QST

devoted entirely to

amateur radio

July 1961

60 Cents

50¢ in Canada

BEGINNING IN THIS ISSUE — A FOUR-PART SERIES DESCRIBING A COMPLETE TWO-BAND V.H.F. STATION

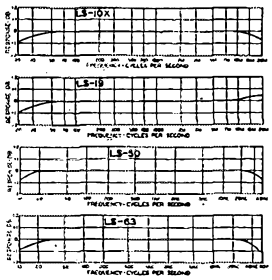
THE STANDARD OF COMPARISON FOR ALMOST 30 YEARS

HIGH FIDELITY TRANSFORMERS FROM STOCK

TYPICAL UNITS

LINEAR STANDARD series

Linear Standard units represent the acme from the standpoint of uniform frequency response, low wave form distortion, thorough shielding and dependability. All units have a guaranteed response within 1db. from 20 to 20,000 cycles. Hum balanced coil structures and multiple alloy shielding, where required, provide extremely low inductive pickup. These are the finest high fidelity transformers in the world. 45 stock types from milliwatts to kilowatts.

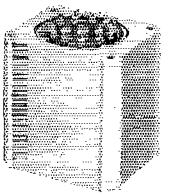


LS-10X Shielded Input
Multiple line (50, 200, 250, 500/600, etc.) to 50,000 ohms . . . multiple shielded.

LS-19 Plate to Two Grids
Primary 15,000 ohms.
Secondary 95,000 ohms C.T.

LS-50 Plate to Line
15,000 ohms to multiple line . . . +15 db. level.

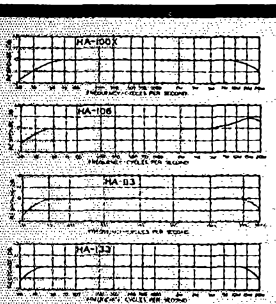
LS-63 P.P. Plates to Voice Coil
Primary 10,000 C.T. and 6,000 C.T. suited to Williamson, MLF, ul.-linear circuits. Secondary 1.2, 2.5, 5, 7.5, 10, 15, 20, 30 ohms. 20 watts.



CASE	LS-1	LS-2	LS-3
Length	3⅛"	4-7/16"	5-13/
Width	2⅜"	3½"	5"
Height	3¼"	4-3/16"	4-11/
Unit Wt.	3 lbs.	7.5 lbs.	15 lbs

HIPERMALLOY series

This series provides virtually all the characteristics of the Linear Standard group in a more compact and lighter structure. The frequency response is within 1 db. from 30 to 20,000 cycles. Hipermalloy nickel iron cores and hum balanced core structures provide minimum distortion and low hum pickup. Input transformers, maximum level +10db. Circular terminal layout and top and bottom mounting.

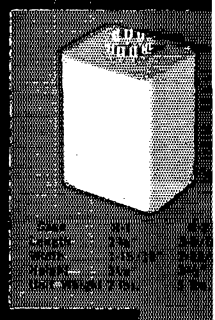


HA-100X Shielded Input
Multiple line to 60,000 ohm grid . . . tri-alloy shielding for low hum pickup.

HA-106 Plate to Two Grids
15,000 ohms to 135,000 ohms in two sections . . . +12 db. level.

HA-113 Plate to Line
15,000 ohms to multiple line . . . +12 db. level . . . 0 DC in primary.

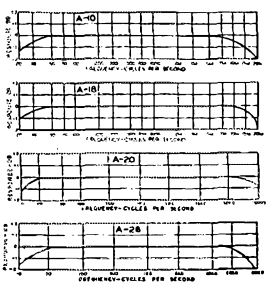
HA-133 Plate (DC) to Line
15,000 ohms to multiple line . . . +15 db. level . . . 8 Ma. DC in primary.



CASE	HA-1	HA-2	HA-3
Length	3⅛"	4-7/16"	5-13/
Width	2⅜"	3½"	5"
Height	3¼"	4-3/16"	4-11/
Unit Wt.	3 lbs.	7.5 lbs.	15 lbs

ULTRA COMPACT series

UTC Ultra Compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. The frequency response is within 2 db. from 30 to 20,000 cycles. Hum balanced coil structure plus high conductivity die cast case provides good inductive shielding. Maximum operating level is +7db. Top and bottom mounting as well as circular terminal layout are used in this series as well as the ones described above.

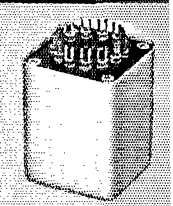


A-10 Line to Grid
Multiple line to 50,000 ohm grid.

A-18 Plate to Two Grids
15,000 ohms to 80,000 ohms, primary and secondary both split.

A-20 Mixing Transformer
Multiple line to multiple line for mixing mikes, lines, etc.

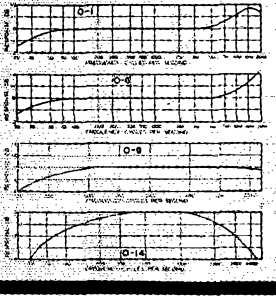
A-26 P.P. Plates to Line
30,000 ohms plate to plate, to multiple line.



A CASE	
Length	1¼
Width	1¼
Height	2"
Unit Weight	¼

OUNCER series

This Ounce units are ideal for portable, compact service and similar applications. These units are extremely compact, fully impregnated and sealed in a drawn housing. Most items provide frequency response within 1db from 30 to 20,000 cycles. Maximum operating level 0 db. These units are also available in our stock series which provide plug-in base. The 0-15 is a new line in this series using two heavy gauge, high-alloy shields for high hum shielding.

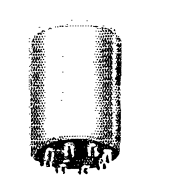


0-1 Line to Grid
Primary 50, 200/250, 500/600 ohms to 50,000 ohm grid.

0-6 Plate to Two Grids
15,000 ohms to 95,000 ohms C.T.

0-9 Plate (DC) to Line
Primary 15,000 ohms, Secondary 50, 200/250, 500/600.

0-14 50: 1 Line to Grid
Primary 200 ohms, Secondary .5 megohm for mike or line to grid.



OUNCER CASE	
Diameter	⅞"
Height	1-3/1
Unit Weight	1 oz.

WRITE FOR
1961 CATALOG

●

OVER 1000 ITEMS
FROM
STOCK

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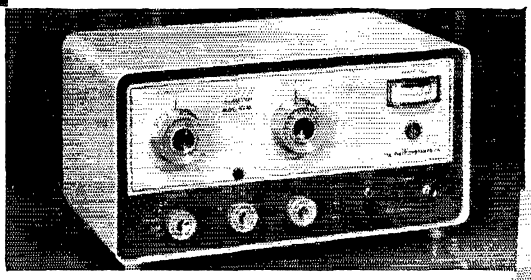
Very Hot News . . . from hallicrafters

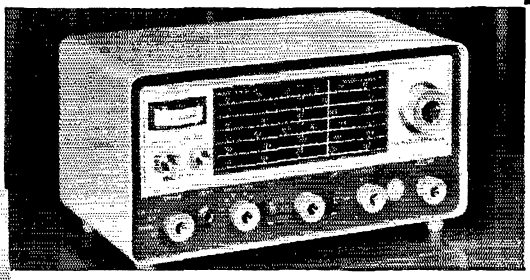
Two great new kits... a complete, high-performance AM/CW station, from the world's most experienced designers of short wave equipment

HALLIKITS, we call them—a completely new concept of kit engineering that brings to your workshop, for the first time, these two outstanding advantages:

First, the unparalleled design experience of Hallicrafters' communications laboratories; and *second*, production-line proof of "Constructability" *before you buy.*

Have a wonderful time! Save a bundle of money! End up with a station the most experienced amateur would be proud to call his own.





HT-40 TRANSMITTER, $89.95

A perfect match for the handsome SX-140, both in quality and appearance. Hallicrafters' transmitter leadership is evident in every precision-engineered feature of this crystal-controlled 75-watt beauty—features as important to old-timers as they are to novices.

- **FEATURES:** You get excellent CW performance as well as AM. Full band switching, 80 through 6 meters. Enjoy easy tune-up and crisp, clean styling that has efficient operation as well as appearance in mind. Unit is fully metered, TVI filtered.
- **SPECIFICATIONS:** Maximum D.C. power input: 75 watts. Power output in excess of 35 watts CW, 30 watts peak AM phone. (Slightly less on 6 meters.) Frequency bands: 80, 40, 20, 15, 10 and 6 meters.
- **TUBES AND FUNCTIONS:** 6DQ5 power output; 6CX8 crystal oscillator and driver; 12AX7 speech amplifier; 6DE7 modulator; silicon high voltage rectifiers.
- **FRONT PANEL:** Function (AC off, tune, standby, AM, CW); Band Selector (80, 40, 20, 15, 10, 6); Drive control; Plate tuning, plate loading, Crystal-V.F.O.; Grid Current; Meter; AC indicator light; RF output.
- **REAR CHASSIS:** Microphone gain; antenna co-ax connector; remote control terminals; AC power cord.

SX-140 RECEIVER, $104.95

Doesn't it make sense to team up your skill with the experience of a company who has designed and built more high-performance receivers than any other in the world? Especially when the result is the *lowest-priced amateur band receiver available?*

- **FEATURES:** You get complete coverage of all amateur bands 80 through 6 meters, with extremely high sensitivity and sharp selectivity. Unit has RF stage; S-meter; antenna trimmer; and XTAL calibrator. Tuning ratio is 25 to 1.
- **CONTROLS:** Tuning; Antenna Trimmer; Cal. Reset; Function (AC off, standby, AM, CW-SSB); Band Selector; Cal. on/off; RF Gain; Auto. Noise Limiter on/off; Selectivity /BFO; Audio Gain; phone jack; S-meter Adj.
- **TUBES AND FUNCTIONS:** 6AZ8 tuned RF amplifier and crystal calibrator; 6U8 oscillator and mixer; 6BA6 1650 kc. IF amplifier and BFO; 6T8A 2nd detector, A.V.C., ANL and 1st audio; 6AW8A audio power amplifier and S-meter amplifier; (2) silicon high voltage rectifiers.

P.S. *Both units are available fully wired, and tested. SX-140, $124.95, HT-40, $109.95.*

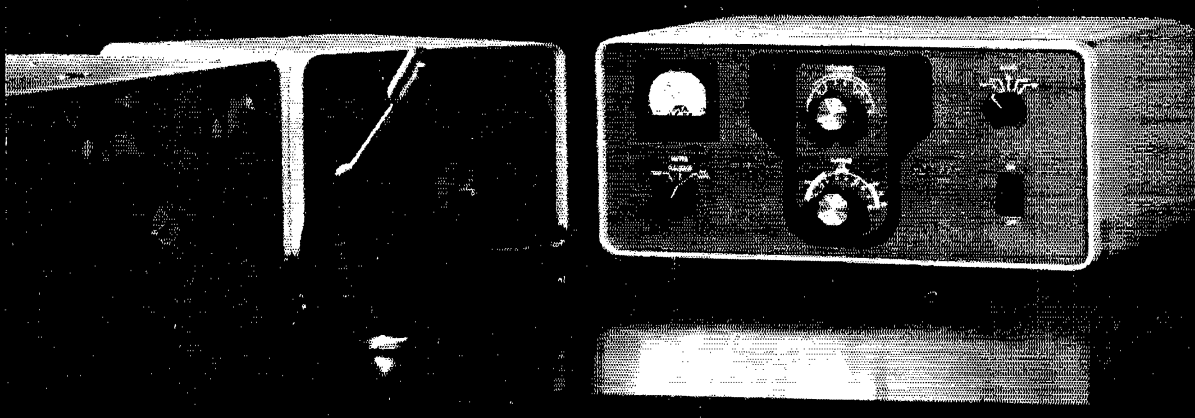
halli-kits *from* hallicrafters

Chicago 24, Illinois

... where the new ideas in communications are born!

Export Sales: *International Div., Raytheon Co., Waltham, Mass. Canada: Gould Sales Co., Montreal, P.Q.*

highlight your station with the 30L-1 linear



Desktop kilowatt amplifier from COLLINS

The compact Collins 30L-1 Linear Amplifier provides for 1,000 watts PEP input on SSB and 1,000 watts average on CW. It is designed for use with the famous Collins KWM-2 or 32S-1, as well as with most other 70-100 watt CW/SSB exciters. □ Visit your Collins distributor for details, and see the quality line—the Collins line of amateur equipment. Order the 30L-1 now for early delivery! Only $520.00.

COLLINS

COLLINS RADIO COMPANY • CEDAR RAPIDS, IOWA • DALLAS, TEXAS • NEWPORT BEACH, CALIFORNIA

QST

JULY 1961

VOLUME XLV • NUMBER 7

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OFFICES

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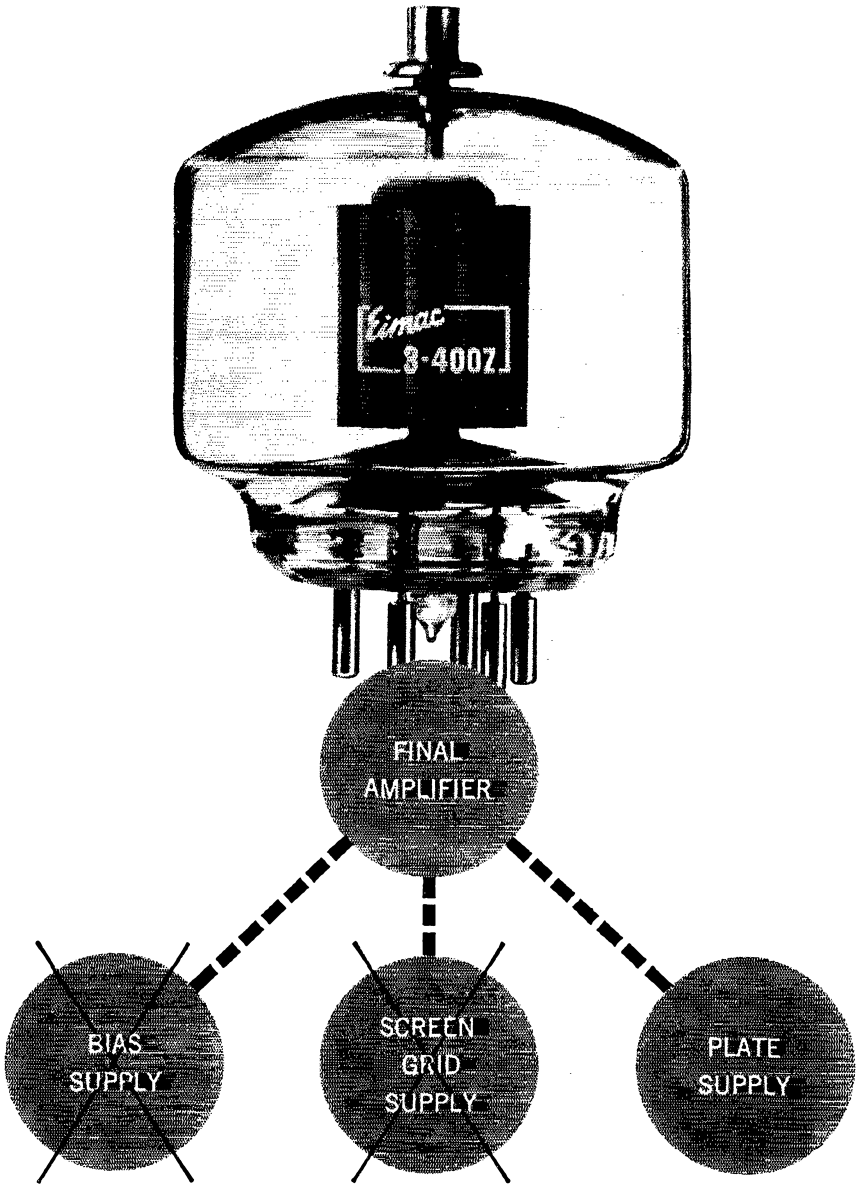


Cross off two power supplies with one of Eimac's new zero-bias triodes!

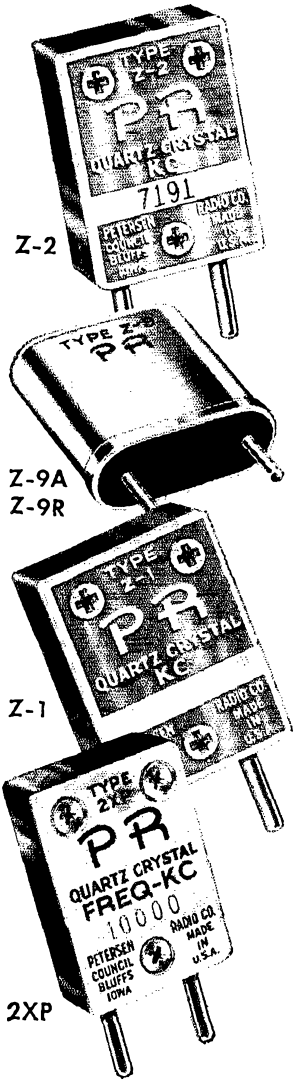
Another major advance from Eimac: the first high power zero-bias triodes anywhere. Just one of these new tubes will eliminate *both* screen grid and bias power supplies to simplify your circuit designs. Take your pick of three types: the 3-400Z, shown above, (plate dissipation: 400 watts)... the 3-1000Z (1000 watt plate dissipation)... the ceramic-metal 3CX10,000A7 (10,000 watt plate dissipation). Each offers a power gain of over *twenty times* in grounded grid service. And their small size accommodates today's lower, more compact equipment. You'll find these zero-bias triodes ideal for class B RF and audio amplifiers. And you'll find them *only* at Eimac... world leader in transmitting tubes. For ratings, specifications, other details, write: Power Tube Marketing, Eitel-McCullough, Inc., San Carlos, California.

Eimac

It pays to insist on

PR *crystals*

STANDARD OF EXCELLENCE SINCE 1934



AMATEUR TYPES

Fundamental, PR Type Z-2

Frequency Ranges in Kcs.: 3,500 to 4,000 (80M); 7,000 to 7,425 (40M); 8,000 to 8,222 (2M); 8,334 to 9,000 (6M).

Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting; ±500 cycles..... **$2.95** Net

(All Z-2 Crystals calibrated with a load of 32 mmfd.)

Third Overtone, PR Type Z-9A

Hermetically sealed; calibrated 24,000 to 24,666 and 25,000 to 27,000 Kc., ±3 Kc.; .050" pins..... **$3.95** Net

6 Meters, PR Type Z-9A

Fifth overtone; for operating directly in 6-meter band; hermetically sealed; calibrated 50 to 54 Mc., ±15 Kc.; .050" pins. **$4.95** Net

CITIZENS BAND CLASS "D" Type Z-9R, Transmitter

FCC assigned frequencies in megacycles: 26.965, 26.975, 26.985, 27.005, 27.015, 27.025, 27.035, 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225, 27.255, calibrated to .005%. (Be sure to specify manufacturer and model number of equipment) $2.95 Net

CITIZENS BAND CLASS "D" Type Z-9R, Receiver

Specify I.F. frequency, also whether receiver oscillator is above or below transmitter frequency. Calibrated to .005%. (Be sure to specify manufacturer and model number of equipment.)..... $2.95 Net

Type Z-9R, Radio Control

FCC assigned frequencies in megacycles: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255; calibrated to .005%. (Be sure to specify manufacturer and model number of equipment.)..... $2.95 Net

Type 2XP

Suitable for converters, experimental, etc. Same holder dimensions as Type Z-2.

1600 to 12000 Kc., (Fund.) ±5 Kc..... **$3.45** Net

12001 to 25000 Kc. (3rd Overtone) ±10 Kc..... **$4.45** Net

ALL PR CRYSTALS ARE UNCONDITIONALLY GUARANTEED. ORDER FROM YOUR JOBBER.

COMMERCIAL TYPES

Commercial Crystals available from 100 Kc. to 70 Mc. Prices on request.

Type Z-1, MARS and CAP

Official assigned frequencies in the range. Calibrated to .005%. 1600 to 10000 Kc..... **$3.45** Net

Type Z 1, TV Marker

Channels 2 thru 13.... **$6.45** Net

4.5 Mc. Intercarrier, .01% ..... **$2.95** Net

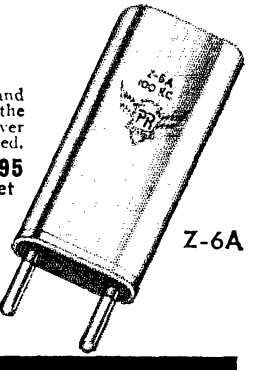
5.0 Mc. Signal Generator, .01% ..... **$2.95** Net

10.7 Mc. FM, IF, .01% ..... **$2.95** Net

Type Z-6A, Frequency Standard

To determine band edge. To keep the VFO and receiver properly calibrated.

100 Kc. . . **$6.95** Net



Z-6A

PETERSEN RADIO CO., *Inc.* 2800 W. Broadway

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Section Communications Managers of the ARRL Communications Department

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

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Santa Barbara	K6CVR	Robert A. Hemke	728 W. Mission	Santa Barbara
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Southern Texas	W5QEM	Roy K. Eggleston	1109 Vernon Drive	Corpus Christi
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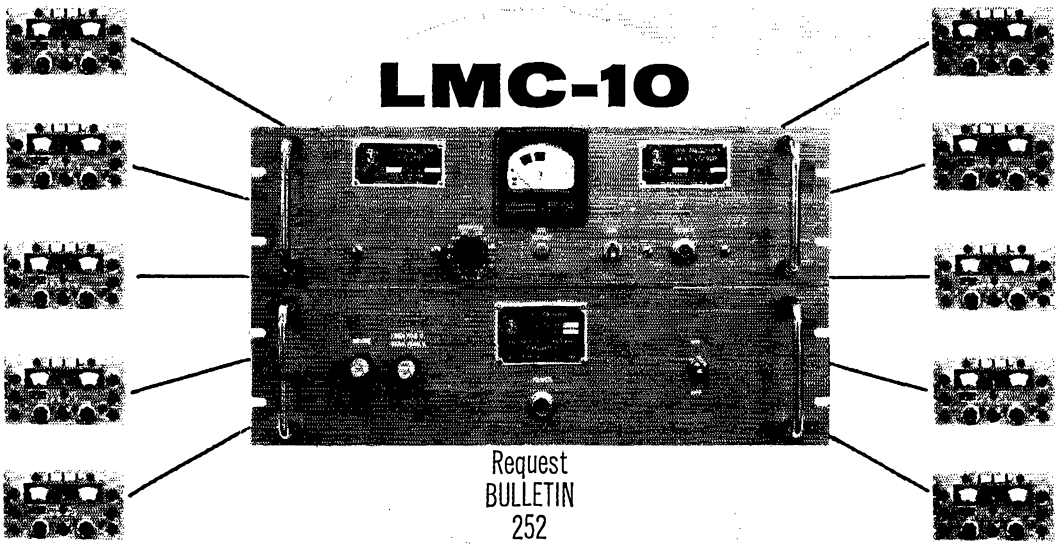
Alberta	VE6TG	Harry Harrold	1834-5th Ave.	N. Lethbridge, Alta.
British Columbia	VE7FB	H. E. Savage	4553 West 12th Ave.	Vancouver 8, B. C.
Manitoba	VE4JY	M. S. Watson	249 Lanark St.	Winnipeg
Saskatchewan	VE5HR	H. R. Horn	2121 Ewart Ave.	Saskatoon

*Official appointed to act temporarily in the absence of a regular official.

100 KC TO 2 MC

LOW FREQUENCY
ANTENNA COUPLER

LMC-10



Request
BULLETIN
252

COUPLES ONE ANTENNA TO TEN RECEIVERS

FREQUENCY RESPONSE:	100 kc to 2 mc, flat within ±2 db.
GAIN:	4 db nominal.
NOISE FACTOR:	Better than 7 db.
INTERMODULATION:	The equivalent antenna voltage of an intermodulated signal will be down at least 50 db with respect to the level of either of two equal amplitude signals whose equivalent antenna voltages to produce the intermodulated signal are: 250,000 μv for 70 ohm antenna
HARMONIC DISTORTION:	Less than 1%.
ISOLATION:	Output-to-output: 45 db or better at 2 mc, rising 3 db/octave to 60 db at 100 kc. Input-to-output: Better than 60 db.
INPUT/OUTPUT IMPEDANCE:	Nominally 70 ohms unbalanced.

THE TECHNICAL MATERIEL CORPORATION

World Wide Suppliers of Electronic Communication Equipment

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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.

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

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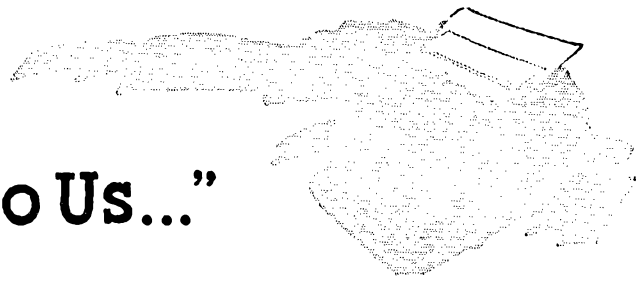


"It Seems to Us..."

20 METERS — A CHALLENGE

"On motion of Mr. Denniston, unanimously VOTED that the League recommend to amateurs of the United States and possessions that they refrain from transmitting on frequencies between 14,335 and 14,350 kc. so that our amateur friends in other countries using single sideband may establish contacts with our amateurs and with each other with greater freedom and success. (Mr. Eaton indicated that he would make the same recommendation to Canadian amateurs.)"

Thus, in minute 69 of the 1961 Board of Directors Meeting, did the 16 active amateurs who lead the League act to solve one of the vexing problems which confront amateurs. Will it work? If the radio amateurs, both in the United States and elsewhere, want it to work badly enough, it will. Not by government regulation, not by brute force, but by agreement among the fraternity itself.

To most of those who frequent the phone portion of the 20-meter band, it has become apparent that the expansion of the American phone band which went into effect on March 10, 1960, had created a new problem while solving some old ones. Before the change, U.S. amateurs using a.m. customarily worked the lower half of the 14.2–14.3-Mc. segment, and tuned for Canadian and DX calls just below 14.2 Mc. The s.s.b. operators worked the upper portion of the American phone band, and listened for amateurs in other countries from 14.3 to 14.35 Mc. In this respect, the old arrangement had much to recommend it.

On the other hand, QRM in the American phone band had risen to a deafening level. With two-thirds of the world's amateurs in the U.S. alone, and with a span of 5000 miles separating Maine from Hawaii, the band has been used heavily, not only for DX, but also for domestic contacts. As early as 1946, the Board, responsive to the wishes of the membership, voted to seek extension of the phone band at 20 meters. Several such proposals were made by the Board since then, but for one reason or another either withdrawn by the Board or rejected by FCC. Finally, in 1959, the FCC issued a Notice of Proposed Rulemaking to expand the band to the new figure of 14.2–14.35 Mc. A great deal of comment was filed with the FCC in response to the Notice, both by Americans and by foreign amateurs. After weighing the pros and cons carefully, the FCC decided that its primary concern had to be for U.S. domestic operation, and it enacted the increase.

Initially, there was some trouble within the United States in getting amateurs to adjust their operating habits to the new band limits. Both a.m. and s.s.b. operators seem to prefer a separation of the two modes. Yet at first some operators on each mode tried brute-force techniques to achieve redistribution by mode according to their own desires. Happily, liberal doses of the traditional ham spirit have reduced this particular problem considerably. The great majority of amateurs seem to be respecting the rights of their fellows in the twenty-meter band — and this is just as it should be.

One problem remains. The DX s.s.b. contingent, though small by comparison with its counterpart here, is growing rapidly. These good friends of ours, however, have been having a great deal of difficulty in working us and each other through the cloud of QRM arising from American stations, some of which use a good deal more power than that permitted most amateurs overseas. As a result, more and more foreign sideband operators have considered themselves forced to use frequencies around 14.1–14.15 Mc. to escape the s.s.b. QRM from Ws and Ks at the high end, and interference from DX and Canadian stations using a.m. in 14.15–14.2 Mc. This in turn causes problems for the c.w. operators all over the world and particularly for the RTTY gang, now using frequencies near 14.1 Mc. Further, some American amateurs, trying to work DX on s.s.b., have started to move down near 14.2 Mc. to work their foreign counterparts, threatening to upset the normal division of the American phone band for domestic work.

Thus, the only practical solution seems to be a strip of frequencies at the high end reserved for overseas stations on s.s.b. and therefore, the Board is urging all American amateurs to avoid transmitting between 14,335 and 14,350 kc.

It will take some time to spread the word. We urge all who read this to observe the new plan, even though it won't seem effective at first. There is a danger that some hams will start complying, but give up because they don't think others are cooperating. Then too, there

(Please turn the page)

will undoubtedly be a few individuals who will put themselves above the needs of the fraternity, and continue to transmit in the top 15. All one can do is to say, once, and politely as possible, "Say, OM, you're in the DX section". If the amateur ignores the hint, skip it; an argument probably won't help any Repeated reminders by several different amateurs may have the desired effect eventually.

The DX stations on s.s.b. can help a great deal in putting the plan into effect. First, they should use the top 15 regularly. Second, when calling CQ, the foreign stations should announce that they will listen for Ws and Ks on some frequency below 14,335 kc. Third — and most important — amateurs outside the U.S. should not work any American who is transmitting in the top 15. Some hams both here and overseas may feel the plan does not go far enough, but we hope that everyone will help to give it a fair trial. The alternative seems to be a ruthless jungle of QRM. QST

Alberta — The 27th Annual Glacier Waterton International Peace Park Hamfest will be held at Waterton Lakes Park, Alberta, on July 22 and 23. This is all the dope we have, so for further information contact Dave Forster, VE6FF, P.O. Box 424, Lethbridge, Alberta.

Idaho — The WIMU Hamfest will be held at Mack's Inn, Idaho, on August 4–6. There will be events of interest to OMs, YLs, and XYLs. Lodging and camp grounds are available. For further information contact John A. Swenson, W7VNO, Logan, Utah.

Illinois — The annual Shawnee Amateur Radio Assoc. hamfest will be held July 16 at the Duquoin State Fairgrounds. The program will include a swap table and free coffee and doughnuts. Registration is $1.50 in advance or $2.00 at the gate. There will be a sideband dinner on the evening of July 15. For further information contact Leonard Novara, K9IZE, 1418–20 Walnut, Murphysboro, Ill.

Illinois — The Quad-Co Radio Club will sponsor the fourth annual hamfest of the Breakfast Club on Sunday, July 30, at Terry Park near Palmyra. The Illinois Emergency Net will hold a meeting, and all other groups are invited to meet at the hamfest, giving prior notice to the hamfest committee. Bring your own basket lunch. Sandwiches and soft drinks available on the grounds. Mobile talk-in on 3.873 and 29.6 Mc., from 0400 to 1100. All sorts of contests and games, including golfing and fishing. Bring your swap gear. Registration is $1.00 in advance, or $1.50 at the gate. For tickets write to "Hamfest", c/o Bob Clark, K9BTL, 350 E. Prairie, Waverly, Illinois.

Indiana — The 13th Annual V.H.F. Picnic sponsored by the Wabash Valley Amateur Radio Association will be held on Sunday, July 30, at Turkey Run State Park, about 40 miles north of Terre Haute near Highway 41. This is an outdoor affair, but if you do not care to bring your own basket lunch, food is available at the Park Hotel and Restaurant. Further information is available from Ken Mier, K9EFO, 2446 Cleveland Avenue, Terre Haute, Indiana.

Kentucky — The annual MO-ARK-KY hamfest, sponsored by the Paducah Amateur Radio Club, will be held on Sunday, July 9, at Noble Park Community House, Noble Park, Paducah. This all day get-together of amateurs from Southeastern Missouri, Northeastern Arkansas and Western Kentucky, is the big amateur gathering of this section. A complete noon-day meal will be served. Entertainment for children and non-ham adults. No registration fee. For further information, contact R. C. Davis, K4BDN, 369 Wallace Lane, Paducah, Kentucky.

Kentucky — The Louisville Hamfest-Picnic-Auction will be held on Sunday, August 6, from 9:00 A.M.–4:00 P.M., CDT, at Cherokee Park, Louisville. For further information, contact Lew Lingham, Route 3, Box 451, Anchorage.

Maryland — The Graveyard Net will hold its annual picnic at the Aberdeen Mouse Lodge, Aberdeen, Maryland, on July 8 and 9. Features will include auctions, a transmitter hunt, and mobile judging. Several distinguished visitors are expected but no names are available at this time. A banquet, to be followed by a dance, will be held at 7 P.M. on July 8. Banquet costs are $2.50 per person, with children 15 and under $1.25. General entrance fee is $1.00 per person. For further information, contact Walter O. Carr, W3LDD, 124 Bay Blvd., Havre de Grace, Md.

Maryland — The Maryland Emergency Phone Net will hold its annual picnic at Braddock Heights, Maryland on July 23. Braddock Heights is located about 4 miles west of Frederick, Md. on Alternate 40. An excellent place for the whole family. Registration fee is $1.00 per person, which includes soft drink tickets for the family. There will be an auction, rummage sale, mobile contest and ladies program. Come early, bring a picnic lunch and enjoy the day. Mobile stations will be able to contact the picnic station on 3820 kc., 2 and 6 meters. For further information contact Henry B. Ray, First Place, Greenwood Acres, Annapolis, Maryland.

Maryland — The Amateur Radio Clubs Associated of the Greater Baltimore Area will sponsor a hamfest on July 8, from 10:00 A.M. to 6:00 P.M., E.S.T., at Kurtz's Pleasure Beach (on the Chesapeake Bay near Pasadena, Maryland). Cost is $.50 for children 6 to 12 years and $1.00 for anyone over 12. There will be swimming, soft-ball, contests, prizes, an auction, and more. Food is available at the beach, or bring a picnic lunch. For complete details and tickets contact James H. King, jr., K3IEV, 2300 Rockwell Avenue, Baltimore 28, Maryland.

Mississippi — The 4th annual hamfest of the Biloxi Amateur Radio Club will be held in the Beach Community House at Biloxi, on July 1 and 2. There will be the usual hamfest activities and all the shrimp you can eat for $1.00. For further information write the Biloxi Amateur Radio Club, Inc., P.O. Box 1574, Biloxi, Mississippi.

Missouri — The Missouri Picnic will be held on July 30 at Eldon. A basket dinner will be served at noon, with each person to bring his own service and a well-filled basket. For further information contact Flora Sidebottom, KØMMR, or Paul Cooper, KØTGG, at Eldon, Missouri.

New York — The 1961 annual hamfest of the North Country Radio Club will be held Sunday, July 16, at the Norfolk Rod and Gun Club, Norfolk, N. Y. Auction, speakers, 2–6–75 meter talk-in for mobiles. Bring your own lunch, or lunches and refreshments will be available. The admission price is a piece of ham gear for the auction. More expensive articles will be sold on a commission basis. For further information contact Arthur T. Robinson, W2IDM, 5 King St., Massena, N. Y.

Pennsylvania — The South Hills Brass Pounders and Modulators, Inc., will hold their annual hamfest on Aug. 6 in the Museum Building at South Park, Allegheny County, Pennsylvania. There will be a swap and shop and various other activities. Pre-registration is $1.50, or $2.00 at the door. For further information, contact Roy C. Melvin, W3LYC, 1609 Blossom Hill Road, Pittsburgh, 34, Pa.

Virginia — The Lonesome Pine Hamfest will be held on July 22 and 23, at the Southwest Virginia 4-H Center in Abingdon. Swimming, meals served, overnight accommodations, contests, prizes, rag chewing, and a good time planned for the whole family. An all-night marathon on the 22nd is planned on 80 meters. For further information contact James Cole, K4HRO, 240 Gillespie Drive, Abingdon.

Wyoming — The annual Wyoming hamfest will be held Saturday and Sunday, July 22 and 23, in the Big Horn Mountains at Deer Haven Lodge, 40 miles east of Worland, Wyoming, on U. S. Highway 16, sponsored by the hams of the Big Horn Basin. Plenty of cabins or campgrounds are available in the area. A full program of banquet, contests, and transmitter hunts. An unexcelled opportunity to see deer, elk, bear and other wildlife in their natural habitat. For further information contact the Hamfest Committee, 433 Arapahoe, Thermopolis, Wyoming. QST

During the course of the recent Board meeting, the following telegrams in tribute to the work of the American Radio Relay League were received from the Armed Forces and the *Armed Forces Communications and Electronics Association*:

GREETINGS AND BEST WISHES FROM THE U. S. ARMY SIGNAL CORPS TO ALL MEMBERS OF THE BOARD OF DIRECTORS OF ARRL ON THE OCCASION OF YOUR ANNUAL MEETING. FOR THE MANY SERVICES RENDERED TO THE ARMY AND TO THE SIGNAL CORPS BY MEMBERS OF THE AMERICAN RADIO RELAY LEAGUE OVER THE YEARS, WE ARE INDEED MOST GRATEFUL. BOTH IN WAR AND IN PEACE, ASSISTANCE RECEIVED IN COMMUNICATIONS AND ELECTRONICS ACTIVITIES FROM DEDICATED RADIO AMATEURS WHOM YOU REPRESENT HAS BEEN INVALUABLE TO US. AS WE TAKE NOTE OF THE CHALLENGES THAT FACE US TODAY, WE ARE HEARTENED BY THE PROSPECT THAT WE SHALL CONTINUE TO RECEIVE THE UNSELFISH SUPPORT AND COOPERATION OF ENTHUSIASTIC AND FORWARD-LOOKING ORGANIZATIONS SUCH AS YOURS. BY SUCH CONTINUED SUPPORT, WE CAN ALL LOOK TO THE FUTURE WITH CONFIDENCE. (signed) MAJOR GENERAL R. T. NELSON, CHIEF SIGNAL OFFICER, U. S. ARMY.

YOUR BOARD OF DIRECTORS MEETING PROVIDES AN EXCELLENT OPPORTUNITY FOR ME TO EXPRESS APPRECIATION FOR ALL AIR FORCE COMMUNICATORS TO THE BOARD AND THE MANY MEMBERS OF THE ARRL. YOUR LEAGUE THROUGHOUT THE YEARS HAS PROVIDED THE INCENTIVE AND ORGANIZATION WHICH HAS ENABLED THE AMERICAN AMATEUR TO CONTRIBUTE SO MUCH TO THE AMERICAN CIVIL AND MILITARY COMMUNICATIONS PICTURE. WE ARE ALL APPRECIATIVE OF YOUR CONTRIBUTION TO CIVIL DEFENSE AND DISASTER COMMUNICATIONS; HOWEVER, QUITE OFTEN WE TEND TO OVERLOOK THE GOOD WORK YOU ARE DOING IN PROVIDING BASIC IDEAS AND INCENTIVE FOR FURTHER STUDY IN THE COMMUNICATIONS AND ELECTRONICS FIELD. THIS INFLUENCE IS VERY EVIDENT IN THE QUALITY OF COMMUNICATIONS PEOPLE WE HAVE AND ARE GETTING IN THE AIR FORCE. YOUR HANDBOOK AND MANUALS ARE OUTSTANDING. CONGRATULATIONS AND KEEP UP THE GOOD WORK. (signed) MAJOR GENERAL HAROLD W. GRANT, DIRECTOR OF TELECOMMUNICATIONS, U. S. AIR FORCE.

PLEASE PASS TO THE BOARD OF DIRECTORS, AMERICAN RADIO RELAY LEAGUE, BEST WISHES FOR A SUCCESSFUL MEETING AND A HEARTY WELL DONE FOR YOUR OUTSTANDING CONTRIBUTIONS TO THE WORLD OF AMATEUR COMMUNICATIONS. BEST REGARDS. (signed) FRANK VIRDEN, REAR ADMIRAL, DIRECTOR NAVAL COMMUNICATIONS, ASSISTANT CHIEF OF NAVAL OPERATIONS.

THE NATIONAL OFFICERS AND DIRECTORS OF THE ARMED FORCES COMMUNICATIONS AND ELECTRONICS ASSOCIATION JOIN WITH ME IN PROFOUND TRIBUTE TO THE ACHIEVEMENTS AND EXECUTIVE DIRECTION BY ARRL IN THE AMATEUR RADIO FIELD BOTH ON THE NATIONAL AND INTERNATIONAL LEVEL. OUR CONGRATULATIONS. (signed) SPARKY BAIRD, GENERAL MANAGER AND EDITOR, SIGNAL.

COMING A.R.R.L. CONVENTIONS

August 5–6 — Oklahoma State, Tulsa.

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

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

September 29–30 — Ontario Province, Windsor, Ontario, Canada.

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

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

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

October 28 — Kentucky State, Lexington, Kentucky.

OKLAHOMA STATE CONVENTION

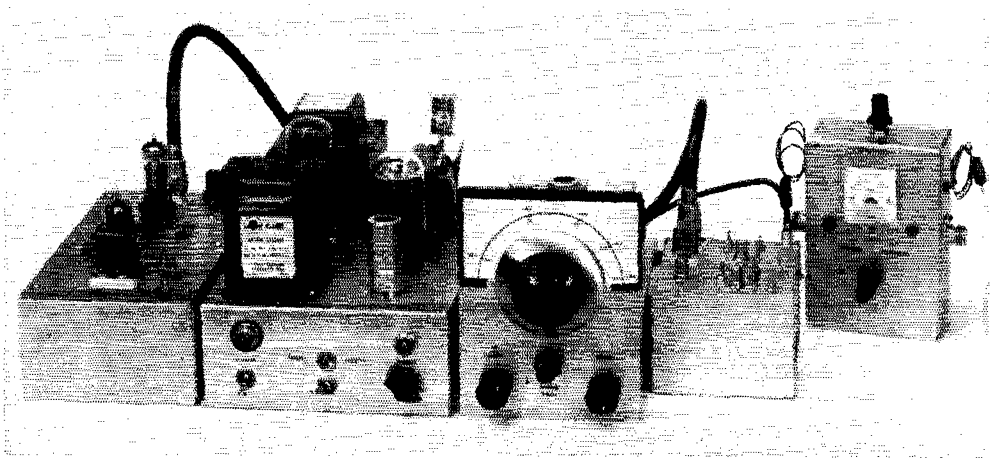
August 5–6 — Tulsa, Oklahoma

The Second Annual Oklahoma State ARRL Convention is to be held at the Alvin Plaza Hotel in Tulsa with convention activities set to begin at 11 o'clock Saturday morning, August 5 and to end at 2 o'clock Sunday afternoon, August 6. A varied program will include v.h.f., s.s.b., RTTY, MARS and an ARRL forum.

Initiation ceremonies for the Royal Order of the Wouff Hong are set for Saturday midnight while earlier in the evening, from 7:30 to 11 o'clock, family type entertainment is planned.

Ed Tilton, W1HDQ, *QST*'s v.h.f. editor, is to be the principal speaker at a v.h.f. luncheon. The convention concludes Sunday with a noon banquet. As a special note, the convention committee has arranged a professional fashion show for the ladies and a conducted bus tour of the Tulsa area. A free nursery will be provided for the younger harmonics. Talk-in transmitters will operate on 3825 kc. and 50.25 Mc.

Hotel reservations and convention registrations, with the registration and banquet at $6.50 per person, should be sent to the Northeast Oklahoma V.H.F. Society, Inc., 1202 Philtower Building, Tulsa, Oklahoma. Checks should be payable to the "Second Annual ARRL-Oklahoma Convention". Tickets for the v.h.f. luncheon are being sold separately at $2.50 per person. Special convention pre-registration ends July 10.



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

An Efficient Layout for 50 and 144 Mc. Entirely Home-Built

Part I—A Simple Tuner for Use with Converters

BY EDWARD P. TILTON,* W1HDQ

This complete station for 6 and 2 is not the cheapest way to set up for v.h.f. business, but in quality and versatility it is way ahead of what the same expenditure would buy in ready-made gear. Built in simple subassemblies that plug together directly or through cables, it can be a long-term project if your finances and spare time make this desirable. Build it for one band, at first, or make whichever portion of the station you need most. Though the equipment is labeled and described for the beginner, we have a feeling that a good many v.h.f. men who have been around a while will find it of interest, too. Our cover this month shows all the units for both bands. Subsequent issues of *QST* will describe all of these units.

Buy or build? This question faces every new amateur, and it is likely to remain with him as he advances in the art. Buying is the quick and often easy way to get started in amateur radio. There are still sound arguments for building one's own, however, and plenty of hams, new or old, still play the game that way.

First, there is the matter of cost. Admittedly, parts cost money these days, but if the job is done wisely the newcomer can build himself a complete station for much less than similar facilities would cost ready-made. Then, nearly all commercial gear is a compromise in one or more ways. When you roll your own, you can design your station to do what *you* want it to do, and to look the way *you* want it to look. You don't pay for anything that you don't need. A transmitter that works from 80 through 6 meters, for example, is a poor investment for the fellow with no interest in anything but v.h.f. work. It's a sure thing that a v.h.f.-only rig will deliver a lot more 6-meter watts per dollar than the multiband variety.

But perhaps most important is the nature of the hobby itself. Despite all the easy approaches to it, ham radio is still a *technical* avocation. The fellow who learns his way around is going to get more out of hamming than the mere purchaser of boxes. When you collect the parts (and perhaps make a few of them), put a station together with your own hands and skill, and make it work to your satisfaction, you have accomplished something. The end result is *your* station in a way that no commercial package can ever be, and you will be a better ham for having done the job!

Our station was designed to help you start on the v.h.f. bands that way. You may not need to build all of it. If you already have a good communications receiver, you may not be interested in the simple tuner shown here. If you want to work on just 6, or only on 2, the equipment for the band of your choice will do the job just as well as if the station was designed for that band only. Nothing necessary is omitted, and nothing in the way of useless glamour is included. Each unit is intended to do its job well, and to allow

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

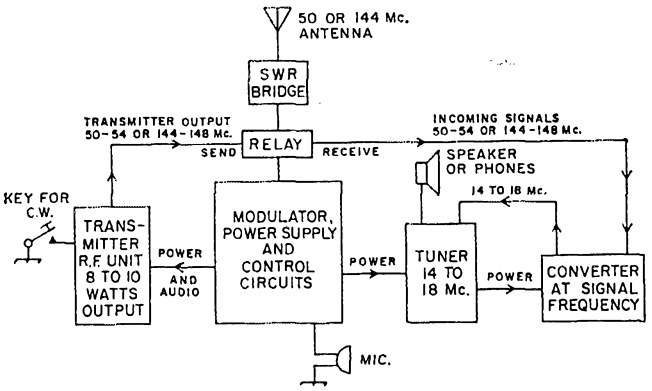


Fig. 1.—Block diagram of the two-band v.h.f. station. A central unit contains the speech equipment, power supply and control circuits. The antenna connects to a send-receive relay on the back of this unit through a standing-wave bridge. The transmitter r.f. assemblies for 50 or 144 Mc. plug into the left side of the control unit, and a tuner for 14 to 18 Mc. (described in this issue) into the right side. Converters for 50- or 144-Mc. reception plug into the right side of the tuner. The various units may be interconnected with cables, instead of being plugged together, if operating convenience so dictates.

for improvement of the station later on.

The transmitter r.f. units are stable and efficient. They include provision for c.w., and may be adapted to variable-frequency control. They will make fine exciters for high power later on. The modulator and power supply use quality components, and are handy items around any ham shack. Control circuits are included, so that the question of how to use the gear in actual communication (so often left unanswered in items supposedly for the beginner) is completely taken care of. The receiving system is a little different from anything you've seen in modern v.h.f. articles, but it does the job. You can receive c.w. with it, as well as a.m. or f.m. phone, and it can even produce readable s.s.b. signals with a bit of care. The converter "front ends" for 50 and 144 Mc. are excellent performers, and if you decide later to use a communications receiver in place of the tuner, they will give you v.h.f. reception second to none.

Last, but by no means least, nearly every v.h.f. station description tells the builder to use a standing-wave bridge in tuning up the transmitter and adjusting the antenna — but few home-built s.w.r. bridges will work on 6 or 2. This station includes a v.h.f. s.w.r. bridge. But enough of the sales talk. Let's get to the business at hand.

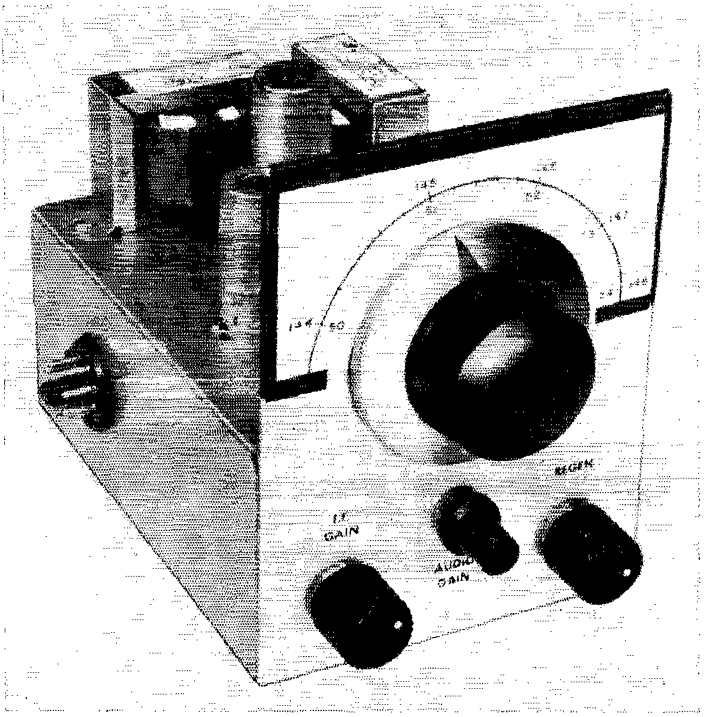
The Receiving System

Some means of listening is usually the first requirement of the newcomer, so we will consider reception first. It is almost standard practice in v.h.f. circles to employ a converter of some sort, which changes the signal on 50 — 54 Mc. or 144 — 148 Mc. to some lower frequency before it goes through the detection process. There are several reasons for this, but perhaps the most important is selectivity. It is difficult if not impossible to attain the desired degree of selectivity at 50 Mc. or higher, but the difficulty decreases with frequency. This is the main reason for the use of so-called double-conversion receivers, even on our lower amateur bands.

In a communications receiver, a 14-Mc. signal, for example, may be converted to 455 kc. or lower, where it is more readily amplified than at the original frequency. In our receiver we convert from 50 or 144 Mc. to 14 Mc., and our amplification and detection take place at the latter frequency. This is not quite as good as if it were done in the manner of the communications receiver, which would include a second conversion, but it does have advantages for the home constructor, not the least being simplicity. We can tune 14 to 18 Mc. with our little tuner, without the tracking problems that bedevil the designer of a superheterodyne-type 14-Mc. receiver, and the whole works involves only a broad-band amplifier, a detector, and a simple audio system. These jobs can be handled easily with three tubes.

Ahead of this we use crystal-controlled converters, which amplify the signal and then convert it to some frequency between 14 and 18 Mc., at which point our tuner takes over. If you decide to go to the communications-receiver method of reception later on (a desirable step if you can afford it), these converters will give you v.h.f. reception of the highest caliber. The simple tuner need not be abandoned, however. It can serve for portable operation, or for use under any circumstances where the ultimate in sensitivity and selectivity are not required.

You can listen on the 14-Mc. amateur band, and to various commercial and broadcasting services between the top end of that band and 18 Mc. with the tuner, so it makes an interesting project on its own. Consulting the circuit diagram, Fig. 2, it will be seen that the tuner uses two 6CB6s as i.f. amplifier and detector, followed by a two-stage audio amplifier using a 6CX8 triode-pentode. Power is obtained by plugging



The simple tuner for the v.h.f. station. The tuning range is calibrated for the v.h.f. bands, though the tuner actually covers 14 to 18 Mc. The calibration is drawn on white paper and taped to the area around the vernier dial. Controls below the dial are the i.f. gain at the left, the regeneration at the right, and audio gain, center.

into the side of the modulator and power supply unit directly, or through a 4-wire cable of any convenient length. If the power supply has not yet been built, the tuner may be tested on any supply capable of delivering 150 to 200 volts d.c., at a few milliamperes, and 6.3 volts a.c. or d.c. at about 1½ amperes. A 6-volt car battery and 90 volts of B battery will also handle it, though drain from a B-battery source may be excessive when a converter is added.

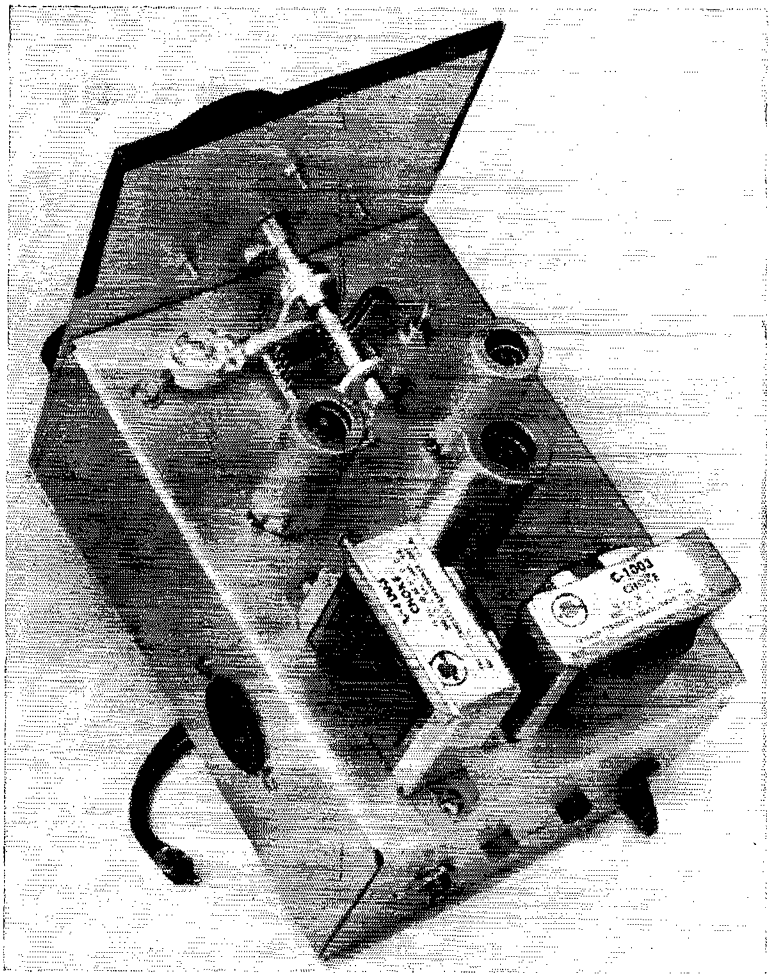
The detector tuning capacitor, C_1, is attached to a vernier dial (National Type AM-7). The actual tuning range is from just below 14 to just above 18 Mc., but the white dial scale taped to the front panel shows the equivalent v.h.f. ranges, 50 to 54 and 144 to 148 Mc. The calibrated scales can be added after the receiver is completed, and you have the range where you want it on the dial. Controls below the dial are i.f. gain, left, audio gain, center, and regeneration at the right.

Regeneration is the means by which we achieve a fair measure of performance from so simple a receiver. Three tubes may not seem like much in these days of umpteen-tube chrome-plated monsters, but this receiver is not unlike those that were in general use not too long ago. A regenerative or superregenerative detector is a marvelous device when properly controlled, and with the tubes we have today they can be made to work much better than the blooper receivers our predecessors made out with in the '20s, and even in the '30s. Such a receiver requires a bit of skill and patience in tuning, but when you learn how to ride it, the regenerative detector will take you a long, long way! As a tuner following a crystal-controlled v.h.f. converter, its equal would be hard to find in the low-priced communications receiver category.

The amplifier stage, V_1, preceding the detector provides gain, but more important it isolates the detector from the converter stages, and makes control of regeneration a relatively simple matter. The gain control, R_1, allows the operator to feed signals to the detector at the optimum level for all types of reception, and while this makes for two-handed tuning and the need for a bit of juggling now and then, it helps the simple receiver to do its job in an effective manner.

The detector may be operated in three different conditions by varying the screen voltage (regeneration) control, R_2. At low screen voltages the detector works at low sensitivity, but in a completely uncritical manner, making it fine for strong local signals. As the voltage is turned up you hear the noise rise as the detector nears the oscillation point. Sensitivity and selectivity pick up here, and if the detector is adjusted carefully just below the point of oscillation, the sensitivity on modulated signals is very good. Condition 2 is reached when the detector goes into oscillation. In tuning through a signal you hear a beat note, just as with a communications receiver with its beat oscillator on. This is the c.w. or s.s.b. mode, and highest sensitivity is found just on the high side of the point where oscillation stops.

Condition 3, superregeneration, occurs at higher screen voltage, and is characterized by a loud "rushing" noise when no signals are being



Rear view of the tuner. Note that a double-bearing capacitor is used for tuning the detector circuit. The ceramic padder to the left is C_2. The detector is the left of the two smaller tubes. Asymmetrical arrangement of the two audio chokes is for minimum hum pickup.

received. Only modulated signals can be copied with a superregenerative detector, for there is no audible beat with the incoming carrier; only a drop in the background noise when the signal is turned in. The degree of quieting is dependent on signal strength, and the stronger signals (locals and some DX) quiet the noise almost completely. In superregeneration the detector is not easily overloaded, and tuning is uncritical. It is markedly insensitive to ignition and other impulse noise. Audio quality is inferior to other modes of detection, however, and the rushing noise takes some getting used to. Old-timers in the v.h.f. game will tell you that there is no music as sweet as the rush of a smooth superregen, but you will not love it that much, at first, if you're new to v.h.f. hamming!

Building the Tuner

Parts arrangement in the tuner is not fussy, but a layout template is available for drilling the chassis if you want it.[1] This is most useful if you use components mechanically similar to those in the original, a restriction that is not too important otherwise. Probably the only critical item is the main tuning capacitor, C_1. A double-bearing model with mounting feet front and rear is desirable here, for there may be a slight amount of backlash in the tuning with single-bearing types. A template that comes with the National dial can be used in laying out the front panel. The three potentiometers can be arranged in any convenient manner.

The power and audio circuits were wired with Belden Type 8885 shielded wire. This is not absolutely necessary, but it is a great aid in doing a neat job. Shielded leads can be any necessary length, and can be run in corners of the chassis or wherever convenience dictates, so long as their shields are bonded together at intervals with solder and held in place with an occasional grounding lug. But don't use shielded wire for any circuits carrying r.f.!

[1] Templates for use in drilling the surface of the tuner chassis, the top plates of the two transmitter r.f. units and the top surfaces of the two converters are available without charge from the ARRL Technical Department. Be sure to mention the ARRL publication, the edition, the page number, and the equipment for which the template is desired, and send a stamped self-addressed envelope with your request.

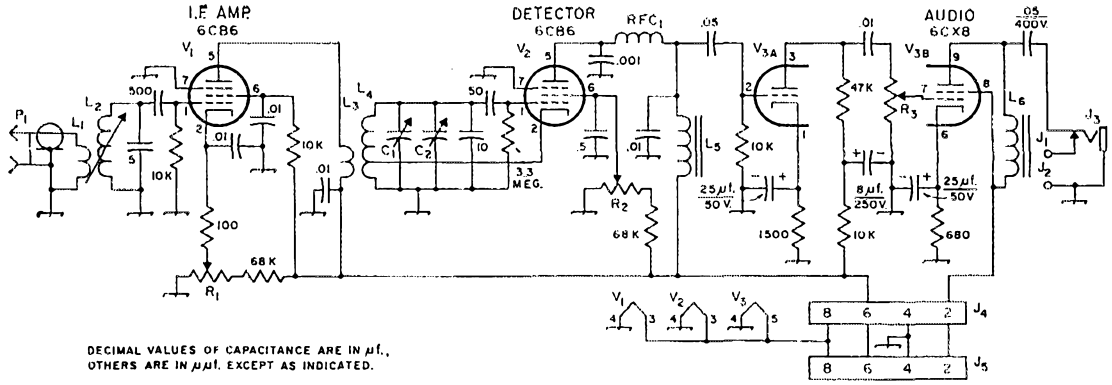


Fig. 2—Circuit diagram and parts information for the 14- to 18-Mc. tuner. Capacitors marked with polarity are electrolytic. Others are paper—tubular, ceramic or mica, 200 volts or more, unless marked. The .01 and .001-μf. are ceramic disk. Resistances are in ohms, resistors are ½ watt unless specified.

C_1—50-μμf. double-bearing variable (Hammarlund MC-50-S).
C_2—4-30-μμf. ceramic trimmer (Mallory ST554N or Centralab 822-EN).
J_1, J_2—Insulated tip jack.
J_3—Closed-circuit phone jack.
J_4—8-pin male chassis fitting (Amphenol 86-CP8). Goes on left side of chassis.
J_5—Octal socket (Amphenol 77-MIP-8).
L_1—3 turns No. 24 insulated wire wound over low end of L2.
L_2—4½- to 10-μh. iron-slug coil (Miller 21A826RB1).
L_3—4 turns No. 24 tinned, 32 t.p.i., ½-inch diam.
L_4—10½ turns like L_3. Both are made from single piece of B & W Miniductor No. 3004. See text. Tap at third turn from inner end.
L_5 L_6—16-hy. 50-ma. filter choke (Stancor C-1003).
P_1—Shielded phono plug, attached to 18-inch length of small-diameter 52- or 75-ohm coaxial cable.
R_1, R_2—20,000-ohm control (25,000-ohm also suitable).
R_3—500,000-ohm control, audio taper.
RFC_1—100-μh. r.f. choke.
V_1, V_2—6CB6.
V_3—6CX8.

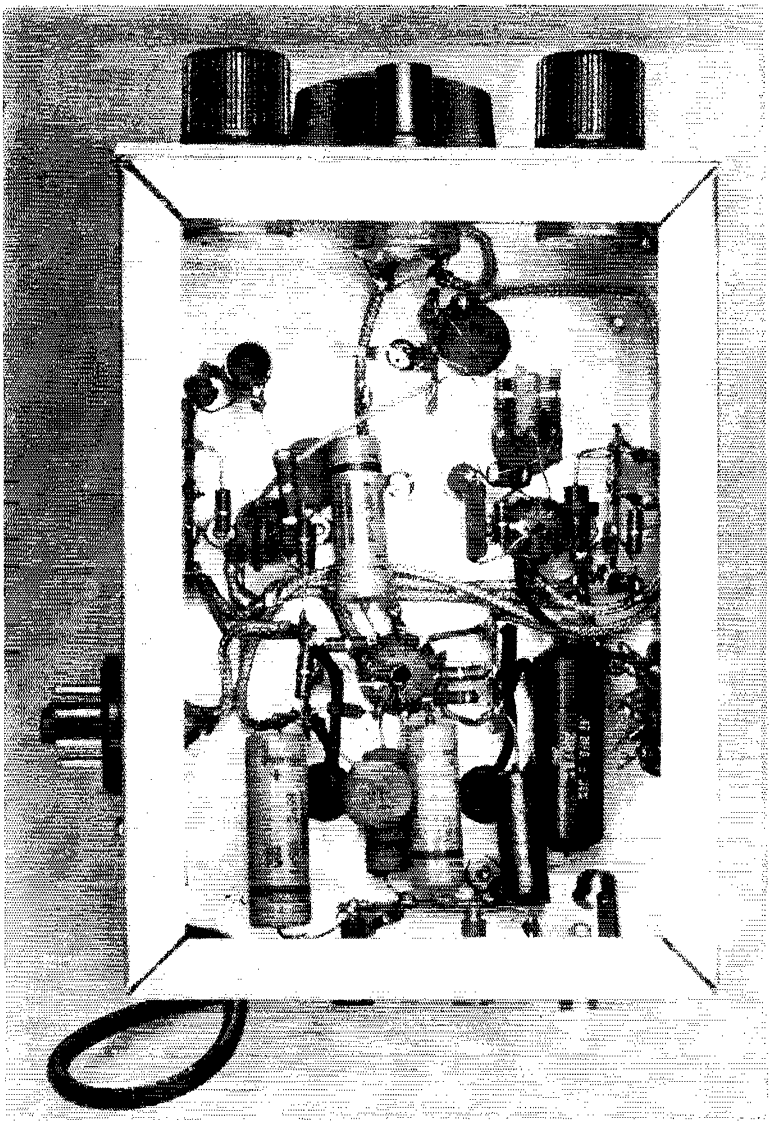
Use of insulated tie-point strips for mounting small parts also makes for a neat wiring job. When you assemble the tuner put these strips adjacent to each socket. Use whatever lugs you need and clip off unused ones when the wiring job is done. Cultivate the shielded-wire and terminal-strip habits and you'll have a big jump in the matter of neatness in your construction projects. The *ARRL Handbook* chapter on construction practice will give you other helpful ideas.

Looking at the tuner from the top rear you see the tuning capacitor, C_1, and its padder, C_2, at the front. The ceramic padder is at the left, with its rotor lug clamped under a washer and its stator lug soldered to the front stator bar of C_1. At the right of C_1 is the tuning screw for the i.f. amplifier coil, L_1-L_2. A feedthrough bushing (National TPB) is mounted directly in back of the left-side stator lug of C_1. The 10-μμf. fixed padder, the 50-μμf. grid capacitor, and the top end of L_4 are connected to the underside of this feedthrough.

The detector tube, V_2, is at the left, and the i.f. amplifier, V_1, is at the right, just in back of C_1. The dual audio amplifier, V_3, is near the middle of the chassis. The two chokes at the rear and left side of the chassis are L_5 and L_6, respectively. These are used instead of audio transformers, and just about any small filter choke will serve. Audio transformers are also OK, though somewhat more expensive. The output coupling arrangement, L_6, the .05-μf. capacitor, and phone and speaker jacks, are for use with ordinary headphones or a speaker that has its own output transformer (a transformer for use with ordinary audio output tubes will do). A connection directly to the voice coil (low impedance) will not work with this coupling. With speaker leads plugged into the tip jacks, J_1 and J_2, the speaker is connected automatically when the phones are removed from J_3. The position of the jacks and the hole for bringing out the coaxial input lead, on the back wall of the chassis, is not critical.

The male power plug, J_4, on the left side of the tuner when viewed from the front, fits into a matching socket on the right side of the modulator unit. To use the tuner at some distance from the modulator, a cable of the required length may be made with an Amphenol 78-S8 socket at the tuner end and an 86-CP8 plug at the modulator end. These should be covered with Amphenol 3-13 plug caps. Placement of the plugs and sockets in the side walls of the various components of the station is not important, so long as they all will match up.

Except for the i.f. and detector coils, L_2 and L_4, placement of other parts is not critical, and considerable variation from the original can no doubt be made without affecting results. The i.f. coil is a standard Miller slug-tuned unit of approximately 7-μh. inductance. The primary coil, L_1, is wound over the bottom turns of L_2. It is wound on, cemented in place, and left to dry while other work is done. The turns are in the same direction as the secondary, and the bottom ends of both windings are connected to ground. The top end of L_1 is brought to a tie point, where the coaxial line is connected to it.



Bottom view of the tuner. Arrangement of parts, other than the i.f. amplifier coil, L_2 (upper left) and the detector coil, L_4 (upper right), is not particularly critical. Power and audio circuits are wired with shielded wire.

The detector coils, L_3 and L_4, are made from a single piece of B & W Miniductor. Start with a piece having at least 20 turns. This fine-pitch coil stock can be cut readily if a sharp knife is held against the plastic supporting strips and heated with a soldering iron pressed against the top edge of the knife. When the blade nears the melting point of the plastic, the ribs can be cut easily. At the sixth turn press the wire down toward the axis of the coil. It may then be cut or broken. Thread the ends back out and unwind a half turn each side of the cut. Now unwind the outside turns until there is left a coil of 4 turns and one of 10½. The tap is made by pushing down the third turn up from the inner end of the larger winding. This makes a point that can be soldered to for the lead to the cathode of the 6CB6.

This assembly is mounted in a horizontal position supported on tie points by its leads, as shown at the upper right in the bottom-view photograph. The outer end of the larger coil goes to the feed-through bushing, the outer end of the smaller to the plate of V_1. The balance of the assembling and wiring is almost completely uncritical, though neatness and ease of adjustment will be served if leads are kept short, particularly in the circuits of the amplifier and detector tubes.

Adjustment and Operation

If the tuner has been wired correctly it should be possible to hear signals of some sort on it almost at once. Apply 6.3 volts a.c. for the heaters between Pins 4 and 8 of J_4. Temporarily connect Pins 2 and 6 together and apply plate voltage,

preferably not much over 150 volts at first, positive to Pins 2 and 6 negative to Pin 4. Plug in the phones or speaker. Have all three potentiometers turned down. First try the audio gain control, R_3. Turning it up should bring up the level of noise, and possibly hum. Set it at a comfortable level, and turn the i.f. gain, R_1, about three-fourths on. Turn up the regeneration control, R_2, until a rushing sound is heard. Attach a few feet of wire to the tip of the plug, P_1, and turn the dial slowly.

Some signals should be heard, unless you have hit one of those rare times when the 14-Mc. range is completely dead. When you find a signal, experiment with the setting of the i.f. gain control, R_1, and the regeneration control, R_2. If you have never used a regenerative or superregenerative detector before, the intricacies of adjusting it properly will take some learning. Practice with various signals, trying the three conditions mentioned earlier. You may be surprised to find that a little receiver like this can pick up a lot of stuff, once you learn how to tune it properly.

Now, you're ready to peak things up, and get the dial calibration around to what you want. The tuning capacitor, C_1, has the ceramic capacitor, C_2, connected across it, so the setting of the latter will markedly affect the tuning range of your vernier dial. If you have made your coil correctly, setting C_2 to near maximum capacitance will place the 14-Mc. amateur band near the maximum-capacitance end of the tuning range of C_1. If you succeed in locating the amateur band you will find c.w. signals at the low frequency edge, and phone signals above them. Adjust C_2 gradually until the lowest-frequency amateur c.w. signal comes in with the dial close to its maximum-capacitance setting. A good signal to look for now is WWV or WWVH on 15 Mc. One or the other of those stations, perhaps both, will be receivable at least part of the time almost anywhere in the United States. With these and the low end of the amateur 14-Mc. band, you have the first megacycle of your tuning range well marked.

Note that an indicating pointer for the dial is made by sticking a triangular-shaped piece of black plastic tape to the nickel-plated rim. Put the capacitor at the maximum setting, and then attach the pointer to the rim so that it is bisected by the left side of an imaginary horizontal line drawn through the center of the dial. When you turn the dial around to bring the capacitor plates all out, the mark will be at the right side. If you have used components similar to the original, you can set the padder, C_2, so that 14 Mc. is just above the horizontal point at the left, and 15 Mc. will come just a bit to the left of vertical. The next megacycle of tuning, to 16 Mc., will occupy slightly less space, and the third and fourth megacycles (to 17 and 18 Mc.) progressively less. This is a fortunate result of the plate shape in the tuning capacitor: the more active lower halves of the v.h.f. bands you will eventually be tuning will be spread out more than the less-occupied frequencies at the high ends.

When you get your converters working, 14 Mc. will be 50 or 144 Mc., 15 Mc. will be 51 or 145 and so on. The tuner will operate almost exactly the same when working with the converters as it now does on 14 to 18 Mc., except for variations that will be discussed when the time comes. For the moment, you can tune 14 to 18 Mc., and there is a lot going on in that range most of the time. It won't do any harm to practice tuning with this little gimmick, for one of the prices of performance with simple equipment is some trickiness in operation. There is more to running this one than turning the dial!

With the tuner plugged directly into the power supply you may find that the hum level is too high to suit you. This is the result of inductive pickup from the power-supply components by the chokes in the tuner audio circuits. The position of the chokes was adjusted for minimum hum pickup, but it is still considerable at high audio levels. Running the tuner with even a short cable between it and the power supply will bring down the hum level markedly. Use of completely shielded chokes or audio transformers also reduces the hum level, but at higher cost.

QST

Strays

The Cosmos G. Calkins Memorial Award for 1960, presented annually to a Michigan amateur making an outstanding contribution to amateur radio in Michigan, went to Currin L. Skutt, W8FSZ, who is seen at the left receiving the award from Gordon Main, W8OCK, president of the Central Michigan Amateur Radio Club. OM Skutt has been active in helping the Secretary of State for Michigan process the applications for call-letter license plates, in Michigan phone nets, on the TVI Committee of CMARC, and has served as president, vice-president, treasurer, and director of CMARC.

Sporadic-E Warning Service for the Six-Meter Man

BY DAVIS A. HELTON,* WØPME

THIS discussion is the result of a little squib hidden away in the v.h.f. column of *QST* a few months ago, in which a VE2 reported that WØPME gave him his first Missouri QSO on 6 meters one day last winter. A few other 6-meter men in the area scored, too, but dozens missed a good chance because they didn't know the band was open.

During the spring season (May–July), sporadic-*E* isn't hard to find, and tropo openings aren't hard to dope out. Most of the serious v.h.f. men I know watch the weather maps in the local paper and let an f.m. broadcast tuner do the work for them. An aurora is even harder to miss, and 10 meters makes a good indicator for *F*-layer DX, but what about off-season sporadic-*E*? These openings are more often missed than spotted. A lot of wintertime sporadic-*E* goes to waste simply because many 6-meter DX men have closed shop, and the level of activity on the band outside metropolitan areas is low.

For short, spotty *E* openings, TV Channel 2 isn't much of an indicator. Most of the time the ionization level isn't high enough to affect it, and there may be no TV station on that channel in the area of the opening.

The best indicator of all, in my opinion, is a little 40- to 50-Mc. f.m. tuner of the type purchased by deputy sheriffs, village marshals, and auxiliary police, to monitor their local state police stations. Now there is no law against listening to the police services, as long as you abide by the provisions of the communications secrecy regulations. So, if you want to steal a jump or two on some of the 6-meter DX hounds, give it a try.

A good setup would be to use the tuner to work into whatever extra audio system you have kicking around the shack. For an antenna, the best is just a vertical doublet, about 55 inches of element each side of center. A ground plane will also serve nicely, and your 6-meter beam will work after a fashion. Now, how do you tell what you're hearing?

The base stations in the police service are assigned calls consisting of three letters followed by three numerals. The first letter is always K. The second letter indicates the call area (these coincide with the ham call areas), and the third is merely part of the numbering system. That second letter is what you want: A or B means WØ; C or D is W1; E or F, W2; G or H, W3; I or J, W4; K or L, W5; M or N, W6; O or P, W7; Q or R, W8; S or T, W9. Simple, isn't it?

The almost universal practice in this service is to begin a transmission with the name of the town calling, and to conclude a series of transmissions with the assigned call. If, for some reason, you are still unable to determine the location of the station, and you have its assigned call, you might contact the radio station of the local state police and ask them to look it up in their APCO manual. This is a large book listing locations of police stations in alphabetical order of their calls, then listing, by state, the licensed stations, their calls, and frequencies.

Once you begin making a list of states and the frequencies on which you find them, you can set the tuner on some likely frequency, set its squelch, and forget about it. The i.f. selectivity in these tuners is rather broad, but they are usually reasonably sensitive. It is seldom necessary to check their frequency. Since the police themselves use equipment that is much more selective, their channels are close enough that you will not only hear the one on which the tuner is centered, but an adjacent channel on each side. For our purposes, this is an advantage.

Since there is insufficient space to assign separate channels to each state, they are assigned on a shared basis. The frequency coordinating committees try to set up a sharing system in such manner that states on the same channel are too far distant to interfere with each other in a tropo opening and too close to be affected by *F*-layer skip. This is rather difficult to do but works out fairly well. (The foregoing will please be ignored by the Colorado and Nebraska Highway Patrols, who knock each other out regularly!)

One thing to be avoided is setting your monitor on a channel assigned exclusively for mobile transmitter use. Most states use a system by which the mobile units monitor the base station on one frequency and transmit on another. The only identifications you would hear on a mobile channel are car numbers, badge numbers, or an FCC-assigned mobile call of two letters and four numerals — not much value in pinpointing the location.

There you are! Dozens of 2- to 5-kilowatt transmitters manned 24 hours a day, many on the same or adjoining frequencies, with antennas

(*Continued on page 132*)

*c/o Radio Division, Missouri Highway Patrol, Jefferson City, Missouri.

The Spare-Parts Plutocrat

BY BILL HAYWOOD,* K4ATG

No ham shack is complete without the proverbial spare-parts junk box. Here's a good way to start one. The author estimates a $71 return in usable components for a $5 investment.

How many times have you run across articles reading somewhat as follows: "If you have a well-stocked junk box, this equipment will cost almost nothing," or, "The power transformer from an old TV set is ideal for the power supply."? Almost as often, the sentence that proves fatal to so many construction projects appears. Usually it goes something like this, "Total cost, if you purchase all parts new, will be approximately $50.00."

If you have an overstocked junk box, a bank account in the same condition, or never intend to build a piece of electronic equipment, stop reading; this article isn't for you. However, if you can't qualify for membership in this select group, get set to strip components from an old TV set and join the ranks of the Electronic-Parts Plutocrats.

The photograph offers ample evidence that there is a very large number of valuable parts awaiting the enterprising ham in almost every old television set. Of course it isn't necessary to straighten the leads so nicely, and seldom will a junk box boast so many clean and bright components, but the appearance of most parts collections will be benefited by the little extra work required.

The Approach

How do you become a TV-set stripper? The prescribed formula is as follows: Take your telephone directory and turn to the yellow pages. Under "Television" the names of local TV repair shops and merchants will provide a list of potential sources of "so-called" junk sets. Jot down the numbers and dial one selected at random. Briefly explain your reason for calling. Include the fact that you are an amateur radio operator if you are licensed. Usually you will get a quick, "Yes, we have some old sets," or "Sorry, we just threw out all our old junk." At any rate, chances are sooner or later one of the names on the list will come through with the answer your ears have been straining to hear. "Yes, we have loads of old junk TV sets."

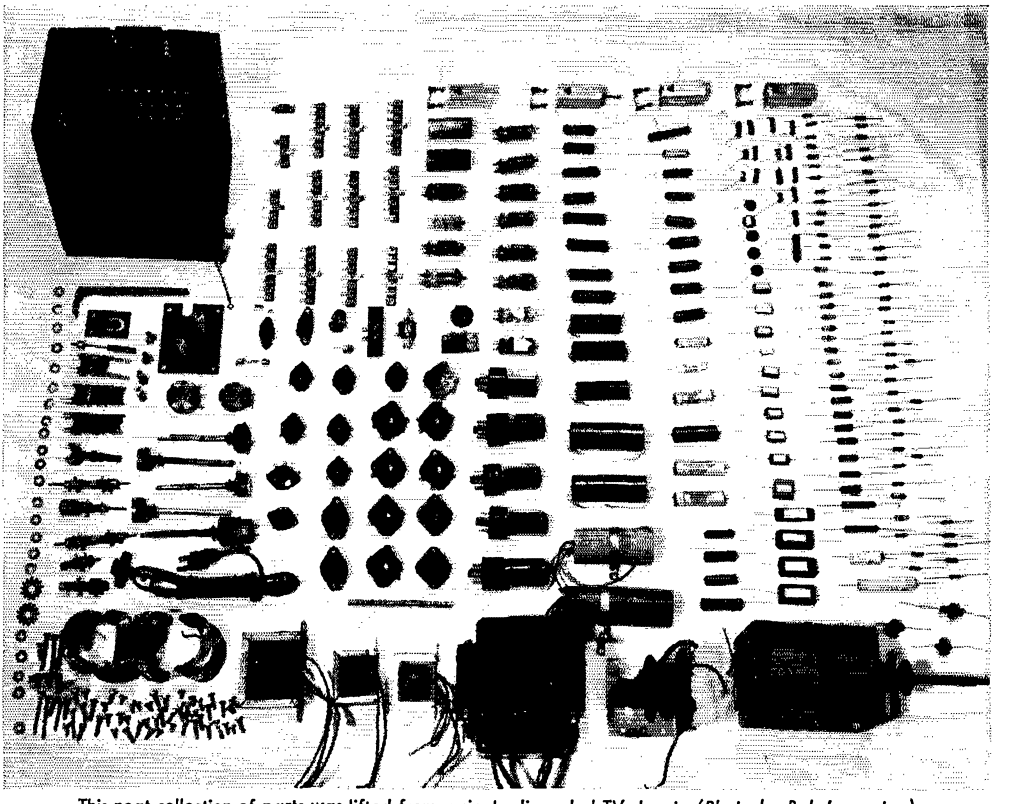
Once you get this answer, take a few dollars, a buddy to help load the plunder, and dash down to scout the lay of the land. At this point the old charm should be exercised in its most eloquent form. This may sound a little on the shady side, but it is just using good common sense. You can't afford to pay much for the old set, and yet the shop owner must get what he considers a fair price for his merchandise. You aren't buying a "fair-trade item," and he will charge in accordance with what he thinks the set is worth. Here again the old rule which dominates all other price structures comes into play — the rule of supply and demand. If no one comes around looking for old sets, they are useless and worthless. If demand for old sets arises, their value goes up. An over-eager or anxious purchaser can create that demand. It is reasonable to assume that unless a certain amount of restraint is exercised in trading, you may come away empty handed and leave a disappointed businessman who has wasted valuable time because no sale was made. The price, naturally, will depend to a great extent on the condition of the set and components left intact. Remember to look for the power transformer and check its condition. Take a close look at the wiring and smell the transformer leads. A burned-out transformer usually gives off a strong odor of burned varnish or lacquer.

Removing Components

When you hoist the prize onto your workbench and begin removing parts, the fact that a TV set attracts large amounts of dirt and grease will become apparent. Parts will often be completely encased in a substance having the appearance of soot. An outstanding characteristic of this coating is the tenacious way in which it resists removal. A soft cloth moistened with mineral spirits, and a little elbow grease, will provide the solution to this problem. Parts soon emerge bright and glistening, actually preserved by the grime.

Exercise good workmanship in removing parts from the set. As in every other worthwhile project, a little extra care and patience pays large dividends here. Resistors and capacitors hurriedly cut loose or jerked out of the set will often prove very difficult or impossible to use. A hot soldering iron with a clean tip and adequate capacity is a big help. It will enable you to melt soldered joints quickly so that parts can be re-

* 1129 50th St. West, Birmingham 8, Alabama.



This neat collection of parts was lifted from a single discarded TV chassis. *(Photo by Bob Lancaster.)*

moved before they are heated excessively. Grasping leads with needle-nose pliers also helps reduce danger from overheating. Above all, work carefully. High-quality parts will emerge from the TV set only if they are treated as such.

Your Profit?

Are the salvageable parts worth the time and effort and the price of the set? Obviously the answer is a definite yes. In a typical case, a hasty check on those components likely to be useful to the home builder revealed that the initial cost of five dollars (the cost of the set from which the pictured parts were taken) amounted to less than one-fourteenth their catalog value. Absolutely no effort was made to obtain a "special" set, and parts shown were all removed from one chassis.

Naturally, all the material taken from an old TV set will seldom be used by anyone. However, a few parts can be put to use in almost any project, and articles boasting that the equipment described can be built for nothing if the builder has a well-stocked junk box will take on new meaning for you.

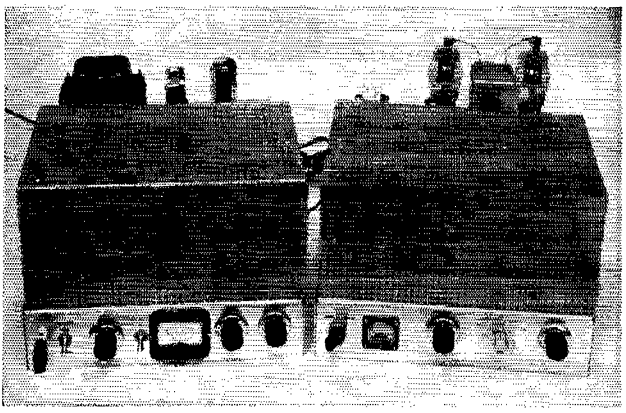
Identifying Values

Only after all parts are disassembled and neatly arranged in cigar boxes, plastic boxes, or perhaps an old chest of drawers, will the real challenge face a large number of amateurs. This is the problem of learning to identify parts and determine component values from color codes. *The Radio Amateur's Handbook* is a fine place to obtain knowledge of this sort. The chapter entitled "Construction Practices" contains a

(Continued on page 134)

Catalog prices of items in the photograph are shown below. Items such as the flyback transformer, yoke, hardware, etc., are not included in the list.

Catalog Price	*Item*
$ 9.85	Resistors
3.28	Sockets, plugs, jacks, line cord, etc.
22.00	Tubes
2.33	Tie strips, insulators, shields, etc.
11.00	Power transformer
2.75	Choke
2.00	Output transformer
8.51	Electrolytic capacitors
9.28	Ceramic, mica, plastic, and paper tubular capacitors
$71.00	Total catalog value
5.00	Total cost
$66.00	Indicated savings



This view shows all four of the units—exciter and amplifier in the front, power supply and modulator at the rear. As mentioned in the text, considerable space and expense can be saved by incorporating the rig into a single unit.

Plate Modulation for the TV-Set/Surplus Transmitter

BY LEWIS G. McCOY,* W1ICP

If you've been reading *QST* for the last few months you should recognize two of the units shown in the photograph. The low-power transmitter appeared in March *QST*[1] and the 150-watt amplifier in the April issue.[2] By combining these two units and making a few changes in the power supply, a very economical 150-watt c.w. transmitter can be built. The power transformer taken from the old TV set had more than enough current rating to run the 150-watt setup — in fact, there was enough power left over to operate a plate modulator. So it was decided to add one, making a combination 150-watt c.w. or 120-watt phone rig. Also, since keeping the cost down was the primary feature of the transmitter, it was decided to try to do the same with the modulator.

A large part of the cost in building any plate modulator is in the modulation transformer. A 60-watt job (you need 60 watts in order to fully modulate 120 watts of r.f.) usually costs from twelve to fifteen dollars. In looking over the surplus market a good bet appeared to be the MD7/ARC-5 modulator, which is designed for the ARC-5 transmitters and uses a pair of 1625s, the same as the tubes in our transmitter. The MD7/ARC-5 modulator has an excellent modulation transformer, a pair of 1625s, a 12J5 and other items that are of use. Depending on where you look in the surplus market, the MD7 can be purchased as low as four dollars for a used unit. This certainly appeared to be an answer to the cost question — and so it was, as you can see from the photographs.

The four chassis include the exciter, amplifier, modulator and power supply. Admittedly, this takes up more room than necessary. If the builder is starting from scratch, the whole works can be combined on a single large chassis, thereby reducing the cost. Besides the lower cost of a single large chassis as compared with four small ones, you would save on coax fittings, cables, cable connectors, and other miscellaneous items.

Modulator Circuit Details

A 12AX7 dual triode is used as a speech amplifier in the modulator unit, Fig. 1. The original MD7 used carbon-mike input, but it was assumed that most amateurs would prefer crystal or other high-impedance microphones, so the extra speech amplifier was used. Output from the 12AX7 is used to drive a 12J5 which is transformer-coupled to the grids of the 1625s. The 1625s are operated in Class AB_1. T_3, the modulation transformer, has three secondary windings. One is for the plates of the modulated r.f. amplifier and another is for the screens of the same tubes. The third winding was used in the original

*Technical Assistant, *QST*.

[1] McCoy, "65 Watts at Low Cost," *QST*, March, 1961.

[2] McCoy, "Surplus Tubes + an Old TV Set = 150-Watt Amplifier," *QST*, April, 1961.

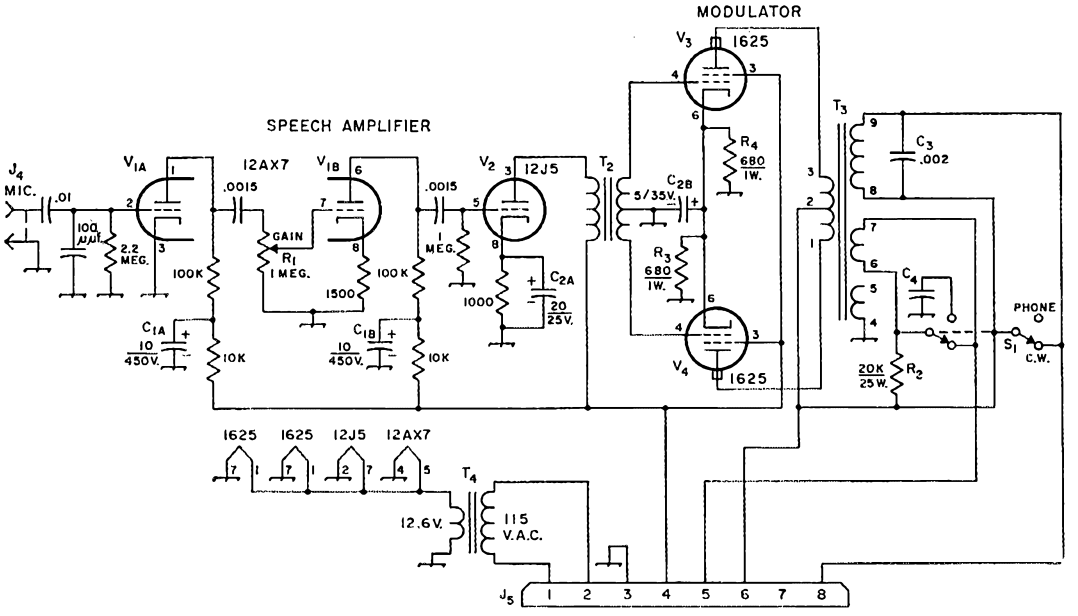


Fig. 1—Circuit diagram of the modulator unit. Unless otherwise indicated, capacitances are in μf., resistances are in ohms, resistors are ½ watt. Capacitors not listed below can be paper, mica, or disk ceramic.

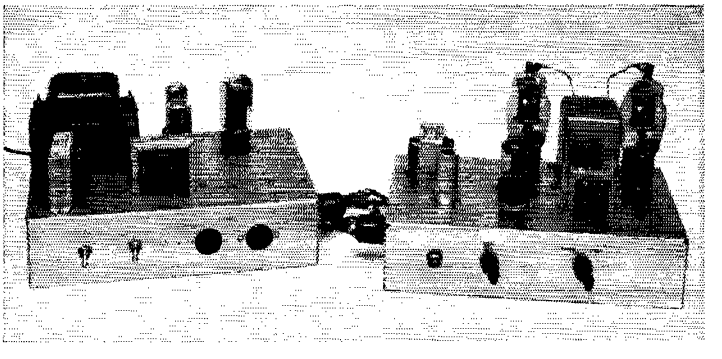
C_1—Dual 10-μf. 450-volt electrolytic.
C_2—Dual electrolytic from MD7; see text.
C_3—0.002-μf. paper or disk, 1000 v.
C_4—1.2-μf. electrolytic from MD7.
J_4—Microphone connector (Amphenol type 75-PC1M).
J_5—Octal plug, male chassis-mounting type (Amphenol type 86-CP8).
R_1—1-megohm control, audio taper.
R_2—20,000 ohms, 25 watts; see text.
R_3, R_4—680 ohms, 1 watt, from MD7.
S_1—Ceramic rotary, 1 section, 2 poles, 6 positions, 2 positions used (Centralab PA-2003).
T_2—Driver transformer, single plate to pushpull grids. Ratio 3:1 primary to ½ secondary (Stancor A-4723).
T_3—Modulation transformer from MD7; see text.
T_4—12.6 v., 2.0 amp. (Knight 61G420, Triad F-26X, Stancor P-8130).

equipment for side-tone output but is not used in this circuit. S_1 is a double-pole switch that is used to short out the screen and plate windings of T_3 when the transmitter is used on c.w. This serves to protect the transformer from voltage surges.

The TV power transformer used in the original installation didn't have a heavy enough filament winding to carry the additional modulator tubes, so an inexpensive 12.6-volt transformer, T_4, was installed in the modulator. This transformer takes care of all the tube heaters in the unit.

