.*	*Time*	*Sessions*	*Ave. Tfc.*	*Ave. Attendance*
AENB	3575	0100	28	3.4	9.7
AEND	3725	2200	24	.8	7
AENM (s.s.b.)	3965	0030	31	6	41
AENP (morning)	3955	1230	25	3	—
AENP (night	3955	0000	34	2.03	28
AENT	3970	2230	33	3.25	11.5

Sorry I could not attend the Mobile Hamfest. W4NML represented me and reports an FB hamfest. Congrats to W4TSY on receiving his A-1 Operator certificate. W4OXU and K4WSK received Citizenship awards as outstanding ham citizens in Alabama for the year. WA4GNK has a new He-45A. WA4BDW has started a nice bulletin for the AEND Novice Net. W4ATK has a new SR-150. W4CIN now is General Class. W4OGT and K4NGD have Sixer mobile. Lightning hit the rig of WA4CWI. Remember the N. Ala. Hamfest Aug. 18 at Decatur. K4KJD has been appointed Asst. Dir. by W4ZD. Traffic: (May) K4WOP 201, WA4EXA 194, K4BSK 75, W4USM 54, K4-NUW 48, K4AOZ 44, K4WHW 34, WA4BDW 32, K4FZQ 23, K4HJM 22, K4NKT 18, K4NGD 16, W4NML 16, K4GXS 15, WA4CWI 13, K4JDA 12, K4ANB 11, W4-YER 11, K4ZBX 11, K4KJD 10, K4BTO 8, W4DS 7, WA4CCV 6, K4PHH 6, WA4EEC 4, K4WSH 4, W4ZNI 4, K4RIL 3, WA4FWP 2, K4RSB 2, K4TDJ 2, K4UMD

(Continued on page 126)

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2, W4CIU 1, WA4IHI 1. (Apr.) W4YER 46, K4THT 26, K4TNS 20, WA4CCV 6, K4FTC 2.

EASTERN FLORIDA—SCM, George E. Cushing, W4QVJ—SEC: W4IYT. The Florida SET was a qualified success. W4EXM came to the Clearwater area from a one-year hitch in Iran as EP2AM. The Jacksonville Beaches Radio Society elected: W4KQP, pres.; W4TBY, vice-pres.; WA4AKS, secy.; WA4ECQ, act. mgr. The North Florida Society conducted Operation Shopping Center around Jacksonville using a downtown park location as communications central. Miami's Biscayne Club now has a memorial call in honor of W4VMT, now a Silent Key. The Dade Club already is under way with plans for a January Hamboree. DXer and SSer W4JLD is now trafficking in the Orlando area on c.w., of course. *Regular c.w. check-ins are needed from Jacksonville*, West Palm, Lakeland and others. A few clubs are getting good newspaper publicity. Tampa's W4DUG hosted the Tampa Chess Club for an air-waves match with the Philadelphia Chess Club and had four columns of pictures in the *Tribune*. The Jacksonville Sunday paper now carries a regular ham column. Alert clubs can get an excellent public relations job done by being aware of possibilities for publicity. W4IMI and W4LVV now have over 300 confirmed DXCC. WA4AZK should be there by the time you read this. Mail your reports no later than the second day of the month for inclusion in the report. Check with your EC on his hurricane emergency plans. You never can tell when the ill wind might blow, but good. Traffic: (May) WA4BMC 800, W4KIS 502, WA4IJH 446, K4KDN 355, W4MIN 293, WN4IXI 235, WA4GBM 191, K4BY 180, WA4JYB 163, W4EHW 148, W4BKC 144, K4COO 143, K4SJH 138, WA4BGW 130, WA4LHK 126, K6SXX/4 114, W4AKB 93, W4CKR 92, W4ZJZ 86, WA4COR 78, W4IEI 75, W4TRS 71, WA4DMV 67, WA4CJC 64, W4CWD 62, W4VWL 58, K4LCF 45, K4DBT 42, W4IYT 34, K4JLD 33, W4NGR 30, K4DAX 26, WA4ESS 24, WA4CNZ 22, K4MTP 21, W4DQS 20, W4LMT 20, W4NGE 20, K4RNG 19, W4BBZ 17, W4SMK 16, WN4ISI 15, WA4AME 12, K4RHL 12, W4ZBL 12, K4MZR 11, K4ENW 10, K4YSP 8, K4PVP 6. (Apr.) K4EHY 523, WA4DMV 488, WA4JMP 352, WA4APB 194, K4YSN 168, WA4GBM 135, WA4IJH 95, W4IEI 75, WA4JYB 53, W4CWD 44, K4JLB 36, W4IYT 34, W4NGR 32, WA4LHR 20, W4KCG 19, WA4AME 16, WN4LBM 11, W4BBZ 9, W4DQS 9, K4ZIF 9, K6SXX/4 6, K4OSQ 3, W4KRC 2, W4CKB 1. (Mar.) K4RNG 1, K4MTP 1.

WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: WA4LLE. PAM: W4WEB. V.H.F. PAM: W4ZGS. RM: W4BVE. The Spring SET met with good success in Western Florida. Tallahassee, Panama City, Fort Walton and Pensacola kept stations on Nets A, B, C and D for most of the test. Other towns stood by on Net B or one of the v.h.f. nets. Madison: K4KHV has moved here and puts out an FB signal with his 75-meter mobile. WN4NBT, WN4NLD and WN4NWB are new Novices. WN4IMC has a QRP rig on 80 meters running 90 mw. to 1S4. WA4NRP received his Conditional Class ticket and is using the S/Line. Area RACES station now has RTTY capability as well as s.s.b. WA4EJF worked Washington State on 6 meters, also several other far west states. K6PSJ/4 is on 6 meters with a Comm. III and beam. WA4GJO finished his 6-meter converter and ARC-5 combination. Ft. Walton: New EARS officer are K4IRG, pres.; W6PUB/4, vice-pres.; K3MJV/4, secy.-treas.; K4LXV, act. mgr.; W4UXW, editor. W4ZWD is off the traffic nets temporarily because of illness. W4RKH, W4ZGS, W4PLK, WA4BOZ and WA4EVU are active on 222.5 Mc. Local 2-meter stations monitoring 145.2 Mc. worked aero mobiles WN4KGZ and K6MFN/4 en route to the East Coast, Pensacola: W4AXP is hunting DX on 20-meter c.w. W4VBU came back from the Mobile Hamfest with first prize in the hidden-transmitter hunt. W4EWG and W4SRM were also-rans. W4HIZ was a recent visitor in town. Traffic: (May) K4VFY 341, WA4FIJ 44, WN4IMC 30, K4QAC 25, W4ZWD 24. (Apr.) WN4IMC 27.

GEORGIA—SCM, James A. Giglio, W4LG—SEC: W4YE. PAMs: W4KR, K4PKK and W4RZL. RM: W4DDY. The Coosa Valley Emergency Net meets each Sun. at 1:30 P.M. EST on 3950 kc. K4PKK has completed the installation of a 5-over-5 antenna that is 72 feet high. It is good to have W4VL back in Georgia. An excellent program on transformer design was presented by WA4DQQ at a meeting of the Northwest Georgia Amateur Radio Club recently. We hear that WA4BLL is as happy as a lark with his Heathkit sideband rig on 6 meters. K4YFU is experimenting with loading a steel tower antenna on the h.f. bands. WA4GPA and W4SBN will vacation together in W6-Land. Another ham happy with results with a KWM-1 is K4NQQ. W4SLP has a new alternator on the mobile rig. We suspect that he is planning high power. WA4EHT has an FB mobile signal with his new Swan. K4PYM is employed by radio station WRWH. The 4RDN operates on 7125 kc. at 10 A.M. EST daily. Join W4PIM and the gang there when you can. K4BAI advises that he has six weeks ROTC

(*Continued on page 128*)

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HQ-145C Rec 174
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VF-1 VFO 17
VHF-1 Seneca 159
HA-10 linear 219
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HX-10 Marauder 279
SB-10 SSB adaptor 59
HX-11 Xmtr 29
DX-20 Xmtr 24
HP-20 Supply 29
HR-20 Receiver 129
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NC-173 Receiver 89
NC-183 Receiver 119
NC-183D Receiver 189
NC-190 Receiver 159
NC-240 Receiver 69
NC-270 Receiver 169
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camp at Fort Benning this summer. K1KSH/4 has won the BPL medallion for the third time. W4GHE has a nifty new QSL card. WA4MOC is sporting a 100-ft. antenna tower. He is Asst. EC for Daugherty County. Traffic: K4MCL 359, W4DDY 241, K1KSH/4 164, W4LME 78, K4WWY 68, K4FRM 59, W4HYW 28, W4AAY 23, K4YRL 17, K4DKY 6, W4BZ 4, W4FWH 4, WA4GPA 2, K4NQQ 2.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—The CZARA held its meeting in the RAT HOLE for a run down on c.d. communications setups during an emergency. KZ5JD and KZ5RV gave a lecture on the c.d. setup and types of equipment in use and to be installed in the near future. The next meeting will be scheduled for the Administration Building where further talks concerning c.d. will be given. After the meeting the teenage members took over a Gonset Communicator setup for 10 meters and worked a few W9s loud and clear at 9 P.M. local time, well after sunset. KZ5HR demonstrated for the young Novices the thrill of talking long distance with low power. KZ5KR is back from a short vacation in Texas. KZ5JT completed the Heath mobile s.s.b. rig. KZ5ED has set up equipment.

SOUTHEASTERN DIVISION

LOS ANGELES—SCM, John A. Mckowen, W6FNE—Asst. SCM: Richard H. Ingham, WA6DJB. SEC: K6YCX. RMs: W6BHG, W6QAE, PAMs: W6ORS, WA6TWS, K6PZM. Traffic for the month held close to April with K6EPT, W6GYH, WB6BBO, K6MDD and WA6WTK qualifying for the BPL. Highlight of May was the meeting at the Los Angeles Press Club to honor W6NCP. His years of service to amateur radio were recognized by the State Dept. and all military services. With the future possibility of merging the NTS and AREC it behooves all of us to support both of these services to the utmost. Contact your SEC, K6YCX, for information concerning membership in the AREC. The NTS is represented in this section by SCN on 3600 kc. c.w. Net mgr. is W6BHG. WA6TWS is net mgr. of So. Cal Six, the phone net on 50.4 Mc. New officers of the Lockheed ARC W6LS, are K6TCL, pres.; WA6ICE, vice-pres.; WA6UKA, treas.; WB6BGF, secy. W6USY got his ticket renewed to 1968. As old as he is Arch is a true optimist. W6CK is back on the rolls as an active OO. We could use more like him. W6SRE still is racking up miles on that Chrysler instead of hours on the home rig. WA6KVS is plotting the sporadic *E* cycles for the 6-meter gang. W6AM has put up 2800 feet of new poles. That's a lot of firewood, Don. K6CDW now is operating from Canoga Park. My key clix were too much for him. W6JQB is busy as usual but now has time to get back on the air. WA6TMY received his 20-w.p.m. CP award. A hearty welcome aboard to my Asst. SCM, WA6DJB. Traffic: (May) K6EPT 1620, W6GYH 797, WB6BBO 593, K6MDD 554, WA6WTK 553, WA6TWS 358, W6QAE 307, K6HIT 234, WA6KWV 222, WA6UHM 156, WA6TYV 133, WA6KAW 121, W6BHG 92, K6HWV 91, WA6GAG 74, WB6AJT 58, W6KKW 54, WA6USU 45, K6SIX 43, K6PZM 42, WA6WIZ 42, WA6CFQ 40, W6USY 36, W6FNE 19, WA6GLN 17, W6CK 15, WB6BZX 36, WB6BBH 11, WA6CXB 11, K6JCT 8, W6NKR 8, W6SRE 6, WA6KVS 4, W6ORS 4, W6VOZ 2. (Apr.) WB6BZX 7, WA6CKR 6.

SAN DIEGO—SCM, Don Stansifer, W6LRU—W6IEY, OES in La Mesa, reports many openings during May on 6 meters, and added activity in the area on both 432 and 1240 Mc. Asst. Radio Officer for RACES in the Santa Ana area is W6WRJ, with K6RCK as secretary. WA4KPF, chief operator at W6IAB, Camp Pendleton, reports that plans have been approved to move the station into a new building. The June meeting of the San Diego DX Club was held at the home of WA6OZL in La Jolla. WA6SBO and W6QNM fished in Mexico during their vacation. W6RCD and family went to Europe during the summer. W6CAE is now on 2 meters with the DX Net. Your SCM visited the Newport Club in late May and met with the Orange County AREC gang. The EC in Orange County, W6VAA, is doing a good job with the help of four Asst. ECs. W6EWU, Asst. SCM, went to Hawaii in late May and June. K6RCK, OES in Santa Ana, reports working 3 VE stations and a W7 on 6 meters in May. WA6NFI, in Anaheim, reports that a model 26 RTTY rig is now on the air. K6BTO, OES in Bonita, is now on RTTY on 1240-432-222 and 147 Mc. I understand that there are no San Diego hams checking into SCN at the moment. How about some of you local c.w. traffic men taking care of this? Our traffic total for May was 15,433, high for the month per my records. All ORS stations got their reports in on time. Thanks. Don't forget the convention Oct. 11-13 in San Diego. See you there. Traffic: (May) W6IAB 4206, K6BPI 3979, WA6ZOW 2469, W6YDK 1479, W6EOT 849, WA6NFI 603, K6LKD 373, K6IME 149, K6GJM 82, WA6ROF 72, K6TFT 69, WA6ZID 56, WA6BDW 24, W6WRJ 15, K6RCK 8. (Apr.) WA6NFI 735.

(*Continued on page 130*)

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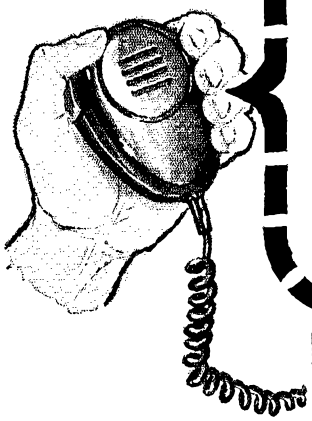

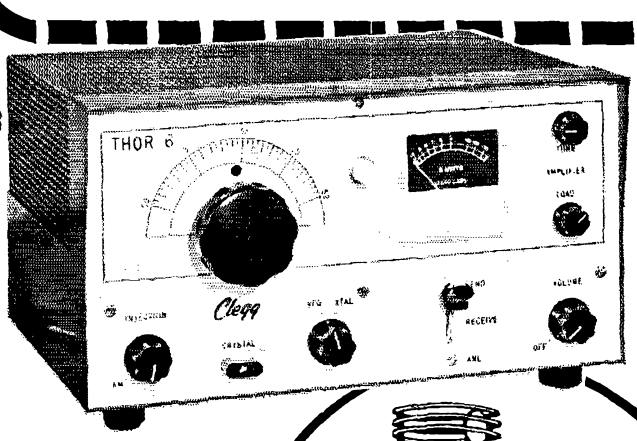

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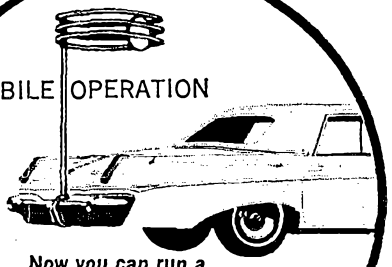

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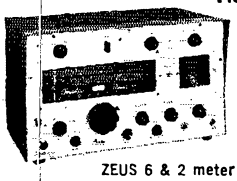

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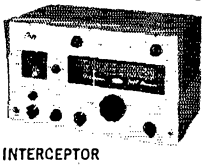

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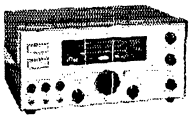

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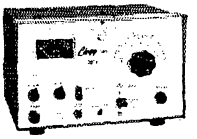

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SANTA BARBARA—SCM, William C. Shelton, K6AAK—SEC: WA6OKN. The VAFB gang has its S/Line in and working; the club is very active and has a nice newsy paper. W6OUL, sent his usual fine report and sent news of the Fresno Convention; W6JFP won a mobile power supply. W7WST/6 is now at Point Mugu and is active on the traffic nets. The Ventura County Club held its annual auction and a swell time was had by all. The Paso Robles Club is going great and has station W6LKF on the air. W6MLZ visited them on charter night. Officers are WA6TDO, pres.; W6TOP, vice-pres.; W6FWY, secy.; W6BRY, treas. The club meets the 2nd and 4th Tue. IOHRA certificates were presented to WB6BZT and WA6OJN. W7ZVY/6 was active on FD. The Ventura County area has been invaded by 16-kv. power distribution lines and the QRM from same is putting most of us off the air. The clubs of the area are after the Power Co. in full force to clean it up. Traffic: W6OUL 14, K6AAK 12, W7WST 5, W7ZVY/6 3.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM; E. C. Pool, W5NFO. SEC: K5AEX. PAM: W5ROO. RM: W5LR. New officers of the Caravan Club of Dallas are W5TQC, caravan master; W5ZSV, asst. caravan master; W5FNK, secy.-treas.; W5TFH, program director; W5ZYA, asst. program director. This is an s.s.b. mobile club and operates on 3915 kc. Novices who are interested in a traffic training net should contact Mike Le Fan, WN5EQQ, 1802 S. 13th St., Temple, Tex. The object of the net is to get used to handling traffic and learn proper net procedure. 7180 kc. is the proposed net frequency. W5KIK has a new NCX-3 and will have time to get it installed and working properly for his vacation trip to the West Coast. Jake says the only reason he got it was to keep in touch with his new grandson born in April. W5BNG is on s.s.b. with an HT-32. The Permian Basin ARC held its annual hamfest in the Ector County Coliseum June 2 with 350 registered. A Drake TR-3 was won by K5LOZ. Much to my regret I had just been released from the hospital and was unable to attend. The Governor of Texas issued a Proclamation designating June 7-14 as Amateur Radio Week in Texas. Seems like everyone has been busy getting married or graduating from high school or college or preparing for the trip to the convention so I did not get much news this time.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—The SCMs new address is 5324 West 8th St., Tulsa 27, Okla. Thanks to K5RWL, K5ZCJ, K5ZUS and others for picking up traffic for me. Two new amateurs in Oklahoma are K7RPA/5, of Chickasha, and W5WSM, of Broken Arrow. There has been comparatively little storm activity this spring but thanks to W5CZB, K5LZF, W5PPE and others for their diligence, W5TKC got his 2nd lieutenant's commission, a new super sport car and a wife, all within three weeks. K5CBA finally made it on RTTY. WA5AQI moved to Tecumseh. W5JMQ is setting up a rig at his new place of business. Congratulations to K5BAT, who was awarded the Silver Beaver and a special citation from the State Legislature for his Boy Scout work. For a blind man Doc has done wonders. We name him Oklahoma Amateur Radio Operator of the Month. He is a good operator and deserves this honor as well as the other. Hungry? Go see W5FKL; he has canned chili and barbecue beef. W5ADC took his vacation early; he says his air conditioner WD-60 (windows down and 60 m.p.h.) works better in cool weather. K5IZP's new QTH is Elk City. K5YZM lost his life while putting up a 2-meter antenna. It fell over into the high line. Our sympathy to Buddy's family. Traffic: K5TEY 645, K5VNJ 389, W5PPE 264, K5IBZ 102, W5DRZ 79, K5LEZ 49, W5KIY 39, K5DLP 27, K5ZEP 27, K5AUX 23, W5EHC 20, W5PML 20, W5WDD 12, K5LZF 9, K5CBG 5, K5RWL 4, W5WAX 4, K5CBA 2, W5PNG 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: W5AIR. PAM: W5ZPD. RM: K5BSZ. K5MWH is a new OO in Baytown. We are glad to see *HARC News* back in circulation. The Galveston County slow-speed c.w. AREC Net meets every Thurs. at 1930 on 7170 kc. Net control is WA5AXS. More check-ins would be appreciated. W5BPF has a new kw. linear, K5HFC a new HX-50, WA5DSI a new homebrew keyer. K5YYD is mobile with a new transceiver. Glad to learn that W5GI is out of the hospital, but sorry that Lon had to give up the EC job. W5MVL is the new EC and I know that he will do a good job. Best wishes, Lon, and sure hope to see you around again soon. Any amateur who is attending A.&M. College should write W5AC, M.S.C. Radio Committee, Memorial Student Center, College Station, Tex. and the boys will send information that might smooth out some of the rough spots. K5JTP/KL7AG is on 20-meter s.s.b. every day looking for traffic from King Salmon, Alaska. K5ZSC has a new 58-ft. fold-over tower and homebrew quad. K5QEW is

