QST

devoted entirely to

amateur radio

PUBLISHED BY THE AMERICAN RADIO-RELAY LEAGUE

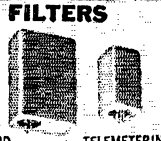
FOR EVERY APPLICATION

IMMEDIATELY AVAILABLE—FROM STOCK

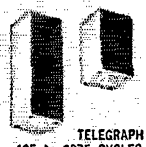
Over 1,000 items to cover virtually every electronic application. . . . 400 Hermetic items, proved to MIL-T-27A, eliminate costly test delays. . . . Highest reliability in the field. . . . Immediately available from your local distributor. Write for catalog.

FILTERS

LOW PASS HIGH PASS BAND PASS 60 to 12000 CYCLES.



TELEMETERING 400 to 70000 CYCLES.



TELEGRAPH 425 to 2975 CYCLES.

HIGH Q INDUCTORS

VARIABLE STANDARD

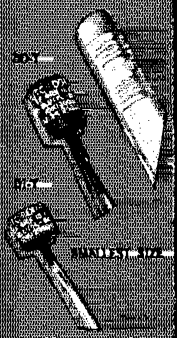
VARIABLE HERMETIC

DECADE INDUCTOR

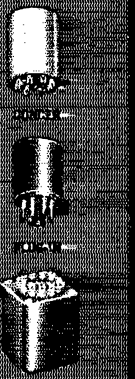
LOW FREQU. TO 2500 HYS.

PERMALLOY DUST TOROIDS HIGHEST Q, ACCURACY, STABILITY.

TRANSISTOR AUDIO



COMPACT WIDE RANGE



TRANSISTOR POWER

LINE ADAPTORS

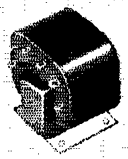
COMMERCIAL GRADE

HERMETIC POWER COMPONENTS

Military, Industrial

PLATE TO 6 KV CT

REACTORS TO 1.25A

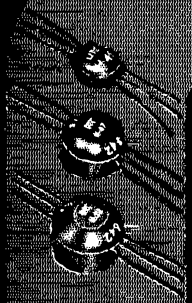


FILAMENT 400 CYCLE

HERMETIC AUDIOS

FOR TUBE, TRANSISTOR, CHOPPER, AND MATCHING SERVICE. .8 to 12 OZ.

PULSE



HIGHEST FIDELITY

AMATEUR SERIES

MAGNETIC AMPLIFIERS

REPLACEMENT TYPES

And Special Units to Your Specifications

UNITED TRANSFORMER CORPORATION

150 Varick Street, New York 13, N. Y.

PACIFIC MFG. DIVISION: 4008 W. JEFFERSON BLVD., LOS ANGELES 16, CALIF.
EXPORT DIVISION: 13 EAST 40th STREET, NEW YORK 16, N. Y. CABLES: "ARLAB"

From the engineering team that developed the incomparable HT-32A comes a transmitter that brings SSB within reach of all... HT-37

The price: $450.00. Here, for the first time, is a moderately priced SSB transmitter that retains the essential performance characteristics which made its big brother the most wanted single sideband transmitter of all.

Same power. Same rugged VFO construction. Identical VOX. And a smooth, distinctive speech quality that insures excellent on-the-air reports.

You can judge — and own — the HT-37 now. Your distributor will soon have it on featured display.

Technical Details

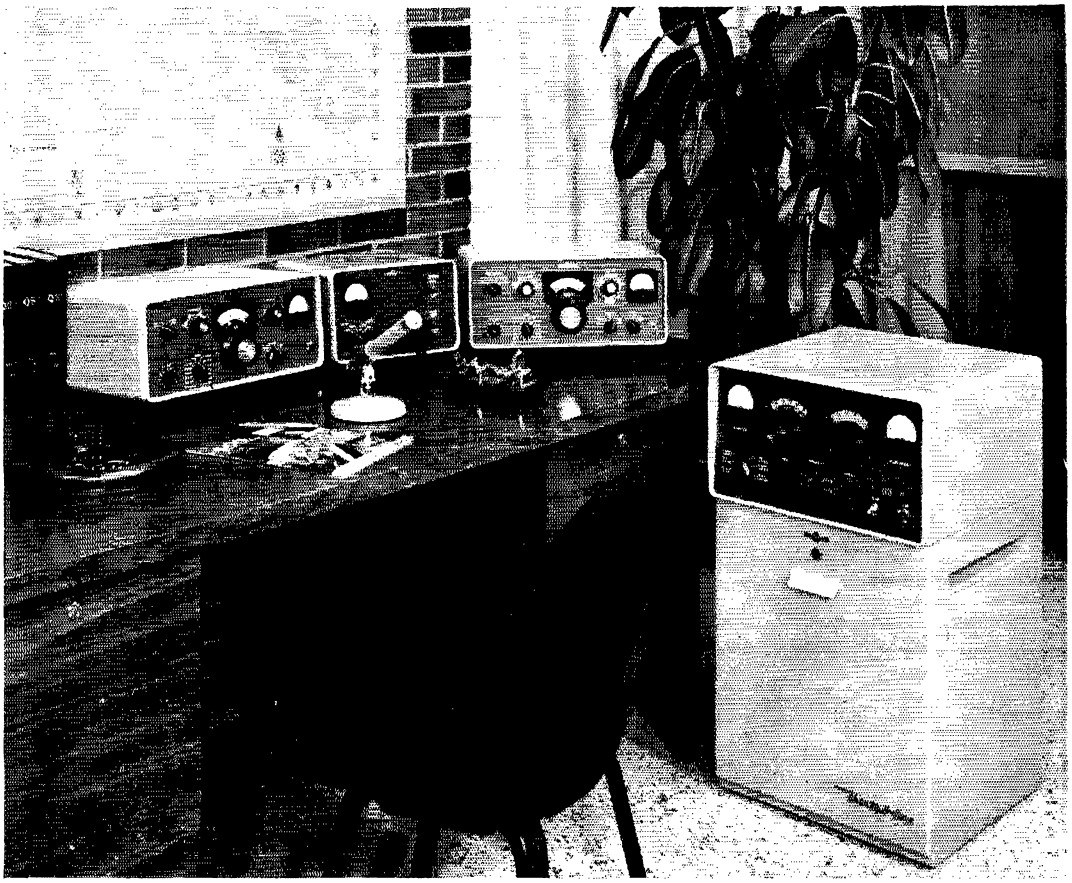
VFO employs double reduction disc drive, fixed T.C. **Sideband suppression** 40 db. at 1000 CPS. **Power rating:** 70-100 watts P.E.P. output CW or SSB. 17-25 watts carrier on AM phone. Two 6146's in the final. 3rd and 5th order distortion products down 30 db. **Carrier suppression:** 40 db. or better. **CAL System:** Instant CW CAL signal from any transmission mode. **Cooling:** convection with final operated at low dissipation in standby. **Size:** 9½" high, 18¼" wide, 16¾ "deep.

the new ideas in communications are born at . . .

hallicrafters

Chicago 24, Illinois

Export Sales: International Division, Raytheon Mfg. Co., Waltham, Mass.
Canada: Gould Sales Co., Montreal, P. Q.



COLLINS S/LINE where beauty is more than skin deep

Finely finished in blue-gray tones, Collins S/Line gives your ham shack the most modern and distinctive decor. Controls and meters on the panels of Collins S/Line provide you with maximum operating convenience and efficiency. But exterior styling is only a fraction of Collins advanced design. It goes deeper. Inside each unit of the Collins S/Line you'll find the latest circuitry, the careful craftsmanship and quality components that make Collins S Line truly a system-engineered single sideband radio station.

From microphone to antenna, Collins S Line operates as an integrated high powered SSB ham station. With Collins 75S-1 Receiver you get SSB, CW and AM reception on all amateur bands between 3.5 and 29.7 mc. The 75S-1 can cover the entire HF spectrum between 3.5 and 29.7 mc by selecting the appropriate HF beating crystal.

The 32S-1 Transmitter, with an input of 175 watts P.E.P. on SSB and 160 watts on CW gives you strong, clear signals.

Add the 30S-1 Linear Amplifier and you can operate at the full legal limit on SSB, and 1 kw on CW. Front panel switching on the 30S-1 lets you operate on two SSB power levels; 100 watts from the exciter alone, or the 1 kw meter average input for SSB.

Collins 312B-4 Speaker Console integrates the Transmitter, Receiver, Linear Amplifier and other accessories into one complete operating unit.

Visit your Collins Distributor and give the S/Line your own thorough inside-and-out investigation. See for yourself, why, when it's Collins S/Line, beauty is more than skin deep.

COLLINS

QST

JUNE 1960

VOLUME XLIV • NUMBER 6

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

OFFICES

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

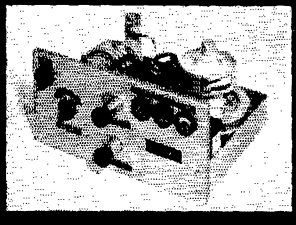
Subscription rate in United States and Possessions, $5.00 per year, postpaid; $5.25 in the Dominion of Canada, $6.00 in all other countries. Single copies, 50 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

Entered as second-class matter May 29, 1919, at the post office at Hartford, Connecticut, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1102 Act of October 3, 1917, authorized September 9, 1922. Additional entry at Concord, N. H., authorized February 21, 1929, under the Act of February 28, 1925

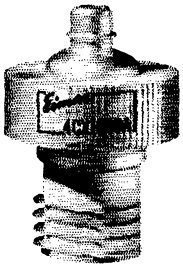
INDEXED BY
Applied Science and Technology Index

Library of Congress Catalog Card No.: 21-9421

—CONTENTS—



YOU ARE LOOKING AT ONE OF THE SMALLEST 1-KW TRANSMITTERS EVER BUILT



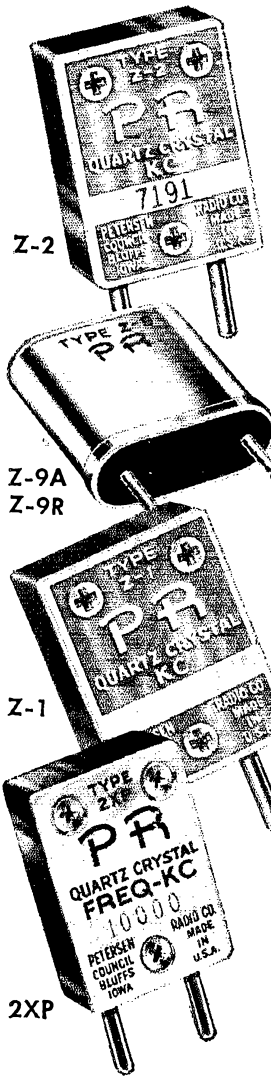
Designed by Jo Jennings, W6EI, of San Jose, California, this AB1, SSB amplifier is only 5½ inches high, 11 inches long and 7 inches deep. At the heart of this exceptional table-top miniaturization is an Eimac 4CX1000A ceramic tetrode. This rugged tetrode provides high power in a small package. And its integral-finned anode cooler keeps blower requirements at a minimum. With many outstanding features such as these, Eimac ceramic tubes are most often the starting points in the design of compact, efficient SSB equipment for amateur and professional use.

EITEL-McCULLOUGH, INC. • SAN CARLOS, CALIFORNIA

It pays to insist on

PR *crystals*

STANDARD OF EXCELLENCE SINCE 1934



AMATEUR TYPES

40 and 80 Meters, PR Type Z-2

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

2 and 6 Meters, PR Type Z-9A

Third overtone; multiplies into either 2-meter or 6-meter band; hermetically sealed; calibrated 24000 to 24666, and 25000 to 27000 Kc., ±3 Kc.; .050" pins..... **$4.95** 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. **$6.95** 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; calibrated to .005%. (Be sure to specify manufacturer of equipment).....$2.95 Net

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

Specify I.F. frequency, also whether I.F. is above or below transmitter frequency. Calibrated to .005%. (Be sure to specify manufacturer 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 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

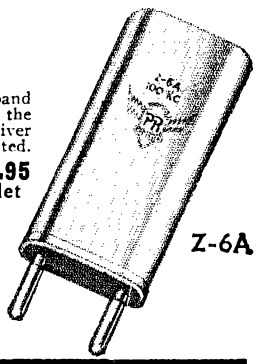
5.0 Mc. Signal Generator, .01% ..... **$2.95** Net

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

COUNCIL BLUFFS, IOWA

EXPORT SALES: Royal National Corporation, 250 W. 57th Street, New York 19, N. Y., U. S. A.