Power-Supply Details

To operate the exciter and modulator, certain changes are required in the power supply as originally described in April *QST*. Fig. 2 shows the revised circuit of the supply. In the original circuit only a high-voltage source was needed. In the revised unit additional components, L_2 and



At the left is the power supply. If you compare this view with the original in April *QST* you can quickly identify the changes. The choke at the left front corner is L_2. Across the front of the chassis from the left are S_2, S_3, J_1, and J_2. Along the top rear of the modulator chassis from the left are T_4, the 1625s and the modulation transformer, T_3. Just in front of T_3 is T_2, the driver transformer. On the front of the chassis are the microphone jack, gain control, and phone-c.w. switch, S_1.

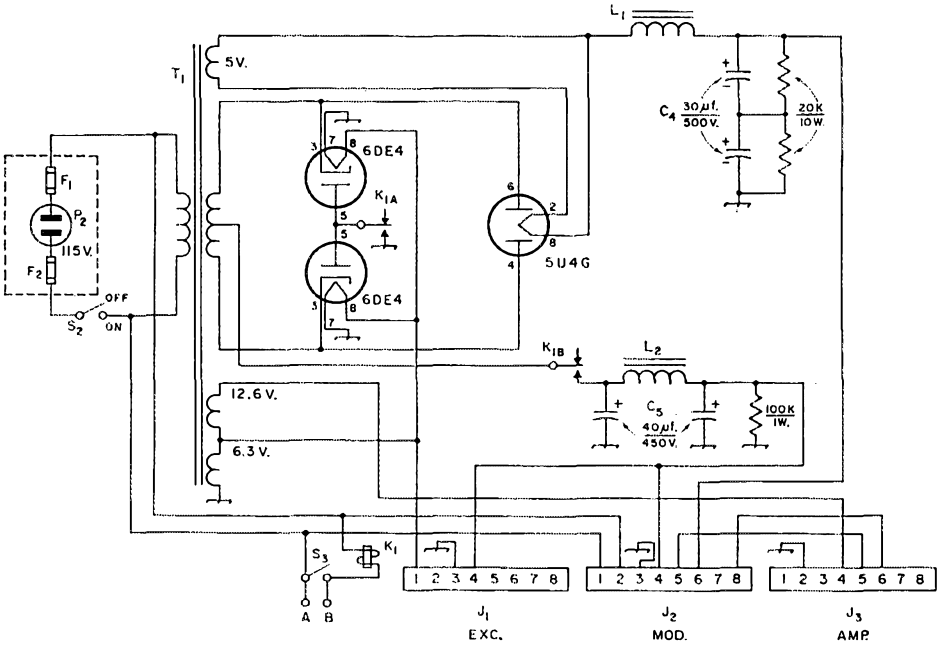


Fig. 2—Circuit diagram of modified power supply. Capacitances are in μf., resistances are in ohms.

C_5—Dual 40-μf., 450-volt electrolytic.
J_1, J_2, J_3—Octal sockets.
K_1—D.p.d.t. 115 v. a.c. relay (Potter and Brumfield KA11AY).
L_2—15 hy., 75 ma. (Stancor C-1002, Knight 62G138).
S_3—S.p.s.t. toggle switch.
For other parts designations see Fig. 2, p. 22, April, 1961, *QST*.

C_5, are added to supply a filtered low-voltage source. This voltage, taken from the center tap of T_1, works out to about half the value of the high voltage.

Another addition to the unit is K_1, a double-pole 115-volt a.c. relay. This relay is controlled by S_3, the transmit-standby switch. The relay contacts are used to turn the d.c. voltages on and off. Some operators prefer to have the control switch mounted in a convenient spot at the operating desk. Terminals A and B on the power supply are provided so that external leads can be connected to the supply and the unit can be operated by a remote switch.

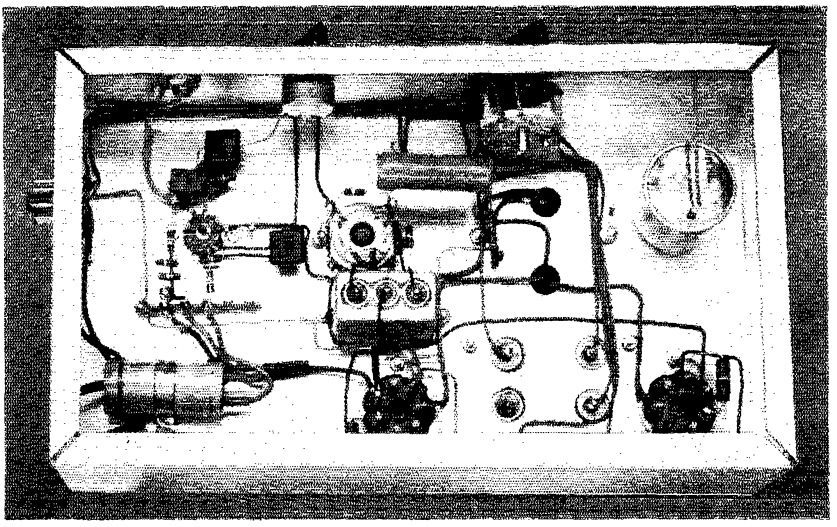
Connectors J_1 through J_3 are octal sockets serving as the power terminals for the cables to the three units, exciter, amplifier, and modulator.

Only two changes are required in the exciter shown in the photographs for it to be used as a driver for the amplifier. Remove one of the amplifier tubes, as a single tube will provide all the drive that is needed. The other change is to rewire the power plug (P_1 in the original description) to conform with the connections of J_1 in Fig. 2 of this article. Of course, if you already have a power supply built for the exciter you can use it without making any changes in the power connections.

Modulator Construction

A 3 × 7 × 12-inch aluminum chassis is used to hold the modulator components. While it probably would be possible to use the MD7 ARC-5 chassis for the unit, a much neater job can be done by removing all the needed parts from the surplus unit and mounting them on a new chassis. The component layout of the modulator isn't critical, but it is a good idea to follow the general layout shown in the photographs. There are six terminals on the bottom of the modulation transformer, with an identifying number marked on the case alongside each terminal. When making the six holes in the chassis for the terminals be sure to mark the terminal number alongside the hole on the underside of the chassis, as it is easy to make a mistake when installing the unit. Incidentally, the No. 4 terminal is the case of the transformer, or ground.

Use a piece of shielded wire between J_4 and Pin 2 of the 12AX7 and ground the shield at both ends; this will reduce any chances of hum pickup on the lead. C_2 is a metal-cased dual electrolytic capacitor taken from the MD7. There are three terminals on the unit. One, marked "20-μfd.," is the positive terminal of the 20-μf. section; the case of the capacitor is the negative terminal. The middle terminal is the positive end of the 5-μf. unit, and the remaining one is the negative end. C_4 is a 1.2-μf. capacitor, also in a metal case; the single terminal is positive and the case is negative. R_2 in Fig. 1 is the original screen-dropping resistor (20K, 20 watts) used in the 150-watt amplifier. Installing this resistor in the modulator simplifies the cable wiring between the units. The only change required in the amplifier is to bring out a lead from Pin 3 of the clamp tube



The potted capacitor C_2, which was taken from the MD7, is in the center of the chassis in this bottom view of the modulator. Just above C_2 is R_2, the screen dropping resistor that was moved from the amplifier to the modulator. At the upper right-hand corner is C_4, another potted capacitor taken from the MD7.

to P_1 of the amplifier circuit. See Fig. 3 for details of this change.

Tune Up and Testing

Before applying power, check all your cabling connections carefully. In fact, if you have an ohmmeter it is a good idea to make continuity checks between the units to be sure you haven't made any wiring errors. Be particularly careful that all chassis have a common ground connection.

Connect all the power cables to the power supply, and connect the exciter to the amplifier, using a short length of coax cable. Put a dummy load on the amplifier (a 100-watt lamp will be suitable for the purpose). Put the modulator-c.w.-phone switch in the c.w. position and turn on the power. Next, adjust the exciter so that you have about 8 ma. of final-amplifier grid current and then resonate the final tank. Adjust the loading on the amplifier as outlined in the previous article. However, only load the amplifier up to 120 watts input, as this is maximum rated input for plate modulation for 1625s.

Next, switch the c.w.-phone switch to the phone position and while talking into the microphone, increase the gain control, R_1, until the light bulb load brightens up on voice peaks. Plate current for the two 1625 modulator tubes rests at about 50 ma. when there is no speech input and will kick up slightly — to not more than 60 ma. — on voice peaks when the r.f. amplifier is being modulated 100 per cent. This plate current can be checked by opening the plate lead at the No. 2 terminal of the modulation transformer and inserting a 0–100-ma. meter between terminal No. 2 and the lead that normally goes to it.

In some instances when using a clamp tube on a plate-modulated r.f. stage, it is possible to run into distortion problems because the clamp tube is not entirely cut off when drive is applied to the r.f. amplifier. Checks with a scope on this unit showed that these problems were not present with the clamp tube in the circuit.

Checking percentage of modulation requires the use of additional equipment, and it is recommended that the reader familiarize himself with the techniques by studying the modulation chapter of the ARRL *Handbook*.

We won't say that everyone can come up with the same figure, but judicious scrounging of parts from old TV sets and surplus gear held the price of this complete transmitting setup to less than $50.00. We think that's hard to beat. QST

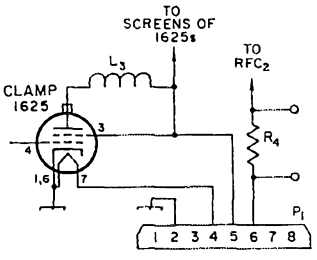


Fig. 3—Circuit modifications for removing the screen-dropping resistor from the amplifier. Designations are the same as in the original amplifier circuit (April QST).

Strays

VE W Contest Correction

VE/W Contest Chairman VE2BB informs us that the following calls appeared incorrectly in their tabulation of the VE/W Contest results appearing in June *QST*. The Ohio winner should be W8QHW and the East Bay winner should be WA6ECF.

Understanding Tetrode Screen Current

Significance in R.F. Amplifier Adjustment and Operation

BY DAVID D. MEACHAM,* W6EMD

This article discusses the behavior of screen current in a tetrode r.f. power amplifier using fixed screen voltage, and explains why a screen-current meter is a better indicator of operating conditions than a plate-current meter. Particular reference is made to the adjustment of AB_1 linear amplifiers.

PERPLEXING screen-current behavior has probably disturbed many amateurs, particularly single-sideband operators. The need for a thorough discussion of the subject has prompted this article. Class AB_1 operation has been chosen for discussion because of its current popularity as a means of achieving good linearity and TVI-free operation. The information given herein assumes grid-driven conditions, but it applies equally well to cathode-driven tetrodes operated Class AB_1 with normal d.c. voltages on the grid and screen, provided that grounded-grid characteristic curves are used for computations.

Screen Characteristics

Fig. 1 shows a set of *constant-current characteristics* for a typical 4CX300A. The term "constant current" is used because the lines plotted are lines of constant plate, screen, or grid current. The grid-voltage scale appears on the left axis and plate voltage is shown horizontally. These curves depict *instantaneous values* of plate and screen current for any given grid- and plate-voltage condition. In this reproduction, the grid-current lines are omitted because grid current is not drawn in Class AB_1 operation. The curves are valid only for a *fixed* screen voltage (350 volts in this case).

Inspection of Fig. 1 will reveal that the lines of constant plate current are nearly horizontal, whereas the constant-screen-current lines are tilted upward from left to right and are concentrated in the left-hand region of the plot. This is generally true for all tetrodes and accounts for the fact that the screen-current meter is *the most sensitive indicator of resonance.* This important fact will be explained subsequently.

Let us plot a typical operating line[1] on our set of curves, as in Fig. 1. Point O (at −55 volts on the grid in this case) is the operating point at which the tube rests with zero r.f. grid drive. Straight line OA represents a tuned r.f. circuit load (a pure resistance at the operating frequency).[2] As 100 volts peak-to-peak grid drive is applied, the first positive half cycle can be represented by a point moving along the operating line from O to A and back to O again. During this half cycle, the grid-voltage swing from −55 volts up to −5 volts and back to −55 volts has caused the plate current to swing from the value at point O (100 ma.) up to the value at point A (850 ma.) and back to 100 ma. again. At the same time, the plate voltage swings from 2000 volts down to 500 volts. The a.c. plate current is made up of all the instantaneous values intercepted by the point traveling along the operating line. The same is true of screen current. During the other 180 degrees of the driving cycle, our point merely travels from O down the slope through cutoff to a point opposite −105 volts on the grid-voltage scale and back to point O again along the operating line. Thus, the negative-going grid voltage swings the plate current down to cutoff (for a small portion of the cycle). Plate voltage continues on up to 3500 volts and back down again due to the fly-wheel action of the plate tank circuit.

* c/o Eitel-McCullough, Inc., San Carlos, Calif.

[1] This is different from the usual load line associated with audio calculations using plate characteristic curves.

[2] OA is actually only half the operating line length. The other half continues from O out beyond the right-hand edge of the chart for an equal distance and represents the effect of the negative half-cycle of grid driving voltage as it swings down to −105 volts and back to point O again. This half of the operating line is not important since the tube does not "work" during the negative half cycle.

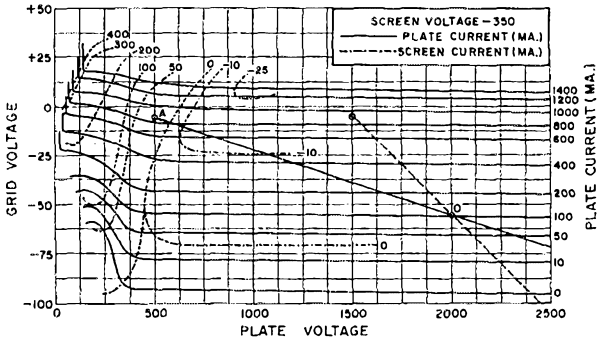


Fig. 1—Typical constant-current characteristics for the Eimac 4CX300A tetrode.

Drive and Tuning

Now that we can predict exactly what the screen and plate current will be for any *instantaneous point* during the grid-voltage cycle, let us ask some more probing questions. What happens when we cut our grid-driving voltage in half? The answer is simple. The *length* of our operating line is merely cut in half! The grid voltage swings to only one half the original peak-to-peak amplitude and the operating point O is still the center of the new operating line length. Now what happens if we detune the plate tank circuit? Detuning the plate circuit actually changes the plate load impedance. How does this appear on our set of curves? It tilts or rotates the operating line *about the operating point* O. As the load impedance is lowered (detuning from resonance), the operating line[3] assumes a steeper angle (a zero-impedance load would be represented by a vertical operating line).

As "seen" by the tube, the act of tuning to resonance amounts to increasing the load impedance to a maximum value consistent with the degree of antenna loading selected. Thus, the operating line will have *minimum slope* at resonance. Notice the angle at which our typical operating line in Fig. 1 cuts the constant-plate-current lines. It's a small angle. As the plate tank circuit is tuned to a point out of resonance, the operating line might assume the position indicated by the dashed line[3] (lower impedance). Note that the angle between the dashed line and the plate-current lines has not changed radically, and that our moving point will still intercept *essentially the same plate-current values*. This is precisely the reason that plate current in a tetrode is not a good indicator of resonance (very little dip). Look at the screen current. It consists of zero or even negative values in the out-of-resonance position. At resonance, though, it is positive. Thus, a peak in screen current *indicates resonance*.

During the rotation of the operating line while tuning, its length actually changes, since it is confined vertically only by the constant peak-to-peak amplitude of the grid-driving voltage (two imaginary horizontal lines, one at −5 volts and one at −105 volts). The length increases as resonance is approached and reaches a maximum at resonance. As the length increases, point A penetrates the heavy-screen-current region and the d.c. screen current reaches a sharp peak at resonance.

Loading

What happens if we change the antenna loading? This merely changes the plate-load impedance (still resistive). Again, the effect is to tilt the operating line about the operating point. As the load impedance is lowered (more coupling), the operating line assumes a steeper angle (such as the dashed line). It is easy to see that as loading increases, screen current decreases. Thus, screen current is *also an indicator of loading*. Screen current varies somewhat from tube-to-tube of a given type, but if each tube is loaded to the same value of screen current at resonance (with the same drive) power output differences will be small, and loading and linearity will be essentially the same.

D.C. Meter Readings

During the r.f. cycle, our point traverses the operating line and intercepts many different instantaneous values of screen current and plate current. The *average* of all these values is what the d.c. meter in the circuit reads. The *fundamental frequency component* of plate current is utilized in the plate circuit to produce output (except in a multiplier where use is made of a harmonic component of plate current). For a given operating line, both of these values can be calculated.[4] Suffice it to say that for Class AB_1 operation, the d.c. meter reading is approximately one third the peak value of current at the top of the operating line, and the fundamental component of plate current is approximately one half the peak value.

Tune-Up Procedure

Contrary to somewhat popular opinion, a linear amplifier should *never* be loaded for maximum power output. Loading should be set to obtain a predetermined value of screen current under single-tone or inserted-carrier driving conditions. Ideally, loading should be set for minimum distortion — a rather difficult feat in practice. It is recommended that the amateur try to duplicate as nearly as possible a given set of data-sheet conditions as presented by the tube manufacturer. These typical operating conditions are usually given for peak-envelope operation (single-tone or inserted-carrier) and represent the maximum input on c.w. or the peak-envelope-power input (*not* meter peaks) on single sideband. After adjusting drive, tuning, and loading to duplicate a given set of conditions, the single tone (or carrier) is removed and the single-sideband audio gain is adjusted so that grid current is never drawn and the condition adjusted for above is never exceeded on peaks. The peak-to-average ratio of d.c. plate current (as read on a fluctuating meter) varies, with the individual voice, from about 2:1 to over 3:1. Thus it is normal on voice peaks for the plate-current meter to read no more than *half* the value of current obtained in the maximum static single-tone condition.

A straightforward tune-up procedure consists of the following steps:

1) Insure that the tetrode amplifier is neutralized and free of parasitics.

2) With recommended heater, plate, and screen voltages applied, adjust the d.c. grid bias to obtain the recommended zero-signal value of plate

[3] The tank-circuit impedance would no longer appear resistive at the operating frequency, but would contain a reactive component. Under these conditions, the operating line becomes an ellipse whose center is point O and whose major axis is represented by the dashed line.

[4] By the use of the Eimac Tube Performance Computor, Application Bulletin No. 5, which is based on the method presented by Chaffee in the *Review of Scientific Instruments*, October, 1936.

current. This value affects linearity and plate dissipation.

3) Connect a suitable dummy load and set the loading control for rather heavy loading.

4) With a single-tone source, gradually increase the drive from zero to a value that produces a significant though small change in screen current.

5) Resonate the plate tank circuit by tuning for a *peak* (in the positive direction) *in screen current.*

6) Resonate the grid tank circuit (if any) by watching for a *peak in plate current.*

7) Now increase the drive until either the desired value of single-tone screen or plate current is reached (whichever is reached first).

8) Without drawing grid current, adjust loading, plate-tank tuning, and drive level to duplicate as nearly as possible a given set of data-sheet peak-envelope conditions. Remember that plate current increases with drive, whereas screen current peaks at resonance and decreases with heavier loading.

After matching a set of data-sheet conditions, the amplifier is ready to connect to an antenna. With a suitable antenna connected, it should be easy to repeat the operation obtained in Step 8 above by merely adjusting plate-tank tuning and loading with the same drive level as before. Now set up for voice single-sideband drive and adjust the audio gain for the highest level possible without drawing grid current on voice peaks or flat-topping (check this with a scope).

Reverse Screen Current

Most transmitting tetrodes employing oxide-coated cathodes exhibit negative screen current under certain conditions of operation. This is nothing to get alarmed about — it merely means that on the average, more electrons are leaving the screen than are being intercepted by the screen. This results because of secondary electron emission at the screen grid. Small values of negative screen current are not detrimental to tube operation and are quite normal for some tetrodes. Such values usually appear under heavily-loaded conditions or during the idling condition.

Large values of negative screen current are abnormal and should be avoided. Excessive secondary emission usually results in higher values of intermodulation distortion. This condition also prevents an accurate determination of screen dissipation.

Protection

Screen protection can take many forms. Before using a given circuit, it should be analyzed to insure that it satisfies the two basic criteria for screen protection. First, the circuit connected to the screen must be capable of maintaining the proper screen voltage in the presence of moderate negative d.c. screen current, or normal positive values of current. Second, the protective circuitry must not allow a condition of excessive screen current (positive or negative) to persist, since this causes excessive screen dissipation and resultant tube failure.

The first of these two criteria can be easily satisfied by the use of a bleeder resistance connected directly from the screen to ground, in combination with a suitable well-regulated power supply. The bleeder resistance should be made equal to the screen voltage divided by the largest negative d.c. screen current to be expected for the particular tube used. This eliminates any power-supply problems (soaring voltage) when "supplying" negative screen current.

Complete screen protection satisfying both criteria can be obtained by adding a screen-current overload relay to a bleeder and regulated-power-supply combination. The overload relay will protect the screen against excessive currents, either positive or negative, and the regulated power supply will maintain the screen voltage at the proper value as the d.c. screen current varies. The bleeder resistance from screen to ground will not allow the screen voltage, in the presence of negative screen current, to rise above the proper value. This bleeder is good insurance, since even some regulated power supplies react in an undesirable manner when subjected to a negative-current load.

When using a screen-current overload relay, one can easily provide for manual resetting in the event of an overload. This feature allows time to consider why the overload occurred and prevents repeated successive overloads. Using an s.p.d.t. relay, merely connect the armature to the positive supply through the coil (with the usual pull-in-adjusting potentiometer shunting the coil). Connect the normally-closed contact to the screen through the screen-current meter and the normally-open contact through a resistor to ground.[5] Adjust this resistor so that the current through it will hold the relay closed, once it has been tripped. First, of course, the pull-in shunt should be adjusted for pull-in at the value of screen-bleeder current, plus screen current, that produces maximum rated screen dissipation. Now, with this circuit it will be necessary to shut off the screen supply (or push a circuit-breaking series reset button) to reset the overload relay after an overload has occurred.

In contrast to the protective scheme outlined above, voltage-regulator tubes offer a simple and nearly foolproof method of screen-current protection. Their use will completely satisfy the first criterion and also the second criterion insofar as positive current overloads are concerned. Since excessive negative current is uncommon, one may elect to disregard protection against its occurrence. VR tubes then become an inexpensive and practical solution for the amateur.

The VR tube solution consists of an appropriate combination of VR tubes (to add up to the desired screen voltage) connected in series to ground and fed from a high-voltage source through an adjustable dropping resistance. The screen bypass capacitor from screen to ground

[5] See Evans, "Screen Protection and More," *QST*, October, 1960. — *Ed.*

and a screen-current meter from screen to the top of the VR-tube string complete the circuit. Adjust the dropping resistance to so that the VR string extinguishes at or slightly lower than the value of screen current that produces maximum rated screen dissipation. R.f. screen-current peaks will be supplied by the screen bypass capacitance and the VR tubes will "see" only the d.c. component. Now, excessive positive screen current will extinguish the VR tubes, lowering the screen voltage. The VR tubes will supply normal positive current values while maintaining screen voltage at the desired value. Negative currents will not change the voltage, but will merely increase the current flowing through the VR tubes.

Use A Screen-Current Meter!

In conclusion, it should be obvious to the amateur that a screen-current meter is a vital necessity in modern transmitters employing tetrodes. By proper interpretation of screen-current readings, one can easily tune to resonance and properly load the tetrode amplifier. The plate-current meter is useful *only* as an indicator of drive level and *average* plate-input power (knowing the plate voltage). One more meter — for grid current — is useful but not absolutely necessary. A one-milliampere meter in the grid circuit will warn the operator by a slight kick when grid current is being drawn on voice peaks. QST

Old DX Clobber

BY JOHN G. TROSTER,* W6ISQ

DAH dit dah dit dah dah dit dah cq cq cq de ZD9XX cq cq cq cq dx cq cq cq dx de ZD9XX —"

"Oh boy, listen to that. Never even heard one of those before. Come on ZD9, hurry up and sign before everybody in the whole world hears you — please sign —"

"Cq cq cq cq dx cq cq dx de ZD9 —"

"DAH DIT DAH DIT DAH DAH DIT DAH. CQ CQ CQ DX CQ CQ CQ DX CQ CQ CQ DX - -"

"What hoppin? Who's this guy? Get off this frequency fer cryin' out loud. Doncha hear that ZD9?"

"CQ CQ CQ DX CQCQCQCQCQCQ DE W6XXX W6XXX DX K."

"Not a thing. Total silence. I thought so. He scared all the other fish outa the ocean. Wonder where my ZD9 went? Maybe I ought to give him a call in case he stuck around. At least no one else is calling. Just me and that ZD9 and that local DX clobber. OK, I'll give him a short — hold it —"

"Cq cq cq cq de ZD9XX cq cq dx cq —"

"CQ CQ CQ DX CQ CQ CQ DX DE W6XXX CQ CQ CQ DX CQ CQ CQ DX DX DE W6XXX CQ CQ DX —"

"Ohhhhhh nnooooo. Be calm. I'll call the ZD9 and have him QRX — maybe he'll move a little if he isn't rock bound. Use the old bean. I'll just QSY a little out from under this old DX Clobber and here we go — ZD9XX ZD9XX de W6ISQ. Pse QRX bd QRM — Check the frequency — ok all clear — ZD9XX de W6ISQ K."

"Phooey — nothin'. Not even my local buddy."

"CQ CQ CQ DX CQ CQ CQ DX DE W6XXX CQ CQ DX —"

"I should have known better! And that ZD9 is at least S7 here. Even with a beam end-on you'd think he'd hear something on this frequency. Wait till he quits that miserable CQ — then I'll tell him who he's drowning out — or killed off —"

"CQ CQ DX DE W6XXX DX K."

"See if he gets anyone. Ha. I'm glad! Not a peep. Hold it. There's my old ZD pal. Who's he with?"

"ZS1XX de ZD9XX. Tnx fer cl. Haven't been able to raise anyone. Answered a W6 who was S8 in hr but he never came back. A little QRM on him calling CQ but he was way out in front. Maybe condx ng tonite."

"Oh me — well, at least he heard me. Wait till he finishes with the Zs then we go — he'll recognize my call at least!"

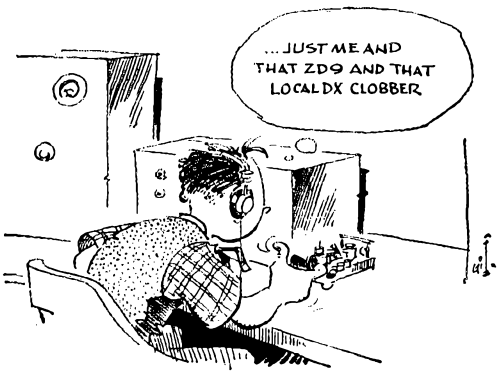
"Well tnx fer cl. Must QRT nw and go bed. 73. ZS1XX de ZD9XX SK. CL."

"No, no — not yet. Don't quit now. You're in the clear. Old DX Clobber isn't on now. It's you and me — all clear — come on back —"

"CQ CQ CQ DX CQ CQ CQ DX DE W6 —"

Snap, snap, click. QST

*45 Laurel Avenue, Atherton, Calif.



Strays

Note! International surface mail rates (except to Canada and Mexico) are changed effective July 1. Letter rates to all other countries in the Postal Union will be 11¢ for the first ounce and 7¢ for each additional ounce. Post cards will be 7¢.

The 50-Ohmer Transmatch[1]

Getting a 50-Ohm Load for Your S.S.B. Rig

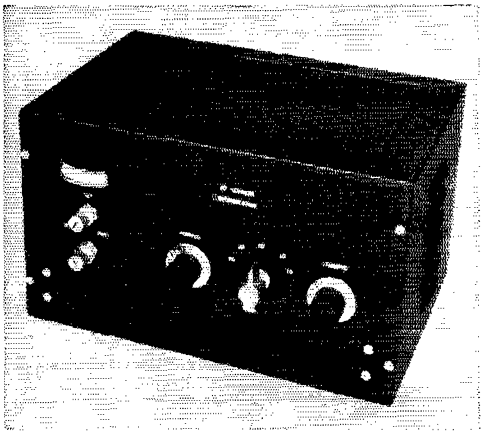
BY LEWIS G. McCOY,* W1ICP

THESE days, nearly all manufacturers of single-sideband exciters are building their transmitters with pi-network tank circuits designed to work into a 50-ohm load. If the actual load on such a transmitter is something other than 50 ohms, the amplifier cannot be loaded properly and the over-all operation is not optimum.

Amateurs using such equipment often have multiband beams or trap dipoles which, when fed with 50-ohm coaxial cable, are supposed to present a 50-ohm load to the amplifier. Unfortunately, no antenna designed to cover an amateur band will look like a pure resistance of 50 ohms across the entire band or even a portion of the band. There is bound to be a mismatch as you move across the band. The degree of mismatch depends on many factors. Height of the antenna above ground, its proximity to nearby objects, and its actual impedance at resonance all have an effect on the match between the line and the antenna. The match between the feed line and antenna determines what the transmitter "sees." When the line and antenna are not matched the transmitter won't be working into a 50-ohm load. The basic point to keep in mind is that if the amplifier is designed to work only into a 50-ohm load, any significant departure from this load probably means the amplifier won't do the job it was designed for.

* Technical Assistant, *QST*.

[1] A generic name coined by the editors to apply to any type of matching network inserted between a transmitter and a transmission line. There has been an obvious need for such a term, since "antenna coupler" is inadequate both technically and psychologically.



The completed 50-Ohmer is installed in this black crackle cabinet. On the left is M_1 and just below it are the controls for S_1 and R_2. The tuning control near the center of the panel is for C_1, the band switch is to the right of C_1 and the control for C_2 at the far right.

The problem of using coax-fed multiband antennas, and still have the system "look" like 50-ohm load, is not at all difficult. What is required to do the job are two pieces of equipment. First of all, a matching indicator is needed. By matching indicator we mean a device that will show you when the transmitter is actually looking into a 50-ohm load. The Monimatch, or for that matter, any 50-ohm reflectometer, can be installed in the feed line to show when the line is matched. When the line is matched, the transmitter will see a 50-ohm load. However, the reflectometer only shows us what the match is, so the other item required is a device that will make sure the rig is working into a 50-ohm load. What is needed here is an adjustable r.f. transformer. In brief, the transformer can be put in the coax line between the rig and the antenna and adjusted so that the transmitter sees only a 50-ohm load. This is what the 50-Ohmer will do.

What It Is

The 50-Ohmer combines a reflectometer and a band-switching adjustable r.f. transformer in one cabinet. It is capable of handling mismatches of about 5 to 1, which is considerably more than you should encounter with any of the coax-fed multiband antenna systems. Fig. 1 is the circuit of the two units. The transformer circuit consists of C_1, L_1, L_2, and C_2. S_2 is the band switch and is used to short out unused portions of L_1 and L_2.

A modified length of RG-58/U is used in the reflectometer or bridge. An 8-inch length of wire is installed between the inner and outer conductors of the coaxial line. This pickup wire is terminated in R_1, through S_1. Power traveling along the line induces a voltage in the pickup wire. In one direction, this voltage will be canceled out in the crystal-rectifier r.f. voltmeter circuit consisting of CR_1, M_1 and R_2. However, power traveling in the opposite direction will cause the voltmeter to read. The bridge is designed to match the impedance of the line, 50 ohms, so whenever a mismatch occurs on the line the voltmeter will show an indication. By using the bridge as an indicator, C_1 and C_2 can be adjusted so that any reasonable range of impedance values appearing at J_2 can be transformed, through the matching circuit, so that at the input end, J_1, the transmitter will see a 50-ohm load.

Building the Unit

The complete 50-Ohmer is mounted on a $2 \times 7 \times 11$-inch aluminum chassis and installed in a $7 \times 12 \times 8$-inch cabinet (Bud C-994). If you already have an s.w.r. bridge, as many of the s.s.b. gang do, the bridge portion can be

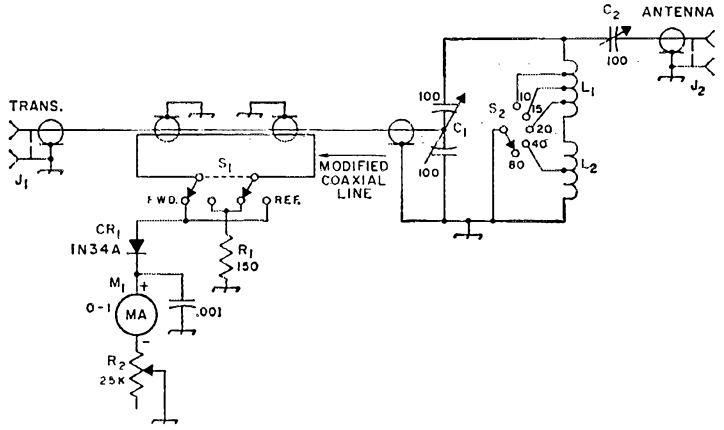


Fig. 1—Circuit diagram of the 50-Ohmer. Decimal values of capacitances are in μf., others are in $\mu\mu$f.

C_1—100-$\mu\mu$f.-per-section, split stator (Hammarlund HFBD-100-C).

C_2—100-$\mu\mu$f. variable (Hammarlund MC-100-SX or Johnson 100 FD 20H).

CR_1—1N34A germanium diode.

J_1, J_2—Coax chassis terminal, SO-239.

L_1—9¾ turns No. 14, 1¾-inch diam., 4 turns per inch (B & W Miniductor 3021, Illumitronic Air Dux 1404T). 14-Mc. tap 2½ turns from junction of L_1L_2; 21-Mc. tap 7½ turns from junction of L_1L_2; 28-Mc. tap 7½ turns from junction of L_1L_2.

L_2—28 turns No. 14, 1¾-inch diam., 8 turns per inch (B & W Miniductor 3022, Illumitronic Air Dux 1408T). 7-Mc. tap 5 turns from the junction of L_1L_2.

M_1—0–1 milliammeter.

R_1—150 ohms, ½ watt.

R_2—25,000-ohm control, linear taper.

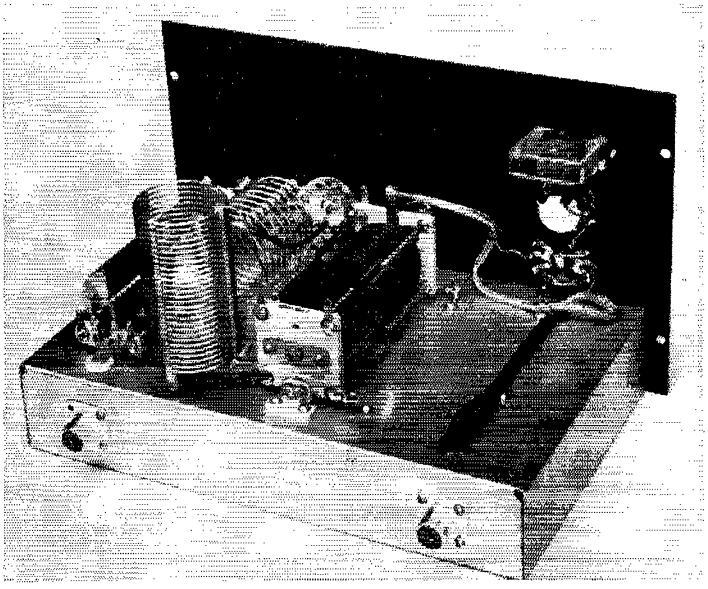
S_1—2-pole, 2-position switch (Centralab 1462).

S_2—Ceramic rotary, one section, one pole, 5 positions (Centralab type 2501).

eliminated and a smaller chassis and cabinet used.

In the unit shown in the photographs, a 20-inch length of RG-58/U was used to connect from J_1 to C_1. The pickup wire for the bridge is an 8-inch length of No. 28 insulated wire. Either enameled or cotton-covered wire can be used. Before making up the modified line, install S_1, M_1, and R_2 on the panel of the cabinet. After S_1 is mounted, lay out the coax line as shown in the top-view photograph and mark the coax braid at the two points (about 6 inches apart) near the arms of S_1. To insert the pickup wire under the braid, first bunch the braid by pushing it from the end toward the center. Punch a small hole at each point on the braid where it was previously marked. You can then feed the pickup wire through one hole and out the other, leaving about one inch projecting at each hole after the braid is smoothed out. Make sure the pickup wire isn't shorting to the braid, by checking with an ohmmeter. You can then mount the

(Continued on page 136)



On the right in this view are the components for the reflectometer. The split-stator capacitor is C_1. The vertically mounted toil is L_2, while L_1 is horizoncal C_2 is at the left. The chassis fitting on the rear, just below C_2, is the output terminal; the other, at the right, is J_1.

The Characteristics, and How To Use Them, of —

Semiconductor Rectifiers

BY DAVID T. GEISER,* WA2ANU

The semiconductor power rectifier is gradually losing that "expensive" tag, and the cheaper it gets the more attractive it becomes in transmitting power supplies. But some hams have learned, to their sorrow, that you can't take the liberties with crystal diodes that you can with many tube rectifiers. Here's why — and how to avoid trouble.

SEMICONDUCTOR rectifiers are becoming popular in amateur equipment, both in the home and in the car. While this type of component has a justifiable reputation for reliability, in actual application the semiconductors have certain weaknesses that must be considered before their inherent reliability can be attained. This article briefly discusses some of the characteristics of the rectifiers and lists some precautions helpful in their use. Discussion is limited to the germanium and silcon types.

How a Rectifier Works

A rectifier is a component that conducts electricity better in one direction than the other. Any electrical part that meets this requirement can be used as a rectifier. Many varieties of rectifiers are or have been used. Old timers may remember the electrolytic rectifiers and detectors that were used on occasion between 1900 and 1930, in which metals and chemical solutions were combined in forms very similar to present-day electrolytic capacitors. Mechanical rectifiers have been used when the characteristic of the input electrical wave was known (like ordinary a.c.) and switches were closed only when the current was flowing in a particular direction. The car radio synchronous vibrator used in the era before transistor radios was an excellent example of this type. However, vacuum-tube and mercury-vapor rectifiers have almost entirely replaced the mechanical and electrolytic types because, having electron-triggered or electron-flow methods of conduction across the open space in the tube, these rectifiers only conduct with one polarity of applied voltage.

Like the electron tube, the semiconductor rectifier also operates on the principle of electron attractions. A crystal is formed of silicon or germanium (Fig. 1) with impurities added in one region differing from those in the adjacent regions. The result of these impurities is that one part of the crystal structure has more electrons than the structure calls for, while the other region has too few. The vacant parts of the structure of the second region are called "holes." The electrons are negative charges of electricity, and the holes are positive charges. (Where a material has neither holes nor electrons that can be easily moved by applied voltage, the material is an insulator.) The region of extra electrons is called the n region, that with extra holes is the p region.

The boundary between the regions, or p-n junction, is where the rectification takes place. If the p region is connected to the positive terminal of a battery while the n region is connected to the negative terminal, the charges will cross the junction and be replaced by charges from the battery. If the battery is reversed, the charges will tend to be drawn away from the junction by the battery, and there will be no free charges in the immediate vicinity of the junction to carry current across it. This makes the junction look like an open circuit when "reverse" polarity is applied to the rectifier, and automatic rectification takes place with voltage polarity change.

Power Loss

The semiconductor rectifier is not perfect. The differences in material on opposing sides of the p-n junction make it slightly difficult for current to cross the junction when only a small forward voltage is applied. Germanium usually requires about a fifth to a half volt in the forward direction before full current will flow, while silicon requires six-tenths of a volt to a volt for each junction. This voltage drop required to cause current flow means that power is lost in the junction (watts = volts × amperes) and some heat will develop. The semiconductor rectifier is attractive because the voltage and power loss are less than in many other kinds of rectifiers.

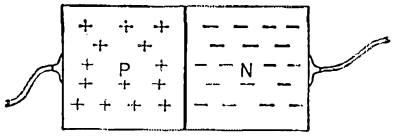


Fig. 1 — Rectifying semiconductor junction with excess electrons (n region) and electron vacancies or "holes" (p region).

Semiconductor rectifiers are not perfect in the reverse direction, either. Fig. 1 shows the electrons and holes as if their regions were exclusive, but there are always a few holes in the electron region, and a few electrons in the hole region.

* Light Military Electronics Dept., General Electric Company, Utica, N. Y.

A semiconductor region is *mostly* p or *mostly* n, in the same sense that a town may be Democrat or Republican. The effect is that of the majority. Also, small breaks in the crystal structure make current carriers available. These carriers, if located near the p-n junction, will cross it when reverse polarity voltage is applied and permit reverse current flow. In spite of this, modern semiconductor rectifiers that are rated for one ampere commonly have less than a milliampere reverse current at room temperature. High reverse voltage multiplied by leakage current also represents power loss that appears as rectifier heating.

Temperature has a very important effect on leakage current, for as the material of the semiconductor warms, the unwanted carriers become more active, and more of them will contribute to leakage current. A common rule-of-thumb is that the leakage current will double with each 18-degree Fahrenheit rise in temperature. This effect is reversible; that is, as the temperature drops, the leakage current will drop to almost its original value unless the rectifier has been damaged. Too much heat will destroy the rectifier. The heat may come from either internal power dissipation or from outside. It is best to keep germanium below 200 degrees F. and silicon below 300 degrees F. for long life.

Circuits and Their Effect

Three types of rectifier circuits, Fig. 2, may be expected to be found in amateur equipment. Table I lists a number of conditions that the circuits impose on the rectifiers. The chart expresses the voltages, currents, and powers in terms of the d.c. output voltage, current, and power. Thus, where peak inverse voltage is listed as 3.14, the peak inverse (reverse) voltage impressed on the rectifiers when the d.c. output voltage is 1000 volts would be 3140 volts. Naturally, the rectifier in such a circuit should be able to stand this inverse voltage.

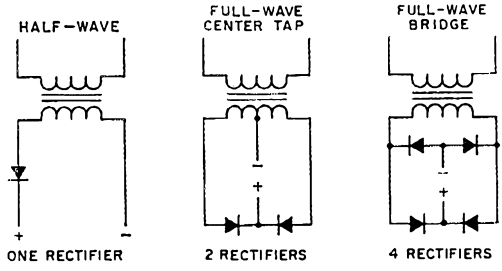


Fig. 2—Several common single-phase rectifier circuits (See Table I). Series strings of rectifiers may be used for increased voltage ratings where single rectifiers are shown.

Table I deals only with cases where the rectifier (semiconductor or tube) is feeding pure resistance or an inductance above the critical value.[1] When the rectifier is connected directly to a capacitor, the capacitor has a tendency to look like a short circuit during charging, both initially and on every rectifying cycle. Most rectifiers, and particularly semiconductors, have ratings for maximum surge current, both for the initial surge (one cycle or a few cycles) and for repetitive surge — that is, the charging that occurs on the conducting part of each cycle after the filter capacitor is once charged. The source of power, whether transformer or line, should have enough resistance or inductance added to it in series to limit the surge currents to the maximum safe value. With a capacitor-input filter, the peak inverse voltage may range up to two times the peak voltage developed across the filter, depending mainly on how heavily the rectifier output is loaded.

TABLE I

Rectifier Circuit Conditions

Circuit	1	2	3
D.c. volts out	1.00	1.00	1.00
Peak volts out	3.14	1.57	1.57
Rectifier peak inverse volts	3.14	3.14	1.57
D.c. current out	1.00	1.00	1.00
D.c. current per rectifier	1.00	.500	.500
R.m.s. current per rectifier			
(resistive)	1.57	.785	.785
(inductive)	Res. only	.707	.707
Peak current per rectifier			
(resistive)	3.14	1.57	1.57
(inductive)	Res. only	1.00	1.00

Connecting Rectifiers in Series for High Voltage

The low cost of the lower-voltage silicon rectifiers, in particular, has provoked the thought of series connection for high-voltage operation. This is quite possible, provided the characteristics of the particular pieces are known; the rectifier manufacturers commonly use series connection to make high-voltage stacks.

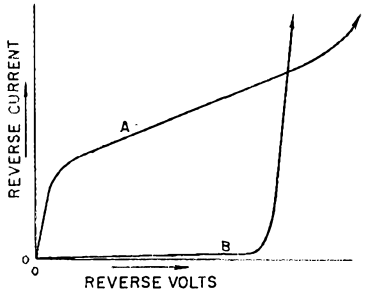


Fig. 3—Rectifier *A* leakage current increases gradually when reverse voltage is increased, while *B* exhibits a sharp increase at a particular voltage. *A* is typical of germanium and large-area silicon units, while *B* represents many small silicon rectifiers.

[1] See the "Power Supply" chapter of *The Radio Amateur's Handbook*.

Rectifiers tend to behave in either of two ways when subjected to high reverse voltage, as shown in Fig. 3. In either of the cases a voltage is finally reached where the voltage within the rectifier forces the material to become conducting. Some rectifiers have practically no conduction until a critical voltage is reached, and then the leakage current increases hundreds of times with a rise of a very few volts. This is typical of small-area silicon junctions. Other rectifiers have a continual and usually more rapid increase in leakage current with increase in reverse voltage, showing a gradual rather than abrupt increase into high reverse current as high reverse voltage is reached — typical of germanium and large-area silicon rectifiers.

In both cases, immediate and disastrous destruction can result unless the current is limited. The ordinary catalog or handbook description gives no clue as to how a particular type of rectifier behaves in this region, *and thus applied voltages should never be more than maximum ratings.* Occasionally typical curves are shown that illustrate how a manufacturer expects his product to enter the region of rapid increase of reverse current, but it is impossible for a maker to check each inexpensive rectifier for compliance. In cases where only a single rectifier has reverse voltage applied to it, this region is relatively unimportant, because it always lies at a higher voltage than the rating. The region *is* important when two or more rectifiers are connected in series to obtain a higher total voltage rating.

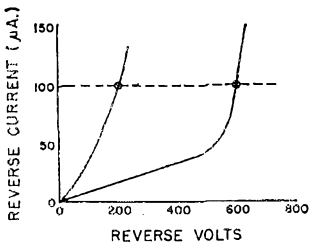


Fig. 4—Division of 800 reverse volts across two series rectifiers having the characteristics shown would result in one rectifier having only 200 volts and the other 600 volts.

When two semiconductor rectifiers are connected in series, how does the voltage divide? Let us imagine two rectifiers in series having to divide 800 reverse volts, and having the reverse characteristics shown in Fig. 4. As this is a series circuit, the reverse current must be the same in the two rectifiers, and the total of the voltages developed must add up to 800 volts. The situation here is intentionally bad, with one rectifier having a "sharp" break and the other a "soft" break in the reverse current-voltage curve. Here we see that at 100 microamperes the rectifier with the soft break is subjected to 200 volts and the sharp-break rectifier must withstand 600 volts. This means that the rectifier with 600 volts across it will have to dissipate three times the power of the rectifier that has the higher leakage current in

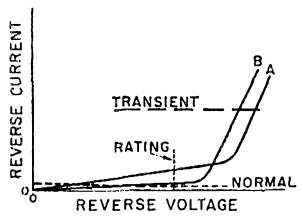


Fig. 5—A pair of rectifiers (*A* and *B* above) may make resistive equalization of voltage difficult. At rated voltage, *A* here has the lower resistance, but *B* has a lower resistance at the transient condition.

normal service. It will, of course, become hotter, and its own leakage current will increase until a somewhat more equal distribution of voltage occurs. The danger in this compensating process is that destruction may occur before a satisfactory equalization is reached. For this reason manufacturers, when assembling series strings, frequently make certain that the diodes used in each string have the same type of break and, if a soft break, are pretty well matched.

General Electric practice[2] is that strings of germanium rectifiers such as the 1N91 should be factory-matched while medium- and high-current silicon units (like the 1N1301) are well-enough matched if they have the same type number and peak inverse voltage rating. With low-current types — for instance, the 1N253, 1N440, 1N536, 1N1115, and 1N1487 — having a sharp knee or break, no particular matching of reverse characteristic or selection of peak inverse voltage rating is required.

When the diodes have a sharp break, the total current is usually low enough to prevent developing enough power to cause destruction if at least a moderate amount of safety factor has been allowed in choosing rectifier voltage ratings. Longer strings of the same type rectifier are inherently safer. Incidentally, it is uncommon to shunt rectifiers with resistors to equalize voltages, though it could be done. One reason not to would be because the voltage division during most of the reverse cycle would differ from the division at transient peak voltages. An example of the difference is shown in Fig. 5, where rectifier *B* (uncompensated) would have greatest impressed voltage normally, but not during transients.[3]

Transients frequently cause different voltages to appear across rectifiers in a series string. Each diode appears as a small capacitor and, of course, each lead of that capacitor has a certain capacitance to ground as in Fig. 6. This string acts as a voltage divider. If we assume that a pulse with a very steep wave front is coming from the left and has reverse polarity, the biggest portion of that pulse is going to appear across the left-hand rectifier. A more equal division of voltages can be achieved by shunting the rectifiers with equal capacitors of 1000 micromicrofarads or

[2] General Electric Semiconductor Products Department, "Series Operation of Silicon and Germanium Rectifiers," Publication ECG-400 3/59.

[3] This discussion assumes that transients are infrequent but cannot be avoided.

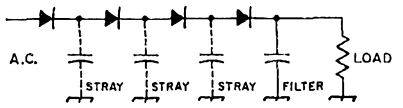


Fig. 6—Transients coming from the a.c. source affect the left-hand rectifiers most because of the bypassing effect of the stray capacitances. Capacitance compensation can help (see text).

more. In long strings it is sufficient to shunt possibly as many as three or four rectifiers at a time (the same number at a time, of course) with satisfactory results. The reason for the unequal distribution of voltage without the compensating capacitors is that the stray ground capacitances (in the example shown) cause current to be bypassed to ground as the transient moves from the left to the right, and little of the transient appears across the right-hand rectifiers.

Transients should be expected to appear even when the power source feeding the rectifier is stable. Switching on the power at a time when the input a.c. is at the peak of the cycle is one cause; the presence of a transformer with inductance in the switched line is another. One source of transients that is not so obvious is in the rectifier itself. The current carriers in the rectifier are usually in motion across the p-n junction at the time of polarity reversal of the rectifying circuit. These carriers are so close to the junction that they will often recross it and give the effect of reverse current, and it does take an appreciable amount of time for them to be cleaned out. This process makes the rectifier look as if it is shorted for this period and, particularly in the case of bridge rectifiers, when the "shorted" period is over for one rectifier, another rectifier or rectifier string suddenly sees whatever voltage the a.c. source has reached during this period.

Rectifiers in Parallel

In the forward direction, a semiconductor rectifier has many of the characteristics of a voltage regulator in that once the threshold voltage (a fraction of a volt) has been reached, the rectifier will conduct very greatly increased current before the voltage rises more than a few additional tenths of a volt. Rectifiers of the same type do not all have exactly the same threshold voltage. If two such rectifiers are paralleled, the difference in the voltage drops will mean that the rectifier having the lower voltage drop will carry the greater current. Equalizing resistors should be used in series with each rectifier, as in Fig. Fig. 7, making the resistance value such that there is a drop of perhaps one volt at the rated current. This makes the difference in voltage drops of the rectifiers have little effect on the even distribution of current.

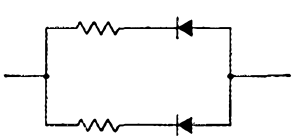


Fig. 7—Small equalizing resistors help divide forward current between paralleled rectifiers (see text).

Insulation and Heat Sinks

Most rectifiers in the power range have a case that is connected to one of the leads, though there are a number of all-glass types. The "hot" case must be insulated by air spacing or other means from the rest of the circuitry to prevent accidental shorts.

This insulation causes some problems when the rectifier is dissipating an appreciable amount of power, for some means must be provided for removing the heat from the rectifier. Most rectifiers that need this treatment to meet their advertised ratings are equipped with a threaded stud mount. There are available mica washers that may be used to provide electrical insulation while permitting considerable heat transfer to the chassis or other metal body the part is mounted on. There are also power rectifiers available with insulated studs that are useful for mounting directly against the chassis. Here, as with the mica washers, the stray capacitance to ground is increased.

Another way of providing cooling for the rectifier is to mount the stud into a metal plate having an area of several square inches, and permit free air or blown air to cool the metal plate. It is necessary to insulate the plate if the stud is in electrical contact with the rectifier.

Acknowledgment

The writings of many other authors, notably that of F. W. Gutzwiller, were freely consulted in the preparation of this article. Much was recast into the above wording, and errors of interpretation, if any, are this author's. QST

Strays

ARMED FORCES DAY, 1961 PRELIMINARY RESULTS

Armed Forces Day, 1961, was indeed a day to remember, with all previous records for participation being left far behind. In 1960, 856 certificates were awarded for perfect copy of the message from the Secretary of Defense — in 1961 well over 1000 hams have qualified for the certificate and in early June copies of the message were still being received at the Pentagon.

The previous high for the number of QSOs made by AIR, NSS, and WAR was 2695, set in 1959. In 1961 the total number of QSOs made by the headquarters stations of the three services was 4256!

Participation was so much greater than expected that it may take a little time to get all the QSLs and certificates processed and mailed. However, be patient, gang — the cards and certificates will be along just as quickly as possible.

This 25-watt 10-meter mobile transmitter is built into a hi-fi amplifier cabinet. The meter switch is to the left of the meter, with the microphone jack and filament switch below. To the right of the crystal socket at the center of the panel are tuning controls for the final (above) and driver. The loading control is in the upper right-hand corner.

Twenty-Five Watts—Mobile

BY WILLIAM W. DEANE,* W6RET

Separate r.f. and audio subassemblies make it unnecessary to work in cramped space in the construction of this 10-meter mobile rig. An unused cabinet from a hi-fi amplifier kit makes an enclosure of good form factor for a dashboard installation.

In writing this article it is not the author's intent that the transmitter be duplicated as presented but to illustrate an approach to a construction problem that might confront others. Recently, when I customized my hi-fi installation, I had left over a very nice French-gray cabinet approximately 13 by 9 by 4 inches.[1] This sat on the shelf for several days, and the longer I looked at it the more I was convinced that something should be constructed around this excellent foundation. It appeared that the most likely prospect would be an all-band mobile transmitter. However, after examining several of my old mobile log books, it was noted that 80 per cent of my mobile operation was on ten meters. Also, I had handy a 10-meter crystal-controlled converter.[2] These two facts led to the development of the 10-meter transmitter illustrated.

Circuit

The circuit, shown in Fig. 1, involves several standard *Handbook* designs modified slightly to fit this particular application. The 807W final tube was selected primarily due to its low cost in surplus. A 2E26 can be substituted if desired. Fig. 2 shows the necessary modification for such a substitution. A 6AK5 operates as a grid-plate oscillator. Crystals are 7-Mc. FT-243 types that quadruple to the 10-meter band. The plate circuit of the oscillator is slug-tuned to 14 Mc. and drives the 6AQ5 doubler-driver. The 6AQ5 plate is tuned to 28 Mc. The shaft of the 6AQ5 plate-tuning capacitor is brought to the front panel where it is identified as the driver control. The 807W operates in a standard pi-network final. C_2 is the neutralizing capacitor which consists of a short length of No. 14 wire extending alongside the 807W tube.

The modulator consists of a 12AX7 driving two 6AQ5s. One half of the 12AX7 is used in a grounded-grid input circuit, and the second section drives the 6AQ5s. The audio driver transformer is a standard single-plate to push-pull-grid type, having a ratio of 1:3. In this particular unit a surplus transformer was used. The modulation transformer is a Triad M3X rated at 20 watts and having small physical size.

Power requirements are 400 v. d.c. at approximately 160 ma., and 2.9 amperes at 6 volts, or 1.7 amperes at 12 volts for the filaments. Power is supplied to the unit via an octal connector on the rear panel. The 1000-ohm voltage-dropping resistor in this installation is located in the base of the dynamotor, but may be installed in the transmitter if desired.

* 8831 Sovereign Road, San Diego 11, Calif.

[1] Cabinet is available from Knight Electronics Corp., 2200 Maywood Drive, Maywood, Ill., as kit part No. 700062. Price $4.75.

[2] Deane, "Simplifying the 10-Meter Crystal-Controlled Converter," *QST*, Nov., 1952.

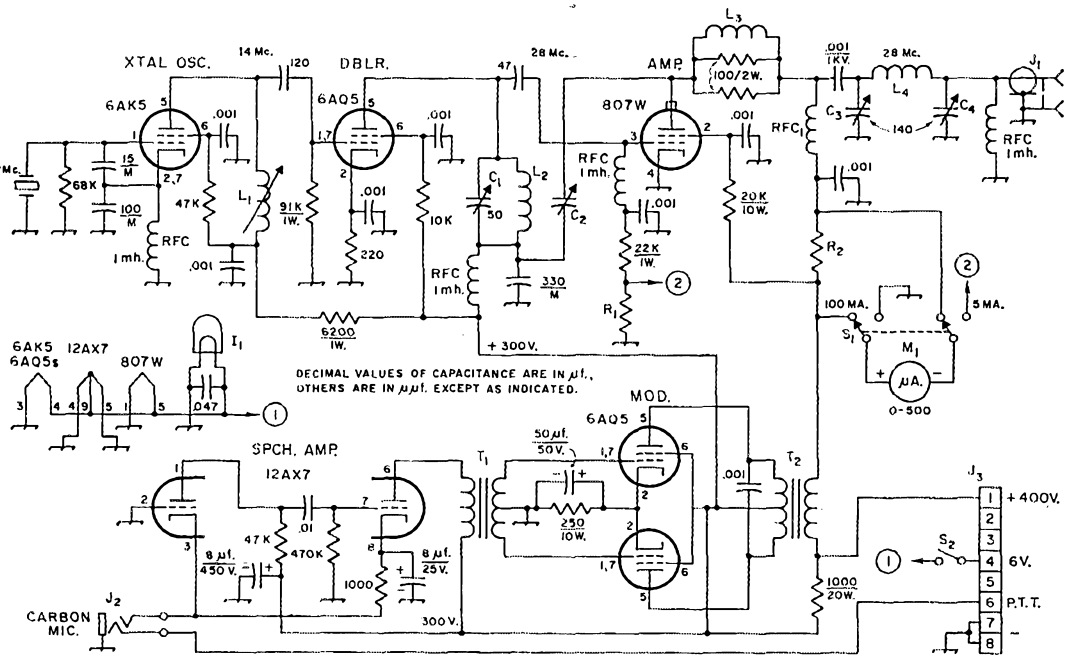


Fig. 1—Circuit of the W6RET mobile transmitter. Resistances are in ohms and resistors are ½-watt unless indicated otherwise. Capacitors marked with polarity are electrolytic; M indicates mica. Other fixed capacitors are disk ceramic.

C_1 — Air variable (Hammarlund MAPC-50B or similar).
C_2 — Neutralizing capacitance, approx. 2 μμf. (see text).
C_3, C_4 — Air variable (Hammarlund MC-140S or similar).
I_1 — 6-volt dial lamp.
J_1 — Chassis-mounting coax receptacle (SO-239)
J_2 — Double-circuit jack (Mallory 702B or similar).
J_3 — Male chassis-mounting octal connector (Amphenol 86-CP8).
L_1 — 18 turns No. 30 close-wound on ⅜-inch iron-slug form.
L_2 — 10 turns No. 22, ¾-inch diam., ¾ inch long.
L_3 — 8 turns No. 20, wound on one of the two associated 100-ohm resistors, turns spaced to resistor length.
L_4 — 7 turns No. 12, 1-inch diam., 1½ inches long.
M_1 — 2-inch d.c. meter, 500-μa. scale (similar unit with 1-ma. scale and appropriate shunts, R_1, R_2, may be substituted).
R_1, R_2 — 5- and 100-ma. meter shunts, respectively (see *ARRL Handbook*, measurements chapter).
RFC1 — 60 turns No. 22, close-wound on ½ × 3-inch ceramic pillar.
S_1 — D.p.d.t. slide switch.
S_2 — S.p.s.t. toggle or rotary snap switch.
T_1 — Single-plate to push-pull grids, ratio 1:3 (see text).
T_2 — Modulation transformer: primary 10,000 ohms, c.t.; secondary 5000 ohms (Triad M3X).

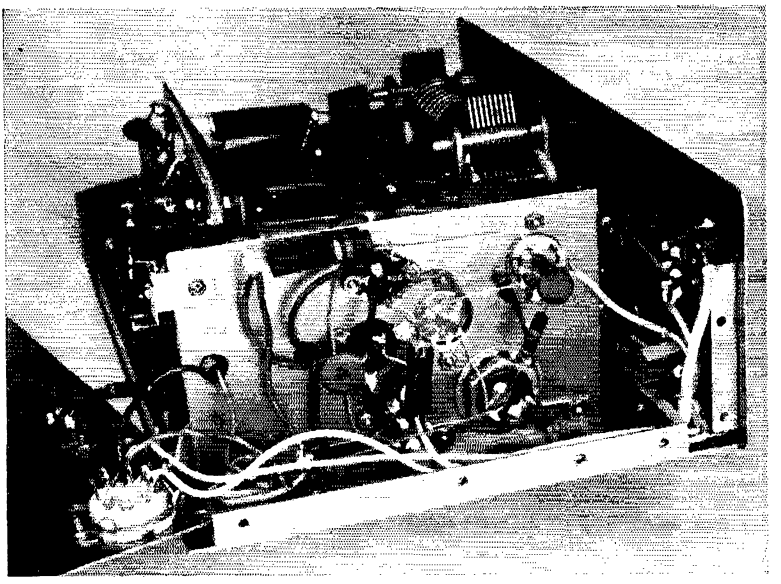
Construction

The transmitter is made up of four separate subassemblies — the front panel, the r.f. panel, the modulator panel, and the rear panel. These panels are attached to the bottom aluminum plate with Reynolds ½-inch aluminum angle. Additional support is supplied by two side brackets. The r.f. panel is 8 by 3½ inches long and was constructed first. The oscillator-tube socket is mounted on the right-hand side of this panel in the top-view photograph. The oscillator slug-tuned coil and the 6AQ5 socket are mounted on the same center line, as shown in the detail view of this section. The driver plate coil and capacitor are mounted adjacent to the 6AQ5 socket, with the coil above the tuning capacitor. The final tube socket and the screen dropping resistors are located on the left-hand side of the panel. This component arrangement lends itself to orderly electrical layout, with component leads alone sufficient for most of the wiring.

In the photograph of the audio section, the angle support has been removed to allow a better view of the panel arrangement. The modulator panel is 6¼ by 3¾ inches. The 12AX7 is mounted in the upper right-hand corner. The driver transformer is located approximately in the center of the panel near the 6AQ5 modulators. The modulation transformer is mounted at the left-hand side of the panel. Since the microphone jack is located on the front panel, the cathode of the 12AX7 is connected to the jack with a short piece of shielded wire.

The photographs adequately illustrate the mounting and arrangement of the front-panel components. The slide switch allows shifting the meter for reading 807W plate or grid current. The crystal socket is connected to the grid of the oscillator with a short length of RG-59/U coaxial cable.

After completion, the front panel, modulator and r.f. panels should be fastened to the bottom plate. Interpanel wiring can now be done and the rear panel installed and wired. The modulator



Rear view of the modulator section.

panel is connected to the rear panel with a small L bracket for additional support. The front panel was finished in chevron blue with white decal markings. The other panels and supports were sprayed with coppertone before mounting the parts. The small white spots that appear in the photographs are dabs of white paint that were placed on each connection to check them off after wiring and final testing for bad or unsoldered connections.

Testing

A conventional a.c. power supply that delivers the required voltages may be used for testing and aligning the transmitter before installation. If such a power supply is not available, a cable should bef abricated that will allow operating the transmitter from the mobile power supply. With the proper voltages applied, and crystal installed, tune the oscillator slug-tuned coil and

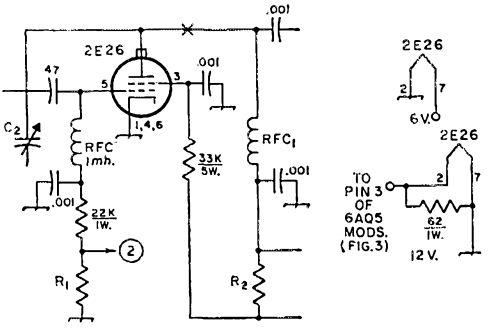
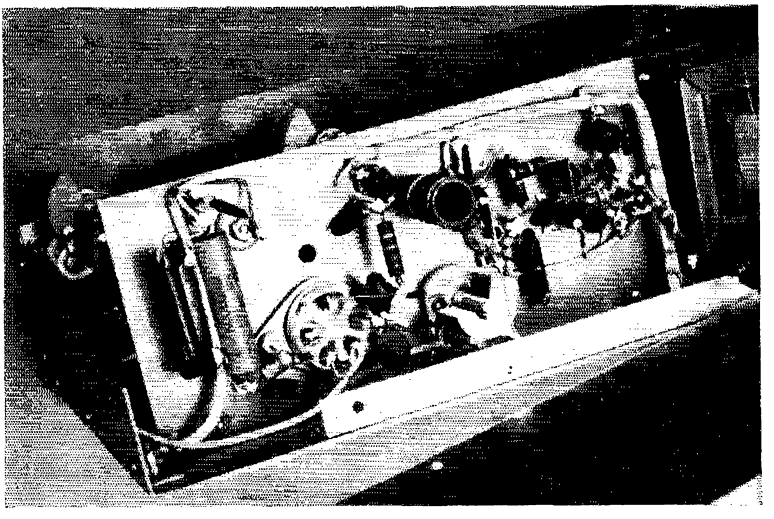
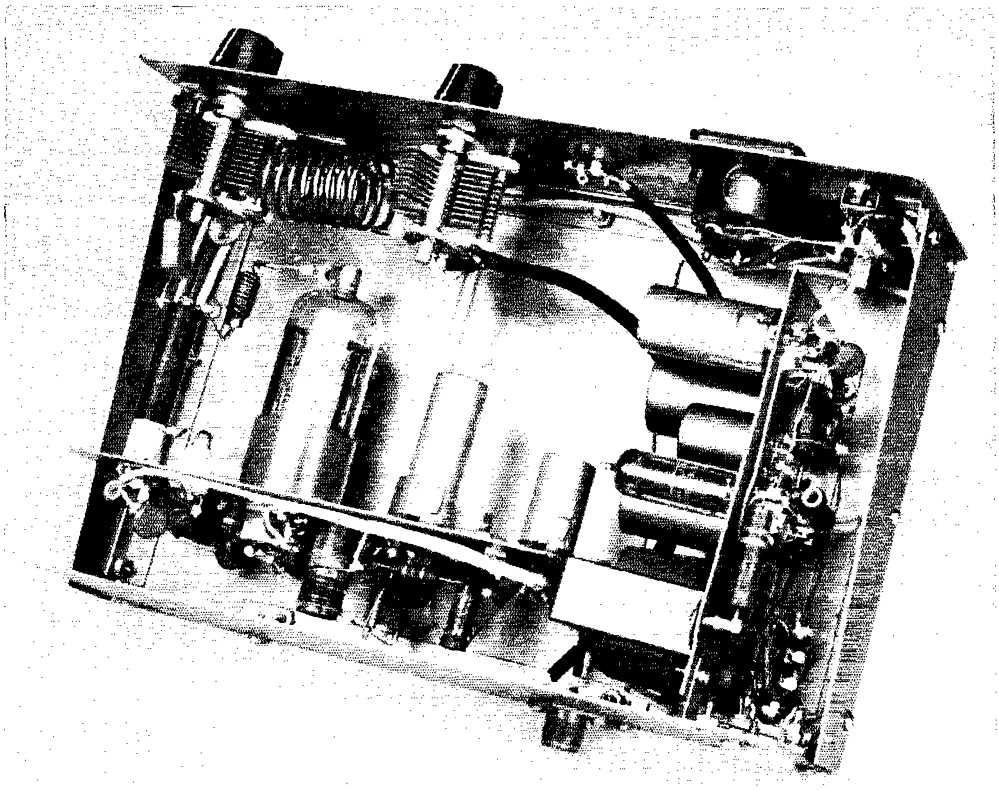


Fig. 2 — Circuit changes required when substituting a 2E26 for the 807W of Fig. 1. A v.h.f. parasitic suppressor may be needed at the point-marked X.

driver capacitor for maximum final grid current (approximately 3 ma.). Then tune the final for



Bottom or rear view of the r.f. section. At the center are the driver tuning capacitor C_1 and coil L_2. The oscillator plate coil is to the right.



Subassembly units simplify construction and wiring where space is limited. The section to the left contains all r.f. circuitry except the pi-network components which are mounted on the front panel. The subassembly to the right is devoted to the audio section. From the consideration of safety, the power connector in the lower right-hand corner should be a male type.

resonance with the meter switched to the plate-current position. Neutralizing may be accomplished by removing the plate and screen voltages from the final and, with a wavemeter, vacuum-

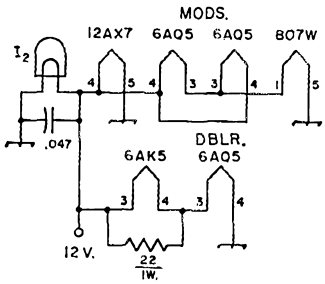
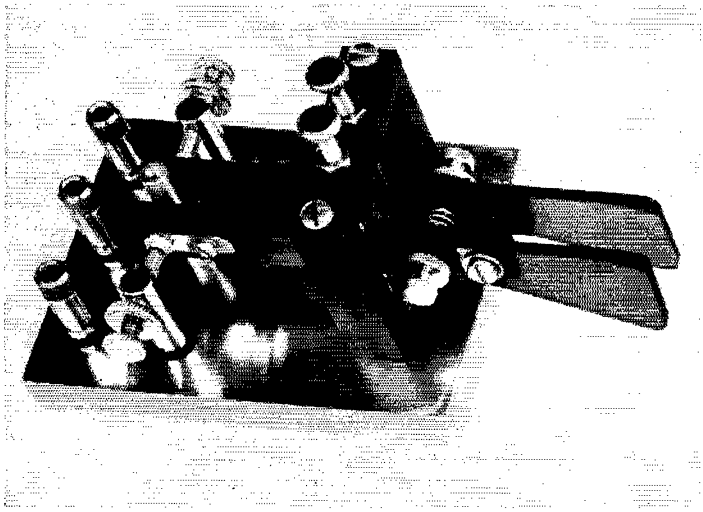


Fig. 3 — Heater wiring for 12-volt supply. I_2 is a 12-volt dial lamp.

tube voltmeter with r.f. probe, or other detecting source coupled to the final plate coil, trimming the neutralizing wire until minimum reading is obtained on the indicator. Each time the neutralizing wire is trimmed, the driver capacitor should be retuned for maximum drive. In the event that 12-volt operation is desired, the filaments can be wired as shown in Fig. 3. QST

Strays

Ready to go! OSCAR I is examined and tested for its first airborne operation from an airplane. The package was carried in a triangular flight over the San Francisco Bay area on April 9, 1961. The 145-Mc. beacon was heard over a wide area during the 2½-hour flight. L. to r. are pilot Hugh McClain, K6SPK; H. L. Auger of CAP; H. Gabrielson, W6HEK, holding the OSCAR package; and R. Esneault, W4IJC/6. More on OSCAR, p. 59.



The Nikey—a control switch with separately-articulated dot and dash levers for use with electronic keyers. Each movable contact is riveted to a small strip of copper fastened to the lever with a 6-32 screw. The screw hole in the strip is slotted to permit alignment.

The Nikey

An Improved Keying Mechanism for All Types of Electronic Keyers

BY NICHOLAS LEFOR,* W2BIQ

Several previous QST *articles on the subject of electronic keys have pointed out the advantages of an actuating switch in which independent arms for dot and dash contacts are provided. This article shows a simple and inexpensive way of making such a switch.*

With the advent of the new "space-age" speed merchants, and an effort to emulate same, a TO keyer and commercial keying mechanism were purchased. After operating the TO keyer for a while, it was felt that a further improvement in "copy" could be made by constructing the transistorized "Ultimatic" keyer.[1]

As indicated by the article, the full value of this keyer is realized by a mechanical key with separately-articulated levers for dot and dash operation. A requirement at this station was to have this mechanism a separate unit instead of being built into the electronic-keyer package as described in KØMHU's article.

The key, as described herein, was checked out with the TO keyer and a surprising improvement was immediately noticeable. The reason for this improvement becomes apparent when it is realized that a great deal of lost motion (moving from the dot contact to the dash contact) is eliminated because of the articulated levers.

Base

Referring to the photograph, it can be seen that all parts were available from a discarded bug key, a hardware store handling Reynold's aluminum bar stock, and the storehouse of a ham's ingenuity. The first requirement for the key was a base of sufficient weight to hold the key firmly to the operating desk. The 3 × 4-inch base, ½ inch thick, of cold-rolled steel, was obtained from a local model shop. Lighter material may be substituted if some provision is made to prevent the key from sliding on the operating desk. The binding posts were available from the junk box. The dot and dash contacts are isolated from the base with insulating shoulder washers.

Keying Levers

The bridge and keying levers are made from ¼ × ½-inch aluminum bar stock. Other material, such as brass or cold-rolled steel, would be satisfactory. The bridge and levers are drilled and tapped as indicated in Fig. 1. Fixed contacts, which are attached to the keying levers, are from an unused relay, and are attached as indicated in the photograph. Note the clearance holes in lever immediately behind the contacts. These holes allow clearance for a riveted-type contact.

Pivot Rods

The pivot rods are constructed of ⅛-inch stainless-steel rod, but either brass or cold-rolled steel would be suitable substitutes. The pivot rods are retained in the levers by means of ⅛-inch 6-32 set screws which may be removed from discarded knobs. The pivot rods are machined to a cone shape by inserting the rod in a drill press, or electric drill, and using a fine file to shape the

* R.D. 1, New Canaan, Conn.

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

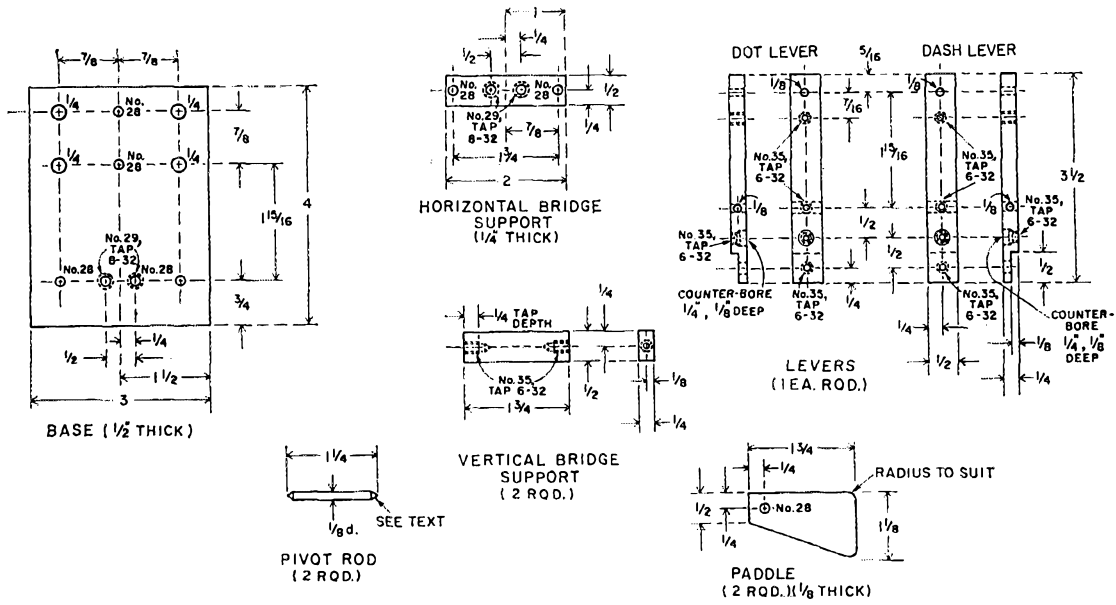


Fig. 1—Sketch showing details and dimensions of components required for the Nikey.

rod to the desired point. The bridge pivot screws (with holes) were obtained from the discarded bug key. The base pivot screws are ½-inch 6-32 cup-point Allen set screws. This type of set screw may be also used for the bridge pivot screws in place of the screws indicated. The pivot rods should be radiused or rounded for use with cup-pointed set screws as opposed to a definite point for use with pivot screws with holes (as used on the bridge).

Spring

Spring tension is supplied by the use of the dot-return spring from the discarded bug. By locating the return spring between levers, as shown in the photograph, only one spring is required. Adjustment of spring pressure requires the use of only one adjusting screw. This adjusting screw and lock nut were obtained from a 69-cent straight key. The other adjusting screw appearing in the photograph was added only as "dress," to provide a balanced appearance.

The paddles were cut from ⅛-inch Lucite but may be of ⅛-inch phenolic or other material on hand that can be shaped to individual preference. The rear stop post is a ¼-inch spacer, 1½ inches long, tapped, 6-32. Three rubber feet are fastened through the base to the vertical bridge supports and rear stop post.

Adjustment

The procedure in adjusting the key is to first position and center the lever contacts on the stationary contacts by adjusting the height of the pivot screws. The bottom pivot screws are locked in position. Final adjustment is made by tightening the top pivot screws until the vertical and horizontal motion of the pivot rods is eliminated and then loosening these screws slightly until there is no restriction in the radial motion of the levers.

To utilize this key to its fullest advantage, the contacts should be as close together as possible without making contact. This spacing will be in the order of 0.002 to 0.004 inch.

To provide a finished appearance, the base was cadmium-plated with an iridescent coating. The bridge and levers were anodized black. After anodizing, all tapped holes in the levers were retapped to clean the threads for good electrical contact.

When the key is properly adjusted, you will notice a decided improvement in your keying. With a little practice on the Nikey, one should be able to acquire the necessary orbital speeds to join the "spacemen" at the low end of 7 Mc. This key should prove versatile for use on the Ultimatic, TO, and all other forms of electronic keyers, and for the real old-timer who may get nostalgic and use it as a side-swiper. QST

Strays

The Third Army MARS training programs on 5850 kc., Friday evenings at 0000 GMT, will feature talks on c.w. operation by W4ANK on July 7 and 14 and on training sessions by K4DXF on July 21 and 28.

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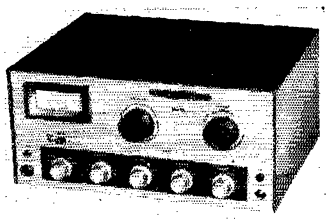
Have you heard this version? W4LPG tells us that in *A Real Book of Electronics*, written by Edward Stoddard and published by the Garden City Book Co., the derivation of "ham" is given as coming from the initial letters of the names of three pioneers in radio — Hertz, Armstrong, and Marconi.

• Recent Equipment —

DX-60 Transmitter Kit



THE Heathkit DX-60 is the third of a series of low-power transmitters that began with the DX-35. The set covers the amateur bands between 3.5 and 30 Mc., has three r.f. stages, and is crystal controlled with provision for operation with an external variable-frequency oscillator. The maximum rated c.w. input of the 6146 final amplifier, 90 watts, can be used on all bands. The 6146 plate tank is a pi network for working into 50- to 75-ohm coaxial line.

On phone the amplifier is screen modulated, with a species of carrier control for squeezing out a bit more power than the plate-dissipation rating of the 6146 otherwise would permit. The audio section of the transmitter uses two dual triodes. One, a 12AX7, is a two-stage speech amplifier. The second is a 6DE7, a tube which has one medium-μ and one low-μ triode. The medium-μ unit is used as a combination speech amplifier and carrier-control tube. The low-μ section is the modulator, cathode-coupled to the screen of the 6146.

Owners of the DX-40 (the successor to the DX-35) will recognize that the r.f. and the audio tube line-up shown in Fig. 1 is the same as that used in the 40. Interestingly enough, though, the actual r.f. circuit is almost a reversion to the original DX-35 arrangement — that is, the crystal oscillator is an electron-coupled Pierce, and the buffer tank is parallel-tuned. In the DX-40 the oscillator was a Colpitts of the hot-cathode type and a pi network was used to couple the driver to the amplifier.

Several innovations in the DX-60 represent distinct improvements over the earlier models. The 6146 amplifier is now neutralized by the capacitive-bridge method, and the drive-consuming series stabilizing resistor used in the 35 and 40 is no longer needed. There is a potentiometer in the d.c. screen supply to the 6CL6 buffer for controlling grid drive to the 6146; in the older sets the drive could be controlled only by the tuning of the buffer plate tank. The oscillator and buffer are no longer connected in series across the amplifier plate supply but get their plate and screen power in more orthodox fashion from a 300-volt tap on the plate supply. In the new model, all tubes in the r.f. string are keyed by the grid-blocking method, a separate negative grid-bias supply being incorporated for this purpose. The current in the keyed circuit is only a few milliamperes with this keying system. Finally, there is a built-in low-pass filter between the final tank and the antenna connector for suppressing harmonics in the TV range.

With one exception, the audio setup is the same as in the DX-40, having only minor changes in the circuit constants. The exception is one that builders of the earlier kits will appreciate — there is now an audio gain control in the speech amplifier. True, it's a screwdriver control inside the set and you have to take off the cover to get at it, but at least it's there. In some future model, maybe, it will show up on the panel among the other controls where it can be adjusted as needed.

R.F. Circuit

The screen of the 6CL6 oscillator is used as the anode for the Pierce crystal-oscillator circuit. The plate of this tube has a tank circuit permanently tuned to 7 Mc.; this circuit is resonated at around the center of the 7-Mc. range and is not adjustable from the panel. For 7 Mc. and all higher-frequency bands, the following stage, the 6CL6 buffer-multiplier, is driven on 7 Mc. It operates as a straight-through amplifier on 40 meters, as a doubler for 20 meters, as a tripler for 15 meters, and as a quadrupler for 10 meters. Crystals in the 40-meter range are recommended for operation on the last three bands. For 40-meter output either 80- or 40-meter crystals may be used; the crystal oscillator acts as a doubler in the latter

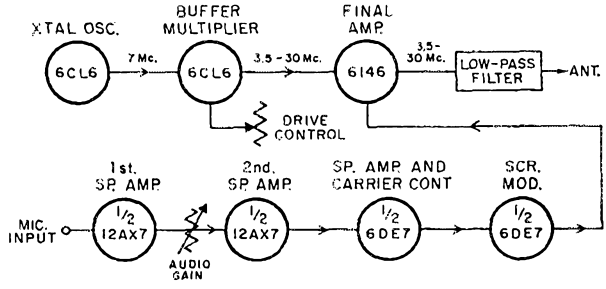


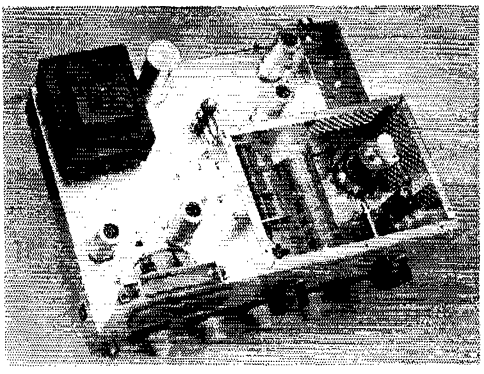
Fig. 1 — Block diagram of the DX-60 transmitter.

case. On 80, there is enough output from an 80-meter crystal to drive the buffer even though the oscillator plate circuit is not tuned to that band. The buffer plate tank uses a sectional coil which is progressively shorted when moving to higher-frequency bands. The band-selector switch is ganged with the band switch in the final plate tank.

The amplifier plate tank similarly has a progressive shorting arrangement for changing the pi-network inductance. The coil is air wound with heavy conductor, and is tuned by a 140-$\mu\mu$f. variable. On 80 meters an additional 68-$\mu\mu$f. fixed NP0 ceramic capacitor is shunted across the variable. The output capacitor is a three-section gang with all sections in parallel to give a total capacitance of 1350 $\mu\mu$f. This capacitor is operated through a 2-to-1 gear reduction so adjustment of loading is not critical on any band. Neither is its tuning excessively slow, as is the case where a small capacitor is shunted by a number of fixed units.

The low-pass filter is a three-section arrangment with *m*-derived end half-sections. The cutoff frequency is 34 Mc. The filter is a much appreciated adjunct to any transmitter, but its presence does mean that the load has to be close to the design value of 50-75 ohms — in other words, coaxial line operating at a low s.w.r.

All three tubes in the r.f. section are biased beyond cutoff in the key-up position. Actual bias is around 130 volts. The key short-circuits part of a voltage divider across the bias supply and completely removes the fixed bias from the oscillator and buffer. With the key down these two tubes are grid-leak biased. Bias for the 6146 final stage is taken from a point a little higher up on the divider and does not disappear completely with the key down; the remaining fixed bias,



There is no crowding in the DX-60 chassis layout. The 6146 final amplifier and its tank circuit are enclosed in the shield compartment at the right; the perforated cover which completes the shielding has been taken off for this picture. The small enclosure at the rear right edge of the chassis contains the low-pass filter. Tubes alongside it are the 6CL6 oscillator (rear) and 6CL6 buffer-multiplier. The upright resistor at the corner of the amplifier compartment is the power-supply bleeder. Tubes in the left foreground are the 12AX7 speech amplifier and 6DE7 amplifier-modulator.

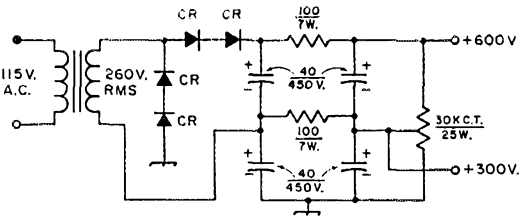


Fig. 2 — The plate power supply in the DX-60 uses a full-wave voltage doubler circuit with silicon rectifiers. Two output voltages are available. The rectifiers, CR, are Sarkes Tarzian Type K, (equivalent to the F-4) having an inverse-peak rating of about 400 volts.

about 25 volts, is enough to protect the tube if through accident it should get no excitation from the buffer-multiplier.

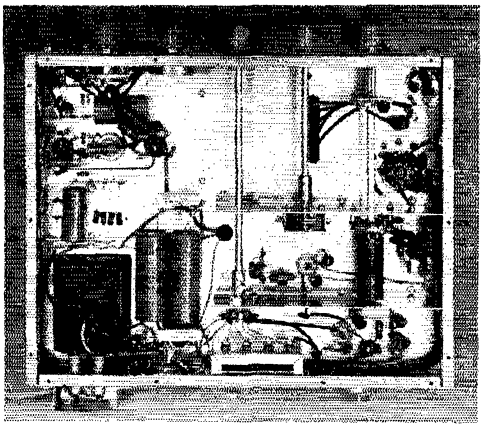
Keying and Modulation

As is to be expected with keyed oscillators, a small chirp could be detected at the higher frequencies, particularly 10 meters. Most of this was found to be the result of voltage variation on the oscillator screen with keying, and was easily cured by connecting a 150-volt regulator tube between screen and chassis. (There is plenty of room for a 0A2 socket on the chassis near the oscillator tube, in the space between the crystal compartment and the interstage shield.) With this change the keying is quite good through 15 meters and probably won't get criticized even on 10. The activity of the crystal used has something to do with it, of course.

The instruction book does not seem to be as clear as it might be on the question of phone operation. The transmitter is rated at 90 watts peak input, which from our experience with the set means 90 watts peak *envelope* power input. In other words, it will modulate up, on instantaneous voice peaks, to the same input as is used on c.w. This does *not* mean that the plate meter can be kicked up to 150 ma. In the phone position of the function switch the no-modulation plate current is 70 to 80 ma. With full modulation the meter kicks to 90-100 ma. when the p.e.p. input is 90 watts. Any higher plate current causes peak flattening — which, as any phone operator should know, is accompanied by splatter.

Power Supply

The 600-volt power supply is of a type that is becoming a favorite with the hi-fi amplifier people — a full-wave voltage-doubling circuit using silicon rectifiers, with an *RC* filter (no chokes). This circuit results in lower peak-inverse voltage across the rectifiers, for the same d.c. output voltage, than is the case with the familiar center-tap rectifier. Thus fewer rectifier units — which are generally rated at 400 volts p.i.v. in the inexpensive types — are needed. With large filter capacitances — the DX-60 has two pairs of 40-μf. electrolytics in series, with 100-ohm filtering resistors between — the voltage regulation is good. Key up, the output was measured at 680 volts; key down, 600 volts. The a.c. voltage out



No crowding here, either. Power connections are made through a wiring harness running around three sides of the chassis. Power and bias-supply components occupy the lower left section. The audio circuits are in the upper left corner. Baffle shields separate the below-chassis wiring of the oscillator (lower right), buffer-multiplier, and final amplifier. Crystals plug into the recess at lower center. A.c. is introduced through feedthrough bypasses in the protective cover at lower left. The only departure from the straight kit assembly in this photograph is the "safety" choke connected to the band switch in the upper right corner; none was included in the original circuit diagram.

of the power transformer is a shade over 250 volts r.m.s.

The bias supply uses a half-wave silicon rectifier and *RC* filter working from a separate winding on the power transformer. Heater power for all tubes is taken from the same transformer.

The pilot-light system in the DX-60 was new to this writer, although it may have been used before. The lights are miniature neon bulbs. One is across the bias supply, with a 470K resistor in series to limit the current. This is the POWER ON indicator, since the bias supply is working in all positions of the function switch except OFF. The other bulb is similarly connected across the high-voltage supply. It lights up in the TUNE, AM and CW positions. These lights do not go off immediately when the switch is thrown to an off position, but stay lit until the filter capacitors are almost discharged — a nice safety feature, although it is a bit startling at first to shut off the power and see the pilots still glowing!

Physical

In construction and layout the DX-60 bears practically no resemblance to its forerunners. It has a modern low silhouette, is wider and deeper, and the panel arrangement avoids the monotony of strictly geometrical balance. The chassis and cover (there is no cabinet as such) are of heavy-gauge steel; the cover is the "wrap-around" type with a folded lip that surrounds the top and sides of the panel.

The meter, which reads either grid or plate current of the final stage, has a d'Arsonval movement as compared with the moving-vane type used in the earlier sets, and is well damped. It is recessed and illuminated.

Crystals — there is provision for four — plug into sockets in a recess at the rear of the chassis. It is not necessary to remove a door and reach inside a cabinet to get at them, as it was in the predecessor transmitters.

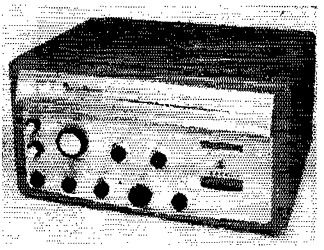
The transmitter is well shielded and filtered for v.h.f. harmonics. The final amplifier has a complete shield surrounding it, installed on top of the chassis. A bottom plate with plenty of screws is used to box in the circuits under the chassis. A.c. input terminals are brought in through feedthrough capacitors. The low-pass

(Continued on page 144)

DX-60 TRANSMITTER

Height: 6 ¼ inches.
Width: 13¾ inches.
Depth: 11 ½ inches.
Weight: 23 pounds.
Power Requirements: 225 watts at 117 volts. 60 cycles.
Price Class: $85.
Manufacturer: Heath Company, Benton Harbor, Mich.

Viking Invader Transmitter



THE Johnson Viking Invader is a filter-type table-top transmitter capable of operating on all amateur bands between 80 and 10 meters on s.s.b., a.m. and c.w. Power input to the final amplifier, a pair of 6146s, is rated at 200 watts p.e.p. on s.s.b., 200 watts on c.w., and 90 watts on a.m. This can be increased to 2000 watts p.e.p. on s.s.b., and 1000 watts on c.w. and a.m. by adding an accessory amplifier, the Invader 2000. The high-power linear portion of the Invader 2000 fits inside the Invader's cabinet in place of the power supply, which is removed and remounted on an external power-supply chassis.