(Continued on page 132)

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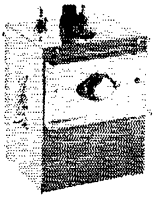

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zone control for Zone 3, and K5YRW is control for Zone 1. South Texas Emergency Net. W5AIR mobiled around Corpus Christi on his way to McAllen for the convention. W5AQK spent a month in Puerto Rico and Guantanamo Bay. Traffic: W5AC 261, K5HDU 55, W5ANV 36, K5LQJ 3.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. E. W. Street, VE1EK, and H. C. Hillyard, VO1CZ. Deepest sympathy is extended to the relatives and friends of Lee Atkinson, formerly VE1AK, who has joined the ranks of Silent Keys. Eileen, daughter of the late Harry Holden, successfully passed her exam and has received her late father's call, VE1AB. Another new call is VE1ALB (the father of VE1AGP). The Annapolis Valley Club's Field Day Award (1962) was won by the Pictou Club. Congratulations to VE7QE (ex-VE1QA) and his XYL on the arrival of a baby girl. Newly-elected officers of the Central New Brunswick Club include VE1ZC, pres.; VE1XR, vice-pres.; Arthur Dutcher, secy.-treas; VE1AGK, publicity; VE1NC and VE1ACK, tech. committee. VE1KK and his XYL, VE1MY have transferred from Truro to Moncton. VO1BL, pres. of SONRA, reports that Premier Smallwood of Newfoundland has presented a "Field Day" trophy for annual competition among the VO1s and VO2s. Another report from SONRA states that 19 passed the DOT examination in a recent 30-day period! Have you checked your *operating habits* lately? Are you setting a good example for the newcomers to our hobby? Traffic: VE1OM 19, VE1YE 16.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The Boy Scouts will hold their 6th "Jamboree-on-the-air", Oct. 19 and 20. If approached by the Scouts, lend a hand. VE3CFI reports a new addition to the Laurentian Net of Cochrane and James Bay. Sudbury elected as follows: VE3BLZ, pres.; VE3ENK, vice-pres.; VE3EXL, secy.; VE3CUO, treas. VE3FGV, VE3GY and VE3DMU are doing stellar work on the OQN and are also on the GBN. VE3CNV operated VE9MAU in ionosphere tests from Sudbury during the eclipse of the sun July 20. VE3ESM and VE3BUK are active again after their illness. VE3EIG was high on the list of OOs in the recent ARRL FMT. VE3AGG has taken over the duties of net frequency marker for the Ontario Phone Net. VE3EAT is on s.s.b. The Westside ARC will celebrate its twenty-fifth anniversary this fall. The London ARC visited the Hammond plant in Guelph. The Quinte ARC and the Kingston ARC combine on their monthly club paper. The Ottawa Valley Mobile Club and the Ottawa ARC held a joint auction. Over 100 attended. The v.h.f. group of these two Capitol clubs did fine in the V.H.F. QSO Party. VE3DWD is on 2 meters. The Toronto AREC, on 75 meters, under the guidance of EC, VE3LI, held a very successful SET in June. To VE3AST of the Scarboro ARC, thanks for a swell paper this past year. New hams in the Scarboro club are as follows: VE3s BBO, BBC, FLI, FLJ, FLZ, FLY, FNM. VE3TT is going high power soon. VE3BLJ has a reversible beam. VE3ETM, pres. of the Windsor ARC, reports that Col. Glenn's film was well received and had the whole club in orbit. VE3BLZ is on 144 Mc. VE3DUW is gone green keys. Traffic: VE3CYR 182, VE3CFR 171, VE3AGG 103, VE3NG 95, VE3AML 87, VE3BMU 87, VE3DPO 79, VE3EHL 72, VE3BZB 68, VE3RN 59, VE3BAQ 53, VE3GI 53, VE3DRF 46, VE3ETM 44, VE3AKQ 31, VE3FGV 29, VE3EAM 28, VE3BLZ 23, VE3ELQ 16, VE3CFI 14, VE3EIG 9, VE3DU 7.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Asst. SCM: Jean P. Achim, VE2ATL. VE2XX is interested in how the onion and corn crop at VE2DR's is shaping up; things look good and the annual corn-brawl sponsored by the SCM should match or surpass earlier ones. VE2BMS supplies news about a Laurentian Camp Net which will operate at 1845Z on 28,520 and at 2330Z on 3580 kc. Purpose is to pass traffic from camps. VE2BMS, VE2BBW, VE2BHH, VE2AQV, VE2BLO and others will take an active part. It has been suggested that 14,120 kc. be used as a calling frequency for any hams in the Lakeshore area, especially for aironautical contacts. VE2QA's XYL is busy weaving curtains for the OM's shack which isn't even finished. We have been told that VE2TR, Sainte Rose, has joined Silent Keys. Sincere sympathy to the family. VE2BMS has a new triband beam and Drake 2B receiver. VE2BB's and his XYL's trip to North Wales was a wonderful success. The MECC held a well-attended hamfest and picnic on St. Helen's Island, also a hidden transmitter hunt. VE2ABJ and his "Paerot-project", a repeater on 3780 kc. and 144,138 Mc. will be launched up to 100,000 feet during the RAQI Convention. The ½-watt transmitters weigh 12 ounces. This project is sponsored by the St. Maurice Valley group. Asst. SCM reports the V.H.F./U.H.F. ARC was active during the V.H.F. Contest from Mt. Orford. VE2IM expérimente le tv amateur avec VE2-

(*Continued on page 134*)

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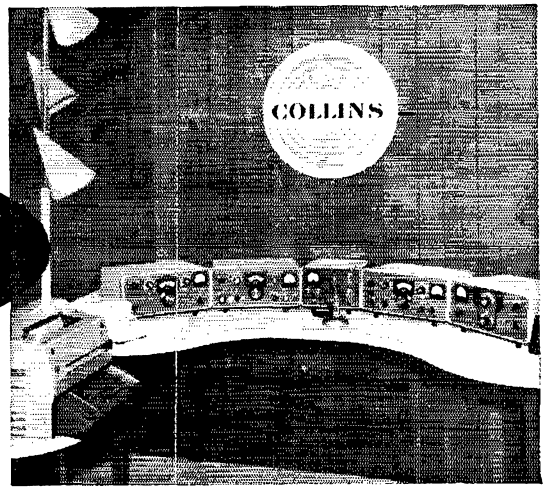

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ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FS. PAM: VE6PV. RM: VE6AEN. ECs: VE6FK, VE6SS, VE6ABS. OPSs: VE6CA, VE6PV, VE6HM, VE6SS, VE6BA. OOs: VE6HM, VE6NX, VE6PL. OBS: VE6HM. ORS: VE6BR. OESs: VE6DR, VE6HO. Our SCM has been on annual leave so VE6PV is working this column. VE6TG is travelling the prairies in general, visiting many hams and attending several meetings, and getting more ARRL appointments. The SEC report shows good activity in the section, and the ECs appear to be doing well. Lethbridge EC Vern Stewart organized a communications assist around the city May 25 for the Royal Canadian Legion band festival. In addition to many regular mobiles from the south, the Vulcan Club had its radio-equipped bus on the job. Alberta is losing another well-known old-time ham in the person of VE6EH, of Edmonton. Good luck to you in VE7-Land. We were pleased to hear from VE8-Land this month. Brad is just back from holidays and reports losing two hams; 8AA is to become a VE5, and ex-8DU is now VE7BHJ. VE8RG is the latest of several 8s to get DXCC. Lack of power prevented much ham activity in the floods at Hay River and Fort Simpson. Three newcomers: VE8-MM, VE8JH, VE8MF. Traffic: VE6HM 164, VE6FK 10, VE6BC 8, VE6FS 7, VE6ADS 6, VE6ABS 3, VE6VE 3, VE6BA 2, VE6PV 2, VE6AHV 1, VE6HS 1.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—Father Dietz, VE7ARX, passed away in his sleep recently. Father Dietz was blind but his one enjoyment was amateur radio. Many have worked him on 10 meters. VE7ALY is out of the hospital and well on the way to recovery. Welcome to our new Victoria area EC VE7BAH. VE7ALU blew his power supply and has been looking for parts to fit. VE7BHH has sent some good suggestions for the Emergency Corps. VE7AMW has been working on the 160-meter rig. VE7CT is moving from Chilliwack to Vancouver; Chilliwack is losing a good technican and instructor. VE7AC made DXCC and now is busy with his orchard. VE7BHW reports good 20-meter DX contacts. Congratulations to VE7UV on making Class A. VE7HJ worked 140 countries his first year in B.C. VE7FD had a heart attack but we are glad to report is recovering. VE7JB has been seen often; how about coming on the air, John? Reports of activity to the SCM for this space is about nil. Thanks to my faithful few. Traffic: VE7BJV 631, VE7BHH 162, VE7-AC 20, VE7BHW 20, VE7AMW 4, VE7AOY 2, VE7AKE 1.

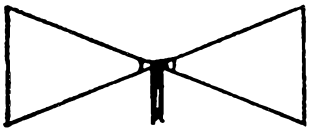
MANITOBA—SCM, M. S. Watson, VE4JY—Acting SCM, Gert Elliott, VE4GE—The WARA arranged for a conducted tour through the communications system of Symington Yards. The few members who turned out for this tour were well rewarded as this was a most interesting and informative evening. At the close of the tour, a delicious lunch was served through the generosity of the staff. The ARLM held a social May 24 at the Canadian Legion Hall. The evening was spent in dancing and a general social get-together. There was a program and lunch was served at the close of the evening. A few of the local mobile gang enjoyed a small transmitter hunt Sun. May 26. The weather was very bad, but a few enthusiasts turned out and enjoyed this mobile event. The monthly meeting of the ARLM was held May 27 in the Free Press Building. The program was a very informative talk on transistors given by Peter Cuthbert. There are no traffic counts this month as conditions on the band have been very bad. Between conditions being so bad and the farmers working on the land, there has been no noon net on 75 meters and the evening net meets only about twice a week.

The World Above 50 Mc.

(Continued from page 70)

and says that there have been a number of openings during the remainder of May. K3MLI noted openings on nine days during the month and says that VP7CX was in most of those days with signals like a local and that he (Hal) worked everyone in Pennsylvania except K3MLI. CO5CM was also heard in Philadelphia on May 5. Rick, K3UTR, sez that six meters opened up on May 5 with Puerto Rico, the Bahamas (I wonder who?), W2, W4, W5, W0s coming through. WA4DMV noted poor band conditions on 50 Mc. during May but sez that on June 1 he worked K7ICW and heard a number of 6s. He also worked WA5ADI and K5GJA and K5UFF. Con-

(Continued on page 136)



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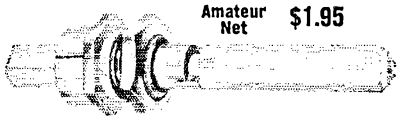

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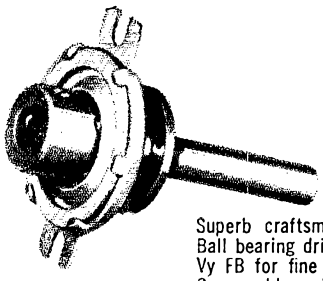

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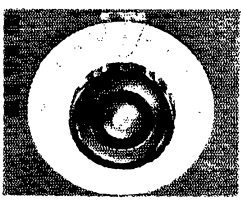

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ditions were different for WA4BMC who noted openings on May 1, 3, 5, 6, 7, 8, 9, 15, 28 and 29, 30 and 31, with 21 states heard and worked plus Puerto Rico. Besides working these skip openings, "Big Mike" also handles traffic. Wonder what she does to relax! In Panama City, Florida WN4IMC caught an opening into Minnesota on May 23. For WA4GDC in Sebring, Florida, it's much easier to list the dates that six was not open than otherwise. Kris caught openings on all the days of May except May 12, 13, 18 and 25; heard or worked thirty-nine states plus Puerto Rico, Mexico, the Bahamas, VE3s, VP5 and TGBOL-TV out of Guatamala.

Out in La Mesa, California, W6IEY reports that during the period between May 3 and June 3 he heard skip on thirteen days and heard about nineteen states plus northern California, VE4, KP4, CO2 and XE1. K6RCK notes contacts during May with VE6OH, VE6AGM, VE6CG and K7ERW. Las Vegas, Nevada had a good month for skip during May. Al, K7ICW, heard openings on fifteen days during the month and worked or heard thirty-four states plus XE1, VE6 and VE7. Not bad for Nevada during May. Out in Michigan, WA8EIQ noted openings on May 1 and 8 and good ground wave on May 11. WA9CWZ in Illinois added 18 states to his WAS total during May with best DX being San Diego, California. Bill sez that on June 2 he heard several CO stations but was unable to raise a one. Also in Illinois, WA9EJA worked into Florida and Colorado during May. Up in Wisconsin, K9FPM sez "six meters has been open regularly with most of the openings to the south with Florida, Texas, Oklahoma, Alabama, Louisiana and Mississippi well represented. Longest DX to date was with K7EMO in Laramie, Wyoming, on May 16." W9JOT, also of Wisconsin, sez that conditions were pretty good during May with stations coming in from all parts of the U.S. WAØCHD tells us that on June 1 WAØDSE worked CO2DL, and on May 5 KØIJJ/Ø worked FG7XT on Guadalupe. Randy noted openings on twelve days during May. From Kansas City, Missouri, WAØFLL sez that since May 1 he has worked 22 states with 16 confirmed using a Clegg 99er and five elements 37 feet high. KØFPC and KØJWN both of Harrisonville, Missouri, report four openings between them with twenty-seven states heard or worked, plus KP4 and FG7.

A most interesting report from WA4EPY in Ozone, Tennessee. Joe sez: "The period from April 30 to May 31 was one of the most remarkable periods of skip openings in recent years. This station noted and/or worked skip all but three or four days during this period. Many of the openings were brief, lasting only four or five minutes. On several days the openings moved in a clockwise direction from New England to Bermuda, Bahamas, Cuba, W5 and up to WØ within a period of two or three hours. At least twice the openings reversed 180 degrees. On May 5 after working several WØ's, we heard and worked VP5BB on Grand Turks and then several New York and Massachusetts stations. The same day we worked WA8DBB in Michigan and K4-PGL/VP9 in Bermuda. On May 7 we were reading VP7CX and VE4s working each other with 5/9 signals both ways.

"Every call area in the U.S. was worked. Every call area in Canada except VE5 [and we heard and called VE5YIX (?) on May 6]. Every continental state except Mississippi, South Carolina, Ohio, North Dakota, Utah, New Mexico, Alaska and Arkansas were heard or worked. Seven countries were worked: Canada, Bermuda, Bahamas, Turks, Guadelupe, Cuba and Mexico. One of the most

(Continued on page 138)

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exciting periods of skip we can recall." (Well, maybe we should move to Tennessee instead of Florida!). In Clarksville, Tennessee, WA4FHY sez that he has heard W6s and 0s plus KP4, VE, FG7, CO and W7s. Same story from K4KYL, WA4IRX and W4IRX also from Tennessee. K4SHY of Kingsport, Tennessee, notes that other than the DX mentioned by other stations from his state, he observed that many North and South Carolina stations which are normally beyond groundwave range were heard on backscatter just after the *E*-skip openings. From Annandale, Virginia and W4GVQ, we hear the same old (?) story (interesting isn't it?). "Skip coming in every day of the month." Dave mentioned that a typical day was May 27 when the band opened to VE1 land and he copied VE1s EW, ADF, OD,AF, IB, OT and AHR. The band then opened to the west and stations in Wisconsin, Illinois, Indiana and Iowa were worked. QST

Hamfest Calendar

(Continued from page 51)

Highway 97). The program includes contests, gabfests, hidden transmitter hunt, XYL contest, games for the children, and a potluck dinner at 12 noon, Sunday. Bring your camping gear and the whole family. Registration $1.00, XYLs $.50. Contact Brian Goodnough, VE7WU, Oliver, B.C. for further info.

New Jersey — The East Coast V.H.F. Society will hold their 5th annual hamfest and old-style picnic on August 4 at Saddle Brook Park, Saddle Brook, New Jersey. Talk-in on 2, 6, and 10 meters. Registration and parking are free. More details on request from W2YIA, 51 Birch Road Dumont, New Jersey.

Virginia — The National Guard Armory in Winchester will be the scene of the Shenandoah Valley ARC's 13th annual hamfest on August 3 and 4. Details from W4ACC, P.O. Box 139, Winchester, Virginia.

DXCC 500

(Continued from page 21)

"W9BRD . . . Rod, I just . . . QRX . . . ('up oars— Suki') . . . DXCC-500 news for *How's DX?* . . . QRX . . . (pull harder on the starboard oar, Suki) . . . No DXCC-500 QSOs . . . island just . . . QRX . . . (let go the antenna now, fellas . . . tread water, Herm, be right there . . . don't worry about the shark, Pedro . . . he don't look too beeeg . . . ahhh, big). Kinda busy, Rod — CUL. W9BRD de W6ISQ . . . /MM. QST

How's DX?