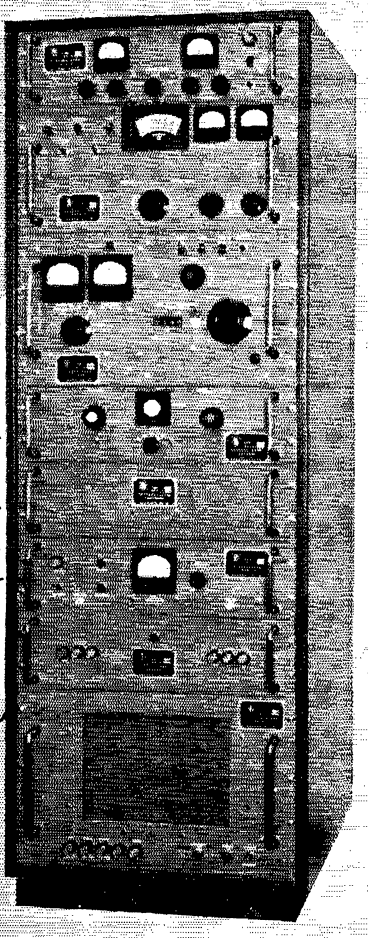
Section Communications Managers of the ARRL Communications Department

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 the 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 also desire applications for SEC, EC, RM and PAM where vacancies exist. OES appointment is available to Novices and Technicians.

ATLANTIC DIVISION				
Eastern Pennsylvania	W3ZRQ	Allen R. Breiner	212 Race St.	Tamaqua
Maryland-Delaware-D. C.	W3BKE	Thomas B. Hedges	2202 Culver St.	Washington 21, D. C.
Southern New Jersey	K2BG	Herbert C. Brooks	800 Lincoln Ave.	Palmyra
Western New York	K2HUK	Charles T. Hansen	211 Rosemont Drive	Buffalo 26
Western Pennsylvania	W3UHN	Anthony J. Mroczka	475-5th St.	Donora
CENTRAL DIVISION				
Illinois	W9PRN	Edmond A. Metzger	1520 South 4th St.	Springfield
Indiana	W9SWD	Clifford M. Singer	7070 East 21st St.	Indianapolis
Wisconsin	W9KQB	George Wolda	2023 South 10 St.	Manitowoc
DAKOTA DIVISION				
North Dakota	WØHVA	Harold A. Wengel	821-14th St.	Bismarck
South Dakota	WØRRN	J. W. Sikorski	1900 S. Menlo Ave.	Sioux Falls
Minnesota	WØKJZ	Mrs. Lydia S. Johnson	1258 Van Buren St.	St. Paul 4
DELTA DIVISION				
Arkansas	W5ZZY	Ulmon M. Goings	P. O. Box 207	Osceola
Louisiana	W5FMO	Thomas J. Morgavi	3409 Beaulieu St.	Metairie
Mississippi	W5MUG	Floyd C. Teetson	2469 Paden	Jackson 4
Tennessee	W4UIO	R. W. Ingraham	105 West Park Drive	Kingsport
GREAT LAKES DIVISION				
Kentucky	W4SUD	Robert A. Thomason	626 Eastwood Drive	Owensboro
Michigan	W8FX	Ralph P. Thetreau	27209 W. Six Mile Road	Detroit
Ohio	W8AL	Wilson E. Weckel	2118 Tuscarawas St., W.	Canton 8
HUDSON DIVISION				
Eastern New York	W2EFU	George W. Tracy	1138 North Country Club Drive	Schenectady
N. Y. C. & Long Island	W2TUK	Harry J. Dannals	RFD 1, Arbor Lane, Dix Hills	Huntington, L. I.
Northern New Jersey	W2ZVW	Edward Hart, jr.	51 Washington St.	Phillipsburg
MIDWEST DIVISION				
Iowa	WØBDR	Russell B. Marquis	807 North Fifth Ave.	Marshalltown
Kansas	WØFNS	Raymond E. Baker	1014 Lincoln St.	Seodosha
Missouri	WØBUL	C. O. Gosch	711 S. Oakland St.	Webb City
Nebraska	WØEXP	Charles E. McNeel	Route 3, RFD	North Platte
NEW ENGLAND DIVISION				
Connecticut	W1TYQ	Victor L. Crawford	RFD 5, Stadley Rough Rd.	Danbury
Maine	W1JMN	Jeffrey I. Weinstein	79 Caleb St.	Portland
Eastern Massachusetts	W1ALP	Frank L. Baker, jr.	91 Atlantic St.	North Quincy 71
Western Massachusetts	W1BVR	Percy C. Noble	37 Broad St.	Westfield
New Hampshire	W1RMH	Robert H. Wright	18 Pine St.	Concord
Rhode Island	K1AAV	John E. Johnson	30 Fruit St.	Pawtucket
Vermont	W1VSA	Harry A. Preston, jr.	10 Cherokee Ave.	Essex Jct.
NORTHWESTERN DIVISION				
Alaska	KL7DQ	John P. Trent	P. O. Box 82	Kodiak
Idaho	W7GGV	Mrs. Helen M. Maillet	Route 1, South	Pocatello
Montana	W7NPV/WXI	Vernon L. Phillips	Box 971	Harlowton
Oregon	W7JDX	Hubert R. McNally	11908 S.E. Madison St.	Portland 16
Washington	W7PGY	Robert B. Thurston	7700-31st Ave., N.E.	Seattle 15
PACIFIC DIVISION				
Hawaii	KH6AED	Samuel H. Lewbel	P. O. Box 3564	Honolulu
Nevada	W7VIU	Charles A. Rhines	Box 1025	Elko
Santa Clara Valley	K6DYX	W. Conley Smith	67 Cuesta Vista Drive	Monterey
East Bay	W6OJW	R. W. Southwell	200 South Seventh St.	Dixon
San Francisco	K6ANP	Leonard R. Geraldi	1500 Cayuga Ave.	San Francisco 12
Sacramento Valley	W6GDO	Jon J. O'Brien	6606-5th St.	Rio Linda
San Joaquin Valley	W6JPU	Ralph Saroyan	6204 E. Townsend Ave.	Fresno
ROANOKE DIVISION				
North Carolina	W4RRH	B. Riley Fowler	Box 143	Morganton
South Carolina	W4GQV	Dr. J. O. Dunlap	P. O. Box 447	Rock Hill
Virginia	W4QDY	Robert L. Follmar	1057 Dune St.	Norfolk 3
West Virginia	W8JM	Donald B. Morris	1111 Alexander Place	Fairmont
ROCKY MOUNTAIN DIVISION				
Colorado	WØBWJ	Carl L. Smith	1070 Locust St.	Denver 20
Utah	W7QWH	Thomas H. Miller	1420 E. 3045 St.	Salt Lake City
New Mexico	K5IQL	Newell F. Greene	504 West Second St.	Roswell
Wyoming	W7AMU	L. D. Brauson	342 South Elk	Casper
SOUTHEASTERN DIVISION				
Alabama	K4AOZ	William D. Dotherow	RFD 1, Box 90-B	Adger
Eastern Florida	W4KGJ	John F. Porter	Box 7295, Ludlam Branch	Miami 55
Western Florida	W4RKH	Frank M. Butler, jr.	494 Elliott Rd.	Fort Walton Beach
Georgia	W4CFJ	William F. Kennedy	1687 Fairway Hill Drive, S.E.	Atlanta 17
West Indies (Cuba-P.R.-V.I.)	KP4DJ	William Werner	563 Ramon Llovet	Urb. Truman Rio Piedras, P. R.
Canal Zone	KZ5RV	Ralph E. Harvey	Box 15	Balboa Heights
SOUTHWESTERN DIVISION				
Los Angeles	W6JQB	Albert F. Hill, jr.	861 No. Millard Ave.	Rialto
Arizona	W7QZH	Kenneth P. Cole	4132 North 18th Ave.	Phoenix
San Diego	W6LRU	Don Stansifer	4427 Pescadero	San Diego 7
Santa Barbara	K6CVR	Robert A. Hemke	728 W. Mission	Santa Barbara
WEST GULF DIVISION				
Northern Texas	W5BNQ	L. L. Harbin	4515 Calmont	Fort Worth 7
Oklahoma	W5DRZ	Adrian V. Rea	P. O. Box 23	Pond Creek
Southern Texas	W5QEM	Roy K. Eggleston	1109 Vernon Drive	Corpus Christi
CANADIAN DIVISION				
Maritime	VE1WB	D. E. Weeks	R. R. 3	St. Stephen, N. B.
Ontario	VE3NG	Richard W. Roberts	170 Norton Ave.	Willowdale, Toronto, Ont.
Quebec	VE2DR	C. W. Skarstedt	62 St. Johns Rd.	Pointe Claire Montreal 33, P. Q.
Alberta	VE6VM	Gordon W. Hollingshead	108 Hudson Rd.	Calgary, Alta.
British Columbia	VE7JT	Peter M. McIntyre	981 West 26th Ave.	Vancouver, B. C.
Yukon				
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.

STABILITY



1 PART IN 10^8 PER DAY

DIRECT READING 320,000 FREQUENCIES

COLOR CODED CONTROLS

BOTH METER AND NEON SYNC INDICATOR

SPECIAL CRYSTAL FILTERS

15 KC BAND WIDTH (7.5 PER SIDEBAND)

PULL-OUT FLIP-OVER DRAWER CONSTRUCTION

AN/URA-30

SBG-1 SINGLE SIDEBAND GENERATOR

For full detailed information write for **BULLETIN 228**

The Model SBG-1, Single Sideband Generator, is a stabilized direct reading exciter system adjustable to 320,000 frequencies over the range of 1.75 to 33.75 megacycles in 100 cycle steps with a basic stability of 1 part in 10^8 per day. The generator is an all purpose device providing SSB, DSB, ISB, and AM.

All frequency determining elements in the SBG-1 are derived from a 1 mc source which has a phasing control for correction to an external standard. Also, the unit may be connected to an external standard of greater stability without degeneration to the standard. When the sideband exciter unit is bypassed, the Model SBG-1 may be used as an ultra stable R.F. frequency source.

Housed in a standard relay rack with 60 inches of panel space, the control portion requires only 29½ inches of rack space. The other components may be housed separately in the event this makes for a more convenient installation.

The TECHNICAL MATERIEL CORPORATION

IN CANADA
TMC Canada Ltd., Ottawa, Ontario

Main Office MAMARONECK NEW YORK

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.

Past Presidents

HIRAM PERCY MAXIM, W1AW, 1914–1936
EUGENE C. WOODRUFF, W8CMP, 1936–1940
GEORGE W. BAILEY, W2KH, 1940–1952

Officers

President . . . . . GOODWIN L. DOSLAND, W0TSN
Moorhead, Minnesota

First Vice-President . . . . WAYLAND M. GROVES, W5NW
P.O. Box 586, Odessa, Texas

Vice-President . . . . . FRANCIS E. HANDY, W1BDI
38 La Salle Road, West Hartford, Connecticut

Vice-President . . . . . PERCY C. NOBLE, W1BVR
37 Broad St., Westfield, Massachusetts

Secretary . . . . . A. L. BUDLONG, W1BUD
38 La Salle Road, West Hartford, Connecticut

Treasurer . . . . . DAVID H. HOUGHTON
38 La Salle Road, West Hartford, Connecticut

• • • • •

General Manager . . . . . A. L. BUDLONG, W1BUD

Communications Manager . . . . FRANCIS E. HANDY, W1BDI

Technical Director . . . . . GEORGE GRAMMER, W1DF

Assistant General Manager . . . JOHN HUNTOON, W1LVQ

Assistant Secretaries . . . . . PERRY F. WILLIAMS, W1UED
GEORGE STEVANS, JR., K1LVW
38 La Salle Road, West Hartford, Connecticut

• • • • •

General Counsel . . . . . PAUL M. SEGAL
816 Connecticut Ave., Washington 6, D. C.

DIRECTORS

Canada

ALEX REID VE2BE
240 Logan Ave., St. Lambert, P. Q.

Vice-Director: Noel B. Eaton, ... VE3CJ
R.R. 3, Burlington, Ontario

Atlantic Division

GILBERT L. CROSSLEY W3YA
Dept. of E.E., Penna State University
State College, Pa.