The Invader is v.f.o.-controlled and its fre-

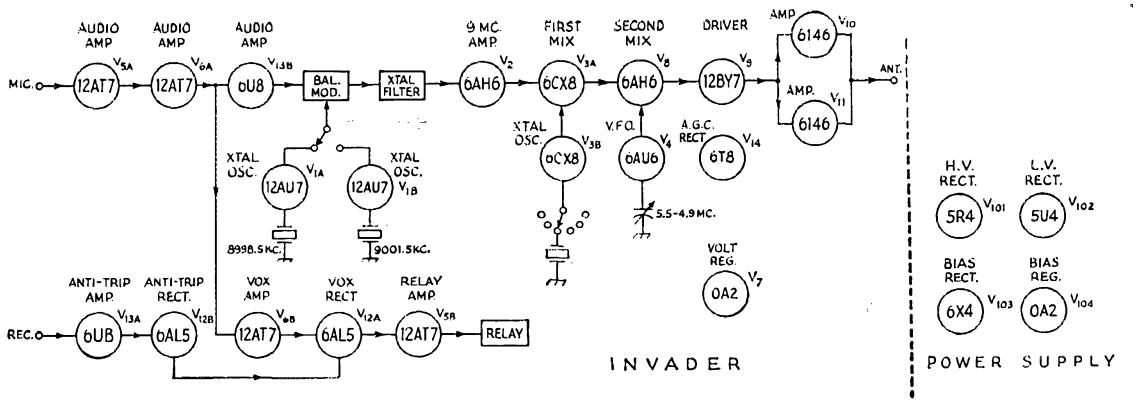


Fig. 1—Block diagram of the Johnson Viking Invader.

quency range extends outside several of the amateur bands so that some of the MARS frequencies can be covered. Seven ranges are used: 3.5 to 4.1 Mc., 7.0 to 7.6 Mc., 13.9 to 14.5 Mc., 20.9 to 21.5 Mc., 28.0 to 28.6 Mc., 28.5 to 29.1 Mc., and 29.1 to 29.7 Mc.

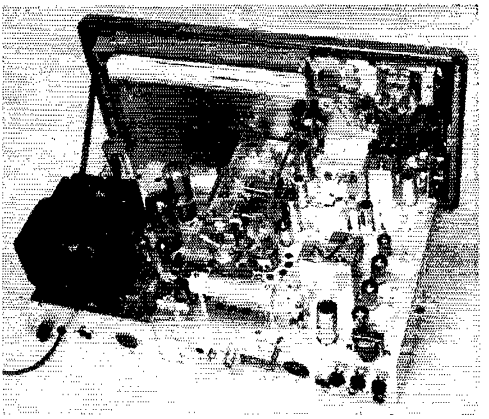
The block diagram in Fig. 1 shows that the basic s.s.b. signal is generated at 9 Mc. By using either of the two possible oscillator frequencies, 8.9985 Mc. or 9.0015 Mc., generated by the crystal oscillator tubes V_{1A} and V_{1B}, the resulting sideband signal is switched to the desired upper or lower sideband. The signal from the crystal oscillator V_1 is fed into a balanced modulator using semiconductor diodes. Also arriving at the balanced modulator is the modulating signal from the microphone and audio amplifier stages V_{5A}, V_{6A} and V_{13B}. In s.s.b. emission, the double-sideband suppressed-carrier signal from the balanced modulator is passed through a multi-section bandpass crystal filter which slices off one of the sidebands. Of course, the filter isn't used when in the c.w. or a.m. mode. The transmitter is rated to have 55 db. or more carrier suppression and 60-db. unwanted-sideband suppression with the filter system.

After amplification in a 9-Mc. amplifier, V_2, the signal is either heterodyned to a first i.f. in the first mixer, V_{3A}, or fed through to the second mixer and v.f.o. combination, which heterodynes the signal to the desired amateur-band frequency. On 80 and 20 meters, where the signal feeds straight through to the second mixer, the sum and difference frequencies produced by heterodyning with the 5-Mc. v.f.o. give the 4- and 14-Mc. signals.

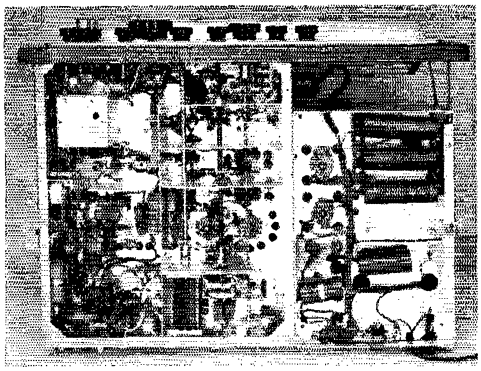
Injection for the first mixer is furnished by a crystal-controlled oscillator, V_{3B}, which operates on all bands except 80 and 20 meters. For example, on 15 meters the crystal oscillator, V_{3B}, oscillates at 25 Mc. and is heterodyned with the 9-Mc. signal from V_2 to give a 16-Mc. signal at the plate of the first mixer, V_{3A}. The v.f.o. has a tuning range of 4.9 to 5.5 Mc. and, in the case of 15 meters, beats with the 16-Mc. signal from the first mixer to produce the 21-Mc. signal.

The v.f.o. is temperature compensated and voltage regulated for the sake of good frequency stability. The tuning rate of the v.f.o. control knob is 200 kc. per knob rotation. Since the v.f.o. tunes only 600 kc., it is necessary to cover the 10-meter band in three steps.

Following the second mixer, the amateur-band signal is amplified by a 12BY7 driver stage, V_9, and fed into the parallel-6146 final-amplifier stage. The mixer and driver stages are gang-tuned by a front-panel EXCITER control. Final-amplifier plate tuning is done with the FINAL TUNING knob, which is a separate control from the pi network LOADING control. The pi network is designed to work into a 30- to 600-ohm load. There is a unique mechanical arrangement for changing the loading capacitance while still retaining single-knob control: As the variable loading capacitor (a differential capacitor) is turned, it engages a switch every 180 degrees of rotation. This switch connects accumulative fixed



The 6146 final amplifiers and their tuned circuits are located just to the right of the large power transformer. A perforated aluminum box covers the final-amplifier components, but it has been removed in this photograph. The empty meter hole in the front subpanel is for mounting a meter used in the Invader 2000 conversion. Rear apron connections on the Invader are, from left to right: fuse, line cord, bias control for external amplifier, power-supply output socket, ground stud, antenna connector, power-supply input connector, anti-trip connector, 117 volts a.c. for antenna relay control, key jack, push-to-talk jack, and microphone connector. The three small controls at the top right of the rear apron are the VOX and anti-trip controls.



The clean wiring and component layout of the Invader are visible in this bottom view. The power-supply chassis is at the right. The shielded box at the upper left contains part of the v.f.o. circuitry.

capacitance in shunt with the variable. As soon as a fixed capacitor is switched in, the variable capacitor is free to rotate another 180 degrees. The fixed capacitor switch positions are indicated in a panel opening and are numbered from 1 through 9. The extreme clockwise position of the switch connects the proper capacitance for loading into the accessory Invader 2000 high-power linear amplifier.

The Invader uses an a.l.c./a.g.c. circuit to limit transmitter output to a predetermined value. The a.l.c. system is not the conventional type; that is, it does not sample the final r.f. output to obtain the a.g.c. control voltage. The system in the Invader uses audio developed by rectification of the r.f. signal in the grid circuit of the final amplifier when the tubes are driven into the grid-current region. This audio is coupled to the a.l.c. rectifier, V_{14}, and the resulting d.c. bias is applied to the grid of V_2 to reduce its gain. The a.g.c. action helps prevent over-driving the final amplifiers.

All meter indications in the Invader are in terms of r.f. output. This single indication serves for resonating the exciter and final-amplifier tuning, and for loading adjustment. The meter also functions as a monitor of voice level in s.s.b. Although the meter can only function as an output indicator in the Invader circuit, a front-panel knob is connected to a meter switch that permits selection of several meter functions for use with the Invader 2000.

The Invader's voice-operated circuits pick up audio from V_{8A}, amplify it in V_{6B}, and rectify it in V_{12A}, where the resulting d.c. controls a relay tube, V_{5B}, that operates a four-pole double-throw relay. Anti-trip operation is obtained by taking audio from the receiver, amplifying it in V_{13A}, and rectifying in V_{12B}. This voltage is applied to the VOX rectifier, V_{12A}. Controls on the rear apron of the Invader are used to set the relative levels of the VOX and anti-trip channels and to set the hold-in time for VOX operation.

Power to operate the Invader is furnished by a compact power supply located inside the cabinet. It supplies high and low voltage for the various circuits as well as regulated bias and screen voltages for the unit. As mentioned earlier, this power-supply chassis is removed to make room for a high-power linear when the Invader is converted to the Invader 2000.

The Invader cabinet has a hinged top for easy access to the interior. The rotating drum slide-rule dial and the output meter dominate the top half of the panel. All of the main operating controls are located on the front panel, together with a five position OPERATE switch which selects the various functions of the transmitter. The OFF position kills all power to the transmitter and the STBY position puts a blocking bias on the driver and final amplifiers. MANUAL position is used for c.w. operation and for manual control of the transmitter while in the other modes. The ZERO position turns on the exciter for zero-beating purposes but applies cut-off bias to the amplifier.

A MODE switch selects the type of emission desired: UPPER or LOWER sideband, A.M. or C.W. The EXCITER, AMPLIFIER and LOADING controls are adjusted for maximum output as indicated by the output meter. An R.F. LEVEL CONTROL adjusts the amount of carrier inserted on a.m. or c.w., and a ZERO LEVEL control adjusts the level of the carrier inserted for zero beating purposes. For relative r.f. output measurements, the meter sensitivity can be varied by an OUTPUT control.

On the rear apron of the chassis there are connections for the key, microphone, antenna, receiver (for anti-trip) and antenna relay. There is also provision for controlling the bias of an external amplifier. — *E. L. C.* QST

INVADER

Height: 11⅝ inches.
Width: 21 inches.
Depth: 16 inches.
Weight: 53 pounds.
Power Requirements: 117 volts a.c., 130 watts standby, 325 watts c.w. and 260 watts s.s.b.
Price Class: $620.
Manufacturer: E. F. Johnson Co., Waseca, Minnesota.

Strays

K9UWX, in Illinois, received a telephone call from a shortwave listener in Michigan who invested a 35-minute toll call to relate how much he had enjoyed the round-table QSO that K9UWX had just been in.

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K2SJN conducted classes for would-be Novices at the Communications Club of New Rochelle. The first student to receive a Novice call received WV2SJN.

High Claimed DX Competition Scores

FOLLOWING are the high *claimed* scores received in time to appear in this issue of *QST*, with final and complete results to appear in a Fall issue. Shown after the call is the *claimed* score, multiplier and number of contacts. Only those c.w. scores claiming over 200,000 and phone scores claiming over 50,000 are listed.

C. W.

Single Operator

W3ECR[1].....554,691-281- 658
W9NZM[2].....514,275-295- 615
W4YHD.....513,783-273- 628
W3GRF.....503,010-270- 621
K2DGT.....445,082-247- 602
W8FGX.....440,000-250- 592
W4KFC.....384,776-247- 526
CE1AD.....376,125- 59-2125
KP4ATV.....367,837- 67-1829
K2DCA.....327,670-217- 504
VK2GW.....300,364- 68-1516
KW6DG.....285,820- 62-1692
W3ALB.....275,808-208- 442
W1BIH.....251,262-198- 423
W9YSX.....250,299-203- 411
PY4GA.....246,720- 64-1359
VK5NQ.....240,912- 56-1452
K6VTQ.....229,308-194- 394
W4JAT.....228,324-191- 388
W3EIV.....218,250-194- 375
HK7ZT.....217,179- 59-1227
W4DQS.....217,160-185- 392
W3KFQ.....214,134-178- 401
W6UBD.....213,012-183- 388
W9ERU.....212,212-182- 392
W4AZK.....210,375-187- 375
YN4AB.....207,174- 43-1673
CE3AG.....204,600- 65-1100
W1JYH.....203,643-187- 363
VK3APJ.....200,880- 54-1240

Multiple Operator

W3MSK.....882,849-341- 853
W3AOH.....553,548-297- 628
W4KXV.....397,935-239- 555
W3BES.....371,250-225- 550
K6EVR.....357,183-233- 511
W6RW.....356,895-230- 515
KH6ECD.....336,861- 63-1813
W3CTJ.....319,152-218- 488
W3MFJ.....261,099-201- 433
K1MLL.....205,200-171- 400

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

PHONE

Single Operator

KP4AVQ.....297,888- 58-1717
K2GXL.....247,101-187- 443
W1ONK.....204,666-154- 447
HI8DGC.....202,565- 55-1228
W9EWC.....202,564-178- 380
W3ECR.....166,635-161- 345
W3DHM.....165,330-165- 334
W3CTJ.....152,922-154- 331
W4QCW.....133,950-150- 299
K6EVR.....131,520-137- 320
W9NZM.....126,836-148- 287
W9DUB.....121,519-137- 301
W3KFQ.....120,650-127- 317
F7BI.....115,560- 60- 642
W4OM.....104,796-123- 284
W1FZ.....103,416-124- 278
OE1RZ.....103,320- 45- 873
W1OKG.....101,598-123- 276
W8ZOK.....101,001-131- 257
HC1KA.....98,952- 38- 870
W8NXF.....98,820-135- 244
SM5BLA.....91,728- 42- 728
K2DGT.....87,914-113- 226
KH6IJ.....87,453- 79- 369
PZ1AX.....79,532- 59- 450
W3KT.....76,955-103- 242
W4LNE.....75,600-105- 245
UR2AR.....75,526- 32- 787
F7BI.....73,188- 38- 642
W9YSQ.....70,290-110- 213
PJ3AI.....69,600- 50- 464
HK4KZ.....62,640- 45- 464
KP4AWH.....60,624- 48- 422
LU1DAB.....60,522- 42- 481
W5KC.....58,212- 98- 198
XE2DS.....57,564- 54- 365
KZ5DF.....56,836- 42- 451
VP3HAG.....56,728- 56- 338
K9ECE.....56,725-108- 172
KW6DG.....55,695- 47- 388
TG5HC.....54,870- 62- 293
K5MDX.....53,700-100- 179
W2GBC.....53,460- 90- 202

Multiple Operator

W1ETF.....288,578-174- 549
KH6ECD.....225,918- 66-1141
W8NWO.....209,655-181- 385
W3BES.....202,852-166- 408
W8NGO.....163,056-158- 344
W4LMK.....73,062- 99- 254

LeMay, Radio Amateur, New Air Force Chief

GENERAL Curtis E. LeMay, well-known throughout the world as an active ham, was recently nominated by President Kennedy to be Chief of Staff of the U. S. Air Force. Born and educated in Ohio, Gen. LeMay entered the armed services as a flying cadet in 1928, serving first in fighter operations and later transferring to bomber aircraft. His career is studded with outstanding accomplishments, both operational and administrative. He is perhaps best known for his B-29 bombardment activities in the Pacific during World War II, his organizing of the Berlin airlift operations after World War II, his command of SAC, and the ubiquitous cigar.

Gen. LeMay's interest in radio goes back to his high school days, but it was not until May of 1935 that he was able to bring that interest to reality. Serving in Hawaii with a pursuit group, he was named Group Radio Officer and immediately set about stirring up interest in ham radio with the enlisted men in his unit. A club was formed and a station constructed. Soon K6MEG was logging QSOs with the mainland and with stations in Asia. General LeMay's interest in amateur radio remained strong, but there were more pressing responsibilities. It was not until he assumed command of the air forces in Europe after World War II that he was able to take a more active interest in hamming. Soon the familiar DL4AFE was on the air from Weisbaden.

His participation in amateur radio and interest in communications became even more useful for national defense when he was named commander of the Strategic Air Command. In building SAC he also built a strong system of communications. He personally participated in such developments as the use of single sideband.

Since 1956 he has been able to devote more time to his ham rig, and many surprised airmen in SAC found they were talking to their commander when they chatted with K0GRL in Omaha. Named Vice Chief of Staff in 1957, he was soon on the air as K4RFA, at Fort Meyers, Va. A change in quarters to Bolling Field resulted in his new and present call K3JUY. In July he will return to Fort Meyers to occupy quarters as Chief of Staff of the Air Force. QST

K3JUY/K4RFA

I.A.R.U. News

Silent Keys
G2NM — G3DQ

It is with deep regret that we must record the passing of two of England's most eminent amateurs.

On April 6, 1961, Gerald Marcuse, G2NM, noted English amateur, past president of the Radio Society of Great Britain, and a founder vice president of the International Amateur Radio Union, passed away at the age of 74.

Gerry began his amateur experimenting in 1913. Following the first World War he became honorary secretary of the Radio Transmitters' Society which in 1925 fused with the Transmitter and Relay section of the Radio Society of Great Britain. After the fusion Gerry became honorary Secretary of the Transmitter and Relay section of the Society.

G2NM

During Easter week of 1925 when the International Amateur Radio Union was formed at Paris with Hiram Percy Maxim (president of the ARRL) as president, Mr. Marcuse was chosen vice president. During the early years of the organization Gerry's contributions were frequent and outstanding.

During the trans-Atlantic tests of 1923 and 1924 the signals of G2NM were received in the United States on several occasions. In 1927, Gerry inaugurated the Empire Broadcasting Service using his own station at Caterham, Surrey. The purpose of the Service was to foster overseas friendships and was a monumental success.

Mr. Marcuse became acting vice president of the RSGB in 1927 and was elected president in 1929. In 1946 he was elected an honorary member in recognition of his outstanding services to amateur radio in general and to the Society in particular.

Mr. William Radcliff Metcalfe, G3DQ, President of the Radio Society of Great Britain during 1960, succumbed on Christmas day, 1960, after a long illness.

"Cliffe" Metcalfe became a member of the Council in January 1955, upon his election to the office of Zonal representative for Northern England. Two years later he was elected Honorary Treasurer. In January, 1958 he became Executive Vice President, and on January 1, 1960, ascended to the Presidency of the Radio Society of Great Britain.

50 YEARS OLD

The oldest radio club in all of England, the Derby Wireless Club, on April 22 celebrated its Golden Jubilee Year. A number of the original members including A. T. Lee (LYX), C. L. Drury (XDF), and G. E. Mart (URX) together with a number of the past officers helped to celebrate fifty years of successful hamming.

Strays

If you have had trouble getting the proper QTHs of amateurs in any of these counties in Virginia — Norfolk, Nansemond, Surry, York, Gloucester, Northampton, Princess Anne, Isle of Wight, Mathews, and Accomac — the Tidewater Mobile Radio Club will try to help you. Contact them in care of A. C. Ferebee, K4IAJ, 314 Maycox Ave., Norfolk 5, Va.

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25 Years Ago this month

July 1936

. . . A report on 5-meter DX during May, when the band suddenly opened for 1000-mile QSOs between the east coast and the midwest, reported the excitement was so great that this was dubbed the "Great Five-Meter Panic."

. . . Technical articles included dope on a push-pull-push crystal oscillator, a 500-watt rig with band-switching exciter, a neon-stick visual modulator monitor, inductive neutralization of r.f. amplifiers, high-fidelity audio, better c.w. reception, a 3-stage 1-kw. rig, and the customary hints and kinks.

. . . There was nearly a page and a half of DX notes.

. . . The 1935 SS was reported on — 676 logs were received, but there were no entries at all from Western Florida, Mississippi, or the Philippines (which at that time were an ARRL section). Top score was W8JIN, with 534 contacts, 63 sections, and 99,509 points. But those were the days when men were men and the SS ran for 10 days. W8JIN spent 86 hours racking up that score!

. . . And "Correspondence" carried a letter from Connecticut Governor Cross thanking radio amateurs for having maintained communications during the recent flood disaster.

Happenings of the Month

Which FCC Application to Use
Examination Schedule
Board Meeting Minutes

LICENSE SUSPENSIONS

Two New Orleans amateurs were given six months suspensions of their General Class licenses for transmitting calls not assigned to their respective stations, specifically on or about January 28, 1961. Roger David Pender, jr., K5MHG and Alfred J. Irving, K5WMN, did not contest the FCC suspensions. Pender's went into effect on April 4; Irving's on April 30. (*Section 12.158 of the FCC's Rules Governing the Amateur Radio Service.*)

The Conditional Class license of Ernest W. Estes, of Beaverton, Oregon, was suspended by FCC for the remainder of the license term (that is, until October 26, 1965) for fraud. Estes indicated in his application for Conditional Class that he resided at Yakima, Washington, a point more than 75 miles from a point where the Commission gives examinations at least four times a year. Later the Commission discovered that Estes actually lives in Beaverton, Oregon, approximately ten miles from Portland, Oregon, where the FCC gives amateur exams three days each week, and so Estes was not entitled to take the Conditional exam. The suspension of K7JWT went into force on April 26, 1961. (*Sections 12.21 (d), 12.44 (c), and 12.162 of the Rules*)

A Novice who popped up on the 75-meter phone band during January and February this year had his license suspended for two months. The FCC action against William H. Frinzely, WV6NYW, of El Cajon, California, became effective on May 2, 1961. (*Sections 12.23 (e) and 12.28 of the Rules*)

WHICH FCC APPLICATION TO USE?

The new FCC forms, which have been optional since early this year, but become mandatory on July 1, have been causing some confusion.

Revised Form 610 (dated November 1960) is the right form about 90% of the time. It is used for new licenses, renewals, changes of address, or replacement of a lost or mutilated license involving the regular combination station-and-operator license which most amateurs have. It is also used by those few amateurs (in schools or other institutions, or a few in the military) who hold an operator license, but have no call sign or station license.

The new Form 610-A is only used for special types of station license. If an amateur already has a combination station-and-operator license, but wants to apply for an additional license at his place of business or summer home (for instance), he uses the Form 610-A. If he has two licenses now that are up for renewal, he files for renewal of the basic combination license on Form 610 and for renewal of the second-station license on Form 610-A.

Any application involving a club license also is made on the new Form 610-A, by the amateur who has been appointed Trustee of the station.

Form 610-A is also used by the officer in charge of an amateur station for recreational use at a military installation (commonly called "602 stations").

Whichever application form is being used, applicants should be sure that they have filled in all the numbered items which apply to them.

U. S. Senator Barry M. Goldwater, ex-6BPI, in his appearance before the Southwestern Division Convention in Phoenix on May 28, told 1100 amateurs that "complete communications between the peoples of the world will be the only solution to peace." The senator furthur challenged the hams, "wouldn't it be great for hams here in the United States to discuss this country's ideals with other hams around the world?" He added, "That once the United States begins to show other countries that Americans want no advantage over them, that we are all "created equal," then we will have taken the first step toward world understanding. The senator admitted that he has an SX-88 so he can listen to us, and used the experience to praise those who take a few faltering steps in the direction of speaking Spanish on the air to Latin American contacts.

Commenting on the damage of past American "boasting" material possessions rather than spiritual assets, he added, "If we can pass on how simple and how beautiful the feelings of Americans are, we can erase this ugly image of the American that now exists."

The ham fraternity picked up a strong ally when the senator promised us full support in the move for reciprocal licensing. His statement was especially gratifying to the representatives from the seven countries which took part in the convention.

Here, l. to r., are ARRL Southwestern Division Director Ray Meyers, W6MLZ; Senator Goldwater; Convention Chairman Bud Blaksley, K7ASK; ARRL General Manager John Huntoon, W1LVQ; and Phoenix Mayor Dan Mardian.

The Commission's licensing unit reports that many Form 610 applications have been received with items 10 through 14 not filled in. As of this writing, notarization is still required on all applications, except those dealing solely with operator privileges; if in doubt, have your application notarized.

Applications for renewal should be submitted not more than 60 days before expiration. Old forms 405-A, 602 and those 610s bearing a printing date earlier than 1960 should no longer be used.

NEWFOUNDLAND, MAINE GET LICENSE PLATES

Radio amateurs in the Province of Newfoundland (which includes Labrador) will be able to get car license plates bearing their call letters in 1962. The license plate committee of the Society of Newfoundland Radio Amateurs which led the campaign for the plates was composed of VO1s EC, BH, FM, and EN. The other provinces granting the plates are: Alberta, Saskatchewan, Nova Scotia, P.E.I., Quebec and New Brunswick.

The State of Maine becomes the 46th to grant call letter license plates. Application forms will be available from the Secretary of State shortly after adjournment of the Legislature. The forms, together with the regular license fee of $15, the special license plate fee of $10, and notarized proof of the holding of an amateur license other than Novice, must be filed by October 31. After the first year, the extra fee will be $5 per year. The same bill also provides for other types of special license plates, the same fees being charged for most of these. The Portland Amateur Wireless Association was instrumental in obtaining the privilege for the hams of Maine.

The only states not now issuing call plates are New York, New Jersey, Massachusetts and Kentucky.

EXAMINATION SCHEDULE

THE Federal Communications Commission will give Extra and General Class amateur examinations during the second half of 1961 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified with the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: October 7, 11 A.M.
Amarillo, Texas: September 13.
Anchorage, Alaska, 53 Federal Bldg.: By appointment.
Atlanta, Georgia, 718 Atlanta National Building, 50 Whitehall St. S. W.: Tuesday and Friday at 8:30 A.M.
Baltimore, Md., 415 U. S. Customhouse, Gay and Water Sts.: Monday and Friday, between 8:30 A.M. and 10 A.M. and by appointment.
Beaumont, Texas, 301 P. O. Bldg.: By appointment.
Birmingham, Ala.: September 6, December 6, 11:00 A.M.
Boise, Idaho: Sometime in October.
Boston, Mass., 1600 Customhouse: Wednesday through Friday 9:00 A.M. to 10 A.M.
Buffalo, N. Y., 328 P. O. Bldg.: First and third Fridays.
Charleston, W. Va.: Sometime in September and December.
Chicago, Ill., 826 U. S. Courthouse: Friday.
Cincinnati, Ohio: Sometime in August and November.
Cleveland, Ohio: Sometime in September and December.
Columbus, Ohio: Sometime in July and October.
Corpus Christi, Texas: September 7, December 7.
Dallas, Texas, 401 States General Life Ins. Bldg.: Tuesday.
Davenport, Iowa: Sometime in July and October.
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.
Des Moines, Iowa: Sometime in September and December.
Detroit, Mich., 1029 Federal Bldg.: Wednesday and Friday.
Fort Wayne, Ind.: Sometime in August and November.
Fresno, Calif.: Sometime in September and December.
Grand Rapids, Mich.: Sometime in July and October.
Great Falls, Mont.: Sometime in September.
Hartford, Conn.: September 13.
Hilo, Hawaii: October 3.
Honolulu, Hawaii, 502 Federal Bldg.: Monday through Friday.
Houston, Texas, 326 U. S. Appraisers Bldg.: Tuesday.
Indianapolis, Ind.: Sometime in August and November.
Jackson, Miss.: December 6.
Jacksonville, Fla.: October 20.
Jamestown, N. D.: October 18, 10 A.M.
Juneau, Alaska, 6 Shattuck Bldg.: By appointment.
Kansas City, Mo., 3100 Federal Office Bldg.: Thursday and Friday, 8:30 A.M. to 1 P.M.
Knoxville, Tenn.: September 20, December 20, 11:00 A.M.
Lihue, Hawaii: October 10.
Little Rock, Ark.: August 2, November 1, 1:00 P.M.
Los Angeles, Calif., 849 So. Broadway: Wednesday, 9 A.M. and 1 P.M.
Louisville, Kentucky: Sometime in August and November.
Memphis, Tenn.: July 13, October 5, 8:30 A.M.
Miami, Fla., 312 Federal Bldg.: Thursday.
Milwaukee, Wisconsin: Sometime in July and October.
Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday, by appointment.
Nashville, Tenn.: August 2, November 1, 11:00 A.M.
New Orleans, La., 608 Federal Office Building, 600 South St.: Monday through Wednesday, code tests Monday only at 8:30 A.M.
New York, N. Y., 748 Federal Bldg., 641 Washington St.: Tuesday through Friday.
Norfolk, Va., 402 Federal Bldg.: Monday through Friday except Friday only when code test required.
Oklahoma City, Okla.: July 13, October 12.
Omaha, Nebr.: Sometime in July and October.
Philadelphia, Pa., 1005 New U. S. Customhouse: Monday through Wednesday, 8:30 A.M. to 10 A.M.
Phoenix, Ariz.: Sometime in July and October.
Pittsburgh, Pa.: Sometime in August and November.
Portland, Maine: October 10.
Portland, Ore., 201 U. S. Courthouse: Friday, 8:45 A.M.
Roanoke, Va.: October 7.
St. Louis, Mo.: Sometime in August and November.
St. Paul, Minn., 208 Federal Courts Bldg.: Friday, 8:45 A.M.
Salt Lake City, Utah: September 8, December 8, 1 P.M.
San Antonio, Texas: August 3-4, November 2-3.
San Diego, Calif., Fox Theater Bldg.: Wednesday, by appointment.
San Francisco, Calif., 323-A Customhouse: Friday.
San Juan, P. R., 323 Federal Bldg.: Friday.
Savannah, Ga., 214 P. O. Bldg.: By appointment.
Schenectady, N. Y.: September 13-14, December 6-7, 9 A.M. and 1 P.M.
Seattle, Wash., 802 Federal Office Bldg.: Friday.
Sioux Falls, S. D.: September 19, December 19, 10 A.M.
Spokane, Wash.: Sometime in October.
Syracuse, N. Y.: Sometime in July and October.
Tampa, Fla., Rm 201, 221 No. Howard Ave.: By appointment.
Tulsa, Okla.: August 17, November 16.
Tucson, Ariz.: Sometime in October.
Wailuku, Hawaii: October 7.

Washington, D. C., 718 Jackson Place, N.W.: Tuesday and Friday, 8:30 A.M. to 5 P.M. Code test 9:30 A.M. and 1 P.M.
Wichita, Kansas: Sometime in September.
Williamsport, Pa.: Sometime in September and December.
Wilmington, N. C.: December 2.
Winston-Salem, N. C.: August 5, November 4.
NOTE: Only General Class and Amateur Extra Class license examinations are given at FCC offices and examining points listed above. All examinations for Novice, Technician and Conditional Class licenses are conducted by volunteer supervisors.

MINUTES OF 1961 ANNUAL MEETING OF THE BOARD OF DIRECTORS

The American Radio Relay League, Inc.
May 5, 1961

1) Pursuant to due notice, the Board of Directors of The American Radio Relay League, Inc., met in annual session at the Disneyland Hotel, Anaheim, California, on May 5, 1961. The meeting was called to order at 9:34 A.M. PDST with President Goodwin L. Dosland in the Chair and the following directors present:

P. Lanier Anderson, Roanoke Division
Roemer O. Best, West Gulf Division
James P. Born, jr., Southeastern Division
Dana E. Cartwright, Great Lakes Division
Milton E. Chaffee, New England Division
Charles G. Compton, Dakota Division
Gilbert L. Crossley, Atlantic Division
Sanford B. DeHart, Delta Division
Robert W. Denniston, Midwest Division
John G. Doyle, Central Division
Noel B. Eaton, Canadian Division
Harry M. Engwicht, Pacific Division
Morton B. Kahn, Hudson Division
Raymond E. Meyers, Southwestern Division
R. Rex Roberts, Northwestern Division
Carl L. Smith, Rocky Mountain Division

Also in attendance, as members of the Board without vote, were Wayland M. Groves, First Vice-President; Alex Reid, Vice-President; F. E. Handy, Vice-President; John Huntoon, General Manager. Also in attendance, at the invitation of the Board as a non-participating observer, was Southwestern Division Vice-Director Howard F. Shepherd, jr. There were also present Treasurer David H. Houghton, Technical Director George Grammer, Assistant Secretary Perry F. Williams, and Robert A. Marmet, a member of the Articles Revision Committee.

2) On motion of Mr. Doyle, unanimously VOTED that the Minutes of the 1960 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

3) On motion of Mr. Kahn, unanimously VOTED that the Annual Reports of the Officers to the Board of Directors are accepted and the same placed on file.

4) Mr. Chaffee, as Chairman, presented the report of the Finance Committee. Mr. Kahn, as Chairman, reported that the Planning Committee had no assignments and therefore no report. Mr. Meyers, as Chairman, presented a report of the Membership & Publications Committee. On request of Mr. Denniston, RULED by the Chair that the report of the Merit & Awards Committee is deferred until later on the agenda. Mr. Chaffee, as Chairman, presented the report of the Housing Committee. Mr. Crossley, as Chairman, presented the report of the Public Relations Committee. Mr. Doyle, as Chairman pro tem, presented the report of the Articles Revision Committee. During the course of the above, General Counsel Paul M. Segal entered the meeting at 10:03 A.M.

5) On motion of Mr. Crossley, unanimously VOTED that the Annual Reports of the Directors to the Board of Directors are accepted and the same placed on file.

6) At this point, supplementary oral reports were rendered by the officers of the League.

7) Moved, by Mr. Meyers, that all references to time in any League publications or bulletins of the Communications Department be in GMT. But, after discussion, on further motion of Mr. Meyers, unanimously VOTED the matter be laid on the table.

8) On motion of Mr. Meyers, after discussion, VOTED, 8 votes in favor to 3 opposed, that each issue of *QST* should carry the schedule of Headquarters station W1AW.

9) On motion of Mr. Meyers, unanimously VOTED that the Board commends Mr. George Hearst of the Los Angeles *Herald Express* and its ham columnist, Tom Cargo, K6UFL.

10) At this point, Mr. Meyers read the following telegram: "The national officers and directors of the Armed Forces Communications and Electronics Association join with me in profound tribute to the achievements and executive direction by ARRL in the amateur radio field both on the national and international level. Our congratulations. (signed) Sparky Baird, General Manager and Editor, *Signal*."

11) Moved by Mr. Crossley, that the Board instruct the General Manager to make proper filing with the FCC to make a change in amateur rules, so as to permit RTTY stations to sign on RTTY instead of c.w. as now required. After discussion, the yeas and nays being requested, the question was decided in the affirmative: whole number of votes cast, 14; necessary for adoption, 8; yeas, 8; nays, 6. Those voting in the affirmative were Messrs. Best, Born,

The ARRL Board of Directors and League officials during the meeting in Anaheim, California on May 5. Seated, l. to r.: West Gulf Director Best; Delta Director DeHart; Southwestern Director Meyers; Pacific Director Engwicht; Midwest Director Denniston; Vice-President and Communications Manager Handy; General Counsel Segal; President Dosland; General Manager Huntoon; Assistant Secretary Williams; Treasurer Houghton; Vice President Reid; Canadian Director Eaton; New England Director Chaffee; Rocky Mountain Director Smith; Great Lakes Director Cartwright; Central Director Doyle; Hudson Director Kahn. Standing, l. to r.: First Vice President Groves; Northwestern Director Roberts; Dakota Director Compton; Atlantic Director Crossley; Southeastern Director Born; Technical Director Grammer; Roanoke Director Anderson; Robert A. Marmet; Southwestern Vice Director Shepherd.

Compton, DeHart, Denniston, Engwicht, Meyers and Roberts; those voting opposed were Messrs. Anderson, Cartwright, Chaffee, Doyle, Kahn, and Smith; Mr. Crossley abstained, as did Mr. Eaton as required by the By-Laws. So the motion was ADOPTED. During the course of the above, the Board was in recess from 10:55 to 11:18 A.M.

12) On motion of Mr. Crossley, unanimously VOTED that the Board instruct the General Manager to make proper filing with the FCC supporting the filing made by the Maritime Mobile Amateur Radio Club for removal of maritime restrictions in the 14-Mc. amateur band.

13) Moved, by Mr. Crossley, that the Board instruct the General Manager to make proper filing with the FCC for change in amateur rules to permit narrow-band transmission of TV and image over radiotelephone equipment in all amateur bands where A-3 emission is permitted, the total band width occupied by carrier, voice sideband and picture sideband components not to exceed that normally required for A-3 emission as employed by amateur stations. On motion of Mr. Kahn, VOTED to amend the motion to restrict such operations to the A-3 portions of the 10- and 15-meter amateur bands. After discussion, the question being on the motion as amended, the same was ADOPTED. Mr. Eaton requested to be recorded as abstaining, in accordance with the provisions of the By-Laws.

14) Moved by Mr. Crossley, that the Board instruct the General Manager to make proper representation to the Postmaster General and/or the proper officer in the Post Office Department for an amateur commemorative stamp in the year 1962, in celebration of the 50th year of regulation of amateur radio in the United States. Moved, by Mr. Meyers, to amend the motion so as to instruct the General Manager to explore the possibility of obtaining such a commemorative stamp in 1962. On motion of Mr. Doyle, VOTED to further amend the motion to provide that the General Manager request the issuance of a commemorative stamp in connection with the 50th anniversary of the ARRL in 1964. The question then being on the amendment as amended, the same was unanimously ADOPTED. The question then being on the motion as amended, the same was unanimously ADOPTED.

15) On motion of Mr. Crossley, after extended discussion, unanimously VOTED that the Board instruct the General Manager to make strong representation to the FCC and/or Department of State or any other agency necessary to expedite reciprocal licensing of amateur radio operators with friendly countries.

16) On motion of Mr. Doyle, unanimously VOTED that the General Manager consult with the amateur section of FCC with a view to modifying Section 12.136 of the amateur rules for mobile operation logging, such modification to consist of entries setting forth location, by state, of the mobile, beginning of mobile operation, stations worked by call sign only, and termination of mobile operation for the period for each day.

17) Moved, by Mr. Compton, that the Treasurer be authorized to invest a portion of the surplus funds of the League in high-quality, growth-type common stocks of well established companies, authorization for investment not to exceed 15 per cent of the total acquisition cost of the total investment portfolio. Moved, by Mr. Doyle, to amend the motion to provide a limit of $10,000 instead of a stated percentage; but there was no second, so the motion to amend was lost. But, after discussion, with the consent of his second, Mr. Compton withdrew the motion.

18) The Board recessed for lunch at 12:30 P.M., reconvening at 2:03 P.M. with all directors and other persons hereinbefore mentioned in attendance, plus Southwestern Division Assistant Director Merrill Swan.

19) At this point Mr. Meyers read the following telegram: "Please pass to the Board of Directors, American Radio Relay League, best wishes for a successful meeting and a hearty well done for your outstanding contributions to the world of amateur communications. Best regards. (Signed) Frank Virden, Rear Admiral, Director Naval Communications, Assistant Chief of Naval Operations."

20) Moved, by Mr. DeHart, that the General Manager be directed by the Board of Directors to publish a v.h.f. handbook. On motion of Mr. Anderson, unanimously VOTED to amend the motion to instruct the Membership and Publications Committee to study the possibility of a v.h.f. handbook and report to the Board. The question then being on the motion as amended, the same was unanimously ADOPTED.

OFFICERS' REPORTS AVAILABLE TO MEMBERS

Each year the officers of the League make comprehensive written reports to the directors. The Board has made these reports available to interested members, in a volume which also includes reports of the directors. The cost price is 75 cents per copy, postpaid. A copy of the financial statement only is available without charge. Address the General Manager at West Hartford, Conn.

21) On motion of Mr. Denniston, VOTED that the League intensify its efforts to obtain additional operating privileges for amateurs between 1.8 and 2 Mc. Mr. Eaton requested to be recorded as abstaining as provided in the By-Laws.

22) On motion of Mr. Engwicht, affiliation was unanimously GRANTED to the Project OSCAR Association.

23) Moved, by Mr. Engwicht, to provide each vice director with current copies of League publications and to provide an annual reimbursement not to exceed a figure equal to 10 per cent of the division director's annual administrative expense allowance for use by the vice director for attendance at state and/or divisional ARRL conventions or the annual meeting of the Board. But, after discussion, on motion of Mr. Smith, unanimously VOTED that the matter be laid on the table.

24) On motion of Mr. Smith, unanimously VOTED that the Membership and Publications Committee consider the cost and desirability of publishing by supplement a ten-year index of all articles appearing in *QST* from January, 1950, through December, 1960, and submit a report to the next annual meeting of the Board.

25) On motion of Mr. Smith, the following resolution was unanimously ADOPTED.

WHEREAS, Claude M. Maer, jr., WØIC, on December 31, 1960, completed eight years' service as director of the Rocky Mountain division, during which period he served on numerous committees of the American Radio Relay League; therefore, be it

RESOLVED, that the Board of Directors, meeting in Anaheim, California, on May 5, 1961, expresses its sincere thanks and appreciation for his conscientious and untiring efforts in the best interests of all amateurs and the League.

26) At this point, the chair announced the following committee appointments for the coming year:

Finance Committee:
Mr. Chaffee, *Chairman*
Mr. Roberts
Mr. Best

Planning Committee:
Mr. Crossley, *Chairman*
Mr. Denniston
Mr. DeHart

Membership and Publications Committee:
Mr. Meyers, *Chairman*
Mr. Eaton
Mr. Born

Public Relations Committee:
Mr. Cartwright, *Chairman*
Mr. Doyle
Mr. Smith

Housing Committee:
Mr. Kahn, *Chairman*
Mr. Anderson
Mr. Compton
Mr. Huntoon

Merit and Awards Committee:
Mr. Groves, *Chairman*
Mr. Reid
Mr. Engwicht

27) On motion of Mr. Doyle, unanimously VOTED that the General Manager is hereby authorized to reimburse the Central Division Director in the amount of $79 as additional expense for the year 1960.

28) On motion of Mr. Born, unanimously VOTED that

the General Manager is hereby authorized to reimburse the Southeastern Division Director in the amount of $45.84 as additional expense for the year 1960.

29) On motion of Mr. Meyers, unanimously VOTED that the General Manager is hereby authorized to reimburse the Great Lakes Division Director in the amount of $122.69 as additional expense for the year 1960.

30) On motion of Mr. Compton, unanimously VOTED that the General Manager is hereby authorized to reimburse the division directors for actual expenses incurred by them during the year 1961, in the proper administration of ARRL affairs in their respective divisions, up to amounts as follows:

Canadian Division Director	$1500
Atlantic Division Director	2200
Central Division Director	2400
Dakota Division Director	850
Delta Division Director	2000
Great Lakes Division Director	1350
Hudson Division Director	2000
Midwest Division Director	900
New England Division Director	1000
Northwestern Division Director	1200
Pacific Division Director	2200
Roanoke Division Director	750
Rocky Mountain Division Director	1500
Southeastern Division Director	2000
Southwestern Division Director	2300
West Gulf Division Director	1500

31) On motion of Mr. Denniston, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of ARRL committees during the year 1961, but not to exceed amounts as follows:

Planning Committee	$1500
Finance Committee	500
Membership and Publications Committee	1000
Merit and Awards Committee	200
Housing Committee	2500
Public Relations Committee	2000

32) On motion of Mr. Smith, unanimously VOTED that, to continue the Board's policy of reimbursing section communications managers and QSL managers of the League for certain travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during the year 1961 a total amount not to exceed $12,000 under terms prescribed by the Communications Manager following the general pattern established by the Board.

33) On motion of Mr. Doyle, unanimously VOTED that, to continue the Board's policy of reimbursing section emergency coordinators for certain travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during the year 1961 a total amount not to exceed $7000, under terms prescribed by the Communications Manager following the general pattern established by the Board.

34) On motion of Mr. Compton, unanimously VOTED that the General Manager is hereby authorized to pay during the period between January 1, 1962, and the 1962 meeting of the Board, expenses against usual authorizations for administrative and committee operations in no greater amounts than 1961 authorized amounts.

35) Moved, by Mr. Meyers, that a manual for prospective and current League officials, as proposed by the Membership and Publications Committee, be adopted subject to revision by the Headquarters staff. After discussion, on motion of Mr. Doyle, unanimously VOTED to amend the motion to instruct the staff to revise the manual and submit it to the Executive Committee for final approval. The question then being on the motion as amended, the same was unanimously ADOPTED.

36) On motion of Mr. Denniston, unanimously VOTED to adopt the recommendation of the Merit and Award Committee concerning the 1961 ARRL Merit Award.

37) On motion of Mr. Chaffee, unanimously VOTED that the Board's instructions to the Housing Committee concerning a proposed new Headquarters building, as adopted at the 1960 annual meeting, are continued for another year.

38) On motion of Mr. Crossley, unanimously VOTED that the Public Relations Committee report be adopted; that a copy be sent to each affiliated club, encouraging each club to appoint a public relations/publicity chairman; and that each director carry with him copies of *Getting Publicity for Your Radio Club* for presentation to this chairman at the club meeting.

39) On motion of Mr. Doyle, unanimously VOTED that the Board of Directors commends the Foundation for Amateur Radio, Inc., of the Washington, D. C., area, on their establishment of a scholarship for college study, to a licensed radio amateur of General Class or higher as a very wise and worthy act on their part.

40) On motion of Mr. Cartwright, the following resolution was unanimously ADOPTED:

WHEREAS, this being the first Board meeting held in this division, and

WHEREAS, the clubs, councils and League officials of the Southwestern and Pacific divisions have been our gracious hosts, and

WHEREAS, their hospitality, courtesy, service and full cooperation have been so unstintingly bestowed upon us; now, therefore, be it

RESOLVED, that this Board in session does hereby extend to these men and women our sincere thanks and appreciation, and that a certificate be presented to the above through Director Meyers, with a copy to the above clubs and councils.

Mr. Meyers acknowedged with thanks, but said the work had really been done by division organization, as exemplified by Vice-Director Howard Shepherd and Assistant Director Merrill Swan, whom he introduced (applause). Mr. Meyers also addressed his thanks to the ladies who provided hospitality for directors' wives.

BOARD THANKS VOLUNTEER A.R.R.L. OFFICIALS

In reviewing the work of the League for the past year the ARRL Board of Directors again found that much of our progress is due to the volunteer efforts of elected and appointed officials in the administrative and field organization of our association. By unanimous action the Board has again expressed its sincere thanks to the Vice-Directors, assistant directors, SCMs, SECs and QSL Managers — an action which we know all amateurs will heartily endorse.

41) On motion of Mr. Kahn, the following resolution was unanimously ADOPTED:

WHEREAS, on November 14, 1960, Byron Goodman completed 25 years of continuous service to the American Radio Relay League, be it

RESOLVED, that the Board of Directors, meeting in Anaheim, California, on May 5, 1961, in recognition of Byron Goodman's untiring efforts on behalf of the League, does hereby express its deep appreciation of his loyalty, fidelity and intelligent devotion to the best interests of amateur radio.

42) At this point the Board took up the report of the Articles Revision Committee. Moved by Mr. Meyers, that Article 4 of the Articles of Association be amended to reflect the change of Secretary as of January 1, 1961. After discussion, the yeas and nays being ordered, the question was decided in the negative: whole number of votes cast, 16; necessary for adoption, 12; yeas, 8; nays, 8. Those who voted in the affirmative were Messrs. Best, Born, Compton, Crossley, DeHart, Denniston, Engwicht and Meyers; those who voted opposed were Messrs. Anderson, Cartwright, Chaffee, Doyle, Eaton, Kahn, Roberts and Smith. So the motion was REJECTED.

43) Moved, by Mr. Cartwright, to amend Article 5 of the Articles of Association by deleting, in line four, the words "two years" and substituting therefor the words "four years." After discussion, the yeas and nays being ordered, the question was decided in the negative; whole number of votes cast, 16; necessary for adoption, 12; yeas 7; nays, 9. Those who voted in the affirmative were Messrs. Cartwright, DeHart, Doyle, Eaton, Engwicht, Kahn and Meyers; those who voted opposed were Messrs. Anderson, Best, Born, Chaffee, Compton, Crossley, Denniston,

Roberts and Smith. So the motion was REJECTED.

44) Moved, by Mr. Meyers, to amend Article 5 of the Articles of Association by striking therefrom the original list of subscribing directors and replacing it with the list as of 1961. But, after extended discussion, Mr. Meyers, with the consent of his second, withdrew the motion.

45) Moved, by Mr. Born, to amend By-Law 10 so that it would read as follows: "The President, the Vice Presidents and the General Manager shall possess all of the rights and duties of the directors, save the right to vote and the right to participate in the call of a special meeting of the Board, as referred to in Article 5 of the Articles of Association, provided, however, that the President shall be required to cast a vote on any matter as to which a tie is found to exist." After discussion, the yeas and nays being ordered, the question was decided in the affirmative. Whole number of votes cast, 16; necessary for adoption, 11; yeas, 14; nays, 2. All the directors voted in the affirmative except Messrs. Anderson and Roberts, who voted opposed. So the By-Law was AMENDED.

46) On successive motions of Mr. Doyle, unanimously VOTED to adopt the committee's recommendation of no change in Articles 6, 7, 8, 9, and 10.

47) On motion of Mr. Doyle, unanimously VOTED to accept the committee's recommendation of no change in Article 12 as concerns eligibility of director candidates from the standpoint of commercial status.

48) Moved, by Mr. Doyle, to amend By-Law 8 to read as follows: "No person shall be an officer, director or vice-director of the League unless, at the time of his assuming office, he is a member of the League and the holder of at least a General Class amateur license, or a Canadian Advanced Amateur Certificate." On motion of Mr. Compton, unanimously VOTED to amend the motion by striking from the text the word "officer." On motion of Mr. Meyers unanimously VOTED to further amend the motion by striking from the proposed text the words "at the time of his assuming office" and substituting therefore the words "at the time of nomination." On motion of Mr. Anderson, VOTED to further amend the motion so as to read "No person shall be President, Vice President, Secretary, Director or Vice Director of the League unless, at the time of nomination, he is a member of the League and the holder of at least a General Class amateur license, or a Canadian Advanced Amateur Certificate." The question then being on the motion as amended, the yeas and nays being ordered, the question was decided in the affirmative. Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays 0. All the directors voted in the affirmative. So the By-Law was AMENDED.

49) On motion of Mr. Doyle, unanimously VOTED to refer to the Finance Committee the question of establishing the office of a Comptroller.

50) Moved, by Mr. Engwicht, to insert a new By-Law to read as follows: "Members in arrears shall be carried on the League records for thirty days, but if they have not renewed their memberships by that time, they shall be dropped." After extended discussion, the yeas and nays being ordered, the question was decided in the negative. Whole number of votes cast, 16; necessary for adoption, 11; yeas, 1; nays, 15. All the directors voted opposed except Mr. Engwicht. So the motion was REJECTED.

51) Moved, by Mr. Doyle, to amend the first portion of the second sentence of By-Law 26 so that it would read: "He shall, subject to instruction from the Board of Directors, and with the assistance of the General Manager, represent the League . . ." The yeas and nays being ordered, the question was decided in the affirmative. Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. All the directors voted in the affirmative. So the By-Law was AMENDED.

52) Moved, by Mr. Meyers, to amend By-Law 30 to add the Public Relations Committee as a standing committee of the Board. The yeas and nays being ordered, the question was decided in the affirmative. Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. All the directors voted in the affirmative. So the By-Law was AMENDED.

53) On motion of Mr. Doyle, unanimously VOTED to provide an index for the Articles and By-Laws.

54) Moved, by Mr. Compton, to insert a new By-Law specifying the duties of the Public Relations Committee as follows: "The Public Relations Committee shall act as a reference body to which the Board may from time to time by resolution refer problems requiring special study and recommendations as to publicity and public relations problems. The Committee shall also have power to originate recommendations." After discussion, the yeas and nays being ordered, the question was decided in the affirmative. Whole number of votes cast, 16; necessary for adoption, 11; yeas, 15; nays, 1. All the directors voted in the affirmative except Mr. Cartwright. So the By-Law was ADOPTED.

55) On motion of Mr. Compton, unanimously VOTED that, pursuant to the terms of the Trust Agreement for the Pension Plan, the following persons are appointed to serve as a Pension Committee from June 2, 1961, to June 2, 1962: George Grammer, David H. Houghton, John Huntoon.

56) The Chair announced the opening of nominations for the election of three additional members of the Executive Committee in accordance with Article 7 of the Articles of Association. Mr. Compton nominated Mr. Denniston. On motion of Mr. Kahn, unanimously VOTED that the nominations are closed and the Secretary cast one ballot electing Mr. Denniston as a member of the Executive Committee to serve until the next annual meeting of the Board. Mr. Engwicht nominated Mr. Meyers. On motion of Mr. Born, unanimously VOTED that the nominations are closed and the Secretary cast one ballot electing Mr. Meyers as a member of the Executive Committee to serve until the next annual meeting of the Board. Mr. Denniston nominated Mr. Kahn. On motion of Mr. Cartwright, unanimously VOTED that nominations are closed and the Secretary cast one ballot electing Mr. Kahn as a member of the Executive Committee to serve until the next annual meeting of the Board.

57) On motion of Mr. Crossley, unanimously VOTED that F. E. Handy and David H. Houghton are appointed special members of the Executive Committee to serve until the next annual meeting of the Board.

58) On motion of Mr. Smith, unanimously VOTED to take from the table Mr. Engwicht's motion relative to vice directors. Moved, by Mr. Smith, to amend the motion by striking the text and substituting therefor the following: "That the General Manager is instructed to provide each vice-director with current copies of League publications, as is the custom for directors." On motion of Mr. Engwicht, unanimously VOTED to amend the motion to include the furnishing of the FCC's annual report. The question then being on the motion as amended, the same was unanimously ADOPTED.

59) Moved, by Mr. Doyle, that the Board express its satisfaction with the manner in which the new General Manager has handled his duties. At the request of Mr. Meyers, the Board ADOPTED the motion by a rising vote (Applause). The General Manager expressed his thanks, and accepted the commendation on behalf of the staff.

60) On motion of Mr. Born, unanimously VOTED that the Board go on record as commending the Field Engineering & Monitoring Bureau of the Federal Communications Commission for its assistance and cooperation rendered amateurs over the past year.

61) On motion of Mr. Born, unanimously VOTED that the Board hereby expresses its sincere thanks and deep appreciation for the untiring work and devotion of the vice-directors, assistant directors, SCMs, SECs, and QSL managers of the League.

62) Moved, by Mr. Anderson, that the Secretary and General Manager Emeritus be paid remuneration in addition to his present contractual arrangement beginning January 1, 1961, and continuing until he reached age 65. But there was no second, so the motion was lost.

63) On motion of Mr. Compton, the following resolution was unanimously ADOPTED:

WHEREAS, the members of the Los Angeles Salvation Army Net have given unceasingly of their personal time and emergency mobile facilities to provide transportation and communications for members of the American Radio Relay League Board of Directors meeting in Anaheim, California, now, therefore, be it

RESOLVED, that the Board of Directors of the American Radio Relay League, meeting on this fifth day of May, 1961, in Anaheim, California, unanimously salutes the Los Angeles Salvation Army Net and wishes them continued success in their efforts to provide emergency communications in civil and natural disasters.

64) On motion of Mr. Best, the following resolution was unanimously ADOPTED:

RESOLVED, that the Board of Directors of the American Radio Relay League, having taken note of the recent expressions of friendship and mutual aims of ARRL and MARS as set down in Military Affiliate Radio System bulletin number 14 of 10 April, hereby expresses its appreciation for this unsolicited expression and requests that our thanks be extended by letter to both Chief, MARS Army, and Chief, MARS Air Force, together with our best wishes for their continued successful operation.

65) On motion of Mr. Meyers, unanimously VOTED to take from the table his motion concerning the use of GMT. On motion of Mr. Meyers, unanimously VOTED that all reference to time outlined or released by *QST*, WIAW, or the Communications Department be made in GMT, as recommended by FCC, and that the General Manager is instructed to insert suitable material in all *League* publications to acquaint amateurs and newcomers with proper time-conversion methods.

66) On motion of Mr. Meyers, unanimously voted that the joint report of the Membership and Publications Committee and the Public Relations Committee be accepted and the same placed on file. On motion of Mr. Meyers, after extended discussion, unanimously VOTED that a monthly award consisting of the original cover plate from *QST*, properly mounted and engraved, be made to the person submitting the best contributed article for that particular issue as determined by the Merit and Awards Committee based on response to the article in the issue involved.

67) On motion of Mr. Meyers, unanimously VOTED that the President appoint a committee to ascertain whether or not the Board desires to consider the subject of employment of legal counsel, and report to the Executive Committee.

68) Moved, by Mr. Engwicht, that in the interest of better relations, on the invitation of any division holding a national convention, all directors be authorized to attend such affairs at the expense of the League. After discussion, the yeas and nays being requested, the question was decided in the negative. Whole number of votes cast, 16; necessary for adoption, 9; yeas, 1; nays, 15. All the directors voted opposed except Mr. Engwicht. So the motion was REJECTED.

69) On motion of Mr. Denniston, unanimously VOTED that the League recommend to amateurs of the United States and possessions that they refrain from transmitting on frequencies between 14,335 and 14,350 kc. so that our amateur friends in other countries using single-sideband may establish contacts with our amateurs and with each other with greater freedom and success. (Mr. Eaton indicated that he would make the same recommendation to Canadian amateurs.)

70) At this point Mr. Meyers read the following telegram: "Greetings and best wishes from the U. S. Army Signal Corps to all members of the Board of Directors of ARRL on the occasion of your annual meeting. For the many services rendered to the Army and to the Signal Corps by members of the American Radio Relay League over the years, we are indeed most grateful. Both in war and in peace, assistance received in communications and electronics activities from dedicated radio amateurs whom you represent has been invaluable to us. As we take note of the challenges that face us today, we are heartened by the prospect that we shall continue to receive the unselfish support and cooperation of enthusiastic and forward-looking organizations such as yours. By such continued support, we can all look to the future with confidence. (Signed) Major General R. T. Nelson, Chief Signal Officer, U. S. Army."

71) On motion of Mr. Meyers, unanimously VOTED that the General Manager is directed to file comment of the League in support of Docket 14025, concerning the availability of Conditional Class license examinations for civilians overseas.

72) On motion of Mr. Compton, unanimously VOTED that the General Manager is instructed to register the support of the League to House Resolution 4113, a bill to amend the Communications Act to eliminate the requirement of notarization of applications for station licenses.

73) On motion of Mr. Meyers, unanimously VOTED that the General Manager is instructed to register the support of the League to House Resolution 5710, a bill to amend the Communications Act to permit early renewal of licenses.

74) On motion of Mr. Compton, unanimously VOTED that the General Manager keep the Board apprised of progress of House Resolution 1118, concerning proposed fees for the issuance of FCC licenses.

75) At this point Mr. Meyers read the following telegram: "Your Board of Directors meeting provides an excellent opportunity for me to express appreciation for all Air Force communicators to the Board and the many members of the ARRL. Your League throughout the years has provided the incentive and organization which has enabled the American amateur to contribute so much to the American civil and military communications picture. We are all appreciative of your contribution to civil defense and disaster communications; however, quite often we tend to overlook the good work you are doing in providing basic ideas and incentive for further study in the communications and electronics field. This influence is very evident in the quality of communications people we have and are getting in the Air Force. Your *Handbook* and manuals are outstanding. Congratulations and keep up the good work. (Signed) Major General Harold W. Grant, Director of Telecommunications, U. S. Air Force."

76) The President appointed the following members of a special committee on the subject of legal counsel: Mr. Meyers, Chairman, Mr. Denniston, Mr. Kahn.

77) Whereupon, on motion of Mr. Compton, the Board adjourned *sine die*, at 6:45 P.M., PDST.

78) (Time in session, 7 hours 15 minutes; total authorizations, $52,597.53)

JOHN HUNTOON
Secretary

REPORT OF THE HOUSING COMMITTEE

May 5, 1961

Since the last meeting of this Board, your Committee has been working on plans for a new Headquarters building at the WIAW site in Newington, pursuant to your vote at the 1960 Annual Meeting. The plans developed by our architects, Jeter and Cook of Hartford, were finalized only after a series of meetings with headquarters staff members, the General Manager and this Committee Chairman. The project was submitted to the Newington Zoning Commission this Spring, a hearing was held and Commission approval obtained in April 1961. That approval is conditioned on several considerations, none of which seem to offer difficulty.

This project has been reviewed with the Executive Committee at each of its meetings, and is familiar to the Finance Committee. In general, approval of both Committees has been evident. However, members of the Executive Committee have raised questions about cost as a result of their individual investigations of costs of similar construction in other areas. Our architects are now estimating the projected cost of this job, including contingency and the cost of site preparation, landscaping and paved areas. Extensive landscaping is planned to offset objections of our residential neighbors. In addition, we hope to have the benefit of cost estimating by a prominent Hartford contractor in advance of actual bidding.

It is the opinion of the Committee that while certain economies may be obtained when actual bidding of the project is sought, it is within the capability of the League to construct the proposed building and provide the site development as proposed by the architects. Actual financing plans are referred to the Finance Committee.

MILTON E. CHAFFEE, *Chairman*

MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 280

May 4, 1961

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met in the Disneyland Hotel, Anaheim, California, at 3:15 P.M. May 4, 1961. Present: President Goodwin L. Dosland, in the Chair; First Vice President W. M. Groves; General Manager John Huntoon; Directors Milton E. Chaffee and Raymond E. Meyers; Vice President F. E. Handy and Treasurer David H. Houghton. Also present, for all or part of the proceedings, were Directors Best, Born, Compton, DeHart, Engwicht, and Southwestern Division Vice-Director Shepherd.

On request of Mr. Meyers, ORDERED, by the Chair, that the minutes of the March 23, 1961, meeting of the Committee be corrected so that the second sentence of the second paragraph would read: "Mr. Meyers provided the Committee with background information on the development of the OSCAR concept and program, and at his suggestion the Committee invited William S. Orr, W6SAI, and M. C. Towns, jr., K6LFH, representing the Project OSCAR Association, to join the meeting."

On motion of Mr. Huntoon, unanimously VOTED to approve the holding of an Oregon State Convention at Coos Bay, May 5–7, 1961, and an Oklahoma State Convention at Tulsa, August 5–6, 1961.

On motion of Mr. Handy, affiliation was unanimously GRANTED to the following societies:

Albion Amateur Radio Club.....Albion, Mich.
Ashtabula Amateur Radio Club.....Ashtabula. Ohio
Carolina V.H.F. Society.....North Carolina
The Des Moines Technical High School Amateur Radio Club.....Des Moines, Iowa
East River Radio Club.....Bluefield, W. Va.
Friendship Amateur Radio Club.....Baltimore, Md.
Juniata Valley Amateur Radio Club.....Lewistown, Pa.
Litton Industries Amateur Radio Society
San Carlos, Calif.
North Jersey DX Association.....Short Hills, N. J.
Nortown Old Timers' Radio Association
Toronto, Ont., Can.
Panther Valley Wireless Association.....Tamaqua, Pa.
Park Radio Club.....Livingston, Mont.
Southeastern Montana Radio Club.....Miles City, Mont.
State University of Iowa Amateur Radio Club
Iowa City, Iowa
Victoria Amateur Radio Club.....Victoria, Texas
Vestal Central High School Amateur Radio Club
Vestal, N. Y.
Mobile Sixers Radio Club, Inc.....Chester, Pa.
Lewiston Porter Amateur Radio Club, (High School)
Youngstown, N. Y.
The Huntingdon County Amateur Radio Club
Huntingdon, Pa.
Chester County Amateur Radio Club.....West Chester, Pa.
Hoosier Amateur Women's Klub, Inc.....Indianapolis, Ind.
Litchfield Amateur Radio Club.....Litchfield, Ill.
Chain of Lakes Amateur Radio Club, Inc.....Wauconda, Ill.
Wheaton Community Radio Amateurs.....Wheaton, Ill.
The Valley V.H.F. Club, Inc.....Crystal Lake, Ill.
Story County Amateur Radio Club.....Ames, Iowa
Cambridge School H.S. Radio Club.....Weston 93, Mass.
King Philip Amateur Radio Society.....Sudbury, Mass.
Beaverton Mike and Key Club.....Portland 10, Ore.
Evergreen 50 & Up Society, Inc.....Seattle 9, Wash.
Bay Area Radio Klub.....Empire, Ore.
Bandjammer Radio Club of Fremont High School
Sunnyvale, Calif.
Rutherford County Amateur Radio Club.....Spindale, N. C.
East Mecklenburg High Amateur Radio Operators' Club
Charlotte 5, N. C.
Roanoke Valley Amateur Radio Club.....Roanoke, Va.
Fort Pierce Radio Club, Inc.....Fort Pierce, Fla.
North Florida Amateur Radio Society.....Jacksonville, Fla.

At this point Directors John G. Doyle and Morton B. Kahn entered the meeting.

Without formal action, the Committee discussed the proposed "Novice" Handbook, delay in receipt of membership copies of *QST*, administrative relationships with the Project OSCAR Association, and amateur antenna-tower/zoning-ordinance matters.

There being no further business, the Committee adjourned, at 4:18 P.M.

JOHN HUNTOON
Secretary

REPORT OF THE FINANCE COMMITTEE

May 5, 1961

During the year since the last Annual Meeting, this Committee has received monthly reports from the Treasurer with respect to cash balances and the short term financing program previously established. No special attention or comment seemed warranted and no changes have been suggested.

The Committee has been aware of the plans of the Housing Committee concerning a new Headquarters Building to be built in Newington, and their planning has been mindful of the expenditures likely to arise in connection with that project. Accordingly, a policy of relative liquidity has been followed and no long range or permanent type investments have been suggested.

MILTON E. CHAFFEE, *Chairman*

REPORT OF THE MEMBERSHIP & PUBLICATIONS COMMITTEE

May 5, 1961

We, the Committee on Membership and Publications, having the opinion that there is a need for a Manual for the prospective, and those currently holding office as League Officials, hereby submit for your consideration a preliminary document which we feel should be distributed to all concerned.

With the finished publication, if accepted, we suggest that in addition, the Manual contain an index which will quickly refer to various Articles, or Bylaws, policy matters, etc., and that with the Manual, Headquarters include reprints of material which may be of help in exploiting the merits of Amateur Radio and the League.

We request the adoption of a motion that the Manual be accepted as a League publication outlining the scope of responsibility of elected and appointed League officials. We suggest further that as policies change, or additional material may become available, that corrected pages or changes may be made by all holders of such a manual.

It has been a pleasure to serve the Board as members of this important Committee and we appreciate the confidence that the President placed in us to represent the Board in this phase of League functions.

Respectfully submitted:

RAY E. MEYERS, W6ML7, *Chairman*
JOHN G. DOYLE, W9GPI
CHAS. G. COMPTON, WØBUO

REPORT OF THE PUBLIC RELATIONS COMMITTEE

May 5, 1961

The Public Relations Committee has had one formal meeting and has had much mail correspondence. A number of items have been discussed and some conclusions have been drawn.

Newspaper publicity is both the responsibility of our League Headquarters and local clubs and members. Items of national and international importance should rightfully originate from League Headquarters and be sent to Press Associations. As to whether it will be sent out over the wire is much a matter of proper contact at the top level by League Officers and the whim of press associations as well as precedence of other news then on the wire. This leaves considerable publicity that can be developed by the local amateur clubs or groups. In this connection it is recommended that all Directors, Vice Directors and active Assistant Directors keep supplied with a few copies of the brochure *Getting Publicity for Amateur Radio*. This brochure is prepared by the League Staff and is free. Handing out one of these brochures at any group or club meeting is a good diplomatic gesture, especially when it is turned over by the ARRL representative to whomsoever may be designated to handle the job by the Club President, or group leader — just sending the brochure out does not always seem to get the job properly done.

It must be borne in mind that any publicity must be fresh news. As an example, "Field Day" can be presented before, during and immediately after it happens. Invite the local newspaper to send a photographer and a reporter to witness operations. Action is the most convincing to a newspaper man. Evidently local publicity has caught on very well in many communities and is gaining. One hundred and thirty-two pieces of such items have been mailed to the chairman since last May, no telling how many were not mailed. No items received was less than one half a column in length and seventeen were full page items with photographs. Most of these items came from five divisions, with no items from four divisions. It is recommended that all directors push such publicity with the clubs in their respective divisions.

Word has reached the Committee that local TV programs have been produced at no charge to the amateurs, under station Public Relations and Interest, in areas of four divi-

sions. Local Radio and TV stations and National networks have produced programs which contain favorable connotation to the amateur radio service. Several prominent amateurs conducting and/or announcing local or national TV programs have made comments or put in a good word on amateur radio. Radio broadcasting stations have accepted announcements concerning club meetings and activities and produced short programs, live and on tape. Thirty-eight local stations in Pennsylvania have accepted seven one-half to two minute taped spot interviews on amateur radio. This likely has occurred at other locations but knowledge has not reached the Committee. The idea of the League producing programs on tape for broadcast and TV was explored and reported on by the League Planning Committee last year. It was not recommended because of the expense involved. The Committee concurs in these findings as being too expensive. If some "angel" would like to take over a program or series of programs on amateur radio we are sure the League would be very receptive. However, local TV and broadcast programs should be explored by local clubs and made use of to the fullest. This is the recommendation of the Committee, and each director should call attention to this possible opportunity to all clubs in the respective division.

The kinescope entitled "The Ham's Wide World" is being heavily used in some divisions, shown initially to Amateur Club groups, with an explanation that while the showing is not intended to be of great interest to the already licensed audiences, it does bring attention to what the ARRL is doing to improve Public Relations for amateur radio. Many amateurs viewing this kinescope are associated with Scouting, Church or Community Activity organizations, Civic Clubs or Service Organizations, like VFW, American Legion, etc. Since meeting programs for such organizations pose the same problems that our Radio Clubs face, a good program is usually welcomed, and "The Ham's Wide World" does a tremendous job of selling amateur radio. In fact, in one division in which this kinescope has been given wide showings, the League publications group, "The Gateway to Amateur Radio" has shown a very extensive sale and is constantly increasing. The Committee wishes to impress upon all directors the great value of this approach.

Certainly one facet of good Public Relations is the excellent work of the great number of TVI Committees. This has been given recognition by the FCC through the Director of the Field and Monitoring Service, Mr. George Turner. Letters of commendation are mailed to each TVI Committee that has served, with copies to the ARRL director of the division. In locations where TVI is a problem and there are no TVI Committees, it is recommended that the director of the respective division assist Clubs in the formation of such a TVI Committee.

An item on membership relations: as a combined report of the PR Committee and the Membership and Publications Committee we recommend the adoption of the "Plaque Award." Details relative to this recommendation are part of the M and P committee report as the prime committee.

The Committee wishes to commend the Foundation for Amateur Radio, Inc. of Washington, D. C. area on their establishment of a scholarship for College study, to a licensed radio amateur of general class or higher as a very wise and worthy act on their part.

The Public Relations Committee wishes to compliment the Headquarters Staff relative to items developed and being developed for better membership and public relations. To name a few, mailings to new amateurs, booklet to citizens band enthusiasts through manufacturer, TVI and publicity folders to amateur clubs. However, nothing along this line can take the place of the kind and courteous answers to communications from members and prospective members coming from all ARRL officials.

GILBERT L. CROSSLEY, *Chairman*
JOHN G. DOYLE
DANA E. CARTWRIGHT

REPORT OF SPECIAL COMMITTEE TO REVIEW THE ARTICLES OF ASSOCIATION AND BYLAWS OF ARRL

Pursuant to paragraph 54 of the minutes of the 1960 annual meeting of the Board of Directors of ARRL, a committee was appointed by the President to review the Articles of Association and Bylaws of the League and to consider all changes referred to it in writing by the directors. The committee was further directed to report its recommendations for revisions of the Articles and Bylaws to the Board at its annual meeting which would be the meeting in 1961.

Pursuant to this direction the committee met in Hartford on Saturday, November 19, 1960, and carefully considered all the changes referred to it by the directors and desires herewith to make its report on its deliberations. To clarify matters the committee report will concern itself first with the Articles of Association in numerical order and then the Bylaws in the same order. The report will attempt to explain briefly the nature of the suggested change and the action of the committee and its reasoning in the action which it took.

First, however, the committee would like to express its opinion as to the general desirability of amendments to the Articles of Association on the one hand and the amendments to the Bylaws on the other. It should be understood by the Directors that the articles of association of a corporation should be considered somewhat in the nature of a charter or constitution, which outlines in general but brief terms the name of the organization, its purposes, and sets out a very general framework for its operation just in the same manner as the United States Constitution sets out in general terms the basic rules under which the government should be conducted. So far as the day-to-day details of the governing of the corporation are concerned, the Bylaws and specific resolutions passed by the directors are adequate to set forth these detailed instructions and as a matter of general policy it is quite well to avoid the insertion of details unless the same are absolutely necessary. Thereby it becomes unnecessary to be making application to the Secretary of the State of Connecticut for a change in the Articles of Association every time some slight change occurs in the desired organization of the League. These changes can be made very properly in the Bylaws, leaving the Articles of Association as the general framework against which the League organization is cast.

Moreover, aside from established corporate practice there is another very good reason for not making amendments to the Articles of Association except when amendments are absolutely necessary. For many years ARRL has enjoyed the status of an organization exempt from federal income taxes under the appropriate provisions of the Internal Revenue Code on the grounds that it is an educational and scientific organization devoted to the educational betterment of its members. It is the committee's opinion that we should avoid a multiplicity of filing documents with the Secretary of State in the State of Connecticut or other appropriate governmental agencies much as do business corporations organized for profit.

Accordingly, your committee, in its consideration of the various changes proposed by the directors, has followed a policy of attempting to solve the various problems through amendments to the Bylaws, which are purely private rules and regulations governing the conduct of the activities of the League and which have no official status as far as any governmental organizations are concerned — thus leaving the Articles of Association as they were, very wisely written some years ago, to stand as a general framework against which our day-to-day activities are cast.

Articles of Association

There follows a summary of the committee actions:

Articles 1 and 2: No changes proposed.

Article 3: Mr. Meyers proposed an amendment to reflect a proposed move of ARRL headquarters to Newington. Your committee felt this change could easily be accomplished at an appropriate time after a decision has been reached concerning a move of the headquarters' location.

Article 4: Mr. Meyers proposed an amendment to reflect the change of Secretary as of January 1, 1961. Your committee felt that this is unnecessary inasmuch as the regular procedure in such matters is to file a certificate with the Secretary of State indicating the name of the registered agent therein designated by the directors for the person upon whom legal process may be served. This is customary corporate procedure inasmuch as many corporations often change their registered agent, but it is quite cumbersome and expensive to make amendments to the Articles of Association every time such a change occurs.

Article 5: Mr. Meyers proposed an amendment to provide that terms of directors be four years instead of two. The committee felt that this was a policy matter involving a basic change in the League's organizational structure, and felt therefore that it did not have jurisdiction. Should the Board decide to change the policy and adopt new terms of tenure for directors, the amendment in language can be simply accomplished.

Mr. Meyers proposed to strike the list of directors presently shown in Article 5 and replace it with the list of current directors. The committee found that the present listing is required by law, as the directors named in Article 5 are those who were the subscribers (as indicated in the Preamble to the Articles) at the time the Articles were adopted. The committee noted that names of current directors are filed with the Office of the Secretary of the State of Connecticut biennially, as required by law. As concerns Mr. Meyers' alternative proposal to list current directors in the Bylaws, the committee felt that because directors are listed in each issue of *QST*, which is the ideal reference, and because Bylaws can be changed only at a meeting of the Board, which would mean that they would be "out of date" (so far as listing of directors is concerned) for approximately six months of each year, it recommended no change.

Mr. Meyers proposed an amendment to provide that special meetings of the Board shall be called on written request of one-half the *elected* directors. In accordance with its established policy, the committee felt this would best be accomplished, if found desirable, in the Bylaws rather than in the Articles. Directors Anderson and Maer registered their opposition to the proposed amendment, whether Article or Bylaw. However, if the Board should act favorably on the proposal to amend, it is the suggestion of the committee that this be accomplished by amendment of Bylaw 10, so that it would read:

"10. The President, the Vice-Presidents and the General Manager shall possess all of the rights and duties of directors save the right to vote and the right to participate in the call of a special meeting of the Board, as referred to in Article 5 of the Articles of Association, provided, however, that the President shall be required to cast a vote on any matter as to which a tie is found to exist."

Article 6: Mr. Meyers proposed an amendment of the last sentence so as to make reference to Article 12. The committee felt that there is no ambiguity, that the words "herein specified" clearly include Article 12, and therefore recommends no change.

Article 7: Mr. Meyers proposed an amendment specifying certain dates for meetings of the Executive Committee. The committee felt that this would be an undesirable change in that it greatly restricts the flexibility of the Committee to meet at other times more convenient or suitable to its purposes, and therefore recommends no change.

Article 8: Mr. Meyers proposed an amendment requiring the President, in the event of a vacancy in the offices of both director and vice-director of any division, to fill the office based on recommendations from affiliated clubs in the division. The committee, in passing noting that this situation had never arisen, felt that this would be a very unwieldy arrangement, and that it might cause considerable dissension among clubs who would undoubtedly recommend a number of different candidates, with only one to be chosen, and therefore recommends no change.

Mr. Kahn proposed an amendment to provide a removal procedure for vice-directors, in the event of failure or refusal to act. The committee found that vice-directors do not have specific duties, and noted that any attempt to assign them duties might abrogate the responsibilities of directors under Connecticut law. Since the vice-director has no duties, except to assume the office of director under specified circumstances, the committee could conceive of no basis on which a removal procedure could be set up.

Article 9: Mr. Meyers proposed an amendment requiring, essentially, a "non-Communist" affidavit from League officers. This subject is discussed under Article 12.

Article 10: Mr. Meyers proposed an amendment requiring a two-thirds vote in the event of proposals to amend the Articles of Association. The committee found that this is covered by Connecticut law and therefore could not be adopted in conflict therewith. (The requirement under Connecticut law is a three-fourths majority of the directors.)

Article 12: Mr. Meyers proposed an amendment requiring, essentially, a "non-Communist" affidavit from candidates for the office of director. The committee felt that this is unnecessary because Full Members of the League hold amateur radio operator licenses issued by the Federal Communications Commission, and it is the responsibility of the FCC to accomplish any screening felt necessary from this standpoint.

Mr. Meyers proposed an amendment to insert the word "amateur" before "radio communication." The committee felt that the present language is quite satisfactory, having been suitable for past usage and that the proposed change might create serious problems for the Executive Committee —e.g., a candidate employed by a commercial radio company which, although not in the amateur equipment business, might well be a competitor for amateur frequencies. The committee therefore felt the change was unnecessary and undesirable.

Mr. Meyers proposed an amendment to limit candidacy for directorships to holders of General or higher class amateur license. The committee felt this proposal was a basic policy change and therefore had no recommendation. However, should the Board decide to adopt such change, the committee recommends it be accomplished in Bylaw 8 by amending it to read as follows:

"8. No person shall be an officer, director or vice-director of the League unless at the time of his assuming office he is a member of the League and the holder of at least a General Class amateur license, or a Canadian Advanced Amateur Certificate."

Article 13: Mr. Kahn proposed an amendment to establish the office of a Comptroller and delegate some of the responsibilities of the General Manager to said Comptroller. The committee felt that this was a basic policy matter and therefore had no recommendation, but suggests that the proposal might best be referred to the Finance Committee for consideration.

Mr. Meyers proposed an amendment to require the General Manager to attend all meetings of the Executive Committee. The Committee felt that this was unnecessary, inasmuch as the General Manager is named as a member of the Committee under the language of Article 7, and it is assumed he would normally be present at Executive Committee meetings.

Bylaws

Bylaw 3: Mr. Engwicht proposed a thirty-day grace period for expiring memberships. The committee felt this was a matter for policy decision by the Board, and should the Board act favorably, the following language is suggested as a new Bylaw to be inserted after Bylaw 3:

"Members in arrears shall be carried on the League records for thirty days, but if they have not renewed their memberships by that time they shall be dropped."

Bylaw 9: Mr. Meyers proposed amendment concerning the listing of directors. The committee dealt with this matter in its consideration of Article 5.

Bylaw 18: Mr. Meyers proposed an amendment concerning four-year terms for directors. The committee dealt with this matter in its consideration of Article 5.

Bylaw 26: Mr. Crossley and Mr. Meyers proposed an examination of this Bylaw as concerns delegation of the responsibilities of the President. The committee recommends that the first portion of the second sentence of Bylaw 26 be amended to read:

"He shall, subject to instruction from the Board of Directors, and with the assistance of the General Manager, represent the League. . . ."

Bylaw 30: Mr. Meyers proposed to add the Public Relations Committee to the list of standing committees of the Board, and to add a new Bylaw specifying its duties. The committee has no specific recommendation, but notes the change may be easily accomplished if the Board so decides.

Bylaw 00: Mr. Meyers proposed the addition of a new Bylaw to provide for the appointment of an advisory committee to the Board. The committee noted that the Board could appoint such a committee at any time it desired, without the necessity for a specific Bylaw. The committee felt that, in any event, the decision is a policy matter for Board consideration and therefore has no recommendation.

General: 1) Mr. Meyers proposed an index for the Articles and Bylaws. The committee felt such an index could be provided if it is desired.

(Continued on page 142)

Project OSCAR Measurements and Tracking

BY ARTHUR M. WALTERS,* W6DKH;
RALPH WELLS,** K6QMJ; CARL HILLESLAND,*** K6LFI

Is your club looking for a space-age challenge? OSCAR is an ideal project for the ambitious club group that can pool equipment and personnel to do a complete job of supplying the information indicated in this article. On the other hand, individual hams can make worthwhile contributions too, by concentrating on one or two of the columns indicated on the report form reproduced below.

PHASE ONE of the Project OSCAR Program is planned to consist of orbiting a 100-milliwatt beacon transmitter with a c.w. identifier HI on 145.00 megacycles. This article tells how to determine *when* and *where* to look for OSCAR, and the data that the Project OSCAR Association desires to be reported by amateurs who copy the OSCAR signal. The main flight objectives of Phase I OSCAR are:

1. Attempt to obtain useful predictions of the satellite's orbital path by a statistical analysis of a large amount of relatively low-accuracy tracking data.
2. Qualitative analysis of signal propagation characteristics at 145 megacycles.
3. Measurement of internal temperatures in the satellite to verify theoretical calculated temperatures.
4. Measurement of Doppler shift.
5. Determination of the lifetime of the OSCAR package.
6. One of the most important purposes of all: to arouse amateur interest in the new age of space communications which is fast breaking all around us. The OSCAR Association hopes that this program will encourage amateurs everywhere to sharpen their technical knowledge and make increased progress in the areas of high-gain steerable antennas, low-noise stable v.h.f. receivers and precision measurement techniques.

Amateur Reception Reports

It is desired that any amateur copying the OSCAR beacon submit an OSCAR Tracking Report to the Project OSCAR Association, P.O. Box 183, Sunnyvale, California. Since it is expected that thousands of reports will be received during the life of an OSCAR package, standardization of the reports is an absolute necessity. A uniform method of reporting tracking information has been worked out to present the information desired in a brief and standard form. All tracking information submitted to the Project OSCAR Association by mail must be on an 8½ x 11 inch sheet of paper in the format[1] shown in Fig. 1. On the preliminary aircraft flight test of the OSCAR package on April 9 (See Stray, p. 39, this issue), over 40 reports from the central California area were submitted. One of the major stumbling blocks in the analysis of this data was the complete lack of uniformity in the size of paper, format and presentation of material. Data submitted on a national or international scale will have to be submitted in a standard format or the task of the voluntary labor in reducing the data will be utterly hopeless.

It is realized that not every interested amateur will have all the necessary equipment to measure azimuth, elevation, signal strength and Doppler shift with a high degree of accuracy. Nevertheless, incomplete reports can be useful; the only requirement is that these too be on the standard form to permit analyzing the date. Just fill out such columns as you can, using the form shown in Fig. 1.

OSCAR TRACKING REPORT FORM

Send To: P.O. Box 183 Sunnyvale, Calif. U.S.A.

STATION CALL

LAT: 37 deg. 14 min. 42 sec. N
LONG: 121 deg. 58 min. 07 sec. W
DATE: day 25 month 5 yr 61

Name:
Street:
City:
County:
State:
Country:

TIME (GMT)	AZIMUTH (degree cw) from North)	ELEVATION (deg. above horizon)	SIG. STRNGH (DB above noise level)	SECONDS per 10 "His"	DOPPLER SHIFT cps + or - from 145.0 mc	REMARKS (Note #)
1828:00	208°	5°	2	75	-550	1
1829	213°	10°	3	75	-646	
1830	220°	15°	8	75	-848	
1831	234°	21°	14	75	-1202	
1832	251°	24°	16	75	-2140	
1832:30	264°	25°	16	75	-3670	2
1833	284°	25°	16	75	-3682	
1834	310°	23°	16	75	-5216	
1835	340°	20°	14	74	-6126	
1836	460°	12°	10	74	-6529	
1837	353°	6°	3	74	-6735	
1837:24	354°	5°	0	X	-6772	3

REMARKS: 1. First Heard
2. PCA based on maximum rate of doppler change
3. Last heard

5-15-61

Fig. 1—OSCAR Reporting Form, with typical data. Amateurs working individually may be able to provide readings for only one or two columns, which information will still be quite useful to the project.

* Publications Supervisor, Hewlett-Packard Corp., Palo Alto; ** Special Project Engineer, Western Development Lab, Philco Corp., Palo Alto; *** Reliability Engineer, Philco Corp., Palo Alto; all correspondence c/o Project OSCAR, Box 183, Sunnyvale, California.

[1] To facilitate the submission of reports on standard forms, the Project OSCAR Association has printed a supply of these forms which will be sent by the Association prior to the first firing to all who have requested them.

Station Location

One of the most important entries on the tracking report is the location of the reporting station. In order to obtain useful orbit data on OSCAR, we must work with a uniform, unambiguous set of coordinates such as *latitude* and *longitude* for each reporting station. The task of converting the ordinary city and street address "QTH" information to exact latitude and longitude is hopeless unless each report supplies the necessary information. Several methods of determining your latitude and longitude are possible. Perhaps the easiest to use is a *Sectional Aeronautical Chart*, published by the U.S. Coast and Geodetic Survey (USCGS). These charts can be purchased at most local airports for less than a dollar. The charts show topographic features, roads, cities, and towns, and are overprinted on a latitude-longitude grid. Most pilots will be happy to assist you in interpreting your charts and reading the latitude and longitude from it. For purposes of the OSCAR tracking, latitude and longitude reported to the nearest minute (e.g., 37° 19′ north 121° 58′ west) is sufficiently accurate. If greater accuracy is desired, the USCGS publishes topographical maps with which it is possible to locate individual houses and other landmarks. For even greater accuracy, a local surveyor might be able to help you determine the coordinates of your antenna to the nearest second of latitude and longitude (about 100 feet.)

Time

Time is the next most important measurement. Fortunately, this is extremely easy to measure. Your trusty receiver, tuned to WWV or CHU[2], can give you an accurate time check to set an electric clock. The *Radio Amateur's Handbook* contains a section on WWV broadcasts. The time check should be of sufficient accuracy to record all information within 10 seconds. To eliminate a lot of mental gymnastics by the Project OSCAR data reduction staff, it is essential that all reports be in *GMT*. This is simply a matter of adding or subtracting a fixed number of hours to local time. An excellent article on GMT is in the April, 1961, issue of *QST*. Except for the time the satellite is first heard, the time of maximum Doppler shift, and the time that the signal is last heard, all measurements should be made on exact one-minute intervals (e.g., $21^h\ 33^m\ 00^s$) so that simultaneous reports can be compared. Because of the intended low altitude of the OSCAR package, approximately 12 minutes of observation per pass is the maximum expected. It will be common to record less than this number of observations, depending on the distance between the station and the package at the closest point during a pass.

Azimuth

If an amateur has a rotator and a directional antenna, the *azimuth* information should be reported. This data, together with time, latitude and longitude, will be used to help predict the future location of the OSCAR package in its orbit. The most accurate tracking possible, of course, is desired. It is recognized that the typical multi-element beam is not capable of the same precision as a 60-foot parabolic antenna. However, the large number of simultaneous bearings can be analyzed to obtain reasonably accurate azimuth data. For example, an excellent track of the April 9 "fly-over" test was produced from amateur bearings on the 2-meter signals. The more accurate the bearings reported, the better the precision of future orbital predictions.

The azimuth bearing of your antenna should be reported in degrees clockwise from true north. (East equals 90°, South equals 180° and West equals 270°). Your antenna should be aligned with *true* north prior to the OSCAR flights, and checked periodically. Two simple methods of alignment of the antenna with true north are capable of giving reasonably accurate results.

North Star Method

In the northern hemisphere, the "North Star" or Polaris is a good reference point. This star is within 1° of the true north point in the sky at all times. Fig. 2 shows the northern constellations in

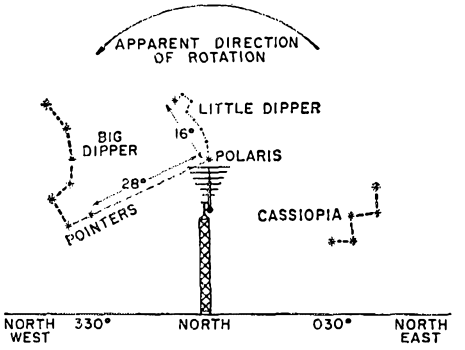


Fig. 2—Antenna alignment using Polaris. This is the way the sky will look at 35° N. latitude at 2400 local time during June, 2200 during July, and 2000 during August.

reference to Polaris. The constellations appear to rotate about Polaris in a counter-clockwise direction each night at a rate of 15° per hour. The sky diagram is approximately correct for the times shown. An additional check to determine that you have really located Polaris is its angle above the true horizon. This is approximately equal to your latitude. To align your antenna, position it so that the boom appears as shown in Fig. 2. A spotlight trained on the boom will aid in this task if there is insufficient light. Correct the rotor control box so that the true north is indicated.

Magnetic Compass Method

An alternate method of aligning the antenna involves the use of a magnetic compass. Magnetic north is not the same as true north in most parts of the world, so that the magnetic north reading

[2] CHU announces Eastern Standard Time every minute, by voice, transmitting on 3330, 7335, and 14,670 kc.

of a compass must be corrected for variation. Lines of equal magnetic variation are shown on the aeronautical charts. The rule is to add east (E) variation, and subtract west (W) variation from the magnetic compass readings to obtain the direction of true north. To check the antenna direction using a compass, locate an object that is true north or some other known direction from your antenna and align the antenna with this point. The magnetic compass method will work equally well in the northern and southern hemispheres.

Elevation

Most existing amateur facilities do not at present have the ability to control the position of their antennas in elevation. Since the beacon transmitter will be high in the sky at times, it may be desirable to add this feature. A second rotor at right angles to the azimuth rotor may be used to accomplish this. The elevation angles reported should be in degrees above the horizontal.

Signal Strength

To give some approximation of absolute signal level, it has been decided to record signal strength above noise level. The suggested method is to run your receiver "wide open" and note the "S" meter reading. The peak reading above this, minus the residual reading, should be recorded.

What is really needed here is an absolute method of calibrating ham receiver sensitivity. Lacking such a calibration, about all that we can do is assume that 1 S unit equals 6 db. Thus if your residual noise level with the receiver gain at maximum is S2 and the needle kicks up to S6 on the keyed pulses, the difference would be 4 S units. Since one S unit equals 6 db., the signal strength would be recorded as 24 db. Unfortunately, the S-unit system now used has no uniform standard and has no scientific value.

HI Rate

The keying circuits of OSCAR are temperature sensitive. A calibration of the *keying rate per minute versus temperature* has been made for the OSCAR package. The "HI Rate" should be determined from the time in seconds that are required to receive ten HIs, from the beginning of a H to the end of the tenth I. Hams reporting HI rate will enable the OSCAR Association to evaluate theoretical calculations of the expected temperature inside the package.

Doppler Shift

Doppler shift is the difference between the transmitted and received frequencies. It is caused by the relative motion between the transmitter and receiver.[3] It is exactly the same thing as standing alongside a railroad track and listening to a train whistle as it approaches and then goes away from you. The whistle will be higher in pitch when the train approaches and lower in pitch as the train goes away. At the exact instant the train is opposite you, the pitch of the whistle as you hear it is the same pitch as that the whistle is actually emitting. The maximum OSCAR Beacon Doppler shift will be about 7 kilocycles. The actual received frequency will change from high to low as the beacon passes overhead.

By plotting this frequency against precise time, the exact time of PCA (point of closest approach) can be determined. The time of PCA will be where the rate of change in frequency is a maximum. Fig. 3 shows a setup which will enable reasonably accurate Doppler shift measurements with simple equipment. If a tape recorder is available, the beat note may be recorded and played back after the pass to obtain Doppler curves. This procedure will reduce the number of hands needed during a given pass and permit practice in the technique of Doppler measurement. An example of a typical Doppler curve is shown in the May issue of *QST*.