(Continued from page 76)

the annual W9-DXCC Banquet slated for September 14th at Chicago's Sheraton (K9s and WA9s are not excluded, of course). Mac promises a program well worth the countries *you may miss* by attending — *check with him* for reservation particulars *now* . . . . . Dewliner VE8CL makes plenty of 14-Mc. noise with 700 watts and a Telrex sprayer on Victoria island, 250 miles north of the Circle . . . . . Back in the game after a 42-month layoff, W4IIKJ is struck by the increase in single-sideband DX activity. "Back in '58 the mode was just beginning to get popular for DXing." . . . . . *QST*'s Damon Runyon, W6ISQ, is having his famed objectivity sorely tested in 20-meter pile-ups of late. Easy with that Wouff Hong, Jack! . . . . . K5JTP knocks off good 20-meter stuff over the mike of KL7FAG at King Salmon . . . . . According to K5JVF, SM3AEH/mm works flocks of W/Ks on regular runs between San Francisco and Vancouver, 40 c.w. preferred . . . . . KP4AXU may find DXing somewhat tougher now *with a less desirable Eight call* . . . . . W7DJH observes slack 14-Mc. conditions really putting pile-up pressure on KG4AM and similar "easy" items down Caribbean way

(Continued on page 140)

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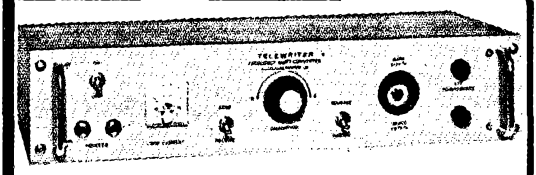
VALUES OF THE MONTH



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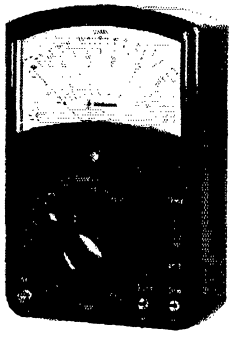

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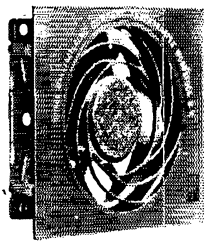
Amateur Net..... **$14.95**



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.-.-.- VE7BBB reports 15-meter bandmark XE2BM following the m.u.f. down to 20 with a new sideband sender. Despite the heckling of two small assistant ops, VE7BBB weighs in her first two years of hamming at 792 QSOs with OMs, 120 with YLs, and a half-DXCC's worth of DX. Eva's shack walls are hard pressed to display her 85 certificate awards .-.-.- Now local chatter via the clubs and groups: Successful applications by G3ESY, UA0KFG and FO8AA make a total of 57 California Awards dispensed by NCDXC. . . . On short notice W0MLY managed roughly 2300 contacts as TI9RC from Cocos islet in May. Dick has other early DXcursions in mind, so be alert! . . . If all goes well VP2VB/mm and *Yasme III* will be getting their land legs in Texas about now. . . . CRAS (El Salvador) offers Diploma El Salvador to DXers who confirm five contacts with members YSs since July, 1962. At least one QSL from each of the country's three call areas must be included. Check with CRAS for complete rules. . . . OX3JV (OZ7JV) expects to give Greenland a DX shove on 80, 40 and 20 s.s.b. plus some c.w. . . . K8WMQ relieves K8BIT in the editor's sanctum of *Splatter*, bimonthly organ of West Virginia's Kanawha Radio Club, and a periodical whose well-balanced diet includes a ration of DX coverage. . . . American SWL Club's *SWL* summarizes h.f. DX observations of Pacific signals recorded in Maryland during the historic high-altitude bomb test a year ago July: "(1) Signal drop-out effects were immediate; (2) signal drop-outs were not total, for residual signals could be heard slightly above the noise level; (3) sunrise effects were much more pronounced than normal; and (4) signals did not appear normal for approximately 48 hours. Drop-outs were not as prolonged as expected, lasting only a few hundred seconds. Effects were serious but short-termed."

Ten Years Ago in "How's DX?" — The passing of AC4YN, "Mr. Rare DX", causes Jeeves & Co. to pause and recall an exciting chapter in the history of DX .-.-.- Twenty meters evidently is the main route to faraway places in August, 1953. Some 14-Mc. code catches reported are C3AW, FE8AE, HE9LAA, I1BLF/Trieste, KT1UX, LB8YB, M1B, MB9BS, MF2AG, OE13s HP USA, OQ5GU, TA3CR, VK1s BA HM, W5TUX/KJ6, ZCs 2AC 3AA, 9S4s AL and BS. On 14-Mc. phone there are EA6AR, KG6IG, OQ0DZ, SU1MR, VK1BJ, VS7GW, YI2AM, ZC5VR, ZD4BK and ZS9G .-.-.- Forty c.w. is good for C3BF, EA6AF, FF8AJ, KB6AY, KJ6AX, LUs 3ZO 4ZO 4ZS 5ZO, W2AOS/KG6, ZC5VS and ZD4AF .-.-.- Noisy 3.5-Mc. c.w. turns up CT2BO and VQ4HJP. QST

Correspondence From Members

(Continued from page 66)

and the ruin of the true ham. — *Philip Haurus, K3OHS, Yardley, Pennsylvania.*

OLD TIMES

¶ It's good to have K7UGA back with us (p. 93 May *QST*). This recalls another illustrious senator of former years in amateur radio, one, Senatore G. Marconi, active in a "transatlantic" of December 12, 1901 (p. 14 *Two Hundred Meters and Down*). — *John Sharpley, W9ANB, Milwaukee, Wisconsin.*

INCENTIVES IN A NUTSHELL

¶ I have read with interest the discussion in *QST* on the merits of reinstating advanced licensing procedures and wish to enthusiastically commend the League for its stand on this matter. My personal views are strongly in favor of your position. We must not permit the United States to sink to the level of mediocrity which is the certain result of removing incentives and rewards. The essence of democracy lies not in equal *privileges* for all but in equal *opportunity* for all to earn their own place in the sun. I believe this should be particularly true in our own hobby of amateur radio and would personally be more than willing to start over from scratch to establish my rights and privileges as an operator according to my qualifications and industry. — *R. P. Burr, W2KQP, Huntington, New York.*

WILDLIFE TRACKING

¶ There is a large and steadily growing interest in radio tracking among naturalists these days, as is

Continued on page 142)

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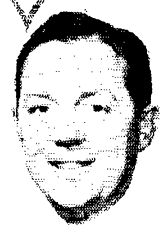
WØARA
Butler, Mo.



Ted Henry
W6UOU
Los Angeles, Calif.

Walt Henry
W6NRV
Anaheim, Calif.

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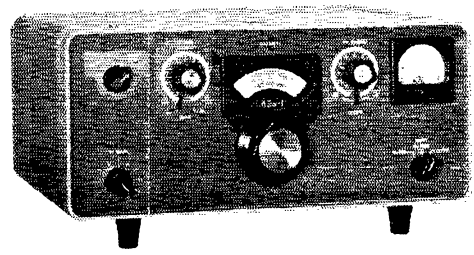

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evidenced by the formation three years ago of a Wildlife Telemetry Branch by the Wildlife Society's Techniques Committee. At an interdisciplinary telemetry conference held in New York last spring papers were presented describing tracking experiments with rabbits, woodchucks, porcupines, bears, ruffed grouse, monkeys, and turtles. So far, effort has been concentrated mostly on locating and tracking animals, but the trend is to develop equipment capable of transmitting physiological information about free-roaming animals such as heart rate, respiration, and body temperature.

The field of wildlife tracking and telemetry is one in which the Radio Amateur could make some very worthwhile contributions. Hoke Franciscus (W3-ELV), for example, has been assisting Drs. Frank and John Craighead on a grizzly bear tracking project in Yellowstone National Park since the fall of 1960 and has given a great deal of valuable help and advice. More often than not, tracking experiments are being carried on with limited budgets by people to whom some of the finer points of electronics are one step away from black magic. Can you think of a place where a ham with a few hidden transmitter hunts under his belt would be more welcome? If you are interested, drop a line to Dr. Lowell Adams, Hastings Reservation, Jamesburg Route, Carmel Valley, California, or to Frank or John Craighead, Montana Cooperative Wildlife Research Unit, Montana State University, Missoula, Montana. They can put you in contact with naturalists in your area who are doing, or who want to begin, tracking or telemetry work and who would be glad to get some technical assistance.

— *Joel R. Varney, Palo Alto, Calif.*

A Day at the FCC

(Continued from page 57)

Each emergency or distress call is unique: as an illustration, a Chinese vessel lost its rudder in the Atlantic and was at the mercy of the waves. Our d.f. network bearings enabled a rescue ship to reach the scene. In another instance, a plane had ditched off Puerto Rico. FCC bearings helped the Coast Guard rescue ship locate the plane and save the occupants. On occasion the craft may not have enough power for observation by several stations and only a line of direction from one station is obtained. In one such instance recently, our station at Waipahu, Hawaii, obtained the only bearing on a small boat bound for Honolulu. This enabled a Coast Guard plane to follow the line of direction and locate the stricken craft.

Although Laurel does not have primary responsibility for space monitoring, other stations of our group do and this brings with it increased attention to the equipment requirements in this particular field of specialization. It is recognized that eventually this field will expand to the degree that more of our stations will be concerned directly with it and this will certainly include Laurel.

Various requests for data from our other government agencies and from those of other countries also require equipment arrangements for whatever the nature of the data requires. Laurel, for instance, contributed data on recorded signal observations during recent high-altitude nuclear tests. Our other stations also supplied similar data.

As an aid in furthering international cooperation among nations, Laurel has a room set aside for international training operations which includes monitoring and direction finder equipment of sufficient scope to permit training in operations similar to our main monitoring work. Our engineering staff assists

(Continued on page 144)

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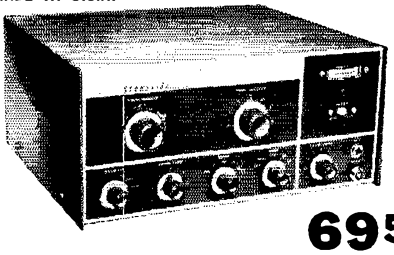

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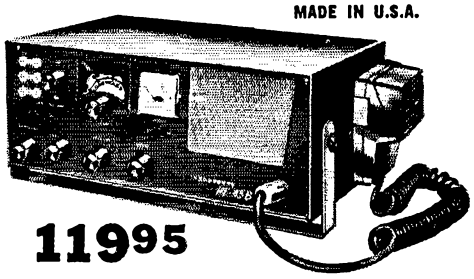

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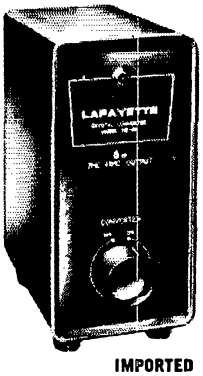

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in the instruction of men from other countries of the world while they are with us for this training.

The day at a monitoring station never ends. One watch merges into those which follow and since we have no favorite band, we pursue the m.u.f. up and down, through propagation storms, static, and interference, always keeping in mind our basic objective — an orderly radio spectrum. QST

Finger Keying

(Continued from page 38)

weights are removed and the bug dot contact is adjusted so there is continuous contact in the dot position. In this case the lead from the left (top view) finger lever is connected to the dot contact circuit and the lead from the right-hand lever is connected to the dash circuit. The dot and dash contact points must be in separate electrical circuits.

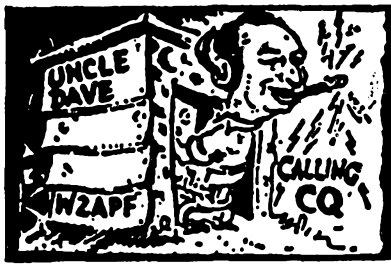
Case 2: The bug is operated independently of the electronic keyer and must be separated electrically from the finger-keying system. To isolate the two, the finger-lever contacts must hit against an insulated contact strip rather than against the base of the bug. This may be done by gluing a 2 × 1-inch strip of thin plastic or electrical tape on the bottom of the base in the contact area, and then gluing a slightly smaller piece of the thin sheet metal (tin can) on the plastic or tape for the contacts to hit. This contact strip and the contact points constitute an isolated circuit and the leads can be brought outboard to a terminal strip mounted on the top side.

The feel of the finger keys is "solid," and the appearance of the bug is essentially unchanged. The performance is excellent. It has held up well under the excitement of "pile-ups" and "rare" DX. True, the contact points and general construction are not rugged, but they are more than adequate to carry the current in modern keying circuits and to withstand the gentle but rapid touch of finger keying.

Skill will be acquired easily, if the author is a fair judge. Place the right index finger on the dot lever and the right middle finger on the dash lever. Move the fingers up and down and the c.w. flows. For straight key action, put the electronic keyer in "semi" position and use the right lever as a straight key, but remember you are not "pounding" brass.

If you wish to go further into finger keying consider this possibility: in many electronic keyer circuits dots are made when the dot and dash circuits are closed simultaneously. This leads to an interesting keying technique. For example, an "x" can be made by putting down the dash lever for one dash, pressing down the dot lever for two dots without releasing the dash lever, and then making the second dash before releasing the dash lever. Thus the whole letter is made with only one stroke of each finger. Other letters, numerals, and punctuation configurations can be made in similar combinations which practice and patience can master.

Hams are always adventurous, imaginative, and looking for new things. Try this one! QST



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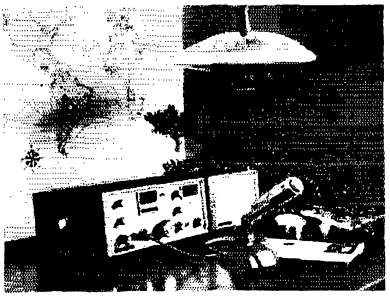


NCX-3

New NCX-3 triband transceiver covers complete 80, 40 and 20 meter phone and CW bands with all features built in—conservative 200 watt PEP on SSB, 200 watt CW, 100 watt A. M.! Break-in CW keying. VOX and PTT, S-meter, SSB/CW AGC, separate AM detector for fully compatible AM operation. The only tri-band transceiver with all features required for fixed station as well as mobile operation, with performance equal to or better than separate receiver/transmitter combinations.....**$369.00**

NXC-A AC Supply/Speaker Console.....**$110.00**

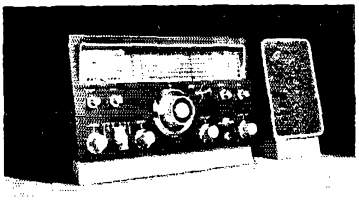
NCX-D DC Supply.....**$119.95**

NC-303

Popular top-quality SSB receiver covering all amateur bands from 160 through 10 meters, with slide-rule "band in use" dial scales and X-band converter input for 6, 2, and 1¼ meter bands. 40:1 tuning ratio, selectable sideband, product detector, bandwidths from 400 cycles to 8 KC, 30 db notch filter, audio peaking control. CW break-in provisions, fast attack, slow decay AGC for SSB and CW, 1 microvolt sensitivity. National's top receiver!.....**$449.00**

NTS-2 Speaker.....**$21.95**

XCU-27 100 KC Calibrator.....**$26.60**

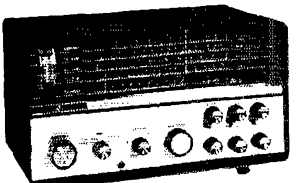


NC-270

Medium priced ham band receiver covering 80 through 6 meters, with selectable sideband, product detector, notch and depth controls, built-in 100 KC calibrator. Uses National Ferrite Filter for steep-skirted 5-step selectivity, has 1 microvolt sensitivity—even on 6 meters! Amazing mechanical and electrical stability, and more features than any receiver in its price class.....**$279.95**

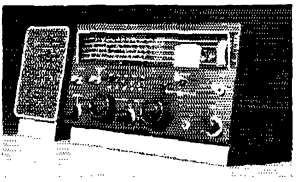
NTS-3B Speaker.....**$19.95**

NC-121



Brand new NC-121 general coverage receiver tuning 540 KC-30 MC. Ideal for the beginning amateur because of transformer power supply, two IF stages, Q-multiplier operative on CW and AM, product and diode detectors, S-meter operative on SSB/CW and AM, SSB/CW AGC. Variable BFO, automatic noise limiter, built-in speaker, RF and audio gain controls, earphone jack. Handsome styling feature sturdy extruded aluminum front panel, anodized for protection against wear...**$129.95**

NC-190



SSB 540 KC-31 MC general coverage receiver offering National's patented Dial Selector for instant choice of amateur or foreign broadcast calibrated bandspread. 60:1 bandspread vernier tuning, double conversion, SSB/CW AGC, product detector, diode detector, S-meter operative in both SSB/CW and AM modes. 3-step variable IF selectivity using National Ferrite Filter. Ideal for station receiver, second receiver for general coverage listening, use as tunable IF for VHF converters. **$219.95**

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Happenings of the Month

(Continued from page 62)

subject petition filed by International Crystal Manufacturing Co., Inc., on January 14, 1963, be denied. In support whereof, the following is respectfully submitted:

The subject petition requests the Commission (1) to establish a new class of license in the Amateur Radio Service which would be issued upon simple request without examination or other showing of technical qualifications, and (2) to set aside twenty-three channels in the 28-29.7 megacycle amateur band for use by such licensees. Except for an input power of 10 watts instead of 5 watts to the amplifier supplying power to the antenna, and a slight change in frequencies of operation, the specifications for the transmitting equipment would be identical to the present specifications for Class D stations of the Citizens Radio Service, to which twenty-three channels between 26.96 and 27.255 Mc. have been assigned.

While the League welcomes newcomers to the amateur ranks and actively encourages licensees of the Citizens Radio Service to acquire the minimal code and technical knowledge required for an amateur radio operator's license, it most strongly opposes the subject proposal because such a class of license would not satisfy the minimal requirements for and objectives of a licensee in the Amateur Radio Service.

Section 12.0 of the Commission's Rules sets forth the following fundamental principles for the Amateur Radio Service:

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

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

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

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

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

Article 41 of the Radio Regulations (Geneva 1959) of the International Telecommunications Union requires demonstration of ability in Morse code as a prerequisite to the granting of an amateur radio operator's license for operation below 144 Mc. Although less specific in the matter of technical qualifications, the same Regulations obviously contemplate an examination in radio technique, the exact level being left to the judgment of each administration.

It is obvious that the subject proposal neither satisfies the fundamental principles of the Amateur Radio Service as set forth in the Commission's Rules nor meets the minimal requirements of the Radio Regulations of the ITU. For these reasons alone, the subject petition must be denied.