Vice-Director: Edwin S. Van Deusen W3ECP
3711 McKinley St., N.W., Washington 15, D. C.

Central Division

JOHN G. DOYLE W9GPI
4331 N. Wildwood Ave., Milwaukee 11, Wis.

Vice-Director: Phillip E. Haller W9HPG
6000 S. Tripp Ave., Chicago 29, Ill.

Dakota Division

CHARLES G. COMPTON W0BUO
1011 Fairmount Ave., St. Paul 5, Minn.

Vice-Director: Martha J. Shirley W0ZWL
Box 78, Black Hawk, S. D.

Delta Division

SANFORD B. DE HART W4RRV
227 S. Purdue Ave., Oak Ridge, Tenn.

Vice-Director: Victor Canfield W5BSR
Box 965, Lake Charles, La.

Great Lakes Division

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

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

Hudson Division

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

Vice-Director: Lloyd H. Manamon W2VQR
709 Seventh Ave., Asbury Park, N. J.

Midwest Division

ROBERT W. DENNISTON W0NWX
Box 631, Newton, Iowa

Vice-Director: Sumner H. Foster W0GQ,
2315 Linden Dr., S.E., Cedar Rapids, Iowa

New England Division

MILTON E. CHAFFEE W1EFW
53 Homesdale Ave., Southington, Conn.

Vice-Director: Carmine A. Polo W1SJO
17 Park St., West Haven 16, Conn.

Northwestern Division

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

Vice-Director: Harold W. Johnston W7PN
2727 Belvidere Ave., Seattle 6, Wash.

Pacific Division

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

Vice-Director: Ronald G. Martin W6ZF
1011 Terrace Drive, Napa, Calif.

Roanoke Division

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

Vice-Director: Joseph E. Abernethy W4AKC
768 Colonial Drive, Rock Hill, S. C.

Rocky Mountain Division

CLAUDE M. MAER, JR. W0IC
485 Race St., Denver 6, Colo.

Vice-Director: John H. Sampson, Jr. W7OCX
3618 Mount Ogden Drive, Ogden, Utah

Southeastern Division

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

Vice-Director: Thomas M. Moss W4HYW
P.O. Box 644 Municipal Airport Branch,
Atlanta 20, Ga.

Southwestern Division

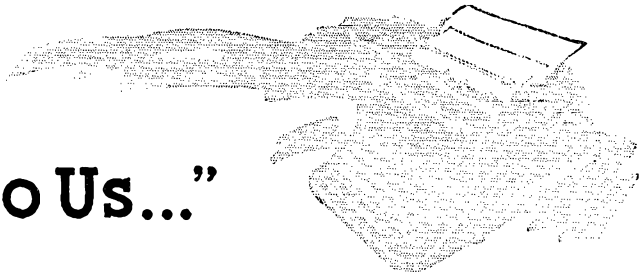
RAYMOND E. MEYERS W6MLZ
717 Anderson Way, San Gabriel, Calif.

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

West Gulf Division

GRADY A. PAYNE W5ETA
5103 Linden St., Bellaire, Texas

Vice-Director: Robert D. Reed W5KY
4339 S. Peoria, Tulsa 5, Okla.



"It Seems to Us..."

SWITCH TO SAFETY

". . . All the local hams and myself agree that Wally had more intelligence than to do something like this, but he probably did it without thinking," writes a ham friend of K9PRR, one of two Elmhurst, Illinois, high-school juniors who were killed instantly while stringing up a long-wire antenna — over a power line.

As newspaper accounts of the tragedy relate, the youths were putting up a 100-foot antenna between two trees in the yard. They had carefully soldered 18-inch lengths of copper wire together and were ready to fasten it to the trees. One of the boys tied a crescent wrench on the end of the wire to give it weight. While the ham held one end, his pal tossed the weighted end over a 2300-volt power line and caught the wrench as it fell.

The boys were standing on wet, soggy ground, when the antenna hit the electric wire. Either the power line insulation was worn, or the antenna wire cut through it.

". . . *he probably did it without thinking* . . ."

Alertness to safety precautions out-of-doors is just as important as care with potential electrical hazards in the ham shack. Without exception, overhead wires must be avoided, whether power or telephone lines. *Never* assume that insulated wires are safe. *Never* secure an antenna to any power or telephone pole. *Never* tie an antenna to a tree when electric or phone wires run through it. Anywhere power lines exist, the safety-conscious amateur will always visualize a hands-off danger flag, a vivid reminder that chance contact can be fatal.

And remember that, indoors, 115 or 230 volts in house wiring, and 350 or 500 volts in a speech amplifier or receiver power supply, is enough to end an amateur's career. While the tragic story which prompted our safety discussion this month occurred out-of-doors and dealt with high-tension lines, let's quickly enumerate ten important principles making up the ARRL Safety Code for your ham shack.

❖ Kill all power circuits completely before touching anything behind the panel or inside the chassis or enclosure. It takes so little time to pull a power plug from the wall socket.

❖ Never allow anyone else to switch the power on and off for you while you are working on equipment. While your hand might be gently resting on a plate-cap, your friend might then decide that you wanted the power to be turned on.

❖ Don't shoot trouble in a transmitter when tired or sleepy. Even that extra cup of coffee won't help, after you have made a fatal mistake.

❖ Never adjust variable links by hand. It's tempting but dangerous.

❖ Avoid bodily contact with grounded metal (racks, radiators) or damp floors while working on the transmitter. Bedroom slippers do not provide much insulation either.

❖ Never wear phones while working on gear. Never!

❖ Follow the rule of keeping one hand in your pocket — it could save your life.

❖ Never pull test arcs from transmitter tank circuits — the pencil you hold may turn into a posie stem.

❖ Instruct members of your household how to turn the power off, and how to apply artificial respiration. Your local Red Cross chapter can supply instruction sheets on the latest approved method of resuscitation.

❖ Finally, develop your own safety techniques. Take time to be careful. One moment of carelessness is one moment too late.

These safety suggestions are a part of the *ARRL Safety Code*. Copies are available from Hq. on request and should be posted in every ham shack.

Examine your shack carefully for hazards you might least suspect. When visiting a ham friend, don't be bashful about offering safety suggestions.

Switch to safety! QST

OUR COVER

A salute from *QST* to the Army Signal Corps, which on June 21 celebrates its one hundredth anniversary. Our cover this month is by way of comparing the status of Army signals in 1860 and in 1960. The photo on the upper portion of the cover shows a couple of Army men waving a flag, which, in 1860 and for many years afterward, was about the only way of communicating across any distance at all. If a fog rolled in, or heavy smoke, you had no signals. In today's army, as indicated on the lower panel of the cover, a jeep driver can pick up a radiotelephone, dial a central switchboard, and be instantly connected to any one of a hundred other jeeps in the area. If phone patches were legal, he could possibly even check home to see how the wife and kids were withstanding the rigors of war.

Eyes right, and read more about the Army Signal Corps.

COMING A.R.R.L. CONVENTIONS

June 4–5 — Southeastern Division, Atlanta, Georgia.
June 18–19 — West Gulf Division, Dallas, Texas.
July 30–31 — North Dakota State, Minot.
September 2–4 — Pacific Division, San Mateo.
September 10–11 — Central Division, Indianapolis, Indiana.
September 16–17 — Quebec Province, Montreal.
October 7–8 — Great Lakes Division, Cleveland, Ohio.

Hamfest Calendar

(See page 70)

SOUTHEASTERN DIVISION CONVENTION

Atlanta, Georgia — June 4–5

A Southeastern Division ARRL Convention and Greater Atlanta Hamfest to be held June 4–5 in Atlanta is being sponsored jointly by the Atlanta Radio Club and the Confederate Signal Corps. The site is the new air-conditioned activity building of the Shrine Yarrab Temple, 400 Ponce De Leon.

Technical sessions, operational displays, and equipment displays by distributors are planned. A welcoming swimming party at the Gary Motel, reserved for out-of-town guests, will start the activity for Saturday, June 4. A dinner-dance is set for 7:30 that evening and a Royal Order of the Wouff Hong Initiation at midnight with Director James P. Born, W4ZD, in charge of the ceremonies.

The Sunday morning program begins with a "dutch" breakfast at 8 o'clock. Demonstrations are to be presented by Georgia Tech. The Confederate Signal Corps will hold a transmitter hunt and code contests. Dinner will be served in the Temple dining room ($2.50; children $1.25).

General convention information may be obtained from Ed Lewis, W4MDS, 805 Cowan Avenue, Hapeville, Ga., or Dr. H. J. Climo, KN4-PRS, 55 Osner Drive, N. E., Atlanta, Ga.

WEST GULF DIVISION CONVENTION

Dallas, Texas — June 17–19

The Convention committee of the West Gulf Division is extending an invitation to the "Big 30 Round-up" at Dallas, Texas on June 17–19.

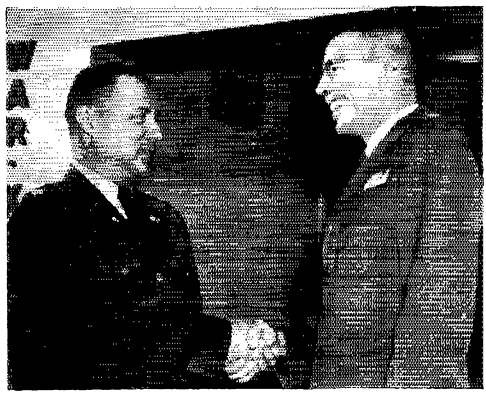
The Baker Hotel is the site. A Friday night, June 17 pre-convention party is planned, to be followed by well-known technical speakers on Saturday and Sunday. XYLs are being given special consideration with extra activities. Transmitter hunts on 75, 10 and 6-meters are planned by the Dallas Caravan Club.

Sponsoring the West Gulf Division Convention is the Greater Dallas Amateur Radio Council, representing eleven clubs in Dallas County.

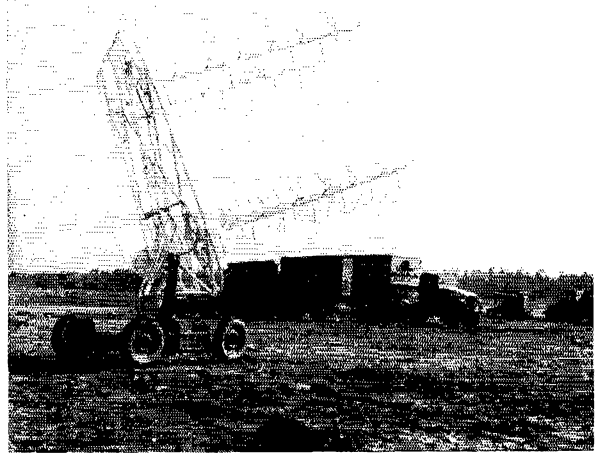
Convention registration is $10.75 and includes a banquet, luncheon and dance. Further information is available by writing to West Gulf Division Convention, 3127 Fifty First Street, Dallas 16, Texas.

Strays

W1NXJ cites news report of a Fort Monmouth staff sergeant who can send 30 words a minute with either hand, 18 a minute with his right foot and 16 with his left foot. But shucks, says W1-NXJ, that's no trick. "Sending with the left foot, alack and alas, is an all too common phenomenon on the bands!"



Major Sidney S. Rexford, left, is the new Chief MARS Army. Here, he is getting a welcome from Capt. William E. Bettis, Chief MARS Air Force.



Messages may be transmitted to and received from the new Atlas Satellite through this intricate antenna and other electronic equipment in the mobile vans behind it. The equipment is the tracking station at Fort Stewart, one of four in Project Score.

100 Years of Army Signals

BY MAJOR SIDNEY S. REXFORD,* W2TBZ

MARKING one hundred years of Army signals on 21 June 1960, the U. S. Army Signal Corps celebrates a century of service to the Army and the Nation.

From colored signaling flags to a communications satellite relaying voice and teletype messages in outer space, it is a unique record: the first independent signaling organization of the military, the first such organization to support the Army in wartime, and the first of its kind in many other respects. It has been responsible for civilian as well as military communications advances.

The founding of the Signal Corps as a separate branch is attributable to an Army surgeon, Major Albert J. Myer, whose interest in helping the deaf led to a system of sign language between military outposts. Authorized as Signal Officer of the Army on 21 June 1860, Major Myer filled a unique position as director of the first full-time signaling function of a national army.