While there are many more sophisticated ways to do these things, the main thing to remember is that *precision* is the key to useful work. A really stable 145.00-Mc. reference signal is necessary to get Doppler measurements. Drift of less than 500 c.p.s. in 30 minutes might be a good goal. Accurate time is easy to get. Beam antennas do not need to be fancy! A multi-element Yagi will give a sharp pattern and will be easy to point.

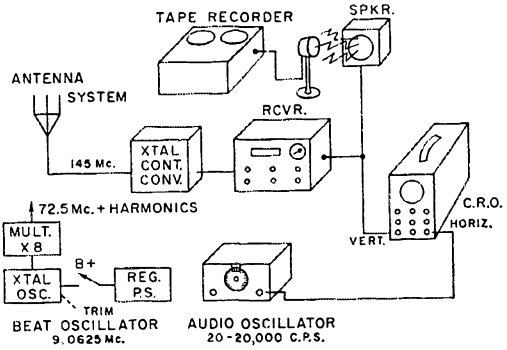


Fig. 3—Setup for measuring Doppler shift. The incoming signal will be weak, and a very strong local beat-oscillator signal will cause the receiver a.v.c. to reduce receiver sensitivity. Therefore the coupling between the crystal-controlled reference and the converter input circuit must be very light—oscillator radiation in the room may be more than sufficient. Checks may show that the frequency multiplier may not be necessary; the 16th harmonic of the crystal oscillator may be strong enough to cause an audible beat with the incoming OSCAR beacon signal.

In making Doppler measurements start with the beat oscillator about 500 c.p.s. above the incoming frequency, the beat note will then increase in frequency during the pass. The microphone picks up the beat tone from the speaker, along with the operator's narration of GMT and measured audio frequencies at times these measurements are taken. (Note: Signal strength measurements must be made with the beat oscillator turned off.)

[3] For further details on Doppler shift see Garner and Wells, "Ground Support for Project OSCAR", *QST*, May, 1961.

The orbital elements mentioned in the May *QST* article on OSCAR are not available gratis, as stated at the top of page 46 of that issue, but can be obtained on subscription from the Volunteer Satellite Tracking Program. The subscription costs $3.25 in the U.S. and Canada, $4.50 in other countries. Send your order to SATOR Subscriptions, VSTP-SPSE, Box 6932, Washington 20, D.C., enclosing check or postal money order payable to VSTP-SPSE. Be sure to specify the MOON-BEAM Subscription — and don't forget to give your correct mailing address.

Two Yagis, at right angles, with a coax switching system will give nice sharp patterns for horizontal and vertical angles. With a single Yagi, vertical polarization will be best for obtaining elevation if you can tilt your beam. Extreme antenna height is not really necessary. We hope to offer practical suggestions in subsequent articles for ways of getting bearings of usable accuracy with simple methods.

Method of Reporting

The Project OSCAR Association desires to obtain reports both by mail and via the communications networks. A separate article is planned to be written, covering the net communications and methods of dissemination the predicted orbit information. Because of the perishability of orbital data it is desired that as many reports as possible be relayed via the amateur radio communication system. Follow-up reports by the mail system will be used to verify the speed and accuracy of the radio reports.

Acquisition Prediction

Since the OSCAR package will probably be in a relatively low-altitude polar orbit, it will be readable for rather short periods of time during a "pass". The number of passes at a given location will vary with the location of the receiving station. The purpose of an acquisition prediction will be to determine *when* (time) and *where* (azimuth) to listen for OSCAR. Several methods of predicting the "when and where" are possible, but all require data concerning the orbit of the OSCAR package, and some means of converting this to time and azimuth.

Orbital parameters for the OSCAR package will be transmitted throughout the world via amateur communications circuits, including WIAW. Since it would be an impossible task to convert these parameters to the time and azimuth for thousands of amateur stations all over the world for each orbit (there will be about 16 orbits per day), a standard report will be sent over the nets. A simple homemade computer will be required to convert this information to the azimuth-time data needed to acquire the OSCAR package. The computer consists of a world map and a transparent plastic overlay with the path of an orbit plotted on the overlay. Computers have been constructed using polar and Mercator projection maps. The Great Circle Charts ordinarily used for antenna positioning are not suitable for the computer. A photograph of the Mercator type of computer is shown in Fig. 1 of the article "Ground Support for Project OSCAR".[4] Fig. 4 shows a north polar projection computer. The Polar Projection Computer is more applicable to high and middle latitude stations, and the Mercator Computer is more useful for near-equatorial stations. The procedure for constructing either type is similar, although the finished appearance is different. The construction of a computer might make a suitable club project.

Making the Computer

Obtain a world map, either Mercator or Polar projection. The larger the map the better.[5] Larger maps make it easier to locate yourself, but require more space to use and to store. Smaller maps may show only the largest cities, and it may be necessary to locate yourself by using the latitude and longitude of your station. In any case it is essential that the chart have a latitude and longitude grid. Obtain a sheet of thick celluloid, or other transparent plastic material larger than the map. Mount the map on a heavy piece of cardboard or plywood. Renumber the east longitude lines to indicate longitude west of Greenwich (0° longitude):

165° E = 195° W	75° E = 285° W
150° E = 210° W	60° E = 300° W
135° E = 225° W	45° E = 315° W
120° E = 240° W	30° E = 330° W
105° E = 255° W	15° E = 345° W
90° E = 270° W	0° = 360°

(360° minus east longitude = west longitude). This is necessary since the longitudes in the prediction messages are measured *west* of Greenwich and east longitude is not used. Temporarily fasten the plastic over the map with masking tape. With the Mercator map, mark the equator on the overlay. On the overlay for polar projection maps, mark the equator (a circle) and the north or south pole, at the center of the circle. This can be done with narrow (⅛-inch or 1/16-inch map tape available at stationery stores. You are now ready to plot the coordinates of a high-latitude orbit, typical of the one that OSCAR will follow. Table I gives the coordinates of the track. Unless this information is updated in *QST* or via the communications net, it will be applicable to the flight of OSCAR I. Note that longitude is given in degrees and hundredths, not minutes. For northern or southern hemisphere polar charts only the points for the applicable hemisphere will plot. The points are now joined in a smooth curve using the map tape. On a Mercator

[4] Garner & Wells, "Ground Support for Project OSCAR", *QST*, May, 1961, p. 45.

[5] Suitable Mercator or polar charts can be obtained from many navigational instrument stores. Typical Mercator charts include: Rand-McNally's Imperial 32 × 50 inches or Cosmopolitan 20 × 30 inches. A suitable North Polar chart is Hammond's Global Strategy Map, 20-inch diameter.

TABLE I

Latitude, Longitude and Time Coordinates Typical OSCAR Track

Direction	Lat.	Long. West	Time Correction Minutes & Tenths
S — N	00	300.00	0.00 (Point A)
S — N	10° N	299.28	2.49
S — N	20° N	298.47	4.94
S — N	30° N	297.46	7.36
S — N	40° N	296.07	9.77
S — N	50° N	293.97	12.18
S — N	60° N	290.38	14.63
S — N	70° N	282.85	17.17
S — N	80° N	255.71	20.16
Northmost Point		215.65	21.63
N — S	80° N	175.58	23.12
N — S	70° N	148.45	26.23
N — S	60° N	140.95	28.97
N — S	50° N	137.38	31.69
N — S	40° N	135 31	34.45
N — S	30° N	133.95	37.27
N — S	20° N	132.98	40.15
N — S	10° N	132.20	43.11
N — S	00°	131.53	46.14
N — S	10° S	130.85	49.23
N — S	20° S	130.09	52.40
N — S	30° S	129.14	55.62
N — S	40° S	127.81	58.90
N — S	50° S	125.77	62.21
N — S	60° S	122.25	65.58
N — S	70° S	114.78	69.03
N — S	80° S	087.71	73.01
Southmost Point		047.86	74.92
S — N	80° S	007.46	76.81
S — N	70° S	340.56	80.61
S — N	60° S	333.08	83.78
S — N	50° S	329.53	86.77
S — N	40° S	327.46	89.64
S — N	30° S	326.10	92.41
S — N	20° S	325.10	95.09
S — N	10° S	324.30	97.69
S — N	00	323.59	100.23

Note: Start at the left edge of the chart with Point A for Mercator Charts where 60° E (300° W) is the left edge. Where 180° is the left edge, subtract 120° from all "Long. West" Table entries.

chart the track should resemble a sine wave, and on a polar chart it should be nearly a straight line. Next, mark the times indicated in Table I on the track and label Point A. The time marks will be used to correct the equator-crossing time given in the prediction message to obtain the times that the OSCAR package will cross any given latitude.

To finish off the polar computer, cut along the plastic circle at the equator and make a small hole in both the map and plastic overlay at the pole. Use a bolt, or other similar fastener, to attach the disk to the map. For the Mercator chart, make a pair of parallel slides to permit the overlay to be moved back and forth along the equator in slide-rule fashion. Your orbital computer is now ready for the OSCAR experiment.

Using the Computer

The OSCAR prediction messages sent from W1AW or other official sources will contain the following elements:

Date and month (Greenwich date).

Revolution number.

GMT of equatorial crossing northbound (S-N).

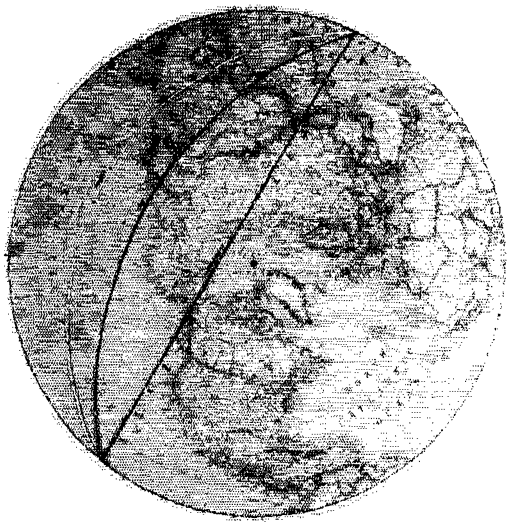


Fig. 4—Satellite computer based on polar projection.

Longitude of crossing measured west from 0° (Greenwich). Point "A" on the overlay should be placed over the longitude of crossing on the world map for a given revolution. The track over the earth's surface is then given for that orbit. For each succeeding orbit, point A must be positioned over its corresponding longitude of crossing. The time of crossing any given latitude is obtained by adding the time in the OSCAR prediction message to the time on the overlay for the latitude.

The direction to search for OSCAR can be found by estimating the bearing from your location to the point on the track where you expect to acquire the signal. Also the direction of the nearest point and the fade point can be determined. Some experience will enable you to more accurately estimate the angles, but with the beam width of the Yagi antennas in use, extreme accuracy is not necessary.

Conclusion

With the information in this and other articles on OSCAR, amateurs will be able to participate in the program and gain experience for future OSCAR flights. Any questions or suggestions concerning this article or the OSCAR program should be sent to the Project OSCAR Association, P.O. Box 183, Sunnyvale, California.

Credits

A word of thanks should go to Carl Buchhass, WA6GGW; Ed Hilton, W6VKP; Bill Hawkins, WA6GAU; Carl Shaw, W6HTR; Hal White, K6RNX/ and Les Vickery, W6AKR, all member of the Hewlett-Packard Radio Club. They have given freely of their personal time to help process the reports sent in after the April 9, 1961, fly-by test of the prototype OSCAR beacon. They have also made many valuable suggestions

(Continued on page 144)

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

JUDGING from the number of inquiries we have received, it would seem that the amount of "building your own" is not as dead as some people think. In particular, the tremendous popularity of the nuvistor has been most gratifying to those of us who were inclined to think that even on the v.h.f. the art of experimenting was fast disappearing. It would seem that all the articles on the use of the nuvistor are concerned with its application at 144 Mc and higher. However, the letters we receive are mainly concerned with how it can be used on 50 Mc. Now there is a school of thought which says that you do not need a good noise figure on 50 Mc. In general these proponents of poor receivers are going strictly by the book and do not speak from experience. It is a fact that if you live in a noisy location you will not get as much benefit from a good noise figure as you would if you lived in the Rhododendron Swamps. It should be pointed out, however, that the only noise that you always have with you is that generated by nature. Man-made noise is usually transient and in addition is of the pulse type which can to some extent be alleviated by the use of a properly designed noise blanker. One of the best tests of your receiving ability is to point your antenna at the sun when it is at the horizon. If you cannot hear a large increase in your receiver noise level, you just don't have an adequate receiving setup. I am not going to be guilty of putting a limit on how good a noise figure it is worth while to shoot for on 50 Mc.; I personally have not had a receiver that had a noise figure that was "too good" for receiving weak signals. I have been in locations where the man-made noise was in fact many times higher than the solar noise but the use of a high-linearity, low-noise front end still allowed better copy on weak signals.

In keeping with our thoughts on the matter of low-noise front ends for 50 Mc. we have been testing several circuits using the 6CW4 as a first stage in a two-tube converter. By far the simplest and easiest to get working is the grounded grid configuration. The gain of the 6CW4 in this circuit is sufficient to over-ride the noise of a good mixer and results in a converter with a noise figure of 2 to 3 db. (depending on the particular tube). The circuit for this little gem is given in Fig. 1. The coil sizes are listed in the coil table. An i.f. of 14 to 18 Mc. was chosen to fit our particular circumstance. (The prime reason in our case is the additional r.f. selectivity available on the 1-Mc. band as opposed to the higher frequencies.) This converter makes no attempt to cover the whole band at one tuning. The coils L_1, L_2, and L_3 are resonated at approximately 50.2 Mc. and the converter response is down about 3 db. at 51 Mc. If the prime operating range is at some other frequency the tuning of L_2 and L_3 should be adjusted accordingly. L_1 is loaded by the 6CW4 and is in fact so heavily loaded that it requires no retuning to cover the band. The tap on L_1 should be experimentally determined to suit your individual case. In our

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

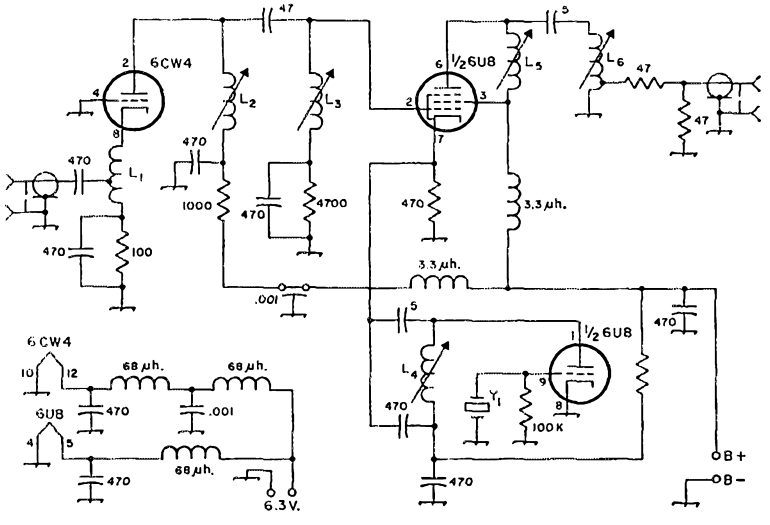
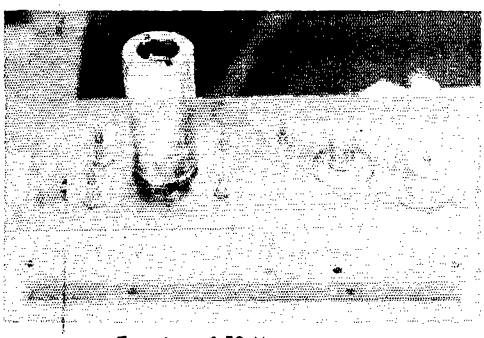


Fig. 1—Schematic for 50-Mc. converter using 6CW4.



Top view of 50-Mc. converter.

case it was adjusted to match a 5-ohm line with a v.s.w.r. of about 1.2 to 1. (Unknown phase.)

As is the case with any construction article where the writer has made only one of the subject designed, it is wise to be aware of the fact that the writer is only telling you about the things that worked for him and is quite likely to leave out all the things which made trouble for him. For instance, the crystal oscillator in this design is a perfectly straightforward design but it has a tendency to oscillate on the fundamental of the crystal as well as the overtone. This results in more than one local oscillator frequency and the reception of some stations on more than one frequency. It can be cured by proper adjustment (Note! the term "proper adjustment" usually indicates that the writer doesn't know what the problem is, but it can be cured if you fiddle around long enough with the crystal oscillator tuning.)

Results using the converter were very gratifying. Overload from strong locals was considerably better than any converter that we have tried and weak signal reception was equivalent to the best we have been able to do with a 417A preamplifier which we normally use at W1HOY. Considering the extreme simplicity, we feel that it is a real winner for 50-Mc. work.

Coil Table for 50-Mc. Converter

L_1 — 9 turns BW3003 tapped 2¾ turns from cold end.
L_2 — 20 turns No. 26 wire ¼ inch diam. (LSM coil form — white slug)
L_3 — 14 turns No. 26 wire ¼ inch diam. (LSM Coil form — white slug)
L_4 — 20 turns No. 26 wire ¼ inch diam. (LSM coil form — white slug)
L_5 — 28 turns No. 28 wire (PL5-5 form — red slug)
L_6 — 28 turns No. 28 tapped 7 turns from cold end (PL5-5 form — red slug)
Y_7 — 36-Mc. crystal

PROJECT MOON BOUNCE

The 1296-Mc. moon-bounce effort at the W1BU location is back in operation. Schedules are being kept with W9QXP and company and with the club station at Purdue (W9YB), Indiana. So far no schedules with any West Coast or out of the country stations. W8LIO at Dorset, Ohio, is in the process of adding to his dish to bring it up to thirty feet in diameter. This should result in the first amateur phone contact via the moon-bounce route. W1BU will be open for schedules during the months of July, August and September.

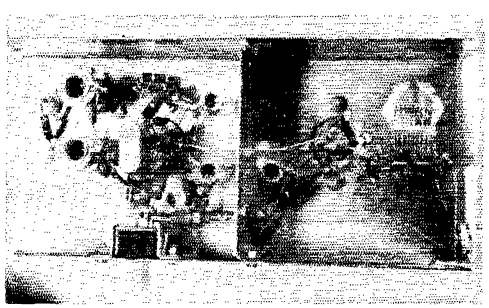
Here and There on 6 and 2

Once again the sporadic-*E* season is upon us in full swing; it's one of those things that the newcomers to 50 Mc. look forward to anxiously, and the old-timers say it just can't be as good as previous years. No matter how we look at it, about 85% of the six-meter operators enjoy working skip. It is also the season for gripes from both the newcomers and the oldtimers. How many times have you heard the comment: "He (or she) is on MY frequency"? How many times have you heard: "Those v.f.o. boys are at work again hopping from frequency to frequency"? Or — "No wonder they get the contacts, using that high power and big beam"? Or — "Wonder why he is on the air, he has the states that are coming through"?

Each one of us has our own answer to these and many other comments, and probably we'll never agree, but common courtesy should take precedence. As far as "My frequency" goes, I think we all know the answer to that one: no matter how closely the frequency is checked, particularly when the band is open, the same thing happens that happens on the low frequencies. You just have to learn to share the frequency; if you're not in the habit of doing so it will be a little difficult at first but will be well worth while if you pick up the knack. The v.f.o. comment might be answered by saying "What are v.f.o's made for?", but there is also the fact that the fellow might possibly be trying to keep off of someone else's spot, or is just trying to get that particular bit of skip. Going along "piggy-back" can be a great deal of fun but can be slightly dangerous, too, depending on the parties concerned. High power and big beams — they're nice too. Probably this group started out with low power and small beams, accomplished what they could with them and then progressed to bigger and better power and beams with the thought in mind of extending their knowledge and accomplishments in the v.h.f. field. If you have a "gripe" or some criticism, tell the party concerned, don't tell the fellow a few kc. away or the one who lives next door; and most of all accept criticism directed your way, remembering all the time that you probably said the same thing last year about someone else.

Seems that Pete, VE8BY, has finally had a break; on April 15 he heard VE3BZS/2 on c.w., gave him a call but had no luck. Next he heard VE4CV R4 S6 and received a 4–5 report from Cass. A couple of hours later Pete heard and worked VE6MO in Viking, Alberta, and reports of 5–9 were exchanged. The line forming to the right to work VE8BY then read, VE6DB, VE6FF, VE5CU, VE6MO and VE6OH. Pete, VE8BY, has been very persistent for the past year or so in his 50-Mc. activity and in his attempts to raise activity on that band. It finally paid off for him with the aforesaid contacts. Congratulations, Pete, and good luck with future persistence.

From Albion, Michigan, and K8NEY we hear that a number of short openings were heard during the month of April. While mobile in the Detroit area on the 23rd of that month, George heard 9s and 5s very briefly. On the following day W5BLV and K5VTS in Texas were worked and on the



Bottom view of 50-Mc. converter showing placement of components.

26th the 4s in Florida were getting through to Michigan. K8NEY and W8UMF, North Royalton, Ohio, having been keeping nightly skeds on 50.120 since November, and the contacts have been seventy-five per cent reliable for this five month period over a path of approximately 190 miles. W8UMF has four-over-four for an antenna and is running 500 watts; K8NEY uses a five-over-five and 40 watts. Average signal of K8NEY in Ohio is S4; W8UMF's signal in Michigan S9 plus. Signals have been going down since February with QSB on the upward trend. Another Michigan station, K8SPW reports good opening on April 14 to W2, W3, W4, and W7 lands. Seems that the W5s are showing up everywhere; WA6KVS tells us that on April 7 K5LHL copied the local six-meter net in Redondo Beach, California, and then checked in as a visitor. W6IEY mentions that during the opening of April 4 he heard K5UGM calling KH6CYF; wonder if that contact was made. We heard (unofficially) that KL7s were working into Florida, Tennessee and Kentucky around the middle of May, but have not received the information from anyone who actually was on one end of these contacts, on 50 Mc. W6IEY also reported openings on April 2, 9, 23, and 30 of April on 50 Mc. Signals from the South were heard on April 7 by W9FCV who heard Cuba, Puerto Rico and Chile during a six-meter skip session. Also 9 land, K9PNP sez he is putting up a new 30-foot tower and expects to soon be getting his 4-element beam up thar soon. Mitch is running 75 watts and is anxious to keep c.w. skeds with anyone interested. From Wichita, Kansas, and Dot, KØGIC we hear that the six-meter band was open there, also, on April 7 when Florida, Alabama, Georgia, Texas and Louisiana were coming through; and again on April 23 when Pennsylvania, New Jersey, Ohio, Michigan and New York all came through with very good signals. Band was also open the following day to Alabama, Mississippi and Louisiana but was very erratic. Seam to have several reports on the April 7 opening 'cause here's another comment from Jim, K4KYL, that the band was open to most of Texas for two hours on that day. Jim also mentions openings on the 21st, 23rd and 24th of April. K4KYL is using a Viking 6 N2 running 100 watts; he's active on both of these bands and will soon be active on 220 Mc. sporadic *E* started for Hugh, K3IZM, in the D.C. area on April 16 and April 23 when he was hearing mostly 5s and 9s. Amongst the skip reports we'll sneak in a good ground-wave report from Bob, W1EXZ, in Danville, Vermont, who says that on the evening of April 22 ground-wave was extremely good. At that time he worked K1DVJ, Framingham, Mass.; W1FCP, Swampscott, Mass.; W1AWM, Peabody, Mass. W1AWM was the strongest 50-Mc. signal from eastern Massachusetts ever heard at this QTH. (No apologies necessary, Bob.) Bob mentions that he has not been too active recently due to business taking precedence, but we're happy to learn that he is on the air sometimes. Wonder if the rest of the country realizes that it is difficult for the rest of New England to work Vermont on 50 Mc., too. 23rd of April six was open into Missouri, Nebraska and Kentucky for WA2BDP in New Jersey; and W3JYL, Pennsylvania, reports working into Nebraska, Iowa, Missouri and Kansas with good reports on that date. Tony, W3JYL, also reports local activity only on 144-Mc. and no activity on 220 Mc. after listening every night for two months. Seems as though there should be some activity in that area on 220 Mc., but it was probably active when six was open. W3ZRR also sez that sporadic *E* is perking up during April. From Plattsburgh AFB, Bernie, K1BVI/2 passes along the dope that on May 10 he heard an opening to Ø land. He was unable to make any contacts as his 50-Mc. final still needs to be completed. Two-meter activity is high in that area also, with Bernie logging over one hundred stations in seven months. Alabama is represented this month by K4FHU who sez that the first half of May has been very rewarding to 50-Mc. operators, with skip coming in from the North, South, East and West., mostly from W1, 2, and 3 call areas. K4EDS and K4SRU both worked CO3NR in Havana, Cuba on May 11; while K4WHZ heard KZ5s coming into his QTH on the 10th. Certainly sounds like Alabama is having fun. George, K4FHU worked K8JYS in Michigan on May 9 and K4RPA on the 11th and 12th.

Among the few reports received concerning 144 Mc., we have one from W5ML in Vivian, Louisiana. Art sez that during the tropo openings of April 21, 22, and 23 he worked W4FWH and K4SJF in Alabama and Georgia. K5JHG in Atlanta, Texas, now has seven states on 144; and W5FHF has six states. Art, W5ML, has sixteen states on two meters and is gunning for New Mexico. Florida, North and South Carolina, Virginia and Pennsylvania. He's heard 'em all but ——. From his new location and higher elevation and higher power he's hoping to pick up a few new states. Regular operation on 144 Mc. every night at W5ML from 2000 to 2300 for you boys looking for Louisiana, Nantucket, Massachusetts has several active two-meter boys, among them is Nick, K1NGJ who reports hearing VE2AX calling CQ on c.w. on May 2.

Aurora reports have come in from the 1, 2, 3, 4, 8 and 9 call areas for the month of April. K1AII and W1NKA both report the April 2 aurora with W9EET the furthest contact. W1NKA also sez that April 14 came through with a very good auroral session when VE3CUA and

(*Continued on page 144*)

2-METER STANDINGS

W1REZ	32	8	1300	W6WSQ	15	5	1390
W1AZK	28	8	1205	W6NLZ	12	5	2540
W1KCS	24	7	1150	W6DNG	9	5	1040
W1RFU	24	7	1120	W6AJF	6	3	*800*
W1ARJ	23	7	1130	WØZL	5	3	1400
W1HDQ	22	6	1020	K6GTG	4	2	800
W1MMN	21	7	1090	W6MMU	3	2	950
W1IZY	20	7	1180				
K1CRQ	19	6	800	W7JRG	12	4	1040
W1AFO	17	6	920	K7HKD	11	5	950
K1AFR	17	5	450	W7CJM	5	2	670
				W7LHL	4	2	1050
W2NLY	37	8	1390	W7JIP	4	2	900
W2CXY	37	8	1360	W7UJ	4	2	253
W2ORI	37	8	1320				
W2GQ1	33	8	1200	W8KAY	38	8	1245
W2BLV	30	8	1020	W8SDJ	37	8	1220
W2AZL	29	8	1050	W8PT	37	9	1260
K2IEJ	27	8	1060	W8IFX	35	8	980
K2LMG	25	8	1160	W8LOF	33	8	1060
W2AMJ	25	6	960	W8SFG	34	8	1040
K2CEH	23	8	1200	W8RMH	32	6	910
K2DWJ	23	6	860	W8GGH	32	8	1180
K2HOD	23	7	950	W8BAX	32	8	960
W2PAU	23	6	753	W8NOH	31	8	1090
W2ALR	23	7	960	W8SVI	30	8	1080
W2RXG	23	8	1200	W8ÇHW	30	8	860
W2SMX	23	7	1090	W8LPD	29	8	850
W2LWI	21	6	700	W8WRN	28	8	680
K2KIB	21	5	900	K8AXU	29	8	1050
W2ESX	20	6	750	W8DX	26	8	720
W2WZR	19	7	1040	W8ILC	25	8	800
W2UTH	19	7	880	W8JWV	25	8	940
W2RGV	19	8	720	W8WNM	25	8	900
K2RLG	17	6	980	W8GFN	23	8	510
				W8LCY	22	7	680
W3RUE	33	8	1100	W8BLN	21	7	610
W3GKP	31	8	1180	W8GTR	17	7	550
W3SGA	31	8	1070	W8NRM	17	7	550
W3TDF	30	8	1125				
W3KCA	28	8	1110				
W3BYF	28	8	1070	W9KLR	41	9	1160
W3EPH	22	8	1000	W9WOK	40	9	1170
W3LNA	21	7	720	W9GAB	34	9	1075
W3NKM	20	7	730	W9AAG	33	8	1050
W3LZD	20	7	650	W9REM	31	8	860
				W9ZIH	30	8	830
W4HJQ	38	8	1150	K9AAJ	29	8	1070
W4HHK	37	9	1280	W9PRP	28	8	820
W4ZXI	34	8	950	W9LVC	27	8	950
W4UTU	34	8	1160	W9EQC	27	8	820
W4MKJ	33	8	1140	W9OJI	27	8	910
W4AO	30	8	1120	W9ZHL	25	8	700
W4VLA	26	8	1000	W9BPV	25	7	1030
W4BQM	25	8	1040	K9AQF	24	7	900
W4AIB	25	8	900	W9LF	22	7	825
W4WNH	24	8	850	W9KPS	22	7	690
K4EU8	24	6	765	W9CUX	21	7	800
W4JCJ	23	6	725	W9PMN	19	6	800
W4VVE	22	6	720	W9ALU	18	7	800
W4RMU	21	7	1080	WØBFB	37	9	1350
W4TLV	20	7	1000	WØIHD	31	8	1030
W4IKV	20	6	720	WØSMJ	29	9	1075
W4OLK	20	6	720	WØLFE	28	7	1050
K4YUX	18	8	830	WØQDH	27	9	1300
W4LNG	18	7	1080	WØRUF	22	7	900
W4RFR	18	9	820	WØINI	21	6	830
W4CPZ	18	6	650	WØTGC	21	7	870
W4MDA	17	6	750	WØRYG	20	8	925
				WØIC	19	7	1245
W5RC1	35	9	1215	WØMOX	19	6	1150
W5AJG	30	9	1360	WØJAS	18	6	1130
W5JWL	29	7	1150	WØAZT	17	6	1100
W5DFU	28	9	1300	KØAQJ	16	6	1120
W5PZ	27	8	1300	WØIFS	16	6	1100
W5LPG	25	7	1000				
W5FYZ	26	9	1160	VE3DIR	30	8	1330
W5KTD	23	8	1200	VE3AIB	28	8	1340
W5JWL	29	7	1150	VE3PQN	19	7	790
W5ML	16	5	700	VE3DER	17	8	1340
W5FSC	12	5	1390	VE3AQG	18	8	1300
W5HEZ	12	5	1250	VE3HW	15	7	1350
W5CVW	11	5	1180	VE2AOK	13	5	550
W5NDE	11	5	625	VE3BPB	14	6	715
W5VY	10	3	1200	VE2ABE	9	4	580
W5SWV	10	3	600	VE7FJ	2	1	365
W5YYO	7	4	1330				
W5UNH	6	3	1200	KH6UK	1	2	2540

The figures after each call refer to states, cal areas, and miles.

The 1961 Novice Roundup Results

JANUARY 28 through February 12, 1961, magic dates for the neophyte. This was *the* time when all Novice-grade amateurs had the opportunity to jump in and get their feet wet in a competition. The Novice Roundup is the time to have fun while learning and improving new and basic operating skills. This year 138 Novices reported their efforts in the contest and 54 of the non-Novice group did likewise. The year's outstanding job was turned in by KNØBPO working 485 stations in 63 Sections, *j.b.!* Extra perseverance and determination was demonstrated by the following group, with scores over 10,000 points: KNØBPO 30,555; KN7LUV 21,106; KN1QFC 14,575, WV2OCG 13,110; KN9WRX 12,320; WV2NAW 12,087; KN9WZB 11,232; KN8YAU 11,067; KN9YTJ 10,810.

Section leaders stand by, certificate awards are scheduled for mailing in mid-July.

— *E. W.*

Non-Novice Scores

K1BCS 4142, W1AW[1] 3200, K1KRP 2212, W1GPN 1058, K2KWZ 8610, WA2IZM 5184, W2MUM 5084, W2MTA 9 2565, K2OFD 2070, WA2ANA 1890, WA2IBJ 1640, W2NJY 1105, K2IBF 969, WA2IKL 570, K2KHK 252, K2YMM 112, WA2AYA 44, K3ANU 4160, K3IPB 3038, K3GNI 2403, W3MSR 1875, K3MWT 448, K3ALL 240, K3JGV 240, K3JHT 117, K4AYE 6880, K4LRX 1344, K4TVC 874, K4GMR 833, K4RJA 4 330, K5QBN[2] 408, W5LJT 46, K6CJF 8648, WA6FYW 2128, K6ICS 1728, WA6GMO 924, K6EIL 486, WA6HEX 272, KW6DG 585, K7CTI 7224, K7CPC 2016, K7KCZ 240, K8RMK 5408, K8HLR 658, K8HZO 588, W9CLH 5382, K9GDF 855, K9UCP 656, K9RHY 322, K9ALP 9 56, W9HHX 25, KØUDQ 13,250, KØWWW 264, KØZEI 187.

Soapbox

"Completed WAS in the contest." — *KN9YTJ.* . . . "A lot of good operators on but I was surprised to hear so many Novices on who were not in the Roundup." — *K1KRP.* . . . "Dad, WØYCR, gave me a lot of tips on contest operating procedures and encouraged me to keep going when I felt like giving up." — *KNØBPO.* . . . "A lot of fun giving a couple of west coast Novices their first New York QSOs." — *W2MUM.* . . . "Didn't hear much activity on 15 although it was good for a few sections. Thanks to the non-Novices who accounted for almost 50% of my contacts." — *KN1QFC.* . . . "Besides working the Novices I was also in competition with my xyl Billie, K3JGV. As you will notice, we ended in a tie." — *K3ALL.*

[1]W1WPR, Opr; [2] KN5BVK, Opr.

Call-Area Leaders

KN1QFC	WV6NQN
WV2OCG	KN7LUV
KN3LXN	KN8YAU
KN4WJT	KN9WRX
KN5ERQ	KNØBPO

. . . "What a contest! Worked 10 new states and having had my license only 3 weeks before the contest I couldn't help learning a lot of operating skills." — *KN8YA.* . . . "The contest is real fun for Novice and General alike and for at least 15 of the KNs I was first California." — *K6CJF.* . . . "This provided an excellent means and incentive for code proficiency improvement." — *KN8UAH.* . . . "Didn't notice any big scores this year with the exception of KN7LUV who was on 15 meters every time I tuned across the band regardless of whether I was looking for contest participants or not, hi. Heard several fellows with beautiful fists and appropriate comments were passed on to them." — *W9CLH.* . . . "The NR was a barrel of fun and I gained valuable operating experience. Looking forward to more contests now." — *KN8WKH.* . . . "Very fine group of Novices participating this year." — *K1BCS.* . . . "Partly because of the contest and partly because of K1BCS who sent me a radiogram telling me 'good luck in the contest and hope to see you in traffic nets when you get your General' I am now avidly studying my theory and trying to work up my code speed." — *KN5ENQ.* . . . "It really was fun. Next year I hope to be working the Novices who can experience the excitement I did." — *KN5ETI.* . . . "I'd like to pass along my thanks and gratitude to those I QSOd. The willingness and cooperation of these operators was above par." — *KN8TRJ.*

Scores

Scores are grouped by ARRL Divisions and Sections. The operator of the station listed first in each section is award winner for that section. *Example of listings:* KN3MKU 1387-63-19-15, or, final score 1387, number of stations 63, number of sections 19, total operating time 15 hours.

ATLANTIC DIVISION

Eastern Pennsylvania

KN3MKU . . . 1387- 63-19-15
KN3MNT 936- 57-13-23
KN3NIE 700- 35-20- 7

Md.-Del.-D. C.

KN3LXN . . . 8640-155-48-39
KN3LYW . . . 6670-145-46-19
KN3MHH . . . 2190- 58-30-37
KN3NEB 1725- 60-23-21
KN3MBV . . . . . 880- 44-20- -

S. N. J.

WV2OGK 1760- 70-22-

W. N. Y.

WV2LDB . . . 1386- 56-21-26

W. Pa.

KN3MRG . . . 6324-186-34-29
KN3LWM . . . 3025-106-25- -
KN3NHZ 1440- 62-20-17
KN3MNP 494- 23-13- 8

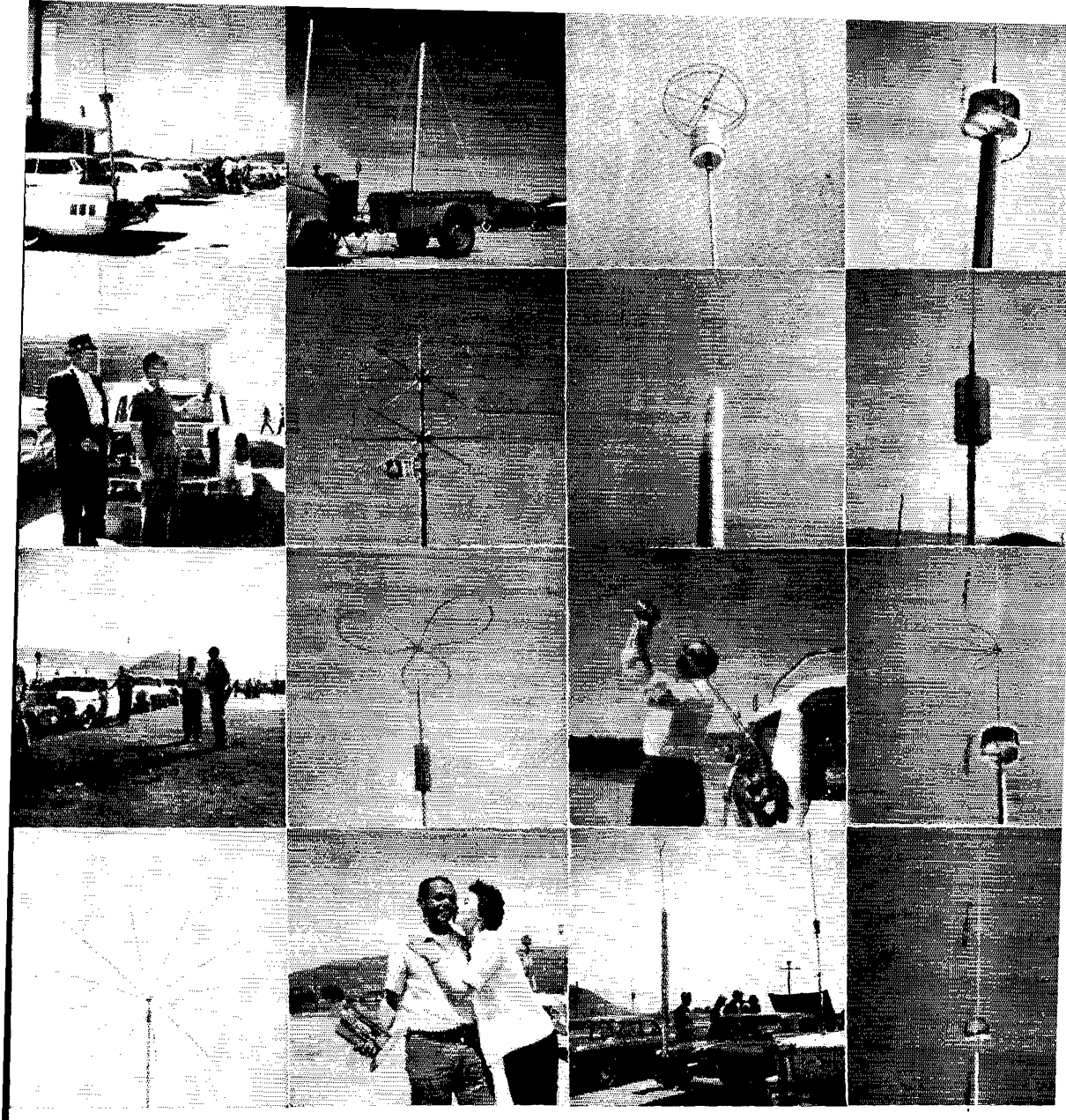
CENTRAL DIVISION

Illinois

KN9WRX . . 12,320-205-56-31
KN9ZDI . . . . 6400-145-40- -
KN9YIH 4953-112-39-18

(*Continued on page 138*)

Eleven-year-old KNØBPO shares this fine shack with notable father, WØYCR. Scott now holds his General-Class license and has worked over 100 countries. At the time of the NR, the rig used was a home-brew 6V6-807, shown to the right in the picture. Scott says the certificates are his Dad's but he expects to have a lot of them himself before too long. Top scorer of the 1961 NR with 30,555 points.



California Mobilecade and Field Trials

On April 15 and 16 over a hundred mobiles gathered at San Luis Obispo Air Field, approximately half way between Los Angeles and San Francisco, to participate in this third annual contest of mobile efficiency. Field-strength readings were taken at a location one mile from the mobile transmitters, and after this reading was squared it was divided by the transmitter power input. Winner was David Evans, WA6JJG, whose mobile antenna is shown above in the fourth row, first column. WA6JJG is also shown in the fourth row, second column, holding the winner's trophy in one hand and receiving an additional reward for his victory. The other photos show the great variety of antennas that were in use.

The complete results supplied by Ted Glick, K6LJA, show that WA6JJG's plate input power of 7.26 watts was among the lowest of the 52 competing mobiles (W6SCP, who finished third, was running 5.4 watts, and K6TTV in 20th spot had a mere 3.825 watts input). Highest power of all was K6HWL at 800 watts, but the majority of the stations were grouped around the 50-watt level.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Gnats! . . .

Guess we can forget about Walser Valley. Among several pieces of mail on the subject we offer a treatise by K3BTJ who writes from the Continent where he attends school:

> Your note on the Walser Valley in April *QST* was quite interesting, except that Ripley slipped up this time. The *Walsertal* is NOT "completely surrounded by Germany." It only borders on Germany in the northeast; otherwise it borders on Austria. However, this alpine valley is only accessible by car from Germany, since mountains separate it from Austria which can only be crossed on foot. For this reason Walser Valley (in reality two valleys, the Large and the Small) is served by the German Post, and all supplies for the place come from Germany. Stamps and currency are German, though Austrian currency is also usable. And there are no border customs between W. V. and Germany while there are between W. V. and Austria! Otherwise the area is administered by Austria. It's quite a tourist resort. If Ripley had looked some 20 miles to the northeast he would have found Jungholz, a valley in a similar position. So far as I know there are no hams in either place. If there were they would be just some more OE7s. . . .

Nothing like having an operative right at the scene, is there? Well, don't feel too bad about it. Save your Walser Valley QSLs. Some clown will come along with a WWV award at any moment.

What:

Summer's many distractions take their yearly toll of DX activity in W/K/VE/VO latitudes. W9YMZ, for example, finds his 20-phone fishin' seriously disturbed by that pernicious curse of suburbia, the mating call of the crab grass. Fish are bitin', DX ain't, according to K6CJF. But Kermit, Bill and the rest of a sturdy core of "How's" informants keep our Bandwagon rolling nevertheless. The DX emphasis, as usual at this time of year, is on

20 c.w. where K1HTV, W2JBL, K2s JUA UYG, WA2s BQK CCC EGK (118/82 countries worked/confirmed), HZF KMY (115/96), KSD (73/49), KWB OCA, K3s KHK (91/71), MNJ, WHUO, K4TEA (180/165), K5s ALU (61/37), MHG PSO, W6s JQB RCV, K6s CJF (130/-119), ROU (123/91), TZX, WA6IVM, W7s DJU LZF POU (81/63), K8s JCB (150/130), LNL PFY (75/34), TJW, W9CLH, K9s QMJ SRR TOK UCG UHH (136/107), UKM YDY, K0s BQI JPL OSV OSW, IIER, ZS2U, s.w.l.s R. Kemp and A. Rugg get their minds off the heat with the help of **AC5PN** (14,080 kc., 1300 GMT), **BV1US**, **CEs** 1DC 2JW, **CMs** 2WS 8SL, **CNs** 8BF 8JF 8MB 8RM 9CF (32), **COs** 2DJ 6AH **CPs** 1DA (33) 3CN, **CRs** 4AN (53) 4, 6CA, **CTs** 2BO (24), 3AV, **DMs** 2ACO 2AGH 2WIL 3BLM 3SJ 3RVL 3VVL, **DUs** 1OR 7SV (30) 7, **EAs** 6AF 23, 8CG (56), 8CP (2) 22, **0AB** (56) 16, **FA9VJ**, **FB8s** YY XX ZZ (27) 13, **FF4s** AF 19, AL (56) 16, **FG7s** XC XI (66), **FK8AW**, **FQ8s** AR 16, HW 17, **FY7YI** (50), **GD3FBS** 22, **HAs** 1KSA 1KSH 3KMF (95) 3, 5BT 5FO 5KDP 5NC 6KVB 7PZ 4, 8KCU (77) 4, **HB4s** FD TZ, **HC2s** CS IU, **HH2s** JV OT, **HKs** 1HV 1QQ 3AH, **HL1s** AT 6, KQ, **HPIs** IE (35), SB TE, **HR2FG** (30) 2, **IS1s** FIC 18, DKL (45) 2, ZUI, **IT1TAI** (55) 22, JAs in all call areas but the 4th, **JT1AC** (65), **JZ0s** PH (65) 11, PO, **KAs** 2JL 2YA (34) 13, 7DX (75), 7TB, **KC4USN**, **KGs** ICX 1FD (80), 4AP 6AIG, **KM6s** BI (48) 4, CB 5, CC (30), **KR6s** JM 7, LD 3, **KV4s** AA (80) 22-23, AQ (23), **KW6s** DF DG (20), **KX6BU**, **LAs** 1LG/p (20), 2NG/p (2), LJ3G, assorted **LUs** 1NE (51) 23, 1ZO (48) 4-5, 2NE 2ZO 23, 2ZR (5), 3YB 3ZO, **LZs** a-plenty, **OA4BR** 5, **OD5LX** 4-17, **OE9EJ** (70), **OX3s** BI, 21, NK (50), **OYs** IR 1X 2, 7ML 8RJ, **PJs** 2AW (38), 3AE 3AJ, one PX1PA, **PY4ZG** 3, **PZIs** BF BH, MP4TAC 17, **SL3ZB**, **SVs** 1AO (76), 0WO 0WT 0WZ 2 of Crete, **TFs** 2WFS 22, 3MB (16), 5TP (61), **TI2s** CMF DN 5, PZ (92), TN8AG 22, **UAs** 1KED (97) 22 of F,J,L., 2AC (51) 2AW 2BD 9AA 9AU 9BA 9BZ 9DT 9EE 9EZ 9FN 9JV 9KAG 9KAI 9KCA 9KCE 9KEA 9KOA 9KOG 9KQA 9MK 9OU 9PB 9VN 0AG 0AU 0AW 0AZ 0BI 0BN 0EF 0EH 0EK 0EQ 0EV 0II 0IK 0IX 0JU 0KAE 0KAR 0KDA 0KID 0KJD 0KKB 0KSA 0KYA 0OK 0OM 0RD 0RK 0SL 0TN, **UB5s** CD DI JR KAB KAK KBG KDS MF MT MZ NM UG, **UC2s** AR AX BG BW KAA KAG KAO KSB LE, **UF6s** KAF KPA, **UH8DA** (65), **UI8s** AE AG 21-1, **UL7s** CD CH HA HV LE 0-1, **UM8s** FZ KAB (12), **UO5s** AA KAA KAB, UPOL-8, **UP2s** AD AX KBA. KAF NM, **UQ2s** BA CO DF, **UR2s** BU 7, CO KAH KAN KAT, UT5CC 4-5, UW3ME 4, **VEs** 8DX 8TU 0MC, **VKs** 9GP 9PZ 11, **0TC** (15) of Wilkes, **0VK** 6, VO2AH (68) 0, **VPs** 5BK 5GK 5BL (58), **5CD** 5BH/mm, 6AM 6PX, **7NE** 7NQ 23, 9AK 9BO 9CX 9DL 9EP 9EU 9EX 9L, **VQs** 2AC (40) 22, 4KRL 5GJ 8BW (53), **VRs** 1B 2DK (13) 11, 3L 6TC (167) 5, **VSs** 1AP 17-18, 1FW 17-18, 1GZ (40) 13, 1JT 1JW 6DV 6EP 9AAC 21, 9ARW 9MB, **VU2BK**, W8OLJ/-PK (65), **XE2KF0**, **XZ2TH**, **YNs** 1AA 4AB (58), YOs and YVs in quantity, **ZA2BVR** (48) 21, **ZB2s** A AD (25), **ZC4AK**, **ZD7s** SA (40) 2, SE, **ZEs** 5JI 8JJ (50) 22, 8JV, **ZK1AK**, **ZPs** 5LS 23-2, 8AR 4, 9AY, **4X4NJ** (12), **5As** 2CW 23, 3CAD, **5N2s** DCP 6, GUP IJS (81), LKZ WM (50), **5U7s** AC (25) 22, AH 7, **6W8CW** (75) 22, **9G1s** BQ 16, CW 22, **9U5s** DS (40) 21, SA 8 and TT. Nighttime skip is unpredictable and some short skip bugs the boys now and then, day shift.

20 *phone* still is single-sideband DX headquarters according to the gist of reports from K1HTV, W4s IUO LJV, K5PSO, K6PJT, WA6IVM, K8JCB, W9YMZ (101, 93 on sideband), K9s QMJ YDY, K0JPL and R. Kemp. They specify the workability of **CP5EA*** (297) 15, **CRs** 7CR* 11, 7GF 9AH* (275) 14, **CTs** 1HE 1IP* 20, 2AH* (314), **DU7SV*** (305) 17, **EI4J*** (296), **EL2U**, **EP2AG*** (282), **HH2JT*** 20, **HI8GA*** (346), **HR3HH** (340) 5, **HV1CN*** 19, **HZ1AB*** (345) 22-23, **KB6BC*** 7-8, **KCs** 4USH* (275) 5, 4USV* 2, 6FSE* 12, **KGs** 1AA* 1BO* (314), 4AA 6AAY* (294) 13, 6AKS (320), 6FAE (295) 6-8, **KM6BI*** (276) 3, **KR6s** KV* 17, MB* 12, MT* (282) 17, **KW6DB*** (308) 6, **KX6s** BQ* (320), DF* (263) 5, LU2ZR* (290) 4, **MP4BCC*** 20-21, **OA4J***, **OD5s** CC* 19-20, CW* (325), **PJ3AJ**, **PZ1s** AP* 4, AX*, **SVs** 1AG* (308), 1AR* 0WN 23, **TG9s** BM (153) 5, AD*, TI2s CMF J, **VK9s** BM* 12, NT* (305) 9-13, TC* (298), **VPs** 2AB* 23, 9AK 9BN 9EI 9MM, **VRs** 1G 2AP* (327) 6, 2BJ* (316), 4CB 12, 5AC* (266) 6-7, VS6AE* (280) 14, W7HMP/**KB6*** (280) 10, **XEs** 1AAW 1YF* (318), 2IL 2NF, **ZD1ES*** 23, ZE1JT* (310), **3V8CA*** (343) 22-23, **6W8AU*** (300), **9K2AM*** 21, **9M2DB*** 16-17 and **9Q5US*** 23 . . . . . Asterisks in the foregoing indicate s.s.b.ers. We call your attention to the editorial on page 9 of this issue.

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VK4EL has scored nearly 21,000 QSOs with 212 countries since 1932. Eric runs 75 watts c.w., 60 phone, to an end-fire array or triband ground-plane, receiving with a double-con super. VK4EL's equipment, including this classy console, is thoroughly homebuilt.

15 phone's summer potentialities will be investigated by K1HTV, WA2CLQ, W4LJV, K4TEA, W5EHY, K5s ALU MHG PSO VTA, K8s JCB LNL TJW, K9s QMJ VLQ, listeners R. Kemp and A. Rugg with the cooperation of **CE3s** FK (308) 0, RC (254) 0, **CN8s** EU IK, **CO**6HR, **CT1SX**, **EA8**CI., **EI6**AG, **EL**s 2V 8D, **GB2SM** (233) 15 of England, **HC**s 5IS (304) 0, 7KQ, **HH2s** RD V, **HI8GA**, **HK**s 2YO 7YB (210) 22, 8KT, **HP1SB**, **HR**s 1HP 2MT 88M, **HZ1AB*** (428–437) 15, **KB6BC*** (420) 23, **KG**s 1AA* (430) 17, 1FD* (435) 8, 4AN, **KR6KS*** (430) 23. **OA**s 1H 4HK 6AGI 8B, a dozen TI2s, **TG9BK**, UA1CK (197) 15, **VK**s 3GJ* (420) 3, 7RX, **VP**s 2DA 2GAQ 3MM 5AK (222) 22, 5BB 5OD (170) 19–0, 6HR 9WB, **VQ**s 2JD (205) 19, 2WZ 4HX, **VR2**s AS DF (230) 3, **VS9MB**, WA6KMT/KM6* (403) 0, **XE**s 1AAP 1DDE 2NF 2SJ (300) 22, YN3LBV, lots of YVs, **ZL**s 1CA 1R1 2AC 2AN 2AX 2BE 3WM, **ZP5JP** (246) 23, **4X4BL**, **9G1DU*** (433) 22, **9K2AY**, **9Q5**s EV ID and **9U5KU** — asterisks, as usual, for s.s.b.

15 c.w. appeals to K1HTV, WA2s BQK CLQ CEK KSD KWB OCA, K3KHK, K4TEA, W5EHY, K5s ALU MHG PSO VTA, W6ROV, K6s CJF ROU TZN, WA6IVM, W7POU, K8s JCB LNL TJW, K9s QMJ UKM, K0s AXU OSV OSW, 1IER, ZS2U, R. Kemp, A. Rugg and such DX desiderata as **CE**s 1AD 3RC (21) 23, 3RY (39) 1, 1CO 1EC, **CN8CJ**, **CR5AR** (58) 2–10, **DM2AIO**, **EA6AM**, **EP2AF**, **FF4AL**, **FQ8**s AR HD (58) 18, HK 16, HP (35) 19, **FR7ZD** 13, **HC**s 1LE 2IU 3BB, **HK**s 1QQ (45), 3TH 7YB 7YC (95) 21, 7ZT, IT1AGA, JAs 1ACB 1BWA 1DGW 1VX 3AF 6ZU 7AD 7KY 8ZZ, **JZ0PO**, KA2JL, **KG1FD** (54) 19, **KM6**s BI (50) 1–0, CB, **KR6**s JM LY U8N, **KV4AQ**, **KW6**s DF DG, LA2NG/p 17, **LU3ZO**, **MP4BBE** 8, **OA**s 4HK 4JH 6AGI, **OX3NK**, **PY7LJ** (63) 19 of Fernando de Noronha, **SL5ZL**, **SP**s 8KAR 9DN 9LS, **TI2**s LA WA, TN8AU (48) 19, **UA**s 9KCE 9GF 0KIA (45) 2, **VP**s 2AD 16, 7BP (55) 22, 9EX, **VQ**s 2MS (74) 18, 2WM (60) 18, 3HD 3HZ 5IG (55) 19, **VR3L**, **VS**s 1HU (22) 15, 9AAC 8, 9MB, **WP4**s AWA AYP, **XE**1s PCM PJ, YN1TAT, **YV**s 1EM 5ACP 5AWM (7) 22, **ZB1HC**, **ZP**s 5CF 9AY, **4X4NJ**, **5A**s 3CZ 5TA, **6W8CW**, **7G1A**, **9G1BQ** 15, **9Q5US** and **9U5VL** 7.

15 Novice ranks are thinning as the ionosphere does likewise, but WV2s MEC PMD (15/16), QMC, KN5BJW, WV6ORS and KN8UKH broke loose for EA2DM, G3IDZ, **GI5DX**, HA8CF, **HB9X1**, **HP1AC**, **HK7YB**, 1IMQ, **KH6**s DKA UL, **KP4**s AJH AXN, LA6EF, **OE**s 3WB 8SH, **OH**s 5RA 8OR, **OK1KCI**, **ON4**s CE CK FD, **PY**s 2CCR 1, 5FO, **SL5AB**, **SM7BPO**, **SP9RF**, **WH6ECZ**, **WL7DPA**, **WP4AYP**, XE1VB, **YV5AIR**, **ZL**s ICA and 2GH . . . . . WA6CYT, tuning the 21-Mc. Novice range in England, logged some long-haul types this spring: KN5s FSN DNE DSN DXR, WV6s KVO LTM NQF NTP NYZ OPM OYT QHU, KN7LOY, KN0s BQI CNC CNO ERB FQY GHF and ZRX.

10 phone gives further ground in m.u.f. statistics. K1HTV, W2QCI, W4LJV, K4TEA, K5s PSO VTA, K6CJF, WA6IVM, K8JCB, R. Kemp and A. Rugg persist to produce word on **CX**s 1CN 2CX (430) 23, 3AM, **HC5CA** (400), **HK1OI**, **HP**1s CN SB, **KV4BT**, scads of LUs and OAs, **PJ2MC**, **PY8MA** 17, **TG9**s BJ BM, **TI2**s CMF J, **VK**s 2ADE 2FU 3QV 0, 4EP, **VP**s 5BB (464) 23, 6AM, VQ4HX, VR3L, XE1WF, YN1TAT (512) 20, YVs 1FH (650) 18, 5BAO (640) 20, **ZE2JA**, **ZL**s 1ABO 1, 1AMO 1AUM 2, 1CA (465) 19, 1LV 1RI 0, 2AQT 2MU 2RC 2UD (315) 19, 3QK and *a helping of ZS colleagues.*

10 c.w.? Still with us, by gosh, thanks mainly to K1HTV, WA2EGK, K4TEA and 1IER, stubbornly assisted by **EA7s** CL CP, **KV4AQ**, **KW6DG**, **OA1BR**, **OE5JE**, **PY**s 1ADA 7LJ, **TI2LA**, YN1AA and **ZS6PTA**.

40 c.w. now boasts a strong segment of year-'round adherents world wide, so if you're game for some static there's usually plenty of DX to work, summer or winter. K1s HTV KSH, WA2s BQK KSD KWB, K3KHK, K4TEA, K5s ALU CDA/mm PSO, W6s JQB RCV, K6s CJF PJT, WA6IVM, W7DJU, K9s SRR YDY, K0s JPL UTX and tuner Rugg snapped up **CN8MB**, **CO2s** CT PY WL, **CP1DA**, **DM3RD**, EAs galore, **EI8AC**, **Fs** 2MA 8HV, **GC2MCH**, HAs 3KGC 5KBP 5KFR, a slew of IIBs, **IICs** 1JU 1LE (38), 2AC, **HKs** 1FF 2YO 3TH 7ZT, **HP1SB**, **JAs** 1BEB 1CJU 1CMG 1DID 1EPX 1EZM 1FDU 1FHX 1GIV 1YL 2BDY 2BKP 2UJ 3AG 3AQN 3ARX/1 3BQH 3CKJ 4APS 4BAW 5OU 6ACZ 6AK 6CY 6PN 7AKC 7GD 7NK/1 7SW 7WE 8AHL 8AJS 8AMK 8FC 8LN 9KA 9RC 9MV, **KM6CB** (23) 11, **KV4BV**, **KW6DG**, **KZ5s** MQ TJ, **LU2ZR** (5), LX1CR, **LZ1s** KSK KSV VK, **OEs** 1FT 3LI 6RZ, OKs by the dozen, **OH7NF**, **PJ2ME**, a flock of PA0s and PYs, **PZ1AY**, SL6DC/mm, SMs in number, **SPs** 3KEI 5GX 6FZ 9LS, **TI2CMF**, **UA0s** FS KID KKD LJ (5) 10, LU, **UB5s** KCF ZE, **UC2s** KAC KSB, **UJ8AC**, **UO5KAA**, **UP2KNP**, **UQ2AN**, **UR2AL**, VKs in most call areas, **VPs** 4TK 6AL 9CX 9DL 9EP 9EU 9L, **VR2DK** (2) 9, XE1s MK XK (38), **YOs** 2KAB 3LAI 8GL, a batch of YUs, **YVs** 1BV 2BJ 5AEB 5ALI 5APX, one ZC3TX, many ZLs, **ZSs** IJA 6KT and **6W8BF** . . . . . There's quite a technical challenge on 7 Mc. for the beam gang: how to get some gain and directivity on 40 meters with antenna dimensional requirements double that of 14 Mc. So far the simple vertical still seems to be king.

40 phone doesn't scare off K1HTV, K6PJT, K8JCB and K0JPL, and they have **HI7CJY**, **HK2WD**, **HZ1AB*** (296) 1–2, **JAs** 1AEA* (93) 9, 1DRQ* (91) 9, 2BAY* (94) 9–10, 5HT* (91) 9–10, **KG1FR** (296) 3–4, **KP4AXU**, **PY8SB**, **PZ1AY***, **VP6AL** and **YV5APX** checked off their stalk lists. (*) = s.s.b.

80 c.w. is next stop for this month's "How's" Bandwagon. Here we find K1HTV, K3KHK, K4TEA, K6PJT, W7DJU, KV4CI and monitor Rugg defying the atmospherics for **DJ3VC**, DL3ML, DMs 2AVN 3BM 3DG 3LA 3ML, **EL4A**, Gs 2DC 3ERN 6ZO 8JR, HA5KBP, **HB9EU**, **JA9DJ/8** (2) 10, **KH6DVD**, **KL7AUG**, **KV4AQ**, **LA6U**, **LZ1KPW**, a dozen OKs, **ON4***HC*, ***PA0LOU***, ***PY7LJ***, **SP9ADN**, **UB5WF**, **UC2KSA**, **UP2KBA**, **VK**s 3ADB 78M 7WA 7ZZ, **YO2BE**, **YUs** 1BKL 3CDE 4AAH and a few rugged ZLs.

160 c.w.'s lone late development has K1s HTV and KSH scoring with **VP9EU**. W1BB's 1960–'61 Bulletin No. 5 contains interesting reflections on the season just past. Therein we note that G3PU claims all continents worked on 160 ahead of W8GDQ; a recent QSO with **UO5AA** gives him 38 top-band countries. We also see that

ZC4AK closes down for G3MBS or GM3MBS after working 165 stations in 14 countries, 5 United States and four continents on 1.8 Mc. Front-running Midwesterner appears to be W9PNE with 33 160-meter countries in the log. And now it's time to turn our attention to documentary considerations in the column segment we call

Where:

Asia — HS2M discovers, "The problem of getting out QSLs is a major one. APO mail goes and comes twice weekly. Regular mail is more regular but its cost is high. I have designated K4JEY as my QSL manager for the Stateside boys. Fellows needing QSLs from HSs 1B 1F 1R 1JK 1JN 1MQ 1SD 1UN 1VR 1WR 2A and 2MP will find me ready to assist. I do not have forwarding addresses for HS1s D and K at this time." . . . . . K8RFH advises, "My dad, HS1X (W1FAX), has nominated me his QSL manager. Please call attention to my new address [which follows]." . . . . . "After my departure EP2AF will become QSL manager here," notifies EP1AD. "I will continue to answer cards sent to my K1ORQ address." Hal was scheduled to leave Tehran early last month . . . . . KA2JM raises a point we periodically touch upon. "I've returned some cards received at the FEARL QSL Bureau of which I am manager. They are for amateurs who are not members of FEARL. We do not have funds for forwarding to those who do not support the FEARL Bureau. I might suggest that Statesiders ask KAs if they belong to FEARL before QSLing via this bureau." More than a few overseas societies operate their QSL bureaus on this same pay-as-you-use basis. To avoid a sadly deficient returns percentage, *QSL DX stations via QSL bureaus only when they instruct you to do so.* And if you patronize a so-called "outgoing QSL bureau" make sure that its proprietor takes proper account of this pitfall . . . . . W5DKK remarks, "I have sufficient QSLs to forward to any who did not receive confirmation of QSO while I was KR6JR. I hope my policy of QSLing every new contact helped pave the way for good KR6-W/K/VE relations; I'll be happy to check the log for strays upon request."

Oceania — "I have received the logs of KC6PE of the Eastern Carolines for QSOs made from October 28, 1959, to August 4, 1960," declares W9SFR. "Self-addressed stamped envelopes are requested for U. S. A. contacts, international Reply Coupons for non-Stateside QSOs. Otherwise reply will go via bureau." . . . . . KA2JM learns that LA6CF/mm, operating aboard good ship *Bonneville* in the Pacific, expects a 5000-QSL backlog by the time he puts in at home port. Must have a good location! K9UCG says that shipping your LA6CF/mm QSL to W7ZAS with s.a.s.e. will help things along . . . . . FEARL *News* mentions that Rabaul Amateur Radio Club, P.O. Box 170, Rabaul, T.N.G., serves as the Australian New Guinea QSL bureau address . . . . . KW6IDC cheers, "Tell the gang not to worry about losing KW6DG-bound cards through incomplete addressing. Even 'KW6DG, Wake Island,' cards have been arriving OK." But it pays to acquire the habit of addressing your mail as clearly as possible nonetheless.

Europe — DL4QV (K5HZC) and other newly-ticketed DLs find an old bugaboo plaguing them — too-rapid reissuance of call suffixes. "Many operators use the listed *Call Book* address for a DL1, blissfully unaware that the person listed no longer holds the license. Such QSLs are kicked around until they finally reach the wrong fellow." And the chap checks the dates on the cards, finds they don't jibe with his log, and probably takes no further action . . . . . "W8APN is my QSL manager for non-European contacts," verifies DL5HN (K8OOK). "Europeans can QSL via the DL1-DL5 bureau [mentioned here last month]. The usual s.a.s.e. consideration and GMT usage apply." . . . . . K2LTI advises, "I will be acting as QSL manager for all future U.S.A. contacts of GW2DUR. S.a.s.e., of course." . . . . . "Send all cards for the EI0AB DXpedition to EI6X," instructs the latter. "Answers will go via bureau unless return postage is arranged." . . . . . OY7ML wonders, "Why do W/Ks so often write 'Faeroes Islands'? Faeroe Islands is correct." Okay, Martin; perhaps the misimpression stems from such sources as *Webster's* which lists your QTH as simply "Faeroes". We stand corrected . . . . . Regarding April's GD6UW outburst, G3NHL assures, "QSLs will be made out for all QSOs, then forwarded on receipt of incoming cards." . . . . . "I'm still QSL manager for CT2AK," affirms K8IXZ of 1936th AACS Sqdn., Box 95, Lajes Field, Azores, "but I'll be heading for France or England in September. Then I may have to turn over the task to someone else." . . . . . "UA3FE/0 QSLs have been printed and will shipped out soon," UC2AA assures the West Gulf DX Club . . . . . OY7ML wants to hear from the HP1LO he worked in December, 1958.

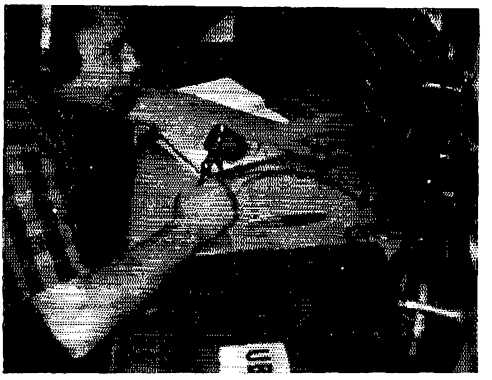
South America — The calls K9DVF, HK3LX and HK3TH all have been mentioned as sources for HKØTU Malpelo Island QSLs. WGDXC has it that s.a.s.e. and three IRCs to HK3LX will do the trick . . . . . "The calls KC4AAB and LU2ZR are being used at present by W9ADM who will be at Ellsworth station, Antarctica, for the next year," writes W9LGR, W9ADM's XYL. W9DHQ is the designated QSL agent.

Hereabouts — Nominations are arriving for "QSLers of the Month" listing in response to April's suggestion. BV1USB, FB8BC (for FB8ZZ), FQ8HP, VS6AE, W7VEU (for the East Pakistan work of AP2CR), ZS7R and 5U7AC are specifically commended by C. Stewart, K2UYG, W3LMA, W6MDK and K9UHH. S.w.l. A. Rugg seconds the motion on several of the same. AP2CR, incidentally, made it an even 300 for W3LMA . . . . . Check with your local U.S.P.O. branch regarding new postal rates and regulations effective this month. There are revisions of special moment to DXers . . . . . W3AYD will act as QSL manager for Jamaica's VP5BL, QSOs dated April 30, 1961, and thereafter. S.a.s.e. or IRC required . . . . . W4LVV disclaims connection with VP7NE and KC-type QSL matters . . . . . KØGVB/mm, aboard an arctic icebreaker, promises thorough QSLing in response to all cards received. Use only GMT reference, of course . . . . . K4ASU's spring Caribbean activity as K4ASU/PJ and K4ASU/VP occurred aboard flagship USS *Pocono* with special authorization. During QSOs Bud tried to make it clear that he was a shipboard deal but some DXCC aspirants doubtless will collide with Rule 8. K4ASU performed with the amphibious forces as Admiral Taylor's chief radioman . . . . . K2LTI of Lafayette Radio announces, "We are in process of printing a batch of QSLs expressly for use by DX stations. Realizing the prohibitive cost of postage at DX points . . . we feel that as a distributor and manufacturer this is one way in which we can aid the hobbyists we cater to. By the way, if any of the DX gang desire a QSL manager in the States they can drop me a line." . . . . . "When I worked 9U5VS as a Novice I had never heard of such a call," writes Texan Chuck Stewart, omitting his own. "Until I spotted his QTH in your column I thought some local was trying to kid me. Thanks to *QST* I was able to get a QSL from a very rare country." Glad to be of service, podner . . . . . "As of May 1, 1961, I am the W/Ks-only QSL manager for KZ5-MQ," says K5VTA. "The customary s.a.s.e. and GMT by all means; otherwise replies will go via bureau at infrequent intervals." . . . . . VERON and WGDXC suggest the KP1 bureau address for your May VP5CD DXpeditionary QSLs . . . . . W3EAI desires QSL/QTH info regarding the ZD8SC he worked in 1958. Stan still at VS9AZ? . . . . . W1QVJ promises 100-per-cent no-fee QSLing for the Caymans DXcursion briefly described in "Whence" . . . . . From K4JQV/VP9: "QSL replies for my operation will go by surface mail unless return airmail envelope is enclosed." In addition to the recommendation in the list to follow, K4JQV/VP9 answers to Lorae Support Team No. 3, FPO, New York, N. Y. . . . . A logful of thanks to W1s UED WPO YYM, W2JBL, K2UYG, WA2s CCC EGK KSD, W3ICQ, K3KHK, W4HUO, K4TEA, W5EHY, K5s ALU VTA, W6RCV, K6TZX, W7s LZF UVR, K8ICB, W9s CLH LGR QGR, K9s GZK UCG UHH UKM VLQ, VE3CJ, HS2M, OY7ML, ZS2U, listener A. Rugg, Far East Auxiliary Radio League, Japan DX Radio Club, MARTS (Malaya), Newark News Radio Club, Northern California DX Club, VERON (Holland) and West Gulf DX Club for these individual postal possibilities:

AC3NC (via VU2JP)
CN8JF (via K4BUP)
CN8MB (via K4VUR)
DL4DG, A. Vesce (W1SRB), 3189 Sig. Co. (Sp.), APO 57, New York, N.Y.
DL4s QA QC QF QO QS, 592nd Sig. Co. (Sp.), APO 742, New York, N.Y.

UA1KAE's spooky-sounding signal has kept Russia's Antarctic outpost on ham bands for years with over 8000 DX QSLs to show for it. Operators George (left) and Oleg (center) man the Pt. Mirny kilowatt mostly during the austral winter months. Scientist-exchange visitor WØODE (right) hopes to help issue Mirny QSOs with his own push-pull 6L6s and 51-J as WØODE/KC4 until next March.

DL4QV, T. Yarnes (K5HZC), 592nd Sig. Co. (Sp.), APO 742, New York, N.Y.
DL5HI, P. Grillo (K9PDH), 180th USASA Co., APO 108, New York, N.Y.
DL5HN (via W8APN; see preceding text)
EA0AB (via EI6X)
EL4YL (via EL4A)
EP1AA, Dr. M. Masud, P.O. Box 951, Tehran, Iran
ex-EP1AD (to K4ORQ)
EP2AR, I. Koutchesfahany, Av. Soraya 64, Tehran, Iran
EP2BB, W. Jochimsen, U.S. Consulate, APO 205, New York, N.Y.
EP2BC, SFC G. Stracke, U.S. Army Hospital, APO 205, New York, N.Y.
EP2BD, I. Dunbar, 51265 ICEPC, Kharg Island, via Abadan, So. Iran
EP2BE, A. Alseus, Diawild Trading Co., Saraye Omid, Tehran, Iran
ex-EQ2AT-EP5X (to W2AYN)
FB8ZZ (via FB8BC)
FG7XC (via W3GJY)
GW2DUR (W/Ks via K2LTI)
HC1LE (via W2MUM)
HC2CS (via WICV)
HC8SC, J. Guerrero, San Cristobal, Galapagos, Ecuador
HK0AI (via W9WHM)
HK0TU (see preceding text)
HR3HH (via KØZIE)
ex-HS1C, 605 La Marre Dr., Fairfax, Va.
HS1F, U.S. Embassy, Bangkok, Thailand
HS1X, c/o C. Anderson, K8RFH, 5089 Embassy Pl., Dayton, O.
HS2M, c/o J. Wood, K4JEY, Box 5042, High Point, N. Car.
JZ0PH, J. Hesp, Hortensiaweg 1953, Biak, Netherlands, New Guinea
K3HVN/PK (to K3HVN)
K4ASU/PJ/VP/mm (to K4ASU)
K4JQV/VP9 (to K4JQV)
KØGVB/mm, G. Ernst, USS *Burton Island*, (AGB-1) FPO, San Francisco, Calif.
KA2DD, J. Polsgrove, Det. 1, 6988th RSM, Box 46, APO 328, San Francisco, Calif.
KC4AAB (via W9DHQ)
KC6PE (via W9SFR; see preceding text)
ex-KR6JR, J. Hunt, W5DKK, 1927th AACS Sqdn., Barksdale AFB, La.
KZ5MQ (W/Ks via K5VTA)
LA6CF/mm (via W7ZAS)
LU2ZR (via W9DHQ)
LU3ZO (via RCA)
LU8XQ, R. Ballou, Estacion, Aeronaval, Ushuaia, Tierra del Fuego, Argentina
MP4TAN, D. Higgins, R. Sigs., Trucial Oman Scouts, BFPO 64, Trucial Oman
OA4HK (via K1EKO)
OA4M (via RCP)
ex-OQ5PS, E. Protois, Stanleyville B.P. 1071, Republic of Congo
PY2BYR, F. Dal Medico, P.O. Box 225, Bauru, S.P., Brazil
PY8RK, E.T. Dos Reis, R. Clodoaldo Freitas 1312, Teresina, PI, Brazil
SP3DG (via K1MEM)
SV0s WO WT, c/o ISWL, 12 Gladwell Rd., London N.8, England
TF2WFS, A. Smith (K9QBT), APO 81, New York, N.Y.
TG9BJ, c/o U.S. Embassy, Guatemala City, Guatemala
TI2PT, Apto. 1209, San Jose, Costa Rica
TN8AG, Box 108, Brazzaville, Congo Republic
VK5ZC, 19 Marshall Terrace, Brooklyne Pk., Adelaide, S.A., Australia
VK9GK (via W2CTN)
VP5BL (via W3AYD; see text preceding)
VQ2EW (via W2CTN)
VQ2WM (via W2CTN)
VQ5GJ, Box 355, Kampala, Uganda
VR1G (via W6BSY)
VR4CB, P.O. Box 53, Honiara, Guadalcanal, Solomon Islands
VS1KU, Alexander School A.R.C., Gilman Barracks, Singapore
VS1KW, R. Hargreaves, 22 Chiltern Dr., Braddell Hts., Singapore 13
VS1KY, D. Mitchell, RAF Stn., Changi, Singapore
XE1FFB, J. Orozco, P.O. Box 31158, Mexico City 19, D.F., Mexico
XZ2BB, Saw Oo, Box 449, Rangoon, Burma
YS1MR, P.O. Box 1026, San Salvador, El Salvador
YV5AOS (via RCV)
YV5AWM (via RCV)
ZA2BVR (via ZA2BAK)
ZD1ES (via VE3BQP)
ZD3P (via RSGB; W/Ks via W7VEU)
ZP9AY (via W2CTN)
ZS2MI (via ZS6ANE)
ZS6VT, A. Rees-Parker, Box 1188, Johannesburg, S. Afr.
ZS7P, P. Lamont, P.O. Box 3650, Johannesburg, S. Afr.
ZS7S, G. Stones, P.O. Box 98, Mbabane, Swaziland
5N2RJD, No. Region Development Corp., Kaduna, Nigeria



UB5WF's contacts with Ws 1ME 1BB and 2EQS in mid-January are believed to be the very first U. S.-Russia 160-meter QSOs on record. Vlad also pushed his 150-watter across to VE1ZZ in early March. UB5WF and the rest of the 1.8-Mc. clan eagerly await arrival of the 1961-'62 top-band season.

ex-6O2AB (to MP4TAN)
6W8CW (via W2VCZ)
9G1BQ (via W2CTN)
ex-9M2BV (to VE3BV)
9M2FM, K. Gnanasegran, Police Dept., Kuala Lumpur, Malaya
9M2FQ, J. Price, 21b Long Row, Majedee Barracks, Johore Bahru, Malaya
9U5BB, P.O. Box 1534, Usumbura, Ruanda-Urundi, R. of C.
9U5DS, P.O. Box 1186, Usumbura, Ruanda-Urundi, R. of C.

NOTE: No guarantee of accuracy or officiality goes with the preceding. Beats just twiddlin' your thumbs, though, while you wait for that sure thing.

Whence

Europe — OH0RJ, via W8ZCQ and W1WPO, gives us the Aland Islands hamming picture: OH0s NA, inactive; NB, one watt on 80 meters; NC, s.s.b. on 80 through 10; ND (NC's XYL), 80 and 40 phone; NE, QRT while at sea; NF, workable on 3517, 7034 and 21,105 kc., c.w.; NG and NH, busy building; NI, active on c.w. around 3520 and 7027 kc.; RJ, busy with commercial TV work on the Finland-Sweden Eurovision link; and AZ, a 144-Mc. fan. OH0RJ is constructing s.s.b. and mobile gear which should soon remove him from the QRT category . _ . _ . Now the Azores angle via on-the-scene K8IXZ: "CT2s AC AH AI and AJ are QRT. CT2BO holds forth on c.w., and CT2AK is tickled with the s.s.b. rig of CT2AH. I'm trying to get him on 40 and 80 phone where I hear the States rolling through loud and clear almost every night." . _ . _ . G3HZM says the G3NLT gang at Openshaw Technical College, Lancashire, are having a DX ball with their 120-foot-high skywire . _ . _ . Faeroe Islands fare via OY7ML and W3ICQ: OY7ML hopes to defeat poor transatlantic conditions with a new array. OY5S prefers to rag-chew with Scandinavians on a.m. but will lend an ear to W/Ks on occasion. OY8RJ busies himself on 14-Mc. c.w., as usual . _ . _ . _ Els 2AJ 2W 2X 4AI 5AB 6W 6X and some s.w.l.s. were behind the EI0AB effort at Kilronan, Aran Islands, in late May. A DX-100, HRO and TA-33 went along, plus an SB-10. This crew similarly disported EI0AA in the Blaskets last year for 666 contacts . _ . _ . UO5AA proudly tells K3CUI, "My 11-year-old daughter Lyuda expects to be on the air soon as UO5YL. Sh'll use my station." . _ . _ . W0ODE learns that antarctic UA1KAE operator Oleg returns to Leningrad at this time. Op George stays on till next March . _ . _ . The UA3FE loaner rig evidently made s.s.b. converts of UM8FZ and UJ8AG in May, according to listener J. Howard . _ . _ . "PACC contest results nil here," deplores W7DJU. "Heard only one PA0 and he was swamped by W/Ks." . _ . _ . "TF2WFS (K9QBT) looks for buddies with an Elmac 50-watter on 14,080 kc. around 2200 GMT," informs W9QGR . _ . _ . UA1DZ tells K2UYG that Franz Josef Land activity is limited to that of UA1KED . _ . _ . Notes on Yanks in Germany: DL4DG (W1SRB) frolics on 40 c.w. with a 40-watt 6F6-6V6-6146 homebrew lineup. DL5HI (K9PDH) quickly caught 33 countries on sideband, 67 on c.w., with an HT-37, 75A-4 and dipole. DL5HN (K8OOK) has a homebuilt 75-watter, NC-125 and long-wire cooking on 20 and 40 . _ . _ . NCDXC and VERON find that ZA2s BAK and BOR prefer the chase on Mondays and Tuesdays, 1500-1800 GMT, 20 or 40 c.w.

Oceania — ZK1AR commentary via W1YYM: "I had to work my regular shifts during the 1961 ARRL DX Contest

so, between short bursts of sleep, I would carry on with the W/K/WA gang. ZK1BS appeared to be on the go for short periods, also my neighbor, ZK1AK. After the first few hours of operating in the second week end of the c.w. section I set my sights for the 100,000-plus points mark, figuring that with 52 multipliers I would need 642 QSOs. With about three hours remaining I found 21 Mc. opening up nicely and was able to reach 695 before my recheck reduced this to 677 or so." ZK1AR managed about 105,600 points on c.w., 11,000 on phone, according to W1YYM . . . . FCC, through W1LVQ, points out that QSOs with PK-*prefixed* stations still are taboo for FCC-licensed amateurs (ITU Ban List) but that contacts with, say, K3HVN/PK, could pass. E.g., PK3HVN, no go; K3HVN/PK, okay. This is the way things stand at least until Indonesia dissociates itself from International Telecommunications Union amateur radio prohibition preference . . . . This year's VK/ZL Contest, sponsored by WIA and NZART, is slated for (c.w.) September 30th-October 1st, and (phone) October 7th-8th. Mark your operating calendars — details in proper time . . . . K6CJF reports DU7SV back at it with the usual popular 20-c.w. routine . . . . W9YMZ has VR6AC's availability pinpointed at 0500-0730 GMT, Mondays, Tuesdays and Wednesdays, near 14,245 kc. . . . . KW6DG (KØSLD) remakes his 40-meter skyhook for 80. "Hope to have the rig on 3500-3900 kc. soon (can't use 3900-4000 kc. here). Got a letter from K6QPG, formerly K6QPG/KW6, who thinks we may have the first Wake DXCC memberships (KW6s DF and DG). Mary is still stuck at 99 confirmed." . . . . K2UYG finds G3JFF (VS1HU) eager for VR1M and VR4 action this fall and winter while gadding about the Pacific on a survey mission . . . . Pacific notes via FEARL, NCDXC and WGDXC: VK2AQJ mentions WIA's claim as the world's oldest amateur radio society, founded 1910. . . . KS6CU and ZM6AB are said to swell the 14-Mc.-c.w. Samoa ham population. . . . One VK9DJ is reported on code and voice from Nauru.

Africa — EL4A expects his XYL to sign EL4YL upon return to Liberia after a summer visit Stateside and a handshake with W1UED of ARRL Hq. . . . . DL7AH, who has 238 countries bagged back home, is with United Nations personnel in the Congo attempting to teach radio under trying conditions. Harry is reachable c/o ICAO, ONUC, B.P. 7248, Leopoldville . . . . . NCDXC's *DXer* confirms that May's ZD3P sideband display was produced by wandering 5N2PJB . . . . . VQ8AP figures on a return to St. Brandon isle next month . . . . . WGDXC learns that VQ4AQ's potent 7-watt portable is all set for the trans-Africa vacation that may take him through ZD6 ZS8 ZS9 ZD7 and ZD8 territory.

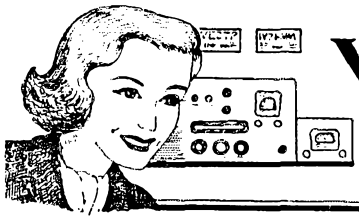
Asia — Thailand thoughts through HS2M: "Most hams here are active between 1300 and 2000 GMT but conditions to the States have been quite poor. I'll have a four-element beam going as soon as the weather permits me to raise it. Schoolwork limits my own activity with 75 watts around 14,050-kc c.w., 0800-1030 GMT. No 7-Mc. work yet — too many local BC stations grinding away there." Neighbor HS1X's activation is described by son K8RFH: "Dad operates from Bangkok on 14,280-14,320-kc. single-sideband where a 12-ft.-high Windom works out well. He plans to add a bidirectional two-element Twinlead beam and possibly a new linear final." HS1X is W1FAX; K8RFH formerly signed W1WTE . . . . . S.w.l. Mike Conradson, stationed in Japan with his father, tells us of doings at KA2YA. There WA2LHI, W5WJS, K5s PDP YGQ, W6GMA, WA6BKQ and others man Yokota Radio Club's HT-32, SX-101 and rhombic. Club treasurer K5YGQ also signs KA2RT with a DX-100, HQ-160 and dipole on 20 phone . . . . HM1AP scored a possible Korea first with WAC QSLs from LA3DB, KR6M1, PY1HX, ZS6ARI, ZL1AV and a K4. Cho's QRP and two crystals raised a quick 26 countries on 20 c.w. . . . . KR6JR, with a well-earned sideband DXCC membership, returns to Louisiana after a four-year Okinawa stay. Watch for John as W5DKK on 20 and 40 . . . . . K5CDA/mm's skeds with W9WNB are going well on the Calcutta run although 21 Mc. grows steadily less reliable. The arrival of *Penn Shipper* in Bombay triggered a recent hanfest with VU2s CR EA EZ MD and ex-VU2CD . . . . . ARRL Director VE3CJ (VP5BP) reports VE3BV back home from 9M2BV DX sport . . . . . JA8AE exuberantly tells K6DV of Japan's new c.w.-only 7000-7030-kc. DX range. W/Ks will have a much clearer shot into Asia now when the bounce is right. By the way, W6MDK has collected over 200 7-Mc. JAs this year . . . . . EP1AD reports EP5X-EQ2AT (W2AYN) heading for Korea . . . . . More Asian items via VERON and WGDXC: OD5CT, MP4QAO, HB9TL. Ws ITYQ and 8GCN are the committee behind 9K4A of the Kuwait Neutral Zone. . . . EP2AG seeks the Dakotas near 14,300-kc. s.s.b., 0300 and 1600 GMT, to complete his WAS. . . . HZ1AB, a famous DX institution whose history goes back more than a decade, is said to be nearing shutdown.

South America — . . . . . Cuenca Radio Club, P.O. Box 1366, Cuenca, Ecuador, offers a certification to W/K/-VE/VOs based on confirmed QSOs with four Cuenca HC5s and one Loja HC3 station. Amateurs outside our hemisphere can qualify with only two such HC5s, or one Cuenca HC5 and one Loja HC3 . . . . . K5VTA comes up with worked Belo Horizonte LABRE award No. 133. . . . . .

Hereabouts — We welcome YS1O to the "DXCC^2" club, No. 41 in the series and the second Central America filing since TI2HP's No. 10. See page 69, July '59 *QST*, for details on "DXCC^2" . . . . . W6BYB ran off with NCDXC's riotous intraclub 40/80-meter contest this spring. John rolled up 692 QSOs with 61 countries on 7 Mc., 110 contacts with 20 countries on 3.5 Mc. K6CQM, W6s LDD UOV and FYM were bunched in that order far down the stretch. W6BYB does it with a GSB-101 and Hy-Gain tower vertical . . . . . "It is anticipated that during the first week in July there will be a DXpedition operating from Grand Cayman Islands, W4s AZK QVJ and K4YCW participating. Watch 7010, 14,010 and 21,010 kc. for c.w., 7210, 14,310 and 21,110 kc. for single-sideband (occasional listening periods on 14,110 and 14,210 kc. for a.m. stations)." This from W4QVJ . . . . . W7DJU is bewitched by occasional "one-way-skip" sessions on 40 and 20 meters when the bands are jammed with loud DX that fails to hear his normally effective signal. Beaming in offbeat directions sometimes gets results under these conditions . . . . . W1-QLT reports lack of Mexican hamming authorization for this summer's Alcan reefs research project. Towne will be active as W1QLT/mm when aboard ship, though, and this link will be depended upon in emergencies . . . . . British Columbia DX Club hosts the Pacific Northwest DX Convention on the 19th-20th of next month at Vancouver's Grosvenor Motor Hotel. A punch-packed program is in the making — check with VE7KJ for details concerning your reservation . . . . . "Bermuda no longer issues regular VP9 calls to visitors," enlightens K4JQV, "so K4JQV/VP9 will be on the air here until November with 90 watts c.w., 35 on phone. On examination of current license status and payment of three pounds you may be issued a permit to operate with your own call slant-VP9." . . . . . Ex-W2AIS-ZC8PM expects to be signing KV4CI/mm once again soon . . . . . K0GVB/mm has an HT-32, SX-101A, Drake 2-A, GSB-101 and some verticals aboard icebreaker USS *Burton Island* in the far north. "I'll be using 20 mostly, with some a.m. work on 40 and 75 meters. After this year's Arctic cruise we may try the Antarctic tour in 1962." . . . . . FEARL recommends a check with Anchorage Radio Club, P.O. Box 211, Anchorage, for the specs on their Alaskan DX Certificate, a decorative diploma based on contact with the proper assortment of KL7s since 1954 . . . . . W6GPB supplants W6BYB as administrator of NCDXC's popular California Award.

Ten Years Ago in "How's DX?" — "Tetrode Bill" O Hassenpfeffer runs into a stone DX wall and reluctantly turns his attention to more gentlemanly traffic work in the 80-meter nets . . . . One-sixty has gone fishin' for the summer but 80 still produces stuff like HZ1KE, KJ6AN, TA3GVU and ZM6AK . . . . . Forty's most noteworthy nominations are FKS8AZ, FM7WF and ZD4AB . . . . . The seasonal accent is on 20 c.w. where Cs 3FA 3KJ 4AK 8OA 9AA 9DZ ET3A, F8EX/AR, FK8AD, FL8AE, HE9LAA, KH6KL/KP6, KJ6AP, KS4AP, MB9BJ, MD2JB, MI3-AB, OQ5VN, SU1s AD GM, TA3FAS, VK1NL, VSs 2MIM 7NX, VT1AF, ZC6DO and 9S4AR run gaily rampant . . . . . Twenty phone offers AC3PT, FE8AA, FL8AD, HC8GI, VT1s AB AC, W2AQE/KM6 and 9S4AX . . . . . The best on ten voice are FG7XA, MD2AM, OQ5s CC NK and 3V8BA . . . . . IARU begins endorsing WAC diplomas for all 3.5-Mc. work, and we see that Northern California DX Club has *six* 200-country men on its membership roll . . . . . Andorra and Monaco are prime targets for European summer DXcursionists . . . . . Jeeves tightens a guywire the hard way, while pictures of H1s AXD BXD and TA3-GVU's ARRL Hq. DXCC presentation complete the column for July, 1951. QST

JA1CO and XYL JA1YL recently put their cozy Tokyo hamshack at the disposal of guests Mr. and Mrs. WØVSZ and friends. From left to right we meet JA1CO, YL JA1DGL, JA1BNW, WØVSZ's XYL, and JA1YL. Gear at left is "his;" that at right, "hers."



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

RESULTS: TWELFTH ANNUAL YL-OM CONTEST

The top YL c.w. and phone winners in the annual YL-OM contest, conducted Feb. 25-26 and March 11-12, 1961, hail from our two newest states. Top YL c.w. scorer was Geraldine Nichols, KL7ALZ, of Spenard, Alaska, and top YL phone scorer was Sheila Goodhue, KH6DLD, of Oahu, Hawaii.

Approximately 350 logs were received in this year's contest. YLRL vice president and chief log-checker Onie Woodward, W1ZEN, admonishes that once a contest number has been given, this number must not be changed. If a number is inadvertently skipped or given twice, the log must show these errors. The total contacts would, of course, show the correct number worked.

Cups have been awarded to the YL and OM first-place c.w. and first-place phone winners. Certificates have been awarded to high place c.w. and phone winners in each district and country.