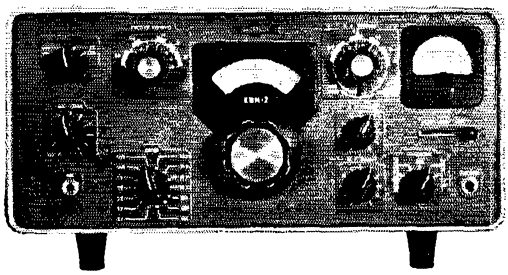
Even if the proposal met the minimum requirements of the applicable rules and regulations, it is the considered opinion of the League that establishment of such a class of license would seriously undermine the Amateur Radio Service.

Under the present rules of the Commission, a person desiring to enter the amateur ranks may do so through a number of classes of licenses. The simplest is the Novice Class, which requires minimal code proficiency and minimal technical knowledge. Next is the Technician Class, which requires minimal code proficiency but greater technical knowledge. The operating frequencies available to these two classes are limited. In addition, the Novice Class license is limited to one year and is nonrenewable. Establishment of the proposed class would remove any requirement for self-training and study which is the foundation of the Amateur Radio Service.

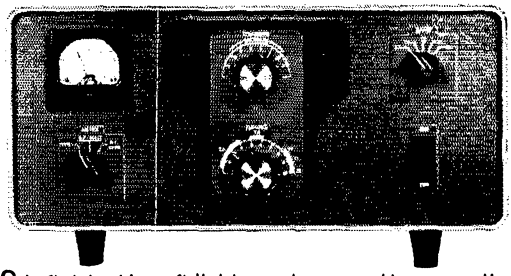
The League has been increasingly concerned over certain developments in recent years in the Amateur Radio Service. In some instances, technical knowledge and operating proficiency have not kept pace with the development of new equipment and techniques, notably single sideband suppressed carrier (s.s.b.) telephony, and overcrowding of the high frequency (h.f.) amateur bands. As a result of this concern, the following resolutions were adopted unanimously at the annual meeting of the League's Board of Directors held on May 3, 1963:

(Continued on page 148)

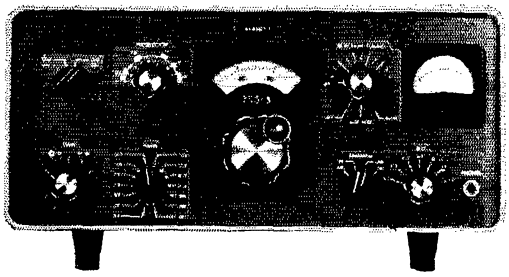
Either your ham equipment



1 is designed around the latest systems concept

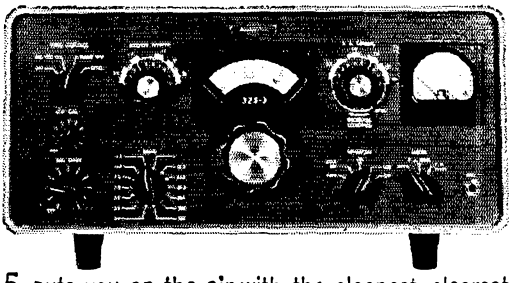


2 is finished in soft light-gray tones and has smooth, stylish lines



3 gives you swift, sure precise tuning on each unit

4 has station flexibility to let you operate as a transceiver or on separate frequency control, on HF or VHF



5 puts you on the air with the cleanest, clearest signal on the amateur bands

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

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

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

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

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

* * *

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

* * *

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

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

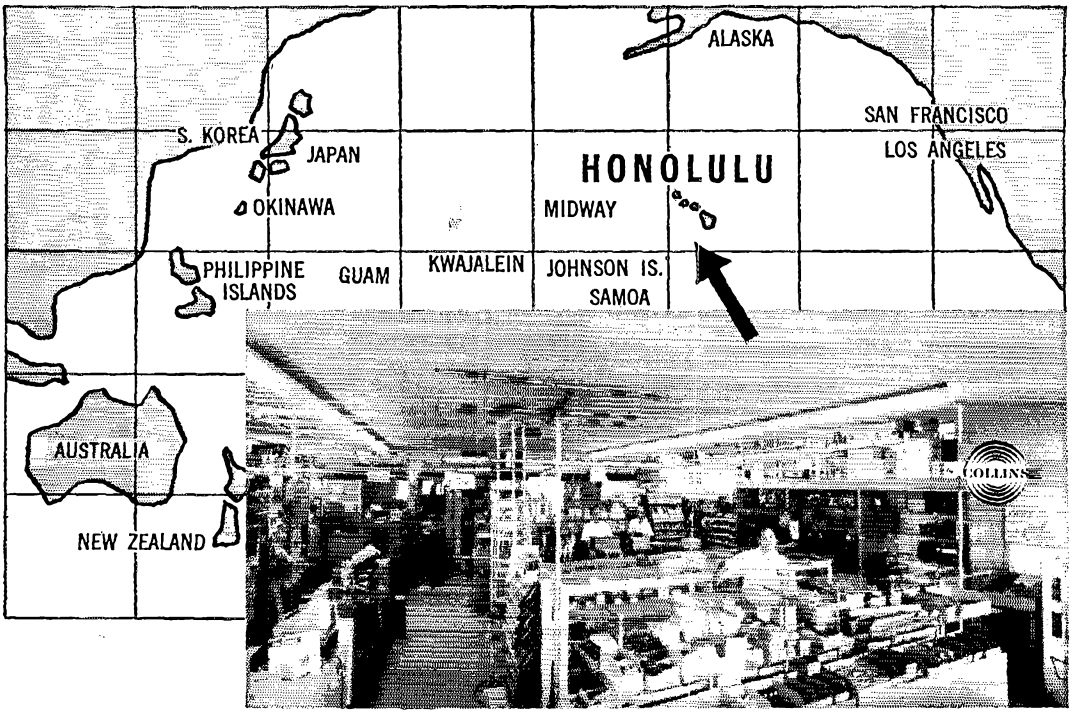
"1) To make proper choice of bands below 30 Mc. appropriate to the distance to be covered.

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

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

"4) To expand the use of v.h.f. for local contacts wherever possible, with the ultimate aim of conducting all short-distance communication in this portion of

(*Continued on page 160*)



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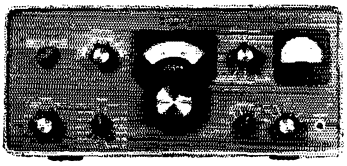
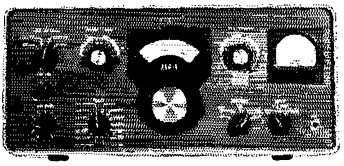
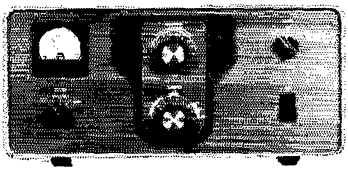


75S-3 Receiver — $680



32S-3 Transmitter — $750



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the spectrum.

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

The lowering of qualifications, as proposed by the subject petition, would be diametrically opposite to the programs of self-improvement supported by the League.

For these reasons, the League respectfully requests that the subject petition to establish a Hobby Class of license in the Amateur Radio Service be denied.

Respectfully submitted,

THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED
ROBERT M. BOOTH, JR.
Its General Counsel

1735 DeSales Street, N.W.
Washington 6, D. C.

June 5, 1963

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

In the Matter of	
Amendment of Sections 12.111 and 12.114 of the Commission's Rules, Amateur Radio Service, to Authorize One Mc. Television Transmission in Voice Sub-bands of 52.0 to 54.0 Mc. and 145.9 to 147.9 Mc.	RM-399

OPPOSITION TO PETITION FOR RULE MAKING

The American Radio Relay League, Incorporated, a non-profit corporation organized under the laws of the State of Connecticut and having as voting members more than 84,000 amateur radio operators licensed by the Federal Communications Commission, respectfully requests that the petition of Wayne Green, filed on December 26, 1962, requesting amendment of Sections 12.111 and 12.114 of the Commission's Rules to permit one megacycle television bandwidth between 52.0 and 54.0 megacycles and between 145.9 and 147.9 megacycles, be denied.

In support whereof, the following is submitted:

The most widely used bands in the extremely valuable very high frequency (v.h.f.) portion of the spectrum available for amateur radio use are the two lying between 50 and 54 megacycles and 144 and 148 megacycles. Both because of propagation characteristics and because components, circuits and techniques normally used for lower frequencies may be used with but little modification, these two bands are most essential to the amateur service.

These two bands are presently used by thousands of United States amateurs of the Technician Class who are not permitted to operate on lower high frequency (h.f.) amateur bands. Many other amateurs employ these two bands from choice because of their unique propagation characteristics. For communications up to 100 miles or so, these two v.h.f. bands are highly reliable, offering greater freedom from disruption by various forms of natural and man-made interference than do the lower frequencies. Because of their propagation characteristics, the League, as a matter of policy, has encouraged the use of the v.h.f. amateur bands for local and area communications wherever possible. Many emergency and other networks operate in these bands.

The 50-54 Mc. band, being in the boundary territory between frequencies commonly used for long-distance and local communications, occasionally exhibits many forms of long-distance propagation, and thus is of extreme interest to the scientifically inclined amateur. To further the propagation studies, the frequencies between 50.0 and 50.1 Mc. have been reserved for A1 (c.w.) emissions.

The 144-148 Mc. band also exhibits interesting propagation anomalies. Because this and higher frequency bands are little affected by conditions in the ionosphere, the band is ideal for amateur experimentation in the field of space communications. The first privately constructed and financed satellite ever placed in orbit was an amateur satellite, Oscar I, which operated in this band. Oscar II also operated in this band. When Oscar III is placed in orbit in the near future, signals received between 144.075 and 144.125 Mc. will be retransmitted back to earth automatically on 145.875 to 145.925 Mc.

The instant proposal to make two megacycles of each band available for amateur television must be viewed in light of the present and anticipated future use of these

(Continued on page 152)

bands. As the petitioner notes, the bandpass requirements for television are "enormous . . . as compared with other modes of communication." According to the petitioner, a total bandwidth of at least 800 kilocycles will be required for a single low-quality video signal of 100 lines and 60 frames per second. Thus, even with some overlap of adjacent sidebands and without considering the aural channel, only two or three stations in the same general area would be able to operate simultaneously in either band. Such video signals not only would cause interference to but would receive interference from other signals within the band occupied by the video signals. In addition, other services immediately above 54 and 147.9 Mc. might cause and be subjected to adjacent channel interference, including Channel 2 television signals in the 54–60 Mc. band.

The League does not agree with petitioner's argument that the 420-450 Mc. amateur band is unsuitable for amateur television. Groundwave propagation characteristics of the band are well known not only from amateur experience but also as the result of extensive use of the adjacent 450-470 Mc. band by the mobile services and the frequencies immediately above 470 Mc. by the television broadcasting service. The recent action of the Commission in removing power limitations in the 420-450 Mc. band makes possible operation with input powers up to 1 kilowatt in most areas. Equipment is readily available, both for transmission and reception. Wideband rather than narrow or limited band transmission may be used. By reduction of the video bandwidth, a larger number of stations may operate simultaneously. Because the 420-Mc. band is thirty megacycles wide, as compared to but four megacycles for each of the other two bands, the impact of video signals upon other amateurs will be far less in the 420 Mc. band.

It is the considered opinion of the League that transmission of wide-band 800 kilocycle or one-megacycle video signals in either the 50 or 144 Mc. bands would produce a most inefficient utilization of these heavily used and limited amateur bands. For these reasons, the League respectfully requests that the subject petition be denied.

Respectfully submitted,

THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED
ROBERT M. BOOTH, JR.
Its General Counsel

1735 DeSales Street, N.W.
Washington 6, D. C.
June 5, 1963

REPORT OF THE PUBLIC RELATIONS COMMITTEE

The Board of Directors
American Radio Relay League

The Public Relations Committee met on two occasions during the past year. The development and preparation of material was completed to more effectively present to the public a simple and straightforward story of the hobby of amateur radio—what it can accomplish in the public interest and how it has an unique appeal to people of all ages, races and backgrounds. This booklet will have particular public relations value at hobby shows, trade fairs, state fair radio exhibits, etc. All affiliated radio clubs must be made aware of its availability and encouraged to use it to the best advantage at every appropriate opportunity. Also, information concerning the value of such material should be given proper space in *QST* to make all League members aware of its purpose and availability.

This committee recommends that a continuing effort on the part of each Director, Vice Director, Assistant Director, Club official, and League member is essential to maintaining a flow of news material that will be of particular local interest and desired by newspapers and similar news media. To those League Officials and members who have been successful in presenting a good public relations image for the amateur, this committee expresses sincere appreciation.

The committee feels that there is also a definite need for better public relations within the amateur ranks in order to encourage an increase in club affiliation and League membership. The need for and the benefits of club affiliation must be stressed. Here the key word is "*benefits*". ARRL must offer something that will be of particular assistance to the local radio clubs in their organization, programming, and membership drives.

To fill this need for greater assistance to affiliated clubs,

(Continued on page 154)

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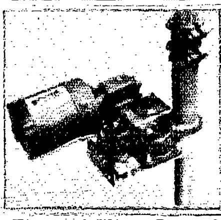

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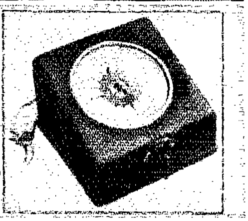

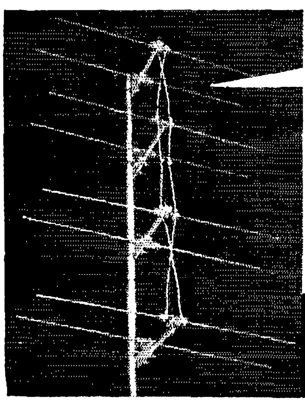

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Cush Craft 621 Hayward Street, Manchester, N. H.

A FULL LINE OF AMATEUR COMMUNICATION ANTENNAS

the following is offered for your consideration and approval:

1) Club recognition through awards should be more substantial and clubs must be encouraged to participate as a group in such ARRL sponsored activities as Field Day, Sweepstakes, and DX Contests.

Affiliated clubs should be categorized as to membership — for example, less than 25; 25 to 50; 51 to 100; and over 100 licensed members. The club states its membership upon filing intent to participate as a group in an ARRL contest. Each Director should be supplied with identical trophies for the different categories and when winners in each category are determined by headquarters, the Director or one of his assistants can make a proper presentation at a hamfest, convention, or club meeting.

This brings ARRL closer to the club, encourages friendly competition, and is a vehicle for a news release.

2) ARRL must provide better and varied subject material for club programs if we are to hold club interest. In addition to the present training aids and program film library currently available, the creation of an absentee lecture series composed of color slides and tape recording on such subject matter as operating procedures, efficient use of equipment, and current construction to be presented by certain of the headquarters staff would fill a great need for club programs and again points out the value of affiliation.

The program can be made up, packed in a suitable mailer, and supplied free to affiliated clubs with only the return postage to be paid by the club.

3) Since League membership and club affiliation are inter-dependent, there is a great need for cultivating membership drives at the club level. The 1962 Booster Pin Campaign proved quite successful and should be repeated yearly. To assist in organized membership drives, it is suggested that ARRL encourage all clubs to annually schedule local drives to coincide with the Booster Pin campaign. As an added incentive, free ARRL Membership Pins might be supplied to all clubs who qualify for the 100% ARRL Honor Roll.

Good public relations for the League and for local radio clubs must be maintained by an aggressive and alert program of selling ARRL to non-member amateurs as well as to the general public.

Respectfully submitted:

NOEL EATON, VE3CJ
CARL SMITH, WØBWJ

May 1, 1963

REPORT OF THE PLANNING COMMITTEE

The Board of Directors
American Radio Relay League

The Planning Committee 62-63 having but one assignment, (Item 47, 1962 Board meeting) — study of a petition to permit Technician operation in the 10-meter band — was solved by FCC action. This Committee, under the date of 21 July 1962, in turn advised the Executive Committee that no further action would be taken by the Planning Committee and the Board was so advised by the General Manager in a subsequent Directors' letter.

We suggest that possibly the Public Relations Committee give serious consideration to the preparation of a movie that could be used by affiliated clubs, or possibly TV stations, depicting what amateur radio involves, and the part the League and our membership play with respect to performing a public service.

It is also suggested that the Board give careful consideration to a possible West Coast outlet to supplement WIAW with respect to the broadcast of Official Bulletins, code practice transmissions and contact periods, calling your attention to a motion on this subject made at the last Board meeting, that was not acted upon.

We recommend that the Membership and Publications Committee, and the Board, give consideration to a token payment to authors of articles published in *QST*, even if it only involves a year's subscription to the magazine.

As an incentive for club participation in membership drives, it may be that the General Manager and the Board may care to consider raising the discount for new members obtained by those affiliated clubs promoting League membership.

It has been a pleasure to have served the Board in our humble capacity as members of the Planning Committee. By working closely with each other and communicating our ideas and views by mail, expenses of this Committee have

(*Continued on page 156*)

been nil. It may be that the $1500 budgeted for our use could be turned over to the Building Fund.

Respectfully submitted:

RAY E. MEYERS, W6MLZ, *Chairman*
GILBERT L. CROSSLEY, W3YA
CHARLES G. COMPTON, WØBUO

REPORT OF THE FINANCE COMMITTEE

To the Board of Directors
American Radio Relay League

The Finance Committee met at the Headquarters on Thursday, May 2, 1963.

Complete and uniform accounting is essential to our full compliance with the current regulations of the Internal Revenue Service. While expense accounting is being adequately handled for staff members, no definite guide was available for proper instruction to Directors. After discussion, it was agreed that a guide to expense accounting for Directors should be prepared by this Committee which, if found acceptable by the Executive Committee, might serve as policy for this Board.

The Committee briefly reviewed the financial position with respect to building expenditures and concluded that no action was required.

The Committee commends the General Manager and Treasurer for their efficient handling of building finances.