At once he began to build a corps of signalmen whose services during the Civil War proved so invaluable that a formal U. S. Army Signal Corps was established in March of 1863. The orange color distinguished by the historic Army Dragoons, who were redesignated Cavalry, became the branch color of the new Signal Corps. The new Corps was to serve as both a combat arm and a technical service, a dual role continued to this day.

Major Myer's signalmen employed the wigwag flag by day and torches by night, waving them in a code system, watching and reading through telescopes between companion stations. The system was effective in fixed lines along the Potomac River above and below Washington, and in tactical actions throughout the war.

Major Myer also had ideas of putting the electric telegraph into the field service of the Army. Civilian telegraphers, directly controlled by Secretary of War Stanton and paid by the Quartermaster, were from the start of the war employed in the military effort of the North. This was the U. S. military telegraph, which provided command and administrative communications between major headquarters.

But Major Myer wanted tactical electric telegraph which could be moved about for free employment in the field, when visual signals could not be used. Working with civilian inventors, he brought about the development of Army's first electrical communication device, the Beardslee magnetoelectric telegraph set. Hand-operated (without batteries) and readily portable, it could signal over several miles of insulated field wire, which soldiers laid rapidly over the ground or strung on lance poles. They called it the "Flying Telegraph."

Congress in 1870 authorized a national weather service and assigned it to the War Department, whose Army Signal Corps telegraphers at outlying posts offered a ready and inexpensive means of simultaneous weather reporting from coast to coast. The weather service of the Corps grew rapidly, soon comprising hundreds of reporting stations from the Atlantic to the Pacific and in adjoining areas of Canada and the Caribbean. Regular weather reports and storm warnings became a popular and demanded routine, and included exchange of weather data with foreign nations and the beginning of international cooperation in large-scale scientific efforts.

The Signal Corps in 1880 participated in the first Polar Year, an international effort to learn more about the Arctic, with two expeditions — one to Point Barrow, Alaska, the other to Lady Franklin Bay on Ellesmere Island, opposite northern Greenland.

In 1891 Congress decided that the weather service was too civilian in character to remain in the Army, and the Department of Agriculture took over this service as the Weather Bureau.

Meanwhile new modes of communicatons had come to the Army — the heliograph (an apparatus for telegraphing by using the reflected rays of the sun) and the telephone.

Immediately after the loss of the weather function, the Army resumed interest in military balloons, assignment of this responsibility being made to the Signal Corps. In the Spanish-American War the Corps' one balloon did duty during the assault on San Juan Hill.

In 1900 Congress assigned to the Army Signal Corps responsibility for communications to and within Alaska — cable and wire lines serving not

* Chief MARS Army
(Historical portions by Office of Technical Liaison OCSigO and SigC Historical Division.)

Major General Ralph T. Nelson, Chief Signal Officer, U. S. Army

only military garrisons there but all civilian needs as well, to the benefit of mining and fishing interests and other settlements scattered throughout the Territory. Radio, or wireless telegraphy, was introduced in 1898 into the Army by the Signal Corps. One of the first military circuits employing this new technology was a 100-mile link across Norton Sound to Nome, Alaska, obviating a difficult land line or underwater cable route to that outlying settlement.

The success of the Wright airplane in 1903 led to the formation of the Aeronautical Division in the Signal Corps in 1907 — and a contract with the Wright brothers for an airplane to meet Army specifications. The plane made its initial flight at Ft. Myer, Virginia, on September 3. In the course of subsequent flight tests, this airplane crashed on September 17, severely hurting the pilot, Orville Wright, and fatally injuring his passenger, 1st Lt. Thomas E. Selfridge, a Field Artillery officer on duty with the Army Signal Corps for aviation service — the first man ever to die in heavier-than-air powered aircraft. The next plane which the Wrights built to meet their Army contract was delivered in 1909. U. S. Army aircraft continued as a Corps responsibility until the War Department took aviation out of the Signal Corps in May, 1918, setting it up as the Air Service — which later became the Army Air Corps.

In 1913, Brig. Gen. G. P. Scriven inherited an expanding variety of Army Signal Corps activities. These included field radios, aircraft radios, increasingly elaborate long-range wire, cable and radio circuits, and fire control systems for directing the fire of large guns on targets visible only to remote observers. A month before the United States entered World War I in 1917, Brig. Gen. G. O. Squier became the Chief Signal Officer.

Squier built up the Corps tremendously, from fewer than 2,000 officers and men to over 50,000 by the close of 1918. A permanent Army Signal Corps post at Ft. Monmouth, New Jersey, was begun as Camp Alfred Vail, centered on a nucleus of signal schools and laboratories.

Squier induced the world-renowned physicist, Dr. Robert A. Millikan, to come from the University of Chicago to head up Army Signal Corps research and development activity. Many new kinds of equipment, particularly vacuum tube radios, were designed and produced by industry.

In France the outpost companies of field signal battalions provided all telephone, telegraph and radio service down to the barbed wire, while signal telegraph battalions built heavy-duty communications lines across the country. At Paris the Signal Corps maintained a laboratory in which worked such scientists as Maj. Edwin H. Armstrong, who developed the superheterodyne circuit during his overseas service, and who later invented frequency-modulated radio.

Army photography became an increasingly important Army Signal Corps function during World War I, expanding to include motion pictures and training films so necessary to train quickly large numbers of recruits.

During the decade of inevitable military shrinkage after World War I and the ensuing decade of the depression, one Chief Signal Officer after another struggled to maintain, against oppressive shortages of money and men, a skeletal Signal Corps. They promoted new developments in wire and radio, and brought out a steadily improving series of SCR (Signal Corps Radio) numbered sets of ground and airborne radios. They improved the War Department Radio Net and Army communications links within the continent and beyond — to such outlying posts as Hawaii and Panama.

Gen. Mauborgne, a research-minded chief, especially supported the highly secret beginnings of Army radar, which Col. Blair, Director of the Army Signal Corps Laboratories at Ft. Monmouth since 1930, had initiated. Col. William R. Blair holds the fundamental and basic patent for American radar. From the Signal Corps' pioneering in the development of our country's radar have evolved the many radars used in the military and those employed in numerous civilian applications such as navigation, storm tracking and air lines flight direction and control.

In the years immediately before America plunged into World War II, the Signal Corps promoted Dr. Armstrong's newest contribution to radio, frequency modulation, which soon revolutionized mobile communications in Army combat.

Maj. Gen. D. Olmstead succeeded Mauborgne a few months before the attack on Pearl Harbor, an occasion when the Army Signal Corps radar ACR-270 on the north shore of Oahu performed properly, detected the Japanese airplanes 130 miles away, and gave the warning which men would not believe.

At once Olmstead received a superhuman task of expansion which paled the rapid growth of the Corps in the previous World War, not so much in manpower as in research, development, and production. While the Corps leaped from 27,000 to 350,000 officers and men in four years, enormous and increasingly intricate growth occurred

in the research, development, and supply of equipment, in the training of men in the applications of new electronic devices and weapons previously unheard of: complex radios in every tank and command car (push-button f.m. radio), mobile long-range radio, radio relay, carrier communications, radio-teletype employed in the new world-wide system of ACAN (Army Command and Administrative Net), and radar.

Radar alone soon equaled the great variety of radio and wire items in the many forms in which this new technique developed — radars both for ground troops and for the explosively expanding Army Air Corps. Under Maj. Gen. H. C. Ingles, Chief Signal Officer, 1943–1947, the Army Signal Corps emerged from the four-year ordeal much larger and with far wider activities and responsibilities than ever before. This was true despite the fact that the Corps lost to the Army Air Corps late in 1944 all electronics responsibility for aviation, and lost late in 1945 all radio intelligence activity. This last, a specialized application of communication-electronics, had greatly expanded during World War II. Though these losses momentarily cut away from the Corps nearly half its men and activity, within a few years the Signal Corps' assumption of new and important missions regained and enlarged its stature in the Army.

The fact that significant research and development did not greatly decline was exemplified by man's first contact with the moon, accomplished by Army radar[1] at the Signal Corps Radar Laboratory, Camp Evans, Belmar, N. J. In 1946, this proved the feasibility and marked the beginning of space communications in which the Corps continued to pioneer, culminating in SCORE — the Army-developed signal communications relay equipment — which radioed President Eisenhower's Christmas message to the world from outer space in 1958.

Electronic support for guided missiles began in 1949 at the Army's White Sands Missile Range in New Mexico and soon grew into the large U. S. Army Signal Missile Support Agency. The experience and early participation in this phase of communications-electronics work was to permit the Army Signal Corps to provide major science and electronics support to subsequent missile and space programs.

Phenomenal growth in recent years — accelerated by the missile and space era — has characterized numbers of other major Signal Corps efforts. For the nation's air defense, *Missile Master*, an electronic control and coordination system for use with *Nike* and *Hawk* missile batteries, was developed by the Corps and industry. The first operational system was put in action at Ft. Meade, Maryland in December of 1957. Additional systems to perform this vital electronic air defense mission are being installed at key complexes throughout the United States.

The advent and rapid development of Army missiles brought forth a relatively new and expanding electronics mission area for the Signal Corps — that of combat surveillance and target acquisition — essentially gathering information day and night, in all weather, about the enemy for employment of weapons systems against him.

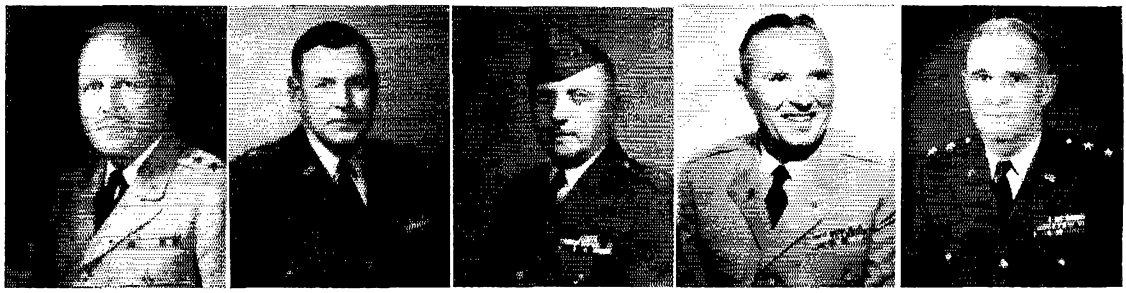
The U. S. Army Combat Surveillance Agency was established to provide direction for this major systems area. The Corps developed and introduced on an expedited basis a number of surveillance equipments — a few of these being modified versions of existing off-the-shelf type items. Among these new equipments were first generation pilotless surveillance drones; the man-packed *telescout* television system; mobile and portable surveillance radars, one weighing only 80 pounds, and sensors such as airborne radars, infra-red and photographic cameras. Development continues toward improved systems utilizing a variety of means — radar, photography, infra-red, TV, seismic and acoustic — some to be carried in advanced surveillance drone vehicles and manned Army aircraft.

Significant advances were made in avionics, involving electronic devices and communication for Army aircraft. Besides communication sets, a mobile control tower was developed. The Corps is developing, in a joint program with the Navy, an instrumented flight system for helicopters and fixed-wing aircraft, with real picture presentation to the pilot. Also in progress are navigational systems employing visual map presentation to show the pilot the in-flight location of his plane.

Automatic data processing, added to the world-wide ACAN system in 1955, is being directed to tactical communications; and militarized equipments for use in the field army are under development. The first model of *Mobidic*, a large mobile all-purpose computer, will be deliv-

[1] *QST*, May, 1946. p. 65.

No wonder the Army went to wireless!



Amateurs in the Corps—from left to right, Maj. Gen. Herbert L. Scofield, K8DBH; Maj. Gen. Earle F. Cook, W4FZ; Maj. Gen. James Dreyfus, W4KHN; Brig. Gen. Elmer L. Littell, K3BNI; Maj. Gen. William D. Hamlin, W4WH.

ered to the Signal Corps this year (1960). These and other advances in elaborate tactical communications, including a tiny belt-pack or helmet radio carried by an individual soldier, made possible by micro-miniaturization techniques; mobile and air-transportable long-range communications central for STRAC-type missions; and satellite communications have revolutionized once again the art of military signaling founded by Major Myer a hundred years ago.