Here are the winners. Congratulations to all!

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

YL C.W.	*Contacts*	*Sections*	*Score*
KL7ALZ, Geraldine Nichols	424	66	27,984
K5LIU/5, Mildred Wright	414	54	27,945*
KØIKL, Joyce Polley	402	55	27,638*
YL PHONE			
KH6DLD, Sheila Goodhue	553	75	51,844*
W5DRI, Dena Morgan	544	62	42,170*
KØEPE, Martha Wessel	621	67	41,607

OM C.W.	*Contacts*	*Sections*	*Score*
W5WZQ, David Blaschke	74	36	3,330*
K2EIU/2, Kenneth Keeler	65	30	2,438*
W4VNE, C. A. McCullough	59	30	2,213*
OM PHONE			
W8AJW, Jack Siringer	105	40	5,250*
W4SVJ, Richard Brandt	88	43	4,730*
K4JIG, W. H. Egbert, Jr.	74	37	3,423

YL C.W.

W1RLQ	19,451
K1IJV	7085
K1LCI	4991
W1YPH	3000
K2ZQG	16,296
W2EBW	9594
WA2LOZ	6006
W2RUF	4992
K2ACJ	2929
K2JYZ	2219
W2EWO	105
K2JBX	90
W3TSC	16,233
K3EHZ	15,010
W3SLS	13,073
K3JCV	7308
W3CDQ	1008
K4JYQ	18,605
K5ZNK	13,500
K4TFL	8415
W4UF	7700
W4UTO	375
K4RHU	163
K4LMB	149
KN4BWQ	53
K5LIU/5	27,945
K6OWQ	18,495
K6ENL	12,220
K6QPG	4185
W6PCA	2480
WA6AOE	613
K7HSB	17,700
W7PUV	5130
K7ADI	810
K8MKG	14,513
K8LPI	13,205
W8KLZ	6521
W9MLE	13,169
K9TUD	8788
W9USR	4030
W9MYC	1175
KØIKL	27,638
WØKJZ	16,394
K9GIC	11,615
WØOPX	60
KL7ALZ	27,984
VE3AJR	4830
VE3DDA	380
VE5DZ	2079
JA1YL	65
VK3KS	1283
YU1BKL	653

OM C.W.

W1GKJ	1110
W1NEP	919
W1AZW	480
W1OPZ	469
W1NJL	298
K1ITU	264
W1GPN	255
W1VBR	255
W1MRQ	143
W1INB	128
W1MD	100
W1EHJ	88
K1NOL	78
W1SXX	15
K2EIU/2	2438
WA2DIG	1590
K2GTC	1291
W2AAU	874
W2CVW	858
K2IMK	840
K2SPP	808
W2KAT	726
W2EMW	725
W2UAP	675
W2LHL	420
W2NIY	248
WA2KQG	248
K2DDK	240
WA2OJD	234
WA2KQK	75
W2HBO	15
W2NHH	5
W3GYP	1654
W3ARK	834
W3QLW	551
K3DFU	446
W3CDG	375
W3MSR	234
W3UHU	200
W3BXG	101
W4VNE	2212
W4SVJ	2135
W4JUJ	1208
K4GPH	356
W4HYW	320
W4RZU	169
W4HOS/4	90
W4CHA	25
W5WZQ	3330
W5DQK	1594
K5OCX	1300
W5DWO	1269
W5CYQ	1073
K5PKA	808
K5IGW	293
K5UYF	179
K5CBA	64
K6CJF	1519
W6WLV	163
K7NFU	792
K7GFH	400
K7IWD	70
K7JCA	30
K7GTK	15
K8KFP	1849
W8NAN	1250
W8IBX	1200
W8CXS	1064
W8KPL	880
W8BQV	520
W8PYX	150
W8AJW	394
W8APC	322
W8VDF	179
W8DM	77
W8NHC	61
W9LNQ	1957
W9BZW	1690
W9CLH	1234
K9DWG	1170
K9ICG	1155
K9ASF	1104
W9YAE	1018
W9RKP	880
W9QWM	810
W9YDQ	788
K9UCR	308
W9DYG	188
K9YYR	188
W9FNX	70
WØKCG	1885
WØVKB	1200
WØRNH	990
W0GAX	760
K0QLY	510
WØEMG	431
WØVFE	320
WØDEP	255
WØARO	238
WØMCX	154
VE2IL	990
VE2AQO	180
VE3DYJ	520
VE3RN	413
VE3MI	285
VE3OL	20
VE7BFN	195
DL6MK	113
F8TM	20
F2SQ	1
HK7ZT	20
IT1AGA	38
JA2JW	68
JA2YAB	5
JA2WB	1
JA1CUM	1
KW6DG	56
LA6U	20
SP6FZ	156
TF3AB	20
VP7BP	25
YU1SF	1

YL PHONE

W1RLQ	23,283
K1LCI	12,100
W1ZEN	8050
K1DWH	5050
W1YPH	2828
K1ADY	2198
W2EWO	7028
K2JYZ	5744
K2OEW	2920
K1NKS/2	2300
W3TNP	27,525
K3JGV	1339
W4WYR	21,994
K4CGW	18,920
K4QNI	10,836
W4GUZ	2852
K4LMB	881
W5DRI	42,170
W5ERH	33,188
K5YIB	21,490
K5JXD	14,630
K5LIU/5	5643
K5JCY	3976
K6EXV	13,814
W6WBH	11,008
WA6HKE	7887
W6JZA	1703
K6UHI	512
K7JQG	20,591
K7MRX	9713
K7ADI	4703
W7OOV	3250
W6WDL/7	180
W8NDS	13,515
W8ATB	496
W8KLZ	435

W8LGY	309	WØOPX	924	W1HOZ	331	W3BXG	105	W5OUH	660	W7KOI	630	K9LVK	60		
K8VFR	349			K1AQE	120	K3BPQ	88	W5GFT	132	W7RZY	595				
K9AMD	19,316	KH6DLD	51,844			K3DFU	38	K5FLD	316	W7ACD	588	KØUAF	1121		
W9UON	7576			K2EIU/2	1408			K5CBA	244	W7OJV	244	WØVKB	675		
K9QGR	3240	VE4PE	6191	W2COB	1230	W4SVJ	1730	W5BJU	205	W8AJW	5250	WØKCG	495		
K9WCC	1000	VE6RP	11,110	W2KIW	1150	K4JIG	3423					WØYQR	391		
W9MYC	323	CT1YE	3996	WA2OJD	765	K4HIA	2513	W6FGJ	3023	W8UMR	1994	WØARO	375		
		G3LWY	188	K2JTU	585	K4STY	2248	K6CJF	1830	K8CIP	1409	KØRFX	280		
KØEPE	41,607	YN1EDB	16	W2PEV	544	W4JUJ	1125	W6JVA	1856	K8RMK	808	KØMRO	213		
WØRAW	13,740			K2GTC	100	K4OVE	784	W6BSY	1392	W8WT	744	KØGIA	110		
KØITP	9950	***OM PHONE***		W2MYN	40	W4KPB	206	K6MPX	760	W8CXS	123	KØAJW	79		
KØHEU	9585			W2CVW	30			W6QXF	416	K8NHC	1	VE3RN	158		
KØIKL	6418	W1NEP	2025			K5IID	3191	K1HTK/6	40						
WØVTX	6255	W1GKJ	1290	W3BVL	660	W5IWL	3060			K9AKF	1375	G3NFV	5		
KØORH	5539	W1LKG	1125	W3QLW	486	K5OCX	2228	W7SFK	2176	W9LKI	1344	HP1AC	689		
KØGIC	3120	K1KDP	760			K5UYF	891	K7ILQ	1789	W9LNQ	736	KW6DG	25		
WØWDM	2613	K1CEY	540	W3CDG	169	W5DWO	858	K7NFU	1755	K9QFR	720	SM5CHA	1		
KØVHR	2338	W1TQS	459	K3ALL	120	W5NXF	713	W7DZB	1406	W9QWM	683	VP7BP	630		

Dave Blaschke, W5WZQ, of Houston, Texas, took time from DXing on 20 c.w. (251 countries confirmed) to capture first place OM honors in the c.w. section of the YL-OM contest. Last year, in his first YL contest, Dave won the OM certificate for the fifth district.

Second place YL c.w. winner in the YL-OM contest Mildred Wright, K5LIU (ex-W3YTM) has been a high YLRL contest scorer several times since 1956. This YL from Pasadena, Texas, is a member of GAYLARK and TYLRUN.

Have you been too busy to participate in contests lately? First place phone winner in the 1960 YL-OM contest Sheila Goodhue, KH6DLD, has three babies, the oldest only five, and is expecting in July! A member of DXCC, and Certificate Hunter's Club, Sheila is ex-KL7BHE and W8EBM.

The new Miss Monterey County of California is also, we're delighted to note, a ham. Lovely Geraldine Kahle is K6RQB. It isn't quite everyday that we meet a YL who has also been crowned a beauty queen, so while we don't have much information on K6RQB's ham activities, perhaps other details would be appreciated.

Nineteen year-old "Jinny" of Pacific Grove was crowned 1961 contest queen by her sister Julia, who held the same title last year. During the pageant, for her talent performance, Jinny performed a dual scene from "Anastasia". Statistically speaking, the hazel-eyed, brown-haired winner is 5 feet 7½ inches tall, measures 38-25-37 and weighs 125 lbs. She is a sophomore at the University of Pacific, where she is an A student and has won top honors with the school's debating team. Jinny's dad is also a ham, K6TYQ. In addition to ham radio, Jinny enjoys golf, badminton, swimming, and bowling. She made the beautiful white formal gown she wore for the crowning ceremony too.

Since the Miss Monterey County Pageant is a preliminary to the Miss California and Miss America pageants, maybe someday Miss America will be an active ham!

— • • • —

Over on the East Coast Gwynn Collins, K4AGM, of Pensacola, Florida, for our money, could well be a candidate for the Miss America contest too. As brilliant as she is lovely, Gwynn has been gathering outstanding scholastic honors by the dozen. We don't blame proud Dad, W4MS, a bit for "bragging" about his daughter's record: "Gwynn will graduate from Florida State University in June with a B.S. degree in Biological Science. For the past four years she has received the Mortar Board award for the highest grades in her class. A member of the Florida Alph Chapter of Phi Beta Kappa, Alpha Delta Pi, Alpha Lambda Delta, Phi Sigma, and Phi Kappa Phi, Gwynn has a scholarship for the graduate school at Tulane University Medical School, where she will do research work in anatomy." Gwynn's mother Carrie is also a ham — W4AXF. Most of Gwynn's hamming has been on six meters, and in spite of her heavy scholastic program, she has managed to work 43 states, 12 countries, and 4 continents!

Miss Monterey County of 1961, who is also K6RQB.

Gwynn, K4AGM

Hints and Kinks For the Experimenter

GRID AND PLATE CAPS

USERS of tubes such as the 5894 and 6524, which have the plate lead protruding through the top of the envelope, may be interested in the method I use to make plate connections. The chassis mounting insulated phone tip jack, such as the H.H. Smith type No. 241, makes a snug fit over the lead and, at the same time, is easy to slip on and off without putting any undue strain on the glass seal. The jacks also provide a certain amount of heat dissipation.

— *Charles Hummel, K3BFA*

GLASS CUTTER

YOU can cut out almost any shape of glass from a piece of old window glass with a pair of tin snips or stout scissors. The secret is to do it under water! Keep both the glass and the snips under water as you cut. It's just like working with cardboard and it's a simple job to cut circles, squares, etc. The next time you need a new meter glass, try this method. It really works!

— *Dick Hinz, W6DIE*

(Darned if it doesn't! — *Ed.*)

INEXPENSIVE CIRCUIT BREAKER

IF your shack is fused separately from the rest of the house circuits by a conventional screw-in house fuse, replace it with a Mini-Breaker, available from most hardware stores for about two dollars. These miniature circuit breakers can be obtained in ranges of 5 to 30 amperes and will screw into the same socket as the conventional fuses. Once they have been "blown," they can be reset manually and are ready to go again. They soon pay for themselves after a few "blows"!

— *Bill Davenport, W.A2OZV*

DUMMY LOADS FROM AUTO REGULATORS

I REMOVED the carbon bar resistors from the back of an old junked automobile voltage regulator, bolted three of them together in series and came up with a 54-ohm noninductive dummy load. The resistors have copper-plated ends with the resistance stamped in the metal. The resistance varies from 7 to 38 ohms and therefore the desired load resistance can be obtained by series or paralleling. The 54-ohm group I use seems to work well as a load for my Ranger, which has outputs in the vicinity of 50 watts. The load gets plenty hot, but for intermittent use during tests it has held up well. The regulator resistors from late-model cars have flat wire-wound resistors which will not work in this application.

— *John J. Marlatt, K7AGI*

WATER HEAT SINK

RECENTLY while constructing a receiver, I was winding coils on plastic coil forms. When I tried to solder the coil leads to the pins on the plastic forms, the coils softened from the heat and caused the pins to sag and lose their proper spacing. To eliminate this I held the coil, pins extending upward, wrapped a piece of tape around the upper end of the coil so that the tape formed a well in which I put a small portion of water to act as a heat sink. The scheme works fine and I now can take my time when soldering the connections.

— *William Nicholson, W3KOC*

DE-SOLDERING TIP

THE melted solder that accumulates when you are unsoldering connections may be quickly and easily removed by brushing with a paint brush. Use a small ½- to ¾-inch natural bristle brush. If it is made from synthetic fibers, small balls will form on the end of each bristle because of the heat, but this will not affect the effectiveness of the brush. It is an easy job to remove excess solder from the holes in soldering lugs, tube pins, etc. The brushing may produce small quantities of splattered solder but these can usually be removed without much difficulty.

— *George P. Firmin*

RUBBER-BAND HEMOSTAT

WHEN I solder semiconductor diodes, transistors, or other items easily damaged by heat, I protect them from the heat by gripping the leads with long-nosed pliers which have a rubber band wrapped around the handles. The rubber band keeps the pliers gripping the wire tightly.

— *Sam Taylor, jr., W6RJC*

MINIATURE DRILL

WITH the advent of transistors and miniature components, there has been a need for drilling very small holes. An excellent bit can be shaped for the purpose from a common sewing-machine needle. The needle shank is large enough to fit nicely in a chuck and it will drill through plastic or soft metals. Place the needle point up in a small vise and break it off as nearly as possible to the lower edge of the eye. Now with an ordinary pocket Carborundum, dress the broken section flatly across the top. Next, place the needle at an angle of about 35 degrees to the jaws of the vise and move the Carborundum squarely across the needle. Now reverse the needle and shape the other side to 35 degrees. A magnifying glass will aid in determining whether the bit has the proper symmetrical wedge-shaped tip.

— *Cecil Palmer, W5NHW*

Correspondence From Members-

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

CONTEST "Q" SIGNAL

¶ During the week end just past I participated in the USSR DX contest and I have come to the conclusion that there is a definite need for the addition of a "Q" signal.

Frequently during the contest I was called by stations that I had worked before and had to explain to the caller that we had worked before. A "Q" signal would quickly explain the situation to the caller and time would not be lost.

Also this "Q" signal could be used during normal contacts just for general information to the stations involved in a QSO.

I feel that either a definite "Q" signal (QWB?) should be invented or the organization sponsoring a certain contest should include in its announcement a "Q" signal to serve this purpose.

Anybody agree? — *Thomas D. Yarnes, K5HZC/DL4QV (AP9), New York, N.Y.*

QSL TROUBLES

¶ For the benefit of those who wonder why so many QSL cards were not answered, and who may be thinking all kinds of bad things about the guy who never bothers to QSL, may it be pointed out that each year there are literally thousands of QSLs which never reach their intended destination. The post office department is confronted with a serious problem. Of the hundreds of cards daily that have insufficient addresses, practically none have a return address on the address side of the card. How is a post office employee supposed to know where the card is from? There is little to do with such cards but send them to the dead-letter office to be destroyed later.

Our town has a radio club and the post office has formed the habit of putting all poorly-addressed QSL cards in the club's box. We can usually run down the intended addressee. Very frequently, we receive a card addressed such as this: ARS KN5FVZ "Ben", Enid, Oklahoma. Obviously, to the average postal worker, the call letters are completely useless. So the address amounts to "Ben", Enid, Oklahoma. Anyone who has the intelligence to get any type of license ought to know better than to waste his cards in such a manner.

Another poor practice is using ancient call books. If your call book is 4 or 5 years old, you can expect to find the correct address only about 70% of the time. The simple process of placing your return address on the "address" side of the card can save you a lot of cards and the post office a lot of headaches. — *Ken Isbell, W5QMJ, Enid, Oklahoma.*

220 Mc. AND UP . . .

¶ After reading Mr. Baker's letter regarding the use of simple equipment on the v.h.f. and u.h.f. bands (Correspondence from Members, May, 1961, *QST*) I feel that a rebuttal is in order. It must be that he did not read my article, "Wideband F.M. on 220 Mc.," carefully enough. He calls the equipment described obsolete and unstable. If he is right, then there are thousands of people listening to obsolete broadcast stations every day!

There are hundreds of such stations operating between 88 and 108 Mc., duly licensed by FCC. They are using basically the same method of modulation, and the same 75-kc. deviation, that my 220-Mc. gear employs. The receivers used are identical to the ones I modified for 220-Mc. work.

Mr. Baker did not define his interpretation of "stability." Does he measure it in cycles? An s.s.b. transmitter that drifts 100 cycles in a 5- or 10-minute transmission would be called unstable, because this is enough shift to cause trouble with that mode. But an a.m. transmitter drifting several times that much would not be criticized. Thus, stability is measured in terms of the requirement for staying effectively in tune, in the service for which it is being employed. A drift of 30 or 40 kc. is not objectionable when a receiver intended for wideband f.m. service is used. Did you ever check the drift of the average TV receiver oscillator in *cycles*? You'd find it to be plenty, but few TV owners have trouble with drift, because of the great bandwidth of their receivers. On this basis, my 220-Mc. gear would not be classified as unstable.

His remark about "irresponsible operators disrupting serious experimental work at the low edge of the band" has a dog-in-the-manger aspect. With such work admittedly confined to a narrow segment at the edge of the band, it behooves us to take a hard look at what our amateur bands are for. Should such extreme priority be given to professional engineers (with ham licenses) who are doing this "serious work," especially in a band that is 5000 kilocycles wide? Or does the fellow whose resources and technical skill are limited by circumstances have the right to use these bands as he sees fit, so long as he operates legally and does not create unnecessary interference?

I will not attempt to answer this in detail, but I do suggest that each of us do a bit of thinking along these lines before jumping to hasty conclusions. If we don't get hams active on our higher bands, who cares what kind of equipment they are *not* using? Let's get them interested and active first, and let refinement come later — if, when and where the occupancy warrants it! — *Cal Hadlock, W1CTW/W1IQD, Arlington, Mass.*

THE NEXT STEP?

¶ Kudos to Lt. William H. Curry, jr., W4RXY, for his most comprehensive article on "World Time Keeping". The logic of recording times in the log in GMT is irrefutable and the ARRL Board is to be commended for recommending its adoption.

It is suggested that the Board continue its logical thinking and revise the *Handbook* insofar as certain formulae are concerned which are used in calculating wavelengths and fractions of wavelengths in solving antenna problems. Reference is made to the formula for determining a wavelength in the current *License Manual* on page 29, which is based on the metric system and to page 23 of the same manual in which temperature coefficient is given in the Centigrade scale. Yet the *Handbook* states formulae in feet and inches. It is a disservice to amateurs, particularly the beginner, to educate him in the metric system and then tell him how to solve a problem in another system. If the editors of the *Handbook* feel that the feet-inches system should be continued, then the double standard should be abandoned and, for example, the six-meter band should be referred to as the 236-inch band or the 19½-foot band. Actual measurements can be made with a metric rule obtainable in most hardware stores. It might be interesting to see what other amateurs think about this. — *Robert L. Atkinson, K8PNH, St. Joseph, Michigan.*

APPRECIATES OOs

¶ I would like to express my appreciation for the work done by your Official Observers. I am a Novice and have been operating on the 40-meter band. April 8, 1961 I received a post-card from W6ADB stating that my signal was "OK on frequency, but had strong parasitic clicks intermittently on 6938 kc." This was my first indication that anything was wrong. I spent two weeks off the air getting rid of the parasitic oscillation. As a result of the research required, I am better informed on the subject and learned considerably more about my kit-type transmitter.

This report by your observer helped me to comply with the FCC regulation. It is through the efforts and time given by your members, such as Stan Wymar, that amateur radio is a success. I am strongly in favor of the work your organization is doing to represent amateur radio and wish to say thanks. — *Shepard B. Porter, WV6OYM, Petaluma, Calif.*

(*Continued on page 140*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, W1DGL, Ass't. Comm. Mgr., C. W.
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

Top 15 Kc. of Twenty for DX Stations Only! ARRL urges and recommends that all United States and Canadian amateurs voluntarily help make successful 14 Mc. DX possible by refraining from use of those frequencies between 14,335 kc. and 14,350 kc.

The League's Board of Directors in originating this recommendation writes in the purpose "that our amateur friends in other countries using single-sideband may establish contact with our amateurs and with each other in greater freedom and success." DX amateurs, as reported editorially in October '60 *QST*, have been most gracious in adjusting to and accepting changes in frequency allocations. S.s.b. has become the order of the day at the high end. This new 15 kc. reservation for DX has already been hailed in one club publication as capable of producing a lot of good DX results. This depends, of course, on your full cooperation in this gentlemen's agreement, to keep U.S. occupancy below 14,335 kc. FCC does not look with favor on regulatory actions to subdivide bands narrowly with the continuing specialization and inevitable changes in techniques. This emphasizes that our amateur-radio destiny is to be shaped by following our own common sense rules for the general good.

In the light of this and other gentlemen's agreements, "enforcement," of course, is effected by mass actions of approval or disapproval. We feel quite sure amateurs generally will be behind this recommendation. The DX itself, if necessary, may adopt the policy of not answering W- or VE- amateurs whose frequencies are in the 15 kc. at the high end.

W2ZX suggests that the recommendation should also end such DX blights as "list making" and "on frequency calling." He means, of course, that operationally one must start regarding the 15 kc. high-end frequencies, as much outside our prerogative as are the c.w. frequencies at the low-end. Let us do this, and conduct all calling and working in this voice area from our frequencies *below* 14,335 kc. in the band. Make the high end truly "for the DX!"

Some Points to Help Voice Operating. *The Sidebander* frequently offers excellent procedural and operating data and news for the voice operator. Some points suggested by Phil Carter, W1CRA, for New Years' consideration seem to us keyed for daily values in operating work. With full credit to the source may we then pass along the following for consideration:

—— Keep all monologues under 15 seconds. Raise specific questions to indicate your interest in the other operator's activities.

—— On the air avoid, if possible, subjects which are of a controversial or political nature. (Remarks heard in our presidential campaign never would have passed a network censor.)

—— If one has a personal grievance why blow off steam on the air? Call on the telephone for any such.

—— When changing frequency be sure to avoid landing on top of another's QSO! (If on s.s.b., it is simpler and more efficient to switch from upper to lower sideband if QRM bothers instead of changing frequency.)

—— Tuning up on the frequency where one is contemplating a break-in is *not* always appreciated . . . even if you know the other parties.

—— The Golden Rule is good in any language . . . and can work wonders for you.

Conelrad Test. Were you caught napping in the April 28 drill or did you meet the FCC requirements? How would it be if the chips were down and it became *more than a test* for you to observe *radio silence* on given signal? Is your conelrad provision always operational, *every* time you as an amateur go on the air? Such is our responsibility under present regulations, even though early summer should see a governmental re-study of conelrad concluded. (It is said today's war plans are too sophisticated for such radio-navigational homing possibilities to matter.)

"East meets West", SCMs that is. K4SJH, SCM Eastern Florida greets W4RKH, the SCM of Western Florida, at a recent meeting with state CD officials.

FCC did not, as in earlier years, excuse radio amateurs from taking part in its conelrad test during OCDM's Operation Alert. The Commission instead requested voluntary cooperation and participation by full radio silence on the part of U.S. amateur stations on receipt of the alerting signal throughout the nation. Notice was given amateurs by ARRL Official Bulletins (radio), by a flash in April *QST*, and finally by W1AW, so this can hardly be called a surprise drill. And still it fell short of 100% radio silence. If you were away at work you may not have been involved. But again you might not escape this easily, given an unheralded radio signal, with broadcasters suddenly going quiet, except for selected station patterns on 640 and 1240 kc.

From the many unsolicited comments reaching the League, we're glad to note much on the credit side. Amateur radio as a service has to be "responsible" to be assured its existence. We can hardly condone those self-appointed operators piping "other" stations down, creating arguments and adding their signals and QRM. Remarks and reports from ARRL OOs, still subject to analysis, cover this and about everything that happened. "Highly successful; the bands went real quiet." "A most interesting operation." "It proved to me the value and advisability of ARRL membership." "Operation was a little above normal afterward." "Novices should be done away with." "In this silence I heard only a few VE's." "A So. Amer. DXer was trying to tell a U.S. amateur conelrad applied only to b/c stations, so please, he should transmit."

The reference to Novices is understandable in that of some five-hundred cooperative notices sent (re conelrad), two notices out of every three went to a Novice. But when considered that we number over 200,000 licensees, the observance of silence was unmistakably of a high order. The look at each band showed observance generally quite good, with the possible exception of the Novice segments. We wish we might give the reader benefit of all comments from all observers; some were illuminating. The following over-all view of the conelrad test results is a nationwide one, as given in a selection of random Observer comment representative of each FCC licensing area:

"Excellent cooperation in radio silence except for Novices." — K8HTM. "Amateurs seemed eager to cooperate. After the warning the bands were quite clear" — K9IVG.

"80% to 90% of all c.w. activity on 7 Mc. stopped, perhaps no more than 20% in the Novice frequencies. Apparently many of these stations do not have or use a conelrad alarm system." — W3NNC. "On 80 fone and c.w. it was quiet; 40 c.w. had most violators . . . half my reports were for Novices. On 20 c.w. and phone there was plenty of DX, but no USA stations. 15 was quiet with some DX phone." — K2VZJ.

"A quick scan of our amateur bands with the tape recorder running found little U.S. activity. I consider the ARRL publicity toward this very effective." — W4IYT, SEC.

"75 and 40 were very active bands before the alert. 40 was not so good. Apparently KN's didn't get the word. 75 got quiet except for RACES stations with tactical calls, but they were not in their RACES-assigned segments." — W5BKH. "Surprised to see so many on during the alert. It was *stupid* to break silence to quiet others." — W6CK. "Was surprised at the *lack* of violators; most heard were VE's and stations sending QRT." — W1QHS. "Most amateurs were quickly quiet, but some took it on themselves to tell others off." — K9BIV. "If the *real thing*, some should be better trained!" — KØGEL.

"Was most pleased to find both two and six completely quiet as to general amateur contacts." — W1OFK. "In general good compliance. WØ — was warned by RACES control and changed to tactical call at once." — WØLST "General observation of silence excellent. Word about the alert seemed widespread. The well meaning over-the-air QRTs should be stopped." — WØQVZ. "In the 10-mins. before the test, 90 % of the rag chews finished and conelrad-silence was observed. A few on 20 continued to engage in DX work sending CD! QRT! CONELRAD! which added confusion; better those on the air be guided by OO notices." — K1LFX.

"All should get the word but a few never hear. The worse offenders I heard were a.m. operators, followed by s.s.b. in the 20-band." — K6KUU/6. "40, 20 and 15 were active prior to and after the conelrad condition. Heard an XE2 and VE7 continuing." — K7ETN. "So many 7 Mc. Novices it was difficult to sort out and identify them." — K8EEB. "A good first try; took but five minutes for the band to clear in this area." — W2BVE.

". . . 20-meters never did quiet. Afterward all bands resumed." — K5TGW. "The real culprits were the self-appointed policemen jumping around to order people off. . . ." — W4FJ. "All in all a *good* showing . . . but those who give tests to our Novices should make sure they are going to have conelrad monitors and follow conelrad provisions. 80 and 6 were quiet in SF and the Bay Area. 40 not so good." — W6OKR.

— F.E.H.

HIGH-CLAIMED SCORES, APRIL CD PARTIES

The following are high claimed scores; figures show score *claimed*, number of QSOs, and number of different sections worked. Final and complete standings will appear in the July *CD Bulletin*.

C.W.

K5DGI	208,000-635-65
W3TMZ	193,920-606-64
W2OIB	193,440-624-62
W9YT[1]	192,290-568-67
K2DXV	180,230-533-67
W4PRO	178,240-557-64
W3GRF[2]	177,660-558-63
K4PUZ	177,450-542-65
K8MTI	172,620-543-63
K8KCO	169,920-524-64
W3DQG	161,510-517-62
W1JYH	159,650-508-62
K2SSX	153,120-523-58
W3GYP	153,090-481-63
K5BSZ	151,125-460-65
W4YE	150,150-455-65
W4HQN	150,080-441-67
K5ABV	149,120-461-64
K2EIU/2	138,470-448-61
K1JDN	134,190-426-63
W6ISQ	133,905-405-65
W9JJN	133,610-424-62
KØQCQ	123,525-400-61
K4UBR	123,380-391-62
K4RAD	120,950-405-59
K4TEA	120,280-381-62
W6WX	116,560-369-62
W2GKZ	115,610-385-59
W4BZE	114,755-381-59
W9LNQ	112,200-369-60
W6JVA	108,600-356-60
K9ELT	108,580-350-61
W3MSR	108,360-380-56
K4KWQ	107,970-354-61
K9ORK	104,160-330-62
W1EOB	102,785-330-61
WA6HRS	100,800-331-60
W2OPB	100,650-359-55

PHONE

W1YK[3]	32,580-174-36
K2EIU	29,750-164-35
W9YT[4]	25,010-116-41
K5MDX	23,735-101-47
W2OIB	23,430-142-33
W6UGA	19,800-110-36
K9RFW	19,760- 98-38
W8NOH	19,000- 90-40
K4UBR	17,490- 99-33
W9PNE	16,625- 88-35
KØLUZ	15,510- 91-33
W3TMZ	13,775- 95-29
W0EEE[5]	12,750- 75-34
K4PUZ	12,325- 81-29
W4BGP	10,800- 80-27
K3ANU	10,125- 76-25
W3GYP	10,005- 82-23
W3NF	9880- 69-26
K5HD	8320- 60-26
W1DXS	7750- 62-25
W3DQG	7590- 62-23
W1GKJ	7500- 55-25
W4KFC	6825- 58-21
W1ECH/1	6555- 50-23
W2EEN	6400- 60-20
W9VSO	6370- 49-26
W2GKZ	5985- 50-21
K1JQO	5760- 48-24
W9LNQ	5610- 42-24
K2QDT	5600- 56-20
WA2EKE[6]	33,300-181-36

[1] W9SZR, opr. [2] K3GUR, opr. [3] K2PHF, opr. [4] K9ELT, opr. [5] KØLGZ, opr. [6] Multiple operator.

Right now, we're deeply embroiled in a statistical analysis of the AREC, based on some 538 EC reports that have been received since the call for reports went out near the first of the year. The reports are still trickling in, and sooner or later we're going to have to cut them off so that we can get on with making the overall estimates on our nationwide strength. This year we got squeezed out of the Annual Reports to the Board of Directors by the "blue card" survey, and maybe this is just as well because we weren't ready to report AREC data yet anyway. It was a bigger job than usual, this year.

Understand, we're not complaining. With the appointment of a bunch of new, eager, active SECs has come what you might call a purge of ECs — that is, many inactive, do-nothing ECs got the axe. As a result, our total number of EC appointees has fallen from approximately 1700 to approximately 1500. But in this group there are more *active* ECs, so actually the amount of AREC activity has gone up, not down. A total of 407 EC annual reports was received in early 1960; this time, we have received well over 500, despite the decrease in potential. Of course we have no way of gauging how much of this increase was a result of the simpler reporting form and the "bribe" of AREC decals and how much is general increase in interest. Probably all factors are involved. We would venture to guess, however, judging from correspondence received and other indications, that we would have shown *some* increase even without simplification and reward incentives.

As we said, the analysis is not yet complete, but you might be interested in some preliminary observations. To begin with, the overall percentage increase in number of reports is about 32%. Along with this, we also note that our percentage response from ECs has gone up from 22.8% to over 30%, a notable improvement. As usual, the greatest number of reports came from the 9 call area (101); the rest ranked this way: Fourth (70), Ninth (68), Fifth (67), Seventh (56), First (55), Second and Eighth (33), Third (24), Sixth (21), Canadian (17).

By far the greatest percentage improvement in sending in reports occurred in the Ninth Call Area (70%). All areas except the Eighth registered more or less improvement in number of reports, but the Eighth showed a 15% decrease. Increases of 50% or better were registered in the First, Third, Sixth and Seventh call areas. All in all a very good showing.

We're not quite ready with section standings yet, but we note that in total number of reports received, Indiana is way out in front with 39. Others with over 20 reports are Iowa (26), E. Fla. (25), Eastern Mass. (24), Minn. (22), and Wash. (21). Section standings are based on percentages, however, so better watch out for Oklahoma (19) and South Dakota (17) too.

We repeat, these are preliminary data. The final statistics in an Emergency and Traffic Bulletin later this year will probably show slight differences.

The usual difficulties in analyzing returns remains. For example, it would seem that about 15% of our ECs don't know what section they are in. A good half of them didn't bother to include a return address on their cards, so we had to look them up before we could send their decals — not a difficult procedure, just time-wasting. Some ECs apparently didn't bother to read the instructions at all; they just jotted down the calls of amateurs to whom they intended issuing decals in the numbered spaces. Other inconsistencies in reporting continue to hound us, despite the fact that we have made the reporting form a little easier to use. For example, where we ask for *the* primary agency served, fully half of the ECs put down two or more agencies. One report we never have been able to identify — it came with a smudged postmark and with no name or call on it on either side. Several others we had to identify by some pretty cagey sleuthing.

Nearly all of those who commented on the new type of report form were in favor of it. So far, only one EC has expressed himself as not liking the new form. We like it too; it makes tabulating and filing much easier and takes up much less space. Besides, not having the answer right next to the question makes it less disconcerting when some EC says he has five mobile units and ten of them operate on two meters. — *W1NJM.*

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Addendum: Add WØYIO to the list of participants in the Iowa sleet storm, Feb. 18.

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At 0730 on April 11, K4SGB, MARS director at Dow Air Force Base, Me., was notified that a jet fighter was missing and presumed crashed in the vicinity of East Holden, Me. As the MARS station was not operable, amateur radio was used for communications. K4SGB/mobile proceeded with the search party and K1QDG set up a rig at the air base. When contact became precarious, W1FCS in East Holden served as relay. When K4SGB's mobile developed modulator trouble, W1AWY/mobile was dispatched to assist, while K4SGB/mobile operated by c.w. to W1AWY/mobile who relayed to W1FCS and thence to K1QDG/1 at the base. At approximately 1530 the crash was sighted, but weather prevented the use of helicopters. K1ADY/mobile joined K4SGB/mobile and communications were maintained until 1830. Thanks to splendid cooperation of amateurs, 3940 kc. remained clear for more than seven hours. — *K4SGB/1.*

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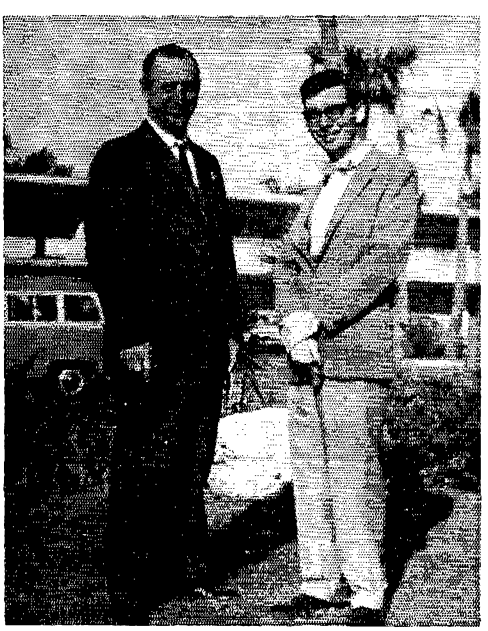
On Apr. 23, a severe snow and wind storm caused emergency conditions in North Dakota. The North Dakota Post Office Net operated from 1830 to 1930 CST, then continued operation as an emergency net, with KØITP as NCS. *WØs* AEG GQD and KØYXJ also acted as NCS during the operation and KØDWX operated mobile from Goodrich during a power outage. Traffic was handled for the power company, the telephone company, for stranded motorists, sick people and the Air Force. Operation continued into the following day. Amateurs who took part in this emergency activity: *KØs* AZX CLD DHB MPH PKO RLF RFY RRZ TVI TNI UTL YJB, *WØs* AQR BHF BHT FNZ GCI HBR HVA IHM MQA OOD PHC QOZ VAL VMS WYG YYN YCL ZCM. — *WØHVA, SCM North Dakota.*



These are the two perpetrators of Florida's state AREC Plan and Procedures, W4IYT (left) and W4MLE, SECs of Eastern and Western Florida respectively. Copies of the plan will be sent free on request to W4IYT, Box 501, Miami Springs, Fla.

On Feb. 13, members of the Hillsborough Amateur Radio Society of Tampa, Fla., assisted Tampa police in regulating the traffic congestion caused by the annual "Gasparilla Day" parade. Fourteen mobile stations were set up at strategic intersections along the parade routes, with control stations at the police department and direct communication with the chief of police in downtown Tampa. Information and instructions were transmitted from the police helicopter to the officer at a particular intersection via the amateur mobile located at that point. Accidents and causes of bottlenecks were quickly relayed to the chief of police and wreckers or other means of assistance were quickly dispatched. The MARS NCOIC at MacDill AFB provided generators and antenna equipment for some of the installations. The operation, prepared and executed by W4BNE and W4UHF, received high praise from the police and the press. — *W4UHF.*

When an auto struck a utility pole in Rainsboro, Ohio, on Apr. 23, K8JHO, who lived nearby, was able to activate the Rocky Fork Amateur Emergency Net and help was quickly summoned. K8OJL assumed NCS, K8PXP dispatched an ambulance and K8PSM summoned the highway patrol, all in jig time. — *W8CEZ.*

The Missouri Storm Warning Net was activated on Apr. 24 in the midst of high winds, heavy rain, hail and possible tornadoes. There was considerable damage and communications disruption throughout the state, although no severe tornadoes developed. WØOHC and KØJAD carried the brunt of the NCS work, and KØJAD maintained continuous contact with the weather bureau at Columbia. Liaison was maintained with nets in other states. WØOHC alerted the state patrol so that Tipton and California, towns without net members, could be warned. — *WØOVV.*

On May 5, when a tornado struck and virtually devastated Howe, Okla., the Pittsburgh County Amateur Radio Club (W5CUQ) set up a station at the grammar school and handled messages with the outside world via W5DIJ in Texas. Operating the station at Howe were *K5s* GBR VTI, *W5s* AKH UAO. — *K5YBC/4.*

On May 6 a tornado hit Hamilton, Ind., disrupting telephone and power service. Soon on the scene were 34 amateurs of the Steuben County AREC and RACES group. A direct link between the sheriff's office, mobile units at the scene and civil defense was established. Hand-carried portables on 6 meters were taken into the stricken area to search for injured people, while mobile units reported damage done to telephone and power lines. Among those taking part were *K9s* GLL GXI HTJ JJZ KAL LSA QAV SGS TFI THZ VHH WJH WOG YXR, *W9s* AMH BBX BGY BTZ CFG JXK MS PMZ PRO QWI YCB YVS, KN9EXI, K1CMT, K2QVC, *W3s* HJR QVD, *W4s* CTU MPY, W7WYZ. — *W4CTU/9, EC Steuben County, Ind.*

Widespread storm activity, accompanied by local thunderstorms, high winds and possible tornadoes, alerted many amateurs in the middle Atlantic area on Feb. 25. W3ECP monitored the Maryland Emergency Phone Net frequency after the alert, later relieved by W3BM and W3EQK. Amateurs reported in from time to time with reports on local conditions such as barometric pressure, temperature, wind velocities, etc. The alert passed with no communications emergency and no serious damage, but the amateurs were standing by to assist if needed. — *W3EQK.*

Pretty good reporting record for March — 34 SEC reports representing 13,567 AREC members. This is getting mighty close to the half way mark and represents a new all-time record for SEC reporting. Three more reports in a single month and we'll carry out our threat, made some time ago, to list the sections *not* heard from instead of those which reported. However, March reports were received from the SECs of NYC-LI, Maine, E. Mass., *San Diego*, Minn., E. Fla., N. Texas, San Joaquin Valley, Ohio, E. Bay, Ga., *W. Fla.*, Wash., Kans., Ind., Nevada, Iowa, Tenn., Ore., S.Dak., Mich., Wyo., Md.-Del. D.C., *Ala.*, N.N.J., Utah, Colo., S. Texas, *E. Pa.*, S.C.V., *Wis.*, Okla., W. Mass., *Vt.* Those in italics submitted their first 1961 reports.

This is the tenth year we have kept these records of SEC reporting. Nine years ago, in March of 1952, we recorded 17 reports representing 2949 AREC members, so you can see that we have really made progress since then.

Meet KØIZM, SEC for Kansas, also holder of OBS and OPS appointments.

RACES News

On Feb. 25, a severe blizzard which struck Indiana closed all roads in and around Grant County (Marion), stranding thousands of basketball fans in Marion and on the surrounding highways. The Grant County RACES Net on 50.45 Mc. was activated at 1515. Impassable roads prevented setting up in the C.D. Building, so RACES net control was maintained at K9IEW with landline connections to c.d. and police headquarters. The RACES net maintained communications between Marion and surrounding towns and the Indiana Storm Net on 75 meters, handling traffic concerning road conditions, welfare, location of missing persons and direction of rescue equipment to snowbound cars and trucks. Operation continued until 1330 the following day. Stations participating: *K9s* CLP IEW LDV RYV VUII VND WNR YBY YGI ZRP IEW PQM, *W9s* CVO MXV VIA BSZ ZTZ. — *K9IEW, RO Grant County, Ind.*

Wyoming RACES has made considerable progress this year, according to state RO W7BHH. On Mar. 5 a very successful statewide drill was conducted in which more than 32 amateurs participated and messages were relayed into 20 out of 23 counties. Still a lot of work to be done, says Joe.

A.R.R.L. ACTIVITIES CALENDAR

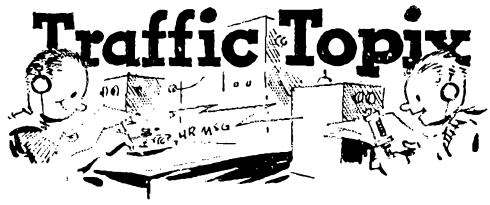
(Dates shown are in GMT)

June 24–25: Field Day
July 7: CP Qualifying Run — W6OWP
July 15–16: CD Party (c.w.)
July 22: CP Qualifying Run — W1AW
July 22–23: CD Party (phone)
Aug. 3: CP Qualifying Run — W6OWP
Aug. 22: CP Qualifying Run — W1AW
Sept. 14: CP Qualifying Run — W6OWP
Sept. 14: Frequency Measuring Test
Sept. 16–17: V.H.F. QSO Party
Sept. 20: CP Qualifying Run — W1AW
Oct. 7–8: Simulated Emergency Test
Nov. 11–13, 18–20: Sweepstakes Contest

OTHER ACTIVITIES

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

Aug. 26–27: Second All Asian DX Contest, Japan Amateur Radio League (next month).



Recently we received a letter from an incredulous amateur who stoutly claimed that such traffic totals as those submitted by W3CUL are utterly impossible, and that therefore she must be cheating. He then proceeded to prove his contention mathematically and chastised *QST* for having the gall to print such outright lies.

This reminds us of the story about the farmer who, upon visiting the zoo and seeing a giraffe, snorted and walked away in disgust, saying "There ain't no sech animule!" The above-mentioned mathematical "proof" was based on an assumed average of one message per each eight minutes. While this might be a reasonably accurate over-all average of traffic handling (we've never tried to calculate it), for the real zealots it's a mighty low average. But even if you cut this in half and then cut the half in half, more than 12,000 message handlings a month represent an almost-incredible amount of time. So, thinking that others are also probably skeptical, we asked Mac to give us a rundown on how she does it — knowing, of course, that she had plenty of time to write letters between messages!

Well, as it turns out, there is no special secret formula. As in most extraordinary achievements, the principal ingredients are hard work and plenty of time. We wish we could quote extensively from Mac's very nice letter, but under the necessity for brevity we can say that such totals are achieved by (1) avoidance of nets; (2) keeping schedules with only topnotch traffickers; (3) operating seven days a week with no movies, no dinners out; (4) always keeping schedules on time; (5) use of full break-in; (6) use of abbreviated procedure, such as sending messages in groups (without QSL between each message); (7) maintenance of a speed (not fast) which promotes errorless transmission and therefore fewer "breaks" and tills; and (8) having big rigs, good antennas and spares for everything.

On top of the actual handling of the traffic on the air, of course, there must be some kind of organization and classification so that you can put your hands on the right traffic at the right time and don't waste time thumbing through stacks of messages. The messages must also be serviced and counted, which takes more time. So on the air, there is no time wasted, everything is cut to a bare minimum. Mac estimates about 428 hours were spent on the air in December. Messages are handled, sometimes, at the rate of 80 an hour, and she has taken as many as 300 at one sitting, and as high as 750 in a single day. In March *QST*'s BPL column (Dec. traffic), 14 of the stations with totals in four figures are regular W3CUL skeds, plus another ten BPL'ers that same month. Mac's activities don't just make BPL for her, they put quite a few other stations in the BPL column as well. She is practically a one-man (oops, I mean one-woman) traffic system. And she has been taught the ropes by the best in the fraternity, such as W4PL, W4IA, W5MN, W3WV, W6KYV, W4IYT, W7CZY, W7BA, W6GYH, W2BO, W9TQD and W1TYQ — you'll find a lot of these calls in the post-war column above.

And now, as Mac says, for the clincher: OM Al (W3VR) does all the shopping, cooking, and most of the housekeeping. No bill collectors, no doorstep salesmen, no days off, no social life, and there you have it — 12,000 message points per month! Yes, it's possible, with practice. Want to try it? The 12G mark represents a saturation point, but Mac hopes that with additional use of RTTY she might be able to beat this!

The question occurs, why does she do it? Well, we often thought that any psychoanalyst would have a field day working on some of our traffic men. Why, indeed? Probably simply because she gets deep satisfaction from it, which is a perfectly legitimate reason. Anyway, that's not the subject of this treatise. She does do it, and above is *how* she does it. Many good traffic men could become better traffic men by observing and emulating her methods. And leave us not be skeptical or critical because it may be something we could not or would not do ourselves. — *W1NJM.*

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Net reports. Eastern Wireless System reports 30 sessions, 319 check-ins, traffic total of 280. Northeast Area Barnyard Net had 25 sessions, 709 check-ins, nine messages. The Interstate SSB Net had 836 check-ins, total traffic of 271. The 7290 Net: 42 sessions, 1494 check-ins, 827 traffic. Early Bird Transcon Net: 275 messages. That's all the net reports we received for this month.

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National Traffic System. According to our statistical summary, the *Second Region Net (2RN)* was the best region net in NTS during 1960, just barely nosing out RN5 and RN6, which tied for second place. The final standing is based on a total of rankings in five categories: number of sessions, traffic total, rate, average traffic per session and representation. We find that although 2RN ranked first only in representation, its other rankings were sufficiently high to give it the first-place nod. Here's the lineup for 1960, showing how each region net "placed" in each of the five categories:

Net	*Sessions*	*Tfc*	*Rate*	*Average*	*Rep.*	*Final Standing*
2RN	2	7	2	7	1	1
RN5	5	4	4	3	4	2
RN6	7	1	6	1	5	2
TEN	1	2	3	5	11	4
9RN	10	3	1	2	8	5
4RN	4	5	8	6	3	6
3RN	3	8	7	9	2	7
1RN	8	6	5	4	7	8
RN7	6	9	10	10	12	9
TWN	11	10	9	8	9	9
8RN	9	11	11	11	6	11
ECN	12	12	12	12	10	12

These five categories balance each other out so that it is difficult to achieve a high standing by emphasizing one at the expense of the other. In 1960, as can be seen 2RN won out on the basis of number of sessions, high rate and stellar representation, although its traffic totals and average were nothing spectacular. Also, note that although RN5 achieved neither a "first" nor a "second" in any category, its general performance was sufficient to give it a high standing, almost tops and tied with RN6 for second — and RN6 had "firsts" in *two* categories. Look at TEN: if this net had placed as high as 7th in representation, it would have achieved first place; however, its low representation pulled it down to fourth.

This photo of "Mr. Traffic" (W4PL, seated) was snapped by K5SGK during an April visit to Ben's shack. Looking over Ben's shoulder is W5MXQ, SEC of Louisiana.

QST for

That's the way it goes. There remains some room for argument concerning the validity of the above analysis, but at least you can see where the greatest need for improvement lies.

April reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
1RN	60	773	.389	12.9	72.9
2RN	60	600	.528	10.0	96.6
3RN	60	518	.331	8.6	100.0
4RN	60	574	.300	9.5	87.5
RN5	54	726	.452	13.4	81.7
RN7	60	476	.238	7.9	54.1
8RN	59	308	.182	5.2	81.5
9RN	60	603	.312	10.1	75.4
TEN	85	1115	.640	13.1	66.3
ECN	20	98	.272	4.9	81.7[1]
TWN	30	446	.351	14.9	83.3[1]
EAN	26	1147	.827	44.1	98.0
CAN	30	1144	.862	38.1	100.0
PAN	30	1270	.724	42.3	100.0
Sections[2]	1381	8795			
TCC Eastern	99[3]	646			
TCC Central	90[3]	1120			
TCC Pacific	97[3]	922			
Summary	2075	21281	CAN	9.1	CAN/PAN/3RN
Record	2043	27780	1.057	17.8	100.0

[1] Region net representation based on one session per night. Others are based on two or more sessions per night.
[2] Section nets reporting: AENT, AENB, AENO, AENP Morn, AENP Eve (Ala.); VSN, VFN & VN (Va.); TN (Tenn.); QKS (Kans.); FMTN, FPTN, GN, QFN ; TPTN (Fla.); QMN (2 Mich. Nets); KYN (Ky.); SOCAL 6 (Calif.); MSN, MJN, MSPN Noon, MSPN Eve (Minn.); SGN (Me.); W. Fla. Fone (Eve'); W. Fla. Fone (Morn); PEN (Sask.-Alta.-Man.); NTTN & NTX (Texas); WSSN & WIN (Wis.); SCN (Calif.); GSN (Ga.); CN & CPN (Conn.); WSN (Wash.); RISPN (R.I.); GBN (Ont.); CCW (Colo.); NJQ & SDN (S.Dak.); S. Dak. 75 Phone; SCN (S.C.); ILN (Ill.); BUN (Utah); MDDS (Md.-Del.-D.C.).
[3] TCC functions reported, not counted as net sessions.

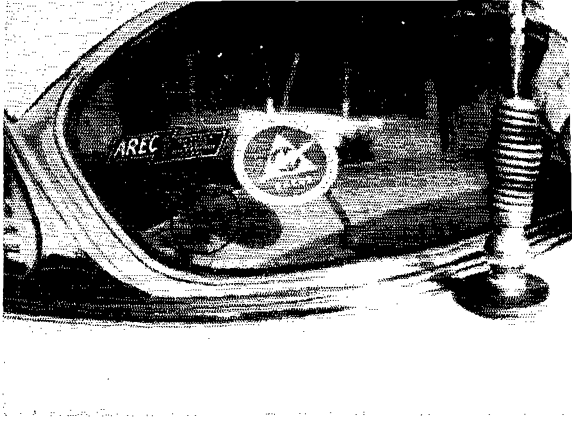
Well, by dint of extended effort on the part of section nets, we managed this month to top the previous record high for number of sessions. Traffic total is considerably down, however. Note that we do not late-list section nets. If your report doesn't get here by copy time, it is not included.

W1BVR has awarded 1RN certificates to the following: *K1s* APR BBK GGG ITS JCC KSG LBB MEM MHM MPM MZB *W1s* BYH BKG EIB NTH RZG TXL YBH YK, K2RMQ/1, K5OEA/1. W3UE points out that 3RN has had 100% representation from sections for three consecutive months, and that the E. Pa. section has been represented in 372 consecutive sessions. A 4RN certificate was issued to K4ZYI who helped Georgia make 100% representation in April. West Virginia is slipping again, on 8RN. Three TEN sessions were washed out by conditions, four unreported by the NCS. W9DYG celebrates his first year as CAN manager and hopes to remain for at least another year. PAN is experiencing plenty of difficulty with QRN, particularly in the mountain area, but hopes to remain on 80 meters for a while longer.

Transcontinental Corps. Eastern area TCC is having some trouble with the B (EAN to PAN) function; W1SMU is trying to reorganize and coordinate. Conditions have slowed things down on PAN. Conditions are going to get lots worse before they get better, so stick in there, you guys. April reports:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	99	89.9	1858	646
Central	90	94.4	2308	1120
Pacific	97	95.9	1832	910
Summary	286	93.4	5998	2676

The TCC roster: Eastern Area (W1SMU, Dir.) — *W1s* AW EMG NJM OBR SMU WEF, *W1.2s* APY COO, *K2s* SSX UFT, *W2s* EML FAF WG WRE, W4DVT, *W3s* ELW UPH, VE2AZI/W1, VE3CWA. Central Area (W0BDR, Dir.) — K4AKP, *W9s* DYG CXY DO ZYK, *WØs* LCX SCA BDR.



The new AREC decal stands out well, along with RACES and Red Cross decals on the mobile unit of W4IYT.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for April Traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	246	1321	1015	296	2878
W0BDR	106	868	761	4	1739
W0LGG	259	663	628	35	1585
W0LCX	20	684	600	84	1388
W6YDK	1108	78	51	27	1264
K0ONK	161	535	528	12	1236
W9JOZ	18	524	538	3	1083
K4AKP	46	481	457	24	1008
VE2AZI/W1	25	492	458	5	980
K2UAT	191	377	333	59	960
W7BA	10	454	424	30	918
K6BPL	66	416	349	67	898
K8EPT	10	431	226	205	872
W6WPF	54	378	356	15	803
W8UPH	9	394	342	51	796
W6GYH	144	355	280	7	786
W3EML	20	378	360	20	778
W9DYG	39	387	313	36	775
W7DZX	10	358	311	39	718
WA6FCO/4	521	87	68	19	695
K0WWD	141	277	199	78	695
VE3CWA	87	291	254	18	650
W9ZYK	28	287	245	71	631
W3VR	46	291	272	11	620
W8DAE	42	293	192	66	593
W0KIK	55	524	7	1	587
K4BJH	117	271	194	0	582
W1SMU	11	287	263	9	570
W0DUA	13	275	281	0	569
WA6ECF	33	259	228	26	546
K3HWX	?	268	230	38	543
K0ORK	37	252	217	30	536
WA2CIG	29	250	240	10	529
W5ZHN	13	256	196	59	524
W9IDA	15	248	244	4	511
K5USA	4	254	249	2	509
Late Reports:					
W6WPF (Mar.)	167	498	484	14	1163
K2UAT (Mar.)	196	408	349	43	996
W6GQY (Mar.)	345	121	346	101	913
WA6ECF (Mar.)	71	372	328	30	801
K6EPT (Mar.)	20	247	146	101	514

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB	78	1782	1759	23	3642
K6MCA	44	673	640	20	1377
W4LEV	139	194	176	5	514

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

K1BCS	283	K8KMQ	141	K9AOM	115
W6GQY	193	K3JYZ	138	W9TT	110
K5MBK/5	183	W2GKZ	123	W0IZO	104
K8AAG	172	W5SMK	122	K6ROU	101
K7BKH	162	W9AIM	122	WA2CCF	100
W9NZZ	156	W3KUN	116	Late Report:	
K9OZM	151	K4BSS	116	W4GJI (Mar.)	118
K6GK	150	W2EW	115		

More-Than-One-Operator Stations

W5AC	156	K1JAD	114

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: WA2GQZ, K3HWX, K3KPD, K4KDN, K4VDU, W0DUA, K0RRL.

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

RESULTS, FEBRUARY F.M.T.

The February 15–16, 1961 FMT, open to all amateurs, brought entries from 331 participants who made a total of 1147 measurements. Of these, 140 ARRL Official Observers submitted 449, and 191 non-OOs made 698 readings. All taking part have received individual reports of their readings. The standings accredited to the more precise in each group appear below; all listed show ability of the highest order in Frequency Measurement. September *QST* will announce details on the next ARRL FMT.

Observers	*Parts/ Million*	*Non-Observers*	*Parts/ Million*
W4JUI	.0	W6YAW	.1
W8CUJ	.0	K3KSI	.2
W8YCP	.1	W1PLJ	.3
W5NKH	.2	W8GQ	.3
W4CVO	.3	K8VLI	.6
KØOVQ	.3	W9TZN	.9
W8GBF	.5	K6HI	1.1
W6GQA	.8	K9PHE	1.1
W2AIQ	1.9	KØLTH	1.1
K6MIZN	2.1	W6MMC/7	1.4
W2LS	2.2	K4UYY	1.6
W5FMO	2.7	WØSUD	1.6
W4CMP	2.8	W3AHZ	1.7
KØJCF	4.3	W6FVO	2.7
K7BWV	4.9	W4TL	2.9

HIGH SPEED CODE TEST RESULTS

The Connecticut Wireless Association's high speed code proficiency program is beginning to suffer from the law of diminishing returns. The March code test was transmitted by three stations: W1NJM simultaneously on 3637 and 7120 kc.; K6DYX on 3690 kc.; and W6EOT on 7005 kc. Fifteen certified copies of the texts at various speeds were received, of which ten operators qualified as follows: At 60 w.p.m., W6EAR and K9AUB; 55 w.p.m., James Truly; 50 w.p.m., W6OAZ, K6SST, WØKCG; at 45 w.p.m., W2UAP, K6GZ; 40 w.p.m., WA6FKN, WA6HWB. Failing to qualify: At 60 w.p.m., KØILM; 50 w.p.m., W2CVW; 45 w.p.m., Gordon Bent; 40 w.p.m., K6JEI, W4USM.

Conditions were not the best on Mar. 20, the date of the code test, and many reported QRM as being a contributing factor to missed copy. Ten additional operators reported that they copied or tried to copy but were unable to get enough to make submission worth while for one or both of the above reasons.

The next code test is tentatively scheduled for Sept. 11, call up starting at 0100 GMT as usual. W1NJM frequencies will be as above, other frequencies and stations will be announced later. Watch the W1NJM code practice sessions (each Mon. at 0130 GMT) for announcement of further details.

DX CENTURY CLUB AWARDS

HONOR ROLL

W3GHD....311
W4DQH....310
PY2CK....309
W6AM....309
W2AGW....309
W8JIN....308
KV4AA....308
W2HUQ....307
W6CUQ....306
W3KT....306
W9RBI....306
W8BRA....306
W3JNN....305
W8DMD....305
W9YFV....305
W1ME....304
W7GBW....304
W7GUV....304
W5ADZ....304
W1GKK....303
CE3AG....303
W6EBG....303
W8BF....303
W8BKP....302
LU6DJX....302
W5ASG....302
W8UAS....302

Radiotelephone

PY2CK....309
W8GZ....302
W8BF....302
W3JNN....299
W9RB1....299
VQ4ERR....298
W8KML....297
W6YY....296
4X4DK....296
CX2CO....296
W6AM....295
ZS6BW....294
W7PHO....294
W4DQH....292
W3RIS....289
W1FH....289

From April 1, to May 1, 1961 DXCC Certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

W4EEE....242
WØOQK....183
W5INL....173
K2KFP....132
SP9TA....120
W9MGZ....118
SP2DX....116
K4DSW....115
K4HDQ....115
JA3SJ....114
W5JD....113
W4HUE....112
JA5FQ....112
WA6EPQ....109
W5NGW....105
LA8GF....104
PI1MID....104
W3GQF....103
W5CXU....103
K9UHH....103
K2ZCD....102
K4MPE....102
W5FJV....102
W7MAH....102
W8HNY....102
W9LVO....102
DL4LE....102
ZS6YB....102
W4HOS....101
W4CWO....102
K6ENO....102
KH6DLF....102
K2JDW....101
K1AEY....100
W2WJS....100
K4YYL....101
W8OCK....101
W9EYC....101
K9JZE....101
K9PNV....101
W1SIK....100
WA2IDM....100
K5OGP....100
K8AEB....100
K8ANX....100
W9MDF....100
WØZAQ....100
VE2AZN....100
OZ4LP....100
OZ9U....100
W4EWI....100
K4HMX....100
W9EYC....100
G5WO....100

ENDORSEMENTS

W1BIH....301
W1CLX....301
W2HMJ....301
W1JYH....300
W2LPE....300
W3GAU....300
W4TM....300
W9HUZ....300
W2GUM....290
W5KC....290
W7KTN....289
W9AMU....287
WØNTA....281
W9UXO....273
W1HX....272
W2BPS....271
W4AZK....271
W8EV....271
W2BRV....270
W4BYU....270
W5BZT....270
W3RNQ....267
W8GLK....263
W9YNB....262
K6KII....260
W9FVU....260
W9RKP....260
WØBCI....260
LA3DB....260
W2DGW....254
W5TIZ....253
W6ANN....251
W8VDJ....251
II8M....251
W1HGT....250
W2PCJ....250
K5BGB....250
W5BRR....250
K2SHZ....249
W4GQY....249
K2UVU....246
K6RWO....241
W88JU....241
W2FXA....240
W4DKP....240
W8SZS....238
W8ZCQ....236
K5KBH....233
I1UA....232
W4WDI....230
W4JAT....229
W6ONK....223
W9UZS....221
W2TP....220
W3AXT....220
W3RBW....220
W4UKA....220
G2BVN....219
W2QKJ....216
W5ERY....211
W9HQF....211
F8EJ....211
VE2BV....203
W3WPG....202
ZK1BS....202
W1FTX....201
W4CKB....201
WØOJW....201
K2QHL....200
W8JXY....193
KØRAL....192
W9MBF....191
W4BFR....190
K4RJN....190
K2ZKU....190
PAØVO....186
W2GZZ....183
K9PPX....181
PAØZL....181
W2LNB....180
W2QQ....180
W7BTH....180
W9QFC....180
VE3CIO....180
K9GZK....179
KP4AOO....173
W4CXQ....171
W6UNP....171
K1IFJ....170
W3HER....170
SP6FZ....170
ZL1AMO....166
K2DJD....165
HZ1AB....164
OA4FM....164
W6JH....162
W4EJN....161
W2FLD....160
W6CBE....160
W8KMD....160
W6BFW....159
HB9EO....159
K4EDF....152
K8GHG....152
W7UVR....151
DJ4OP....151
W7GPP....150
VE3BMO....150
OH2VZ....150
ZE7JV....150
OE1FT....149
ZL2GH....147
K4JEY....146
KH6NV....143
W3UDN....142
W6BZ....142
W2ZX....280
W8VDJ....251
II8M....251
ZL1KG....251
W9JJF....241
W5TIZ....233
I1UA....231
W1CLX....222
F3DJ....220
DL6VM....202
W1HJB....200
W8SKO....200
LU8CW....199
W4TDW....191
K5JEA....190
ON4BX....187
W1HX....184
W8SZS....183
W2QKJ....181
W3AYD....180
W5HWX....180
ZK1BS....180
W5INL....172
W4BYU....171
I1ASO....151
W4HRR....150
W8JXY....150
F8MY....150
W1DGJ....140
W3QIR....130
K9PPX....130
KØTJW....125
W9CYL....124
SM5VS....123
W4BQY....122
F8WF....122
K2OEA....120
KØRAL....112
K8LSG....110

U.S.-Canada Call Area and Continental Leaders

KH6CD....261
KL7PI....249
WØELA....300
VE1PQ....256
VO1DX....251
VE2WW....251
VE3DIF....260
VE4XO....200
VE5RU....220
VE6NX....256
VE7ZM....297
VE8AW....195
ZS6BW....294
4X4DK....299
G3AAM....300
G4CP....300
ZL2GX....300

Radiotelephone

W2BXA....283
W5BGP....256
KH6OK....261
KL7AFR....190
WØAIW....283
VE1PQ....161
VO1DX....141
VE2WW....226
VE3QA....241
VE4RP....102
VE5RU....203
VE6TF....181
VE7ZM....277
EA2CQ....270
ZL1HY....288

W1AW SCHEDULE

(July, 1961)

(All times given are Greenwich Mean Time)

Operating-Visiting Hours:

Monday through Friday: 1700–0500 (following day).

Saturday: 2300–0630 (Sun.). Sunday: 1900–0230 (Mon.).

Exception: W1AW will be closed from 0500 July 4 to 1700 July 5 in observance of Independence Day.

A map showing how to get from main highways (or from Hq. office) to W1AW will be sent to amateurs advising their intention to visit the station.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules.

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800.

Phone: 1820, 3945, 7255, 14,280*, 21,330, 29,000, 50,700, 145,800.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes.

Times:

Monday through Saturday, 0000 by c.w., 0100 by phone.

Tuesday through Sunday, 0330 by phone, 0400 by c.w.

General Operation: Use the chart on this page for times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in GMT, the operation between 0000 and 0500 each day will fall in the evening of the previous day in some U. S. and Canadian time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Tuesday, Thursday and Saturday, and at 5, 7½, 10 and 13 w.p.m. on Monday, Wednesday, Friday and Sunday are made on the above-listed frequencies (except 1820 kc.). Code practice starts at 0130 each day. Approximately 10 minutes' practice is given at each speed. On July 22, instead of the regular code practice, W1AW will transmit a certificate qualifying run.

*Single sideband.

OPERATING AIDS

Any of the following aids to more effective operation can be obtained without charge from the ARRL Communications Department, 38 La Salle Road, West Hartford 7, Conn.: ARRL Numbered Radiogram List, Net Directory, QN Signals for Net Use, RST System, CW Ending Signals, Phonetic Alphabet, WAS List, ARRL Countries List and DXCC Rules, Contest QSO Record (for avoiding duplicate contacts), DX Code, Safety Code, WAS Map, The AREC (Points Before, In and After Emergency).

GMT CONVERSION

To convert to local times subtract the following hours:

ADST −3, AST −4, EDST −4, EST −5, CDST −5, CST −6, MDST −6, MST −7, PDST −7, PST −8, Honolulu −10, Central Alaska −10.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050 14,060; *phone* — 3765, 14,160, 28,250 kc.

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 July 22 at 0130 GMT. Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted July 7 at 0400 Greenwich Mean Time on 3590 and 7129 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each day at 0130 GMT. Approximately 10 minutes' practice is given at each speed. Reference to tests used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date Subject of Practice Text from May *QST*.

July 6: *Codamite*, p. 11
July 12: *UE57zs in Grounded Grid*, p. 16
July 14: *Twins on Twenty*, p. 24
July 18: *A Roof-Top Mobile Antenna*, p. 26
July 21: *Balanced Detector in a T.R.F. Receiver*, p. 29
July 26: *The T Patch*, p. 34
July 29: *Ground Support for Project OSCAR*, p. 45

W1AW GENERAL-CONTACT SCHEDULE

(July, 1961)

W1AW welcomes calls from *any* amateur station in accordance with the following time-frequency chart.

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	.....	13,280	7080	13,100	14,280	14,100	.....
2200–2300	.....	13,280	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.

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ –SEC: DUI, RM: AXA, PAM: IVS. The Eastern Pennsylvania (EPA) C.W. Net meets nightly at 1830 EST on 3610 kc. The Pennsylvania Phone Net meets Mon. through Fri. at 1800 EDST on 3850 kc. HNK is NCS for the Pennsylvania Post Office C.W. Net and meets Mon. at 2030 EST on 3610 kc. BNR/6 is having his troubles obtaining auto call letter plates in W6-Land. For the first time since his appointment as OBS, DJW has had to delay Official Bulletin transmissions because of rig troubles. K3CAO has a new Heath "Sixer" and is working Delaware Co. and S. Jersey. New appointments: K3GAU and K3JJJ as OESs; K3KZG and K3CAH as OBSs. EML is gathering parts for a keyer; he thinks his 1923 model bug will give up the ghost soon. EU went on a trip through W9- and WO-Land with a 6-meter portable. The jr. operator of ID, who is SKL, is planning a June wedding. K3KNL has been having v.f.o. trouble and was inactive on the traffic nets. K3GAY also reports inactivity on the bands because he has been working up a speech on his Ph.D. K3KEL is moving to Montoursville. GYP was present at the Frankfort RC and Potomac Valley RC joint meeting. K3CNN received the Keystone Award and is now working 40-meter DX. K3KBO is using a new 10-15-meter beam and made necessary repairs to his v.f.o. K3BFA did some horsetrading and swapped all his 6-meter gear for low-frequency equipment. In the Philadelphia Area the Cupid Net meets at 11 P.M. Fri. on 50.85 Mc with K3KFD as NCS. New officers of the Ambler Teen-Age ARC are K3GND, pres.; K3LKK, vice-pres.; K3LZL, secy.-treas. The Philadelphia Electric RC put its club station, K3LDD, in the employees hobby show. While RKP, "Rubles, Kilts and Pennies," was in QSO with K3DQH, "Dimes, Quarters and Halves," K3HQD, "Halves, Quarters and Dimes," broke in. YLL is anticipating a location change in shacks. BUR is day shift and QRL EPA Net. Do you have a Conelrad alarm system in your station? The c.d. alert showed some stations did not. Regarding monthly reports, *it they are not at this office* by the 6th of the month, they will be late for publication. Traffic: (Apr.) W3CUL 2878, EML 778, YR 620, K3HWX 543, GSU 404, IMP 249, W3HNK 136, FAF 130, AXA 95, NNL 67, K3BHU 62, HTZ 62, CAH 44, W3KMD 37, CTC 35, AEQ 31, K3JLW 31, JSX 31, W3ZRQ 31, K3IPA 25, W3ISX 18, BFF 17, EAN 16, K3MYO 14, KBO 12, W3TEJ 9, ITI 7, K3NZD 7, W3ADK 6, BUR 6, K3CNN 6, W3HOF 6, K3KFD 6, LZL 5, W3GYP 3, K3KEL 3, LNM 3, W3PVY 3, K3GAY 2, KNL 2, W3ID 1, WQL 1. (Mar.) W3FAF 117.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—SEC: CVE. MDD Traffic Net meets at 1915 EST Mon.-Sat. on 3650 kc.; MDDS (slow speed) Net on 2030 EST daily at 3650 kc.; MEPN (phone) Mon.-Wed.-Fri. at 1800 and Sat.-Sun. at 1300 EST on 3820 kc. April appointments: K3BVJ as EC for New Castle County, Del.; K3IRF as OBS; K3JVB as OES; K3BVJ, K3GZK, K3MDL and W3WZL as ORSs. Section Net certificates went to K3GZK and K3MDL. Mark your calendar now for the big MEPN Picnic to be held at Braddock Hgts. Park July 23. K3APM sends in a good traffic count from Timonium. BUD reports the St. Marys AREC held a successful emergency-powered drill Apr. 1. The PVRC and FRC held their annual joint meeting Apr. 30, at which time FRC took the 1960 SS gavel! K3BVJ is back in Delaware and active as EC and ORS. CDQ *is recuperating from her operation.* K3CWG now has a slow-scan TV transmitter on. ECP maintains his activity in MEPN. The Foundation for Amateur Radio held it quarterly meeting at Ft. Meade with "Space Communications" as the subject. The FSARC was the host club for this well-attended Apr. 21 meeting. EFZ maintains his traffic activity. K3EIZ reports that several trainees have taken the Novice Class exam as a result of the Aero ARC code classes. K3EIY is busy in high school. EOV is busy with traffic and RTTY. BAY is building a v.f.o. for 6 meters. K3GZK liked his first CD Party. 4EXM/3 checks in again via KR6AM on Okinawa, and expects to be back in D. C. soon. HCE sends in an excellent report on amateur band activities during the Conelrad Alert of Apr. 28. K3HJD has a grounded-grid amplifier for 2 meters. HQE is busy mowing the grass. K3IRF is building a new keyer for his OBS skeds. K3IZM is assembling a new kw. linear. K3JIQ likes his new vertical and says it does FB on 10 meters. K3JVB has 150 watts and a new dipole on 6 meters. K3JYZ made BPL, which included 7 messages to the White House! JZY reports that the Frederick County RACES plan was in effect during the Conelrad Alert. Congrats to K3KHK on winning a cruise to the Bahamas as first prize for his Science Fair project. K3KHN reports on a good 6-meter opening. Outstanding certificate-holder K3KPZ reports that his dad is back on the air as RA. K3LFD enjoys traffic work and maintains a high level of activity. K3LJB is on phone. K3LLR is working on his 6-meter rig. K3LNH has antenna problems. K3LUQ has moved to Germany. MCG has another 60-ft. tower up. K3MDL had a ball at the Apr. CD Party. K3NKX reports from Johns Hopkins. K3OWS is a new ham in the Delaware Area. KN3OWX *is another new one.* KN3PEJ is active in Baltimore. Glad to hear that RNY is W3 winner of the VK/ZL Contest. OSF still is active as OO. TX keeps up his traffic skeds. K3WAG is MDD net control on Wed. K3WBJ is installing a new trap antenna. Congrats to ZAQ on being the section's most consistent OO reporter at this time. ZNW is keeping the slow-speed net going. Traffic: K3JYZ 257, WBJ 160, LFD 138, KPZ 132, MDL 107, W3ZNW 70, EFZ 63, K3MZY 61, JIQ 54, WAG 54, W3JZY 50, TN 44, EOV 41, K3APM 39, W3BKE 29, K3GZK 27, W3ECP 26, HQE 24, BUD 18, K3LUQ 12, KHK 10.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. RMs: W2BZJ, W2HDW and W2ZI. Officers of the Cherry Hill Amateur RC are K2LJY, pres.; W2FYS, vice-pres.; W2SDP, treas.; and WA2FGS, secy. The club has a 28-Mc. net Tue. at 10 P.M. The Gloucester Co. ARC and the Salem Radio Club had a tri-county joint meeting June 9. WA2CVV has a new antenna. WA2NPD is doing a fine job teaching code at the Gloucester Co. ARC, N.J. Phone and Traffic Net *totals for April:* 30 *sessions,* QNI 486 *and traffic* 180. W2ZI was reported heard in SM-Land during the recent 160-Meter QSO Party. Congrats to K2RXB, Margate, who has received the A-1 Operator certificate. K2SOX, Margate, is building a double sideband rig. W2IU, Absecon, has just returned from a trip to G-, GM- and EI-Land. Two newly-licensed XYLs reported in Burlington Co. are WA2SFW, the XYL of K2IDEI, and WA2SFX, the XYL of WA2IIJI. The Southern Counties ARC made extensive Field Day plans. The club meets at the Army Reserve Training Center, Northfield, NJ. NJN's April traffic total was 387. Many thanks to WA2GQZ, *The Scope* editor, and to K2VNL for their fine bulletins. The DVRA provided another fine get-together with its Annual Old Timers Nite. WA2KOK passed the General Class exams. K2MPV has enlisted in the Air Force. The Cumberland County Radio Club now meets at Friendship Hall, Buena. W2PAU is reported to be in Thule, with the next stop Clear, Alaska. K2HOD, Delanco, SJRA's *Harmonics* editor, received a commendation from ARRL Headquarters for the fine editorial work he has been doing. Our new SEC, K2ARY, plans a meeting of all ECs and Asst. ECs in the section to coordinate the facilities that are available for emergency communications. Keep up the fine work of reporting your activities each month. Traffic: (Apr.) W2RG 131, K2DEI 117, W2BZJ 97, K2ECY 58, W2ZI 56, K2RXB 50, K2MOV 48, K2EWR 26, K2SOX 12, K2SNK 10, WA2HJD 8, W2IU 6, WA2MEQ 2. (Mar.) K2ECY 30.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF and W2EZB. PAM: W2PVI. NYS C.W. meets on 3615 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, IPN on 3980 kc. at 1600. WA2CIG made PPL. Appointments: K2OQO as OO, K2LNG as OBS, K2DXV as ORS, WA2LSJ as OES WA2HEC as OPS. NYSPTEN CPs were earned by WA2CEA, WA2CEF and WA2GLA. The Eastern Wireless System meets daily on 7090 kc. at 2215 GMT. This takes the place of ESN and HTN, now defunct. WA2COO is net mgr. The RARA Hamfest was attended by more than 500 hams and was the usual

success under W2ICE, chairman. K2KNV won the NYS c.w. sending contest—23 w.p.m., no errors, with a straight key. Section hams performed their yearly stint for RACES by participating in OPAL '61. If you haven't volunteered your services it would be prudent to contact your local Radio Officer. If you don't know who he is, drop us a card. Plan to attend the 1st Annual N.Y. State ARRL Convention in Niagara Falls Sept. 15, 16 and 17. The Syracuse V.H.F. Roundup is scheduled for Oct. 7. Jamestown Area Radio Amateurs (JARA) elected K2TXB, pres.; K2DPA, vice-pres. W2JIE, secy.; and WA2IWF, treas. The club plans a hamfest for Sept. 23. The Greene ARC held its 3rd Annual "Marty-Gras," which drew a record attendance of 185. W2EMW has a tri-band beam. WA2PAC reports that a local 220-Mc. net has been organized. 222.5-Mc. f.m. is monitored at all times. K2RNX made DXCC. WA2ADK reports that the SWNYVHFA is going to establish a calling frequency on 6 meters. The RARA elected K2SSB, pres.; K2ISP, vice-pres.; K2UXP, secy.; and K2UCI, treas. The Utica ARC was incorporated. W2HQX was awarded a plaque and life membership in the UARC in commemoration of his 50 years of amateur activities. His first assigned call, "8BW," was issued in 1912. Congratulations. WA2GCH reports the Clinton County AREC has "aero-mobile." WA2JKC is on 2 meters and Marine unit WA2JOI is on Lake Champlain. Traffic: (Apr.) WA2CIG 529, W2RUF 279, WA2IYB 206, K2RTQ 201, K2TDG 178, W2EZB 112, K2QQK 77, WA2CRH 74, WA2GLA 69, W1JSH 2 62, K2QDT 62, K2JBX 60, K2SSX 58, W2PVI 52, W2ITU 38, W2PGA 38, W2COB 22, W2RQF 21, WA2HEC 20, WA2OTC 20, K2OFU 15, W2QQK 15, K2ULY, 14, W2MPM 13, K2RYH 10, WA2GCH 9, WA2HOH 9, K2MQA 7, K2BBJ 4, K2BWK 4, WA2EGX 2, WA2MCC 2, W2EMW 1. (Mar.) WA2GCH 62, K2BBJ 30, W2WUX 10.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: KUN, NUG and GEG. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The Keystone Slow Speed Net (KSSN) meets at 1830 EST on 3585 kc. Mon. through Fri. The call of SMV's XYL is KN3OXT, K3HSE has a new 10-meter beam. The Somerset ARC meets the first Tue. of the month in the Boro Bldg. in Rockwood. K3BGI is doing a fine job as editor of the club paper *Roof Garden QRM*. K3CLX has a new kw. linear. The Nittany ARC reports via *QST de K3HKK:* The Horseshoe and Clearfield Radio Clubs were guests of the NARC at the April meeting; K3CBF has a new electronic keyer; K3ISY has a new DX-100; JZF has a new Warrior linear. ZKR has a new G-43 receiver. The Cumberland Valley ARC reports through *Valley QRM:* The club mobiles did a fine job in the cancer drive; the club station, K3GFW, is on 75 and 10 meters with the DX-100. BJZ is putting up a broadside antenna on 75 meters. The ATA of W.Pa. had as guest speaker at its May meeting WRE, who spoke on and demonstrated her collection of telegraph keys. The Etna RC reports via *Oscillator:* OVM was speaker at a recent club meeting; ZPZ has a new jr operator; MUL is mobile again. The Horsehoe RC reports via *Hamateur News:* A new Novice is KN3PEC; the 6-Meter Net meets every Tue. at 1830; QKE and LQD are mobile on 6 meters. The Steel City ARC is digging out after a rough winter, putting up new antenna poles and repairing gear. WRE earned her BPL medallion. The Greater Pittsburgh V.H.F. Society is now publishing the *Radio Log*, with RTV as publisher and editor. K3JTH lost her tower in a recent storm. The Coke Center RC reports: The range station NAV is back in operation; K3JCM is now on phone; JW has taken on new duties as professor at California State College; K3HTR and NCE now are on s.s.b. UZB, MBF, MBN, LIV, QYG and K3GQA participated in the Feb. FMT and did very well. Traffic: W3KUN 243, MFB 139, WDZ 69, SMV 68, K3DKE 26, W3YA 16, UHN 15, K3GQA 14, HSE 10, W3MBN 10, KNQ 9, K3CLX 8, W3BWU 4, K3COT 4, W3SYY 1.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP, RM: USR, PAM: RYU. EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CDT. Only a few weeks remain to register for the Central Division Convention, which will be held in Springfield, Ill., Sat. and Sun., Aug. 26 and 27. A very fine program has been promised for all. XYLs, YLs and OMs alike. A gala array of exhibits also will grace the convention hall and the latest in gear will be exhibited. The Starved Rock Hamfest, which played host to hundreds from the Midwest, had as its featured speaker IHDQ, from the ARRL Headquarters Staff. Dire tor Doyle GPI and Vice-Director HPG, together with your SCM PRN, also were present. The property toll during the tornados and floods of May 7, which ravished southern Illinois, was kept at a minimum because of the fast action of the weather nets and affiliated civil defense program. The featured speaker at the Western Illinois Hamvention was General Homer, the c.d. director of the State of Illinois. K9OZM and K9UOV report that the Illinois Training Net meets Tue. and Thurs. at 0100 GMT on 3740 kc. TZN, HPG, GFF, JJN, REC, VOX, K9JLR, K9CIL, K9JTD, K9GDQ, K9BAR, CWH, DZB, FLQ, HKA, K9RDY, KCR, K9QMJ and ZIV were participants in the recent Frequency Measuring Test. New Novice calls heard were KN9FER and KN9DZN. From all reports of the Official Observers, there were many violations of the Alert during operation OPAL '61. KCR received his WAC certificate. K9IAG was appointed EC of Macon County, and MC was appointed ORS. PVD's new QTH is Springfield, Ill. The Springfield and Sangamon County RACES are now on 145.350 Mc., together with their old 53.46 Mc. frequency. AXV is sweating out her WAS. The new Radio Officer for Joliet is K9HUY. The Midwest YL Convention, sponsored by the Chicago Young Ladies Radio League, Inc., was an FB affair with a varied program. UYP and YJF are working 2-meter DX with the Heath "Twoers." The ILN handled 301 pieces of traffic in 24 sessions and the North Central Phone Net traffic count was 161. USR, NCS of ILN, wishes to enlist more downstate stations. K9HVE had an unusual 20-meter contact with a passenger just off the captured Portuguese liner via PY7CP and enjoyed an hour-long QSO with discussion of the 12-day mutiny. One of the new signals being heard is the Northwestern University Settlement Radio Club station. This station, originated by the Jaycees, is aimed at bringing in boys off the street and introducing them to this fascinating hobby. IDA and K9OZM are recipients of the BPL certificate for April traffic: Traffic: (Apr.) W9IDA 511, K9OZM 406, W9DO 404, IMN 334, USR 214, K9UGY 213, CRT 141, UOV 114, W9JNV 83, K9QAE 53, SCP 49, TVA 39, W9FAW 38, K9KLS 27, W9SNL 27, K9LXG 25, QYW 25, WEG 23, W9PRN 20, K9RAS 20, OCU 12, BIV 9, W9JJN 8, LNQ 5, KN9BGV 3, K9QMJ 2, QPJ 2, RHU; W9WPC 1. (Mar.) K9UOV 177, W9IMN 105, K9KLS 12. (Feb.) W9IMN 89.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ. PAMs: K9AOM, BKJ, K9PFQ and RVM. RMs: DGA, TT and VAY. Net sked: IFN, 0800 daily and 1800 M-F on 3910 kc.; ISN (s.s.b.), 1930 daily on 3920 kc.; QIN (training), 1800 M-W-F on 3745 kc.; CAEN, daily at 1900 on 1805 kc. QIN, daily at 1900 and RFN, 0700 Sun. on 3656 kc. New appointments: K9LZJ as EC for Marion County, YDP as OES and PQQ as OBS. The Indiana Radio Club Council held its annual spring meeting at the Memorial Union Bldg. at the University of Indiana with 100 in attendance. The Hoosier Hills Ham Club held its 2nd Annual Ladies Night and Dinner Meeting Apr. 8 with 80 in attendance. AQW has a new inverted "V" for 40 meters. GJS continues to keep daily traffic skeds on 7 Mc. The Duneland ARA held its annual banquet Apr. 15 with 160 present. K9MAN has a new HT-37 and has joined the s.s.b. boys. K9PNP is looking for c.w. skeds on 6 meters. New NC stations for CAEN are K9IZK, K9PFQ, K9UOV, K9RPE, K9VIM and K9RAS. TEJ is using a 300-ft. tower on 147.3 Mc. f.m. Bulletins can be heard on all bands in Indiana, including 6-meter c.w. and a.m., 2 meters and 147.3-Mc. f.m. and look for K9RFW on 3,615 and 14,084 Mc. on f.s.k. The IRCC's Field Day plaques and Indiana's Outstanding Amateur Award will be presented at the Council's Hamfest and Family Picnic at Garfield Park, Indianapolis, July 16. The Hoosier Amateur Women's Klub (HAWK) announces a new Eye-lash Certificate in addition to its present certificate. Contact K9ILK, certificate custodian, for particulars. *Amateur radio exists as a hobby because of the service it renders.* April net reports: K9PFQ reports 37 for CAEN; VAY reports 201 for QIN and 67 for QIN (training); IFN totaled 342, reports RVM; K9AOM reports 313 for ISN; and TT reports traffic at 59 for RFN. Those making BPL: JOZ, ZYK, MAI, TT, K9AOM and NZZ. Traffic: (Apr.) W9JOZ 1083, ZYK 631, MAI 381, TT 304, NZZ 274, K9AOM 260, W9VAY 143, K9WET 115, W9EHZ 85, K9GLL 80, KN9CMG 73, W9CC 69, SWD 69, K9OET 61, SSI 60, W9GJS 55, RVM 52, K9PUI 51, RMQ 41, W9DOK 40, K9LZN 40, TQE 38, W9RTH 37, QYQ 34, DZC 33, DKR 32, K9GBB 30, W9EJW 22, FWH 21, K9VRU 19, DCX 16, ILK 14, WJC 14, KTL 13, W9YVS 12, FJI 11, BUQ 10, CRS 10, SNQ 10, TEJ 10, K9MAN 9, W9YYX 8, K9IXD 2. W9AQW 1. (Mar.) K9OET 85, MAN 21.

WISCONSIN—SCM, George Woida, W9KQB—SEC: BCC. PAMs: NGT and NRP. RMs: VHP and VIK. New appointees: K9QDA as EC; IHW as EC; K9IHDL as OPS; K9JVP as OO Class III and IV; IQW as OO Class III and IV. BEN certificates went to K9VER and AYK. Results of the February Frequency Measuring Test show that YRO made 6 checks on 3 bands with an average of 39.6 cycles off. GFL made 3 checks on 2 bands with an average of 89 cycles off; RKP made 5 checks on 3 bands with an average of 114.2 cycles off; ONI made 4 checks on 2 bands with an average of 274 cycles off; K9GSC made 5 checks on 3 bands with an average of 342 cycles off. Winners in the Wisconsin State

(Continued next page)

QSO Party were K9JXW for phone only; score 6330; K9LWV for c.w. only, score 2900; W2MTA/9 for phone and c.w., score 1904; SZR/m for mobile, score 657; KN9AAS for Novice, score 352. The Salvatorian Seminary at St. Nazianz has begun a license training program with 10 enrolled and is on the 80-meter Novice band with the call KN9YWN. K9UGJ has 40 states confirmed for one year's operating on 6 meters. K9UTQ received his 25-w.p.m. CP sticker. KN9FAF is a new XYL operator in the Portage Area. Win member and ex-Wisconsinite W8WQH is the proud father of son No. 7. 1QW is back on c.w. for traffic with a 32V-3. The Jefferson County Club elected K9YDY secy.-treas. At the recent Manorad Club banquet, GPI extended congratulations to BZU for 35 years of continuous ARRL membership. Plan to attend the Wisconsin Net Association Picnic at Fond du Lac July 9. Traffic: (Apr.) W9DYG 775, CXY 279, K9GDF 84, W9KQB 80, K9JXW 74, LIT 48, VSO 47, W9VIK 41, YT 39, VHP 38, NRP 24, MWQ 22, K9DOL 17, HDL 17, W9ONI 16, K9GSC 14, W9WJH 9, OTL 7, K9VER 6, YDY 6, UTQ 2, W9ZB 2. (Mar.) K9WIG 9, W9SIZ 8.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—RM: KTZ. PAM: KØKJR. CAQ has had his appointment as EC of Cass County renewed. An OO appointment has been issued to CDO. HNV reports he has a transister 160-meter rig on the air. It uses two N169 transisters and puts out about ½ watt. He had a c.w. QSO with KØVIK on Apr. 30. He plans to try it on phone. A new ham in Williston is W5FTV. The North Dakota 75-Meter Phone Net report for the month of April: Number of sessions 25, total number check-ins 568; maximum check-ins 30, minimum check-ins 10; formal traffic handled 74, informal 62, relays 8. Traffic: KØIVQ 276, MPH 81, ITP 77, WØPHC 38, CAQ 34, KØGRM 32, WØYCL 23, KØTYY 22, AZX 20, GGI 15, WØHNV 15, KØPVH 15, KJR 12, WØMQA 12, AQR 11, IHM 8, KØKBV 8, TVI 6, WØBHT 4, KØUPQ 3, RRZ 2, UTL 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN, SEC: SCT. New South Dakota calls: KNØFVV, KNØGBC and KØCXK, Rapid City; KNØGZZ and KNØHAA, Ipswich; KNØIBY, Sioux Falls; KNØHQD and KNØHPY, De Smet. KØIOB, Baltic, and KØSZM, Canton, received General Class tickets. SCT has appointed KØDPD as EC for Beadle, Hand and Jerauld Counties, KØVYY as EC for Corson and Dewey Counties and KØZMA for Butte and Harding Counties. MPQ, KNØEEZ and KØESC have joined the Sioux Falls 2-Meter Net, making a roll call of 28. KØSZJ has completed the W2AZL 144-Mc. converter. KØUDF is the fourth Sioux Falls station on RTTY. The Hi-Lo ARC, Sturgis, conducts a weekly Novice net on 3717 kc. at 0900 MST. ZWL reports 2622 stations signed in to the WX Net this season. RWE and I visited the EMCARC, Ipswich, Apr. 21. Spring breezes brought KØALU's beam to the ground, while he vacationed in Florida. Traffic: WØSCT 430, ZWL 292, BMQ 127, KØAIE 62, WØOFP 31, PHR 31, KØYNR 22, VYY 17, RQY 12, WØTNM 12, FJZ 10, KØSZJ 9, SEJ 7, WJT 7, WØRWM 6, KØYJF 6, BSW 5, WØPDW 5, KØVIZ 5, ZBJ 3, UXC 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles Marsh, ØALW. SEC: TUS. PAMs: OPX and KØEPT. RMs: PET and KØIZD. OPS KØSBB and ORS ISJ were made NCSs for the MSPN. KØIKL placed third in the recent YL-OM C.W. Test. ORS DQL added an NC-300 receiver to his station. EC VTZ resigned because he is making his home in Arvada, Colo. RM PET called on URQ/KJZ. KØYMC, OXR and PJH, YLs, went mobile. The Hamline U. Radio Club members met in the home of KØLNE, who was host to the club and arranged an unusual program for the first meeting by having on-the-air 10-meter contacts with ARRL Director BUQ, "Old-Timer" JIE, and the Hennipen C.D. and RACES, each of whom introduced the club members into the field he represented. KNØCIB dropped the "N" from his call. The following participated in the Anoka County C.D. drill: WØs HEN, JHS, BSI, KØs CKT, OLG, BNS, GQA, GYS and RHM. KØRDA can be heard on 10-meter phone via a Ranger to a three-element beam; his receiver is an HQ-100C. The Johnson High School Club station is under the call KØSON. CRO spoke at the SPRC on "Zener Diodes." KØs SND and RGP, a "father-son," team are moving to Elgin, Ill. KØWWX has worked 28 countries on 6 meters. KØs ZZS, UKU and PWE won awards at the Science Fair for their scientific entries. KNØs FUI and FTX, of Howard Lake, received their licenses recently. KNØFVF has an Eico 720 and an S-120 receiver on the air. KØs AKM and VPP are new NCSs on MJN. KNØGDA is KØGIR's XYL, Karen. KØPWP, is a senior at Washburn High in Minneapolis. IRD spent a week in Duluth visiting fellow hams and friends. KØSNG renewed his ORS appointment; KØMEQ his EC. KØORK made BPL again. Director BUO attended the Directors' meeting in California. Traffic: (Apr.) KØORK 536, WØISJ 224, HEN 192, KJZ 165, KØSNC 137, QBI 113, WØOPX 89, PET 88, KØJCF 73, PML 66, SBB 64, UKU 60, WØKLG 52, ALW 49, KØEPT 47, LWK 44, WØLST 43, KØIKU 41, ZKK 36, AKM 34, WØBUO 30, WMA 29, KØBAD 25, WØRQJ 25, KØVPP 25, VTG 24, WØUMX 22, KØRHN 20, WØDQL 19, KØIZD 19, WYV 18, ICG 16, WØMXC 16, OET 16, ATO 14, NYM 14, KØJYJ 13, WØRIQ 13, WVT 11, KØSNG 9, WØSLD 8, KØVPJ 6, WØFGP 4, THY 4, SZJ 3, KØVXW 3, KNØEUH 2, KØKYK 2, MEQ 1.