Respectfully submitted:

MILTON E. CHAFFEE, W1EFW, *Chairman*
ROEMER O. BEST, W5QKF

Silent Keys

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

W1HXY, Rocco J. Rossi, Danvers, Mass.
K1MYG, Paul F. Leddy, Stratford, Conn.
W2BER, David J. Paxton, Troy, N. Y.
W2FTS, William H. Olsen, Brooklyn, N. Y.
W2KOA, William C. Hamner, Patchogue, N. Y.
W2MAJ, Elmer J. Knapp, Old Bridge, N. J.
WA2OUS, Leonard E. Silverman, Bayside, N. Y.
K2QWN, John W. Shrimpton, Jr., Camden, N. J.
W2SYS, John A. Semo, Rome, N. Y.
W2VCW, Herbert M. Inman, Jr., Painted Post, N. Y.
WA2WQT, William V. Ewing, Newburgh, N. Y.
WA2ZIF, Aaron Orenstein, Franklin Square, N. Y.
W3IKC, Walter C. Lambert, Bladensburg, Md.
K3JNP, Walter S. Scott, Folcroft, Pa.
W4EZA, Ralph L. Leadbetter, Port Charlotte, Fla.
WA4JMQ, Harry D. Horn, Surfside, Fla.
W4KLP, Marion W. Taylor, Punta Gorda, Fla.
K4LKX, Robert M. Strickland, Dunn, N. C.
W4LZT, Charles W. Bivens, Holly Hill, Fla.
W4MWB, Roy L. Richardson, West Hollywood, Fla.
W4OJX, Clarence E. Jack, Charleston, S. C.
K4ZNJ, Douglas T. Cannon, Charleston, S. C.
K5KFM, Otto D. Stallard, Jr., Dallas, Tex.
W6EXB, Walter M. Cleaves, San Bernardino, Calif.
W6EZS, Thomas E. Smith, Los Angeles, Calif.
WA6GQX, Yoves M. Monroe, Compton, Calif.
W6HIF, Walter L. Bennett, San Bernardino, Calif.
WA6ISR, Theodore Kaye, West Covina, Calif.
WA6RUT, Gary L. Terwilliger, Valinda, Calif.
K7JXG, Carl S. Schubach, Spokane, Wash.
WA8ABC, Paul Snyder, Jr., Canton, Ohio
WN8BVL, Warren L. Anderson, Detroit, Mich.
K8ITR, Patrick N. McCauley, Clarksburg, W. Va.
W8IVA, Gerald E. Bolton, Wyandotte, Mich.
W8PRC, William E. Miller, Dow Air Force Base, Me.
K8UKW, Norman R. Karvonen, Mohawk, Mich.
W9JWL, Frank P. Mahoney, Chicago, Ill.
K9PVC, Emil C. LeGates, Chicago, Ill.
W9RBP, June B. Hengels, Chicago, Ill.
W9ZKB, Paul F. Larsen, Manitowoc, Wisc.
WØMJH, Winthrop M. Mager, Des Moines, Iowa
WØNJI, Coral R. Sargent, Kansas City, Kans.
WØVAV, Roy A. Hutson, St. Louis, Mo.

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.
(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.
(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**
(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.
(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.
(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**
(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

HAMFESTERS Radio Club's 29th Hamfest to be held Sunday, August 11th at Santa Fe Park, near Chicago. See Hamfest Calendar or write Tomp Campana, K9DYW, 1209 W. 74th St., Chicago, Ill. for info.

PEORIA Hamfest: 15th of September 1963. Exposition Gardens, all-weather site. For tickets write Stan Kujawa, 1612 West Columbia Terrace, Peoria, Ill.

S.R.R.C. Hamfest: June 7, 1964. Write for details after April 1, 1964. Starved Rock Radio Club, W9MKS/W9QLZ, RFD #1, Box 171, Oglesby, Illinois.

ANNUAL Wyoming Hamfest August 10-11. See Hamfest Calendar this issue.

14 WEATHER Instrument Plans, $2.00. Saco Industries, Box 2513, South Bend, Ind.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCQ, Ralph Hicks, Box 6097, Tulsa, Okla.

We buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, N.Y.

TOROIDS: Uncased 88 Mhy. like new, Dollar each. Five/$4.00. P. P. DaPaul, 309 So. Ashton, Millbrae, Calif.

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. KEllogg 8-0500.

CASH For your gear! We buy, trade and sell. We stock Hammarlund, Hallicrafters, National, Johnson, RME, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply Inc., 506-510 Kishwaukee St., Rockford, Ill.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N.Y.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N.C.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

TOROID RTTY Kit: Mark-Space discriminator and bandpass filters. Includes 4-88 Mhy and 1-44 Mhy uncased like new condx. toroids; information sheet, mounting hardware and six mylar capacitors. $5.00 ppd. Toroids: specify 88 or 44, less capactrs. $1.00 each. 5/$4.00, ppd. KCM Products, Box 88, Milwaukee 13, Wis.

ACT NOW!! Barry pays cash for tubes (unused) and equipment. Barry Electronics, 512 Broadway, NYC 12. Call 212-WAlker-5-7000.

ATTENTION: Amateur radio equipment repaired, work guaranteed. L & S Electronic Technicians, WA2OQG, Sid Levinson, 393 So. 3rd, Brooklyn 11, N.Y. Tel EV 4-7564.

HAM Discount House. Write us for lowest prices on ham equipment. Factory sealed cartons. Specify equipment wanted! H D H Sales Co., 327 Greenwich Ave., Stamford, Conn.

QSLS?? SWLS?? WPE?? Largest variety samples 25/ (refunded). Sakkers, W8DED, Holland, Mich.

QSL, SWL cards that are different. Quality card stock. Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

C. FRITZ QSLS. Highest quality consistently for a quarter century! Samples 25¢ deductible. Box 1684, Scottsdale, Ariz. (formerly Joliet, Ill.)

QSLS. Twenty exclusive designs in 3 colors. Rush $3.85 for 100 or $6.90 for 200 and get surprise of your life. 5 days' service. Satisfaction guaranteed. Constantine Press. Bladensburg, Md.

QSL Specialists. Distinctive Samples 15¢. DRJ Studios, 2114 N. Lavergne Ave., Chicago 39, Ill.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Catalog with samples. 25¢.

QSLS-SHLS. Samples 10¢. Malgo Press, Box 375 M.O., Toledo 1, Ohio.

QSL-SWL-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

DELUXE QLS. Petty, W2HAZ, Box 27, Trenton, N.J. Samples. 10¢.

QSLS. Special, 100 50 Star U.S. Flags on glossy cards. $3.70. Ppd. Other samples 10¢ or 25c refunded. Dick, W8VXK, Rt. 4, Gladwin, Mich.

QSLS-SWLS. 100 2-color glossy, $3.00; QSO file cards. $1.00 per 100. Samples, 10¢. Rusprint. Box 757, Kansas City 16, Mo.

QSLS: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

CREATIVE QSL Cards. Free, new catalog and samples. Personal attention given. Wilkens Creative Printing, P.O. Box 1064-1, Atascadero, Calif.

QSLS, SWLS, WPE. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLS, 100 2-color, $3.00. Samples 10¢. Brigham, 32 Colson St. North Billerica, Mass.

QSLS, SWLs, XYL-OMs (sample assortment approximately 2¼¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

SUPERIOR QSLS, samples 10¢. Ham. Specialties, Box 73, Hobbs, New Mexico (formerly Bellaire, Texas).

DON'T Buy QSLs until you see my free samples. Bolles, W5OWC, 7701 Tisdale, Austin, Texas.

QSLS 300 for $4.35. Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSLS. Samples 25¢, Rubber stamps: name, call and address $1.55. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS 3-color glossy, 100, $4.50. Rutgers Vari-Typing Service. Free samples. Thomas St., Riegel Ridge, Milford, N.J.

QSLS. Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Sample 15¢. Agents for Call-D-Cal decals. K2VOB Press. 62 Midland Blvd., Maplewood, N.J.

RUBBER STAMPS. $1.00. Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N.J.

QSLS. $2.50 per 100. Free samples and catalog. Garth, Jutland, N.J.

PICTURE QSL cards from your photograph of your shack, home, etc. 1000, $12. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

1½" Call QSLS (2 sides printed) 100, $3.15. Sample free. Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

QSLS At the sign of the "Hobby Horse". Quality at uninflated price and quick delivery. Glossy, red and green. $2.00 per 100 postpaid. Free sample. Hobby Print Shop, Umatilla, Fla.

COMPARE: Deluxe rubber stamp. King-size call; name, address: $2.00. Frey, Box 296, Schwenksville, Penna.

QSLS. 100, $2.50. Samples free. Amee's Printery, W9FXQ Box 13A, Oak Lawn, Ill.

FREE Catalog of QSLS, WPE and CB cards. New designs. Longbrook Press, Box 393-A, Quakertown, N.J.

QSLS. All kinds, free samples. W7IIZ Press, Box 183, Springfield, Ore.

QSLS! Send 10¢ for current specials. Harrison, Box 1171, Hyatsville, Md.

QSLS. Samples 10¢. Filmcrafters, Box 304, Martins Ferry, Ohio.

RUBBER Stamps for hams, sample impressions, Hamm, W9-UNY, 542 N. 93, Milwaukee, Wis.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS. 3-Color glossy, 100, $3.79. Nice colors. Samples 10¢. Gates Print Shop, 317-11th Ave., Juniata, Altoona, Penna.

ATTRACTIVE QSLS: Large variety of styles: cartoons, colors. Samples 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn 13, N.Y.

QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS by The Ink Well. Spencer, Mass. Samples free. Menard, W1DQU.

DESIGN a QSL Card. Sampler Instruction Kit, 25¢. Helps you design, create. We print from your instructions. Samco, Box 203, Wynantskill, N.Y.

COMPLETE Ham Station with Collins S/Line transmitter and receiver; 516F-2 power supply and 312B-4 station control, brand new. Present market price over $2100 plus provincial taxes. Will consider all reasonable offers. Write J. Long, 920 Chenier Ave., Ottawa 13, Ont., Canada.

WANTED: All types of aircraft or ground radios. 17L, 618F or S 388, 390, GRC, PRC, 51J, RVX. Especially any item made by Collins Radio, ham or commercial. Also large type tubes and test equipment in general. For fast cash action contact Ted Dames, K2KUH, 308 Hickory, Arlington, N.J.

FOR Sale: Collins KWM-2 with Water's Notch Filter and 516F2 AC supp., $850.00. W4HVR, Manning Jeter, 746 So. Decatur St., Montgomery, Ala.

NEW And used ham gear. Top trades. Norm, K9HRI at Dahn Electronic Supply, 14 Jayne St., Algonquin, Ill. Mail orders welcome!

LINK 500 w/6M final, $40; Meridian Lab SWR Bridge, $60. new. Measur. 65 VTVM, $30; 1296 Transmitter, G-E, new, $90. 6146-6883 tubes: 3 for $5. K2JSO, 2043 E. 52nd St., B'klyn, N.Y.

INTERESTED In two-meter linear amplifiers, transmitters, receivers, etc. If the price is reasonable, for members of St. Mary's Radio Club, or as tax exempt donation to Missions. K8WLB, St. Joseph's Mercy Hospital, Centerville, Iowa.

304TL tubes wanted. Also other xmttg and special purpose tubes. We will buy military or commercial transmitters and receivers with designations ARC, GRC, URR, 51 and MN. Air Ground Electronics Co., 64 Grand Pl., Kearny, N.J.

CASH promptly paid for your ham gear. Trigger, 7361 North, River Forest, Ill. PR 1-8616.

TUBES Wanted. All types, highest prices paid. Write or phone. Lou-Tronics, Inc., 131 Lawrence St., Brooklyn 1, N.Y. Tel. UL 5-2615.

ATTENTION Mobileers! Heavy-duty Leece-Neville 6 volt 100 amp. system, $50; 12 volt amp. system, $50; 12 volt 60 amp. system, $60; 12 volt 100 amp. system, $100. Built-in silicon rectifier alternators 12 volt 60 amps, $100; 12 volt 100 amps, $125.00. Guaranteed no ex-police car units. Herbert A. Zimmerman, Jr., K2PAT, 1907 Coney Island Ave., Brooklyn 30, N.Y. Tel. DEwey 6-7388.

COLLINS KWM-1 with AC and DC supplies, noise blanker, mobile mount, in exclnt condx. $595. Steel tower, 70 ft., $75.00. M. H. Klapp 17 Kenosha St., Albany 9, N.Y.

$1.00 Frames 60 QSLs. See page 152. Free sample and attractive discount available to ham clubs or ham agents. John Thomas, K4NMT, Box 198, Gallatin, Tennessee.

NATIONAL NC-173 with C-E Model B slicer, $125.00. Morristown, N.J. W2YRK, JE 9-1511.

FOR Sale: 3600-0-3600 at 1000 ma. plate transformers with dual 110V and 220V primaries, $35.00; 7.5 VCT at 45 amp., 4-1000A filament transformers, $16.50. Peter W. Dahl, 5331 Oaklawn Ave., Minneapolis 24, Minn.

FOR Sale: HQ-170 with clock, less than 1 year old, $270.00, or trade for Ranger F. W. plus $120.00. WA8AHG, 852 Walnut St., Elyria, Ohio.

WEBCOR 2150 stereo tape deck, $150; Boehme CW tape drive and keying head, $100; McElroy three bar perf., $20; Meissner EX sig. shifter, $25; VFI, $10; HRO PW-O drive and dial, $7; HQ100C, $130. Cash or trade. K1HOP

WANTED: For personal collection: QSTs January through August 1916; ARRL Handbook Edition 1. W1CUT, 18 Mohawk Dr., Unionville, Conn.

SELL: HC-10SSB converter, like new, $75; QX 535 (see Goodheart ads), $29; VFO-matic for transceive operation on 75A receivers, $80; Testo-matic field strength and modulation meter, 6 coils, $15; UTC-S46 power transformer, $10; S-62 fil. trans., 10 VCT 10 amp., $6; S-12 audio, $3; Merit P 3146 10 VCT, 10 amp, $6. All like new. F.O.B. Lam, 1219 Yardley Rd., Morrisville, Penna. See: SX 101A, $250; HC-10 SSB converter, $75; Transtenna T-R switch, Model 102, outboard, $50. All like new.

WILL Trade new or used ham parts and equipment for U.S. or Canada Philatelic stamps. W9AU, P.O. Box 155, Barrington, Ill.

FOR Sale: Complete instructions including 28-page booklet and 26" x 36" schematic for converting the ART/13 transmitter to AM and SSB. $2.50. Satisfaction guaranteed. Sam Appleton, K5MKI, 501 N. Maxwell St., Tulia, Texas.

NATIONAL NC-98 $100; Globe Chief 90W, $25, exclnt for the Novice. WITQB, 19 Westford St., Gardner, Mass.

MUST Dispose: 82 copies Proceedings of the IRE, 3 volumes complete, 1926 to 1952. Real bargain for lot. Write for list. Mrs. Miriam Y. Knapp, W1ZIM, 191 Beechwood Rd., West Hartford 7, Conn. Tel: 521-2055.

HIGH Power and other equipment; California KW transmitter amplifier, VFO—4-1000A, TVI suppressed, well metered; 75A-1 w/extras; signal shifter, $25.00; 800w amplifier, $50; 1000W power supply, $30; 10KW pwr. supply parts, $150; B&W dipper, $25.00; Simpson VOM, $4.00; field strength $5.00; dynamotors, $2.50; AR-22 $13.00; B&W co-ax switch, $4.00; Ocean Hopper, $5.00; RG8/U, 9¢ ft., RG58/U, 3½¢/ft. Eleven meters 81-4; 20KV vacuum variable, $40; 811As, $2-4; 829Bs, $6.00; 832As, $2.50; 4E27/5-125Bs, $8.00; 4E27, $4.00; 4-125As, $6.00; 4X-150As, $3.00; 750TLs, $25.00; 838s, 90¢; H. V. transformers; H.V. filter caps; wire, co-ax, misc. Write us your needs. Jaeger, 5753 Burma, Oswego, Oregon.

FOR Sale: HT-32A, in mint condx, $475; 75A-4 with 6.1 and 2.1 filters, also vernier knob, in exclnt condx, serial No. in the 4600's, $550, one shot deal. $1000. Write or phone. W1DND.

SELL: Collins 30S-1, 75S-3, 32S-1, 516F-2, 312B-4, 3-el. Tri-band with Ham-M. P & H 'scope. W8RWZ, Tel. 1-513-324-1219.

SELL: Gordon Beam Rotator, with control cable and indicator. Perf. condx. $185.00. Also CV-89A/URA-8A, exclnt condx. freq. shift converter, $200. Also Kleinschmidt TT-4A/TG teletype, exclnt condx, $175.00. Also Hammarlund Sp-600JX, rack mount, exclnt condx, $375.00. W4AIS, 7 Artillery Road Taylors, So. Carolina.

SELL: KWM-2 Serial No. 1362 with 516-F2 power supply. Like new condx, used vy little. Less than 10 hours log time. Too busy. Send certified check for $800. Will ship. Charles Cranfill, Worton, Md.

WILL Ship to best offer, mint condx, HT32A, HT-33A, new spare PL-172; SX-101-3A. K5HOB, 1807 Wyoming, El Paso, Texas.

TRADING? Buying? New-used. Make your own deal. Send to Amrad Electronics, 999 Howard Ave., Burlingame, California. $100.000 stock on hand. Free equipment list.

WANT: Lampkin 105B freq. meter with harmonic generator. Odean Mauldin, 1976 Ruth St., N. W. Atlanta 18, Ga.

SELL: Marauder, $400; Drake 2B with xtal calibrator and Q-multiplier, $225. Cy Cangialosi, 248 Palsa Ave., East Paterson, N.J.

KWS-1 serial 994, in exclnt condx. All factory modifications, including set of spare tubes, instruction manuals. Just plug in and operate for $810. Drake 2-B with xtal calibr., perf. condx in original packing with instruction manual for $200; Johnson 275 watt Matchbox, $32.00; Hy-Gain 20-m. beam, plus AR-22 rotator, $60.00. Will crate and ship any item prepaid except antenna on receipt of certified check or money-order. Albert Weiss, W6UGA, 2370 Knob Hill Dr., Riverside, Calif. OV 3-3149. Antenna is pick-up deal, sry.

COLLINS 75A3, including 3.1 and 6 kc. filters, built-in prod. detector and xtal calibrator, $320.00 cash. C. A. Harrison, W6MLR, P.O. Box 251, Dana Point, Calif.

WANTED: AF-67; Cheyenne, TX-86, or similar rig, and pwr. supply. WA2URL, 87 Brookside Place, New Rochelle, N.Y.

SELL: Heath AR-3 rcvr. In perfect condx: $25.00 or best offer, with manual. KN1EXF, Danville, Vt.

HY-GAIN Tri-bander TH4 Beam, $80; Hy-Gain Tribander beam, $35.00; HO-129X modified as per CQ, xtal calibrator, hot rcvr, $120.00; Gonset 3-30 converter modified 12 volts, $20.00; shipping is extra. Henry Mitchell, W2CAZ, 1100 Altamount Ave., Schenectady, N.Y.

KWS-1, 75A-4. Panoramic Adapter, coax relay, cables, in operation: $1175. M. B. Chatfield, WA6GGQ, 6867 Dume Dr., Malibu, Calif.

MOTOROLA 30-watt FM radio-telephone, 150-172 Mc. xmtr and rcvr, 12 volt DC pwr. supply, microphone, xtals, cables, control head, service manual. In exclnt condx. Complete $75.00. Will ship. Jack Plane, Penn Ave., Niantic, Conn.