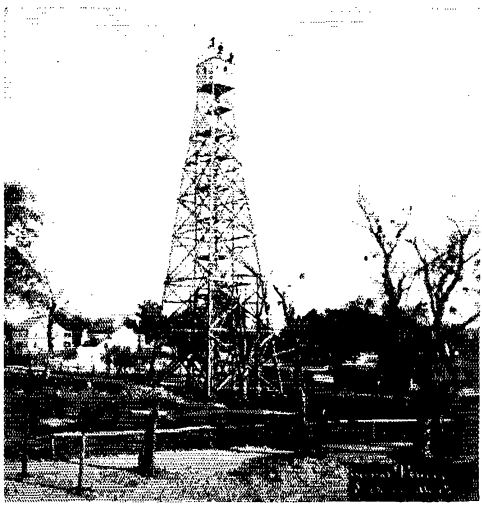
The accomplishments of the Corps have always been the accomplishment of its individuals and lately its teams of individuals. Radio amateurs, as a group apart from ordinary individuals, possess the necessary scientific curiosity and perseverance required by the Signal Corps. Amateurs have been drawn to the Corps since the earliest days of radio and have served in every capacity and at every echelon from Chief Signal Officer down to the lowest private in the ranks. The number of amateurs and ex-amateurs who are now uniformed members of civilian employees of the Signal Corps is not available but indications are that the figure is considerable.

As early as WW I, the Signal Corps recognized the value of amateur operators and by the end of the war nearly every able-bodied amateur was employed pounding brass on either land or sea. It was through the efforts of these amateurs also that those war years saw amazing advances in the art of wireless communications. Many of the country's leading amateurs returned from the war to enter the fledgling communications industries. Their brand names still appear on familiar products.

World War II again placed the burden of supplying trained operators and technicians on the amateur society. An amateur, with an inborn feel for electronics equipment, could be trained in radar and radio teletypewriter repair and operation in a fraction of the time required for a raw recruit. His inventiveness and flair for "haywire" would keep war-weary equipment still plugging away long after it had outlived its normal expected life span. It may have been true that by this time the physical and electrical appearances of the equipment were so altered as to strike horror to the hearts of non-amateur inspectors, but no one could deny that it was still operating.

Not only the amateur himself but, in many cases, his equipment also went to war. Considerable quantities of receivers and transmitters were bought from their amateur owners to help fill equipment gaps until industry could raise production to supply the wartime demand. Cases were reported of amateurs in uniform reporting for duty in military stations to find their own receivers or transmitters waiting there for them.

Not all amateurs assimilated into the Signal Corps went into uniform. Hundreds were hired in the Signal Corps laboratories to work on crash programs in research and development, and as inspectors at manufacturing plants working on wartime projects. Still more took up chalk and textbooks at Signal Corps sponsored schools to teach the communications art to recruits and junior officers. The only deficiency noted in the contribution by the radio amateur to the Signal Corps effort was lack of quantity. There always existed a bigger demand than the supply could satisfy. The amateur ranks have swelled from 50,000 at the start of WW II to 220,000 now. Still there is no doubt that this increase is not yet enough to supply the needs of the Signal Corps and the multitude of other



Signal Tower during the Civil War, at Jacksonville, Fla., on Dec. 12, 1864.

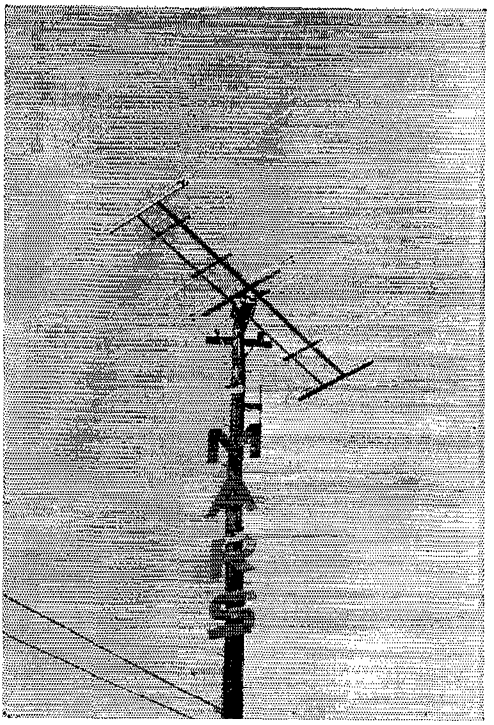
communications requirements in case of a similar emergency.

The contributions of radio amateurs to the Signal Corps have continued unabated and from every appearance will continue to become more marked with the advancement of the state of the electronic art.

The parking lots at our Signal Corps activities are filled with private automobiles with mobile antennas and call letter license plates. Call letters are proudly displayed on the name plates of desks of the most prominent Signal Corps personnel and QSL Cards hold places of honor under the glass desk tops of top Signal Corps executives and engineers. Among them are: Major General Earle F. Cook, W4FZ, Deputy Chief Signal Officer; Major General Herbert L. Scofield, K8DBH, Chief, Procurement and Distribution Division, Office of the Chief Signal Officer; Major General James Dreyfus, W4KHN, Director J-6 (Communications-Electronics), Joint Chiefs of Staff, Office of the Secretary of Defense; Major General William D. Hamlin, W4WH, Commanding General, Fort Monmouth, New Jersey; and Brigadier General Elmer L. Littell, K3BNI, Commanding General, U. S. Army Signal Supply Agency, Philadelphia, Pennsylvania. The amateur membership within the ranks of junior officers, enlisted personnel and civilian employees of the Signal Corps numbers in the thousands. Furthermore, this membership grows daily and even high-ranking officers are obtaining amateur licenses as they discover that amateur radio offers an ideal means of retaining service-made friendships both while in the service and after retirement and lends personal prestige to the individual.

Large numbers of Signal Corps members with amateur licenses have now reached retirement age and are beginning to apply their amateur skill and their Signal Corps training in areas of Civil Defense, municipal governments, youth organizations such as the Boy and Girl Scouts and in the nation's technical education system. Their competence is evidenced by their ready acceptance by these agencies.

The Signal Corps is proud of the assistance the nation's amateur radio operators have provided and the role they have played in shaping the last fifty years of its hundred-year history. In the future every satellite orbiting in space, every tracking station following its path, and every word of communications or bit of information received from it will have been made possible by the efforts of radio amateurs at all levels of Signal Corps Command. The potential for



10 and 20 meter rotary beam antenna of MARS, USARPAC at the 49th State Fair at Sand Island.

contribution of the amateurs to the Signal Corps effort is ever expanding.

The United States Army, with Signal Corps representatives, has repeatedly championed the radio amateur and his privileges against attacks of foreign and domestic interest. The last international conference on frequency allocation saw the entire allocation of amateur radio frequency blocks successfully retained intact. It is noteworthy that the senior United States spokesman at this conference was Mr. Albert L. McIntosh, W3ZM, of the United States Army Frequency Engineering Office, a Signal Corps activity. The theory of reciprocity is still valid. The accomplishments of the Signal Corps relies to considerable extent upon support by radio amateurs and the radio amateurs may look to the Signal Corps for encouragement and careers.

The Signal Corps looks forward to an unlimited mutual association with the radio amateur society and is prepared and anxious to do all within its power to further the interests of amateur radio at home and abroad. QST

Strays

One day last fall WV2CQH wrote to W6TC concerning the HBR-14, requesting some help in winding the coil forms. W6TC replied with some advice, and included the comment that the HBR-14 was hardly a project for a novice. However, in the meantime, WV2CQH, being 15 years old and not realizing that the project was "impossible," had gone ahead and built the HBR-14. Just nine days after he started construction, he had it working on the air! Incidentally, it cost him $38 — money he had saved up from his school lunches.

I.F. Noise Limiter

BY WALTER J. STILES,* K5ENB/W7NYO

Receiver noise-limiter development appears to have moved contrary to the flow of the art since the original work of Lamb.[1] While the pattern for over-all receiver circuit development has followed the path of continually increasing complexity, noise-limiter development has, essentially, taken the direction of simplification. This has necessitated compromises which have been justified by the fact that even the best and most complicated receiver noise limiters could be considered only relatively satisfactory.

Ideally, a noise limiter should operate at the antenna input in order to prevent overloading of any of the receiver circuitry. Such a location for the noise-limiting circuit is currently impractical, primarily because insufficient impulse intensities are available at this point. The Lamb circuit functioned in the i.f. section, but subsequent general practice has moved the limiter farther along the receiver chain to the audio output of the second detector. This change, while providing simplification, has exposed more of the receiver circuitry to bombardment by noise pulses, and thus a general deterioration in performance.

The circuit described here moves the noise-limiting action a step back toward the antenna. The additional protection thus provided is especially desirable for the product detector, which is rapidly becoming commonplace in most communication receivers. The noise-limiting action is in all ways comparable, and in most cases superior, to that of the more conventional audio limiters. The limiter functions equally well on a.m., c.w. and s.s.b. signals,[2] with product and diode detectors, and introduces neither loss of receiver sensitivity nor unacceptable audio distortion. The operating threshold is adjustable. In practice there is an apparent improvement in signal-to-noise ratio, an effect particularly noticeable in reception of weak c.w. in a crowded band dominated by higher-intensity signals.

In the circuit shown in Fig. 1 the 6AL5 serves as a symmetrical pulse-type shunt i.f. noise clipper with adjustable threshold and automatic signal reference. When resistor R_1 is switched into the circuit by closing S_1, capacitors C_1 and C_2 charge to the average peak level with such polarity that they oppose the flow of current in the limiter tube. When a sudden change in level occurs (this normally represents noise pulses) the excess signal is shunted across the i.f. output transformer. Thus a large percentage of the noise pulses are prevented from reaching the detector circuit.

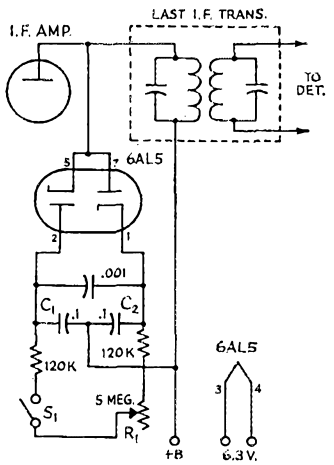


Fig. 1—Circuit of the i.f. noise limiter. Capacitances are in μf. C_1 and C_2 are paper tubular. R_1 is a 5-megohm control, linear taper.

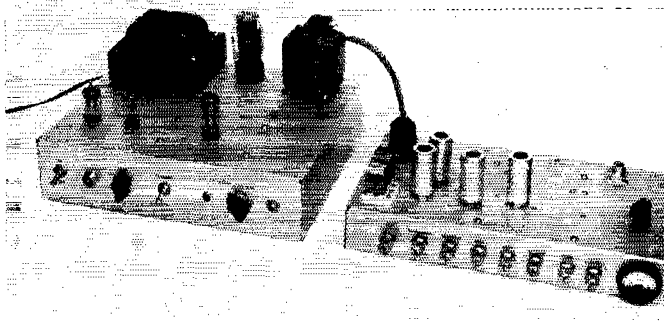
The circuit can be added to most receivers without affecting their original performance except when S_1 is closed. The exact frequency of the i.f. amplifier is relatively immaterial, and the circuit has been tested on both 455 and 2215 kc. with comparable results. Its use to provide noise-limiting action in an automobile receiver should prove to be most effective, and the installation could be made without compromising the receiver's use for broadcast reception. The mechanics of the installation should be such that the leads to the i.f. transformer are as short as possible. If the threshold control R_1 is necessarily mounted in a remote position, it should be connected through a length of flexible coax, such as RG-58/U. Preferably, it should be mounted as close to the 6AL5 tube as practical. If the builder is tempted to return the center tap of C_1 and C_2 to ground rather than to the B+ end of the i.f. transformer, he will discover a noticeable deterioration in performance.

The amount of use of any receiver feature is usually directly proportional to its practical effectiveness. In three years of operating a 75A-4 at K5ENB, the receiver's original noise limiter was switched on less than a total of ten minutes. Since installing the circuit under study, it has never been switched to the "off" position. QST

* 2801 Dorothy, N.E., Albuquerque, N. M.

[1] Lamb, "A Noise-Silencing I.F. Circuit for Superhet Receivers", *QST*, February, 1936.