DELTA DIVISION

ARKANSAS—SCM, Daniel Patterson, W5SMN—SEC: K5CIR. PAM: DYL. RM: K5TYW. The OZK C.W. Net is doing OK, but more members should check in. Quite a lot of traffic can be picked up and you will meet a good bunch of boys. We have a new Novice in Prescott, KN5TFC, and another Novice awaiting his General Class ticket so the activity will pick up around there. All RACES stations should now have their tactical calls. The S. E. Arkansas Amateur Radio Club has a new paint job on its comm. bus. Thanks to the Vocational School, Jefferson County overhauled it and bought a new battery. Application has been made for a club station at the Arkansas Vocational School with CAM as trustee. The equipment possessed by the school consists of an HT-37, a Johnson linear, an HQ-180, an RME converter, a Seneca, a Telerex tower, CRD, etc. The club is sorry to lose FVM but is gaining ZZA and his XYL, CAO, KN5EDH, in Fayetteville, moved from 7-Land Apr. 11 and already has worked 18 stations from his new QTH. He is soon going to try for his General Class license. Traffic: K5USE 308, W5DTR 196, SZJ 31, K5IPS 20, UEK 10, MEA 9, W5SMN 8, K5ABE 4, W5DYL 4, CAF 2, K5TYW 2, VOL 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—New ORS appointees include K5VHJ, WGC, ZAK, UJK, K5QXR, K5KTV, K5CDC, K5ISY and K5QXV. New OOs are LJY and K5RSG. Your SCM held meetings at Lake Charles and Alexandria. The hamfest at Lake Anacoco was a grand success with 162 hams from Louisiana, Arkansas and Texas attending. K5ANK was voted the best known YL ham. The jr. operator of BQH won first prize, K5JRK second and K5ATL third. BV won a prize for being the oldest ham, SGB for coming the farthest. K5AUN for being the youngest. We note the passing of LT, of Donaldsonville, Apr. 18. KC, after taking part in the post office department's command post exercise on Feb. 22, received a letter from the department congratulating him on making the highest score and presented him with the spring issue of the *Call Book Magazine* as a prize. EA has his new DX-100 going. K5CZV is on RTTY receiving and transmitting with a Model 15. MXQ has so many irons in the fire his traffic count is taking a beating. CEZ has a 10-kw. 220-volt a.c. generator. K5LZA expects to bring up his traffic total during the school vacation. K5VHJ is Alt. NC on the Gulf Coast Hurricane Net, at 2330 GMT on 3926 kc. HHA is Alt. NC on the Delta 75 S.S.B. Net, on 3905 kc. each evening at 6:30 CST. K5QXV will be on s.s.b. with an SB-10 and a Ranger soon. K5CDC reports activity in the c.d. exercise and he is building a new 500-watt amplifier. K5USO has his vertical going and reports a good traffic count. Traffic: W5CEZ 294, K5CZV 172, USO 95, VHJ 41, QXV 34, LZA 17, W5MXQ 14, K5EFN 12, W5HHA 11, K5CDC 8.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—The convention at Chattanooga was an FB affair, with several from Mississippi there. K5VOK had his rig at the recent Scout Exposition. The state c.d. director says that over 100 messages were handled in the section by RACES members during OPAL '61. Congratulations were received from the regional director also. ALZ made a fine showing in the recent Frequency Measuring Test. I am now receiving publications from the Natchez and Jones County Clubs. Thanks, fellows, I enjoy them very much. DLA is NCS of the Hoot Owl Net. He keeps biweekly skeds with Guam. K5MDX made 23,735 points in the Apr. C.D. Phone Party. K5AFP is active as OBS now. He has a Valiant on the air. New appointments are CUU and DEJ as OBS and OPS, K5PYS as EC. Traffic: K5RUO 81, W5DLA 20, K5AFP 17, MDX 6.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4OUK. PAMs: W4PQP, W4UVP and W4VQE. RM: K4AKP. The Loudon County ARC is planning a permanent home. New officers of the Roane County Club are K4TKQ, K4VKJ and K4NWP. A new club in the Memphis Area is the Delta Radio Club with K4VIS, K4VLM, W4OGG, K4RKQ, W4BS, W4GQQ and K4KWR as officers. W4PL reports that he has had to give up his busiest net and that he is unable to use the bug. W4TDW is building a parametric amplifier for 1296 Mc. W4OQG is QNI on TN with an Apache and an HQ-145. W4WXH has a new operating desk and a 40-meter antenna. Thanks to W4UOT for his service as PAM and welcome to new PAM, W4PQP. Traffic: K4AKP 1008, W4PL 357, W4FX 253, W4WXH 224, W4PQP 158, W4VJ 90, K4BWS 40, W4UIO 33, W4PFP 32, W4OQG 26,

(Continued on page 98)

ROMANCE ON THE HIGH C'S

(KC'S THAT IS)

It takes a Dayton Hamvention to bring out all that's new in this exciting hobby of ours. Take our entertainment suite, for instance. We're always happy to have hams of all types visit with us wherever we go. But here we had a special group of high speed c.w. men who had come up to visit that loveable old speed merchant, Jim, and maybe some others of us.

There were sidebanders, of course, including Dorothy, K2MGE; and Irv, K2HEA. (They, by the way, did their usual top-flight job of SSB panel moderating at the Hamvention.) Also there were Gus, K9EBA; and Floyd, W9ZVT; and a great many a.m. folks, too. The DX group was topped by Don, W4KVX; and v.h.f. was well represented by Sam, W1FZJ; and Helen, W1HOY. The c.w. group included Bill, W4DKK; George, W2GB; Don, W9SEM; Ray, W8CJK; Jim, W9TO; Stan, W4ZH; Sig, W9FOI; and some more of the fellows, of course.

So the question is, Without, say, Eileen or Flo or Mae or some other of the c.w. fairer sex — where's this romance? Well, a year ago at Dayton, W2GB brought his family to the Hamvention, including beautiful daughter Carol. Attending, too, was Ray, W8CJK. Carol had (then) no interest in things ham, and Ray — well, Ray's thoughts were only of eye ball QSO's with the other highspeeding c.w.'ers. Maybe it wasn't a short-circuit — but there certainly must have been a spark. Anyway, back in our rooms we learned that Carol and Ray have since become happily wed, and if you want to enjoy further details you must listen almost any evening on 7015 k.c. (or thereabouts) as the boys kid Ray at 45–50 w.p.m.

1. Who said c.w. was dead?

2. Many happy returns, Carol & Ray!

— Bill Halligan, W9AC

Bill Halligan Jr. W. J. Halligan W9AC for hallicrafters

"INVADER"

EXTENSIVELY FIELD

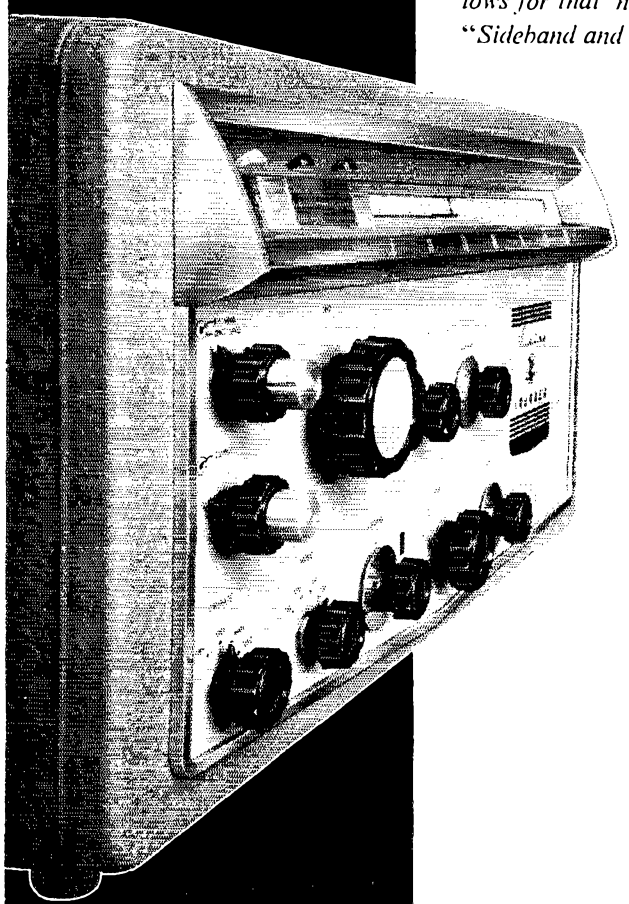
here are typical reports:

"Sideband never sounded so good!"

"Excellent penetration and an outstanding signal!"

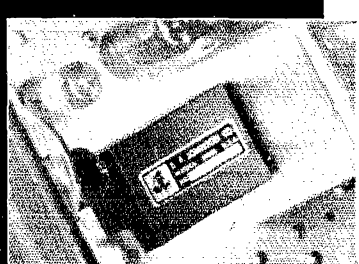
"Full-fidelity voice reproduction—picks up the lows for that 'natural' sound for the first time!"

"Sideband and carrier suppression is tops!"



Here's the transmitter with the sharp, penetrating signal you've been waiting for—plus *more* exclusive operating and convenience features than any other SSB Transmitter on the market today! A classic of modern communication equipment design, the "Invader" offers instant bandswitching coverage 80 through 10 meters—no extra crystals to buy—no realigning necessary—delivers a solid 200 watts CW input; 200 watts P. E. P. SSB input; 90 watts input on AM! Unwanted sideband suppression is 60 db or better! Built-in VFO is differentially compensated. Exclusive RF controlled audio AGC and ALC (limiter type) provide greater average speech power—high gain push-to-talk audio system has plenty of reserve gain for either crystal or dynamic microphones. VOX and anti-trip circuits are extremely smooth in operation—built-in anti-trip matching transformer—adjustable VOX time delay circuit. Mixer-type shaped keying is crisp, sharp—click and chirp free. Single knob wide range pi-network output circuit—fully TVI suppressed. Blocking and operating bias for noise-free T-R switch operation.

Cat. No. 240-302-2—Wired and tested with tubes, crystals and crystal filter. **Amateur Net $619.50**



superior to phasing-type units . . . sets a new standard in filter design!

EXCLUSIVE—Now, for the first time, not only **better** audio fidelity—but balanced audio response in a filter-type transmitter. The only equipment on the market using a specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db sideband suppression—more than 55 db carrier suppression! Select either upper or lower sideband instantly with a front panel "mode" switch.

the finest SSB signal on the air!

TESTED BY DOZENS OF UNBIASED AMATEURS!

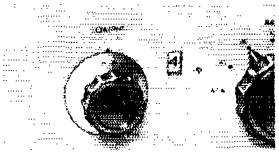
A BOLD STATEMENT FROM E. F. JOHNSON CO.

The sophisticated engineering and styling of the "Invader" is *unmatched* by other equipment within the amateur field—*bar none!*

Long recognized as the "first choice among the nation's amateurs"... Viking transmitters achieved popularity in a solid and healthy way. Known the country over as the line that gives you excellent engineering and performance, outstanding dollar value and more features at a popular price . . . the Viking line now achieves a new pinnacle with the introduction of the "Invader" and the "Invader-2000". We feel that the creative and imaginative engineering in the "Invader" sets aside "old fashioned" ideas that a unit is good simply on merit of the manufacturer's name alone! It has to perform—and nothing outperforms the "Invader!"

EXCLUSIVE—Converts to the Invader-2000, an integrated desk top transmitter, with the addition of high power conversion unit. (Remote power supply can be placed in any convenient location.)

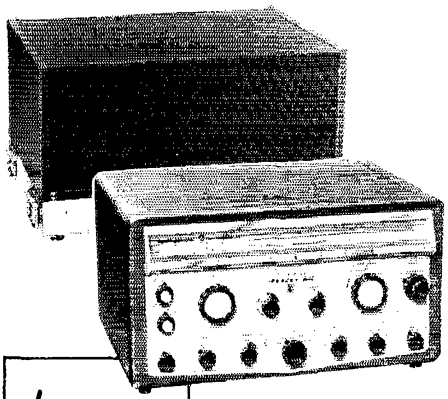
EXCLUSIVE—The only transmitter with both limiter ALC and audio AGC for an extra sharp signal! Reduces overdriving and flat-topping—increases average audio level for greater penetration and the **best** signal anywhere!



EXCLUSIVE—Single-knob wide range output circuit makes it possible to load into just about any conceivable type of antenna!

EXCLUSIVE—Full-time VFO heater element keeps VFO at operating temperature, even with the equipment turned off! No warm-up drift—rock-solid stability!

add hi-power conversion overnight for an integrated 2000 watt desk-top transmitter!



HI-POWER CONVERSION—Take the features and performance of your "Invader" . . . add the power and flexibility of this unique Viking "Hi-Power Conversion" system . . . and you're "on the air" with the "Invader-2000". Completely wired and tested—includes everything you need—no soldering necessary—complete the entire conversion in one evening!

Cat. No. 240-303-2 . . . Amateur Net $619.50

INVADER-2000—All the fine features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply completely wired and tested. Rated a solid 2000 watts P. E. P. (twice average DC) input on SSB; 1000 watts CW; and 800 watts input AM! Wide range output circuit (40 to 600 ohms, adjustable.) Final amplifier provides exceptionally uniform "Q". With multi-section power supply, tubes and crystals.

Cat. No. 240-304-2 . . . Amateur Net $1229.00

free **8-PAGE BROCHURE...** Yours on request ...complete specifications and photographs on the "Invader" and the "Invader-2000"!

FIRST CHOICE AMONG THE NATION'S AMATEURS

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★ HOW TO BECOME A RADIO AMATEUR

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★ OPERATING AN AMATEUR RADIO STATION

Anyone starting out in amateur radio will find these publications a necessary part of his reading and studying for the coveted amateur radio operator's ticket. Written in clear, concise language, they help point the way for the beginner. Tried and proven by thousands upon thousands of amateurs, these ARRL publications are truly the "Gateway to Amateur Radio."

$1.50

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- **Designed for round-table QSO's**
- **Eliminates unnecessary details**
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- **Each page is a QSO with basic data logged just once**
- **Each book is a permanent file**
- **Fits your desk; measures 8½ x 5½ closed**

This new log book puts the fun back in operating by taking the work out of log keeping. Designed for round-table QSO's, you log basic data only once on a page and fill in spaces for each station's call, handle, etc. Each page has a calendar and spaces for traffic summaries, schedules, and notes. You get a neat log as you operate; no more laborious transferring of notes to another book for permanent filing. Get 5 log books and a handsome vinyl cover in which to keep the current book on your desk, FREE with your Heathkit Amateur Gear order of $50 or more!

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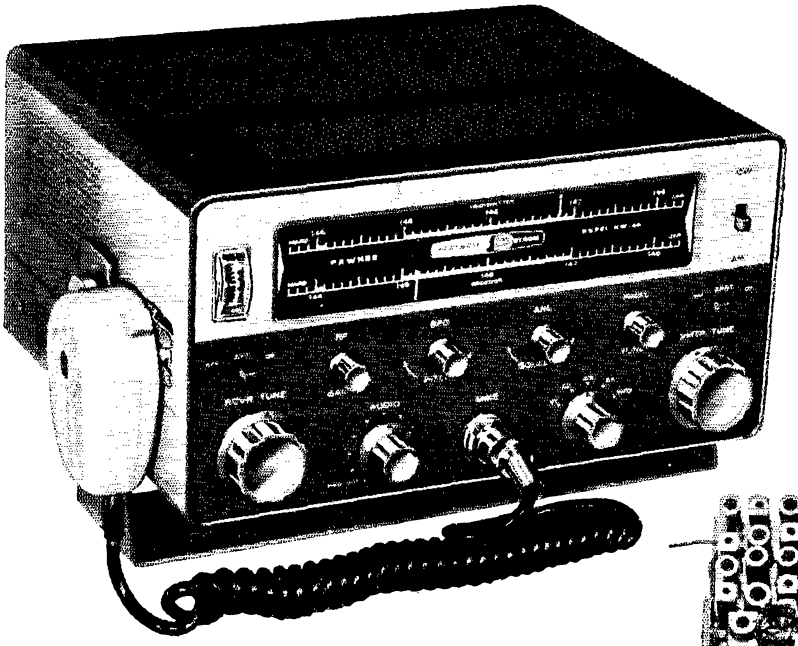
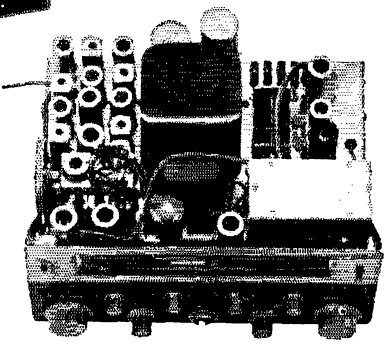




KIT HW-10 $199.95

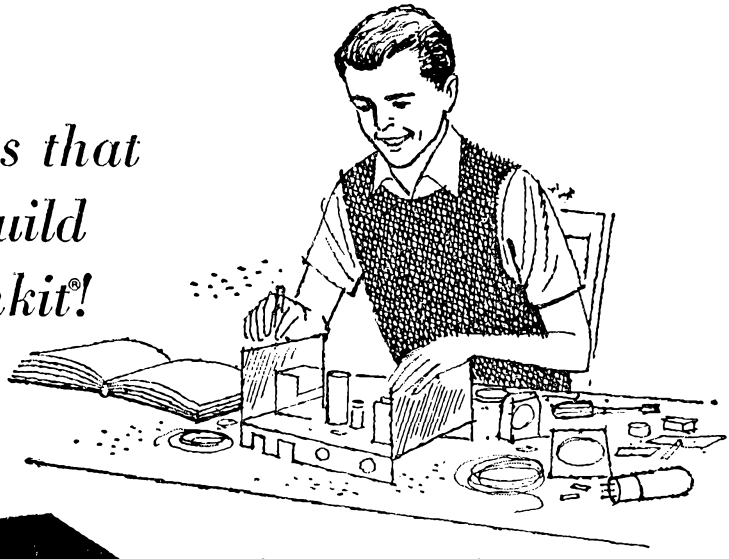
Compare features, performance, and price...and you'll choose Heath's new VHF transceivers, "Pawnee" and "Shawnee"

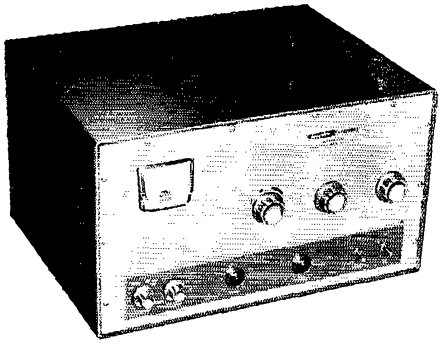
• Output: 10 watts nominal CW, 8 watts nominal AM • Built-in VFO • Tracked exciter stages for single-knob tuning • 4 switch-selected crystal positions • "Spotting" switch • Built-in low pass filter • Built-in 3-way power supply, 117 vac, 6 or 12 vdc • Push-pull 6360 final rf amplifier • Dual-purpose modulator provides 10 watts for plate modulation or 15 watts for public address operation with external speaker • Push-to-talk microphone • Double conversion with first oscillator crystal controlled, first IF and second oscillator gang tuned • Voltage regulated oscillators • Illuminated slide-rule dial • Tuning meter automatically reads signal strength or relative power output • Squelch and noise limiter controls • Built-in speaker • Heavy-duty AC & DC power cables • Primary fused relay • Complete shielding • Compact, 6" h x 12" w x 10" d • Recommended for the experienced ham kit builder; time approximately 70 hours.

KIT HW-10 (6 meter), **KIT HW-20** (2 meter)...$20 dn., $17 mo.....**$199.95** ea.

SPECIFICATIONS—Frequency coverage: (HW-20) 143.8 to 148.2 mc; (HW-10) 49.8 to 54.0 mc. **Noise figure:** (HW-20) 8.5 db or less; (HW-10) 6 db or less. **Sensitivity:** for 10 db S/N ratio, 0.5 uv or less. **Squelch sensitivity:** less than 1 uv. **Selectivity:** 15 kc at 6 db down. **Image rejection:** better than 70 db. **IF rejection:** 50 db. **Output impedance:** 50 to 72 ohms, unbalanced. **Transmit & receive power requirements:** At 6.3 vdc: 14.5 & 8.5 amps; at 12.6 vdc: 7.5 & 4.5 amps; at 117 vac: 120 & 60 watts.

Guarantees that you can build any Heathkit®!





- **Operates SSB, AM & CW on 80 through 10 meters**
- ***Exclusive internal RF shielding* for maximum TVI suppression**
- **Interlocked switching of HV for maximum protection**
- **Clean, functional styling—easy to build**

HERE'S THE RIG THAT'S WINNING PRAISES AROUND THE WORLD . . . THE NEW HEATHKIT "WARRIOR" G-G KW LINEAR

The HA-10 is a completely self-contained desk-top kilowatt linear, loaded with special features! • Amplifier and HV, filament and bias supplies are built in. • Drives with 50-75 watts, no matching or swamping network required. • Grounded grid circuit puts part of drive in output for up to 70% efficiency. • 4 paralleled 811A's, fan-cooled, and 2-866A's. • Oil-filled, 8 ufd 2 KV capacitor and 5-50 henry swinging choke for high peak power output with low distortion. • Neutralized, for high stability. • Best value in amateur gear. 100 lbs.

Kit HA-10...$23 dn., $20 mo.....**$229.95**
Assembled HAW-10...$33 dn., $28 mo.....**$329.95**

SPECIFICATIONS—Maximum power input: SSB-1000 watts P.E.P., CW-1000 watts, AM-400 watts (500 watts using controlled carrier modulation), RTTY-650 watts. **Output circuit:** Variable pi-network (50 to 75 ohms). **Driving power required:** 50 to 75 watts—depending on frequency. **Input circuit:** Broad banded—requires no tuning. **Input impedance:** 50 to 75 ohms. **Band coverage:** 80, 40, 20, 15, 10 meters. **Panel metering:** Switch-selected, grid current, plate current, high voltage and relative power output for ease of loading. **Tube complement:** 4-811A, 2-866A. **Size:** 19¾" W. x 11⅞" H. x 16" D.

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IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been tal king about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-T12TG)

OR IS K4ZRA THE NEW CHAMP?

Read his letter, and see his diagram of a typical installation and what it achieved:

2539 Christie Place
Owensboro, Kentucky

GOTHAM
Miami Beach, Florida

Gentlemen:

While I was at home last summer, I had occasion to use your GOTHAM vertical antenna on the air for about two months. I was quite amazed with the excellent performance of that inexpensive and simply installed antenna. It did everything you, K6INI, and others said it would, in spite of the generally poor band conditions during the summer months.

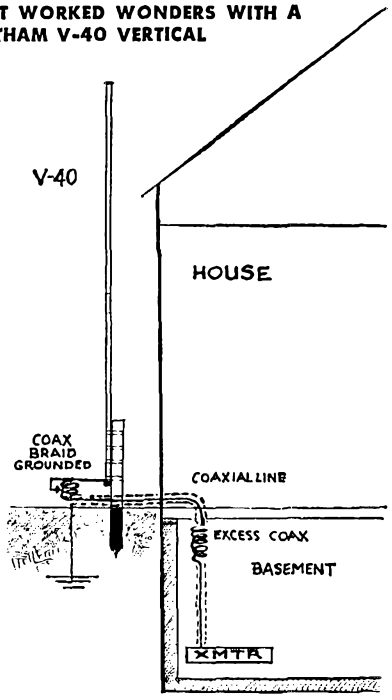
During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallicrafters reboxed SX-28.)

The above mentioned contacts were made with the vertical mounted several inches off the ground, without radials, with only a simple ground connection to the coaxial shield. Later I raised the antenna up about 20 feet and installed the radials and this improved the already good signal pattern and enabled me to pick off another 12 DX countries and other DX contacts in a couple of weeks of good band conditions. In the latter part of August I used several single-band vertical and ground plane antennas and found that the single GOTHAM vertical equalled all these individual antennas.

Another attractive feature is the versatility of installation. It works high or low on ground, with or without radials,

K4ZRA's INSTALLATION

THAT WORKED WONDERS WITH A GOTHAM V-40 VERTICAL



mounted in any space. Of course I did find that the best installations were the two mentioned above, but they were fairly simple to arrange, especially the first one!

The GOTHAM vertical is also a superior receiving antenna and I would strongly urge you to recommend that it be used for receiving as well as transmitting.

I just wanted to tell you how pleased I was with the overall performance of your antenna. For an inexpensive, easy-to-install, dependable antenna that really works for both DX and "local" W/K contacts, I don't see how one could ask for more and I would certainly recommend a GOTHAM V-40 to anyone desiring these features. Good luck in 1961 with those FB antennas!

Sincerely,
Daniel F. Onley, K4ZRA

FACTS

ON THE GOTHAM

V-80 VERTICAL ANTENNA

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph windstorms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. ONLY $16.95.

73,
GOTHAM

YOU COULD WORK WONDERS WITH A GOTHAM VERTICAL ANTENNA!

FILL IN AND SEND TODAY!

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

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Station Activities

(Continued from page 88)

K4FNR 14, W4PAH 10, W4UVL 9, K4PUZ 5, K4RIN 5, W4JVM 4, K4LPW 4, W4SGI 3, W4TYV 3, K4VOP 3, W4ZJY 3, K4KYL 2, W4VNU 2.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD – Asst. SCM: W. C. Alcock, W4CDA. SEC: W4BAZ. V.H.F. PAM: K4LOA. PAMs: W4SZB and K4OZI. RM: K4KWQ. The *Kentucky Net Procedure Manual* has gone to press and should be in your hands by the time you read this. If not, copies may be obtained from the SCM. Also available are license renewal forms. Net Directories, *Operating an Amateur Radio Station* booklets and other ARRL forms. K4LRX is thinking of buying an SB-10. W4ADH is working on a transistor mobile for 6 meters. K4KWQ has a new eleven-element beam for 6 meters. K4HSB is off while changing to a new Ranger. The ABC V.H.F. Club of Louisville is active with monthly meetings and programs. reports K4ZQR. WN4AGH has a new HRO-50 receiver. K4DFO sent five QO cards for operation during the Conelrad Alert. QO reports were sent by K4ZRA and K4ZQR. W4CDA reports the emergency trailer was a big success at the Scout Exposition. Traffic: W4BAZ 325, K4CSH 251, K4KWQ 193, W4CDA 48, W4SUD 33, K4OZG 31, WN4AGH 29, W4RNF 27, W4YYI 24, K4LOA 21, W4SZL 18, W4SZB 17, K4DFO 16, K4ZQZ 15, K4LMS 12, K4ZQR 7, W4VJV 4, W4WVU 4, KN4YZV 4, W4ADH 3, K4HSB 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: ELR. RMs: EGI, SCW, QQO and FWQ. PAMs: K8CKD and JTQ. V.H.F. PAMs: NOH and PT. Appointments: ALG, DXL and RHD as ECs; K8BZL and K8KVM as OBSs; BAN and K8SPW as OESs; VPC as QO; ALG, CQU and YAN as OPSs: EGI, K8EXE, HKT, JKX, OCC, K8QEX and YAN as ORSs. Officers of the Midland ARC are IAS, pres.; K8HGA, vice-pres.; K8QIG, secy.; K8AZB, treas.; K8HGA, act. Grand Rapids held its usual good hamfest. The Cos Calkins Award went to FSZ. The QMN Net Picnic will be held Sun., Sept. 10, at SCW's farm. Do not bring food. The SCVARC held a joint meeting with the Sarnia RC. JH's XYL won an SX-101 at Bay City. The Michigan Council of Clubs had a good meeting there. Grand Rapids also had about 1200 hams present. The Oak Park ARC is doing FB in the Oakland AREC. K8RJC does OK in the FMTs. The Muskegon AARC has house-cleaned its club station. ZHO. The FARL says "New RC in Milford." Information please! QFR has a new antenna farm in Belleville. At the Saginew VARA: Mobiles working in the Cancer Drive were W8s QQK, LNE, HZF, CTY, K8s MEQ, SWQ, PNX, NUN, AQA, OIC, DML, CYL, LHK and CJE. The SVARA is working on the County Fair. Finally saw "Pioneers of Wireless" at the MCRC, from A.W.A. The Oldsmobile RC (Lansing) changed its frequency from 75 to 2 meters. K8AEV has a new daughter. VVR is now chairman of the TVI committee, Lansing. K8BRJ is in Pinecrest Sanatorium, Cutlerville, suffering from a nervous breakdown. CRB had a heart attack. EGI is the new QMN general mgr. and JTQ is PAM for the Wolverine S.S.B. Net. RPN and GLW are now s.s.b. BTX is on 75 meters. SS/8 moves traffic for the Morse Telegraphers Club. K8PKU has an Invader 2000. WQH now has 7 boys and 3 girls. IXJ works G8JR on 80 meters. SCW had the mumps. K8BZL has a new Lampkin MFM frequency meter. The Cherryland RC moved to Red Cross Hq. With 10 meters dead many General Class licensees are going to 6. K8QJH got DXCC. Traffic: (Apr.) K8IUZ 217, KMQ 187, W8NOH 146, K8HLR 121, OTJ 114, EXE 96, W8OCC 96, FDO 87, FWQ 68, SS 68, K8NHC 57, PKU 55, W8MPD 54, FX 47, K8DJQ 42, W8IUJ 39, QQO 39, WQH 35, EU 33, INJ 32, DSW 31, K8GJD 27, MEG 27, W8EOI 26, EGI 25, K8JJC 23, LZF 22, W8ILP 21, K8LPY 21, W8SCW 21, ZJE 21, AHV 20, K8BZL 19, W8HKT 19, CQU 16, K8KVM 14, W8TBP 13, JKX 11, K8QCJ 11, W8OQN 10, AUD 9, ALG 8, FSZ 8, K8TJH 8, QEX 6, JED 5, KQV 5, EFY 4, W8NWW 4, YAN 4, K8PAU 3, W8BEZ 2, (Mar.) W8FDO 101, K8REM 44, W8TIN 19, K8LNV 13, PAU 9, W8WXO 7, K8KVM 3.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: HNP. RMs: BZX, DAE, VTP and K8ONQ. PAMs: HZJ and K8MFY. We learn from Tusco RC's *Beam* that K8JPA left for a hitch with the Marines. K8JOR is stationed at Ft. Hood and K8WQG and KN8ZHH are new hams. Warren High School RC's officers are K8PVN, pres.; KN8TNR, vice-pres.; KN8UES, secy.; KN8TNL, treas.; and BXA, sponsor. K8OJG is on 6 meters. K8JMG is on 20-meter s.s.b. LZR is now K6CTT. Piqua RC's 1961 officers are K8DSP, pres.; JEI, vice-pres.; and WKN, secy.-treas. The club meets the 1st and 3rd Mon. of each month. The OH-KY-IN V.H.F. Society is a newly-formed v.h.f. club in the Cincinnati Area with K8GYH, pres.; PBX, vice-pres.; K8GYK, treas. K8ONQ has a new SX-111.

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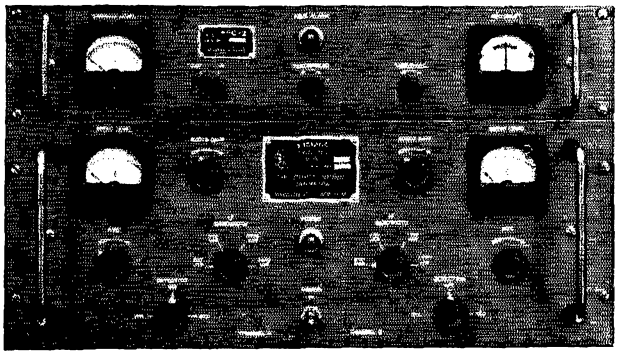

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WRP/Ø was home on leave from the Air Force. K8BXT was the first K8 to receive the W807 award. K8NCV has a new Drake 2A receiver. The official bulletin of the Warren ARA states at its meeting in a local church they had demonstrated to them the 2nd largest electronic organ in the world, UYX is now VP7BQ. Seneca RC saw the film, "Voices Under The Sea." The Columbus ARA's *Carascope* informs us that the stork brought RRJ a baby boy; ETU is back in town and BEB described millimeter wave-length techniques and equipment used. Massillon ARC's *MARC News* tells us that the members heard a talk by Mr. Tillitsky, of Ohio Bell, who explained the various changes the company has experienced, some of the recent developments made and their future plans; VYU and K8GZT were discharged from the Navy. From the Fort Hamilton ARC's bulletin we note the members heard a talk on radio-controlled model aircraft. Canton ARC's *Feedline*, with its new commercial look cover page, has a picture of OYV sitting at his station and it tells us KN8s YSC and YVZ are new Novices; K8POL has a new Viking II, IGA and K8MZS have new HY-Gain multi-band verticals. We see from Dayton ARA's *R-F Carrier* that GQ spoke on Transistor Power Supplies; 9ODQ is mobile in the area while attending school at NCR and the club this year is running a DARA States Worked Award for on all bands. We are told by Findlay RC's *The W8FT News* that IYC is its Ham of the Month; a new organization of Ohio YL operators known as the Buckeye Belles is being formed and two color movies were shown. Inter-city RC's *IRC News Bulletin* tells us the club saw the color slides and heard a talk on the History of DX and TAJ received his DXCC. Springfield ARC's *Q-5* reports its 75-, 2- and newly-formed 6-meter nets are very active and K8s RND, YRG, ZEN and KN8YST are new hams in the area. I want to thank the Parma RC on receiving my first PRC *Bulletin*. This club meets the 2nd and 4th Fri. of each month. New amateurs in the Sandusky Area are K8ZGF and KN8ZOE; new Generals are K8s RMW and WLP; K8s KBF and MAZ are on s.s.b. Toledo's *Ham Shack Gossip* names K8LBU as its Ham of the Month and tells of a certificate SOS (Sylvania on Six) which may be earned by working seven of them; BRE is back on the air; K8JDS is home after a vacation in Arizona; KN8YTS is a new ham. *Smoke Signals from the Indian Hills RC* states that FAT demonstrated new gear. VYU has been appointed OO. Greater Cincinnati ARA's *Mike and Key* informs us the members saw a color movie, "Song of the Clouds," put out by Shell Oil and contained an article What is New? which brought back fond memories and a few chuckles. Your Director, UPB, and your SCM attended the Springfield ARA's Annual Banquet and both spoke to the club. The next day we attended the Dayton Hamvention. There were 2703 registered, 845 at the banquet and 191 took their General Class examinations. The award for being the outstanding amateur in a four-state area went to OVG, and the Ohio Council of Amateur Radio Clubs presented its 1960 Field Day trophy to the Tusco RC. Banquet speaker was IHKK, who spoke on Ham Radio in the U.S.S.R. Prizes were won by UQW, K8AUQ, KN8ZHO, 9JPO, K8RSI, K8ADI, K8NDZ, K8DLS, BOJ, 4GD, ADP, ACG, ZMY, K8QMD, WGA and K8KUU. Traffic: (Apr.) W8UPH 796, DAE 593, HCR 299, BZX 214, ZYU 203, K8AAG 197, QHH 138, ONQ 113, SQK 101, OEX 92, W8AL 45, K8RUC 42, W8CXM 41, K8KSN 40, PBZ 39, BDZ 38, MYG 26, MFY 25, LUP 24, W8TIZ 23, QCU 22, YGR 18, K8EJI 13, HTM 12, W8IBX 10, LMB 10, EEQ 8, LT 8, OKN 8, K8AXK 7, RO 5, BNL 4, W8HFK 4, K8RXD 2, RYU 2, W8WYS 2, K2, TER 1, (Mar.) K8MTI 38, EJI 10, W8MLN 6, TXT 6, ONT 5, K8MAZ 4, W8GBZ 3, K8WLP 1.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; ESS on 3590 kc. at 1800; MHT (Novice) on 3716 kc. Sat. at 1300. Appointments: W2DGW, W2HZZ, K2MPS, K2UTC and WA2DJJ as OBSs; K2ZEL and WA2NBU as OESs. Endorsements: K2EIU as ORS and W2URP as OO. New officers of the Rip Van Winkle Club are WV2LSU, pres.; WV2KYI, vice-pres.; K2YJL, secy.-treas. Congrats to the Novices running the Rips. WV2QAG has a new Globe Chief and WV2QQY a new Ranger. At the R.P.I. Club, W2SZ, the new officers are K2YJH, pres.; K2LCF, vice-pres.; K2ZMO, secy.; WA2FML, treas.; and W4NNC, equipment supervisor. A new 35-w.p.m. certificate hangs in the shack of W2URP. The Schenectady Club showed slides and had a tape narration of 25 members' stations at a meeting. This is a novel idea for clubs. Channel 10 (Albany) is running Novice classes over TV to about 500 students at 6:30 A.M. twice a week. W2KYQ has a new S/Line rig. W2TVR, formerly of Utica, is now an Albany resident. The Yonkers Club sponsors contests for prizes at each meeting. Speaker at the R.P.I. Club was W2JYB, Professor Emeritus of Physics, who started radio operating in 1907. W2BGO reports one state RACES net han-

(Please turn the page)

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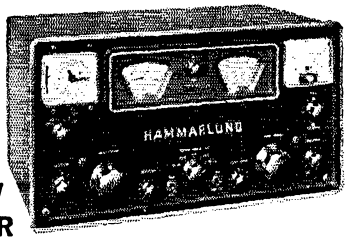
Important new features have been added to the general coverage HQ-145 to make it the Hammarlund HQ-145X—at no increase in price. Provision for a crystal controlled channel has been included for use at any point within the entire frequency range of the instrument (540 KCS to 30 MCS). Highly desirable in net operations, citizens band, to obtain weather information, and to calibrate test equipment against WWV standard. Also features optional use of citizens band channel markings. (Crystal not supplied.) **$269.00** Amateur Net

and adds the "NEWEST OF THE NEW"



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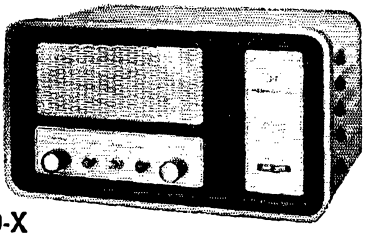

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dled 22 per cent of all traffic at NYSCC during OPAL '61 in competition with 14 land-line circuits. WA2DST and WA2JZH are council delegates from the New Rochelle Club. New DX-60s are found in the shacks at WA2JZH, WA2JZI and WV2QNB. The April issue of *73 Magazine* carried a TVI article by K2SJN. Good reading. Mount Vernon passed an ordinance allowing ham towers. Traffic: K2MBU 177, W2THE 132, WA2HGB 122, W2EFU 115, K2RKY 56, K2TXP 33, K2EIU 17, W2URP 17, K2HNW 16, W2GYV 2, W2PKY 2.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals—W2TUK—SEC: W2ADO. RM: K2UFT. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0030 GMT, nightly and 0015 GMT on Sat. NLI (early), 3630 kc. at 2330 GMT nightly. NYC-LIPN, 3908 kc. at 2230 GMT nightly. V.H.F. Traffic Net, 145.8 Mc. at 0130 GMT Tue.-Wed.-Thurs. It is with deep regret that I report one of our section's finest members, W2GXC, as a Silent Key. Harry, our late RM, was a devoted NLI member, active in CD Parties and other contests. His fine fist will be missed by the many who had the pleasure of contacting him. K2UFT, who was acting RM, has accepted the section's RM assignment. Your continued support of NLI will be greatly appreciated. BPL cards were earned by K2UAT, W2GKZ and W2EW, the latter two on originations plus deliveries. WA2GPT still is looking for elusive Nevada for WAS. K2BH has returned to W1QGU for the summer. WA2ICX is handling traffic with his DX-40 and NC-125. The gang at the Polytechnic Institute of Brooklyn, W2BXK, are now experimenting with voice modulation of the 52-Kmc. rig. New officers of the Columbia U. RC, W2AEE, are WA2NWG, pres.; K2BEA, vice-pres.; ex-K2VXS, secy.; Bill Bell, treas.; K2ZEP and WA2ORM, tech. directors; and K2ZIQ, comm. mgr. W2CLD, in his KWM-2-equipped mobile, has now operated mobile in 37 states and has issued more than 100 of his "Worked W2CLD/mobile" certificates to stations contacting him in ten or more states. W2DFK is active with a "Twoer" and an eight-element Telrex. K2IBJ is converting a transistorized CB handie-talkie to 10 meters. Your SCM is now using a VHF-126 converter for v.h.f. work and a little "Twoer" for lots of fun on 144 Mc. WA2PAV has a Communicator III on 6 and an Eldico rig on 2 meters. A home-brew 150-watt s.s.b. rig is in operation at K2RHG. The EWS (Eastern Wireless System) Net meets at 2215 GMT daily on 7090 kc. If you are interested in further details, contact our own RM, K2UFT, or WA2COO, net manager. Officers of the Radio Club of Brooklyn are W2BN, pres.; K2IWC, vice-pres.; W2KW/W2CCD, vice-pres.; K2JFL, secy.; and W2AAZ, treas. The Mohawk Radio Club has received the club call, W2CW. K2MJO is now using Teeratt gear on 144 Mc. The many friends of ex-W2KFV, now K7NIY, will be pleased to know that George is now an Asst. Director of the Southwestern Division, Asst. SCM of the Arizona section and SEC, too. George and Georgie are enjoying their Arizona home. Please remember to use the best frequency for your communications requirement. Don't QRM a DX band with crosstown kws, when a watt or two will do the trick on another band. Thanks and 73. Traffic: (Apr.) K2UAT 960, W2GKZ 286, WA2GPT 234, W2EW 210, K2UFT 207, WA2BWO 108, WA2CZG 50, W2GP 39, W2JBQ 36, WA2GAF 32, K2CMJ 21, W2PF 18, W2UAL 18, K2BII 16, K2THY 12, W2OBU 10, WA2ICX 9, W2BXK 7, W2AEE 6, K2AZT 6, K2QBW 6, K2RHG 5, WA2PAV 2. (Mar.) K2UAT 996, WA2PAV 14, WV2OTS 8.

NORTHERN NEW JERSEY—SCM, J. Sparks Remeczky, K2MFF—SEC: WA2APY. RM: K2VNL. PAM: K2SLG. V.H.F. PAM: K2KVR. Section nets: NJN daily at 2300 GMT on 3695 kc., NJPN Mon. through Sat. at 2200 GMT and Sun. at 1300 GMT on 3900 kc., N.J. 6 & 2 at 0300 GMT Thurs. and Sun. on 51.15 Mc. and at 0200 GMT Wed. and Sun. on 147.75 Mc. The above times are based on EDT. The only new appointee is K2BEV as OO. The NJN reports 30 sessions held, attendance 539 and traffic 387. The NJPN reports 30 sessions held, attendance 486 and traffic 180. The N.J. 6 & 2 Nets report 22 sessions, attendance 220 and traffic 70. WA2BDP received the White Rose certificate. K2SCD received his 10-w.p.m. certificate. WA2HFI will be on 220 Mc. as soon as he erects an antenna. The officers of the newly-formed South Amboy ARA are WA2FVL, pres.; W2MIE, vice-pres.; K2BEV, secy.; and WA2NJB, treas. The new officers of the Livingston ARC are K2LOV, pres.; W2OKO, vice-pres.; WA2HMG, secy.; and WA2EMA, treas. WA2KKH visited WIMX at M.I.T. WA2JHQ received his 25-w.p.m. certificate. K2EQP is having rig trouble again. K2MHP says he is finally installing his mobile rig. The West Jersey RC received its club call, WA2SCZ. K2QYI, W2WOJ and W2ZVW had their ORS certificates endorsed. WA2JDW, a pediatrician, has WA2LIS and WA2GXT as patients. K2DSW and K2MFX were the first to find the hidden transmitter in a hunt run by the Raritan Bay RA. The only casualty was WA2CHS, who ran out of gas. W2OHN, K2KVR and K2YWG operated the hidden

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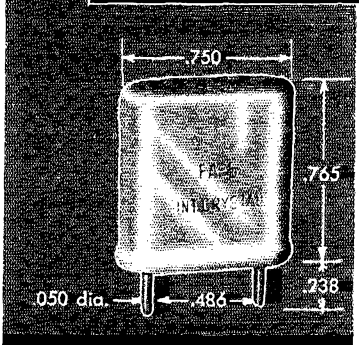
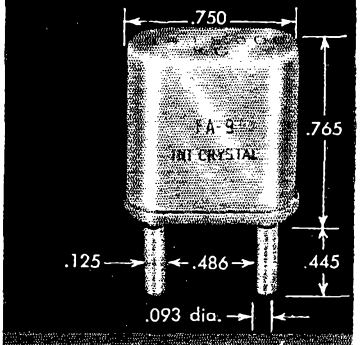
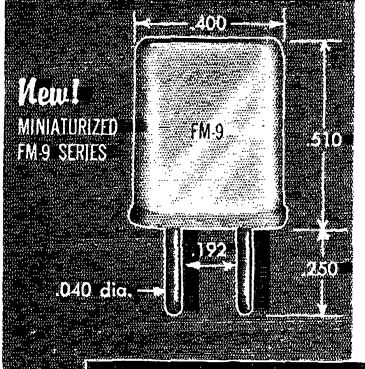
Amateur Crystals

1000 KC to 137 MC - .01% TOLERANCE







Wire mounted, plated crystals for use by amateurs and experimenters where tolerances of .01% are permissible and wide-range temperatures are not encountered.

Just any crystal in any oscillator will NOT combine to produce spot frequencies. These crystals are designed to operate into a 32 mmf load on their fundamental between 1000 kc and 15000 kc. Overtone crystals operate at anti-resonance on 3rd mode and series resonance on 5th and 7th mode crystals.

- **HOLDERS:** Metal, hermetically sealed. FA-5 and FA-9 are HC/6U pin type while the FM-9 is an HC/18U pin type.
- **FREQUENCIES** (Specify crystal type and frequency when ordering.)

	FA-5 and FA-9	Price	FM-9	Price
Fundamental	1000 - 1499 kc	$ 5.75	Not available	
	1500 - 1799 kc	$ 4.95	Not available	
	1800 - 1999 kc	$ 4.40	Not available	
	2000 - 9999 kc	$ 3.30	8000 - 9999.999 kc	$ 5.00
	10000 - 14999 kc	$ 4.40	10000 - 15000 kc	$ 5.50
	15000 - 20000 kc	$ 5.50	15001 - 19999.999 kc	$ 6.50
Overtone (3rd)	10 - 14.99 mc	$ 4.40	Not available	
	15 - 29.99 mc	$ 3.30	20 - 39.99 mc	$ 5.00
	30 - 59.99 mc	$ 4.40	40 - 59.99 mc	$ 5.50
Overtone (5th)	60 - 75.99 mc	$ 4.95	60 - 89.99 mc	$ 6.50
	76 - 99.99 mc	$ 7.15	90 - 100 mc	$ 8.50
	Not available		101 - 110 mc	$10.00
Overtone (7th)	100 - 137 mc	$ 9.35	Not available	

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- **CALIBRATION TOLERANCE:** ± .01% of nominal at 30° C.
- **TEMPERATURE RANGE:** —40° to + 70° C. ± .01% of frequency at 30° C.
- **DRIVE LEVEL:** Recommended, maximum 3 milliwatts for overtones; up to 80 milliwatts for fundamentals, depending on frequency.

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transmitter, WA2CCF earned a BPL card for April traffic. Two new Generals in N.N.J. are WA2LIS and WA2GRO. WA2COO claims he made 7056 consecutive dits with his new bug. The Garden State ARA had a booth at the Matawan Hobby Show. K2UBW, K2ZMZ, WA2GQI, WA2QGZ, WA2KRJ, W2REH and W2GMB were on hand to explain ham radio to visitors and they also originated messages for visitors during the four-day show. New Jersey is one of the few states that does not allow call letter license plates. Many attempts to get them have failed because the Governor would not sign the bill. We will have a new Governor this year and now is the time to write to the candidates and find out their stand on the plates. Remember, the more mail they get favoring the plates now the better our chances of getting the plates after the election. Find out which candidate is on our side and remember him on election day. Traffic: (Apr.) WA2GQZ 441, K2UCY 313, K2VNL 274, WA2CCF 216, WA2COO 165, WA2KKH 135, WA2JHQ 111, WA2APY 106, W2RXL 105, W2QNL 83, WA2EQO 71, W2EWZ 60, K2MFF 59, W2GSA/2 48, K2VNK 43, W2DRV 38, W2EBG 33, K2JTU 25, WA2EDG 17, WA2AKM 16, WA2CNV 13, K2EQP 10, K2QGD 9, K2MHP 8, W2BVE 7, K2AGJ 6, K2ZFI 5, K2PQR 4. (Mar.) WA2APY 173, WA2EDG 84, K2PVH 53, WA2BNF 25.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—Asst. SCM: Walter G. Porter ØUJC. SEC: KØEXN. PAM: PZO. New officers of the 75-Meter Phone Net are PZO, net control; KØAPL, 1st alternate; BRE, 2nd; OFK, 3rd; KAQ, 4th; GOT 1st district, AEH 2nd, VQX 3rd, OLM 4th, VWF 5th (also board chairman), KØBRE 6th, board of directors. The net secy. is KØVKT. Officers of the Coon Valley Club are KØEJN, pres.; HFQ, vice-pres.; YOO, secy.-treas.; SGE, act. chairman. New appointments are as follows: PZO as PAM; YIQ, FDM, PTL, KØZKU and EMV as ECs; LUZ as OBS; YUT as OO; HPQ as OES. The following renewed their appointments: IZI, LXL and VRA as ECs; NYX as ORS; YDV, KØEXN and IHC as OPS; VDY as OES. KØSVH, operated by SVH, SJF and JNK, made 47 contacts on 6 meters and 7 contacts on 2 meters while operating mobile from an airplane Apr. 23. KØAFG, ZQT, ZSU, KNØFXY and FKP are new licensees from the Fort Dodge Area. KNØGNK is new at Des Moines. PZO made BPL on originations and deliveries. ZAQ, operating portable from Ames, is the newest TLCN member. Traffic: (Apr.) WØBDR 1739, LGG 1585, LCX 1388, DUA 569, PZO 400, KØGXP 144, WØNTB 134, PKH 130, KØHBD 57, WØGQ 37, SCA 32, LJW 30, KØWVK 27, WØGOT 26, KØBRE 23, WØIO 23, KØKTP 22, WØPTL 19, YDV 19, KØEVC 18, VKT 18, IHC 12, KAQ 10, WØQVA 9, UHO 9, EEG 6, KØKBX 6, JGM 5, QKF 5, MYU 4, WØNYX 4, KØZMU 2, LUZ 1, RTF 1, VSV 1, YVZ 1. (Mar.) WØQVZ 3, KØKBX 2.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: KØZM. Asst. SEC: LOW. RM: QGG. PAM: ONF. V.H.F. PAM: HAJ. Section nets: KPN, 3920 kc. Mon.-Wed.-Fri. 1245Z, Sun. 1400Z, NCSs KØQKS, EFL, FHU, ORB and IFR. QKS, 3610 kc. daily 0030Z, NCSs SAF, TOL, BYV and KØBXF. Kansas Storm Net, 3920 kc. Mon. through Sat. 0001Z, NCSs SEC and ECs. Appointments: KØLHF as EC Zone 3, KØVQC as EC Zone 11, KØQKS as EC Zone 10, ALA as OO. Welcome KØZPN, ex-K5JCB, to the QKS Net. Nadine, KØUHF, was appointed NCS on HBN. KØEMF has 50 states worked on 6 meters. Temporary officers of the Kansas Federation of Clubs are LNZ, pres.; KØEKN and KØJWT, co-secys. Rolla and Dot, KØGIC and GIA, were named to select a site for the state meeting. KØTFK is the proud possessor of a new SX-111 receiver. Sheldon has been bedfast for 22 years, and recently it was decided that he needed a new receiver by KØVBD, TSY LNZ, KØJWS and ZKA. KØSMV machined the special controls and assisted by Larry's family saved the necessary pennies for the receiver. Open house was held and he was presented with the receiver with 75 licensed hams attending from as far as 150 miles. KØKFU is ready to go on RTTY. KØYEM is mobile with a Cheyenne and an ATC-1. DRL and KKR now have 2-meter mobiles going. KØPOS now has a new SB-10. Traffic: (Apr.) WØABJ 119, FNS 75, TOL 71, SAF 38, IFR 20, KØGIG 18, EFL 11, WØWFD 8. (Mar.) WØSAF 207.

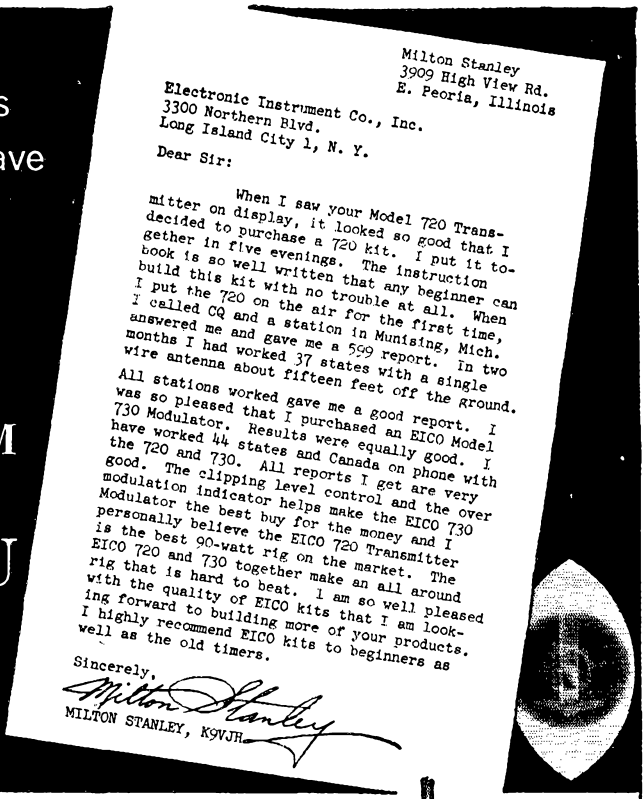
MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØLTP. Asst. SEC: KØLTJ. RMs: OUD and KØONK. PAMs: BVL and OVV. Net reports (Apr.): MEN (3885 kc. 2400 GMT M-W-F), sessions 12, QNI 311, QTC 95; NCSs: KØONK 5, MMR 3, VNB 3, OVV 1, HBN (7280 kc. 1805 GMT, M-F), sessions 17, QNI 404, QTC 211; NCSs: KØWNZ 5, OJT 3, KØLTJ, UHF, REU, KØHGI 2, WØQJU 1, MSN (3715 kc. 2230 GMT M-F) sessions 21, QNI 102, QTC 112; NCSs: KØONK 10, RPH 4, VPH 5, KNØFPC 3, MON (3580 kc. 0100 GMT M-F), sessions 25, QNI 142, QTC 135; NCSs: OUD 8, KIK, UXQ 5, RTW 4, KØQCQ 3, SAIN (3580 kc. 2200 GMT Su.), sessions 5, QNI 16, QTC 11; NCSs: OUD 4, WAP 1. The section participated actively in OPAL '61. The

(Please turn the page)

To the hundreds of Hams who have taken the time to write, we at EICO can only say...

FROM THE BOTTOM OF OUR HEARTS, THANK YOU

We promise to continue to do all in our power to merit your approval.



Milton Stanley
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Electronic Instrument Co., Inc.
3300 Northern Blvd.
Long Island City 1, N. Y.

Dear Sir:

When I saw your Model 720 Transmitter on display, it looked so good that I decided to purchase a 720 kit. I put it together in five evenings. The instruction book is so well written that any beginner can build this kit with no trouble at all. When I put the 720 on the air for the first time, I called CQ and a station in Munising, Mich. answered me and gave me a 599 report. In two months I had worked 37 states with a single wire antenna about fifteen feet off the ground. All stations worked gave me a good report. I was so pleased that I purchased an EICO Model 730 Modulator. Results were equally good. I have worked 44 states and Canada on phone with the 720 and 730. All reports I get are very good. The clipping level control and the over modulation indicator helps make the EICO 730 Modulator the best buy for the money and I personally believe the EICO 720 Transmitter is the best 90-watt rig on the market. The EICO 720 and 730 together make an all around rig that is hard to beat. I am so well pleased with the quality of EICO kits that I am looking forward to building more of your products. I highly recommend EICO kits to beginners as well as the old timers.

Sincerely,
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90-WATT CW TRANSMITTER* #720
Kit $79.95 Wired $119.95
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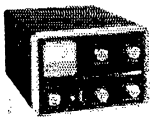
"Top quality" — ELECTRONIC KITS GUIDE. Ideal for veteran or novice. 90W CW, 65W external plate modulation. 80 through 10 meters.



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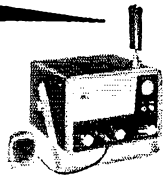
Ideal for novice or advanced ham needing low-power, stand-by rig. 60W CW, 50W external plate modulation. 80 through 10 meters.



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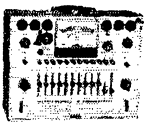

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Missouri Picnic will be held at Eldon on July 30. All amateurs residing in Missouri are cordially invited to attend. For additional information, monitor or participate in the section nets or contact KØMMR, Eldon. The Missouri Storm Warning Net was reactivated during the month. Note that it operates on the same frequency as that used by MEN, 3885 kc. It is activated by any amateur in the section when deemed necessary by severe weather conditions. Many other local nets have been active in this work throughout the section. KØWNZ visited the SCM on his way to W6-Land for a three-week visit with his mother. HUI and his XYL spent several weeks in Arizona, being present for the arrival of their first grandson. KØJPL reports Central America DX on 40 meters. Appointment: KØELG as EC. Cancellation: GEP as ORS, requested because of inactivity at present. Traffic: KØONK 1236, WØWYJ 143, ANT 131, OUD 150, MKJ 84, KØVPH 84, WØKIK 75, KØRPH 71, WØBUL 66, KØBLJ 59, PCK 59, WØRTW 49, OVV 44, KØMMR 30, WØWAP 28, ZLN 28, BVL 27, KØWNZ 21, KNØFPC 15, KØVNB 7, WØEPI 6, KØIHY 4, MAU 4, WØPXE 3, KØVXU 3.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTSU. The Western Nebraska Emergency Net, KØRRL NC, reports QNI 496, QTC 213. This net has secured operation for the summer and will resume operation in the fall. The Western Nebraska Net, 3850 kc. NIK as NC, reports QNI 611, QTC 479, 100 per cent check-in for April KØAIE, KØBMQ, GGP, NIK, OCU and OFP. The 75-Meter Morning Net, WØDGW as NC, reports QNI 742, QTC 132. The 75-Meter Nebraska Emergency Net, EGQ as NC, reports QNI 868, QTC 104, 100 per cent check-in KØCGM. With regrets we accept the resignation of NYU as RM for the Nebraska Section Net (c.w.). Bob has done a wonderful job and we will miss him. KØDGW spent a two-week vacation in Augusta, Ga. KØTSU, KØWFG, BNF and EXP were guests at the meeting of the Central Nebraska Amateur Radio Club in Broken Bow. The Annual Side Band Dinner was held at the Hill Top Cafe at Lake McConaughy Apr. 23 with more than 40 hams and families in attendance. Traffic: WØNIK 587, KØRRL 148, WØAHB 98, KØKJP 86, DGW 83, WØOCU 66, GGP 54, RIH 49, KØQFK 41, WØDDT 40, OKO 37, KØWEP 30, WØEGQ 28, NYU 25, WUV 25, SJF 19, KØALY 18, BRQ 18, HKI 18, WØVZJ 17, KØMSS 16, WØPDJ 16, KØDFO 12, UWK 12, WØYFR 12, KØSLB 9, WØKLB 6, LJF 5, KØQYG 5, ELU 4, MZV 4, SCN 4, WØVFA 4, BOQ 2, HOP 2, HXH 2, WKP 2, HQP 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr. W1CHR—SEC: EOR. RM: KYQ. H.F. PAM: YBH. V.H.F. PAM: FHP. Traffic nets: CPN, Mon.-Sat. 2200Z, Sun. 1400Z on 3880 kc.; CN daily 2245Z and 0115Z on 3640 kc.; CVN, Tue., Thurs. and Sat. 0030Z on 145.98 Mc.; CTN, Sun. 1400Z on 3640 kc. These schedules are in effect while we are on Daylight Time only. K1JAD made BPL on originations. NFG says that a change in job will enable him to devote more time and energy to AREC and RACES work. K1BEN's jr. operator passed the General Class exam and is now K1CPD. Phil advises the Canaan ARS has LUA on 160 through 2 meters and meets weekly on Tue. evenings with a small but enthusiastic group. He serves as secy.-treas. of the group. K1IVR is NCS for the EWS Net on Sat. K1HTV got his Extra Class ticket with K1HOP while at Swampscott and reports that the e.d. drill in New Haven was a success. K1JAD will be closed for the summer with all bands going to summer school at Duquesne. RAN is transferring to a new job in Peekskill, N. Y. LIG, OJR, TCJ and K1s IVR and HTV took part in the February EMT. K1DDY enjoyed some Florida sun. The CVN had 9 sessions, handled 19 messages with 51 stations in attendance. High QNI were FHP 9 and KN1PKQ 8. YBH reports the CPN had 29 sessions handling 194 messages for an average of 7 per session. Daily attendance averaged 24 and net time 48 minutes. The Honor Roll for 80 per cent attendance or higher lists DAV, FHP, MLT, VQH, YBH, K1s AQE, DGK and MZM. Newly active were IUC, VVA, K1s HAH, NJH and PPF. Net certificates have been awarded to ETF, MLT, K1s HEJ and MBA. KYQ advises CN held 30 double sessions and handled 352 messages on the first for an average of 11.7 per session and 140 on the second for a 4.6 average. Attendance averaged 12.8 on the first and 5.1 on the second. High QNI were K1s MZM, IFJ and JAD. CHR has been installing Citizen's Band rigs in the local yacht club launches and teaching personnel how to use the gear *properly!* Reports received: OO from EQV, K1s IVR, GUD and HTV; OES from FVV and K1MNX. New appointments: K1MBA as OPS. Appointments renewed: FHP and AW as OBS; FPF, KYQ and FHP as EC; YBH as PAM; AW and K1AQE as OPS; BDJ as OES; AW, KYQ, BDJ and K1GGG as ORS; KYQ as RM. Traffic: W1KYQ 248, RZG 181, YBH 179, AW 171, K1JAD 159, IFJ 140, W1NTH 123 K1GGG 104, K5OEA/1 103, W1NJM 97, K1IVR 66, HOP 62, W1CHR 55, K1AQE 51, W1RFJ 44, FHP 42, K1MBA 34, DGK 26, W1ROX 24, K1JVZ 8, W1BNB 7, CTI 5, CUH 5, QV 4.

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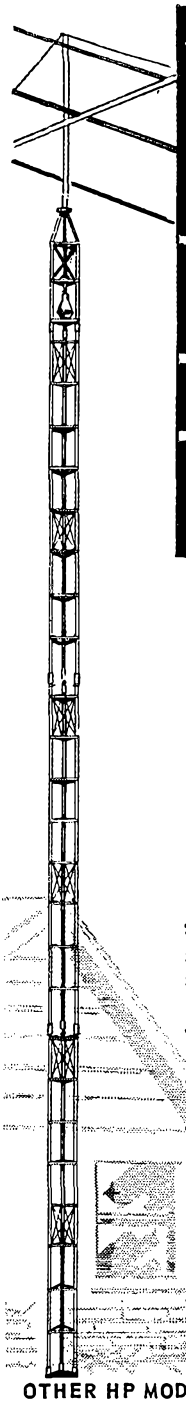

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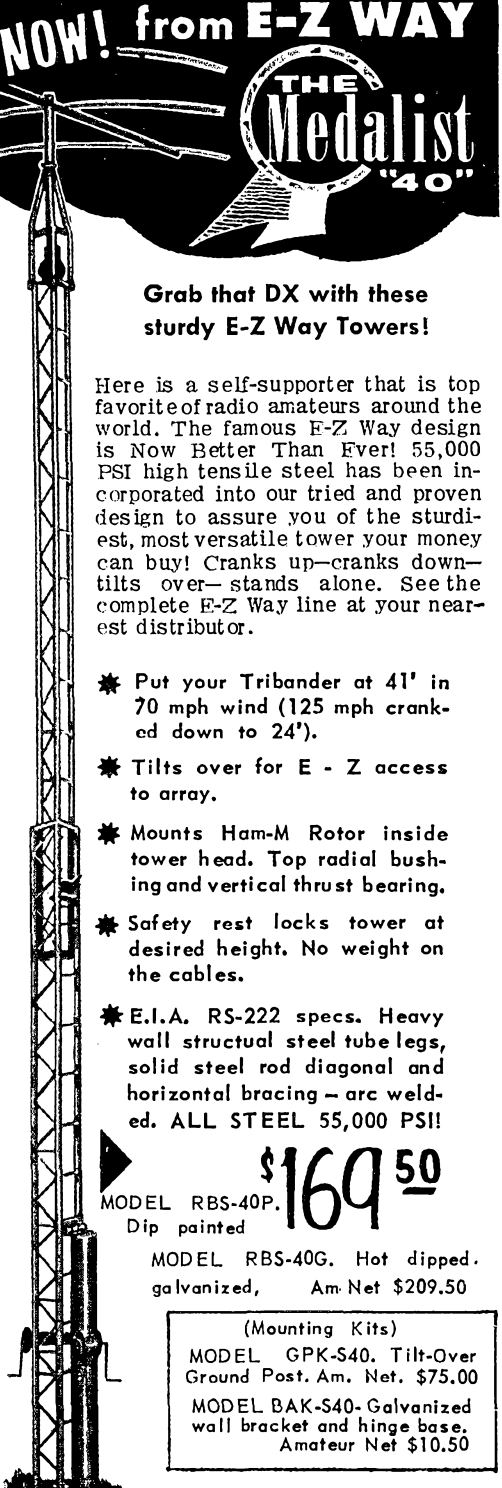

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P.O. BOX 5767 TAMPA 5, FLORIDA

MAINE—Acting SCM, Herbert S. Merrill, K1JDA—New appointments: EPN as OBS. Certificate endorsed: K1LHE as OPS. The PTN meets daily at 1900 on 3596 kc. The SGN meets daily at 1700 on 3940 kc. The MSSN meets daily at 1730 on 3726 kc. The license plate bill has now been signed into law and amateurs wishing their call letters on their plates for 1962 should make application to the Secretary of State not later than Nov. 1. The plates run for 6 years and require a $10 additional fee the first year, $5 additional for the succeeding 4 years, with no additional fee the 6th year. Application should include a signed statement that you hold a valid amateur license, expiration date and call letters. IXC is home from the hospital and doing fine. BPM has received his WACAN and WAVE awards. We goofed—you need to work only 5 not 15 SPARK members for a certificate. The Annual PAWA Banquet was termed a great success by the 110 who attended. ISO reports 2-meter activity is increasing up the coast. K1MDM, at Togus, received a kit as a gift from the American Legion. PNM is trying out a 2-meter double halo on his Volkswagen. NDG has a new 2A receiver. K1BZD is mobile on 75 meters. K1MZB is building a 2-meter 6146 rig. KN1QFY/1 operated at his school science fair with 10 watts. KN1RQE is a new ham in Portland. VBU has a new DX-60. YYW is keeping a sked with 8-Land on 75-meter phone. Traffic: K1MZB 89, W1GRG 62, ISO 48, K1GSF 46, BZD 32, IMI 31, MDM 27, W1EPN 14, K1MBM 14, OAZ 14, OJH 12, W1YYW 10, K1LHE 9, DYG 6, W1OTQ 5, LXA/1 3.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr. AOG is our SEC. DOM is a new OO. ZWQ has a new son. K7OTR, in Phoenix, is ex-1FVD. MDH and DY are on 75 meters. K1MBQ is on 10 meters. ALP attended a meeting of the Capeway Radio Club at K1BUR's QTH. K1s OHN, QLT, AIU and KN1RWS are on 2 meters. The Milton Radio Club is holding meetings and HZR is secy.-treas. pro tem. K1DOS is a "Silent Key." Bob, one of the Mugford twins, has a new son. K1AA, ex-4CC, lives in Wayland. AAU flew to San Francisco in a jet plane. DXN, K1CKR, LRJ, K1GJN, YBY, K1JTN and K1MXT, ex-1BXA, are on 6 meters. BIO spent some time in the hospital but is feeling better. Vice-Director EAE, National Emergency Coordinator NJM and New England SCMs EIB, IIQ K1AAV and ALP met with EFW, our Director, at Swampscott. K1KAL has a new bride and a new KWM-2 for a wedding present. The T-9 Radio Club held Ladies' Night at Middleton Arms. K1LLV is active on 40, 80 and 10 meters. HA is working DX on 20 meters. PLJ, HJP, QX, K1KPS, PTR, K1DIT, AYG, BGW, JSS, OGU and K1LJK took part in the Feb. FMT. K1KKS is working on an s.s.b. rig and has helped to start the Lexington High School ARC Net on 50.4 Mc. Mon. and Wed. nights. K1KBO, the Fort Devens Club station, has been reactivated. K1RBP is chief operator and WA2FTI/1 is asst. NKA has a Saturn 6 antenna on the car. The Spirit of 76 Net is on from 7 to 8 A.M. K1LCQ, now General Class, will be on the 80-meter c.w. net. K1BYV is out of school and on 80-meter c.w. W1LJK and K1LJK met at the hamfest and both have Valiants and SX-101s. K1OIC has a new ground plane. EGV has a new mobile rig for 10 meters. K1JML went to Florida. FQA and OHA made the A-1 Operator Club. BNS has a new TO keyer and is on 7 Mc. BGW has a GR interpolation oscillator. KN1PZB, the XYL of K1MMC, passed the General Class exam and will be on 10 meters. K1BNE is back at work after his operation. RUU is on 2 meters and s.s.b. DJJ has a coaxial for 10 meters. K1NTS is on 2, 6, 80 and 40 meters. K1MVN has an eleven-element Yagi on again. AHE has a 24-element back on the air. PTR, in CD Parties, has an end-fed antenna on 80 and 40 meters. K1MHM is on 6 meters. The Eastern Wireless System meets daily at 1715 on 7090 kc. This combines the Hudson and Eastern States Nets. PEX has an SB-10 Heath s.s.b. BW has a new 40-20-15-meter beam. KP is having beam trouble. K1BBU is awaiting an HT-37. K1CBB is s.s.b. running a 10A and an 813. 2ZJB/1 is in Hingham. K1OJQ has his General Class license. KBN will have a rig for 220 Mc. NJL was in the C.W. CD Party. MX has code practice every Tue. on 0130 GMT. K1DSA has a new son. KN1RIS has a Globe Chief 90A and an AR-2Q multiplier. K1MPJ is on 2 meters. K1MZP has a DX-40 and an NC-125 on all bands. K1AII is working on mixers for 2-6-meter s.s.b. New officers of the Norfolk County Radio Assn. are IDV, pres.; NOV, vice-pres.; AGR, secy.; K1PBI, treas. AAR, PEX, EAE, OFK, QFO and K1PKX won prizes at Swampscott. The Eastern Mass. 2-Meter Net had 23 sessions, 347 stations, 143 traffic. OFK is PAM; ZSS and TWG are advisors; PEX, net procedure; DOM, net manager; K1GYM and MHC asst. net managers. K1QNQ's father died. OFK visited MUD, SIV went on a trip. VYS and OFK were on vacation. New on 2 meters: K1s QQT, DRB, KN1s QOJ and REX. The QRA had a talk by HBB and LEL. The Framingham Club held its election and had a Novice program by RCJ, ZWJ and 8UDL/1. The Wellesley Club held an auction with TTY as auctioneer. KN1QOC is

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secy. of the Cambridge H.S. Club. K1DUJ has a Gonset III on 6 meters. BCN says activity on 2 meters on the Cape has picked up. K1MDI is trustee for the radio club at the Perkins School for the Blind. Appointments endorsed: MX as OPS and ORS; K1DSA as OO; AKN Sandwich, DWY Beverly, YYI Carlisle as ECs. New officers of the T-9 Radio Club are HB, pres.; GGV, vice-pres.; TJP, secy.; ISX, treas. MNK moved to Topsfield. New officers of the M.I.T. Club, MX, are K9CDI, pres.; WAJ, stn. mgr.; 9MGS, treas.; 4QEG, secy.; K4OGP, act. mgr. The Chelmsford ARA meets the 2nd Mon. of each month. BB won a prize. AR is OPS and Belmont EC. Traffic: (Apr.) K1GNR 146, W1EMG 134, PTR 92, K1MHM 90, BYV 65, W1ZSS 56, OFK 53, EJJ 40, K1AFF 35, JAW 34, W1DOM 30, K1IUS 23, W1PEX 22, TWG 21, AOG 20, K1KBO 18, GKA 16, W1RQL 16, K1CMS 14, LCQ 13, W1AYG 12, K1OJQ 12, DTJ 11, W1KBN 10, K1GYM 9, W1SIV 9, K1JML 7, LJK 7, W1AUQ 5, VYS 5, K1AII 4, W1AKN 4, K1MHC 3, W1NJL 3, MX 2. (Mar.) W1EMG 308, K1KBO 11, DSA 2.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: BYH/K1APR. RM: K1IJV. PAM: DXS. The members of the Berkshire County ARA are still talking about the wonderful color slide show put on there by JAH and his Mrs. New officers of the Worcester Tech. Radio Club are NQH, pres.; K1CBW, vice-pres.; MUL, secy.; K1BZI, treas.; *k2CWS, chief operator.* The Worcester County Teen-age Net meets Sat. at 2000 EST on 28.9 Mc., and is open to all under 21 years of age in the Central Massachusetts Area. QWJ is the nominating committee chairman of the Hampden County Radio Association. The Variable Frequency Net is holding nightly ragchews on or near 28.82 Mc. in the Springfield Area. Endorsements: K1CAU as ORS, SPF as EC K1IJV, our outstanding RM, submits the following report on WMN: Traffic cleared 154, average attendance per session 5.5, average messages per session 6.0. Top stations in attendance were K1IJV, K1LBB, BVR, K1CAU and ZPB, in that order. WMSN is going quite well, but WMNN is in need of additional members (Mon., Wed. and Fri. on or near 3744 kc. at 6:30 P.M. EST). RVW, QWJ and VNH are building 1296-Mc. converters. Contact has been established on 1220 Mc. between N. Granby, Conn., and Springfield, Mass. MWE passed the Extra Class exam at the N. E. Division Convention. The BCARA now has 60 members. Mt. Greylock soon will have some h.f. communication (courtesy of BKG, DPY and WF). The Pittsfield boys were very active during the Alert of Apr. 28 and 29. Traffic: K1IJV 166, W1ZPB 165, BVR 156, K1LBB 129, CAU 118, W1YK 104, LDE 60, WEF 49, DVW 15, FAB 4.

NEW HAMPSHIRE—SCM, Ellis F. Miller, W1HQ – SEC: K1GQK. RM: K1CIF. PAM: KVG. GSPN meets Mon. through Fri. at 2400 and Sun. at 1430 on 3842 kc. CNEN meets Mon. through Sat. at 1145 on 3842 kc. NHN (c.w.) meets Mon. through Sat. at 2330 on 3685 kc. OES certificates were issued to CTW and IQD. Congrats, Cal. New officers of the Concord Brasspounders are FTZ, pres.; EAW, vice-pres.; CUE, secy.-treas. New officers of the Contoocook Valley RC are MKA, pres.; K1OXO, vice-pres.; K1LAS, secy.; K1CKL, treas.; K1MID, act. mgr. Best wishes to both clubs for a successful year. A BPL certificate went to K1BCS. The Concord Brasspounders held its Annual N.H. QSO Party Apr. 29-30 and it was a big success. The Annual New England Division Convention held April 8-9 also was a grand success. Your SCM was pleased to see so many at the N.H. Nets' meeting. Many thanks to RMH for writing the March report in the absence of the SCM, who was on vacation. K1KOB reports having worked 80 stations on 6 meters. The Exeter ARS is conducting code and theory classes. Traffic: K1BCS 418, CTF 144, W1CUE 100, KN1OWU 50, W1TA 36, K1GQH 13, W1KVG 10, JNC 3, K1KOB 3.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ. RM: SMU. PAM: TXL. RISPN report: 30 sessions, 338 stations, 47 traffic. The Providence Radio Assn. held its 40th Annual Dinner Dance with a large crowd in attendance. K1DWH received the annual award for the ham doing the most for the club. She was the first XYL in the history of the club to receive it. Members of the Newport County RC participating in Alert 1961 were ETM, MMX, TXL, JHF, JFF, LUO, IAG, WA6FGU/1, 2FJO-1, K1CEE, LRR, CEG, DPY, OUI, KN1QXA, RKX and QXL. K1LDK was admitted to membership in the W1AQ Club of Rumford. The club also issued WRI Certificate No. 9 to 2QHH. Requirements for a WRI certificate are two confirmed contacts from each of the five counties in R. I. and contacts must be either all A-1 or A-3 emission, not a combination of both, made on or after Jan. 1, 1956. The Pawtucket RC held a mystery ride and dance to raise funds for new equipment. K1GRC worked K4OCK on the 6-meter band opening. K1LII has gone mobile with a "Sixer." Traffic: (Apr.) W1SMU 570, TXL 78, K1GRC 30, DZX 27, AAV 15, PNJ 13, BBK 12, W1WED 8, K1LSA 7, GRA 2. (Mar.) W1WED 1.

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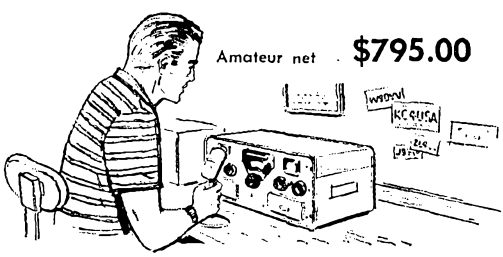

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VERMONT—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB. PAM: HRG. RM: KRV. Stations on a daily 2-meter net in the Newport Area are SYT, K1JEP, RWX, K1JEQ, SAT, KN1QWD, CUN and K1HKI. Our sympathy goes to TJ on the loss of his XYL. K1MPN/1 sent in a traffic report from the Heaton Hospital in Montpelier just before he returned home. New officers of the Central Vt. ARC are K1BGC, pres.; K1OJD, vice-pres.; K1MPN, secy.; and K1BKH, treas. K1HGY is getting out from Brandon on 2 meters. HRG is the proud owner of a Gonset Communicator III. The Middlebury Mike and Key Club has been hard at work testing communications between check points of a planned sports car event. Traffic: VE2AZI/W1 980, W1KRV 125, OAK 52, ZYZ 35, EIB 24, KJG 20, HRG 16, K1IRH 10, MPN 7, OAJ 6.

NORTHWESTERN DIVISION

ALASKA—SCM, John P. Trent, KL7DG—DWZ added to the ranks of Alaska hamdom as an able student of Kodiak Amateur Radio Club members CTB, W6YJU, DG and BEM. DWZ has been on the base as a jr. high school principal for many years. APH monitored and taped rescue communications of the Coast Guard in recovering alive a wrecked airman on Crown Mt. AWR was at Buskin Beach for Field Day. FC is back from the State Legislature where he kept in touch with constituents with /KL7. S.s.b. ranks are crowding out the a.m. in numbers and power with ALJ pioneering the way on Kodiak. New S.s.b.ers include SFN, CTB, DMU and FRI with a new QTH, /7, Spokane, Wash. BEM is very QRL building kw. linears. DG is going to work for EE. ML helped EX with v.h.f. gear in EX's home-built aeroplane. CAH helped get medical aid to a stranded Akhiok school teacher through the Sour Dough Net. We are looking for reports from OMs and XYLs, too. How about it, CUK, AHI, PJ, MF, ZR, et al? DNB, USNR CC 17-5, participated in Armed Forces Day Amateur Radio with DG and DVB on 120-watt c.w. and copying the D.O.D. message.

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—OA, of Boise, and RACES members throughout the state were kept busy handling traffic during OPAL '61, C.D. Alert following the Conelrad drill. The WIMU Hamfest will be held Aug. 4, 5 and 6 at Macks Inn instead of in the usual Big Springs Area, as announced by DLW, pres. All clubs are invited to sponsor a program. Visitors to KXJ's shack are invited to sample the contents of a prominent jug, then to become members of the WDVC (Wine Drinkers Visitors Club)! THD visited the SCM and OM K7CXP, Helen, EEQ, got a request for a QSL for contact made in '57! K7CXP attended the FAA Conference at Purdue U. and learned briefly about Communications via Satelite. K7MJO is a new ham in Boise. JHY moved from a farm to "Surburbia." K7CVB was hospitalized for a serious illness. MXM had foot surgery. EMT will be NCS for CARS in the fall. K7ENY is president of his high school radio club. FARM Net traffic: 78. Traffic: W7GMC 76, VQC 27, K7KBY 26, W7GGV 15, EEQ 5, EMT 5.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ. PAM: YHS. RM: K7AEZ. The MPN meets Mon.-Wed.-Fri. at 1800 hours on 3910 kc. TSN meets Mon. through Fri. at 1200 hours on 7230 kc. MSN meets Tue.-Thurs.-Sat. at 1830 hours on 3530 kc. MBV and RZY are working 2 meters Harlowton to Ryegate. FTO has a translator class going. K7BON and MBV now are on RTTY. YPN is to vacation in California soon. A new call at SACO is K7OZU. KN7s MEK, MFV and MGE will be dropping the "N" from their calls at Harlowton. UWY is recuperating at his home. WA6HRV and WA6HRX have moved to Butte from California. EWR does a nice job on the Havre club paper. NPV, of Harlowton, is finishing up his amateur classes. K7NHV and LGV dropped the "N" from their calls. IBG is mobile again in his vast coverage of the Northwest. A new appointee is K7DVZ as EC in the Bozeman Area. Traffic: K7BKH 256, DCI 148, DCH 60, EWZ 47, W7TVX 41, K7NDV 18, OGF 14.

OREGON—SCM, Hubert R. McNally, W7JDX—AJN was the only eligible nominee for the SCM post and took office June 10. I know he will make a swell SCM. K7JJJ has moved to Sunnyvale, Calif., so K7CNZ is now working with VCM on u.h.f. experiments. DTT reports the new K-W Club in Washington County is now organized and active. JDX tried to outdo DEM on the Rogue River but all he caught was snow and ice! K7KBK spent several days in the hospital for bone surgery on his right elbow. K7IWD sure is active working for various awards and certificates. ZB is about to join the 2-meter gang around Portland and from what I hear the 2-meter activity is really picking up. The OSN had another good month with BRAT Awards going to AJN, ZFH, MTW and K7IWD. K7KZP, a new EC in Union County, is getting things pretty well organized. A fine report for April was received from WKP, our SEC. K7CLL still is taking on a lot of "learnin'" in Salem and should come up with a B.S. sometime soon. K7IMH is working on a rig for 220 Mc. K7EZP

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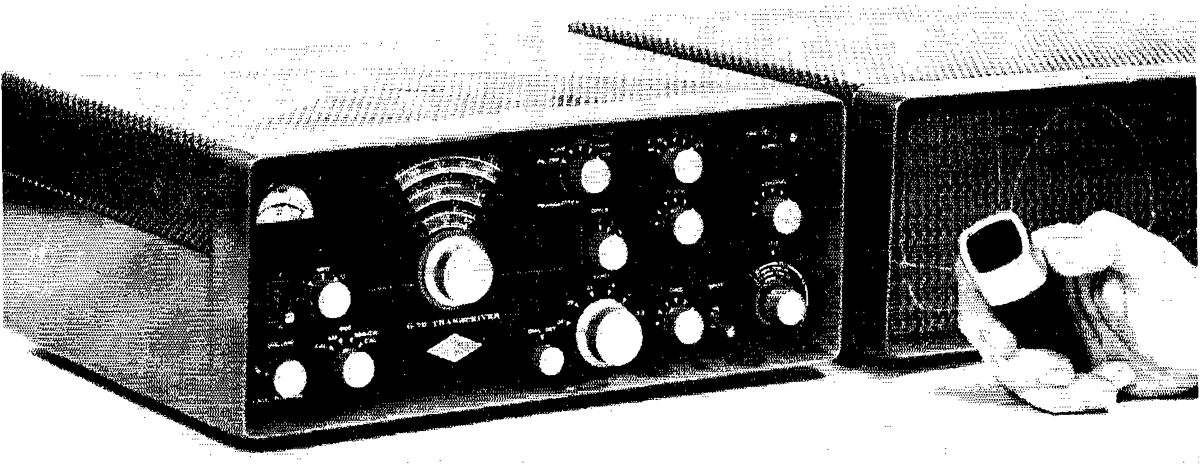

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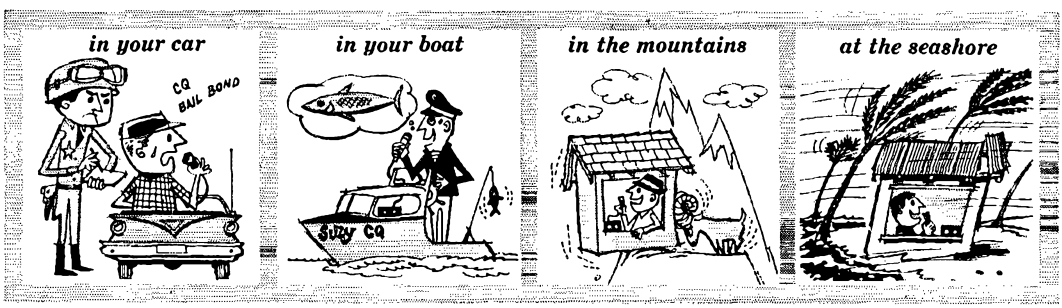

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reports the first season's DX on 6 meters around Apr. 30. A fine RACES drill was held during the Operation Alert exercise and the Portland gang received a nice compliment from the head of c.d. there. Traffic: W7BDU 236, ZB 201, K7IWD 77, W7ZFH 63, K7AXF 62, W7MTW 52, K7KBK 40, W7GUH 39, DEM 19, DTT 14, K7CNZ 11, JWY 7.

WASHINGTON—SCM, Robert B. Thurston, W7PGY. SEC: HMQ. RM: AIB. PAMs: LFA and PGY. Washington nets are WSN, 3535 kc. at 1800 PST, Mon. through Fri.; Washington Amateur Radio Traffic System (WARTS), 3970 kc. at 1730 PST Mon. through Sat.; ESN, 3920 kc. 1700 PST, Mon., Wed. and Fri.; Columbia Basin Net (CBN), 3960 kc. 1900 PST daily. The Mount Vernon (Skagit Amateur Radio Club) Banquet was attended by some 190 persons. K7CZT drew a lot of attention and an honorable mention award with his exhibit, "Semi-conductors for Klystron Modulation," at the Science Fair in Tacoma. CGA and FNA spent over eight hours of continuous operation during Operation Alert 1961. DFS and YFO have a weekly column in a local paper. Eight new Novices were licensed as a result of the Novice class held in Richland recently. IST is rebuilding his low-frequency transmitter. He works 220 Mc. and is looking for contacts. ACA has been appointed to the State Advisory Committee on C.D. Communications. VPW is QRL installing mobile equipment in his new jitney. Many of the Washington section amateurs are going on Zulu Time since this Daylight thing went in effect—less confusion in log keeping, they say. ZVY renewed his OES appointment. JC is QRL trying iron bugs on the Valiant. PSD is working hard on the AREC net and is being assisted by AIB with good results. Nineteen RACES and AREC members joined forces for OPAL '61 in the Pierce County Area. OEB is the new Asst. EC for Benton County, as is JBN for Lincoln County. MKW will assist in the King County AREC. OZY is checking out 25 kw. for Whitman County AREC. RDL checks in via mobile on the AREC State Forum. LFA renewed his OO, OPS and PAM appointments. K7GBW joined Air Force MARS. The SCM's deadline for *QST* copy is the 5th of each month. Your report must reach him on or before that date. Traffic: (Apr.) W7BA 918, DZX 718, GYF 165, QLH 156, K7MFF 153, BOW 89, W7AMC 70, APS 61, ACA 46, VPW 20, JEY 18, USO 16, AIB 14, LFA 12, AXT 8, K7DDQ 6, GBW 4. (Mar.) W7GIP 55.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—Boulder City AREC was active in OPAL '61. MAH is leaving Reno for Portland, Ore. UPS is in Denmark visiting his father. K7DEF and VJR are working on Heath-kit "Twoers." K7AHA has an FB new homebrew s.s.b. receiver. K7BJB is building a new electronic keyer. K7KLT is readying his equipment for 2-meter a.f.s.k. K7CJZ has a new DX-60. K7ETN has been having trouble with flat 6146s. KN7OYJ is a new ham in Elko. Welcome, Nelson. K7ETN, KHU and 6DLV/7 submitted reports in the February FMT. Traffic: W7KHU 96, K7CJZ 20, ETN 4.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Asst. SCM: Ed Turner, W6NVO. SEC: W6ZRJ. PAM: W6ZLO. RM: K6KCB. Participation by amateurs in our section in the April 9 fly-over at OSCAR was tremendously successful. The continued interest of those making reports is greatly appreciated by the committee. Club station W6UW has a new all-band vertical and is installing full break-in in preparation for the July CD Party. *Standing Wave News*, the SCARS's club paper, has a column written specifically for the younger members by WA6LSS. The Monterey Bay Band Jammers with their wives enjoyed a Pizza Party at The Wharf Apr. 30. Marge and Dick Carter, K6ZKH and K6ZNQ, enjoyed showing visitor KR6MD around and helping him to meet some of his buddies. K6TEH is now 100 per cent s.s.b. on 75 through 10 meters. K6TQN is Civil Defense Coordinator for CAP Air-Sea Rescue Sqdn., Port of Redwood City. W6ASH is busy building magnesium chasses for OSCAR. WA6HRS now holds the Amateur Extra Class license. W6AYC is sporting a Mosley tribander. WA6KRG has installed full break-in but is too QRL school for traffic. WA6OLQ has RN6 liaison for NCN Mon. K6KCB has a Sat. TCC sked. WA6HZM has a new "Twoer." W6OII is installing a new mobile job. W6NYO was in New York City on business during May. Traffic: (Apr.) WA6HZM 405, K6KCB 378, K6ZCR 268, WA6OLQ 211, W6WWJ 162, W6FON 117, W6AIT 95, W6DEF 91, W6HC 87, W6YHM 74, K6GZ 35, W6AUC 24, K6VQK 23, W6RFF 16, W6ZLO 16, K6EQE 15, W6OII 11, K6SMH 10, K6TEH 6, W6ISQ 3, K6MITX 3, WA6HRS 2. (Mar.) W6ZRJ 74, W6WWJ 21, W6ASH 17.