WALKIE-Talkie wanted, easily convertible to 46.06 Mc/FM preferably narrow band. Joel Eisenhandler, WA2FQE, 20 Henry Ave., RD #1, Albany 3, N.Y.

WANTED: 30L-1 in gud optg. condx at lowest possible price. W3VDA, P.O. Box 1333, Harrisburg, Penna.

SACRIFICE: HQ-170C with IF noise silencer, $210; black Leica M2 with 35 mm F2 Summicron (swap?) $210. Gerald Kolton, K9GBH, 1801 W. Armitage, Chicago 22, Ill. Tel. EV 4-9670.

SELL: HT-37, SX-99 with CE SSB slicer and Q multip. J. P. Davison, Box 263, Oelwein, Ia.

SELL: Vertical antenna, multi-band, Hy-Gain 18-Ht. self-supporting structure, in exclnt condx, used 16 mos. $75. K2ADZ, 245 Elmwood Ave., Elmira Heights, N.Y.

RME VHF-152 converter, two six and ten meters, Vy gud; $25.00. A. DeSalvo, 2890 East 197th St., New York City 61, N.Y.

SELL: DX100B, HQ-110C, D-104 mike, $300 takes it. Sry, will not ship. K5LOC, 3334 Princess, Dallas, Texas.

WANTED: Instruction manual for McMurdo-Silver Model 900 "Vomax" VTVM, W. A. Monahan, Jr., W6GTR, 817 Pacific Ave., Manhattan Beach, Calif.

HRO-60 or -50 wanted. Please state appearance, condx, history, wils, price and transport arrangements. Robt. Parkison, KØJRU/4, Box 246, Savannah, Ga.

SELL: Masco 2-station intercom, $10; RCA 45-rpm automatic rec. changer, $4; Kodak 8 mm Brownie movie camera, leather case, $10; Brush Soundmirror BK401 tape recorder, as is (needs new heads), $25. Trade? V. R. Hein, 418 Gregory, Rockford, Ill.

COLLINS 30S-1 amplifier, gud condx with tubes and cables, $895 Apache TX-1 transmitter, gud condx, $195. K2POI, 559 Grant Blvd., Syracuse, N.Y.

SIX Complete stations: mike to ant. connector; Heath DX-35, VFO, ant. coupler, Lakeshore rcvr, $100; Lafayette 6M HE-45, VFO, halo, $115.00; Cheyenne AC supp., DC supp., Regency converter, $200; AF67 dyno supp. G66B rcvr dual p.s., a.c. supp. $250; DX-100, SX-71 spkr, $200; Pacemaker, Warrior, Monitor scope, 75A-4, $950 or swap for KWM-2, Valiant, SX-71, $350. K5ABL, 1023 Sunglo, San Antonio 21, Texas.

"KID From Texas" $$$ savings prices on shelf demonstrators and used equipment: Central Electronics 100-V, late serial, $559; Ranger, $139; Drake 2-B, $239; 20-A, $149, Valiant $229; new Swan SW-240's, National NCX-3's, Drake TR-3's and Hallicrafters SE-150's ready for immediate delivery. KWM-1 with AC supply and DX adapter, $419; GSB-101 linear, $179; Elmac AF-67's, $69; Viking II with VFO, $139; W5 Kid from Texas Edwards Electronics, 4124-34th St., Lubbock, Texas, Tel. SW 5-2595.

1296 Mc. Have few new APX-6 RF assemblies for others who want to go 1296. Assembly includes 2C46 oscillator cavity, 2C42 oscillator cavity, 1B40 preselector cavity, plus three Veeder-Root counters. Conversion in September, 1960, QST. Assembly works with any 60 Mc. IF strip. Complete assembly new, less tubes, $10.50 ppd. K6GOX, 4476 Van Ness, Fresno 4, Calif.

SELL: Heath HX-20 SSB xmttr; HP-20 AC supply; xmttr, factory aligned, both: $240.00. Dave Sousa, K2CQV, 964 Sherman Ave., Bronx 56, N.Y. Tel. CY-34998.

SELL: Collins 32S-; with silicon power supply at $425.00; HT-32 at $295.00 and SX-101 Mark III at $195.00. All units are in exclnt condx, rock stable, guaranteed and priced for quick sale. First m.o. or certified check gets fast shipment F.o.b. N.Y.C. Ed Piller, W2KPQ, 157-32 20th Ave., Whitestone 57, N.Y. 212-IN-3-6834.

SELL: NC-300 w/spkr, $200; 6-2-1 ¼ meter converters, in National cabinet, $85; Viking Ranger, $160.00; D-104 PTT, $16.00; Globe 6 and 2 xmttr, $70. All in mint condx. W1AMJ, Tel. 758-4992.

COLLINS 75A2A (75A2 modified by Collins to exact 75A-3) 3.1 kc. and 800 cyc. filters. Homebrewed calibrator. Vy cln, $270 F.o.b. Ranger sequence keying PTT. New function switch. Exclnt wkg condx. Cln, $130.00 F.o.b. All inquiries ans'd. Ben Holloman, W5ENE, 9916 Harwich, Dallas 20, Texas.

WANTED: KW Final, PP Triodes, only. 80/40/20/15/10, power/modulator/Rack not wanted. W1BB.

SALE: Perfect Hallicrafters receiver SX-100, $195.00. Dr. Charles E. Thompson, 103 West Main St., Napoleon, Ohio.

KWS-1 (#774), 75A-4, (#3739), 3.1 Kc), both in excint condx, extra tubes, manuals, best offer for either or both; control console (Junes MicroMatch 262 indicator, 261.1 coupler, 2 selsyns, 2400 clock, antenna relay, in black louvered instrument cabinet) $50; Heavy-duty prop pitch motor (professionally altered) with 8 ft. aluminum tower, transformer, relays $75 Telerex 20M 56-112, $50 Mosley A-315, $20; 120 ft. 51 cond. cable $20; selsyns, brand new, bronze casings, $20. Hank Frey, 39 East 10th St., New York 3, N.Y.

SELL: Globe Chief 90, Globe UM-1 modulator manuals, $69.00. K3NSU, RD 1, Townville, Penna.

ASSISTANCE Please! Starting school station. Odd V.H.F. or U.H.F. equipment greatly appreciated. Thanks. Dave, WB2-GRU, 35-38 221 St., Bayside 61, L.I., N.Y.

FOR Sale: Complete station, includes: Drake 1-A and Ht-37, with mike, TR switch, reflected power meter and antenna, $535. Robert Stuckey, Box 4, Old Fort, Ohio.

EICO 720 transmitter, Eico 730 modulator, Eico 722 VFO. Complete with inter-connecting cables, low pass filter, receiver muting and antenna and power switching relays. All in excint condx. $150. Prefer to demonstrate before selling. WB2ADW, 17 Fleetwood Ave., Spring Valley, N.Y.

THUNDERBOLT 2Kw, $395; Pacemaker SSB, $175; Gonset 500W linear, $85. All L/N, cash. W2DTD, 29 Charles, Merrick, N.Y.

SELL: RME 6900 mint condx. Asking $250. Want: Vibroplex bug, DB-23, SX-101A. Steve Wilson, 19252 Rainbow Drive, Lathrup Village, Michigan.

SELL: SX-101A, $260; HC-10 SSB converter, $75; KW linear SSB-1000F Eldico, $350; Transtenna T-R switch, outboard model, $50. All like new condx. Lamb, 1219 Yardley Rd., Morrisville, Penna.

FOR Sale: 2A/with calibrator, $180; prop pitch, new, $20; Mosley 40 meter 2-el. beam, $45; 4/1000A G.G. amplifier and pwr. supply, $300; 3000 VCT, 500 Ma. and choke, $20; 6000 V, CT 500 Ma., $30. Need: 30S1, 312B5. J. Bruscella, W2LEC.

SELL: DX-100, $135; NC-98, $80; Six and three foot rack panels, electronic keyer, 813 modulators. Four 250TH 800 watt r.f. units and other miscellaneous surplus equipment, chokes, transformers, Blaupunkt AM auto radio. Inquire Lt. Cheatham, K4BUI, Box 332, Max, N.D.

HAMMARLUND HQ-145X xtal calibr. New, original carton, $225. Mr. Boord, HY 9-8200 Monday-Friday 8 AM-6 PM. 379 13th St., Brooklyn 15, N.Y.

SELL: Globe King 500C, in excint condx. Priced right, $400. QSTs 1956 to 1962. Best offer. W. Schroeder, 1230 NW 33rd Ave., Miami 35, Fla.

HALLICRAFTERS SX-100, Mark II, used 10 hours. Must sell. Make offer to Van Weaver, 1090 West Center, Orem, Utah.

CHALLENGER: FW, immaculate. $100. K3PBY.

HEATH Mohawk: like new, expertly wired, $225. Also, well over 100 QSTs, 1930-1939, $10. WA2RKW, 1320 Abington, No. Tonawanda, N.Y.

ESTATE Of K8UKW: Pacemaker, $200; P & H LA-400B, $75; 5 position coax switch, $5. Heathkit SWR, $8. Margaret Karvonen, Box 325, Mohawk, Mich.

SELL: Homebrew transmitter, same as transmitter in August 1960 QST, $50. For info write: Richard Sorrel, K5VYW, Wharton, Texas.

SELL Gonset Communicator II, $100, with matching VFO, $40; Gonset 2 meter amplifier, $60. In excint condx. K2LHH, F.o.b. Great Neck, L.I., N.Y. 10 Locust Drive.

HEATHKIT VF-1, in excint condx physically and electrically, $20. WA2PVO.

6 Meter mobile trans., 40W plate mod. ant and push-to-talk relays, dynamotor, for 6-volts, $25.00. W6RET, 8831 Sovereign Rd., San Diego 23, Calif.

SELL: Hallic. HT-32-A. No scratches. Looks and works like new. $385.00. Also, Nat'l. NC-303, $285. In perf. condx, and looks same. Fred Peterson, KØJVC, RR 2 Iowa City, Iowa.

DX-100. Excint condx, fully modified, tubes including 6146 less than 10 hrs. use, any reasonable offer. K6ZIP, Hollywood Tel. 661-8260.

SELL: Federal 804 signal generator with manual, $85. Heath dipper GD-1A, $15.00. Ship collect. Peter Vander Meer, 500 Elmdale St. NE, Grand Rapids, Mich.

NUVISTOR Converter, CN-2 mtr, factory-wired, unused! $44.00. Inquire: WA6UQM, 518 Miner, Orinda, Calif.

FOR Sale: Central 100v and 600L Collins 75A-4, Ser. 5548. Excint condx: $1200. Prepaid continental U.S.A. W5WI.

RME 4350A receiver with 430I sideband selector and speaker. Excellent condx: $195. Bill Murtough, 5635 Netherland, Riverdale 71, N.Y.

SELL: Mobile trans. plate modulator, 30 wts. dynamotor, in 6v outp. 600v Trans. converter 75. 40 m. KØUMO, Erwin Nistler Eden Valley, Minn.

SELL: Gonset Communicator III six meters, in excint condx, with xtals, mike, $165; DX-40 and Heath VF-1 VFO, vy clean, both $50. WA4ITK, 4031 Woodridge Rd., Miami, Fla.

SELL: PMR7 with mobile power supply, $85; GPR90 with slicer, Mosley citizen band grnd plane, Mosley 40-80 traps. No reasonable offer refused. K2DVJ, M. Robbins, 23-01 Radburn Rd., Fair Lawn, N.J.

FOR Sale: 75S-1 with 500 cycle filter, in excint condx. Best offer over $365; HT-37 with push-to-talk, gud condx, best offer over $325.00. W5LNL, 910 19th St., Plano, Texas.

SELL: College, HQ-110 with speaker and clock, in exc'nt condx, $190; DX-20 immaculate, $35; DX-40, 80-6 with 40-6 VFO, $70; Globe FCL-1 factory wired speech clipper, $15. K4YZG, 3532 Cowden, Memphis 11, Tenn.

COLLINS KWM-1 AC/PS, noise/blanker, mint condx: $450. W9OZY.

FREE! Send for free copy of The Ham Trader if you are looking to swap, buy or sell equipment with other hams. The Ham Trader, Box 153Q, Franklin Square, N.Y.

SELL: Central Electronics 20-A multiphase exciter, factory-wired, in excint condx, reasonable. Louis P. St. Marie, 263 Goodwin St., Fall River, Mass.

SELL: BC610E surplus xmtr, made by Hallicrafters, 500 watt AM, 750 CW. Complete with BC614E speech amplifier; tuning units and final coils for 10, 20, 40 and 75; low pass output filter, coax ant. relay, factory instruction manual. Purchased new and in excint condx. No time to operate. No trades. $250.00. W9DP, Salem, Wis.

COLLEGE Bound: Selling PMR-1, AF-67, transistor supply microphone, TR relay. All ready to go on air, push-to-talk mobile. $200; DX-100 (modified to 1625's final) with homebrew 2M: 4X150 final and driver rack mounted. $125; 1500V 750 ma. rack mounted supply, sry can't ship, $30; B-W model 380 TR s.w., $8; working APX-6. AC supply and 36-el. beam, $20; new Electro-Voice 205 mobile mic, $15.00. Make an offer. K9PKW, 105 Bradley Lane, Roselle, Ill.

WANTED: Commercial, military, all types, ARC, ARN, ARM, BC, GRC, PRC, TRC, URR, URM, TS, 618S, 17L, 51R, others. RITCO, Box 156, Annandale, Va.

FANTASTIC Bargains! SX-99, DX-60, Knight VFO and TM-1-G c.w. monitor, all for $160. Heath Tenner, $20; DX-20, $20. Will deliver 75 miles or you pay shipping. K2SEP.

CLEANING House: Globe DSB 100, $65; Globe Chief 90, $45; UM1 modulator, $35; Globe 755A VFO, $35; Gonset Super 12, $65; Hallicrafters S-40, $50; #520 Shure mike, hi imp. $9. Write: KØKYT, Burns, Kansas.

G-76 Gonset transceiver. Vy clean, latest model with matching Gonset AC power supply: $395. Richard Subin, 309 North Thurlow Ave., Margate City, N.J.

FOR Sale: 75A-4 receiver; BX1031C Panadapter; model 15 teletype with table; CV182/GRC-26A freq. shift converter; Collins 310B exciter; kw transmitter; 10-meter Telrex beam. All gear excint condx. Make offer on lot. N. Konos, W1LMP, 8½ Summit Ave., Salem, Mass.

SALE: Heath AD-22 tape recorder, $169.95. K5HXO, 109 Main, Elk City, Okla.

DX-35 with all modifications and VF-1 matching VFO, $35.00; Heath HD-11 Q multiplier, $10. W. B. Hoaglin, WØMME, Mt. Pleasant, Iowa.

STEREO Tape recorder complete for $125, or will trade for receiver. Will ship. Gerry Ladd, K4KAZ, 3690 Peachtree, Dunwoody, Atlanta, Ga.

DX-100, Professional wiring, coax relay, spare 6146's, in excint condx, deliver within 200 miles, $135 certified check; Stancor 203A, $15.00. W7MQB, 2522 NE. 83rd, Seattle, Wash.

FOR Sale: Collins 30L-1 linear, 32S-1 transmitter, 75S-3A receiver with complete set of crystals. All late models, used less than fifty hours. $15.00. W4KGR, 2333 Elizabeth, Winston-Salem, N.C.

2 KW xmtr used pr. 450TL, new, commercial all-band, compact; needs power supply. $550 or will trade for 51J3, terms available. Joseph Szabat, W3LST, 228 Plummer, Oil City, Penna.

75A-3 for sale. Serial No. 1775, one of last built. Has 3.1, 6 kc mechanical filters, vernier tuning knob, xtal calibrator, plug-in product detector, matching spkr. No scratches, no modifications, manual included. $375.00 firm. W4DLH/2, 32 Hadley Lane, Levittown, N.J.

COLLINS 351D-2 mobile mount, $60; KWS-1, extra set of new tubes including 4X250, Waterman scope, $950; 75A-2, extra set new tubes, 3 filters, Collins station control with rotor, $600. One price: $1350 takes all. Excint condx. Would prefer local deal. WA2IZU, Bill Schiffrin, 212-PY6-9122. 15 Family Lane, Levittown, L.I., N.Y.

MOBILE Station. Like new Gonset G-77 xmtr, Super Six and Superceiver combination, all bands, 6 and 12 volts, independent of BC rcvr, all cables, manuals; Master Mobile all-band antenna; all perfect. Best offer takes all. Smith, W1YBT, 3 Woodlawn Dr., Williamstown, Mass.

HEATHKIT GC-1A .54-30 Mc. transistor portable, like new, $80; Gonset Superceiver and Super Six converter, gud condx, $50; MAR 10 position autotune unit, $10. Heathkit AC-11 multiplex adapter, like new, $20; Heathkit PT-1 AM-FM tuner, like new, $65. W1ZPI, 18 Hunting St., Wellesley Hills, Mass.

CUSTOM Building VHF gear, converters, transmitters, etc. 432 Mc equipment. Free quotes. Frontier Electronics, Orr 1, Minnesota, Everett, WØHPS, and Frankie Hoard, WØPYC.

WØGFQ. Leo has big discounts on overstock of used equipment, due to so many trades on the fabulous new Galaxy SSB Transceiver. Now's the time to save on reconditioned equipment. Write for our latest list, over 1,000 items. World Radio Laboratories, Box 919, Council Bluffs, Iowa.

SX-115 and speaker, $500; Invader 2000, TR switch and low-pass filter, $1.000; Triband Mosley beam rotator tower and cables, $150.00. Console control and operating table, $100. As a package unit, $1700. W3EDI, Tom Ayling, 727 N. Jackson, Media, Penna.

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. Also entire business for sale. Sons gone into service, too much business for me.

QSTs: January 1936 thru September 1960 (Feb. 1937; March, May 1941; Jan. 1943, Jan. 1957 missing), $95; CQ's: December 1952 thru February 1960, complete, $25. F.o.b. Huntsville, Ala. L. A. Wagner, 2602 Scenic Dr.

COURIER Perfect. Ranger, 4 yrs. old but FB. Drake 2B and spkr, perf. HA-1 keyer, perfect. Make offers. K8NUN, 505 N. Wheeler, Saginaw, Mich.

HAVE Number of QST, Radio News and other related magazines 1920 to 1923. Stamped addressed envelope for list. C. Thomas, 66 Curtis Ave., Woodbury, N.J.

EE Student needs money for college; must sell immaculate HT-37. Purchased a year ago; used less than ten hours; like new, not a scratch; in factory carton; $395. All inquiries answered. Dan Marshall, K5UTV. A.S.C. Box 311, Arlington, Texas.