[2] This is the case with the author's 75A-4 receiver, in which, because of the particular circuit arrangement used, it is unlikely that any substantial amount of b.f.o. voltage is present in the primary of the last i.f. transformer. In other receivers this might not be so. In such case the b.f.o. voltage in the i.f. transformer primary would determine the limiting level on c.w. and s.s.b. signals, or at least put a "floor" under the limiting level. — *Editor.*



The complete transmitter, ready for operation on either 50 or 144 Mc. At the left is the combination modulator and power-supply unit. The controls on the front of this chassis, starting from the left, are the power switch, microphone jack, audio gain control, transmit-standby switch, phone-c.w. switch, and key jack. Components and controls on the r.f. chassis, right, are identified in the layout drawings, Figs. 3 and 4.

A Complete Band-switching 50- and 144-Mc. Transmitter

The "Tech" Special

BY LEWIS G. McCOY,* W1ICP

Here's a set that should satisfy the needs of the beginning Technician. Covering both 6 and 2 meters, it delivers more output than the transceivers so popular on those bands, costs less to build. Useful, too, as a driver for a higher-power amplifier.

Now that the holder of a Technician Class license can use 144 Mc. as well as 50 Mc. a transmitter that can be used on both bands makes a logical combination. The newly-licensed Technician probably will want to start off with something that is relatively inexpensive, which automatically excludes high power, but at the same time wants his rig to be something better than a toy. And if it has enough power output to serve as an exciter for a higher-power amplifier later on, so much the better.

The band-switching transmitter shown in the accompanying photographs is that kind of rig. Using the type 7558 tube — an improved v.h.f. version of the 5763 just recently announced by RCA — in the final stage, it is capable of efficient operation on both 50 and 144 Mc., and with a reasonably-good antenna system acting in cooperation, its 15 watts input will put out quite a respectable signal on both bands.

R.F. Circuit Details

The r.f. line-up of the two-band transmitter is shown in Fig. 1. The oscillator, V_1, a 5763, uses 8-Mc. crystals in the grid-plate oscillator circuit, tripling in the plate circuit for both 50- and 144-Mc. operation. The plate tank, L_1C_1, of the oscillator covers 24 to 27 Mc. Output from V_1 is used to drive a 5763 doubler, V_2. On 50 Mc., output from the doubler is fed directly to V_4, the 7558 amplifier, through S_{2A}. For 144-Mc. work the output from V_2 is used to drive V_3, a 7558 tripler stage.

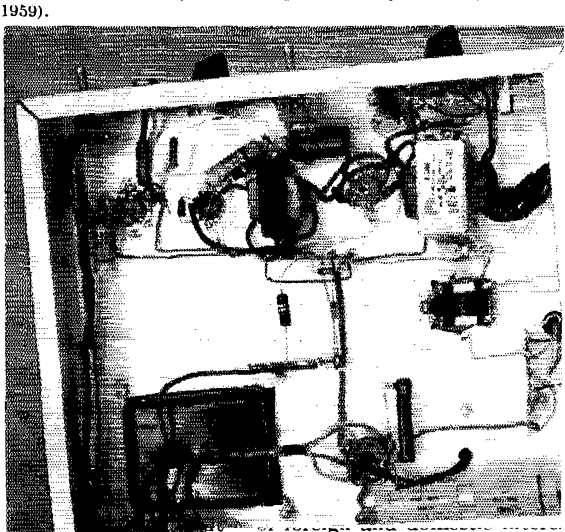
When operating on 50 Mc. V_3 is taken out of operation by grounding the screen of the tube by means of S_{3A}. Although C_5 and the output capacitance of the tube are added to the capacitance of the 50-Mc. doubler circuit, C_3L_2, the minimum capacitance is low enough so that this circuit is capable of tuning to 54 Mc., the top limit of the band.

For 144-Mc. operation, S_{2A} feeds the output of V_2 to the grid of V_3. C_5L_3, together with the input capacitance of the 7558 final, becomes the 144-Mc. grid circuit of the amplifier.[1] Of course, S_3 must be switched to disconnect the tripler screen from ground. S_3 also serves as tune-up control by grounding the screens of V_3 and V_4, as required, to prevent damage to the tubes if their circuits are left off resonance. V_1 and V_2 are protected by cathode bias.

The tank circuit of the amplifier, consisting of L_4, L_6, and C_7, is series-tuned. When the circuit is tuned to 50 Mc. L_6 is the tank coil, but this

* Technical Assistant, *QST*.

[1] This coupling scheme is similar to the one used in the Hallicrafters SR-34 ("Recent Equipment," *QST*, June, 1959).



In this bottom view of the modulator and power-supply chassis the 12AX7 speech amplifier socket is at the upper left; to the right are the 6C4 socket, driver transformer, 12BH7 socket, and modulation transformer. Immediately below the modulation transformer is the keying relay. (A double-pole relay is shown but only one pole is required.) Power-supply components are mounted along the rear (bottom) edge of the chassis.

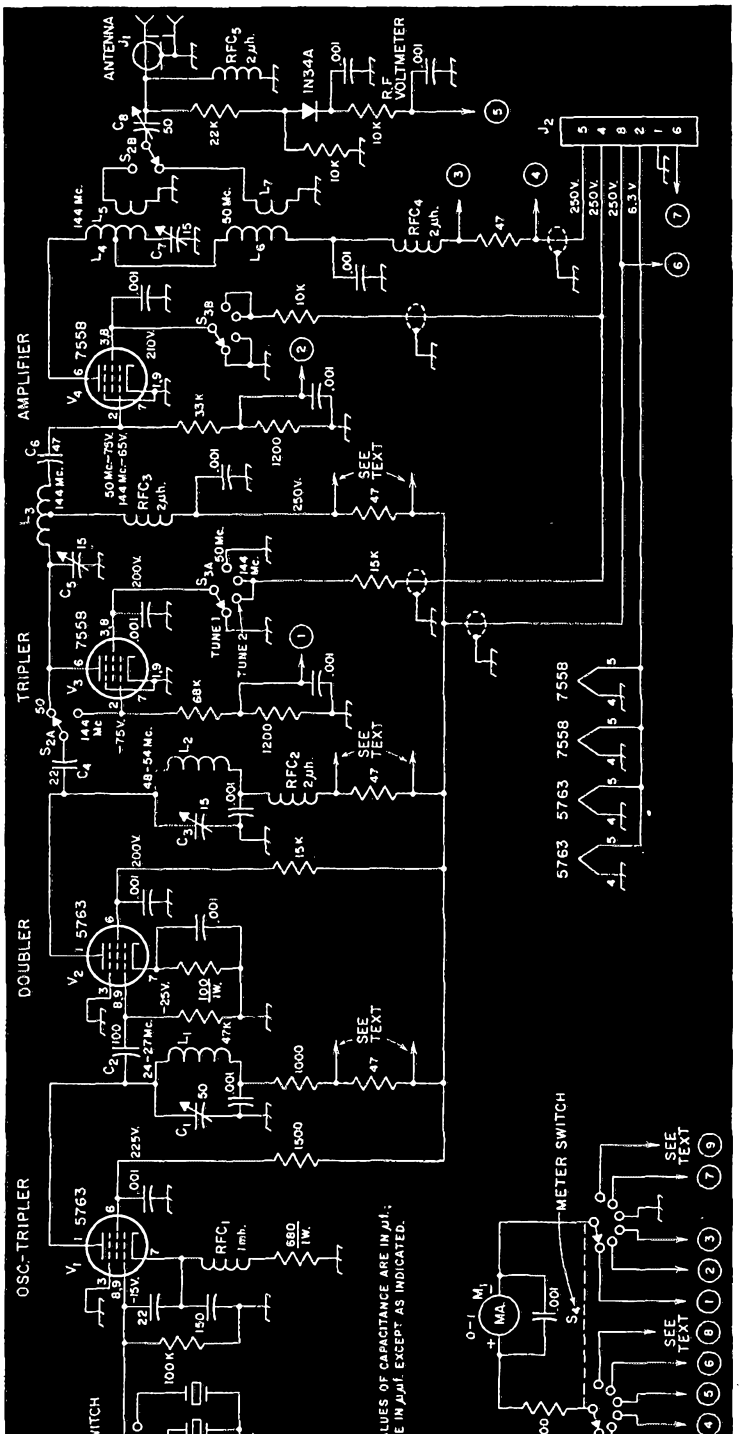


Fig. 1—Circuit diagram of the 50-144-Mc. band-switching transmitter. See separate parts list for components other than the r.f. coils listed here.

L_1—9 turns No. 20, ⅝-inch diam., ⅝ inch long, 16 turns per inch (B & W Miniductor 3007).

L_2—5 turns No. 16, ½-inch diam, approx. ½-inch long (see text).

L_3—3 turns No. 16, ½-inch diam, approx. ½-inch long, tapped at center.

L_4—5 turns No. 14 enam., ½-inch diam., turns spaced to ⅜ inch. Enamel should be scraped from the area at center of coil (2½ turns) for soldering lead from L_5.

L_5—2 turns No. 14 enam., ⅜-inch diam., spaced ⅜ inch (see text).

L_6—4¾ turns No. 14 enam., ½-inch diam., close-wound.

L_7—4 turns No. 20 insulated wire, ½-inch diam., close-wound.

coil acts as an r.f. choke when the circuit is used on 144 Mc., where L_4 is the tank coil. The output links, L_5 and L_7, are switched by S_{2B}. C_8, a 50-$\mu\mu$f. variable capacitor, is the loading control.

A 0-1-ma. milliammeter connected as a low-range voltmeter is used to meter the various circuits. Current is determined by measuring the voltage drop across resistors in series with the circuits in which the current is to be measured. Regular ranges are as follows: modulator and amplifier plate current, 100 ma. each; tripler and amplifier grid current, 5 ma. each. The fifth position of S_4 is used to connect M_1 as an r.f. voltmeter across the output coax connector, thus providing a visual indication when power is

actually going to the transmission line. The sixth position is open, allowing the meter to be used for measurements not included above.

Modulator and Power Supply

The speech-amplifier and modulator, Fig. 2, utilizes a 12AX7 dual triode, V_5, as a two-stage resistance-coupled amplifier, followed by a 6C4 driver, V_6. Output from the driver is transformer-coupled through T_1 to the grids of V_7, a 12BH7 operated with its two sections in push-pull. Either crystal or dynamic microphones can be used with the unit. Output power from the modulator is enough for fully modulating the 15 watts input to the r.f. amplifier.

The tripler screen is also modulated, along with the plate and screen of the amplifier. This increases the drive to the final amplifier on modulation peaks, with a resulting improvement in the modulation characteristic, and simplifies the phone-c.w. switching.

RFC_6, between the microphone jack J_3 and the grid of V_{5A}, is for preventing feedback troubles because of r.f. pickup on the microphone leads.

The power-supply components were selected to provide a B-plus voltage of 250, as this is the maximum rating for the 7558 when operated as a plate-modulated r.f. amplifier. A choke-input filter, consisting of L_8 and C_{9B}, is used.

S_6 is a double pole, single-throw toggle switch with one section serving as the transmit-standby control and the other section, S_{6B}, controlling 115 volts a.c. for an external antenna relay. The transmit-standby function is accomplished by opening and closing the center tap of T_3.

The phone-c.w. switch, S_5, is used to short out the modulation transformer and transfer the screens of the tripler and amplifier to the keying line. A single-pole double-throw 6-volt a.c. relay is used to key the screens of the tripler and amplifier tubes. In the key-up position the screens of the two tubes are grounded. When the key is closed K_1 is energized and screen voltage is applied to the two stages.

Construction

The r.f. section and power supply-modulator are separate units, both using fairly large chassis

PARTS LIST

Capacitors

15 0.001-μμf. disk ceramic.
1 0.003-μμf. disk ceramic.
2 22-μμf. mica (one for C_4).
1 100-μμf. mica (C_2).
1 150-μμf. mica.
1 47-μμf. ceramic (C_6).
1 Dual 450-volt electrolytic, 40 μf. per section (C_9).
3 10-μf., 50-volt electrolytic.
3 15-μμf. variable (C_3, C_5, C_7) (Hammarlund MAPC-15-B)
2 50-μμf. variable (C_1, C_8) (Hammarlund MAPC-50-B)

Resistors

5 47-ohm, ½-watt composition.
1 100-ohm, 1-watt composition.
1 470-ohm, 1-watt composition.
1 680-ohm, 1-watt composition.
2 1000-ohm, ½-watt composition.
2 1200-ohm, ½-watt composition.
1 4700-ohm, ½-watt composition.
2 1500-ohm, ½-watt composition.
3 10,000-ohm, ½-watt composition.
2 15,000-ohm, ½-watt composition.
1 22,000-ohm, ½-watt composition.
2 33,000-ohm, ½-watt composition.
2 47,000-ohm, ½-watt composition.
1 68,000-ohm, ½-watt composition.
2 100,000-ohm, ½-watt composition.
1 220,000-ohm, ½-watt composition.
1 1-megohm, ½-watt composition.
1 2.2-megohm, ½-watt composition.
1 500,000-ohm control, audio taper (R_1).
1 20,000-ohm, 10-watt wire wound.