EAST BAY—SCM, B. W. Southwell, W6OJW—SEC: K6DQM. ECs: K6TYX, K6VXK. K6ESZ, W6FAR, W6WAH and K6HTJ. WA6ECF got a 25-w.p.m. CP sticker and is putting up a new three-element beam on a 50-ft. tower. WA6JCD is out of the hospital. K6ZYZ is QRL a business trip. WA6JCD has a new NC-300.

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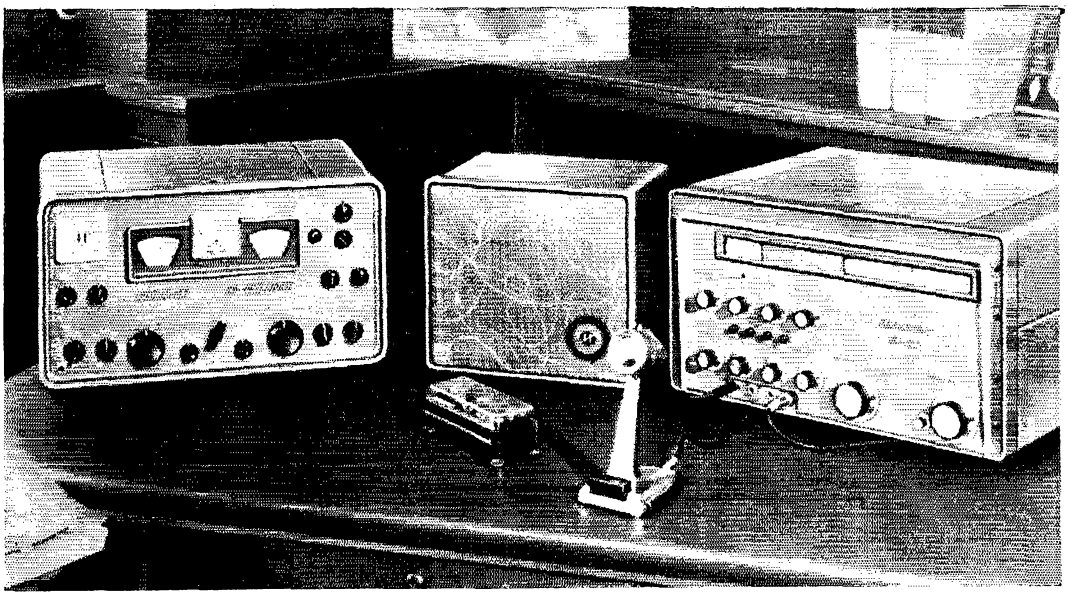

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WA6ECF made BPL in March and April. Congrats. K6OSO is attending Diablo Valley College. WV6RDH is a new Novice in Dixon and is the brother of WA6FKN. The Calif. Maritime Academy at Vallejo has formed a radio club with WV6OSX, WV6OZI and K6RIK sparking the efforts. The SACEN-6 Net has 65 members with 27 actives, and monitors 50.25 Mc. daily from 0715 to 2400 PST. W6OJW has a new Drake 2-A. K6BNQ, W6NBS, WV6PLC, K6ZBN and W6IXE are new members of the Mt. Diablo ARC. WA6HKD and WA6KUU are new members of the HARC. WA6KUU has a Ranger. The Castro Valley High School finally got its antenna up. WA6BBJ is on d.s.b. WA6IMC has a light beam transmitter and has worked 1/2 mile line-of-sight. K6DKQ has a T-90 and a BC-348 with high-gain vertical. WV6NPC has a DX-40 and an S-53A. K6QLS has a Valiant and a G4ZU beam. WA6ONO has a new DX-60. Keep those reports coming in. Traffic: (Apr.) WA6ECF 546. K6GK 305, W6NBX 166, K6ZYZ 67, W6JOH 36. WA6MIE 2. (Mar.) WA6ECF 801, K6ZYZ 108, W6JOH 37.

SAN FRANCISCO—SCM, Leonard R. Geraldi, K6ANP—The San Francisco RC had a most informative and interesting speaker at its May meeting. W6LDD gave a fine rundown on the various legal aspects of tower installations and other problems which confront the amateur fraternity. W6GQA was guest speaker for the MARS Western Division Technical Net on Apr. 9. W6MXJ is now secretary-treasurer of the NCARTS. W6PHS was one of the operators in the EIMAC gang RC Nevada Expedition. The Far West RC is planning an amateur radio booth at the Humboldt County Fair in August. K6OKR is now active on 40 and 80 meters. Congratulations to K6JFY on his new ORS appointment. K6OHJ reports that the mobile field trials at San Luis Obispo were a big success. K6MUZ, president of the San Francisco RC, has added a new ingredient to the monthly meetings. A series of very humerous skits, all touching on various ham activities, has been favorably received. We regret that W6BD has joined Silent Keys. Traffic: (Apr.) W6GQY 387, K6JFY 166, K6SAA 21, K6EKC 2. (Mar.) W6GQY 913, K6JFY 247, K6SAA 12.

SACRAMENTO VALLEY—SCM, George R. Hudson, W6BTY—SEC: K6IKV. ECs: K6BNB, K6GOT and K6BYS. OBS: W6AF. PAM: W6GQS. OOs: W6WLI, W6GDO and K6ER. ORS: W6CEI. OES: W6PIV. OPSs: K6EIL, W6PIV and W6GQS. Your SCM and SEC thank the SARC, Aerojet, McClellen MARS, Golden Empire, Northills, RAMS and Eldorado County radio clubs for the hospitality shown on our recent visits to these clubs. WA6OXE finished the Viking Challenger and Mohawk and has 28 states working for WAS and 7 countries for DXCC. WA6AMK is moving to Nevada. W6GDO has a new Drake 2A mobile. The Camellia Chirps is planning a picnic at Lake Almanor and expects YLRL President K5BNQ to attend. W6AF reports no traffic because the trout are biting. Thanks to W6QYX for the faithful reporting each month. W6WLI has his RTTY scope kit perking. K6EIL just got his Shizuoka certificate. WV6OFN says K6CB has a new s.s.b.-kw. rig on 20 meters and is proud to have had a three-way with KC4USN and VE8MC at the North Pole! Sacramento's own OES has designed at red-hot 2-meter vertical that really works, has just finished a 250-watt c.w. rig with a 4X150 final and has finished building the transistor meter readers for W6CEI and W6HNL. W6VZK, K6YII and W6PIV are helping handicapped Bob Smalley, of Sacramento, to put up a new tower and a tribander and to assemble the Valiant kit. K6BNB helped clear traffic for the California Civil Defense Conelrad exercise. K6BYS, in Chico, has been appointed an EC and WA6IRN and K6RPO have received AREC certificates. The arrangements committee did a bang-up job on the recent Huntoon meeting in Sacramento. There was a nice big turnout and a wonderful speech by General Manager W1LVQ.

SAN JOAQUIN VALLEY—SCM, Ralph Sarovan, W6JPU—The Fresno Amateur Radio Club held its 19th Annual Hamfest May 6, 1961. W6PPO won an HC-500 S.S.B. exciter. W6MXR won a G63 receiver, W6QFR won a pair of 6360 tubes, W6WYT won a Jennings Vacuum Relay, W6LOS won a VOM, W6HIA won both the 6- and 75-meter transmitter hunts, W6PSQ won the 6-meter field measurement test with a converted citizen's bander, W6KUT, W6HYG, W6HVW, W6JPU and W6JCB all attended the 25th class reunion of FHS '36. All of us were members of the QRM Club in high school. While on his way to the Sierras on the opening day of fishing W6GUZ collided with another car. There were no injuries. W6BAN finally found out that the polarity is important in Leece-Neville generators. K6QOK is working a new modulator for his 40-meter rig. W6HKV worked a JA1 on 40-meter s.s.b. W6DUD, WA6HSP, K6OLK, W6JPS, W6JPU, WA6DRH and K6OGX assisted in the C.D. Test on Apr. 28, in Selma. W6JXY got his beam up 60 feet on a crank-up tower. W6EFB is working on the OSCAR project. The SJN had 25 sessions, 520 check-ins and traffic count of 117. K6ROU has worked 123 countries with 91 confirmed. The Porterville Amateur

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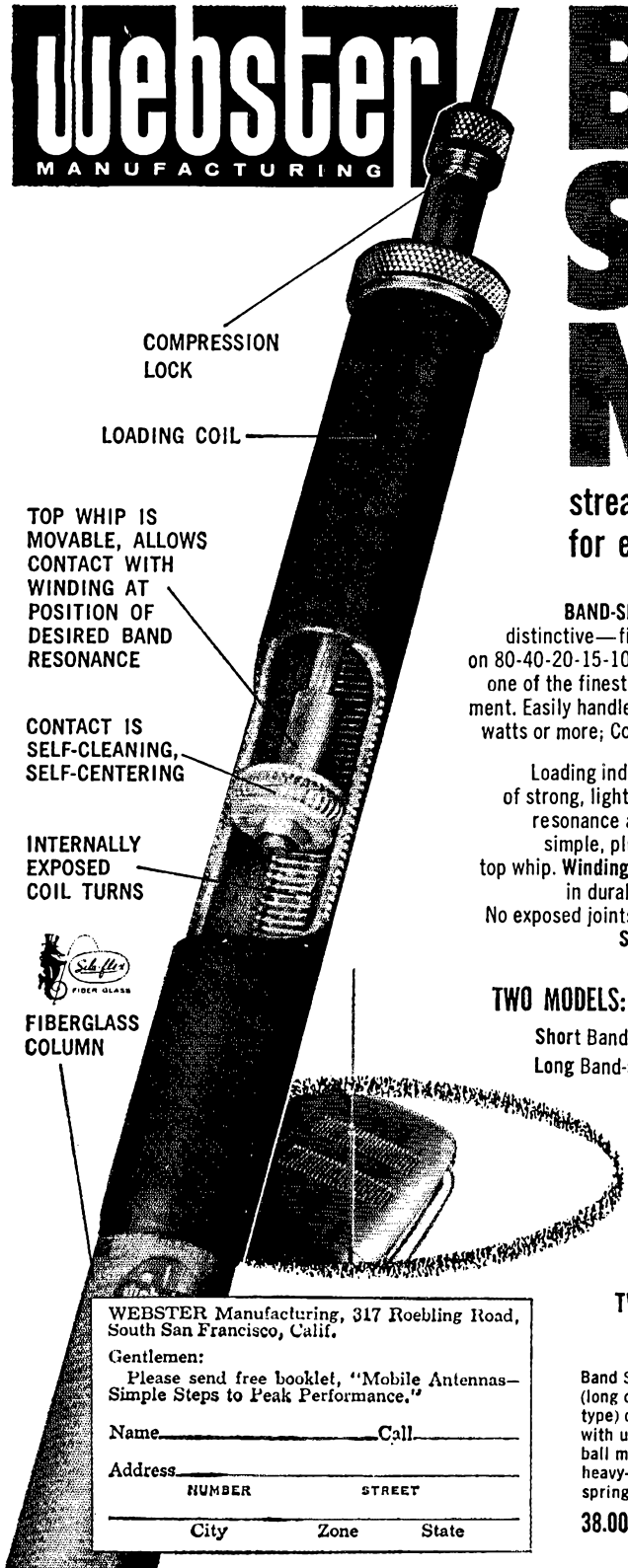

BAND-SPANNER, an exclusive Webster design—distinctive—fine looking on any car—a top performer on 80-40-20-15-10 meter bands (and MARS frequencies)—one of the finest antennas for use with multi-band equipment. Easily handles transceivers with power inputs of 100 watts or more; Collins KWM-2, Gonset G-76 among others.

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Long Band-spanner, 63″ telescoped, 117″ extended.

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No. 1

Band Spanner (long or short type) complete with universal ball mount and heavy-duty spring.

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No. 2

Band Spanner (long or short type) complete with bumper mount and heavy duty spring.

39.00

WEBSTER MANUFACTURING *317 ROEBLING ROAD, SOUTH SAN FRANCISCO, CALIFORNIA*

Radio Club is participating in the Porterville Centennial, and is awarding a special award to anyone who works 3 members of the Porterville Radio Club. The club call is WA6EKP. Traffic: K6ROU 280, K6EJT 80, W6EFB 24.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: W4DRC. V.H.F. PAM: W4ACY. RM: K4CPX. Well the civil defense drill has come and gone. Much study and time was spent by several areas and everything came off in fine shape in those areas: Winston-Salem/Forsythe County had an excellent plan; Mecklenburg County, Rowan County, Greensboro and Burke County all had good plans. There may have been more, but they were not reported. On a state level we had good participation, but a definite plan of operation needs to be formulated. Considerable confusion existed. A state plan such as referred to above for county plans would certainly clarify matters and make for more efficient operation. I was delighted to see and hear the C.W. Net in operation during the drill. It is hoped that the Teletype Net will be in operation before the next state drill. W4BAW and K4YYJ reported on their EC activity. Fellows, we need reports each month from the Emergency Coordinators. How about getting one off to me without fail. Use a postal card if you do not have a form. I have reports from many ORS, only one from an OPS. How about it, fellows? A nice bulletin was received from the NCN, which is very active. I would like a report from the Tar Heel Net. Traffic: W4LEV 514, W4BAW 126, K4VUR 98, K4QWQ 85, K4TPZ 57, K4YNW 53, K4FUN 2.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. PAM: K4HE. RM: W4PED. Excellent scores were made in the February FMT by W4FFH, W4VIW and WØYPT/4. K4FWA will write a ham column for the Greenville papers. The recent hamfest held by the Blue Ridge Club in Greenville, under the leadership of K4LBV, was well attended. Short talks were given by W4GQV and W4AKC. K4QDV was MC. W4TLC has his Conditional Class license and plans increased activity on 2 meters from his new QTH in Taylors. WA4AEV is building 6- and 2-meter transceivers. The Conelrad Drill held Apr. 28 was well publicized by the OBSs with the result that there were very few violations in the state and none on the net frequencies. The Mike & Key Club of Greenville reports that K4JQY is back on 6 meters and that W4DEN is trying to get on 2 meters. RACES groups were very active in the April 26 C.D. Operation Alert. The S. C. S.S.B. Net at its Columbia meeting elected K4JVV, net mgr.; K4MXK, asst.; and W4CE, secy. Traffic: K4ZHV 193, K4AVU 90, W4ANK 80, K4WJR 63, W4FFH 62, W4KNI 48, K4BRP 46, K4HDX 45, K4HJK 42, W4IVE 41, W4VIW 39, W4AKC 37, K4KIT 31, K4LNJ 22, W4PED 16, W4CHD 15, K4HQK 11, K4HMG 2.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—SEC: W4VMA. PAM: W4BGP. RMs: W4LK, K4MXF, K4KNP and W4QDY. New appointee: K4PQV as EC for the Roanoke Area. It's funny but the apologies for the low traffic counts always seem to come from the fellows with the largest totals! W4OOL reports new officers of the SVARC are W4ACC, pres.; K4JNA, vice-pres.; W4TCK, treas. K4JQO, the new Virginia s.s.b. mgr., says that this net is doing very nicely and its traffic report confirms this. ORS W4DLA is building a new big rig which will furnish a potent signal from Lynchburg. W4BGP's new three-element triband is working FB on the DX bands and his new G-76 is working like a house afire. K4LTK reports that things are looking up in the traffic business. K4PRQ will be in Hawaii during June and July. OO W4CVO got a new Gonset G-76 and plans both car and plane use! W4TE is trying to meet four or more traffic nets a day. W4AAD plans much more activity after June graduation. W4KFC is in the midst of construction work on the house which caused removal of all antenna feedlines. W4JUJ, the recipient of a YLCC 300 sticker, won the Kansas Centennial QSO Party for Virginia as well as an HTH certificate and got a 599 c.w. certificate! W4ZM has a "new" 75A-4 to play with. K4CRK reports on participation in OPAL '61 as Asst. Radio Officer for Norfolk Co. and says that excellent local coverage was had. W4JSJ/4 is back on the air with a mess of new gear and a hot signal. Traffic: (Apr.) W4PFC 318, K4MXF 195, K4FSS 154, W4LK 144, K9CVJ/4 128, W4OOL 79, W4JSJ/4 64, W4MYA 61, K4PQL 58, K4PQV 53, W4WO 52, W4CWT 44, W4QDY 43, K4JQO 40, K4AL 37, W4DLA 36, W4KNX 33, W4OWV 29, W4BGP 28, W4RHA 27, K4LTK 22, K4YZT 22, K4UVT 21, K4PRQ 20, W4ZMH 20, W4CVO 19, W4BZE 18, W4TE 16, W4KRX 10, K4QIX 10, W4AAD 4, W4KFC 4, K4KNP 4, K4CHA 3, W4VTO 2, W4JHI 2, K4ARO 1, W4JUJ 1. (Mar.) K9CVJ/4 70, W4JSJ/4 61.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—The Third Annual West Virginia Hamfest will be held at Jackson Mills, July 8 and 9 under the direction of VMP. A feature of this year's hamfest will be an award to West Virginia's outstanding amateur; also the elec-

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"Compares very favorably even to $600.00 receivers. **CONTROL GROUPING PERFECT** and results above expectation. **WOULD RECOMMEND TO ANYONE."**
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"Thanks for putting such a **BEAUTIFUL RECEIVER** on the market."
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tion of a net manager for the c.w. net and a PAM for the phone net will be necessary, because K8HID is resigning as c.w. net manager and WUB is moving with her parents to Grand Rapids, Mich. West Virginia loses a fine and active radio family when the Gwinns (PFL and WUB) move North. HZA was spotlighted in the WVN C.W. *Newsletter*, and GAD made Who's Who in the *West Va. Post office Newsletter*. A new amateur radio club has been formed in the Eastern Panhandle to take care of Morgan, Berkley and Jefferson Counties. ESH and BLR were active during the v.h.f. openings. Congrats to IBF, who was married recently. ORT, IRN, K8DZU, VMP and VOI attended the Dayton Hamvention. Traffic: K8JLF 58, W8NYH 47, K8LOU 41, W8UYR 38, GAD 14, JM 4.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: SIN. PAMs: CXW and IJR. RMs: MYB and WME. OBSs: KØDCC and KØEPD. FEO and RTI received PAN BRAT Awards for their work on CCW during April. Hank, former chief operator at ANA (D.U.), has moved to Cincinnati. Colorado SEC SIN helped organize OPAL in the Denver Area. BMI is using a new horizontal beam on 6 meters. WYX has contacted 138 stations on 2, 6 and 10 meters since Mar. 1 to win the Rocky Mountain Canary Award. The Western Slope Radio Club, Inc., has organized a Novice net known as the Rocky Mountain Novice Net. Frequency: 7175 kc. Times: 1800 on Wed. and 1400 on Sat. ENA now has 20 operators with Conditional to Extra Class tickets, plus 19 operators with Novice and Technician Class licenses. MZN and DND joined the ranks of Pueblo's 7 RTTYers. FEO, TVI, YOK, MYB, QGO and EKQ received the AMPS Award for the period ending in March. IIT received the SNC for the same period. Our congratulations go to WWD on the fourth consecutive BPL earned in 1961. Traffic: KØWWD 695, WØBES 404, KØIIT 268, EDK 204, EDH 200, WØFEO 198, KØQGO 172, RTI 96, DCW 74, WWJ 32, WØCWD 21, KØWYX 12, WØSIN 4, KØLCZ 2.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, 7OCX. SEC: K7BLR. K7NWP again just barely missed making the BPL. K7s HVF, BHE, ELE and KNQ conducted an emergency communications test at Alpine Apr. 22-23. High winds which toppled their shelter did not stop the group from making contact with the Beehive Net and sending messages to c.d. officials and the SEC. The group was representing the Utah County AREC. In the absence of RACES operators the Utah State C.D. requested the help of the Salt Lake County AREC to assist in establishing contact with other towns for the purpose of sending reports to State C.D. Hq. during Operation Alert. The exercise pointed out several weaknesses in the communications system. HVF has a 40-meter vertical up. BUN had some real rough days. K7BGU and WA6GOJ were a big help when conditions were bad. Traffic: K7NWP 475, W7OCX 138, QWH 30, BAJ 4.

NEW MEXICO—SCM, Newell F. Greene, K5IQL—Asst. SCM: Carl W. Franz, 5ZHN. SEC: BQC. PAM: ZU. V.H.F. PAM: FPB. RM: ZHN. The Breakfast Club meets Mon. through Sat. at 0630 MST on 3838 kc. NMEPN meets Tue. and Thurs. at 1800 and Sun. at 0700 on the same frequency. NMBP meets Mon., Wed. and Fri. at 1900 MST on 3570 kc. The reports from OPAL '61 are gratifying. Each year shows improvement, with more stations and better coordination. PDO, MYM, BTL, K5DAB, GYZ, LWU and many others worked diligently during the exercise. 2MTA is now /5 at Alamogordo after a sojourn in Wisconsin. Bill has pitched right in with his able traffic handling. The Carlsbad Annual Picnic is scheduled for Aug. 12. Traffic: W5ZHN 524, UBW 121, K5GYZ 66, LWU 28, W5VC 4.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: IAY. The Pony Express Net meets Sun. at 0830 MST on 3920 kc. The Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. RACES and AREC held a joint Civil Defense OPAL '61 Operation Alert on Apr. 28 and 29 which was a very successful operation with fine coverage of the State of Wyoming. Don't forget the Wyoming Hamfest July 22 and 23 at Deer Haven in the Big Horn Mts., between Buffalo and Worland, Wyo. A new s.s.b. net which meets at 6:30 P.M each evening is very well attended. KLE is manager. The Laramie Radio Club has been revived and is holding regular meetings which are well attended. Traffic: W7BHH 112, HH 63, K7IAY 46, KLE 46, W7LKQ 44, NMW 32, AMU 28, DTD 28, BXS 20, CQL 18, GSQ 18, AEC 16, BKI 16, K7GDX 12, HDB 12, W7ABO 8, K7BMT 8, LHZ 2, W7TZK 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ—SEC: K4JDA. RM: W4RLG. PAMs: K4PHH, K4BTO and W4JJX. Congratulations to W4RLG on being awarded the Birmingham ARC Citizenship Award at the Bir-

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mingham Hamfest. All YLs are invited to call into the Southern Belle Net, which meets Wed. at 7:30 A.M. CST on 3870 kc. An attractive certificate is issued after you have called in five times. K4KDE, KN4NJA and K4ZXX were initiated into the Royal Order of the Wouff Hong at the Chattanooga Convention. K4ODU has a new Heath Apache and an SB-10. Welcome to WN4AKB, a new Novice in Huntsville. The Selma ARC meets in its new clubrooms in downtown Selma. K4KQN reports. Prize winners at the Birmingham Hamfest were W4DDH, K4ZBX, K4ZXA, K5YGS, K4TZZ and W4LUD. Start planning now to attend the North Alabama Hamfest to be held in Florence Aug. 20. W4BMM reports the Cullman ARC is conducting code and theory classes. Welcome to AENB, K4RIN and W4RLZ. W4PKA is busy building a house, changing jobs to a computer engineer, going to school and teaching at the local trade school in Decatur. KN4NSD has a Heathkit DX-40 and an NC-109 receiver. K4IWI reports on good fishing trips along with his excellent OO reports. W4ZSH has the all-new Collins S/Line equipment. All members of the Springville Novice Net participated in a drill during the c.d. exercises by having County VIPs call in to control station (W4OXU, K4WUD) from roving mobile unit, K4AVM, with W4OXU on the mike. Congratulations and best wishes to K4JDA on his recent marriage. K4AUP reports the Muscle Shoals ARC has 31 in its code class conducted by K4CNA. K4ZBX has a daytime c.w. sked with K4JPK. Hats off to a ham family in Huntsville, W4PJI the OM, W4PJJ the XYL, W4PJK the jr. operator, K4WZB the jr. YL. A new YL in Mobile is W4UVN, the XYL of W4LYT. Congrats to W4OQG, new manager of the AENT, teenage net, which meets on 3965 kc. daily at 4:30 P.M. CST. *6-and 2-meter news*: K4FJZ reports 12 stations on 6 in the Auburn Area. K4UMD, AENO mgr., welcomes to the AENO new members K4CTB and K4FQE. K4UMD had the highest score in the recent AREC mobile drill sponsored by the Jefferson County AREC. K4IQU has built a dandy 6-meter transistorized transceiver you can operate and hold in one hand. K4WHW now is on 6 meters in Decatur. W4HSU maintains a regular Tue. night sked on 2-meter phone at 0130 GMT. The rig consists of a Globe Hi-Bander transmitter, an NC-109 receiver, Ameco converter, eighteen-element, 21-ft. boom, 58-ft. high beam. W4UAR reports a sked on 2 meters Tue. at 7:30 P.M. CST and invites other 2-meter stations to listen and join in. Traffic: (Apr.) K4PFM 348, W4RLG 123, K4GXS 50, K4PHH 48, K4HJM 47, W4MI 41, W4OKQ 40, K4YUD/K4YTQ 36, K4AOZ 35, K4SAV 33, W4PVG 30, K4JDA 28, K4CFD 26, W4KIX 22, K4KDE 16, K4WHW 11, K4ZNI 11, K4DJR 10, K4RCA 10, W4BMM 8, K4BQU 8, W4HSU 8, K4TVZ 8, K4RIL 7, W4YER 7, K4TDJ 6, K4UDK 6, K4ODU 5, K4UMD 5, KN4NSD 3, WN4ABX 2, K4QMH 2, W4TOI 2, K4ZBX 2. (Mar.) K4ZBX 6, K4ODU 4, K4AUP 2.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: W4IYT. RM: K4KDN. RM RTTY: W4EHU: L. F. PAMs: W4SDR and K4LCF. V.H.F. PAM: W4RMU. Section nets: FPTN, 3945 kc. M/S 0700; FEPN, 3910 kc. Tue. 1830; East Net 3910 kc. daily 1930; GN, 7115 kc. daily 0830; QFN, 3650 kc. daily 1830; FEPN, 3910 kc. Tue. 1830; East Net 3910 kc. daily 1930; Fla. Sidebanders, 3940 kc. Sun 1700. The May 7 LO Party for Florida LOs proved to be a lively discussion period. W4EXM is now KR6AM on 20-meter s.s.b. W4TRS has joined the power boys with a pair of 813s. W4DVR is now using an HT-32B with his 4-1000A amplifier. W4DDW is preparing Novices for the General Class exam. K4MTP finally got that richly-deserved A-1 Operator certificate. K4BZ is now on 6 and 2 meters handling traffic plus a new code class for the CAP. K4JZU is sporting a new HT-37. Yours truly will be at Boy Scout Camp Sebring as usual the first two weeks in August as counselor and will be handling traffic on 40-meter c.w. with a homebrew transmitter and receiver on 7080, 7115 and 7140 kc. Look at the K4BNE family initials: jr. operators DC and CW, girl AC, XYL BC and Dad RR. OPAL '61 was a big success, according to comments on Forms 1. If you are AREC sign up for RACES also. We are gradually getting away from the bare radiogram type of traffic report. I would much rather have the ARRL Form 1, fellows. Ask me for them. Traffic: (Apr.) WA6FCO/4 695, K4SJH 582, K6PBD/4 335, K4KDN 295, K4LCF 200, K4FMA 170, W4DVR 161, K4DBT 156, K4COO 122, W4TRS 115, W4FE 104, W4SGY 88, K4BZ 82, K4LVE 77, W4EHW 71, K4ENW 69, W4AYD 67, W4CNZ 62, W4AZJ 60, K4AKQ 57, K4RDX 53, W4EAT 52, K4ILB 52, K4VSA 48, K4JZU 47, W4BKC 45, W4IYT 45, K4QQE 41, K4JZN 43, K4AX 29, K4BNE 38, K4OZS 35, K4BY 32, W4LSA 31, W4VCX 31, K4ANR 29, K4DAX 25, W4HTH 21, K4RNS 20, W4HRC 18, W4OWD 17, W4LMT 17, K4MTP 15, W4DSH 14, K4JJZ 13, W4UHB 12, W4DDW 11, W4FFF 11, K4YSN 11, K4ZIF 10, W4KLP/4 9, K4NHK 6, K4LLT 4, K4YPN 2. (Mar.) K4EHY 477, W4GJI 300, K4LML 40, W4AYD 7.

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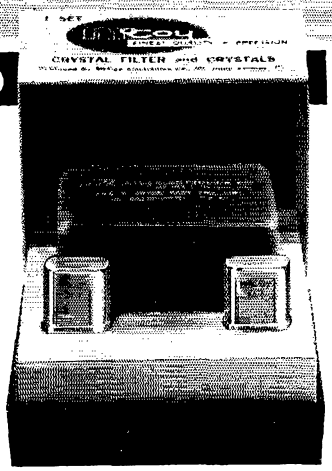
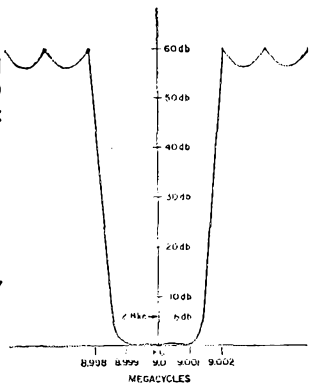
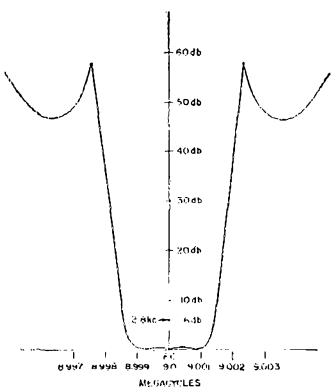
The GOLDEN GUARDIAN (48B1)



TECHNICAL DATA
Impedance: 640 Ohms in and out (unbalanced to ground)
Unwanted Side Band Rejection: Greater than 55db
Passband Ripple: ± .5db
Shape factor: 6 to 20db 1.15 to 1
Shape factor: 6 to 50db 1.44 to 1
Package Size: 2 1/16" x 1 19/32" x 1"
Price: $42.95 Each



The SILVER SENTINEL (32B1)



TECHNICAL DATA
Impedance: 560 Ohms in and out
Unwanted Side Band Rejection: Greater than 40db
Passband Ripple: ± .5db
Shape factor: 6 to 20db 1.21 to 1
Shape factor: 6 to 50db 1.56 to 1
Package Size: 1¾" x 1¼" x 1"
Price: $32.95 Each

Both the Golden Guardian and the Silver Sentinel contain a precision McCoy filter and two of the famous M-1 McCoy Oscillator crystals. By switching crystals either upper or lower side band operation may be selected. Balanced modulator circuit will be supplied upon request.

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WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: K4UBR. Ed Handy, W1BDI, visited clubs in Panama City and Pensacola and gave interesting talks on ARRL activity. Operation Alert 1961 found ham groups in Pensacola, Ft. Walton, Tallahassee and elsewhere active. More counties need to prepare a RACES plan. If you need information, contact your SCM or SEC. K4LOL has been appointed OPS. K2AFQ/4. OO, has moved to Texas. Traffic totals are increasing on both QFN and WFPN. Check in on 3650 or 3836 kc. daily. The Early Bird (6 A.M.) Phone Net has been doing especially well. W4RTN and K4KAA have moved from Madison to Perry. W4KQP is now s.s.b., and represented Perry on OPAL '61. W4HQN was high scorer in the recent CD Party, with 150,000 plus. He is over 200 on DXCC, while W4OSD, the XYL, is up to 87. K4QDN has the new homebrew rig running 150 watts on c.w. He is acting as Asst. EC for K4EYC. Two-meter contact was finally made between Ft. Walton and Pensacola, with Q5 signals both ways using horizontal beams. Let's listen more on 145.2 Mc. WA4AGL is active from Milton on 80-2 meters. WN4AYC and WN4ALH are new hams in Pensacola. Traffic: (Apr.) K4VND 148, K4SMB 83, W4WEB 55, K4LOL 45, K4ZMV 2. (Mar.) K4CNY 342, W4WEB 43.

GEORGIA—SCM, William F. Kennedy W4CFJ—SEC: W4PMJ. PAMs: W4LXE and W4ACH. RM: W4DDY. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 EST Sun. GSN meets Mon. through Sun. on 3595 kc. at 1900 EST and 2200 EST with W4DDY as NC. The 75-Meter Mobile Net meets Sun. on 3995 kc. at 1330 EST., K4YID as NC. The GPYL Net meets Thurs. on 7260 kc. at 0900 EST., K4ZZS as NC. The Atlanta Ten-Meter Phone Net meets Sun. on 29.6 Mc. at 2200 EST; W4BGE net mgr. The Georgia S.S.B Net meets Mon. through Fri. on 3972 kc. at 2000 EST. K4RHB net mgr. The Atlanta Radio Club Phone Net meets at 2100 EST on 21.36 Mc. Sun., W4DOC NC. K4ZYI now is running a kw. and has just about gotten DXCC on 7 Mc. W4DDY moved to Augusta June 9. His new address is 2608 Fuller Dr. Many of the Georgia hams enjoyed the Delta Division Hamfest held in Chattanooga, Tenn. K4PKK reports that the V.H.F. Club had nine mobile 6-meter stations and three 2-meter fixed stations participating in Exercise OPAL '61 with a total of 15 stations and 18 operators from the V.H.F. AREC Club. En route to the Columbus, Ga., Hamfest K4NHQ, mobile, had a flat tire with no spare. A contact with K4ZHT and K4QWX brought them to the rescue. New officers of the Albany Amateur Radio Club, Inc., for 1961-62 are K4TJN, pres.; K4ICW, vice-pres.; W4OJB, act. chairman; Charles Royal, secy.-treas. The Albany Net meets each Sun. at 3:30 P.M. on 3970 kc. The Albany 10-Meter Net meets Thurs. at 8 P.M. on 28,800 Mc. John David now is W4UUR, Mike Henry is now WN4ARR. A. J. Morris is WN4AGA. During OPAL '61 at the State C.D. in Atlanta there were 10 operators who operated W4TJS for 27 hours. Also numerous amateurs throughout the state operated their stations for many hours. W4YEK is the proud owner of a Collins S/Line. Traffic: K4ZYI 141, W4DDY 77, K4FJD 52, W4RLZ 43, K4FPZ 6.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—My report for March was not filed because I was in the process of moving to new quarters and I could not get to any of my notes. SW was hospitalized during his vacation near Augusta, Ga. He underwent surgery but is now back on the job. KR, AC and LE removed Ted's beam for moving to his new location at Cardenas Village since Ted was in the States. KR has shifted his location to the new FAA Housing Area. SW is now operating with a triband trap vertical. The TD antenna farm is not set up yet but I am operating 10 meters with a beam, 15 with a dipole and 20 with a ground plane. GS, better known for her operating at JW, will be on a Stateside vacation for two months. PR also is on vacation so that the CZARA is now short a secretary and a treasurer. Ardie, AT, and Don will keep JW active while Gloria is gone. Several of the local amateurs have run into difficulty with operating privileges because of a ruling requiring residence in the Canal Zone. A number of military men recently arrived without rank and therefore without housing available for their families, requiring them to reside in the Republic of Panama. Under present rulings these operators' licenses would not be any good. Discussions were held with the local authorities and work is being done to see if this can be modified. Mr. Al McCormick gave a lecture on Satellite Modulation at the Crossroads ARC meeting. RV reports that the c.d. drill went off smoothly and that all C.Z. stations were QRT for the time period. Traffic: KZ5OA 70, JW 54, TD 15, FG 12, OB 11, KR 4.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6LVR. PAMs: W6BUK, W6ORS and K6PZM. The following stations earned BPL in April: K6MCA, K6EPT, W6WPF and

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W6GYH. Congrats, fellows! W6GYH worked the C.D. Drill from Saugus while K6SIX was at Biseduz Center in L.A. WA6LQD uses a transistor triple-conversion receiver and a 2.25-watt transistorized transmitter on 145 Mc. K7AGG/6 asst. regional director for the 2-4-6 Net. K6EA is operating a little rig/AIM. K6YVN and W6MDK report that 40 meters is picking up. K6UYK is back on with a KWM-2 and Heath "Twoer." W6NAA has a new emergency net on, the East San Gabriel Valley AREC Net on 50.55 Mc. at 2030 Wed. W6ORS will be mobile again soon from a new Comet. W6SRE is working liaison between 75 and 2 meters for GBN. K6MGO has a 6-meter ground-plane up 50 feet. The San Fernando Valley Radio Club 2-Meter Net has a new NCS in K9UZS/6. WA6HUO reports good DX on 10 meters when open. W6BHG took a long trip to Oklahoma. WA6CKR spent 5 days in the hospital. We wish you a speedy recovery, Mickey! W6MEP reports repeater operation is increasing. WV6OWN is doing very well with an AT-1 on 40 meters. W6FB had a minor heart attack. Take it easy, Fred! K6CDW reports increased activity in the Phone CD Party. W6IBD visited with the Frankford gang in Philadelphia. K6HOV is running an HT-20 on 2 meters. WA6JOC is the new secy. for MCAN-7. W6VOZ was/MM on the Coronado Ferry! A gang from the SoCal 6 Net mobileaded to Hemet. WA6KVS reports several Texas openings on 6 meters. K6TOS is taking a tour of Europe. W6SFX is running a GSB-100 with a Warrior linear! Support your section nets: On c.w., the Southern California Net which meets at 0300 GMT on 3600 kc. daily; on phone, the SoCal 6 Net which meets at 0300 GMT on 50.4 Mc. daily. Traffic: (Apr.) K6MCA 1377, K6EPT 872, W6WPF 803, W6GYH 786, WA6MAP 477, KOCLS 6 470, K6OZJ 323, K6QPH 295, WA6JDB 219, WA6KVS 194, WA6DCZ 170, K6JSD 120, W6BHG 94, K6YVN 69, WA6KQN 68, WA6DWP 52, K6SIX 48, WA6LQD 36, WA6LPS 35, WA6JIJ 31, K6MGO 18, WA6CKR 17, W6USY 17, WA6JOC 15, W6SRE 14, WA6MEH 12, K7AGG 6 11, W6CK 9, W6BUK 6, K6EA 5, WA6QFC 5, W6CIS 4, K6HOV 4, WA6BFC 3, WV6OWM 3, W6NAA 1. (Mar.) W6WPF 1163, K6EPT 514, WA6KQN 34, W6UGA 14, K6BEQ 4.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—Asst. SCM/SEC: George Mezey, K7NIY. PAM: OIF, RM: LND. The Copper State Net meets at 1930 MST Mon. through Fri.; the Grand Canyon Net Sun., at 0800 on 7210 kc.; the Tucson AREC Net Wed. at 1900 on 3880 kc. K7NIY, Asst. SCM, began his term of office by attending the get-together of the ARRL Board of Directors held at Disneyland Hotel, Anaheim, Calif. George renewed many old acquaintances made over the years when he was a W2. Congratulations are in order for the Scottsdale Amateur Radio Club. On Mar. 28, its application was approved and the club is now affiliated with ARRL. Any correspondence with them should be directed to K7AIH, 7607 East Earll Drive, Scottsdale, Ariz. The newspaper, *The Arizona Republic*, published in Phoenix, honors the amateur radio fraternity with one article each Sunday. Recently there were write-ups on K7ASK and K7IHQF. All Arizona amateurs who take *The Republic* should watch the Home and Garden Section. As a token of appreciation and to keep these articles coming, drop a note to Eddie Lee, K7YFG, or Turk Smith, FRR, in care of the *Arizona Republic*, 120 East Van Buren, Phoenix, Ariz. LND, RM, needs c.w. operators for the 12th Regional Net. Anyone interested, please contact Hugh on the Copper State Net or direct correspondence to 342 West Latham, Scottsdale, Ariz. Don't forget the hamfest to be held in Fort Huachuca over Labor Day. Traffic: WØWHE/7 85, W7LND 72.

SAN DIEGO—SCM, Don Stansiter, W6LRU—SEC: W6LYF. RM: W6EOT. Congratulations to the three Orange County clubs, the Fullerton Radio Club, Inc., the Orange County Amateur Radio Club, Inc., and the Newport Amateur Radio Society, who jointly held the 1962 Division Convention June 1, 2 and 3 at the Disneyland Hotel. The latest ARRL figures state there are 1011 League members in this section with 660 in San Diego County, 342 in Orange County and 9 in Imperial County. Sorry to report the passing of Old Timer W6VQ, who started with spark in 1912. WA6BDW vacationed to Indiana, enjoying mobile operation on 40 and 75 meters. New Generals in Escondido are WA6s LKB and KXS. A new Novice there is WV6QJF. W6WSY spoke to the Newport Club in late April on "DX." K6BVY, OO and chief operator at Camp Pendleton, had a traffic total of 3642 for April with three operators. W6EOT, RM, has built a transceiver unit so his 75S-1 controls his DX-100. Your SCM had the pleasure of meeting with Ed Handy from ARRL Headquarters, Director Meyers and SCMs from Santa Barbara, Los Angeles and Arizona after the recent Board Meeting in Anaheim. A number of changes are being considered, including a fuller coverage of SCM meetings with clubs. It is requested that all clubs contact me for a meeting date between now and December so I can set up a schedule to cover as much territory as possible. My talk would be on ARRL, appointments, and would include question

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SANTA BARBARA—SCM, Robert A. Heinke, K6CVR—SEC: W6JLY. Paso Robles RC has a General Class license course every Tue. W6HJL is active again on 40-meter c.w. K6THH has a Viking Adventurer. W6OXJ is going to college in Salinas. W6NGJ and W6YCF are going to the hamfest in Fresno and then to Yosemite for a couple days. Welcome to the Santa Barbara section: WA6OON, WA6OVA, WA6CWM, W4IFW, K6PCM, WA6PAF, WV6PGA, W6VSB, WA6OKN and WA6OIN. K6HLC is back from the Antarctic and now is stationed in Hawaii. WA6NXL got a Communicator for 2 meters. WA6OON is operating mobile on 40 and 80 meters. K6KPU is now in KH6-Land with a new call, KH6EDZ. W6UWL got his old call, KH6AWJ, plus a new one, KB6BP, for his Pacific flights. The Santa Barbara ARC code and theory class had a record 15 students taking the exams for licenses out of a class of 25. Traffic: W6YCF 14, W6JLY 11, W6FYW 6.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—On Apr. 30 the NTEN played host to 183 amateurs at a picnic at the Mineral Wells State Park. It was an old-time affair with each one bringing a picnic basket. HRN introduced Mayor Davis, who extended us a hearty welcome and invitation to return. K5TRY, State RACES Communications Officer, and K5AEX, Region 5 RACES Officer gave talks on civil defense. Mr. Young Sloan, of the U.S. Weather Bureau, explained how the amateur could help the Weather Bureau. K5BKH is on RTTY. K5BDX worked 20 countries during the C.W. DX Contest final. New officers of the Ft. Worth KC Club are K5MUX, pres.; K5VZP, vice-pres.; K5RHZ, 2nd vice-pres.; TVN, secy.-treas. The Arlington State College ARC has turned out two new Novices as a result of its code and theory class. Many amateurs in the Ft. Worth Area took part in the recent c.d. alert, handling traffic locally and to State Hq. at Austin. Acting as net control stations were K5TMR, K5OUZ, K5YPQ, K5ZID, K5ZFI, K5RHZ, K5ENL, K5SXK and W5YPO. Acting as liaison between NTEN and State Hq. were K5QOV and HPH with alternates K5VWS, K5QWR, K5WSF, K5YPO, of the Aeronautics Division's Advanced Weapons Section at Chance Vought, gives visiting Army Helicopter cadets a lecture on infrared suppression problems, and offers to send free messages via radio to their wives, parents and friends. Traffic: K5QWR 374, W5BKH 322, SMK 226, BKH 114, K5PXV 85, ILL 78, W5BOO 57, LR 49, K5VWJ 45, W5ANK 43, GY 37, GNF 34, K5YPO 21, W5EUY 14, K5WSF 8, AVX 6, W5IL 2.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—SEC: K5KTW. Operation OPAL was the big operating event of April. Oklahoma amateurs turned out en masse. Thanks to all, especially ECs and Area NCSs. These were CUQ, EJK, PGI, JJR, QVV, PAA, ODM, MFX, ORH, WSX and K5JJC. The Weather Net had a good workout in April. CZB, K5CAI, K5PDM, AZO and many others were kept busy. Immediately following the tornado in Eastern Oklahoma, CUQ set up portable operation at Howe, but the long skip was in and it was necessary to relay through SUX and DIJ. UAO, K5GDR, BIE, OQM, ZZG, GQG, QHY and K5PAM were among the many other stations helping. A new Novice at Walters is KN5JPM. K5KVR and his XYL K5HFW entertained the Windjammers Club with a huge fish fry Apr. 28. The Quartz Mountain Hamfest had more than 200 in attendance. The North Fork Club, K5IZP president, did a swell job there. New ECs are K5LYM and ODM. New ORSs are MBK and AUX. A new OPS is K5OCX. Good luck to retiring officials IZM, MGZ and K5ELG. Thanks for your work. The SCM had a very enjoyable and profitable visit with the Bartlesville Radio Club Apr. 10. Traffic: K5USA 509, MBK/5 272, W5PAA 243, MFX 188, DRZ 164, K5IBZ 156, DLP 155, W5OOF 111, LTB 66, K5AUX 58, OCX 58, HFW 54, DUJ 41, LZF 40, JOA 34, JGZ 33, ELG 32, W5CCK 31, JXM/5 28, VLW 23, KY 18, UYQ 17, FKL 14, K5VNJ 14, W5WAF 14, K5OOV 13, W5WDD 11, EHC 8, PNG 8, GIQ 6, K5LAD 6, W5WAX 6, K5BNQ 5, W5ADB 4, BBA 4, K5PDM 4, HQE 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: AIR, PAM: ZPD. K5WQM has a new 10-kw. generator for emergency use. The 7290 Traffic Net has 42 sessions, 1482 stations check-in and 806 messages. April was the trouble month for MVL. His s.s.b. exciter went west on him, the high wind took the gears from his rotator, but everything is back to normal again. Antenna and rotator trouble seems to be the style for everyone in Southern Texas, because of the high winds, which here on the coast have been steady from 30 to 45 miles per hour, and at one time were up to 80 miles. We regret to announce OPJ and WMC as Silent Keys. Both were dedicated amateurs and certainly will be missed from the air. The activity of the amateurs in cooperation with the c.d. on OPAL was very good. Very

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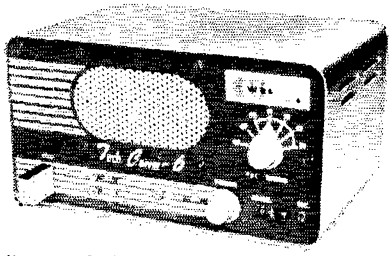

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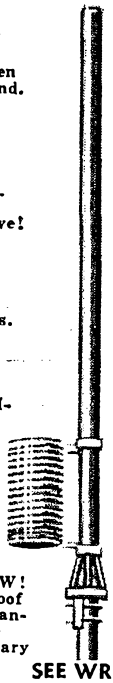

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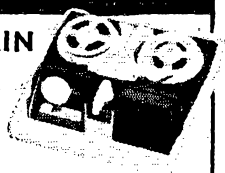

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few stations were heard during the Conelrad Alert, and all nets checked in with the main state control station at Austin. Congratulations, fellows and gals, on a job well done. QKF visited with the Valley amateurs during their get-together. This meeting was attended by amateurs from as far away as Monterey, Mexico. Traffic: W5AC 240, K5WIC 195, W5AIR 90, K5MXO 85, W5ZPD 38, K5MWL 28, WQM 7.

CANADIAN DIVISION

ALBERTA—SCM, Harry Harrold, VE6TG— The Alberta boys welcome all comers to their 27th annual Glacier-Watertown Hamfest, Watertown Park, Alta. July 22-23. Send reservations to Box 424, Lethbridge. The SCM and Calgary group had the pleasure of a dinner and club meeting with Director Noel Eaton, VE3CJ, May 23, all getting a first hand account of Canadian and Board meeting matters. VE6TG invites reports and appointment applications from all active members.

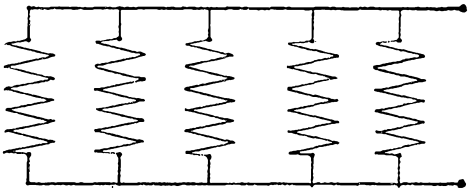
MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: H. C. Hillyard, VO1CZ, and A. E. W. Street, VE1EK, SEC: BL. VO1EC reports that call letter license plates will be available to VO1s and VO2s in 1962. VO1s EX, EC, DT, DN and AO are now using sideband operation. VE1QV has been a frequent visitor to St. Johns. VE1WG has been posted to the West Coast. Bill will be missed in the Halifax Area as he was very active in the work of the Police Boys' Club. SI is now located at Barriefield, Ont. IF has been adding color to his telecasting and plans are under way for a DX TV attempt across the Bay of Fundy from Rawdon to Moncton later this year. LZ and family have returned from a Bermuda holiday. LY has a new filter rig on s.s.b. CL has a new Valiant transmitter. AED is in Ontario for the summer. LE is the new call of the #161 Air Cadet Sqdn. at Saint John. MM and SP have new Gonsets on 6 meters. New calls include AHJ, Halifax, active on 14-Mc. c.w. We regret to advise of the passing of Harold Jackson, ex-VO2B, formerly of St. John's, Nfld. Harold was with the DOT and a member of the Canadian Delegation to the International Frequencies Conference, Geneva, in 1959. Traffic: VE1OM 15, AEB 7.

ONTARIO—SCM, Richard W. Roberts, VE3NG— The Northshore ARC held an FB Dinner at Pickering. The SCM, NG, was a visitor to Windsor. AYS was seen poaching at Craigleith for Rainbow, BJR was assisting. AIL is busy with traffic on the nets. Your QSL or a Get Well card to DOO would help. He lost one of his legs recently. Send cards to the hospital in London or via any London station. Windsor is getting ready for the big invasion this fall for the ARRL Convention. The St. Clair ARC Banquet was a huge success. At the last report Nortown was meeting in the local Police Station. VD still is knocking them dead with his vertical on 7 Mc. BUR is getting DX on Stock Market. CWA has earned his 5th BPL award. BQN is going on 2 meters. HC was first on aeronautical mobile on 2 meters. DLS reports on v.h.f. in the Toronto Area. BD has a new Ranger. DZA will be portable at Meaford this summer. NG worked maritime mobile from his cruiser for F.D. AJA will have a new QTH in North Bay soon. The Sudbury ARC went out for Field Day this year. Now that Marconi has awarded its trophy to the thrice-winning Nortown ARC are they putting up another? DWN was on Ch. 9, Toronto, recently with a plug for ham radio. DOK assisted in an SOS with a ship in Dominican waters. VE0NA was the QSP, on the HMCS *Nootka*. Traffic: VE3CWA 650, NG 180, DPO 125, BZB 63, BAQ 60, COO 47, EHL 46, CYR 36, CFR 28, DTO 28, EAM 28, NO 21, AMT 18, DLC 18, GI 14, DU 9, DH 8, DWN 8, ABI 6.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Business is flourishing on the OQN C.W. Net. WT, net mgr., deserves much credit for instilling such enthusiasm. During April, 27 sessions were held with 159 messages handled and 278 stations reporting in. The Montreal Mobile Amateur Club has changed its name to the Mobile Emergency Communications Corps. This is a very active organization and various types of educational exercises are always taking place. AEW has joined the automatic keyer clan, finishing a W9TO keyer. The way some of the lads use these keyers, they sound more nostalgic than automatic! MP4BBW was a welcome DX visitor to the May meeting of the Lakeshore Club. IC, with XYL EB, paid a visit to their daughter in VP3-Land where they also met VP3MIC, YG and RW. AUH is the newly-elected president of the St. Maurice Valley Amateur Radio Assn. He has 12 very active hams in his region operating on 144.138 Mc. ABE reports some 40 French and 20 English VE2 stations active on this band. YA's Mosley tribander, smashed in a sleet storm, is back in business, and DR's Hy-Gain beam is performing with authority. WA is scrapping the old beam and contemplating something new. CK may brighten our bands again after moving to a new location. We are disappointed to learn that IK shortly will be signing VE3 at Ottawa. AGF/W6 paid a quick visit to Montreal.

(Please turn the page)

analogy #1–resistors in parallel



By placing resistors in parallel, you decrease the resultant resistance–i.e., 5 resistors of 10 ohms each in parallel produce a total resistance of 2 ohms.

$$\frac{1}{\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}+\frac{1}{R_4}+\frac{1}{R_5}}=R_t \qquad (R_t = \text{total resistance})$$

Just as resistors in parallel reduce total resistance to the flow of current–so our **high trade-in allowances, easy terms, wide selections, fast service, and expert advice** make it easier for you to buy your ham gear at Harrison.

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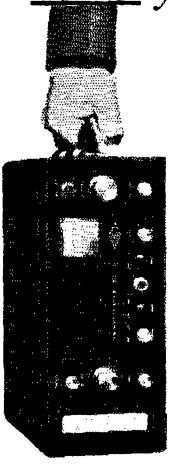

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A complete, compact AM station. Sensitive receiver, powerful 24 watt input transmitter and 115 VAC, transistor 12 VDC supply–all in one sturdy, portable case. A dependable performer in the shack, on the road, and in the field.

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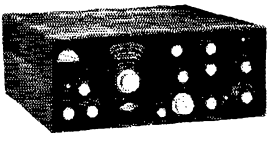
VFO. Covers 6, 2 and 1¼. Works with Communicators I, II, III and IV. Also provides NBFM. Model 3357—$69.50

G-76 100 Watt 6 BAND TRANSCEIVER



Plenty of sensitivity and "sock" on all bands 80 thru 6. Built in VFO (xtal for 6 meters). Ideal for mobile, marine, and portable/fixed—**anywhere** you want a dependable station that will give you real performance and operating pleasure on AM and CW! Model 3338 — $399.50. 12 Volt Transistorized Power Supply—$145. AC Power Supply, Internal Speaker—$145.

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BE visited W6MLZ. Traffic: VE2WT 94, DR 79, AGM 36, AFU 24, ASW 18, EC 17, AFJ 15, BG 15, ANV 5, ABV 4, BDV 4.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—AC and his XYL had a bad auto accident and Reg will be enclosed in steel to support the spine for months. The Terrace Slow Speed Net meets at 1830 hours on 3700 kc. BFW purchased five acres to farm antennas. The bug bit ANW again after thirteen years off the air. BGJ, though blind, is an FB c.w. operator and an excellent phone operator on 2 meters. AOI did a real FB job as net controller during AIG's stay with the Navy. Yes, he is Air force. BAV is active on BCEN with a DX-20. AV is with PGE Electronics. AAF has three jobs. All this to support an AR-88. New appointments: BGE as ORS, AAF as OPS. BGE and BFL as NCSs. Congratulations, gentlemen. Checkers anyone? *See* BFK or BGE. BCEN net *time is* 0200 *and* 0500 GMT. The BCAREC Net, 3755 kc., is on Daylight Time at 1800 hours. PG is 79 years young and real active. Can anyone beat that record? The BCAREC Net, as reported by AIG, our PAM, had 25 sessions, 1362 check-ins, 77 registered messages, 284 verbal messages and 19 members checked in 18 or more times during the month of April. FS, our SEC, requests volunteers for EC posts in Vancouver, Nanaimo, Alberies and Victoria and support from other places. Traffic: VE7BGE 48, AMW 25, DH 11.

MANITOBA—SCM, M. S. Watson, VE4JY—The Manitoba Junior Chamber of Commerce had a provincial "Airway" hookup on Apr. 17 assisted by JW, QD, HC, JY and NE. Civil defense exercise "Toosin" on May 5 and 6 was ably assisted by QD, RB, KG, AN and JY. Congrats to SD and IM, ARRL Sweepstakes winners. Boating enthusiasts TL, WB, FG, GN and NT are getting their radio gear in shape for the summer season. The radio clubs are putting on a display at the Red River Ex. The Brandon ARC Hamfest promises to be a bang-up affair. The ARLM Dinner for Noel Eaton, ARRL Canadian Division Director, was held June 2. At the regular ARLM meeting, Technical Chairman AB conducted a question-and-answer period on TVI. IM has been appointed ORS for the Winnipeg Area. JW has been appointed OO. RO, a veteran ham from spark-gap days who has worked 300 countries and is the possessor of 8000 QSLs and many awards, including the ARRL Public Service Award, was the subject of an article in the WARA *Splatter*. It is with deep regret that we record the passing of AL, of Binscarth, Man., on May 5 after a short illness. Traffic: VE4KN 36, EF 14, QD 12, PE 9, JY 8.

SASKATCHEWAN—SCM, Harold R. Horn, VE5HR —Our congratulations to DZ and ZM on being winners of the ARRL SS Contest, c.w. and phone, respectively. The Saskatoon Club and CU, president and instructor, are to be congratulated on 16 of the 18 members in the classes passing their exams for amateur tickets. QC has a new Drake 2A receiver. GY has a 10B for s.s.b. but likes c.w. too much to make use of it as yet. LM has swapped his Apache for a Johnson Valiant. Our sympathy to the family of JA, who passed away Apr. 10. NQ advises that PEN is doing well and considerable traffic is being handled. DQ took the big step and was married Mar. 30. Our congratulations to you both. EE has a new Gelosо receiver. Two new YLs, Kay and Isabel Shaw, will be heard as soon as their calls are issued. Kay's OM, Ron, also passed the exam. DA is a new call on 50 Mc. VL now has 9 states confirmed on 50 Mc. Traffic: (Apr.) VE5NQ 31, EO 24, LM 22, YR 20, MS 17, HQ 13, DS 12, MS 12, IL 11, VE6AEN 11, VE5NX 10, CE 4, CR 2, NR 2, EQ 1, IT 1, (Mar.) VE5NQ 55, MS 51, EO 44, DZ/GW 22, AG 15, SC 13, VE6AEN 9.

Sporadic-*E* Warning Service

(*Continued from page 19*)

up to 400 feet in the air, subject to the same sporadic-*E* skip that puts the life in 6 meters. But being somewhat lower in frequency, they catch it first.

How effective is this monitoring scheme? Very! I have found that seldom is there sporadic-*E* present that will affect 42 Mc., and not affect 50 Mc. Look at it this way — assuming you use a beam with 8- to 10-db. gain, and the station on the other end of the QSO is similarly equipped. If you run a 6146 or similar final, you are working with the same effect as a pair of 3-kw. finals on nondirectional antennas. Therefore, if you hear *E*

(*Please turn the next page*)

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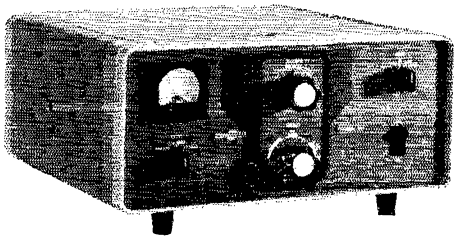

30L-1 Linear Amplifier	$ 520.00
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skip on the police frequencies, if there is any 6-meter activity in the same area, you should be able to open the band to them. Also, by plotting the probable movement of the *E* cloud, you may be able to predict the time of opening to some other state you need for WAS.

State police operators who also work 2 and 6 meters all know that many tropo and sporadic-*E* openings go to waste just because no v.h.f. hams in the right places knew the band was open. They also know that even though the openings may not last as long, or be as widespread, there are many during the fall and winter; many more than the average ham stumbles into.

This may be another way you can break the jinx you seem to have for some elusive state. While most hams may be asleep at night, or at work during the day, these 42-Mc. stations are manned around the clock, and whenever the band opens, you are sure to spot a few of them.

No matter whether you find the police traffic exciting (seldom), amusing (sometimes), or just boring (usually), don't forget that secrecy act! What you hear there, forget it. Good hunting! QST

The Spare-Parts Plutocrat

(Continued from page 21)

wealth of information on the color coding of resistors, and ceramic and mica capacitors. It also covers the color coding of power transformers, i.f. transformers, a.f. transformers loudspeaker coils, and loudspeaker field coils. Manuals included in kits of electronic equipment such as the Heathkits also contain very good information on color codes. The little resistor and capacitor calculators sold for twenty-five cents each are often an excellent investment. These handy little gadgets will quickly give the user the value of many color-coded components.

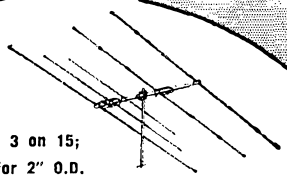
There are, of course, other ways to learn the value or function of strange components you will find in your set. Almost any TV repairman, or ham who has been around for a long time, or clerk in an electronic-parts supply house will usually be glad to give valuable information about the various parts that have strange color codes or are exotic in appearance.

Picture-Tube Disposal

One word of caution — most old sets will have an equally old picture tube. Extreme caution should be used in handling and disposing of this dangerous piece of glass. If available, a face mask or safety goggles should be worn when handling the tube. After all connections and fastenings are removed, the tube can be slid gently from the chassis. If possible, place it in a cardboard box immediately. The box will provide protection and, in the event of accidental breakage, will reduce the velocity of flying glass so that it is less lethal. A phone call to the local parts distributor, or one of your city or county officials, will usually provide information on how and where to dispose of the tube.

OK, Plutocrat, you have your junk box. QST

BULLSEYE BUYS at ARROW!



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CHALLENGER TC-99

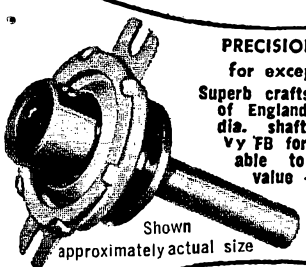
3 elements on 10 meters; 3 on 15; 3 on 20. 16' boom for 2" O.D. mast mounting. Maximum power input 1.2 Kw with 100% AM. VSWR 1.1:1 at resonance. Turning radius 17 ft.

Shpg. Wt. 67 lbs. Net each **$159.50**

Sub-Miniature 0-200 Microampere Meter

A high quality instrument made by International Instrument Co. (Model 100). Only 1" in diam. Ideal for limited space applications. A natural for transistorized grid dip oscillator as described in QST.

$3.95 ea.



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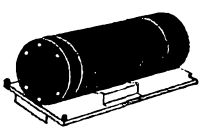
for exceptionally fine tuning

Superb craftsmanship by Jackson Bros. of England. Ball bearing drive, ¼" dia. shaft, 1⅛" long, 6:1 ratio, Vy FB for fine tuning. Easily adaptable to any shaft. Comparable value — $5.95.

Amateur Net $1.50 ea.
10 for $13.50

Shown approximately actual size



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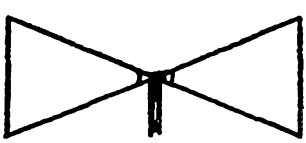

"Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 QST. Complete with B & W 3013 Miniductor. Only 8 ft. long for 10 meters. Wt. 5 lbs.

Amateur Net **$7.85**

AMECO NUVISTOR PREAMPLIFIER

FOR 50, 144 or 220 mc. Over 20 db gain plus a low noise figure, 2 tuned ckts, 6CW4 Nuvistor completely neutralized. Noise figure is 2.5 db @ 50 mc, 3.0 db @ 144 mc and 4.0 db @ 220 mc. Power requirements: 100-150 v. @ 8 ma, and 6.3 v. at .13 amps. Specify frequency desired.

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Versatile Miniature Transformer

Same as used in W2EWL SSB Rig — March 1956 QST. Three sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22000 ohms. (By using center-taps the impedances are quartered.) The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. New and fully shielded.

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TRADE-INS WELCOMED

Transmatch

(*Continued from page 31*)

assembly in place, using bent-over soldering lugs to hold the coax line in place on the chassis.[2]

L_1 and L_2 are mounted between C_1 and C_2. The low-frequency coil, L_2, for 80 and 40, is mounted vertically near the rear of the chassis. The high-frequency coil, for 20, 15, and 10, is mounted horizontally and is held in place by a standoff insulator. A soldering lug is installed on the top of the standoff, the lug being bent around one of the coil turns and soldered. C_2 must be insulated from the chassis and panel. Steatite bushings (National XS-6) are used to mount the capacitor on the chassis. An insulated shaft coupler is used to couple the rotor to the tuning knob on the front panel.

Adjustment

The capacitors and coil will handle at least 150 watts, which is adequate for all the commercial s.s.b. exciters. The unit should be installed close to the transmitter, using a short length of 50-ohm coaxial cable to connect the two together. Turn on the transmitter and feed enough power through to obtain a full-scale reading on the bridge. You'll probably have to adjust R_2 to get the full-scale reading in the forward direction. Next, switch S_1 to read reflected voltage and adjust C_1 and C_2 for a null, or zero reading on M_1. Once you have the zero reading on reflected *vs.* full-scale forward, the controls should not be changed because the unit is now correctly adjusted and the transmitter is working into a 50-ohm load. Bring up the transmitter power to whatever the manufacturer suggests and you are all set to operate. If you shift frquency, it is a good idea to check the match to see how much it has changed. You will probably have to touch up C_1 and C_2, depending how far you QSY. Keep a record of the settings of C_1 and C_2 for each band and you'll find it will only take a few seconds to rematch after changing bands. QST

[2] For additional information on this type of reflectometer, see Bunce, "The 'Mickey Match,'" *QST*, November, 1958, and the chapter on measurements in *The Radio Amateur's Handbook*.

Strays

Forty Over Nine

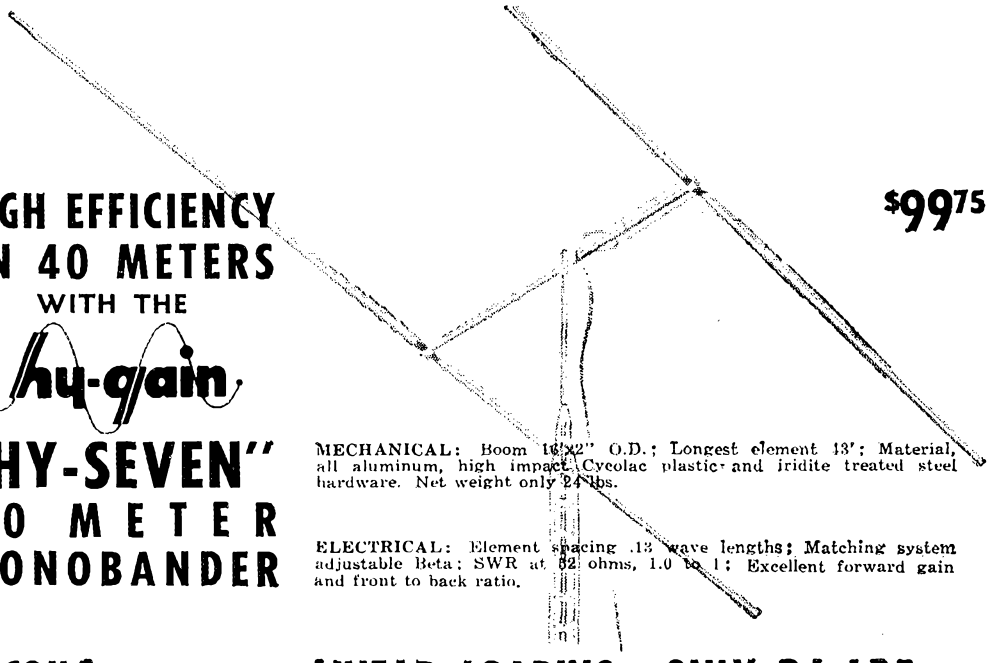
Nine plus forty is what he said,
And your signal is loud and clear."
I took his report with a grain of salt,
But I grinned from ear to ear.

You're the loudest station on the band,
Your signal is booming through."
I said to myself, "This man's no slouch,
For he knows a thing or two."

Your quality's superb," he said,
"Your signal is clear as a bell.
And, by the way, I need your state,
Could you please send a QSL?"

— *W1CMG*

HIGH EFFICIENCY ON 40 METERS WITH THE hy-gain "HY-SEVEN" 40 METER MONOBANDER



$99.75

MECHANICAL: Boom 16'x2" O.D.; Longest element 13'; Material, all aluminum, high impact Cycolac plastic and iridite treated steel hardware. Net weight only 24 lbs.

ELECTRICAL: Element spacing .13 wave lengths; Matching system adjustable Beta; SWR at 52 ohms, 1.0 to 1; Excellent forward gain and front to back ratio.

NO COILS

This new Hy-Gain light weight 40-Meter beam uses no lossy loading coils; makes 40 Meters truly come alive, developing excellent forward gain and front to back ratio. It is a 2-element, reduced size antenna. Reduction in element length is accomplished by the introduction of the new Linear Loading concept, resulting in three important advantages:

1. A small, easy-to-install antenna that stays up.
2. Much higher efficiency than loaded coil types.
3. Virtually impervious to all weather conditions.

Like all Hy-Gain beams, the Hy-Seven is factory pre-tuned, ready for quick and easy assemby. One Year Guarantee insures its top mechanical construction.

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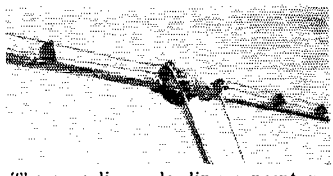
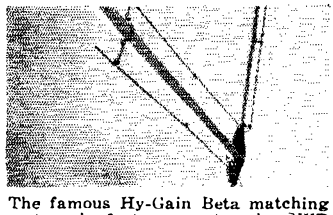
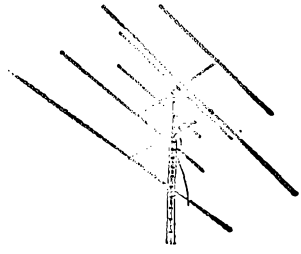


The new linear loading concept reduces element length and maintains higher efficiency than coil loading.



The famous Hy-Gain Beta matching system is factory pre-tuned. SWR guaranteed less than 1.5 to 1 . . . Without further adjustment.

ONLY 24 LBS.



Because of its light weight and convenient size, the Hy-Gain Hy-Seven may be easily stacked with your existing tri-bander installation . . . Complete data is furnished for proper installation.

Available on commercial frequencies. Write for details.

Novice Roundup

(*Continued from page 67*)

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KN9BCH. . . . 1380- 46-30-17
KN9WLC. . . . 1180- 49-20-16
KN9YOK. 740- 37-20-15
KN9ZSE. 351- 27-13- 6

Indiana

KN9WZB. . 41,232-216-52-31
KN9APK. 250- 25-10- 9

Wisconsin

KN9YTJ . . 10,810-215-47-31
KN9YDY. . . . 1650-140-30-16
KN9ZMP. . . . 4320-105-36-32
KN9ZHP. 100- 5- 5- 3

DAKOTA DIVISION

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KNØALX . . . 1920- 54-30-13

Minnesota

KNØBPO. . . 30,555-485-63-35
KNØAKM. . . . 2010- 67-30-30

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KN5BIL. 693- 33-21- 8

Louisiana

KN5FNQ. . . . 6321-147-43-12

Mississippi

KN5FNV. 741- 39-19- 8

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KN8TLX. . . . 1554-128-33-13
KN8WKH. . . 2240- 50-32-32
KN8UAH. . . . 1056- 33-22-14
KN8TBZ. 806- 52-13- 9
KN8OTB. 470- 37-10- 2
KN8TRJ. 459- 26-17- 5
KN8QPC. 110- 7- 5- 5

Ohio

KN8UEI. 5550-150-37-15
KN8VFE. . . . 5148-117-39-19
KN8WID. . . . 2511- 81-31-21
KN8UNG. . . . 1612-104-13- –
KN8UMJ. . . . 975- 50-15-18
KN8WOM. . . . 858- 39-22- 8
KN8WDJ. 700- 35-20- 8
KN8TVC. 684- 38-18- 8
KN8UKH. 629- 37-17- 6
KN8TEG. 243- 12- 9- 9
KN8VVB. 180- 18-10- 8
KN8WGQ. 126- 14- 9- 5
KN8UWO. . . . . 54- 54- 1- –
KN8SOV. 36- 6- 6- 3

HUDSON DIVISION

Eastern New York

WV2PPE. 432- 24-18-10

N. Y. C.-L. I.

WV2NAW. . 12,087-237-51-32
WV2OCX. . . . 5335-135-41-36
KN4AWO/2. . 5270-155-34-36
WV2PJG. 2700- 80-30-17
WV2MUA. . . . 2625-105-25-27
WV2ODO. . . . 2520- 69-30-11
WV2NRK. . . . 1407- 52-21-21
WV2MJF. 680- 25-17- 6
WV2NDP. 510- 36-10-10
WV2LVM. 384- 22-12- 4
WV2NXF. 234- 11- 9- 2
WV2ONO. 175- 25- 7-10
WV2PCP. 96- 16- 6-12
WV2LDP. 85- 7- 5- 4

Northern New Jersey

WV2OCG. . 13,110-215-57-28
WV2ONH. . . . 8140-205-37-31
WV2OAC. . . . 5250-150-35-15
WV2QGV. 138- 13- 6- 6

MIDWEST DIVISION

Iowa

KNØCGZ. . . . 2048-113-16-26
KNØASL. 4920-120-41-20
KNØAAR. 70- 14- 5-11

Kansas

KNØELZ. 2555- 73-35-10

Missouri

KNØBQI. 420- 28-15-16

NEW ENGLAND DIVISION

Connecticut

KN1OAV. . . . 6048-111-48-35
KN1PQS. . . . 3750-135-25-39
KN1PUG. . . . 2052- 61-27-10
KN1OYL/1. . . 450- 25-18-10
KN1PLR. 99- 11- 9- 2

Maine

KN1QFY. 840- 42-20-11

Western Massachusetts

KN1QFC. . . 14,575-255-55-31

New Hampshire

KN1OWU. . . . 5270-150-31-27
KN1PQV. 84- 12- 7-31
KN1QEP. 12- 4- 3- 2

Rhode Island

KN1QQY. 264- 24-11-28
KN1PAM. 126- 14- 9- 3

NORTHWESTERN DIVISION

Montana

KN7LUH. . . . 7482-159-43-14

Oregon

KN7MLO. . . . 2212- 69-28-25

Washington

KN7LUV. . . 21,106-311-61-40
KN7MGQ. . . . 5396-132-38-34
KN7LXC. . . . 2336- 58-32-12
KN7MWK. . . . 168- 14- 7-13

PACIFIC DIVISION

Nevada

KN7MNL. 24- 6- 4-27

East Bay

WV6MJP. 1325-53-25-14
WV6LTI. 1120-55-16-18
WV6NFI. 693-33-21- 9
WV6NRE. 162-12- 6- 5

San Joaquin Valley

WV6NJP. 204-17-12-8

ROANOKE DIVISION

North Carolina

KN4WVP. . . . 3364- 86-29-19
KN3MCO/4. . 3030- 86-30- –

South Carolina

KN4WJT. . . . 4141-101-41-26
KN4NLL. . . . 2016- 56-36- –
KN4ZDK. 80- 10- 8- 4

Virginia

KN4WKS. . . . 3978- 92-39-16
KN4BIS. . . . 2847- 63-39-12
KN4BIY. . . . 2613- 57-39-16
KN4VHH. . . . 2010- 67-30-16

ROCKY MOUNTAIN DIVISION

Colorado

KNØDBG. . . . 3348- 93-36- 9

SOUTHEASTERN DIVISION

Alabama

KN4WHV. . . . 4294- 98-38-19
KN4YMQ. . . . 4278-128-31-20
KN4ZYO. 2077- 67-31-12

Eastern Florida

KN4VRI. 8084-157-47-32

Georgia

KN4NVD. 627- 23-19- 6
KN4WWY. 440- 25-11-19
KN4BWQ. 297- 33- 9- 6

SOUTHWESTERN DIVISION

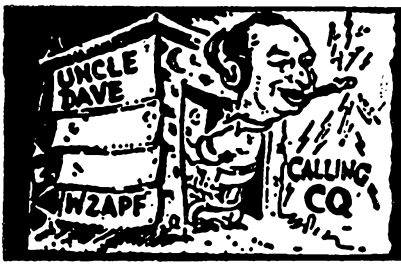
Los Angeles

WV6NQN. . . . 8771-164-49- –
WV6MBI. 531- 39- 9-11
WV6ORS. 310- 31-10- 4
WV6NON. 276- 23-12-10
WV6OWM. 138- 23- 6-18

San Diego

WV6NJZ. 1000- 35-20-12

(*Continued on page 140*)



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Radio Distributing Co. INC.

904 BROADWAY ALBANY 4 N.Y. U.S.A.

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YOUR RESPONSE TO OUR THREE PREVIOUS ADS HAS BEEN OVERWHELMING; THUS WE ARE CONTINUING FOR ONE MORE MONTH WITH THE SPECIAL SALE—MOST ITEMS ARE ONE ONLY—DON'T FORGET WE MAKE A SPECIALTY OF CATERING TO OUR SERVICEMEN IN FOREIGN LANDS AS WELL AS IN THE U.S.

NATIONAL RECEIVERS
NC300 ..... $250.00
NC173 ..... 125.00
NC125 ..... 115.00
HRO50T 195.00
HRO60 ..... 395.00
NC183 ..... 149.50
NC188 ..... 95.00
NC98 ..... 98.00
NC98 ..... 79.50

TECHNICAL MATERIEL CORP. RECEIVERS
GPR90 w/spk. Excelnt. Cond. $395.00

HALLICRAFTERS XMTRS. & RECEIVERS
S102 2 meter rec. ..... $ 39.95
HT32 SSB Xmtr. 495.00
HT33 Linear 450.00
SX99 Rec. 99.50
SX71 Rec. 125.00
HT31 Linear 195.00
HT37 SSB Xmtr. 395.00

GONSET XMTRS.—REC.—CONV.
G28 ..... $225.00
G50 6 mtr. Xceiver 225.00

R.M.E. RECEIVERS
4350 Receiver $195.00
DB22A Preselector 39.50

ELMAC XMTRS. & RECEIVERS
PMR6 Mobile Rec. ..... $ 75.00
AF67 Mobile Xmtr. 114.50

COLLINS XMTRS. & RECEIVERS
KWM-1 Xceiver w/N.B. $695.00
351D1 (mount for KWM-1) 39.95

JOHNSON XMTRS. & ACC.
Thunderbolt Linear $450.00
Viking 1-w/VFO 122 Xmtr. 175.00
Ranger Xmtr. 195.00
Mod (Adventurer) 10.00
Mobile Xmtr. 69.50
122 VFO 39.50
Viking I 150.00
Pacemaker 375.00
Viking II 195.00
6N2 Exciter 95.00

"WRL"—GLOBE XMTRS. & ACC.
300 Xmtr. $250.00
666 (VFO) 25.00
LA-1 Linear Amp. 79.50
90CW Xmtr. 50.00
DSB 100 ..... 74.50
90A CW Xmtr. 65.00
680A AM/CW 79.50

HEATH XMTRS. & ACC.
VF-1 VFO ..... $ 15.00

BARKER & WILLIAMSON XMTRS., ETC.
5100 AM Trans. $250.00
504C Freq. Mult. 24.95

HAMMARLUND RECEIVERS
HQ160 ..... $295.00
HQ140 ..... 150.00

NEW—Demonstrators—Display Models. One of a kind—Subject to prior sale—List second and third choice.

HEATH-KITS
(Overstock—Kit form only)
XC-6 6 mtr. conv. ..... $ 24.50
XR-2P BC Radio 27.95

GONSET
2 mtr. VFO & Preamp ..... $ 44.95

ELMAC
AF67 Mobile Xmtr. $125.00

JOHNSON
10 Watt Amplifier (W) ..... $ 69.95
10 Watt Amplifier (K) 49.95
Adventurer (K) 45.00

NATIONAL
VFO 62 6&2 m ..... $ 29.95

WRL—GLOBE XMTRS.
DSB-100 Xmtr. ..... $ 89.50
DSB-100 (Kit) 69.50
LA-1 Linear Amp. 79.95

LAKESHORE
Bandhopper (VFO) ..... $ 99.50

BARKER & WILLIAMSON
51SB (SSB Gen.) $195.00

TECRAFT
C3/26 (CB) Conv. CB ..... $ 27.50
P1 (P.S.) Conv. pwr. sup. 12.50
CC5/220 Conv. 1¼ mtr. 29.50
CC5/50 Conv. 6 mtr. 29.50

BEAMS—New and Used (as indicated)
Tennalab 5L20RG ..... $ 99.50
(Regular price $225.00)
Mosley VPA1520 (new) 109.50
Mosley VPA1020 (new) 99.50
Telrex 3EL.20mtr. (Used) 49.50
Telrex 3EL.10 mtr. (Used) 39.50
Mosley V144GP (2 Mtr.) Used 17.50
Mosley VPA20-2 (New) 39.50
5A-6M Taco (New) 9.95
10A-6M Taco (New) 17.50
BA6M (Baluns-for-above) 3.95
Hy-Gain 152 MT3 (New) 99.50
Mosley TA31 Jr. 16.95
Mosley V3 ..... 19.95
Mosley V3 Jr. 15.95
Mosley TA32 ..... 59.95
Mosley TA32 Jr. 42.95
Mosley A320 ..... 66.95
Mosley S153 ..... 42.50
Mosely S103 ..... 37.50
Cushcraft AGP15 ..... 11.95
Cushcraft AGP10 ..... 10.95
Cushcraft ATGP3 ..... 24.95
Cushcraft A28A 21.95
Mosley V-27GP (CB) New ..... $ 29.95
Hi-Lite 3E10F 49.50
Hy-Gain 153G 29.50
Hy-Gain 152MT2 ..... 49.50
Hy-Gain 203G 49.95
Hy-Gain 113G 39.95

EXTRA SPECIALS
NEW ITEMS. Overstock and Discontinued Special

Lynmar Baluns:

	Reg.	Special
2J	$11.95	$ 8.95
T-1-J	11.95	8.95

Collins Receiver Filter:
35U1 ..... $17.50 ..... **$10.00**

Hammarlund Xtal Calib. for HQ100, etc.
XC100 ..... $15.95 ..... **$10.95**

2. only 500W. gas generators **$85.00** each plus transportation

HI-FI DEPARTMENT SPECIALS
Stromberg Carlson Stereo-Preamp. Model ASE-434. Reg. $99.95. **Sale... $59.95**
Stromberg Carlson Dual 20 power Amplifier ASP422. Reg. $99.95. **Sale... $59.95**
Stromberg Carlson AS-433 Dual 12 watt stereo amplifier. Reg. $129.95. **Sale $97.50**
Bogen DB-212 Stereo Amplifier Demonstrator. Reg. $119.95. **Sale... $79.95**
Bogen STA-1 Stereo Adaptor. Reg. $16.00. **Sale..... $8.00**
Fisher SA-300 Dual 35 watt Power Amplifier. Reg. $179.50. **Sale..... $120.00**
Fisher 600 Stereo Receiver. Reg. $369.50 **Sale..... $277.50**
Fisher X202 Stereo Amplifier. Reg. $229.50. **Sale..... $182.50**
Fisher 400C. Stereo-Pre-amp. Reg. $174.50. **Sale..... $117.50**
Fisher 30-20 watt amplifier. Reg. $59.50. **Sale..... $39.50**
Scott 222 Stereo Dual 12 Amplifier Demonstrator. Reg. $144.95. **Sale... $99.95**
University S-11-H Speaker System. Reg. $260.00. **Sale..... $130.00**
Utah Coaxial speaker model CSP-12J3. Reg. $25.00. **Sale..... $9.95**
Electro-Voice Stereon 100. Reg. $49.50. **Sale..... $32.50**
Electro Voice Stereon 300. Reg. $69.50. **Sale..... $42.50**
Pickering model 196 Unipoise Arm. Reg. $49.50. **Sale..... $32.50**
Audax CA-60 Speaker System. Reg. $59.95. **Sale..... $39.95**
Connoisseur Professional turntable 33-45. Model C-99. Reg. $59.50. **Sale. $42.50**
Connoisseur Base for C-99. Reg. $14.95. **Sale..... $10.50**

Write Uncledave W2APF with your needs and problems.

TRADE-INS ACCEPTED *AND* FOREIGN TRADE SOLICITED
BANK FINANCING

TIME PAYMENTS 18 Months to pay. Life Insurance at no extra cost

UNCLE DAVE'S RADIO SHACK
A SUBSIDIARY OF FORT ORANGE RADIO DISTRIBUTING CO.

WEST GULF DIVISION

Northern Texas

KN5ERQ	7084-	161-	44-39
KN5FSE	5895-	131-	45-22
KN5ETA	1056-	44-	24- 4
KN5ERI	1012-	36-	22-13
KN5BAJ	220-	12-	10-12

Oklahoma

KN5ADW	3762-	99-	38-22
KN5FQR	2201-	71-	31-20

Check logs: K2MFF, W4OMW, WA8MFY.

Correspondence from Members

(Continued from page 77)

TNX!

¶ I have but one word to describe *QST* and your work: Bravo!

I say this for the gratifying frequency of articles concerning microwaves and the better use of our frequencies. I certainly hope that the articles about this subject go up in two ways, up in quantity and up in frequency.

I honestly believe that these articles show the true ham spirit in the pioneering of all of our allocations . . . — *Gary Eck, K4JYN, Charlotte, North Carolina.*

WISHFUL THINKING!

¶ While reading *QST* for January, 1945, just recently, I came across a very interesting article entitled "*QST* Looks at Television." One of the last paragraphs struck me as rather funny in view of our present situation. I quote the paragraph:

"The costs of television programming are much higher than comparable sound broadcasts and this factor, combined with the inability of the TVL to sit still and look for more than a few hours at a time, seems reason enough to expect that our postwar television will be furnished only at those times when a comparatively large audience may be reasonably expected. In the event that this prediction turns out to be all wrong, and we find that the "viewies" run night and day without even time to polish our glasses we will have to admit that we grossly underestimated both the commercial possibilities of this new art and the ability of the American public to take it."

Would that this prediction had turned out to be true! — *Mike Ansfield, K9WII, Milwaukee, Wisconsin.*

MISPLACED EFFORT?

¶ After looking through the SS scores that fellow hams were able to obtain working *against* each other I tried to imagine what the result would be if all the SS participants would work *together* in an organized traffic or civil defense system.

As you can easily see the outcome would be an efficient traffic system and a very reliable civil defense and emergency communications network. — *George Caplan, K3JHF, Havertown, Pennsylvania.*

GOOD, BUT . . .

¶ I would like to compliment you, the staff, for putting out such an interesting and informative magazine, and for the care and work that obviously must go into the making of *QST*. In particular, I prefer the up-to-date information on contests, FCC Regs changes, and the construction articles.

However, I think that you ought to consider the Novice just turned General in the construction articles. An article on a v.f.o., modulator, and ways to improve the performance of receivers would do a great deal of good. Or are we supposed to just automatically "know it all" when we finally get that coveted piece of paper with C. B. Plummer's autograph? — *Ray L. Mote, jr., KN5FKT, Kingsville, Texas.*

MEMBERSHIP CHANGES OF ADDRESS

Four week's notice is reuired to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of *QST* without interruption.

LAFAYETTE
HAM SHACK VALUES

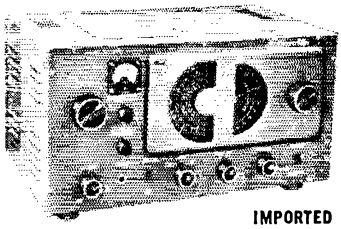
THE LAFAYETTE HE-30 Professional Quality Communications Receiver

IMPORTED **99.50**

- TUNES 550 KCS TO 30 MCS IN FOUR BANDS
- BUILT-IN Q-MULTIPLIER FOR CROWDED PHONE OPERATION
- CALIBRATED ELECTRICAL BANDSPREAD ON AMATEUR BANDS 80 THRU 10 METERS • STABLE OSCILLATOR AND BFO FOR CLEAR CW AND SSB RECEPTION • BUILT-IN EDGEWISE S-METER

Sensitivity is 1.0 microvolt for 10 db, Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER. TUBES: 6BA6—RF Amp, 6BE6 Mixer, 6BE6 OSC., 6AV6 Q-Multiplier—BFO, 2-6BA6 IF Amp., 6AV6 Det-AF Amp. ANL, 6AQ5-Audio output, 5Y3 Rectifier.

Top Value Communications Receiver



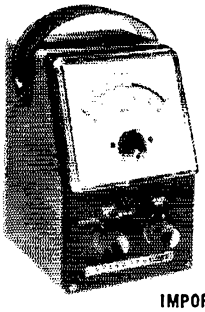
IMPORTED

KT-200WX
in Kit Form
64.50
5.00 Down

• Superhet Circuit Utilizing 8 Tubes and Rectifier Tube • Built-in "S" Meter with Adjustment Control • Full Coverage 80-10 Meters • Covers 455kc to 31 mc • Variable BFO and RF Gain Controls • Switchable AVC and Automatic Noise Limiter

The Communications Receiver that meets every amateur need—available in easy-to-assemble kit form. Signal to noise ratio is 10 db at 3.5 MC with 1.25 microvolt signal. Selectivity is —60 db at 10 kc, image reflection is —40 db at 3 MC.

HE-28 RF WATTMETER AND SWR BRIDGE

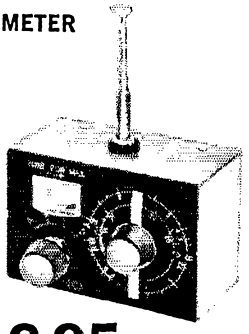


IMPORTED

37.50

150 watts full scale—Built-in dummy load—Wattmeter ±5% to 54 mcs. SWR ±5% for in line use.

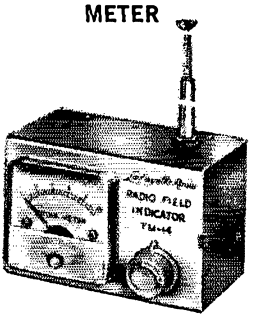
MODEL TM-15 WAVE METER



8.95 IMPORTED

Checks transmitter output for harmonics, parisitics, and out-of-band operation. Provided with magnetic feet. Ideal for the novice.

MODEL TM-14 FIELD STRENGTH METER



6.95 IMPORTED

Complete, no wires to connect. Monitor transmitter output, check antennas, etc. Perfect for mobile, provided with magnetic feet.

LAFAYETTE RADIO

165-08 LIBERTY AVENUE, JAMAICA 33, N. Y.

OTHER LOCATIONS

NEW YORK, N. Y.	NEWARK, N. J.	BRONX, N. Y.	PARAMUS, N. J.	BOSTON, MASS.	PLAINFIELD, N. J.
100 6th Avenue	24 Central Avenue	542 E. Fordham Rd.	182 Route 17	110 Federal Street	139 W. 2nd Street

Happenings of the Month

(Continued from page 58)

2) Mr. Meyers proposed to spell out the duties of the General Manager, the Treasurer, Communications Manager and Editor of *QST*. The committee noted that the duties of the General Manager are already specified in Article 13, and those of the Treasurer in Bylaw 29. The committee noted that the Communications Manager and the Editor of *QST* are employees of the League under the jurisdiction of the General Manager, whose responsibility it is to assign said duties.

3) Mr. Meyers proposed to spell out a policy for the formation of a new division or section. As concerns the formation of a new division, the committee noted that this is a matter for Board decision, and such can be accomplished by a simple amendment of Bylaws when and if desired. As concerns the formation of a new section, the committee noted that this is the responsibility of the Communications Manager and is not a subject covered by the Bylaws.