TEXAS Ham offers Viking II with VFO, low-pass filter, all modifications, $150.00 Viking Mobile 12 volts, $45.00; Gonset G-66B with 12-volt thin-pack supply, $110.00; Heathkit MP-1 transistor power supply, $30. W5CLP, 4906 Westfield, Austin 31, Texas.

FOR Sale: HX-10 Marauder, almost new, with mike and manual, $330; NC-125 receiver, $100; Hallicrafters SX-104 and SX-105, commercial receivers with carrier operated relay and tunable/crystal feature, $50. each. Philip Petersen, WAØCGF/9, 3001 St. Charles Rd., Bellwood, Ill.

FOR Sale: BC-610 complete with speech amp and extra 250TH. Mint condx. Never used by military. $395. Luster U. King, W5NLL, 701 Vine, Corning, Ark.

HRO-60T coils A, B, C, D, spkr, calibr., $215.00 firm. Coils AC, E, F, $30. Will deliver 100 miles rad. BC-610 ant. tuner with vacuum caps, $22.00. Darkroom equipment, Omega D-2; Busch 4X5, like new condx, many extras $390 or trade. W9-KCB, 605 E. Armstrong, Peoria, Ill.

TRIBAND Swan SW-240; Swan AC pwr, supp., spkr, console; mobile mtg. bracket, Knight P-2 SWR/PWR. meter; Drake TV-1000-LP filter. All new and in new condx and in orig. cartons. Other interest reason for sale. $395.00. W5ELF, Rte 3, Box 125-A, Hot Springs, Ark.

SELL: 20-meter antenna (Tennalab), exclnt clndx. Cost $107. Pick up for $30 at 16 Dorchester Ave., Hastings-on-Hudson, N.Y. W2SWA.

SELL: Brand new KWM-2 w/PS. Won at Hamfest. Already have one. Best cash offer. Frank Guetter, W9IHM, Orland Park, Ill.

SALE: Cheyenne and Comanche mobile rig with MP-1 transistor supply, mike, Hustler 20M whip with bumper mount, auto ignition suppressor kit. All in gud condx. $150.00 K2ZZT, John Entwistle, 131 Meeshaway Trail, Medford Lakes, N.J.

COLLINS 75S-1 receiver, low time, always kept covered, like new condx; $375; KW linear PR.4-125As Class AB-1, see page 202 of 1956 Handbook; paneled rack on casters with formica desk top, commercial parts, regulated grid supplies, spare pr. finals, $150.00. 2 ea. BC1000A walkie-talkies, $25 each. Gonset 2-element 20 mtr. Beam $20.00. Gene, W7WHX, 1119 N. Baker, Wenatchee, Wash.

HT-37 used 6 months, $350.00; HQ-160, $225.00. Both in excellent condx. K10IN, Bickell, Granite Drive, Norwalk, Conn.

75A4. Must sell at once. Serial No. 1938, 3.1, 800 cycle filters, noise blanker. Works FB. Asking $425.00 F.o.b. Miami, Fla. Call me for a fast deal at 305-621-6844. K4SCT, 1340 190 St., Miami 69, Fla.

FOR Sale: Collins URR/388 (51J3) receiver, less than 50 hours; BC221M with power supply, in gud condx, two AN PRC-6 handie-talkies, 6 meters; spare tubes, manuals, antennas, handsets, best offer on each. All inquiries answered. Harry Brettschneider, 2134 Ronaldson, Cincinnati 3, Ohio.

MUST Sell antique wireless collection. Send large SASE for list. W6LM, Box 308, Wrightwood, Calif.

FOR Sale: Gonset GSB-100 in exclnt condx, no scratches, manual and original box, $250; homebrew linear pair 813's in grounded grid, $50. WA2YEX, 9 Dawson Dr., Valley Stream, L.I., N.Y.

MUST Sell: HT32A, in orig. carton, $419.00. If you are looking for an exclnt SSB transmitter, don't pass this up. P & H 8020 VFOmatic $40. E. A. Kriz, Box 249, Palmyra, Wis.

THUNDERBOLT Linear, new, in original carton; $450.00. W2PZP, John Hillman, 35 Karyn Terrace, Middletown, N.J.

EX-NOVICE off the air. Selling new Eico 720. Unopened D-104 mike with stand; Hallicrafters S-20R. Package deal: $100. Mario Staiano, 1432 70th St., Brooklyn 28, N.Y. Tel. BE 6-8260.

SELL: P & H linear 800 w. P.E.P., perf. condx: $125.00. Taubin, W2GCW, 144-44 41st St. Ave., Flushing, L.I., N.Y.

FOR Sale: Complete mobile rig: AF-67, Gonset Super Six with noise limiter "Slim Jim" all-band antenna bumper mount and homebrew pwr. supply: $140.00. Clarence R. Smith, W9DMV, 1909½ 6th Ave., Moline, Ill.

LOOKING? Shopping? Trading? Trying to save money? Write Bob Graham for special deals on new and reconditioned used gear. Cash or budget. Graham Radio, Dept. A, Reading, Mass. Tel. 944-4000.

PRICED To sell: Planning new rig. 75S-2 receiver with 1 kc. filter and BFO crystal for RTTY in CW position, six out-of-band crystals, and HD-11 Q multiplier, $395; HX-10 "Marauder" transmitter, $295; HA-10 "Warrior" linear amplifier with built-in relays for barefoot operation, $185; HO-10 monitor scope, monitor 'scope, $45; complete station about with Turner dynamic desu mike $895. AA-50 dual 25 watt stereo amplifier, $25. All items in current top operating condition and like-new appearance with manuals. Prefer pick-up. Enclose SASE with inquiry K8BLL, Box 77, Rte. 2, Stevensville, Mich.

KILOWATT P.E.P. Grounded grid linears, pi-net, bandswitching 80 thru 10. Homebrew. One uses 3-400Z, 2600 volt supply, 3 units rack-mount, $175; other uses four 811's with solid state power same chassis, in 200V cabinet or rack mount, $150. Will consider swap for SSB gear or receiver. F.o.b. Jack Tate, W6IIA, 425 Tufts, Burbank, Calif.

SELL: L & N 5430-A bridge, $45.00; Northern Radio type 119 VFO 2-32 Mc., stability equal to crystal, $125.00; want: Raytheon BA rectifier tube, Electronics Buyers Guide 1961 and 1962 editions. Proceedings of IRE 1950 or later. Robert Ireland, Pleasant Valley, N.Y.

75A4, vernier knob, matching speaker, $525; Viking 500 w/Thunderbolt pwr. transformer, $495. Both in exclnt condx. W6WTV, 19307 E. Swance Lane, Covina, Calif. Tel: 331-4552.

COLLEGE! Must sell: S-107, in orig. carton; QF-1 Q-multiplier plugs into rcvr, DX-40, like new; VF-1, headphones, JT-30 mike, low-pass, $150. K8WNY, 8th St., Manchester, Ohio.

PANADAPTER BC-103C for receivers with 450-470 Kc IF's. Vy gud condx. Scans 100 Kc each side of center: $75.00. E. Shafer, 3479 Kersdale Rd., Cleveland 24, Ohio.

I Want to buy SX-71 or equal. P. Kromayer, 2953 Cornwell, Bethlehem, Penna.

COLLINS 75S-1 like new, $310. Will ship in original packing. KØGRP, Estelline, So. Dakota.

INVADER 2000, Drake 2A. Sell separately or together. Both in mint condx. W4GMN, Box 371, Lebanon, Va.

SELL: DX-40, used about 6 months, perfect, will not ship. Deliver 150 miles. WA2LXK, 76 Wilson St., Hackensack, N.J.

HALLICRAFTERS SX-101A ($245.00); Eico 720 ($75.00), orig. cartons, in mint condx, 5 months old. WN2GAQ, Gould, 1 Wilshire Dr., Lake Success, New York. Tel. 516 HU-2-5333.

HY-GAIN 65B 6M beam, Alliance rotator, rotator cable, 50 ft. RG8/U, $20.00; Trans Pro TM-1 CW monitor, $10. F. S. Eggert, 11833 Wisconsin, Detroit 4, Mich.

JOHNSON LPF VFO Viking II, 180 watts, gud buy, $145.00; HQ-110C and spkr, $175.00. like new condx; beams full size 20M 4 and 2 elements, 15M 4-el. 10M 3 and 3, $125.00; prop pitch rotor selsyns control box hand wound transformer, $65.00; the lot: $500 with gud old tubes, condensers, resistors, relays, meters, coax, QST CQ, etc., to boot, free. W1YKO, 135 Broad St., Whitman, Mass.

COLLINS 75S-2, $395; optional filter and crystal, $50. Robert Meyer, W2UJJ, 6015 5th Ave., Brooklyn 20, N.Y.

SELL: 75S-1, in perf. condx. Purchased new January 1963, serial No. 10167, $360; 500 cycle filter available, $40 extra. 3.1 Kc mechanical filter adapter for 74A-1. Collins manufactured, complete, $45.00. W6KEV, 3088 Greenoak, San Mateo, Calif.

XMTR: Johnson Viking II with VFO factory-wired, $130.00. W2JSM, 316 George St., West Islip, L.I., N.Y. (F.o.b.).

FREE! Interesting sample "Equipment Exchange Bulletin". Bargains! Swaps wanted! Write: Brand, Publisher, Sycamore, Ill.

SELL: SP-400X with power supply and speaker: $125.00. Bargains on tubes and parts. Write for list. W3CNS.

SELLING: Immaculate Globe Scout 65A, $55.00. O. Taylor, WA6PBJ, 24 Southdale, Daly City, Calif.

SALE: HQ-110C, realigned, in perf. condx: $160. Late DX-100B, factory modifications, new final tubes. Spotless, $160. WRL Matcher (Sr.) w/SWR bridge, never used: $30.00. Johnson TR switch, $9.00. Manuals for all. Nicholas Amdur, K1ATK, 47 Bay State Road, Belmont 78, Mass.

WANTED: Coil sets E, F, G, H, J, AA, AB, AC and associated dial scales; NFM 83-50 adapter, Select-O-Ject data sheet, all for HRO-50-T-1. Also 200-V transmitter. All must be in gud wkg order. For sale or trade: Gonset G-76 transceiver, best offer over $285. K1RFX/7, Dave Flinn, 8076 Maple, Fairchild AFB, Washington

HT-37, $345.00; Johnson 10M Messenger, $89. Both are in exclnt condx. Going to college and have no time to operate. Thomas Hurst, K9JQA, 2805 Ridge Road, Madison, Wis.

FOR Sale: Mohican GC1A, AC-DC supply. WA2ZOC, Endicott, N.Y.

FOR Sale: HQ-140X, 10B, VFO, Model B Slicer, $300 or best offer. W7ZOS, Box 278, Saratoga, Wyoming.

FOR Sale: Hammarlund HQ-140X receiver. In gud physical and electrical condx. $125.00. E. M. Wise, K4KYI, 1534 Clifton Rd., N. E., Atlanta 29, Ga.

CRYSTAL Lattice filters: Hycon 10MF, 3 kc. at 10.7 mc; Hycon 2215KA (3 kc) and 2215KB (.5 kc); QST Jan. 1957; SX-42 and spkr, realigned and in exclnt condx, $85.00; Johnson TR switch, new condx, $15.00; SX-28 and spkr, realigned, vy gud condx, $65.00. WØLWZ, 1030 So. Dudley, Denver 26, Colo.

JOHNSON Ranger I, late model, factory-wired, push-to-talk, never modified, perf. condx, $175.00; Hallicrafters SX-28, gud condx, $75; RME HF-10-20 converter, gud condx, $25. W8FWP, 1663 Meriline Ave., Dayton 10, Ohio.

SELL: G-76 transceiver with crystal calibrator and AC pwr. supply, $425; Turner 252 dynamic mike, $10; CDR Ham-M rotator, $75. Brian Peterson, KØPMK, Chappell, Nebr.

KWM-2 with PM-2 and CC1 10/D mike and stand; Waters rejection tuning, 900, 30L-1, new 450 or both 1300. Ham-M new sealed carton 90. W5UV.

COLLINS S/Line—(75S-3, 32S-1, pwr. supp. and console), one year old. Best offer takes all or part. W6EII, 3754 Winston Way, Carmichael, Calif.

SX-99 and Q multiplier and spkr, $100; homebrew electronic keyer, $20. All equipment in vy gud condx. Richard Henry, 21 Oregon Dr., Huntington Sta., L.I., N.Y.

FOR Sale: 20A and VFO, $225.00; NC-270 receiver, $210.00; both in perf. condx with manuals. R. C. Brown, W4UJW, 203 W. Main, Gallatin, Tenn.

B&W Butterfly var. cond., CX111CX, 9 kc. for hi-power push-pull PA. Make offer, or trade for audio generator. K2EGI.

FOR Sale: NC-300 with xtal controlled 2nd oscillator, equipped with 303 WWV receiver and calibrator, 303 vernier dial drive, new tubes, realigned: $229.00; National 2- and 6-meter converters in matching cabinet for NC-300: $45.00; Ranger with PTT and Electro-Voice ceramic mike, $169.00. All of above: $398.00. Johnson TR switch, $14. 21 and 28 Mc bandspread coils for HRO-60, $10 each; Hycon-Eastern IF xtal filters models 2215KA and 2215KB for phone and c.w. $24 each, both $45.00. Jennings vacuum variable condenser type UCS, 15 to 400 mmfd. 15 kv, $39.00. K8BFI/4, 4605 North 17th St., Arlington 7, Va.

HICKOK Model 546 mutual conductance tube checker, $47.00; Jackson model 636 tube checker, $20. You pay postage. Jay White, 10706 Pinole Ct., Cupertino, Calif.

SELL: Make offers! Ranger xmtr, Lysco 600 with antenna tuner, Heath 'scope MOD 0-6, Gonset Super Six converter, never used, all above equipment very clean. F. J. Pauer, 151 Vreeland Ave., Rutherford, N.J. WE 9-9354.

SX-101 Mk III. In excint condx. Covers 160 meters. R-46 spkr, $235.00 F.o.b. Dow-Key DK 60G2C relay, new, $10.00; Ameco code monitor, $10. Nangle, 10 Beacon St., Danvers, Mass.

COLLINS KWS-1, $795; 75A-4, $455; 32S-1, $450; 75S-1, $350; 30S-1, $850; KWM-1, $375; Mount for KWM-2, $75. W8WGA, Phone 13-2770409.

SELL: 27 5-watt Johnson Matchbox with indicator and directional coupler, $65.00; Johnson low-pass filter, $10; mobile rig, Gonset Super 12 converter 10 thru 80 plus noise-limiter plus AMeco xmttr TC86 plus mike plus Honeywell transistorized pwr. supp., $185. Sry. no shipping. W2MNs, Leo Israel, 35 Henry Dr., Glen Cove, L.I., N.Y. or 6-7046

CRYSTALS Airmailed: Kits, SSB, Nets, MARS, Marine, CD, CAP, etc., Custom finished FT-243 .01% any kilocycle 3500 to 8600 $1.75 (5 or more mixed frequency FT-243 $1.50) (10 or more same frequency FT-243 $1.25). 1500 to 1709 $3.95, 1710 to 20.000 Kilocycles $2.25. (Overtones supplied above 10 maracycles.) Fundamentals 10.000 to 13.500 $3.25. Add 50¢ each for .005%. Above 2000 add 65¢ each for HC-6/u hermetics. QST Kits (FT-243): "SSB Package" five mixer $11.95; seven matched filter (FT-241-A) $11.95; "DSC-500", "Phasing" $9.95/set. Write regarding specific needs. Airmailing 10¢/crystal. Surface 5¢. Crystals since 1933. C-W Crystals, Box 2065-Q, El Monte, California.

REAL Values at fair prices on used receivers, transmitters and associated ham gear. H. W. Gordon, Harvard, Mass.

GOING To med school: The following equipment is in mint condx: Heath Marauder, HO-170C with spkr, Shure 440 SL mike. All for $675. K3LXS, 1000 Prospect St., Takoma Park, Md.

JOHNSON Pacemaker, $275; just back from factory check-up. W4LVX, 1875 Shepherd Circle SW, Atlanta 11, Ga. or Phone 404-758-3487.

2 Meter transceiver. Heath Twoer, in perf. order. Also new Westinghouse 12v dynamotor, 325v at 290 Ma. K3OKC, 1225 Elm Ridge Ave., Baltimore, Md.

WEST Los Angeles Area: Repair and calibration service for all communications gear and all test equipment. Also: Used test equipment. Phone 24 hrs. a day. Panco, 2112 Pontius Ave., WLA 25. Phone 477-4761.

75A4 serial #5491, $475. In mint condx. Original warranty still in manual. Used less than 80 hours. Vernier knob, AM, SSB filters. SAC model, same as regular A4 but covers 11 Mc instead of 11 meters, and has provision for the 2 ten meter band positions but will need some additional components to operate on 10. Also LaVoie LA6 100 mc-500 mc. freq. meter in A-1 shape WØKRG. Phone 333-3393, Denver, Colo.

SELL: Heath DX-60, AR-3, QF-1. First check, $95 plus freight takes all. WA5CBQ, Box 684, Bogalusa, La.

ELECTROSTATIC Generator wanted: with output from 20.000 to 80.000 volts: 0-2 Ma. DC of course. Preferably variable. Send all dope to W7FVW, Karl Oksanen, 4740 E. Cambridge, Phoenix, Ariz. Phone: WH 5-5570.

JOHNSON Matchbox 250-23-3 with SWR meter, $50; Carborundum 50 ohm dummyload, $5; Topaz Mobile DC P/S, #C1OWD for G-76, new, 650 DC-250 DC, $65. New tubes, 7094, $11.50; 6146, $2. Other receiving tubes, new, 75% off net. William, 64 Prospect Ave., Hackensack, N.J.

COLLINS 75A-1, $200: Valiant, factory-wired, $280; NC-125 with speaker, $90, all in excint condx. Prepaid shipping on receipt of certified check or m.o. Want: 32S-1 and supply. David Hohfeld, 2216 South Broadview, Wichita, Kansas. Tel MU 4-4424.

FOR Sale: Hallicrafters HT-32A transmitter, $350 and Hammarlund HQ-170C, receiver with clock and spkr, $275. These low prices if sold together Both mint condx. Layton, 9150 S.W. 40th Terrace, Miami, Fla.

HQ-145C, $170; C-E10B, $80; MM-2 with 455 Kc adpt., $80; late P & H 6-10, $170; Lakeshore Band-Hopper VFO, $50. All F.W. vy gud condx. KØBCW, 7120 Clay, Westminster, Colo.

HEATH VF-1. $12; Johnson Challenger, $80; Johnson Matchbox, $30. Gonset Super-12 converter, $44; Lincoln 6-meter transceiver, $40; DX-100 and SB-10. K3AGG, 27 High St., Carbondale, Penna.