Sockets and Connectors

1 Octal plug, female (P_1) (Amphenol 86-CP8).
2 Octal sockets (J_2, and one for V_8).
1 7-pin miniature sockets.
6 9-pin miniature, four with shield base.
1 Coax chassis receptacle, type SO-239 (J_1).
4 Crystal sockets.
1 Open-circuit jack (J_4).
1 Microphone jack (J_3) (Amphenol 75-PC1M).

Switches

1 S.p.s.t. toggle (S_7).
1 D.p.s.t. toggle (S_6).
1 Rotary, 1 section, 1 pole, 4 positions (S_1) (Centralab PA-1001).
1 Rotary, 1 section, 2 poles, 6 positions (S_4) (Centralab PA-2003).
1 Rotary, 1 section, 2 poles, 4 positions (S_3) (Centralab PA-1003).
1 Rotary, 1 section, 2 poles, 2 positions (S_5) (Centralab PA-2005).
1 Rotary, 2 sections, 2 poles, 2 positions (S_2) (Centralab, two PA-1 sections and one type PA-302 shaft assembly).

Transformers

1 Power, 700 volts center-tapped, 200 ma.; 5 v., 3 amp.; 6.3 volts, 6 amp. (T_3) (Thordarson 22R07).
1 Driver, 5.2:1 primary to one-half secondary (T_1) (Thordarson 20D76).
1 Modulation, 10 watts, 10,000 ohms plate-to-plate to 4000-ohm Class C load (T_2) (Thordarson 21M68 or Merit A-3008).
1 Choke, 8 hy., 150 ma. (L_8) (Thordarson 20C54)

Tubes

1	6C4	1	12BH7	2	5763
1	12AX7	1	5U4G	2	7558

Miscellaneous

1 1N34A diode.
1 1-mh. r.f. choke (RFC_1) (National R-50).
4 2-μh. r.f. choke (RFC_2–RFC_6, inc.) (National R-60).
1 Relay, s.p.d.t., 6 volts a.c. (K_1) (Potter-Brumfield type KA5AY).
1 0-1 milliammeter, miniature type (M_1).
1 6-volt pilot lamp, No. 47 (I_1).
1 Pilot lamp jewel and socket.
1 Aluminum chassis, 2 × 7 × 13 inches.
1 Aluminum chassis, 3 × 10 × 12 inches.
7 Tie-point strips, 5 terminals.
1 Terminal strip, two screw terminals (TB_1).
1 Piece of copper flashing, 6 × 8 inches.
1 Piece of 1 32" aluminum, 2 × 6½ inches.
10 ft. No. 14 enameled wire.
10 ft. shielded wire (Belden 8885).
1 Roll hookup wire, No. 20 or 22 insulated, 25 feet.
1 Length B & W Miniductor No. 3007 or Airdux 516T(L_1).
8 Small knobs.
3 Pointer knobs.
1 Line cord and plug, fuse-in-plug type (P_2).
2 Fuses, type 3AG, 1-½ amp.
2 Panel-bearing assemblies, 3-inch (E. F. Johnson 115-256-2).
2 Shaft couplers, one insulated.
Miscellaneous hardware:
8-Mc. crystals as desired.

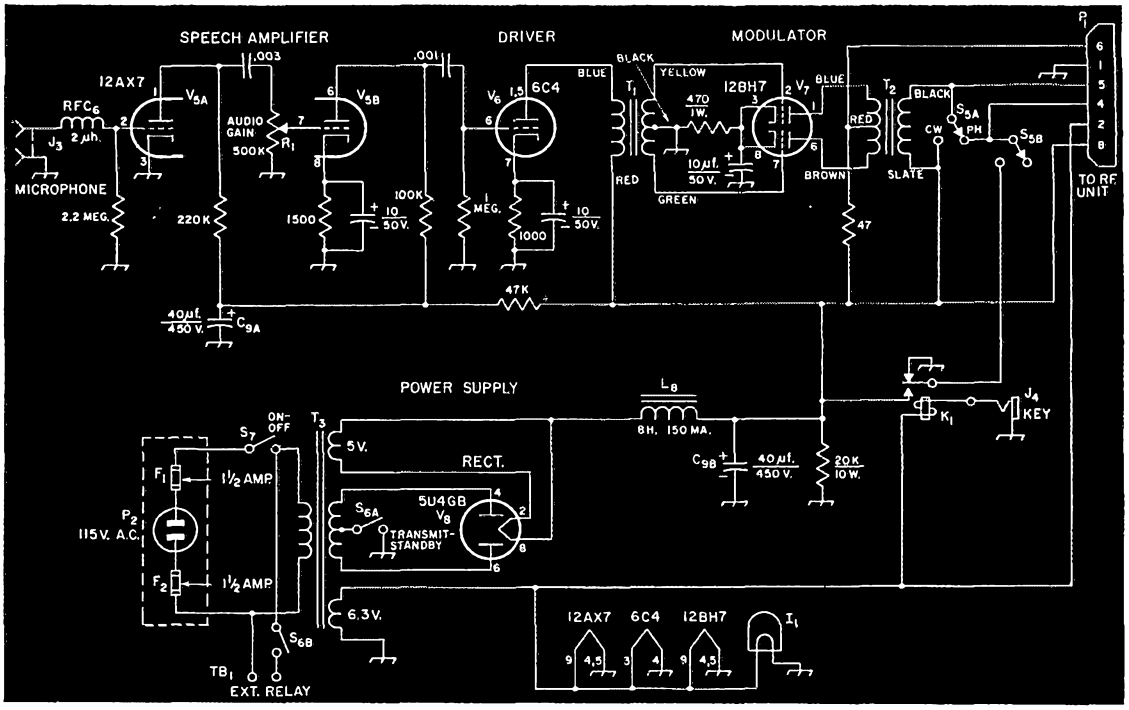


Fig. 2—Circuit diagram of power supply and modulator. Unless specified otherwise, capacitances are in μf., resistances are in ohms, resistors are ½ watt. Capacitors with polarity marked are electrolytic. See parts list for component data.

in the thought that construction would be easier. A 2 × 7 × 13-inch aluminum chassis is used for the r.f. unit, with a 6 × 8-inch piece of flashing copper mounted on the under side of the chassis. All r.f. grounds are made to the copper. The main reason for the copper sheet is to help prevent ground currents from wandering all over the chassis. The copper may not be strictly necessary, but it is a good precaution — at least, the unit as described is stable in every respect.

Figs. 3 and 4 give the important dimensions for mounting components on the front and top of the r.f. chassis. Also, Fig. 4 shows the tube socket orientation which should be followed when installing the sockets. After making the socket holes in the chassis lay the copper sheet against the chassis top and mark off the socket holes on the copper, or else fasten the copper sheet to the chassis in the proper position and cut all the holes simultaneously in both. This will help you insure correct alignment of the two pieces.

The tube manufacturer recommends that the grid and plate terminals of the 7558 be shielded from each other to prevent external feedback when the tube is operated as a straight-through amplifier. For this purpose, a shield shaped like a right angle is used. The shield is made from a piece of aluminum measuring 2 × 6½ inches. It is 1¾ inches high, with a ¼-inch wide lip for securing it to the chassis, and is 3 inches long on one side and 3½ on the other. It is secured to the chassis with four screws and nuts. The shield crosses the socket of V_4 between Pins 2 and 3 on one side and between Pins 8 and 9 on the other. C_7 and the rear section, S_{2B}, of the band switch are mounted on the shield.

The rotor shafts of C_1, C_3 and C_5 should not touch the chassis where they come through the front wall. This means that particular care should be taken when installing the capacitors because there isn't much space to spare between the rotor shaft and mounting holes. Connect the rotor soldering lugs to the copper, using short leads. All r.f. ground connections should be made to the copper plate, keeping the leads as short and direct as possible.

The r.f. coils, L_1 through L_7, are all of the air-wound type. L_1 is supported between the stator of C_1 and one tie point of a terminal strip that is mounted between the socket for V_1 and the edge of the copper sheet. L_2 is installed between the stator of C_3 and a tie point mounted alongside the socket for V_3. L_3 is mounted between the stator of C_5 and one side of C_6; one of the unused terminals on S_{2A} serves as a tie point for the junction of L_3 and C_6.

In the amplifier tank circuit, L_4 is connected between the plate pin of the socket for V_4 and the stator of C_7. The 50-Mc. coil, L_6, has one end connected to a tie point on a strip mounted near the rear edge of the copper. The other lead from L_6 is soldered to the center of L_4. The 144-Mc. link, L_5, is mounted inside L_4 and is connected at one end to the rotor terminal of C_7 (which is grounded) and at the other end to a switch terminal on S_{2B}. We used sleeving (spaghetti) over L_5 to make sure there was adequate insulation between the two coils. The 50-

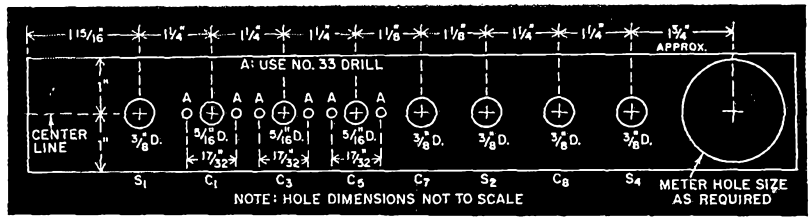


Fig. 3—Drawing showing hole size and placement of controls on front of r.f. chassis.

Mc. link, L_7, is connected between chassis ground and a tie point on the same terminal strip that supports L_6. The link is oriented so that it is coupled to the bottom (cold end) of L_6.

All r.f. chokes should be mounted as close to the coils as possible (although preferably not inductively coupled to them), keeping the leads short. Also, the grid resistors should be connected to the grid pins on the tube sockets with the shortest possible leads. All bypass capacitors should be connected close to the tube terminals or coils they are bypassing, using short lead lengths. When soldering small resistors and capacitors, hold the lead being soldered with a pair of pliers. The pliers will conduct the heat away from the component, preventing damage from too much heat.

Shielded wire is used for the connections from J_2 to the tube heaters, for the screen leads to S_2, and for the B-plus leads to the terminal strips that hold L_1 and L_6. The shielded wire is used to minimize r.f. coupling through the power-supply leads and, with a bottom plate on the chassis, helps confine harmonics within the chassis.

Construction of the power supply and modulator is not critical and the general layout shown in the photographs can be followed. The power-supply components are mounted along the rear of the chassis and the modulator is near the front. The keying relay has a single mounting screw, and a rubber grommet should be used when installing the relay to minimize its mechanical noise while keying.

In the units shown here, the cable which connects the two chassis together is about 10 inches long. A longer cable could be used, depending on the individual operating arrangement.

In wiring the modulation transformer, T_2, you'll find several leads coming from the secondary; two of these, black and slate, are connected to S_5. The remaining ones should be taped to prevent accidental short circuits and then tucked out of the way.

Testing Procedures

Before applying power to the units, carefully check all wiring for errors. Then put the transmit-standby switch in the standby position and turn on the power switch.