CLAUDE M. MAER, jr., *Chairman*
P. LANIER ANDERSON, jr.
JOHN G. DOYLE
ROBERT A. MARMET

Silent Keys

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

K1DOS, William G. Anderson, West Roxbury Mass.
W1GVS, John H. Middlebrook, Portland, Maine
K1IXW, Alfred S. Dracup, North Adams, Mass.
K1JDB, William T. Bowker, Sheffield, Mass.
W1WYG, Adrian J. Hebert, Lyndonville, Vt.
W2GXC, Harry F. Klingener, Valley Stream, L. I., N. Y.
WA2JQI, James S. Herz, Long Island City, N. Y.
W2TYI, Everett Putnam, Bridgeton, N. J.
W2UYS, Louis S. Welch, Trumansburg, N. Y.
W3PG, Cecil G. Harrison, Ellicott City, Md.
W3QOL, Richard D. Dise, Glen Rock, Pa.
W3STL, John F. Telford, Minersville, Pa.
K4FUI, Lowell T. Stenger, Atlanta, Ga.
W4LID, William J. Gwinn, Asheville, N. C.
W5AXI, Arthur E. Hutchins, Largo, Fla.
W5LT, John L. Chambless, Donaldsonville, La.
K5TLX, William H. Phillips, Belton, Tex.
W6BD, Glen Hurlburt, San Francisco, Calif.
WA6MPK, James G. Love, San Diego, Calif.
W6PB, Daniel L. O'Brien, Los Angeles, Calif.
K6QOQ, Edward F. Tennen, San Diego, Calif.
ex-W6VQ, Clement H. Stewart, San Diego, Calif.
K7CWN, Charles R. Schwarz, Phoenix, Ariz.
W7ZV, Felix Thompson, Wenatchee, Wash.
W8EVW, Gayle Hendrickson, Dayton, Ohio
W8FSA, Donald T. Kinney, Ithaca, Mich.
ex-W8FVY, Van B. McDaniel, Youngstown, Ohio
W8GRN, Phil Girard, Detroit, Mich.
K8MHL, W. J. Weiskopf, Cincinnati, Ohio
KN8OKE, William Wren, DeGraff, Ohio
W8PTS, Richard C. Brown, Painesville, Ohio
W8RMT, Jack J. Jennings, Detroit, Mich.
K9COA, Everett W. Springer, Trevor, Wis.
W9ZDL, Edgar J. Schmidt, Hinsdale, Ill.
WØUVL, Wayne A. Trotter, Pierre, S. D.
SM7OG, Erik Segerdahl, Gullabody, Sweden
VE4AI, Arthur J. Balmer, Binscarth, Man., Canada
VP7NM, C. N. Albury, Nassau, Bahamas Island

Strays

J. J. Holmes, VE1AJ, first got interested in ham radio in 1912, while he was living in Richmond, Calif. He wonders if any of those young experimenters of his Richmond days are still around.

Recent Equipment

(Continued from page 44)

filter is also completely shielded from the rest of the set.

The transmitter goes together rather easily. Much of the wiring is in a prefabricated harness, and there are no serious mechanical problems in the assembly. An unhurried job of assembly and wiring took us about 15 hours. Two hours were spent inventorying and pretesting components, and another hour sufficed for a postcheck of the wiring against the circuit diagram before actual tryout.

The instruction book does a pretty thorough job of outlining the assembly. One feature that the writer does not recall having seen in earlier Heath books is a double-page spread of drawings identifying all electrical and mechanical parts. The book does seem to be a bit skimpy on circuit description and operating data. We had to figure out from the circuit diagram just what could be expected to happen in each position of the function switch; there was no mention of it in the book. Deciphering those rotary switches with specially-shaped tabs is worse than trying to solve many puzzles!

— *G. G.*

Project OSCAR

(Continued from page 63)

as to how these measurements might be made by amateurs.

We also wish to thank Mr. Ed Saxton of Philco Technrep Publications, 1070 East Meadow Circle, Palo Alto, California, for furnishing the computer shown in Fig. 4. QST

World Above 50 Mc.

(Continued from page 66)

VE3BSZ/VE2 were coming into W1-land via aurora along with New York, New Jersey and Pennsylvania stations. Bill also observed a short session on April 25, to W4 area. The above auroral reports both on 50 Mc. The Michigan area is represented by W8PT, Jack, who notes that he heard fourteen states during the aurora of April 14, and that WØMOX, Colorado, was coming through with 5-6 sigs. Jack is active once again on 432 Mc., calling "CQ" at 2215 EST nightly with beam on the Chicago area. To date he has worked W9AAG, W9OII, W9ZIII on 432 Mc., but still needs Michigan. In Chester, Virginia, K4EUS observed a weak aurora on 144 Mc. on April 14, hearing W1LMZ, K2GQI and K2IEJ. Sam (K4EUS) is working on gear for 432 Mc. and expects to be ready to go by the end of May. K9GSC reports several 8s heard and K8JKR in Michigan worked during the auroral session of April 15.

Sideband activity seems to be picking up all over the country on the v.h.f. bands. From W4TLV in Demopolis, Alabama we hear that "I was particularly happy and surprised to hear so many s.s.b. stations on two during the first really good temperature-inversion of the season on April 21, 22, 23. Worked during the three and a half days the band was open, on s.s.b., were: W5AJG, W5FYZ, K5TUP, K5SDM, K5PTG, K5YPJ, and W5CTJ. Hearing the tremendous punch of the sideband signals has started a building binge around these parts that should see this station (W4RLV) and W4KCQ on s.s.b. shortly. Rex, W5RCI is

(Please turn the next page)

BUYING COLLINS EQUIPMENT? DEAL THE HAPPY WAY WITH ART BROWN

W91HZ

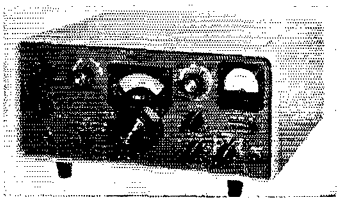
Having decided to convert your station to sophisticated, compact Collins equipment, the next step is to get in touch with Art Brown.

From your interest in Collins, he knows you appreciate fine gear and will expect to trade for one or more well cared for transmitters or receivers. He knows in advance you want top dollar for your present station and will offer it. In order to remain flexible and to provide liberal terms, Brown carries his own contracts. Terms up to 24 months at $6.00 per hundred per year with trade-ins credited to down payment. He handles shipments *fast*.

You can find a growing number of active hams who have enjoyed far more service *after the sale* than they expected.

If you haven't yet made a decision, ask Brown for the new Collins brochure. Use the coupon on the facing page. Mail it now while the thought is fresh in your mind!

The versatile KWM-2 by Collins. Use it in the car, the ham shack, in your boat . . . take it with you *everywhere!* Also available in the CC-1 Case with a PM-2 Power Supply.



KWM-2 $1,150.00
516F-2 AC supply $115.00

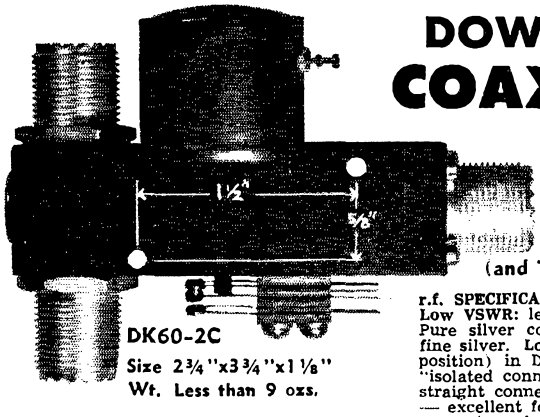
BROWN electronics inc.

1034 Broadway • Fort Wayne, Indiana

PHONE Anthony 3381

DOW-KEY DK60 SERIES COAXIAL RELAYS

A FAVORITE OF AMATEURS! VERSATILE FOR INDUSTRIALS!



DK60-2C
Size 2¾"x3¾"x1⅛"
Wt. Less than 9 ozs.

Available in 4 models, A.C. or D.C.
(and Types C, TNC, BNC, N, UHF Connectors)

r.f. SPECIFICATIONS:
Low VSWR: less than 1.15:1 from 0 to 500 mc. **Low Losses:** Pure silver contacts. Parts in crucial positions plated with fine silver. **Low Cross-Talk:** (greater than 80 db in energized position) in DK60-G and DK60-G2C through use of patented "isolated connector". **High Power Rating:** (a) 1 kw through straight connectors (b) to 10w through "isolated connector" — excellent for video switching. **SPDT r.f. Contacts:** r.f. leakage extremely low, below typical r.f. connectors.

MECHANICAL SPECIFICATIONS:
High Contact Pressures: Long life expectancy greater than 1 million operations. **Continuous Duty:** Teflon feed-through terminals used on coil to provide connection ease.

ELECTRICAL SPECIFICATIONS:
Wide Variety of Coil Voltages: 6,12,24,32,48,110,220 D.C. volts at 2.0 watts; 6,12,24,110,220 A.C. volts at 6 volt-amps, 50-60 cps. (Special voltage or resistance available on request.) **Less Than 50°C Temperature Rise Above Ambient:** Maximum operating temperature is 100°C except on special order. Auxiliary contacts available for power control — DPDT at 5a. 110 v A.C. on *DK60-2C* and *DK60-G2C*.

STANDARD RELAYS INCLUDE:

- DK60 — SPDT r.f. switch.
- DK60-G — SPDT r.f. switch with special "isolated" connector in de-energized position.
- DK60-2C — SPDT r.f. switch with DPDT auxiliary contacts.
- DK60-G2C — SPDT r.f. switch with DPDT auxiliary contacts and special "isolated" connector in de-energized position.

UNCONDITIONAL GUARANTEE (We will repair if faulty within 1 year.)

700 Dealers and Distributors in U.S. and Canada or write:

Manufactured by DOW-KEY COMPANY, Thief River Falls, Minnesota

already s.s.b. to spur us on down here." Barry runs from 500 to 1000 watts a.m., c.w. and f.s.k. to 4X250B's. Antenna is stacked 20-element yagis 100 feet up. Tape-tone converter into 51J-4. California is also building up a good sized group of sidebanders, this bunch on 50 Mc. According to Alan, W6FZA, most of the group is running the legal limit with large, high antennas. The following 50 Mc. s.s.b.ers are active on week-end mornings and anyone with s.s.b. gear is invited to join: K6QXY, W6YX, K6HCP, WA6AVV, K60DV, K6VLM, K6ZEH, W6FZA, W6NLZ, W6QMN, K6PYH, WA6JTC, WA6LYG. K8BGZ writes that he is finally on two-meter s.s.b., and K8NEY and K8IZM say that they are working on s.s.b. gear for 50 Mc.; while K9RRS in Wisconsin is hoping to get started very soon on a s.s.b. transceiver for mobile use on 50 Mc. K1CXX in Auburn, Maine, reports hearing his first s.s.b. station on two-meter aurora. This station was getting through to Dick Q5 copy when the high power boys on c.w. in Massachusetts and New York were very weak.

Two reports in this month concerning TV and ham radio: K3CWG has begun slow-scan transmissions using borrowed tape, sez local picture quality is fair. Scott hopes to be able to complete his own rig after exams. K3GOF has a TV camera under construction.

One more s.s.b. report: WØKMV, Raytown, Missouri, sez there is considerable interest in the area with at least five stations already going on s.s.b. and several more in the process of "getting gear going". Jack also mentions that he did not receive QSLs from several stations he worked last summer while in Arkansas, and as he does not have a *Call Book* he could not look up the QTHs. If you worked Jack, WØKMV, in Arkansas last year and need the Arkansas QSL, he will be happy to send the confirmation. Send to Jackson L. Cox, WØKMV 9603 East 66th Terrace, Raytown 33, Missouri. Well known v.h.f.er W6NLZ has shifted his 50-Mc. skeds to conform with P.D.T. and is on the air, Saturday and Sunday morning 8:00 to 8:30 cw, 50.010, 8:30 to 9:00 s.s.b., 50.110. He sez that results so far have been very good "with W6YX in steady week after week and month after month". s.s.b. into the San Francisco Bay area is fair with WA6AVV the best s.s.b. signal in that area.

Clubs and Nets

The July 4 picnic of the Connecticut Mobileers has become something of a tradition. There'll be another this year, and as before, at the home location of K1HJV, Bethlehem, Connecticut. There'll be plenty of room for cars, trucks or trailers. Everyone with an interest in two-meter work is welcome. Family affair; bring your own lunch. No admission charge. In case of rain there will be shelter available at the nearby Bethlehem Fair Grounds.

The Rocky Mountain Division v.h.f. Achievement Award has been established for the years of 1961 and 1962, to be awarded the most outstanding amateur in the division for his or her record of accomplishment in the v.h.f. field. This award is open to all classes of amateur license holders. The winner will receive a properly inscribed gold plaque, and the runner-up from each section will also receive recognition. Any questions concerning the award or "accomplishments" should be directed to the Director of that Division: Carl L. Smith, WØBWJ, 1070 Locust Street, Denver 20, Colorado.

144-Mc. DX

Speaking of DX, I'm sure that all the DX-minded v.h.f.ers will be pleased to learn that the Okinawa Radio Club has plans for putting a 144-Mc. kw. on the air in the near future. The club has applied for a special permit to allow operation on the 144-Mc. band and plans to have a kw. of c.w. into a stacked rhombic array. First plans call for beaming at Japan. Quite likely a well-equipped west coast station might inveigle them into a trans-Pacific effort. Drop inquiries to KR6LJ, Frank A. Jerome, TSGT 17242755, 1962 AACS AWASE, APO 239, San Francisco, California.

Meanwhile, back at the ranch, you may be interested to learn that Allen, W4RMU, calls CQ nightly at 2100 to 2105 EST with his beam to the north and north east. Frequency 144.080. On 220 Mc. we find W9JFP transmitting with his beam to the east and south east. Vic gets on at 2200 EDST on Monday, Wednesday, Saturday and Sunday. Incidentally in case you think he is fooling, please note that he is running 700 watts to a sixteen-element beam 120 feet high. W7IST points out that anyone within striking distance of the state of Washington can have a weekend schedule with him on 220 Mc. 432 Mc. QST

DX QSLs

Thousands of choice DX cards for U.S. hams lie unclaimed in the files of QSL Managers. The procedure to get yours is simple: send your manager (see list page 150) a self-addressed, stamped envelope. As an experiment, we are listing below some of the W4 calls which have unclaimed cards. If your call is here, send an envelope to Thomas M. Moss, P. O. Box 644, Municipal Airport Branch, Atlanta 20, Georgia. Remember; these are all W4 — no Ks, WAs or WNs.

AAM AAU ARP ACJ ACV ADA ADN AEK AF AFB AFI AFK AFQ AGN
AH AHK AI AIM AIW AJA AJE AKA AKC AKG AKM AKO ALK AM
AMN AMO AN ANR AOI APK APM APP APS AQL AQR ARZ ASL ASR
ATA ATJ AUH AVX AWH AWM AWS AYN AYV AZ

BAN BAY BBF BBR BBC BDP BF BFC BFK BGO BHI BHJ BHU BHZ
BJI BJN BJR BKM BLQ BLR BOL BP BPO BPT BQ BQW BR BRB
BSB BSG BSM BT BTN BTO BTU BUO BV BVD BVT BVV BXX BYV
BZQ

CA CAA CBW CC CCI CCJ CCR CCU CCY CD CDC CE CEN CEU
CEV CF CFB CFH CG CGC CGG CGY CHD CHK CID CIT CJG CJH
CJW CK CKA CLF CMC CMG CMP CMV CMW CNV COR COC COW COX
CPK CPN CQA CQC CQI CQU CRA CRH CRK CRL CS CSK CSU CSV
CSY CTL CTU CUS CV CVA CVT CWH CWM CWY CX CXG CXO CXT
CYA CYR CZW

DA DAL DBW DCH DCL DCT DCV DDH DDY DEC DEM DF DFU DH
DHO DIA DIJ DIL DJ DJC DJI DJR DJW DKE DKF DKJ DKK DKY
DLG DLT DMB DMM DMS DMU DMV DNR DNC DOG DPI DPX DO DOH
DOS DOV DRJ DSF DSI DSZ DT DTW DUE DVW DW DWD DWI DWN
DXI DXJ DXV DYC DYE DZF

EA EAB EAK EBK EC ECJ ECP EDB EDE EDF EDQ EDT ELB EED
EEO EF EFC EFH EFJ EFO EFZ EGE EGN EGT EHC EHD EHJ EHO
EHY EI EIE EIG EIJ EIW EJ EJE EJO EJP EJN EJV EL ELK
EMF EMJ EMS EN ENI EOT EOZ EPI EPU EQE EQM ER ERJ ESL
ESF ESJ ESK ET ETI ETT ETW EUR EUV EUN EVG EVL EVX EW
EWO EWU EWZ EXC EXM EXO EYH EYI EYN EZE EZO

FA FAX FB FBM FBN FC FCB FCW FD FDA FDL FDM FDW FEO
FES FEW FEA FF FFD FFS FFV FG FGC FGH FGM FGU FH FHI
FIR FIJ FIT FIV FJ FJG FKL FKT FLC FLL FLY FM FMD FMY
FN FNL FO FOH FOO FOR FPK FPW FQ FR FRL FRM FRS FRZ
FS FSE FUR FV FVA FVN FW FWF FWX FX FY FYZ FZU FZE
FZH

GA GAE GBD GBL GBS GBX GC GCB GCR GCS GCW GDE GDG GEB
GET GFQ GFV GFW GGA GGR GGS GH GHL GHN GHQ GIB GIE GIB
GII GIL GIW GJB GJW GK GKA GL GLA GLE GLI GLR GM GMA
GMP GMQ GMR GN GNA GNC GNK GNL GNU GOG GPD GQ GQJ GQL
GQM GQP GQR GRA GRB GSG GSM GSS GTQ GTS GU GUA GUN GUT
GUU GV GVD GWC GX GXC GY GYX GZ

HAP HB HBQ HC HCB HCG HCN HCU HDE HDP HDX HDZ HEH HEI
HFF HFT HG HGD HGW HHN HHS HHZ HIM HIW HIZ HK HKJ HKK
HKM HKR HLF HLH HLL HLM HLV HLZ HMG HMN HMO HN HNV HNW
HOY HP HPE HOG HQV HQZ HR HS HSD HSF HSM HT HTH HTZ
HV HVT HX HXB HXC HY HYD HYM HZ HZF HZI HZP HZT

IA IAO IBD IBS IHC IHN IJC IJT IK IKC IKM IM IO IOG
IP IPL IPT IPY IS ISP ISQ ISW ISX ITA ITN ITW IU IV
IVC IVH IXJ IYP IZ IZV IZW

JAT JAV JB JBD JBN JC JCA JCF JCH JCI JD JDG JE JEC
JF JFN JG JGR JHK JHP JI JII JK JL JLE JLW JM JN
JNJ JNL JO JOF JOH JP JPV JPY JQ JQA JR JRD JSQ JTZ
JU JUF JUQ JV JVE JVF JVP JVT JW JWL JX JZB

KA KAC KAH KAV KB KBC KBI KBM KBS KBV KBY KC KCB KCF
KCU KD KDP KE KEJ KEM KET KF KFH KFK KFR KFV KG KGT
KH KHD KI KIC KIX KJD KJE KJT KKA KKM KKP KKU KL KLL
KM KMC KN KNE KO KOI KOY KPQ KRR KRV KS KT KTC KTN
KTX KU KUO KUV KVH KVI KVM KVS KW KWC KWG KWS KXV KYQ
KZ KZI

LAS LB LCF LCV LCY LD LDL LDR LDW LE LEA LEB LEV LEY
LF LGA LGF LGO LH LHZ LI LIW LK LKG LKT LKX LM LMY
LN LNB LNE LNM LNX LO LOJ LOQ LP LPP LPU LPW LQ LR
LRA LRG LRO LS LT LU LUW LV LVQ LVV LW LX LXN LYZ
LY LZ LZF LZW LZX

MAF MAI MAM MB MBE MBO MBR MBS MC MCW MD MDB MDC ME
MED MG MGF MH MIP MIX MJ MJI MJZ MK MKT MKU ML MM
MMB MN MNJ MNP MNR MO MOQ MP MPV MQ MQF MQM MQN MQC
MQV MTK MTV MU MUA MV MW MWI MX MXA MXM MXU MY MYW
MZ MZK MZO

NAD NAL NAX NBO NC NCA ND NDL NE NEY NF NFX NGP NGZ
NH NHZ NJ NJM NKD NKK NM NMO NNI NNJ NNP NNQ NON NP
NPG NQ NQB NQM NRC NRJ NS NSO NSU NV NVJ NVL NW NWB
NWJ NWT NX NXA NZ NZB NZM NZS

OBG OCN OD ODF OOR OEN OEP OES OF OFQ OGG OHB OI OJ
OK OKL OL OMK ON ONE ONO ONQ OO OPC OQG OR ORB ORQ
ORT OSL OST OT OTD OTK OTW OUJ OUV OV OWC OWI OWR OX
OXF OSV OXZ OYA OYG OYL OYO

PA PB PDL PEH PEL PEY PF PFF PFH PFX PG PGN PGS PHF
PHL PHU PI PIL PKI PKS PL PM PME PMJ PNC PNK PNR PO
POI PP PPQ PPZ PQ PQO PQR PRT PT PU PUC PV PVW PY
PYC

QA QAF QBL QD QDZ QE QED QEJ QG QI QIJ QKK QL QM
QN QQ QS QU QV QX QY

RAD RAQ RAS RBG RBO RBY RC RCY RD RDI RF RFD RFE RFM
RFN RFU RGI RGM RHA RHE RHF RHS RI RID RIF RIL RIM RJS
RK RKK RKM RLA RM RMR RMR RN RNA RNG RNT RO ROK RP
RPO RQ RQR RRO RSS RST RSV RSY RT RTU RV RVI RVL RW
RWA RWX RXT RYS RZ

SA SAB SAJ SAL SBX SC SD SDF SF SFW SG SGA SH SJ
SIB SJM SJR SJT SK SKY SL SLD SLF SM SMA SMD SMG SNH
SOF SPG SPL SQ SR SRK SRM SRV SSG SSL SSS SSA SSZ STV
SUE SVG SVQ SW SWR SWU SY SXO SY SYP SYY SZZ

TAJ TAM TAT TB TBX TC TCU TDE TDV TE TED TEW TF TFB
TG TGA TH THH THM TJ TIL TJS TKR TMH TMU TOC TOJ TOT
TOY TQI TQK TQY TR TRL TS TSZ TTD TTQ TU TUA TUF TUN
TVI TVN TW TWG TWW TXE TXU TYO TZ TZA TZJ TZN TZT

UA UAE UCI UD UE UEL UFD UFO UH UJC UJV UK UKQ UKW
ULL ULM ULO UMC UNG UNR UPF UPZ UR USC USQ UUF UUZ UV
UVS UW UWA UWC UWE UX UXU UY UYB UYZ UZU

VA VAV VB VBR VBX VCA VCI VCN VCR VCX VD VDF VDN VEC
VEH VEI VFJ VFR VH VIV VJQ VJV VK VKB VKK VL VM VMJ
VMO VN VNE VO VOV VPD VPF VPN VPO VQ VQB VQE VR VRD
VRP VSC VTJ VU VUO VV VW VWF VWS VWT VXB VY VYC VZQ
VZU

WA WAQ WB WD WGB WH WHC WJ WLV WM WO WOG WOL WP
WPH WPY WQU WR WRH WRP WTY WU WV WVM WVP WW WWW WXA
WY WYI WYU

YAU YB YBX YD YDL YER YEK YFR YG YH YHF YID YIP YK
YM YMB YMG YN YOC YPV YPX YPY YS YTZ YU YV YWB YWY
YWX YY YZC YZE

ZAH ZB ZCG ZCL ZCM ZF ZG ZGD ZH ZI ZJD ZKE ZLE ZN
ZO ZOE ZP ZPS ZPX ZRE ZRH ZRU ZS ZT ZTN ZUJ ZUK ZV
ZVD ZVX ZW ZWH ZX ZY ZZ ZZC ZZS

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.
W2, K2 — North Jersey DX Ass'n, P.O. Box 303, Bradley Beach, N. J.
W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.
W6, K6 — San Diego DX Club, Box 16006, San Diego 16, Calif.
W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.
W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.
WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.
VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.
VE2 — George C. Goode, VE2YA, 188 Lakeview Avenue, Pointe Claire, Montreal 33, Quebec.
VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 833 10th St., N., Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 1291 Simon Road, Victoria, B. C.
VE8 — Earl W. Smith, VE8AT, P.O. Box 534, Whitehorse Y. T.
VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.
VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.
KP4 — Joseph Gonzalez, KP4YT, Box 1061, San Juan, P.R.
KH6 — John H. Oka, KH6DQ, P.O. Box 101, Aica, Oahu, Hawaii.
KL7 — Alaska QSL Bureau, Box 6226, Airport Annex, Anchorage, Alaska.
KZ5 — Ralph E. Harvey, KZ5RV, Box 407, Balboa, C. Z.

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

PEORIA Hamfest, Sept. 17, Peoria Area Amateur Radio Club. Tickets $1.00 until Sept. 9. Write Steve Perry K9AXG, 505 E. Jefferson St., Washington, Illinois.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold W5BCO. Ralph Hicks, Box 6097, Tulsa, Okla.

BEGINNERS-Code memorized in one hour. New Method. Used in Armed Services, ham radio, scouting. "Ketchum's Hour Code Course", $1.00 postpaid. Money back guaranteed. O. H. Ketchum, 10125 Flora Vista, Bellflower, Calif.

COAXIAL Cable new 58Ω 30 ft. length, $1.00; 180 ft., six lengths, $5.00. Send postage one pound per length. Radio magazines, buy, sell, trade. R. Farmer, Plainview, Texas.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Factory service at reasonable prices on Collins, Hallicrafters, Hammarlund, Gonset, National, Harvey-Wells. Our 25th year. 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

GOING Sideband, So, one unmodified Collins 32V3 exciter goes for $330.00. Sorry, can't ship. W9CR. Phone NE 1-6000, Ext. 412. 9 AM to 4 PM. Chicago, C. Reese.

COMPLETE Service: Transmitters and receivers. QSLS. Reasonable. KØDGX. Keith, 601 East 4th St. South, Newton, Iowa.

ANTENNA Farm: 20 acres bordering two state highways. Tall pine trees, brook. Fine radio location. 7 miles to Capitol. $2000. Terms. W1THM.

We Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, L.I., N.Y.

ONE HQ170 receiver with clock. Bought it in 1960. In excellent condx. $295. R. S. Burnett, 1656 Foster, Memphis, Tenn.

SURPLUS Bargains. Command receiver BC-453, $13.95; BC-454, $10; BC-455, new, $13.00; T-19/ARC-5, 3-4 Mc, $10; SCR-522 transceiver, $19.50; BC-348 receiver, $79; ART-13 transmitter, $39.00. Send for new catalog. Hi-Mu Electronics Sales Co., 133 Hamilton St., New Haven, Conn.

LOWEST Prices: Latest amateur equipment. Factory fresh sealed cartons. Self-addressed stamped envelope for lowest quotation on your needs. HDH Sales Co., 919 High Ridge Rd., Stamford, Conn.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, $1.50; General $1.75; Extra, $2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

TRIGGER. Cash paid for ham equipment. 7341 W. North Ave., River Forest, Ill. PR 1-8616, Chicago #TU 9-6429.

6 COILS for Transistor 6 meter converter December QST $5.95. Postpaid U.S.A. Specify I.F. W5ZKT, 1441 Pleasant Dr., Dallas, Texas.

TOROIDS: Uncased 88 Mhy, like new. Dollar each. Five/$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

WANTED: Cash for surplus tech manuals, one or one hundred. State condition and equipment type. W4FXQ, Box 2513, Norfolk, Va.

WANTED: Commercially-built transceivers and QST for any months of 1922, 1923, 1939 and 1940. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

QSLS? SWLS? WPE? Variety samples, 20ø, (refunded). Religious QSL samples with bible verses. 10¢. Sakkers, W8DED, Holland, Mich.

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life, 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS. Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSL-SWL-CB-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples, 10¢ with catalogue, 25¢.

QSLS-SWLS that guarantee higher percentage DX verifications! Samples 25¢ deductible. Box 1684, Scottsdale, Ariz. (Formerly Joliet, Ill.)

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glensdale Ave., Toledo 14, Ohio.

QSLS. Faster, lower prices. Catalog 25¢ (refundable) samples stamped envelope. Dick Crawford, K6GJM, Box 607, Whittier, Calif.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KN6ZMT, Creative Printing, P. O. Box 1064-C, Atascadero, Calif.

SUPERIOR QSLS, samples 10¢. Ham Specialties, Box 3023, Bellaire, Texas.

QSLS, 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., New Brunswick, N. J.

PICTURE QSL. Cards of your shack, home, etc., Made from your photograph. 1000, $13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLS, 300 for $3.95. Free Samples. W9SKR, "George" Vesely, R.R. #1, Box 208-A, Ingleside, Ill.

QSLS, SWLS, reasonable prices. Samples 10¢. Robert Bull, W1BXT, Arlington, Vt.

QSLS that are different, colored, embossed card stock, and "Kromekote". Samples 10¢. HomePrint, 2416 Elmo, Hamilton, Ohio.

QSLS, SWLs, XYL-OMs (sample assortment approximately 9¾¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

QSLS-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

1½" Call QSLs (2 sides printed), 100, $2.75 samples free. Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

GLOSSY QSLS, 100, 4 colors, $3.50. Others less. Samples 10¢. Dick, W8VXK, 7373 No. M-18, Gladwin, Mich.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLS-SWLS, 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS. Samples dime. Rubber stamps: name, call and address $1.35. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS, SWLS. Rubber stamps. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix, Ariz.

QSL: Samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS. $2.50 and up. Samples 10¢. RLB Print M.R. 12 Phillipsburg, N.J.

FAST Service, send stamp for QSL samples. K2 Press, Box 372, Mineola, L.I., N.Y.

RUBBER Stamps, $1.50. Call and Address Hoar, W2UDO, 32 Cumberland Ave., Verona, N.J.

SNAPPY, different QSLs. Dime. Filmcrafters. Box 304, Martins Ferry, Ohio.

QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS. Samples 10¢. W7HZ, Wines, Box 183, Springfield, Oregon.

FREE Samples. Economical QSLs-SWLS. Bolles, 7701 Tisdale, Austin, Texas.

RUBBER Stamps for hams, sample impressions, W9UNY, 542 North 93, Milwaukee, Wis.

QSLS. Large selection styles including photos. Lowest prices. Fast service. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

RUBBER Stamps, name/address $1.00. A. Travis, 2002 West 8th Austin 3, Texas.

CANADIANS! QSLs in fluorescent colors, by silk screen process. Free samples. Martin, 8 Kensington St., Woodstock, Ont., Can.

CANADIANS: Cash for your surplus tubes, any quantity any types. New only. Want large amounts of Army Surplus Tubes. Sam Klein, 5730 McAlear, Cote St. Luc, Que. P., Canada.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA. Wayne Nelson, Concord, N. C.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N. Y.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

New TV tubes, 6198 or 5527, $50.00 W1BYX, Box 122, Rockville, Conn.

WE Are looking for the last of the mobile AM'ers. A complete set of Gonset Mobile Twins, G-66 and G-77 with all power supplies and cables, $300. We will trade high for these. Knox Electronic Supply, Inc., 67 N. Cherry St., Galesburg, Ill. A practically brand new, hardly ever turned on Gonset Communicator III, 6-meter with mike, $200.

WANTED: Wireless Specialty Co., 1P500 with loading coils; also matching 2-step amplifier. Nelson Dunham, W2LO, 42 Cliff Ct., Highland Park, N.J.

SSBERS! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operating; promoting advancement of SSB equipment; and disseminating SSB technical information. Read "The Sidebander", official publication of the SSBARA. Dues $3.00 yearly. Write for membership application, sample "Sideband-er" to SSBARA, 12 Elm St., Lynbrook, N. Y.

FOR Sale: Globe Scout Deluxe, $150.00; VFO, $50.00; Mosley Tranmaster, $10.00; Hy-Gain TBW ant., $10.00; QSTs, run: 1930-1959. Wanted: 40-75 mtr. beam ants: and Hy-Gain, RBX-1 roto-brake. Tom Lesher, K3NCU, Elizabethville, Penna.

HT-33-A Hallicrafters KW linear; about 1½ yrs. old; clean; new PL-172 Penta tube just installed; $485.00. W2PMR, 433 Abington Ave., Bloomfield, N.J.

WANTED: Old time wireless receivers, xmtrs & etc., Magazines, books, give prices and description. W5WB, 702B N. Fillmore, Amarillo, Texas.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Globe, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halsted St., Chicago Heights, Ill. Tel. SKyline 5-4056.

SELL 2 mf. G-E capacitors, 4000V DC, $5.00 or 2 for $9.00. Guaranteed. Dawson, 5740 Woodrow Avenue, Detroit 10, Mich.

FOR Collins in Detroit Area it's Michigan Ham Headquarters also large selection of trade-ins on display. We stock most all Amateur gear and parts and should be able to handle all orders promptly. M. N. Duffy Ham & Electronics, 2040 Grand River Detroit 26, Mich. Tel. WO 3-2270/

SOUTHERN California: Transmitters and receivers repaired, aligned, Bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllog 8-0500.

WANTED: All types of aircraft or ground radios, 17L, 618S, 388, 390, 18S units, Especially any item made by Collins Radio whatsoever. Also large type tubes and test equipments. For fast action write Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

SELL: NC-300, Spk. 100 Kc. Best offer. W3ART.

FOR Sale: Ranger, $160.00; Adventurer, $30.00; BC1004 Super Pro, $95.00; NC-88 N/R, $35.00; SX-111, $175.00, Wanted: Valiant F/W and SX101A., Will sell, buy or swap local only. J. L. Stier, WA2KXA, 2422 Pearsall Ave., Bronx 69, N.Y.

FOR Sale: Viking Challenger, $90; SX-110 with Knight xtal cal., $125, XC6, $20. K8SAP, RFD 2, Hillsdale, Mich.

FOR Sale: Hy-Gain 3-el. TriBand beam, 8 mos. old. Cost $99.00. Take it for $45.00. E. Shafer, 3479 Kersdale Rd., Cleveland 24, Ohio.

RELAY Rack, Bud 6 ft. enclosed, local. W2OKO, 39 Canoe Brook, Summit, N.J. Tel. CR 7-0093.

AMATEUR Paradise Vacation. Livingstone Lodge and cabins. Mascoma Lake, Enfield, N.H. Couples, families, 100 acres, swim, fish, boats, sports. Dartmouth Golf. Tennis, 32nd year. Light housekeeping, $20. PPPW. Children half, literature. Al O. Livingstone, W2OPN.

MORROW Mobile Twins MB-565, MB-6, RTS-600S AC, RTV-630 12V. Microphone, Mounting Kit, Cables, Manuals, perf. condx, $450.00 or trade for good 75A4, RME-6900 in mint condx, factory carton, manual. $325.00; CE-100V, perfect, in factory carton, manual, spotless, $585.00; Telrex DeLuxe 10 Beam, gud condx, $25.00; 12V supply 450 volts at 500 Ma., new, $12.95; Simpson 2" sq. meters $3.75 each, White Wind speed indicator, new, $30.00; 100 ft. RG8/U w/PL-259, both ends, new, $15.00; Triplett 7" sq. 0-5 RF amp., $5.00. Ratelco Conelrad radio, new, $27.50. Larry Arnold K4AET.

PACEMAKER, $225.00, Courier, $175.00. Ralph Churchill, K5PKK, 2012 Atlantic, Dallas, Texas.

JOHNSON Thunderbolt KW linear, amplifier, in exc. condx, $425.00; Johnson KW Matchbox, new, $95.00. Johnson TR switch, $20.00. Cert. check or money order only. Dennis Dressler, KØLAD, 5024 Auburn Rd., RR #7, Topeka, Kans.

PERFECT, as new NC-300 with xtal calib., $220.00; immaculate Courier, $190. W2BAC, 4 Bayard St., Larchmont, N.Y. TE 4-2640.

STILL Cleaning house: Brand new NC-270 and spkr, $230.00; Globe Hi-Bander transmitter, $100. Wollensak T-1500 tape recorder, $100. I will ship. R. Corbett, 46 Prospect St., Torrington, Conn.

1960 QST-CQ, $7.00 ppd. W2JBL.

QUAD Tribander: Complete simplified construction and feeding plans, drawings, $1.00. No stubs. Barrington Specialties, Box 154, Barrington, R.I.

FOR Sale: Hallicrafters receiver, Model SX-99 with separate speaker, Model R-46B. Two years old, original owner. Write: James Freeland, Margaretville, N.Y.

FOR Sale: Two Heathkit CB-1 citizens band transceivers, both like new, sale or on trade for SB-10 or equivalent. Bill Hicks, K4AJF, 903 No. 13th, Lanett, Ala.

SALE: Heath Apache, $200; SX100, $200; spkr, $10; B.W. coax ant. switch, $5.00; Ameco CB-6 6M. converter, $15.00. Bud low-pass filter, 50-72 ohms, $12.50. King, K4SZY, Box 298, Liberty, N.C.

KWM-2 for sale, in A-1 condx, complete with 312B-4 station control, A.C. supply and MM-1 Collins mike, $1050.00. W. B. Robinson, 3 Jamieson Hgts., Williamstown, Mass.

TRADE: Complete 45 watt 6 meter station for SX-99 or SX-110. K4JCX, 121 Maple, Oak Ridge, Tenn.

SELL: Gonset Super 12. $45.00, used not abused. K1JRY, Lakeside Beach, Webster, Mass.

HEATH Lab scope (0-12), $40.00; Heath AR-3 with case, $22.00; Q-multiplier, $6.00 or will trade for mobile gear. R. Jehu, K1GLL, 20 Lois St., Danbury, Conn.

4-1000A linear amplifier, new. HT-32, SX-101, Johnson TR switch, spkr. D-104 mike, SWR bridge, 3500 volt pwr. supply, vertical 10-80 antennae, benches for equip. All for $950.00, plus shipping. Ky-Mar, Box 212, Mitchell, Oregon.

STEEL Operating desk, 30-60, like new. Equipment shelf included, 7 drawers, $125.00. W9AEZ.

FOR Sale: Complete station of W2GSL. Equipment is guaranteed to be in like new condition. WRL-500-B, HQ-160 with spkr, D-104 with G-stand, low pass filter, Jones MicroMatch, 10-15 quad, 80M dipole, 250 feet coax, two 40 ft. steel poles, earphones, spare tubes, RCA VTVM, grid-dipper, swivel chair, many other items. Make reasonable offer for all. All inquiries answered. W2GSL, 52 First Ave., Franklinville, N.Y.

SUPER PRO w/cabinet and pwr. Sweep gen. and Precision E500S scope(5"); linear amp. using 4-125A, B&W fil. choke and B&W 800A tank, fully metered, also 3000 v. 1A supply. Also chokes xfrmrs, meters, relays and hi-pwr tubes. HI offers accepted on any. K5BXO/7, 4800 S. 4860 W., Kearns, Utah.

APPROXIMATELY $7.000 worth of new miscellaneous components, pots, rheostats to 300w, fixed and variable resistors ½ to 300w., precision resistors 0.1 and 1% capacitors variable and fixed, disc ceramic, micas, electrolytic all guaranteed, unused. $375. M. E. Moore, 445 Bahama Dr., Indiatlantic, Fla.

GOING Mobile, sell KWS-1 Serial #503 prime condition, $975.00; 75A-4, also perf. condition, $525. Cash, you pick up. Some extra tubes real bargain, W4ERT, Hobe Sound, Florida. P.O. Box 654.

BEGINNERS: Code bothering you? Now learned in one hour. New method. Quick approach towards ham ticket. Used in Armed Services, Ham Radio, Scouting. "Ketchum's Hour Code Course", $1.00 postpaid. Guaranteed. Oaks Ketchum, 10125 Flora Vista, Bellflower, Calif.

SELL: BC-610 tuning units 47 thru 53, $17.50 set. W7RZY, Box 621, Harlowton, Montana.

NEED College money. Sell all like new: 75A4 serial no. 5444, $600, Globe Scout 65BR, $60; WRL 755 VFO, $35.00. Pete Roussel, K5JCC, 6515 Brompton Rd., Houston 5, Texas.

HQ-170, $275; CE-10B, $90; AR-22 rotor, $17.50; R-46B spkr, $10; D-104 mike, $10; Vantron 300 linear, $45.00; Drake TV-1000-LP low-pass filter, $8.50; Dow DKC-GE 115v. ant. relay, $8.50. Not a scratch on this equipment. Send check and I'll ship. William Morrow, 5731 Bromley Ave., Worthington, Ohio.

NEEDED: Collins twelve volt supply. H. Rowan, Western Electric, Anchorage, Alaska.

SALE: HQ-129X, $110; Lysco 600S, $50.00; Gonset Commander w/VFO, $55.00; WRL 755A VFO, $32.00; CE-10A, $55.00; T23-ARC5, 100 to 156 Mcs., $12.00; 6V dynamotors, cheap; ST203A, $15.00. F.o.b. W3NCX, 1005 Wyoming, Allentown, Penna.

SELL Knight R100 receiver with S meter. Used only ten hours. Professionally wired. $95.00. Prefer local. Write W9ALE, Pufall, 2708 Marmora, Chicago, Ill.

COMMUNICATOR III 6-meter, rarely used, $180.00; 4-element Telrex beam, $15.00; Alliance Tennarotor, $15.00; package for $200. M. Robbins, K2DVJ, 23-01 Radburn Rd., Fair Lawn N. J.

WANTED: 75A4 w/filters. Trade Bolex Deluxe H-8 movie camera. Leather case w/3 lenses. F1.5 taking lens, 3 in. f1.5 telephoto and f2.8 WA lens w/pistol grip handle and filters. W9JFJ, 3013 Oak Street, Evansville, Ind.

SELL: Johnson KW Matchbox 250-30-3 with directional coupler and indicator, like new, $115.00. Want late model Ranger. W4GMN, Box 371, Lebanon, Va.

COLLINS KWM-2, 516F-2, A.C. supply; 516F-1 D.C. supply, 312B-4 station control; 351D-2 Mobile Mount. This equipment is in new condx, $1450.00. Alton C. Culver, 530 Elizabeth Rd., San Antonio, Texas.

FOR Sale: Johnson Ranger, to the highest bidder. Call W. Pinchik, NI 8-8492, 4278 Bedford Ave., Brooklyn, N.Y.

ANTENNA Masts, light weight, sturdy construction, low cost. Free information. Justin E. Spinler, KNØGNH, Owatonna, RR #5, Minnesota.

MAGAZINES: QST, 1940 to current date; CQ, 1945 to 1953, total vols. 319, $65.00. W8SWF, 7711 W. Morrow Circle, Dearborn, Mich.

WANTED: QSTs for personal collection: Jan. 1917, February 1917, May 1917 and September 1917. W1CUT, Box 1, West Hartford 7, Conn.

COLLEGE Bound: Complete 2 meter station, "Twoer" transceiver, 10-element beam, rotor and indicator, all necessary cable and mounting brackets. $100. KN9ZSG, 714 Highland Ave., Glen Ellyn, Ill.

KWS1 just overhauled at Collins factory. Everything perfect, new tubes. 75A4 gud condx. Complete station, $1400. Will sell separately. Contact W9CBV, A. W. Brookstra, 12033 S. 69 Ct., Palos Heights, Ill.

SELL: Vibroplex Blue Racter, in gud condx, $14.00, plus postage. WA2KSD.

HQ-145C, perfect, unused condx, W/clock, xtal calibrator, original carton and book: $195.00. Thomas Schaefer, 702 Chimes, Paramus, N.J.

ADVENTURER transmitter wired and tested. Best offer over $35.00. W2SOU, 245 Poplar, Hackensack, N.J.

BEAM: Hy-Gain TGS-3 10-15-20 meter. Three elements on each band. New, $65.00. Originally cost $99.95. K1GAW, L. R. Case II, 123 Maple Ave., Windsor, Conn.

SELL: KWM-2 with 516F-2 pwr. supply, like new condx, $1025.00. Charles Beard, W5YXG, 5117 Juliandra, El Paso, Texas.

MORE Equipment: New HA-1 keyer and Vibrokeyer cost $95.50, sell for $75.00; VX 101 Deluxe all-band exciter-VFO, $25.00; Wollensak T-1500 tape recorder, A-1 condx, $100; You pay transportation. R. D. Corbett, 46 Prospect St., Torrington, Conn.

FOUR Eimac 304TLs, new, $25.00 each, two for $40.00; all four, $75.00. Swap new $380.00 Bell & Howell 8 mm Zoom camera and projector for gud receiver. Florian Smith, 122 E. Main, Ada, Okla.

SACRIFICE: Year old HQ-100C with BFO, $130. K8IKB, 1414 Tiffin, Findlay, Ohio.

RANGER: Top condition. Best offer. F.o.b. Cleveland, Gerst, 2674 W. 25th, Cleveland 13, Ohio.

SAN Francisco and vicinity: Receivers repaired and realigned. Factory methods. Special problems invited, any equipment. Associated Electronics, 58 South P Street, Livermore, Calif. Skipper, W6KF.

TO Sell: HQ-140x, Hammarlund receiver, $160 (with spkr); DX-35 Heathkit, $30; Heathkit VFO, $10; D-104 xtal mike, $15; Dennis Reising, Morrill, Nebr.

WANTED: Collins KW-1 (AM). Dan Pang, 7126-86th St., Tacoma 99, Wash.

WANTED: Hallicrafters S36 and S37, also National one-ten. John Nagle, 626 E. Main, Moorestown, N.J.

FOR Sale: Complete 6-meter station. LW-51, $60; pwr. supply, $20.00; Tecraft Converter 14 to 18 Mc. IF with pwr. supply, $50. S-76 Hallicrafters rcvr, $90. 4 el. 6-meter beam, Telrex, $20. Dick Mehner, W2PQU, 408 W. High, Glassboro, N.J.

SCHOBER Organ Tone generators. Completely wired, brand new, C and C sharp. Best offer. Ham-M rotator, one month old, $80 or best offer. S. Kaplan, Box 313, Billerica, Mass.

SELL: HT32, SX101A, R-48 spkr, immaculate, $665. Allen Schulman, WØDRT, 1401 Paris, St. Louis 30, Mo.

SWAP: Viking mobile transmitter, Viking Mobile VFO (factory wired) and 6 or 12 volt pwr. supply. Want good ham receiver! No junk! Stanley Cokas, 16 Edgehill Rd., Swampscott, Mass. W1ULR.

POWER Supply 110AC-IN w/350VDC at 50 Ma and 6.3V AC at 4 amp, outp. $8.00 p.p. R. Armstrong, 702 Union St., Schenectady, N.Y. DI 6-1266.

SELL: KWM-1 with complete package. AC supply, 12V DC supply, Mobile Mount, console, $735.00. HT-32A used 18 months, $440.00. All listed A-1 condx. P. J. Gross, 303 N. Wisconsin St., Gunnison, Colorado.

SELL: Viking II transmitter in A-1 condx, $160.00. W8AYS, 1564 Maple, Cleveland 21, Ohio.

SELL: SX-71, $100. Tunes 6 to 80 meters on 5 bands. Excellent condx but needs new "S" meter. Will deliver within 100 miles from Philadelphia. WA2LQT, 493 Fresno Place, Magnolia, N.J.

PREMIUM Quality used equipment, over 1,000 units—reconditioned with trial plan and full 90 day guarantee. Terms available. Write for free lists and top trade-in offer on your present equipment. World Radio Laboratories, Box 919, Council Bluffs, Iowa.

1960 Valiant, $250.00; 1960 Johnson 250-23-3 Matchbox $55.00; Johnson low-pass filter, $7.00. Will pay shipping. KN8SHM, 1504 Lafayette St., Middletown, Ohio.

SELL: NC-60, like new, $40. Postage paid. Sam Bird, Auburn, Illinois.

FOR Sale: SX-71, $135.00; Lakeshore Industries Phasemaster II-A with 458 VFO, $175.00. Both for $300. Charles Bursey, W5UOV, Thalia, Texas.

MUST SELL: Late 10B, VFO, QT-1 with 160 watt linear complete, $195.00; Collins 70E-8A PTO with panel and chassis, $45.00; Geloso 2M VFO, new, $25.00; UTC 250W MultiMatch mod. xfrmr, $10.00; 10W audio amp., $8.00; 6 oil filled capacitors, 8 uf, 1500 WVDC, $1.50 each. Premier cabinet, 10½" panel space, $20. George B. Lagaly, W5NTL, 2551 S.W. 58th St., Oklahoma City, Okla.

STOLEN! 32V3 with B&W 51SB sideband generator. Stolen in Dutchess County area early in May. Had modified open top on V3. Reward! K2OEF.

PORTABLE mill, $10; 2-station intercom, $10; Webcor record-changer, G-E cartridge, $10; G-E 250 portable radio, $10; Mallory 6RS10 battery charger, $10; V. R. Hein, 418 Gregory, Rockford, Ill.

TRADE: Kelsey 3 x 5 printer complete. Want ham receiver or transmitter. S. Heil, Larabee, Iowa.

BRAND New F/W Ranger, $250.00; HA-1 TO keyer, $50.00; Vibroplex Vibro-Keyer, $10.00; Johnson TR switch, $20.00; Heath grid dipper, $12.00; Turner 9SD mike, $10.00. Fred S. Eggert, W8FIL, 11833 Wisconsin, Detroit, Mich.

100V new. Demonstrator. Full warranty. $595.00. Eskin Radio, W2PVK.

FOR Sale: Hammarlund HQ-170C, $275 and Gonset GSB-101 linear, $350.00. Both like new. K5DTV, 10308 McKnight, N. E. Albuquerque, N.M.

COLLINS 30S-1, unused; 32S-1 with pwr. supply, used only 5 hrs; 75S-1, used 4 weeks; all $2,450.00. F.o.b. Radio KP4HH, P.O. Box 5124, Puerta de Tierra, Puerto Rico.

COLLINS: Complete station, 75A4, serial 2486; KWS-1, serial 1329, custom speaker console, like SC-101; Collins wattmeter, 24 hr. Numechron clock, Ham-M rotator control unit built into same cabinet with indicating meter identically matching wattmeter. Complete station $1850 or will sell separately. Will personally deliver within 200 miles NYC. Tolk, K2MPC, HT 4-1434 evenings or YU 8-7711 9:00 AM to 4:00 PM.

SELL: HT-33A, used 11 months, factory modified, class AB1, in excint condx. 1485.00. HT-32A used 13 months, excint condx, $450.00. Mosley TA-33 Sr, perf. $60.00. K1MMu K1MMU, 30 Granaston Lane, Darien, Conn.

HALLICRAFTERS HT-32, excint w/new tubes and built-in audio filter, $450.00 or highest certified check. W2VH, Dr. Paul Haus, 25 Upland Drive, Chappaqua, N.Y.

COMANCHE and MP-1 supply, MR-1, excellent. MP-1 unused. With late changes, cables and manuals. $160.00. K5ITX, 410 Tenn. St., Blytheville, Ark.

B&W 5100B, 51SB-B sideband generator, equipped with CA-1 compression amplifier. L-1000 A linear amplifier. All in excellent condition, used less than 50 hours. $650.00. Equipment must be picked up. Fred C. Kaffer, W2PPS, 175 Maplehurst Ave., Syracuse, N.Y.

SELL DX-40 per condx, $50.00. Ed Nicholson. 136 No. Valleybrook Rd., Haddonfield, N.J.

THUNDERBOLT $375, in excint condx, used 5 months, converting to Invader, 2000. K2HU, P.O. Box 102, Wickatunk, N.J. Tel. WHitney 6-4750.

SWAP For radio equipment: almost new, fully equipped Serro Scotty Sportsman vacation trailer. Would make nice portable ham shack. WICHB.

VIKING Valiant, new condx, factory wired; SX100 rcver, Rohn 40 ft. tower, Hy-Gain TH3 Tribander, AR22 rotator, used little. Extras include spare tubes E-V 605 mike, Dow-Key coaxial relay. Well over $900 value. Will sell separately or complete. Best offer! E. Sanders, W7MFU, 3105 So. 4300 W., Rte. 1, Ogden, Utah.

FOR Sale: Clobe DSB-100, 755A VFO, VOX-10, QT-10, best offer. K2MRB, 491 Mayhew Court, So. Orange, N.J. Phone SO 3-2991.

FOR Sale: Collins noise blanker for 75A4, $85.00. No trades. W6GMC, 614 Bradbury Rd., Monrovia, Calif.

COLLINS KWS-1/75A-4 including instruction books, $1450. Like new. Original owner. F.o.b. Cedar Rapids, KØDRU, 2690 14th Ave., Marion, Iowa. DR 7-3405.

GONSET Super-12, $48.00. Postpaid. W3RZR, 1408 Thornden, Rockville, Md.

BARGAINS: As priced or best offer. Knight 50W, $35.00. Hallicrafters HT-17 transmitter with coils, $20.00: BC-655A transmitter 17.5 to 160 Mc., $20.00. 2 meter station SCR-522 and BC-733, $45.00 converted. Plus much more. Write Clark Arquette, WA6GYB, 2120 Lyon St., San Francisco, Calif.

SELL: Mosley Model TA-33 kilowatt beam antenna. In gud condx. $50.00. E. M. Wise, 1534 Clifton Rd., N.E., Atlanta 6, Ga. Tel. ME 4-2905.

CHART Recorder, Esterline-Angus. Wanted. State type, condition and price in first letter. All answered. WØMOX, Louis Breyfogle, 520 South 44, Boulder, Colorado.

A-1 reconditioned equipment. On approval. Trades. Terms. Hallicrafters SX-99 $99.00, SX-100 $199.00, HT-37, S-85, SX-111, SX-101A, HT-32; Collins 75A-1, KWM-1, 32S-1, 75S-1; Elmac AF-67 $109.00; Gonset G-66B, G-77A, G-50, GSB-100, GSB-101; Hammarlund HQ-100 $129.00, HQ-110 $179.00, HQ-129X, HQ-140X, HQ-140XA, HQ-150, HQ-160, HQ-170, HQ-180; Johnson Adventurer, 6N2 $99.00, Viking II $179.00. Valiant; National NC-98 $89.00, NC-300, HRO-60, NC-183D, NC-303; Heath, Globe, RME, other items. List free. Henry Radio Company, Butler, Missouri.

KWM-2 for sale. Serial #562. Bulletins up to date. Mint condx. Used very little. $950 with 516-F2 115 volt power supply. Will ship. Paul McCoy, WØOZU 1310 Adams Circle, Sterling, Colorado.

CLEANING Shack! Transistor mobile supply, $25.00; Cook 12/6v inverter, $9.00; Supreme audio generator, $25.00; transistor stereo preamplifier, $25.00; Allied KN60OHC spkr, tape recorder, air conditioner for shack, color TV, etc. List. W4API, 1420 South Randolph, Arlington 4, Va.

FOR Sale: NC-303 receiver, cream puff, Speaker, Deluxe calibrator and 2-meter converter, $375.00. WV2LKB, Phil J. Ranieri, 43 Croton Lake Rd., Katonah, N.Y. Tel. CE 2-3326.

SELL: 75A4 Serial #2560, $500; Wilcox-Gay tape recorder, like new condx, $60.00. QST from 1926 to date. W2PF, David Talley, 130 Martense St., Brooklyn, N.Y.

H-77 Hallicrafters receiver, $50.00; J-104 PTT microphone and stand, $18.00; RG8U cable, 5¢ foot; R-46B speaker, $10.00; Telrex 20M beam, $25.00. K6ZZE.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system, $50; 12 volt 50 amp system $50; 12 volt 60 amp system, $60; 12 volt 100 amp syst, $100. Guaranteed no ex-police car units. Herbert A. Zimmermann, Jr. K2PAT, 115 Willow St., Brooklyn 1, N.Y. Tel. DEwey 6-7388.

TRANSMITTER DX-100 excint condx., $150. S. Bedell, 260 Autumn Ave., Brooklyn 8, N.Y.

SALE: Tubes, new each f.o.b.: 2-866, $1.75; 2-4X150A, $5.00; 4-24G, $2.00; 6-83G, $2.00; 1-250TH, $15.00; slightly used: 1-4-125, $10; 4-35T, $3.00. McElroy variable tape-puller and keyer with 4 tapes. Speed Graphic #25 finder and flash, new at $300. Will trade on rcvr. W3WHF, 288 Rose Crest Dr., Monroeville, Penna.

DX-35, $35.00. K2YFM. Tel. DA 7-0136. Ed Sheehy, 50 Brookside, Allendale, N.J.

QSTS 1917 to 1940, 25¢ each. C. Clark, 1301 S. Taylor, Arlington, Va.

SX-101A, for sale, practically new. Will ship. Make offer. W2KVL, Tel. PRimrose 5-9626, 138 Cypress St., Floral Park, L.I., N.Y.

SELL/Trade: PMR6A, $50; Lysco 600, $35.00; 75 Mtr. 35W mobile xtals, $15.00; UTC 250-watt mod. transformer, $15.00; power transformers 1200, 1500VDC 300 Ma., $10.00; 65-145V AC line adjuster, $10.00. Want series 1.2-2.6 mtr. Communicator. W6KEK, 135 Santa Fe Ave., El Cerrito, Calif.

CRYSTALS for 80-2 meters, 25¢ each. Guaranteed. Send for list of frequencies. Stancor power xfrmr. 1200 V. CT, 200 Ma. plus filament windings, $4.75 each plus postage. W6IMC, 210 Allen Road, Hayward, Calif.

BROOKLYN Hams! Don't like to buy anything second-hand, but I've got a clean station that must go, due to an antenna problem (NC-300/DX-100). Come over evenings. Whether you want to buy or not so the grapevine gets word of a really good buy. K2RVY. Melvin Weiner, 5714 Farragut Rd., Brooklyn 34, N.Y.

DALLAS: 3 bedroom brick home for sale in Walnut Hill, 60 ft. Vesto Tower up with T-Bird beam on top. Many extras. Excellent financing. W5ZFC.

HAMMARLUND 145C like new, barely used, $150.00; F.o.b.; Eldico signal generator $10.00; Triumph 5" 'scope, $25.00. Megaw, 5727 Antilles Drive, Sarasota, Fla.

FOR Sale: 30S-1 linear, with no more than 50 hours' use: $1,250.00. KWM-2 with AC power, E-V 600-D mike and full set of spare tubes. Speaker built into P.S. $1,095.00 complete. 32S-1, with A.C. power, $590. Will not ship linear. All equipment is modified to date. Lynn F. Johns, K8IDOM, 223 Concord Ave., Newark, Ohio.

FOR Sale: Fifty-ft. crank-up tower with full size Tri-band beam and rotator. Four bedroom single, two story brick colonial home attached. In northeast Philadelphia. Convenient to everything. Area completely de-TVI'ed for 1 KW operation. Worth the price for this feature alone. 174 countries worked here. 80-meter Windown and 10-meter groundplane included. Price $18,900. Herman Lukoff, W3HTF, 909 Glenview St., Philadelphia 11, Penna. Tel. FI 2-7072.

FOR Sale: 51-J2 Collins rec exc. condx. The first $425.00 takes it. Earl L. Backus, W4OSF, Bruington, Va.

SELL: 1958 S85 receiver with OF1 and built-in crystal calibrator, $90.00, or trade for test gear. 32 ft. Rohn self-supporting tower, $40.00. F.o.b. Wilmington. All inquiries answered. K3BYI, 1211 Virginia Road, Hilltop Manor, Wilmington 3, Del.

SELECTED, reconditioned equipment. Central 20A W/OT-1, Collins 75A4, extra filters, 75A2, Gonset G77A, SX101 III SX111, SX71, S38, HT32, DX-100, DX-40, Viking II, Valiant, Challenger, NC98, NC188, NC109, NC303, RME 4350A, HF10-20, DB22A and many others. Writte for list. Radio Distributing Co., Inc. South Bend, Ind.

SELL: Collins KWM-2, DC supply, AC supply, mobile mount, and many extras such as mobile antennas 10 through 75 meters, mike, spare parts, etc. Everything in excellent condition. $1095. W8MXS, 718 Wager Road, Cleveland 16, Ohio

SELL Viking Ranger, exc. condx. $195.00. Will ship F.o.b. Waseca or deliver within 75 miles. $190.00 if you pick up. WØDAF, 408 3rd Ave., S.E. Waseca, Minn. Phone 835-1092.

COLLINS. Sacrificing. No time to operate. KWS-1, $950.00. 75A4, $450.00. Used less than 12 hours after complete factory modification. Both immaculate. Dr. M. L. Redman, WØENK Rte. #2, Pelican Rapids, Minn.

COMPLETE Station for less than value of the receiver. DX-20 with crystal switcher and 18 xtals. SX-71 Hallicrafters receiver. All for $110. K5FTH, 1305 Berkshire, Austin, Texas.

SX-71 in mint condx, $125.00 Bill Bell, W4JTR 6702 Greenleaf St., Springfield, Va.

FOR Sale: Surplus 550-1600 Kc. Gates 250-watt station. Never operated, includes control desk: modulator; extra tubes: tower lighting kit: coaxial cable; and all wire. Complete in 27 boxes. Wt. 3674 lbs. Original price: $4140.00. Make offer. All inquiries will be answered. Gene Markos, K9JFE, Litchfield, Ill.

FOR Sale: QST issues: March 1921 through December 1927; Sept. 1933 Mar. thru Dec. 1936; Jan. 1937 thru Dec. 1943. Oscar A. Rosel, St. Ansgar, Iowa. Many issues in run of this scope becoming scarce.

WANTED: 75A4. Trade: 75A2 and never used Bolex H-16 with normal, telephoto, and wide-angle lenses. K8RUU, 121 Second, Uhrichsville, Ohio.

SELL: B&W 5100B, 51SB-B; good condx, perfect for AM, SSB, and CW; $425.00. Miles Hardin, K4AVN, Somerset, Kentucky.

SELLING Out entire station. Will sell individually or entire lot: Super Pro military with pwr. supply, $115.00; Tecraft deluxe 6m conv., $35.00; CDR-AR22 rotator, $25.00; Heath tube tester, $20; Heath VFO, $15.00; Heath reflected power meter, $15.00; 48 in. rack gray crackle finish, $40.00; SCR522 trans., rcvr, and power supplies with cables and accessories, $30.00; trans and rcvr need some work. Also surplus scope, needs conversion work, $5.00. $300 takes all. John E. Edwards, K2TNW, 71 Armour Rd., Mahwah, N.J. LA 9-3265.

KWS-1 Ser. 1267, 75A-4, ser. 3531, both in beautiful new condx. Approximately 50 hrs. operating time. Mike, M. C. Jones SWR, bug. Gotham all band vertical f.o.b. $2000 cash. Bob Cava, K6OYD, 113 Wood St., Salinas, Calif.

PACEMAKER $225.00; Thunderbolt $400, Hallicrafters 101-X Mark III with #47 spkr, $250.00; 38 ft. telescoping tower (slightly lamaged) $30.00; Hy-Gain Tri-Band beam (slightly damaged), $50.00; CDR Rotor type M $70. Mosley 40-80 Vertical antenna, $45.00; Johnson TR Switch, Lo-pass filter, S.W. Meter and Coupler, $50.00. All coax connected. Prefer not to ship. Cash and carry entire station: $1,000. W3CJP, H. A. Stoudt, 125 Girard Ave., Hyde Park, Reading, Penna.

RANGER: Latest model factory wired. Perfect in every way. Now used by W1DY. Going SSD. $179 if I don't ship. Also immaculate factory-wired Stancor 202A, 811 final. My standby 130 watt CW rig and a good one. A steal at $49.00. W1DY, Box 297, South Yarmouth, Mass.

COLLINS 30S-1 Linear. Used very little. F.o.b. $1.095. W8VF, Russell Stewart, Yellow Springs, Ohio.

WANTED: 75A2, 75A3 or 75S1. Give price, serial, other details. Can repair if required. Sell 813's, 810's, meters, bug, misc. parts. List on request. O. Hessler, W9OH, R. 2, Box 978, West Chicago, Ill.

FOR Sale: Brand new surplus Westinghouse MW radio frequency unit, tunes 2-30 Mcs. Has seven vacuum variables, output harmonic filter, built-in frequency multiplier. Requires external 2-4.5 Mcs. VFO drive of one watt. Excellent for CW, AM, NFM, FSK, SSB, etc. Requires tubes, easy to build copper tubing coils, power supplies. Commercially rated at 4 kilowatts input. Perfect for maximum reliability rig at 1 kilowatt input. Sell for $500. Cost over $4000. Send stamped envelope for photo, further details. W2IWV, 415 Keyes Rd., Utica 4, N.Y.

SB-10, $65.00 perf. condx. Jim Day, WA6BJE.

100V. $550.00 or make offer. Latest factory modifications. W8GFH.

WANTED: Small mobile transmitter, pwr. for BC-455. State price and condx. K7NEZ, 1125 S.W. St. Clair, Portland 5, Oregon.

TUBES 7094, new, $15.00; 4E27 used, $8.00; Amperex 5894, $3.00; 832, $2.00; W-E 701A, $4.00. All guaranteed F.o.b. J. Harms, Plaistow, N.H.

NEW Sealed carton G-33 receiver, $75.00; SX-100 perf. condx, $150.00; SX-111 new condition, $185.00; new Eimac 4-400A, $20; brand new PL-172 and socket, $125.00; Johnson Adventurer, $25.00; Valiant, factory-wired, $295.00. Sonar SRT-120, $65.00; new HA-1 keyer, $65.00. W1OFE, 10 Mansheld Place, Darien, Conn.

COLLINS KWS-1 Serial #1514 in A-1 condx with D-104 mike, Hy-Gain TH 3 beam, Ham M rotator. The whole works for $1295.00. Come and get it. K2JIK, 11 Grand St., Warwick, N.Y. Phone 986-4755.

BARGAINS: Factory wired Valiant, $350.00; Courier linear, $175.00; HT-32, $350.00; CE MM2 R.F. analyzer, $75; Simpson 488 TV field strength meter, $25.00. Heath audio generator, $20.00. Parts for B&W, KW, Pi net final? R. B. Cooper, W8AQA, 132 Guild, Grand Rapids, Mich.

TRANSISTOR Six or two meter converter circuit boards for construction articles Dec. 1960, May 61, QST. $2.00. Custom-built transistor converters. Daniel Meyer, 430 Redcliff, San Antonio 12, Texas.

SELL: HT 32, clean as they come, original carton, extra crystal: $425.00. Bird wattmeter, 60 watts: $50.00. New 4-125s, $15.00. Want: Old time QSTs. W2DYU, 36 New Lawn Ave., Kearny, N.J.

SELL: HQ-170C, damp chaser, top condx, $275; also 120-watt phone c./w. xmtr, $50.00. Local area deal, Frank Stolpen, W2MZQ, 2132 East 13th St., Brooklyn 29, N.Y. DE 9-8175.

HT-32, in A-1 condx $400.00: HQ-145, like new condx, w/spkr and xtal calibrator, $200.00. KØPPT, 1548 Wellston Place, St. Louis 33, Mo.

CONVERTER 2 mtr. International, new, $12.00; FS Meter, Morrow mobile, $6.00; Heath condenser checker, $10.50; Mercury 35 MM camera 2.8 w/case, $15.00; Ferris Freq. meter microvoiter, 5 mc. to 175 mc., $22.00; Vibrator supply HRO Sr., $5.00; Hammarlund HQ-140 manual $1.00; Receiver 2 mtr. home-built, $15.00; rotator AR2, $15.00; Jones Micro-Match, SW w/indicator, $20.00; BC348 orig. pack. offers. John L. Gifford, 698th Radar Sqdn, Thomasville, Ala.

BC-779A receiver, 100-400 Kc, 2.5-20 Mc. for rack mounting. In gud condx. $80.00. Dan Salley, Rte 5, Winston-Salem, No. Carolina.

HALLICRAFTERS type electronic keyer, including key, excellent condx, $40.00. W1ZHY, 10 Blanchard St., Nashua, N.H.

GO VHF: Viking GN2 transmitter, GN2 VFO, Eico modulator, Ameco six meter converter, 7-11 IF, heavy-duty pwr. supplies, control box. $305.00. Donald Trego, W3GDK, 620 Boyd St., Shamokin, Penna.

HQ-170 with clock, Brand new appearance and performance. Manual and original factory container. Best offer. Going mobile. W1HUM, L. J. Hemington, 12 Sunset Terrace, West Hartford, Conn.

WANTED: VTVM such as RCA Senior or Master, Precision 98-MCP, etc. Send details to Goebel Davis, K5UNI, Tijeras, N.M.

SELL: Gotham Triab Triband beam including 200 ft. RG-8U. Ready to go. Works exceptionally well. $40.00 plus shipping. W4UCZ, Mark, McIntyre, Ga. P.O. Box 1.

AF67, 60 watts of clean AM, FM, CW, with heavy-duty 110V supply and mobile rack. $125.00; Master Mobile whip and mount, 200 watt AM modulator, SCR522 transceiver. Swap 6 ft. cabinet rack for 4-tt. Jim, 5109 Trousdale Dr., Nashville, Tenn.

TECH Manuals, New Original Maintenance books, APA-10 $5.00. APA-38 $8.00. APN-1 $6.50, APN-4 $8.00, APN-9 $10.00, APR-1 $7.50, APR-4 $7.50, APX-6 $8.50, ARC-1 $10.00, ARC-2 $8.50, ARC-5 VHF $8.50, ARC-27 $8.50, ARR-2 $7.50, ARR-5 $8.50, ARR-7 $8.50, ARR-15 $10.00, ART-13 $12.50, BC-224—BC-348 (Specify Model) $8.50, BC-375 $7.50, SCR-274N Command Sets $8.50, SCR-522 $8.50, ARN-5 $7.50, ARN-6 $8.50, ARN-7 $8.50, URC-4 $8.00, TS, TM, RTTY Manuals In Stock, Send Requirements. Free Catalog. With 5000 Items. Bill Slep Company, Drawer 178Q, Ellenton, Florida.

SALE: (2) Complete outfits, fixed and mobile. Heathkit DX-100, Mohawk RX-1, SWR Fwd/Ref power meter AM-2, E-V Hi-Z mike w/stand, cord and plug. Bud LP filter LF-601A, Bud 100 Kc xtal osc. FCC-90B, Dow-Key antenna relay. DK60-2C. Gonset rcvr G-66-B. 12 volt DC/115 volt AC pwr. supp. & spkr. G-77-A xmtr. 12 volt DC/115 volt AC pwr. supp. & mod., Shure hand mike, cord and plug, Webster Bandspanner 10-80M whip. All inquiries ansd. promptly. Best offer. Bill Woolard, K4OKE, 48 Woodlawn Ave., Charleston Heights 57, S.C.

FOR Sale: Factory-wired Viking Valiant. Excellent condx. Used only during summer months due to college attendance. $325.00 at Berwyn, Illinois. K9GOM, 2137 Clinton Ave., Berwyn, Ill.

VIKING Mobile, $50.00: LA-1, $75.00; PE-103 and Johnson base, $15.00; WRL VFO, #755, $25.00; Gonset Super Six (12 volt), $20.00; Viking Kilowatt, $800.00. W5FJR, 515 W. Main, Houma, La.

WITH "Dip-A-Cap" and your grid dip meter, range 1.7 to 85 mc, measure capacity 3.0 to 7000 micromicrofarads easily and quickly, $3.50 each. E. M. Shook, W5IT, 227 West Woodin Blvd., Dallas 24, Texas.

CLEANING House: KWM-1 with noise blanker, 312B-1 spkr, 516E-1 AC and 516-1 DC pwr. supp., Mosley MA-3 and mount, $850.00; Viking, FW 6K2 T-bolt, $325.00; Gonset G-50, $200.00; Gonset G-76 and AC ps. $375; RME DB-23, $25.00; Hickok 820 Caddy Pal, $55; Viking KW Matchbox, as is, $25; Masco RK-6 disc recorder, $25; Webcor 210 tape recorder, $35.00; Wollensak 1500 Tape Recorder, $70. Also complete Ling ham TV station. Wriae for details. W5VVF, Box 776, Kermit, Texas.

GSB-100, excellent condx, $335; KW linear, 4 switchable tanks, four 811s, grounded grid, less pwr. supply, $75.00. Both for $385.00. K6SGQ, 1870 Petaluma Ave., Long Beach 15, Calif.

VIKING I w/TVI kit and relay control, Viking VFO, SX-100, antenna coupler, Dynamic mike and stand, $350.00 cash and carry. B. Arnow, W2BCM, 141-15 79th Ave., Flushing, N.Y.

ATTENTION: Sell or trade, ham gear, magic, stamps. Send for list. 100 South Main, Unionville, Conn.

SSB 100F Eldico SSB transmitter, latest model, with spare 5894 tube, $495. WØFLF, 6148 South Westview St., Littleton, Colorado.

SALE: 15db gain Telrex 6-el. 20 meter Yagi, 20M-646 with or without 80 ft. self-supporting Vesto tower and rotator; Treasure Finder, Goldak, $45.00; Dumont 208B 5" scope, $32.00; Elenco compression preamp, $18.00; 6 choice 6C21s with sockets, $100; B&W CX49A butterfly, bar, link, neut., $20; 550W audio RCA mod. xfrmr 1:1, $15; Collins PTO with dial, $50.00; TVI suppressed 19" panel rack cabinet, 26" HX18" D, $15; beautiful speech amp., 6L6s, $20; 1½ KVA xfrmr 2-110V, 2-1100V windings, $8.00. W3GAU, J. Gillson, 109 Mullin Rd., Wilmington 3, Del.

VALIANT, FW, purchased new Aug. 1960, in exc. condx; Dow-Key relay included, $350.00; moving, must sell immediately. Contact Fred Dorsey, KØRXJ, 250 Jasmine St., Denver 20, Colorado.

FOR Sale: HT32A, year old, in perf. condx: $450.00. Sry, will not ship. Richard Fries, 2209 E. Penna., Allentown, Penna.

32S-1, 75S-1, AC pwr. supply, TA-33 beam, 10-D mic, all for $950.00; Zenith trans. oceanic, $40.00; Sussman, 25 Garland St., Chicopee Falls, Mass.

KWM-2 with AC supply, 516F-2, looks and operates like new. Never mobile. First certified check for $875.00 gets them in factory cartons. Henry G. Hayes, K9CLC, Rt. 2, Fulton, Ill. Phone Albany, Ill., 3718.

W2EWI. Special, chassis and all major parts: $20.00. Stamp for list. W5FTW.

CLEAN-UP Bargains! 400-watt plate-modulated Pi-final transmitter, $150.00; Meissner VFO, $20; NC-183D rcvr, w/matching spkr, $175.00; Viking VFO; Regency all-band transistor converter; 150-watt 2-6 meters, table top unfinished transmitter, $37.00; DB-23 Preselector; signal generator, PA amplifier; DX-20, $20.00; etc. Hurry, Vergne, K2KGU, 420 Riverside Drive, N.Y. 25, N.Y. Tel. MO 6-8513.

FOR Sale or Trade: APR4 receiver and tuning units, 38 Mc to 1000 Mc. W. Wesslund, WØDNW Rte. 2, North Platte, Nebr.

"HORSE-TRADER" Ed Moory is authorized to sell for Cash, Brand new Collins Equipment of the "Late" Chuck Schwartz (W4LVG) Memphis, Tenn., as follows: KWM-2 $965.00, PM-2 Supply $125.00, CC-1 Carrying case $68.75. Six months warranty. Un-opened carton, also Factory reconditioned Collins KWS-1 & Pwr Supply $995.00 & 75A-4 $519.00. "Horse-Thief" Specials' HT-33 Linear Factory Modified and Reconditioned $289.00. Used 200-V $639.00. New HQ-170 Receiver Factory Warranty, $285.00. Viking Valiant $319.00. DX100-B Xmtr $149.00. HT-37 $349.00. Collins Army Version 51J-3 Perfect with Spkr $439.00. Drake 2-A $209.00. KWM-2 Perfect $849.00. Gonset GSB-101 $299.00. Terms Cash: No trades. Or Best Offer. Ed Moory Wholesale Radio, Box 506, DeWitt, Ark. Phone Whitney 6-2820.

SELL: DX-100, $135.00 cash or would like to trade for Gonset G77 or G77A. Charles F. Sims, Box 6, Georgia Tech, Atlanta 13, Ga.

SX-101 Mark III, best offer over $225.00; Modulator 125 watts, $49.50; UTC LS-12, $12.50; cleaning house, many items: meters, tubes, components. What do you need, W2BE.

COLLINS KWM-1 with noise blanker, 516F-1, 516E-1, 351D-1, 312B-1, all in gud condx; will trade for gud boat, motor or trailer or will sell for cash. 15 day money-back guarantee. WØGDJ, 1110 Washington Drive, Marion, Iowa.

HRO-50T, Coils AA, AC, B,C,D, S O J-3 crystal calibrator, NBFM Adaptor, $195, W5HOB, 732 Nottingham, Richardson, Texas.

SELL Apache $235, GSB-101, $275; KW Matchbox, $75.00; HRO60 2-80 RC and 2 mtr conv., $450.00, 40 ft. tower, 20-10 beams and accs., $75.00; Hickok tube tester $125.00; SW-54, $35.00 D-104 mike and some accs. one deal: $900. K1OAV, 45 North St., Danbury, Conn.

HQ-145C receiver with xtal calibrator and spkr, $190; Heathkit Seneca, $165.00; Johnson 6N2 converter, FW, $45.00. R. N. Bunnell, K2CGB, 1 Evans Rd., Riverdale, N.J.

JULY Only: 10% discount QSL's, new samples 10¢. Savory, 172 Roosevelt, Weymouth, Mass.

CRYSTALS Airmailed: SSB, MARS, CE. Net, etc. Custom finished FT-243, .01% any kilocycle 3500 to 8600, $1.49; 1700 to 20000, $1.95. Add 50¢ ea. for .055%. Add 65¢ for HC-6/u hermetics. Free QST construction article packaged sets see previous QST classified. Crystals for all projects. Write. Airmailing, 9¢ per crystal, regular 5¢. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

SELL: HQ-110-C, perfect, $169. W2PWF, 78-42 264th St., Floral Park, N.Y. Tel. FI 3-9382.

RECONDITIONED General Coverage receivers: Hammarlund SP-600 (540 Kc-54 Mc.), $345.00; HQ-160, $259.00; Collins 51J-2 (500 Kc-30.5 Mc), $495.00; 51J-3, $675.00; teletype Kleinschmidt printers, reperforators, Telewriter FSK converters, Panadaptors. Wanted: Collins ground and aircraft radio equipment. Test equipment, Teletype. Cash or trade for new amateur gear. Write Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. (Tel. RIchmond 2-0048).

HAMMARLUND HQ-100, like new, with matching speaker, $100. Ruth Ernst, 3½ E. Wall St., Norwalk, Conn. Tel. Victor 7-8644.

FOR Sale or trade on ham equipment: Camera Rival 35 carrying case and flash attachment, $30; camera Zeiss Ikon Ikonta 4.5 lense, carrying case and flash, $30; Zenith trans oceanic portable radio, $60; Girar Asfazadour, 35-46 65th St., Woodside 77, L.I., N.Y.

EICO 720 xmtr; 730 modulator; Heath VFO anl power supply; control box. All are in excellent condx, $175.00 or your best offer. Will be willing to ship. John Koval, WA2OGC, 264 Ampere Parkway, Bloomfield, N.J.

COMPLETE Station! NYC area! TX-1 Apache, $215.00; SX-100 $185.00; HA-1 Elec. Key with Vibro-Keyer, $80; TA-33 Jr. beam, $55.00; Astatic mike PTT, $20.00; prefer package deal, $525.00. Will deliver within 100 mile area. K1IVT, 36 Wesskum Wood Road, Riverside, Conn. Tel. NEptune 7-0490.

COMPLETE Conversion data for ARC-3 receiver, including schematic. Send $1.00 to Harland Hirst, WA6FGH, Box 1059, Livingston, Calif.

304TLs and THs. All new, in original boxes. $25.00 each. E. Kather, K1QOT, Wayland, Mass.

HAMMARLUND PRO 310 receiver, in exc. condx. Certified check for $250.00. Will ship within 150 miles. Warren J. DeMouth, 258 Horseneck Rd., Caldwell, N.J. Tel. CA 6-6518.

BC-1004 in gud condx, best offer over $100. S-85 (like new condx) w/OFI, $90.00. DX-40 in gud condx, $50.00. Richard Wilkins, K4VHH, Rte. 1, Woodstock, Virginia.

PAIR Wheeler ground power telephones, $18.00; B&W TR switch, mod. 380B, $15.00; Collins 75A2 with Central Electronics Model A Sideband Slicer, $300; 3-element Hy-Gain Tribander with CDR HD rotator and 60 ft. Rohn foldover tower. You to remove, $200; Shure Dynamic model 508C mike w/push-to-talk switch, $15.00; Shield Model 102 mike, $5.00; Heath model AM1 antenna impedance meter and Mod. GD1B grid dip meter, $25.00; SS20A exciter with 458 VFO, $190.00; BC221 frequency meter, $50.00; all F.o.b. Cincinnati. Fred Hofferth, W8FXS, 771 Dunwoodie Dr., Cincinnati, Ohio.

MALE Ham Operator, College student or Graduate, General License req. to teach children in simple layman's English at Summer camp in the Pocono Mountains. Must supply own equipment consisting of single sideband at least 500 watts. Leadership potential most essential. Write qualifications to Pocono Highland camps, N.W. Cor. Castor Ave. and Gilham Sts., Philadelphia 49, Penna.

AR-88 wanted, K3MNJ, 6231 N. 16th St., Phila., Penna.

SELL or trade on mobile equipment: RCA base station 152-174 megacycles, Sry, can't ship; TRY transceiver, converted to 6 meters; 4D32 tube; Photo 25¢, KØSVJ, 406 South Main, Leon, Iowa.

FOR Sale: DX-40 xmttr, $55.00 and Knight R-100 rcvr, cal. and S meter, $110. Both Gud condx. Sheldon Brown, K1MYA, 250 Beaver St., Keene, N.H. EL 2-0093.

SALE: Novice station, Knight R-100 xtal cal. Dow-Key preamp, S-meter, Johnson Adventurer, $150; 6-80 vertical and 45 ft. of RG8U free if you pick up. WA2OCL, Don Davis, Hamburg, N.J.

GONSET Communicator II, in exc. condx, $150. Fred Hildebrand, 220 Chicago Ave., Harrisonburg, Va.

SELL: Almost new SX-111, $200; Drake 2A, $215.00; new guarantee cards included. Dr. Charles Thompson, 103 West Main, Napoleon, Ohio.

VIKING Challenger, just back from factory check-over, and Johnson 122 VFO. Best offer or trade toward good Ranger. KØIPI.

PRECISE 300B, 7" scope, $85.00; Precise 116 tube-tester, CRT adapter, $75; Webster Ekotape recorder, $50; Garrard record-changer, wood base, Pickering cartridge, $20; Astatic crystal mike, desk stand, $5.00. V. R. Hein, 418 Gregory, Rockford, Ill.

DX-40 and VF-1, exc. condx, $75. K4OPC, RFD 1, Penn Laird, Va.

SELL: Valiant, xlnt condx, $325.00; HQ-170 xlnt, $275.00. K2UMH, 53 Louise St., Delmar, N.Y.

HAMMARLUND HJ-120 for sale with 100 Kc xtal calib., $60.00. F. Reed, K2RHG, 86 Oakdale St., Staten Island 8, N.Y. Tel. YU 4-7841.

WANTED: Collins 32W-1 exciter, state price and condx. W9TGT, 801 Glendale Rd., Glenview, Ill.

BEAUTIFUL Apache and SB-10, $300. WA2EXB, ART, 68 West 45th St., New York 36, N.Y.

LOOKING for Collins 390AQRR in A-1 condx. Quote to KP4HH, Box 5124, Puerta de Tierra, Puerto Rico.

EXC. Condx. HRO-60, XCU-2 table spkr and coils A,B,C,D, AC, $330.00 sale or will trade on 75A4 w/serial no. above 4000. W9UZC, 146 N. Washington, Lockport, Ill.

SALE: Complete station: Professionally assembled Apache transmitter $220; SB-10 Sideband generator, $90; Heath VTVM, $20; Eico #460 scope, $75.00; HQ-170C rcvr and spkr, $295; Hornet Triband beam, $50.00; AR-22 rotator, $25.00. All above including mike, bug, foax, station "junk boxes with many items such as xfrmrs, meters, relays, servos, transistors, tubes, etc. $800. M. Geller, K5GQF/2, 666 Shore Road, Linwood, N.J.

SELL: Heath DX-40 and VF-1 VFO, $60. WA2FNF, 92 South Salem St., Dover, N.J. Phone FO 6-4640.

WHEATSTONE Perforator exc. condx, $35.00; McElroy tape puller CTP, new orig. pkg., $35.00. Turner, 412 Washington, Haddonfield, N.J.

NC-109, like new condx, $125.00; new HT-40 transmitter, $80; "Precision" tube tester, $30; Simpson capacity bridge, $15.00. Jim Perry, 14 Oak St., Greenfield, Mass.

RANGER in A-1 condx, one year old, Push-to-talk, $185.00. K2QWG. First certified Check. R. C. Miller, Hillcrest Road, Plainfield, N.J.

SELL for $200 off new price or will trade for SSB gear Ampex 601 full track portable tape recorder and 620 amplifier-spkr used less than 15 hours. New price $784. Roddick, K7BDG, 5105 East Sunset Drive, Yakima, Washington.

FOR Sale: GSB-101, new, $265; L-1001-A, new, $225.00; Eimac 4-65-A, new, $5.00; 4-400-A, new, $30. Want: D.C. supply for KWM-1, transformer, 220/3800V CT at 2.7 amps, $40.00. James Craig, 72 E. Sixth, Peru, Indiana. Tel. GR 3-9306.

FOR Sale: Polar relays Type 255A, $2.00 postpaid. WØZKN, 1061 Gabriel Dr., St. Louis 37, Mo.

COLLINS KWS-1 (#669), $1000 F.o.b. Cedar Rapids, Iowa. In exc. condx. Virgil Schaffer, WØFBH, 3165 Grove Court, Cedar Rapids, Iowa. Tel. EMpire 4-2779.

SELL: Viking II plus VFO and co-ax relay, $195 or your best offer. Also, HQ-129X with spkr, $95 or best offer. George Kimeldorf, 214-15 82nd Ave., Queens Village, L.I., N.Y. Tel. SP 6-9060.

HALLICRAFTERS HT-37, perfect condition, $360.00. W5WJW, 3824 Parkwood, Waco, Texas.

KILOWATT Amplifier: Heath KL-1 Chippewa Amplifier with KS-1 Power Supply. Wired, complete with cables and 220 volt line cord, $450 FOB West Hartford. L. A. Morrow, W1VG, 99 Bentwood Road, West Hartford 7, Conn. Phone ADams 2-2073.

Index of Advertisers

LEE PAUL, K1LCV, covers the non-business aspect of his Raytheon activity via QSO with other members of the company's world-wide field team.

FIELD ENGINEERING WITH A FUTURE

Hustling for 'Hustler'

The smiling ham above is Lee Paul, K1LCV, energetic engineer-in-charge of the B-58 'Hustler' product support group at Raytheon's Sudbury, Mass. laboratory. From his command post, Lee maintains contact on technical problems with various field groups situated throughout the country.

Lee's Raytheon experience typifies the organization's field-engineering-with-a-future concept. Since joining Raytheon three years ago, he has filled a variety of challenging assignments, including depot overhaul, reliability studies and systems test activities at Fort Worth, Texas, Long Island, New York, and other field locations. Now he heads "home support" at Sudbury.

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National
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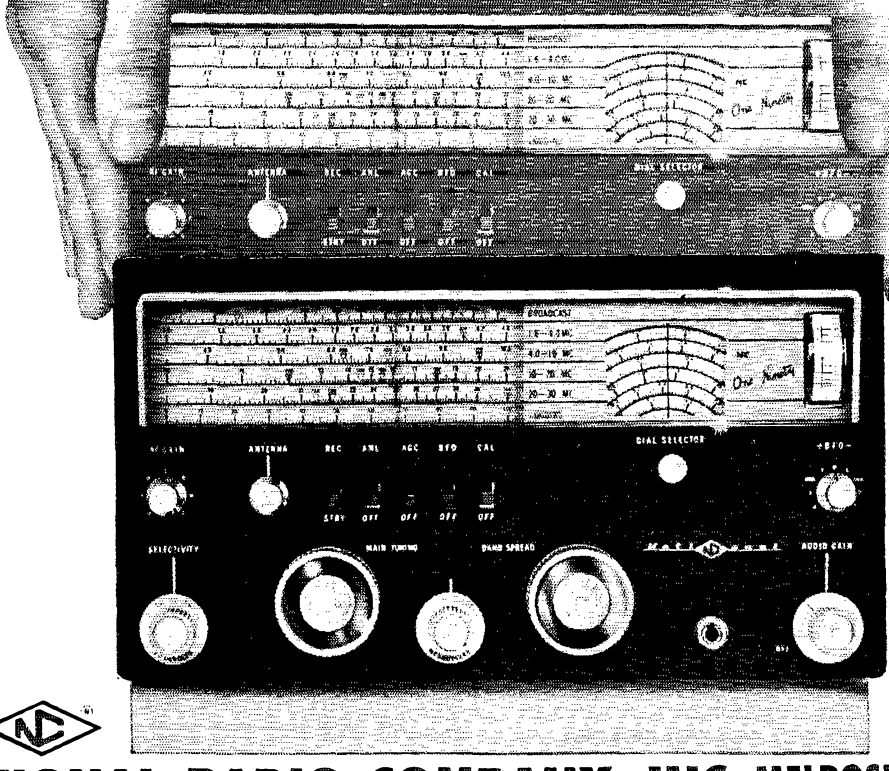

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BEAM POWER for All Powers

Whether you're on SSB, AM, or CW—QRP or QRO—there's an RCA beam power tube for every amateur transmitter power level and for frequencies to 450 Mc and beyond.

Beam power tubes make it practical to build compactness into your rig. They do the job with fewer stages, less expensive components, fewer controls. RCA beam power tubes deliver the power with relatively low plate voltages. Thousands of commercial transmitters prove out these facts.

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Popular RCA "Beam" Power Tubes for Transmitter Application
(listed according to power-input ratings)

RCA Type	Class of Service	Max. Plate-Input Watts■	Max. DC Plate Volts■	Max. Freq. For full Input (Mc)	Max. useful Freq. (Mc)	Heater (H) or Filament (F) Volts
5763	CW AM	17 15	350 300	50	175	6.0 (H)
6417	Same as RCA-5763, except for heater voltage					12.6 (H)
2E26	CW SSB AM	40 37.5 27	600 500 500	125	175	6.3 (H)
2E24	Same as RCA-2E26, but has quick-heating filament					6.3 (F)
6893	Same as RCA-2E26, except for heater voltage					12.6 (H)
832-A*	CW AM	50** 36**	750 600	200	250	6.3▲(H) 12.6●(H)
807	CW SSB AM	75 90 60	750 750 600	60	125	6.3 (H)
1625	Same as RCA-807, except for heater voltage and use of medium 7-pin base					12.6 (H)
6524*	CW SSB AM	85** 85** 55**	600 600 500	100	470	6.3 (H)
6850*	Same as RCA-6524, except for heater voltage					12.6 (H)
4604	CW	90	750	60	175	6.3 (F) quick-heating
6146	CW SSB AM	90 85 67.5	750 750 600	60	175	6.3 (H)
6883	Same as RCA-6146, except for heater voltage					12.6 (H)
829-B*	CW SSB AM	120** 120** 90**	750 750 600	200	250	6.3▲(H) 12.6●(H)
7203/ 4CX250B	CW SSB AM	500 500 300	2000 2000 1500	500	—	6.0 (H)
7094	CW SSB AM	500 400 335	1500 2000 1200	60	175	6.3 (H)
813	CW SSB AM	500 450 400	2250 2500 2000	30	120	10 (F)

*Twin-Type **Total for both Units ▲For parallel-heater connection
●For series-heater connection ■Max. Ratings for amateur use

For technical data on any of these types write RCA, Commercial Engineering, Section G-37-M, Harrison, N. J.

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