COLLINS 310-B transmitter 25 watts CW/AM 80-10 meters. Includes modulator. Bandswitching Pi network output. Excint. $120. Murray Howe, W8NYL, 1220 Forest Court, Cincinnati 15, Ohio.

QSTS Feb. 1921 to Dec. 1960, less five issues. Best offer. Mrs. A. Lorenz, Box 66 Rte 4, Landing Rd., Baltimore 27, Md.

75A4, #3952, $485.00; HT-37, $385, Model 15 teletype, in excint condx. $95. All f.o.b. K2IOW, 2 Woodside Drive, Burnt Hills, N.Y.

SELL: 75A-4, $550; 75S-1 with Waters Q-multiplier, $350. Both in excelnt condx K2RAP, PO. Box 73 New Monmouth, N.J.

RANGER: factory-wired, $150. 275 watt Matchbox, less SWR, $50. WA9BKW, 506 N. 2nd Ave., St. Charles, Ill. Tel. 584-3838.

SELL: SX-101A, like new, original packaging and instructions $290. WA2LSN, 266 Debevoise Ave., Roosevelt, L.I., N.Y.

UHF Experimenters and Technicians! Wonderful bargain in high power pulse station. Move it down to 1296 Mc. or go super high. Navy rec 14 tubes; transmitter 12 tubes includes (2J61), 2304TH) modulator 13 tubes; range and train indicator 20 tubes; power supplies 120V AC-60V input, 14 tubes; components of Navy radar SG-B. Price $200. Wt. 1. ton F.o.b. L.A. Joseph Burns, WA6CNB. 252 S Pacific Ave, Redondo Beach, Calif.

"HOSS Trader" Ed Moory is overstocked on used gear: Cash will buy the following items at unheard of prices: 75A-4s, $439; HT-37, $295; Drake 2-B, $195; SR-150: $469; Swan Tri-Bander, $239; NCX-3, $289; SB-33, $319; 200V, $565; 100-V, $429; 32V-3, $198; 32V-2, $175; Loudenboomer, $189. Items in sealed carton with warranty: 75S-3, $489; KWM-2, $859; new TH-4 beam and demo Ham-M rotor, $169; new 20-meter Swan, $169; Drake TR-3, Immediate delivery. Johnson Invader 2000 kit, unopened carton, $449; new GSB-201, $259; HQ-140X, $109; Drake 2-A, $169; RG-8/U coax, 8¢ ft. Terms: cash. Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas. Phone WHitney 6-2820.

COLLINS 75A3 with product detector, $300; Collins 32V2, $200. College forces sale. John P. Tiedeck, WA2SDE, Indian Run Farm, Woodstown, N.J.

RTTY: Sell TD, Typing reperf (kbd); strip printer (kbd); perforator, All Model 14. K5BQA, 10756 Wyatt, Dallas 18, Texas.

HAMMARLUND HQ-150 Honeywell W612A power supply; Mosley 10-15-20 meter whip. Frank Mrozak, 59 Wellington Ave., Kenmore 23, N.Y.

F.W. Ranger, $160; Viking KW desk, $600; KW Matchbox, $75; HQ-170, $250; AF67 with mtg. rack, 110V supply mobile supply; G66B plus 3-way supply, mike for $215. All gear in excint shape. L. Solberg, K9KDV, RR 3, Hartford City, Ind.

TUBES: second hand—250 receiving and transmitting. Best offer. Mason Booth, 110 Olive, Piedmont Calif.

APACHE, Mohawk, in excint condx. Will trade for small transmitter plus cash or sell for $450. Spare tubes and other extras included. K7KRJ.

SELL: Gonset "Super Six" and "Super-Ceiver", all-band mobile receiver. In perfect optg. condx. Will all cables and instrux. $75 for both units. K3UBU, 2803 Duncan Rd., Wilmington 8, Del.

ADVENTURER Transmitter, new Hamfest prize: $62. New WRL antenna tuner, $12.00. Used Knight signal generator, $16.00. Heath VFO, $16.00. Kent, K4ESX, Dozier, Ala.

SHAWNEE, $225 or make offer. Also 55 ft. crank-over tower. Bob Heiser, K8SMQ. 4173 W. 217, Cleveland 26, Ohio.

WANT: New 4-1000A, no duds! Also 5000-U filter capacitors. Sell Thordarson T-15P20 transformer, 115 or 230 volt primary, 2500-2000-0-2000, 2500 volts at 1875 watts secondary, $45.00. W4BBL.

HQ-129X with spkr, $100; DX-35, VF-1, $45; Eico modulator, $40. Fred, W1NYL, 10 Richard Rd., Lexington, Mass.

QUICK Sale: Sry, no shipping. Viking Ranger plus Hallicrafters S-76 (.56 thru 34 mc.). In excint condx. Original cartons and manuals. Best offer over $200 for both. All replies answered within 30 days. Weekdays after 6 P.M. or Saturday or Sunday. Meyer Kirschner, W2HBS,859 Jennings St., Bronx 59, N.Y. Tel. DAyton 8-2997.

SELL: Globe King 500B, $380; Drake 2B with Q-mult. and xtal calibrator, $260; DX-40 with VFO and Novice xtals, $55; Mosley TA-32 beam antenna, $30; Ameco 2-meter converter with Nuvistor pre-amp, $25. K8YWS, David Steffens, 656 Cascade Rd., Cincinnati 40, Ohio.

BRAND New: Measurements Model 111 calibrator for use with Lampkin 105B freq. meter for .00017% accuracy, $135; also Lampkin 205A, quad scale FM modulation meter, $295. Both units still in factory cartons. Will ship. Ken Sears, 705 North E, Broken Bow, Nebr.

SELL: DX-100 with time sequence keying, otherwise original. $130.00. W8VVE.

COLLINS KWM-2 serial No. 13660: 516E-1 DC supply, 516F-2 AC supply, 351D-2 mount and Shure 350 mike: $1100 or your best offer. 7 months old 30L-1, $400. Wayne Davis, 2928 Reynolds St., Brunswick, Ga.

FOR Sale! SX-101A, HT-32, HQ-110C, DX-100B. All units mint condx. I might trade. Don Short, Pelican Rapids, Minn.

MB-565 Morrow mobile transmitter w/pwr. supplies; TV-600A and RVP-260B new, still in carton. Save $159.00. Will sacrifice for $250 or your best offer. Also RC-348-R, like new, $55.00. Lloyd Gilbertson, 11635 SW Hwy 217, Portland 23, Oregon. Tel. ME 9-4737.

KWS-1, $725 cash. Late serial number. Fone collect for more details (203) 259-9727. Miller, 88 Stonewall, Fairfield, Conn.

WANTED: Heath AT-1 transmitter, VF-1 VFO, AC-1 antenna coupler. Must include instruction manuals and have original appearance; no visible modifications or bad scratches. State complete condition and price in your letter. Tony Casciato, W3BMF/1, 729 Rosemont Ave., Pacific Grove, Calif.

WANTED: 2.1 Kc mechanical filter and reduction tuning knob for 75A4. Also any parts for grounded grid final. Need 813 and 3B25 and 3B28 tubes. Want Collins 30L1 or B & W L1000 final. K3BHB. 903 Western Ave., Jeannette, Penna.

FOR Sale: Central Electronics, 600-L Linear $200; MM-1 Analyzer $75; Collins, 75-S-1 w/noise blanker $450; 32 V-3 $300; 310-B $150; PM-2 P/S for KWM-2 $100; 312-B-4 speaker console $125; Gonset G-77 with 3 way P/S $150; Hallicrafters SX-110 Receiver $140; S-77A $50; Hammarlund HQ-129-X w/SSB selector & sneaker $139; HW-100 $125; HQ-110 $180; Johnson Valiant $275; Viking I $75; Viking II $125; Navigator $100; Challenger $80; Pacemaker $275; National NC 98 $79; NC 109 $125; NC 188 $99.75; NC 183 $135. Grice Electronics, Inc., P.O. Box 1911, Pensacola, Fla.

SELL: BC348 W/Ext power. $80; Ranger Transmitter, $150; RCA Jr voltohmyst, $30; Supreme multimeter, $30. All with manuals. Bruce Wood, 110 Hill St., Warren, Penna.

FOR Sale: HQ-170 24 hr. clock. FAC aligned Aug. 1962. Vy gud condx. Prefer pick-up deal, or will ship to you freight collect. Write, phone Chris, WA20GV, 727 Hamilton Ave., Trenton N.J., EX 6-8305.

SELL: Heath SB-10, in mint condx, perf., $69.00. K9OMO, 521 Alden Road, Muncie, Ind.

APACHE TX-1 xmttr, $180, in mint condx. Will ship. W4PC, P.O. Bx 482, Pinellas Park, Fla.

HUNTER Band-It transmitter, $55; mobile transistor pwr. supply, $19.50; dynamic tube tester, Simpson VOM 260, $15; typewriter, $25; power supplies, hi-fi equipment, tubes, cleanup misc. ham gear, vy cheap. Sell, trade, list. W4API, Box 4095, Arlington 4, Va.

FORCED To sell entire station: Immaculate B&W 5100-S and year old HQ-110 with spkr, mike and coax relay. All in superior condx. Best reasonable offer takes exc. unit. KØFHS, 3230 Quintin, Pueblo, Colo.

WANTED: Receiver NC-183 or NC-183D. State appearance, mechanical and electrical condx and price. William O'Keeffe, 610 Victory Blvd., S.I. 1, N.Y.

ELMAC AF67, PMR7, M1470 PS, relay, cables, M/M 80-10 coil, mast and bumper mount. Ready to mobile or excint portable. $205. K1MRM.

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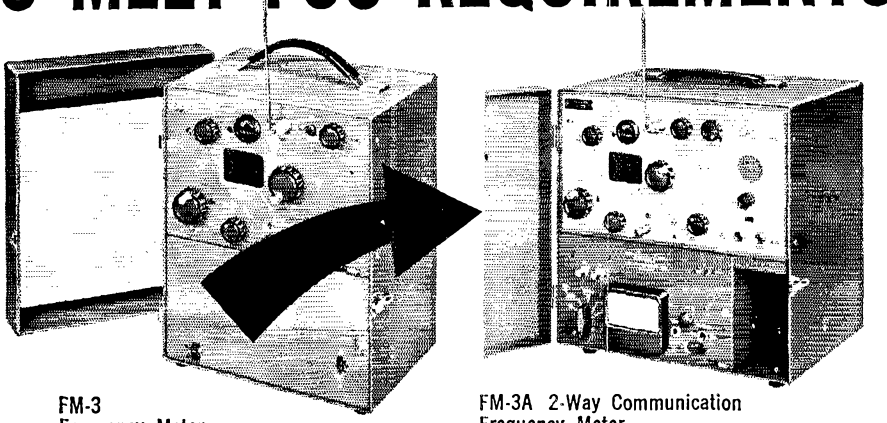

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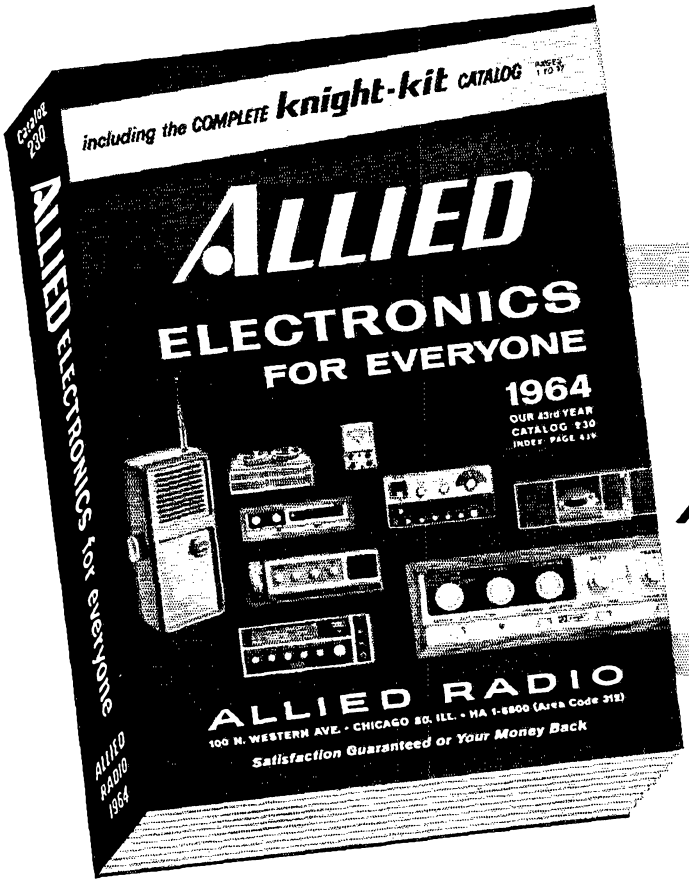

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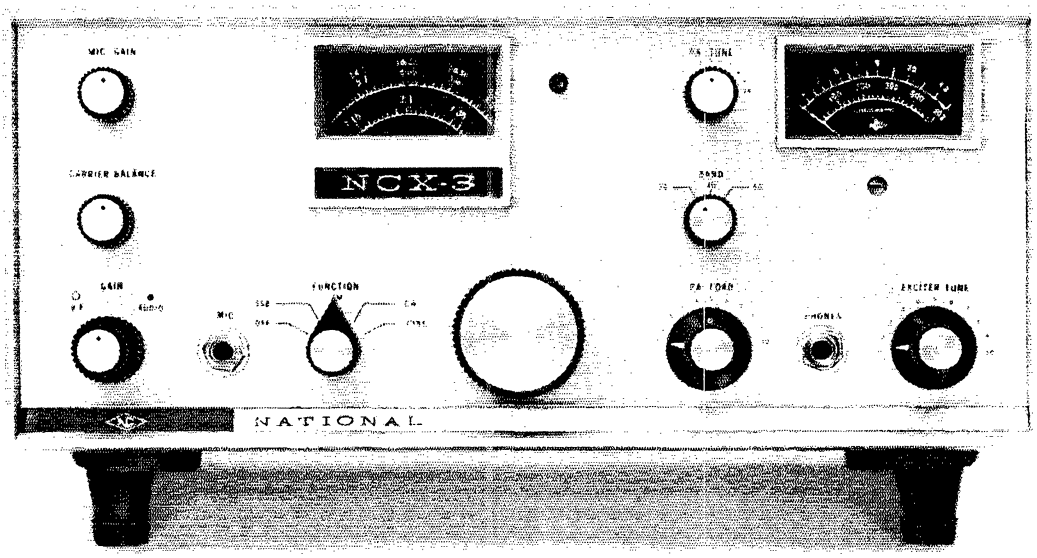

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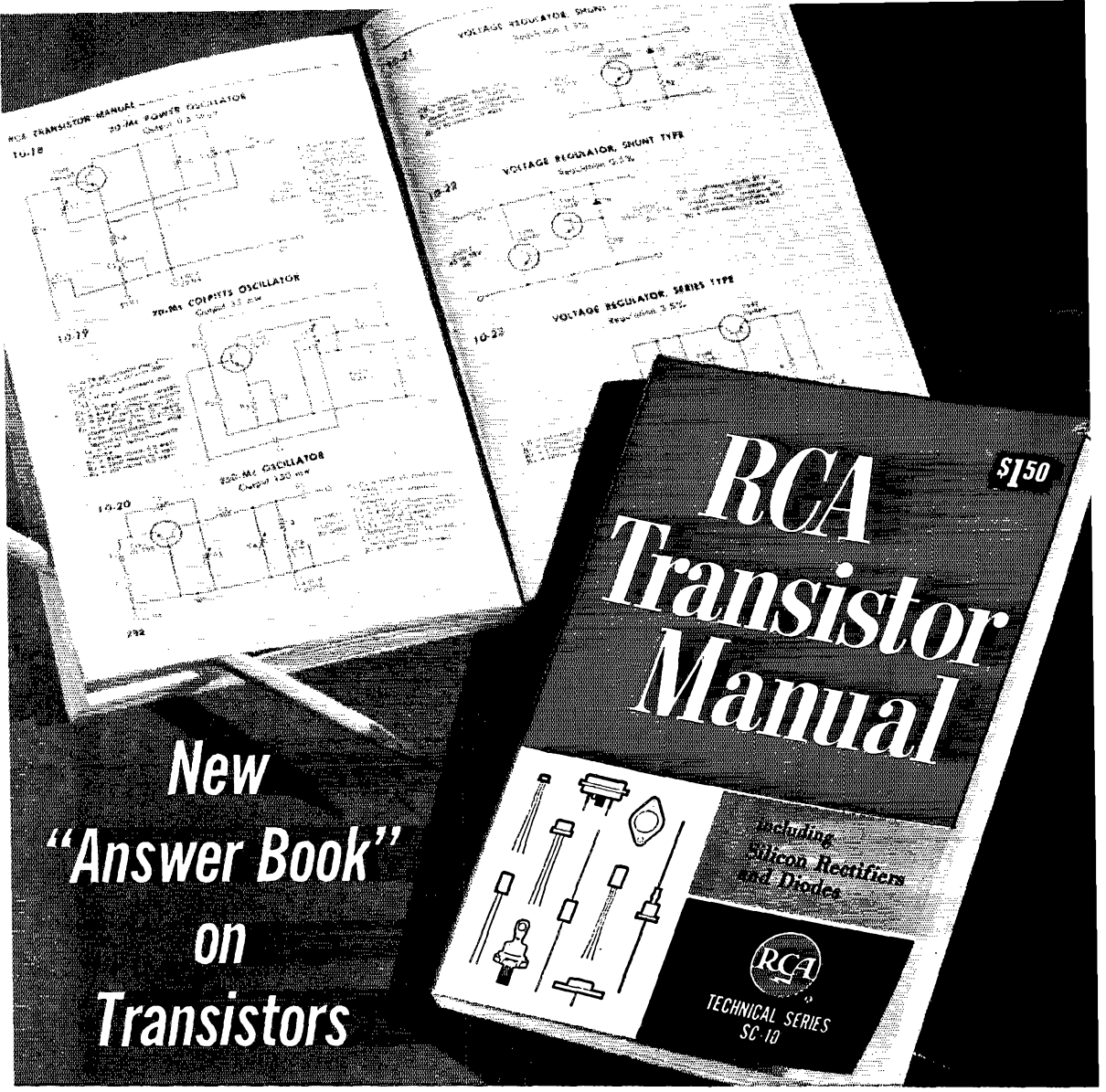

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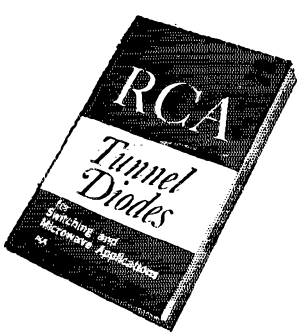

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