In order to facilitate testing, all the important voltages are shown in Fig. 1. The plate and screen voltages can be measured with a regular test meter, if you have one. If not, you can use the milliammeter, M_1, as a voltmeter by setting the meter switch, S_4, to the last (open) position. Then ground the negative side of the meter through switch position 9, and connect a 510,000-ohm ½-watt resistor from point 8 to a test prod. This converts the milliammeter into a voltmeter with a full-scale reading of 500 volts. Be sure to use insulated wire for the test lead and cover the resistor with tape or spaghetti in order to prevent accidental shock. This meter cannot be used to check the negative d.c. grid voltages shown on the diagram, however, because its resistance is too low. A vacuum-tube voltmeter is the best instrument for this purpose. Actually, it is not necessary to check the d.c. voltages at the grids of the tripler or amplifier, because provision is made for measuring the grid currents in these two stages. If these grid currents are as specified later, the voltages at the grids of the oscillator

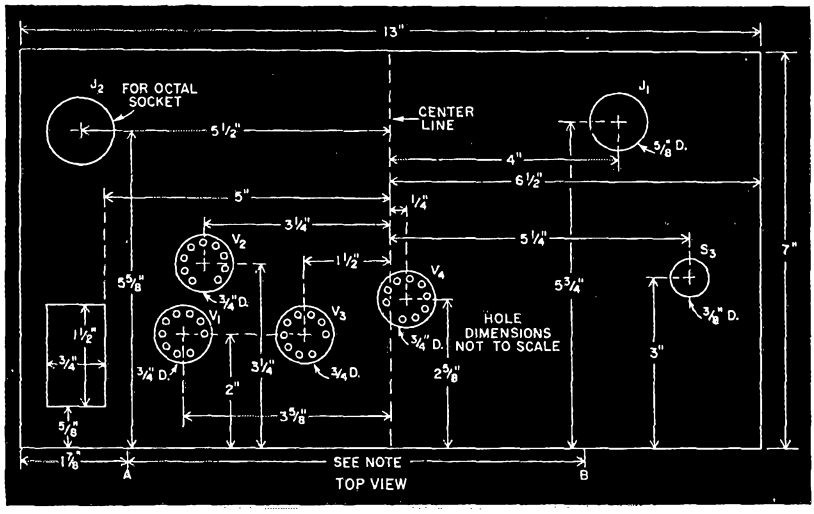


Fig. 4—Layout drawing of top of r.f. chassis, showing orientation of tube sockets. This is a top view; sockets should be mounted so the pins as seen from the top of the socket match this drawing. Note: Copper plate, 6 x 8 inches, butts against front wall of chassis between points A and B

and doubler also will be in the proper range.

Don't be concerned if your rig shows slightly different voltages than those given. Variations are to be expected because of component tolerances, and a difference of 10 per cent or so won't affect the over-all performance.

The open position of S_4 also can be used for measuring the plate currents of V_1, V_2 and V_3. Each of these tubes has a 47-ohm resistor in its d.c. plate lead. With S_4 in the open position, connect clip leads to switch terminals 8 and 9, and clip the other ends across the 47-ohm resistor in the circuit to be measured, with terminal 9 connected to the plate side of the resistor in each case. (Be sure the power is off while these connections are being made or shifted!) The meter has a full-scale range of 100 ma. in this case. V_1 and V_2 each take a plate current of approximately 30 ma. The plate current of the tripler, V_3, is about 40 ma. These currents do not have to be measured in the course of normal tuning procedure, so a check of this type need be made only when the transmitter is first built, or in case maintenance is required after, for example, a component failure.

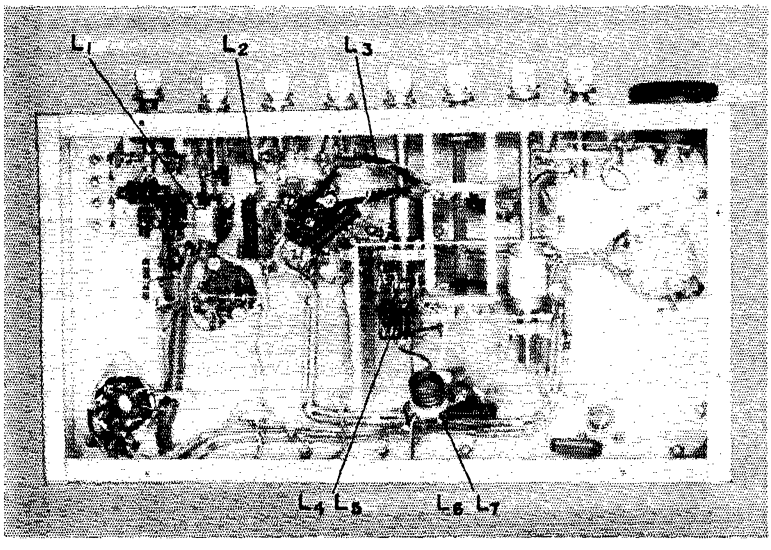
For 50-Mc. tune-up put S_3 in the "Tune 1" position, set S_4 to read amplifier grid current, and adjust C_1, C_3, and C_5 for maximum grid current, which should be between 2 and 4 ma. If you find that you cannot get enough grid current there are a couple of things you can check. First, make sure the oscillator is working by listening for the signal in a receiver tuned either to the crystal frequency or to its third harmonic. If the oscillator isn't working you've got a bad crystal or a wiring error. Another possible reason for insufficient drive is that the C_3L_2 circuit isn't tuning to the 50-Mc. range. Check the setting of C_3 that gives the most grid current; if the plates are fully open it may mean the circuit isn't tuning high enough to reach 50 Mc., in which case reduce the inductance of L_2 slightly by spreading the turns. On the other hand, if the plates of C_3 are fully meshed as you approach maximum grid current, the coil turns must be squeezed together to lower the frequency enough to give you adequate tuning range.

Once you have 2 or more milliamperes of grid current you are ready to test the amplifier. For testing, you'll need a dummy load; a good one for this purpose was described in a recent issue of *QST*.[2] Alternatively, four 6-volt 150-ma. dial lamps connected in parallel make a suitable load. Set S_3 to the 50-Mc. position and turn on the "transmit" switch, S_6. The meter switch should be set for reading amplifier plate current. Adjust C_7 so that the plate current "dips," indicating that the final tank is in resonance. Off-resonance plate current may go as high as 90 ma., while the plate current at resonance will depend on the setting of C_8. Set the meter to read output and adjust C_7 and C_8 for maximum indication. Then switch back to read plate current, which should not exceed 70 ma. The best setting of the controls is the one that shows maximum output with minimum plate current — minimum being some value close to 70 ma., but in no case higher than is necessary for getting the largest possible reading on the r.f. voltmeter.

The tune-up procedure on 144 Mc. is similar, with a few additions. Set S_3 to the first tune-up position and set the meter switch to read tripler grid current. Adjust C_1 and C_3 for maximum tripler grid current, which should be 2 to 4 ma. If you find that you cannot get enough grid current you may have to adjust L_2 as outlined in the 50-Mc. tune-up procedure. Advance S_3 to the "Tune 2" position and switch the meter to read amplifier grid current. Adjust C_5 for maximum grid current, and also repeak C_1 and C_3. If you find that you cannot get enough grid current you probably will have to decrease or increase the inductance of L_3 by spreading or squeezing the turns. The amplifier tune-up procedure is similar to that described for 50 Mc.

(Continued on page 138)

[2] "V.H.F. Dummy Loads," *QST*, March, 1960.



The final amplifier is at the lower right in this view of the r.f. chassis. Near the lower right-hand corner of the copper plate is C_8, which is mounted on the aluminum bracket. An insulated coupler is used to connect C_8 to the panel bearing. Next to the coupling is S_{2B} and to the left of S_{2B} is C_7. The 144-Mc. coil, L_4, is just to the rear of C_7. L_6 is near the rear edge of the copper plate.

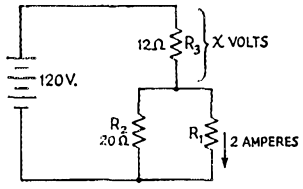
How to Solve a Quist Quiz

BY PETER A. STARK* K2OAW

BEING one who likes to waste time on irrelevant things, I always look first at the Quist-Quiz whenever I get my *QST*. For no particular reason, the one in the June issue seemed especially intriguing, if only because it seemed so easy.

The problem is very easy; in the network of Fig. 1, knowing the applied voltage, the values of the two marked resistors, and the current flowing through the third, calculate the resistance of the unmarked resistor. While easy to solve using the most elementary methods, this problem can be used to demonstrate some of the "cute" techniques of circuit theory which might come in useful in your next project. Here then are six ways of solving the thing.

Fig. 1



Method One: The Simplest Way

Draw the circuit in the form shown in Fig. 1 and call the voltage across the 12-ohm resistor "x" Now we know that the current flowing through this resistor divides and passes through the 20-ohm and the unknown resistor. Using Ohm's Law, the current through the 12-ohm resistor is

$$I = \frac{E}{R} = \frac{x}{12}.$$

The voltage across the 20 ohms is 120 volts minus the x volts, or $120 - x$, and the current through it is again E/R or

$$I = \frac{120 - x}{20}.$$

Since this plus 2 amperes equals the current through the 12 ohms, we write

$$\frac{120 - x}{20} + 2 = \frac{x}{12}$$

and immediately simplify this to

$$\frac{360 - 3x}{60} + \frac{120}{60} = \frac{5x}{60}$$

$$5x + 3x = 480$$

$$x = 60 \text{ volts}$$

and therefore

$$120 - x = 60 \text{ volts}$$

and, since the current through the unknown resistor is 2 amperes and voltage across it is 60 volts,

$$R = E/I = 60/2 = 30 \text{ ohms}.$$

*519 East 86th St., New York 28, N. Y.

Been lucky in getting answers to the circuit problems posed in QST's popular Quist-Quiz department? Been depending on inspiration rather than logical methods? There are other means, too.

In case you aren't a puzzle fan, this is a highly readable resume of a variety of methods useful in solving electrical circuits.

Now that the suspense is broken and we know the answer, let's go to the next method.

Method Two: Kirchhoff's Laws

This is really the first method put into elegant and scientific language. We unknowingly used these two laws in the above solution, but we didn't state them as such. They are:

1) *The sum of all voltages around a closed path is zero.* Suppose you start on the 50th floor of a skyscraper, spend a couple of hours climbing and descending stairways at random, and at the end of the day wind up back on the 50th floor. The sum of the steps you climbed is the same as the sum of the steps you descended, or otherwise you would be on some other floor. In a like fashion, as you go around a closed circle in an electrical circuit, as long as you wind up where you started, the sum of all the voltages you have "climbed" or "descended" is zero.

2) *The sum of all the currents into a point is zero.* It's obvious that all the electrons flowing into one side of a terminal have to come out the other side. If you call all electrons flowing in "plus" and all flowing out "minus" and add them up, you get a zero net current.

Now let's apply these two laws to our circuit. Redraw the diagram as in Fig. 2, and to each arm assign a current I_1, I_2, and I_3, as in the figure.

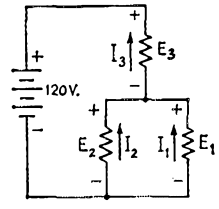


Fig. 2

Then assign a voltage E_1, E_2, and E_3 to each element, fixing an arbitrary direction.

Having drawn this figure, we notice first that $E_1 = E_2$. We next apply the first law to our closed paths:

$$120 - E_3 - E_2 = 0$$

$$120 - E_3 - E_1 = 0$$

$$E_2 - E_1 = 0$$

Next we apply the second law to get

$$I_1 + I_2 - I_3 = 0$$

where $I_1 = 2$ amperes.

Now applying Ohm's Law, we see that

$$E_1 = I_1 R_1 = 2R_1 = E_2$$
$$E_2 = 20\ I_2$$
$$E_3 = 12\ I_3.$$

Combining the above equations, we get the following three equations in three unknowns:

$$120 - 12I_3 - 20I_2 = 0$$
$$120 - 12I_3 - 2R_1 = 0$$
$$2 - I_3 + I_2 = 0.$$

They can easily be solved by use of a little algebra to yield $I_2 = 3$ amperes, $I_3 = 5$ amperes and, of course, $R_1 = 30$ ohms.

Use of Kirchhoff's laws in this problem seems merely to complicate matters. But in some cases it is easier to use these laws than to try to use intuition the way we did in the first method.

Method Three: Successive Approximations

This one is a little hard to apply, but it's a bit on the "cute" side and might be interesting to try.

We at this point make believe we don't know what R_1 is. We do know, however, that it must be somewhere between 0 and 60 ohms. We get the 60 ohms as a maximum this way: Suppose it is 60 ohms. Then E_1, using the notation of the previous method, is 120 volts and therefore E_3 is zero. This implies that there is no voltage drop across a resistor carrying current, which is ridiculous.

All right, let's presume R_1 is 50 ohms. This is just an arbitrary choice; we could just as well take 10 or even 13.743 — or any value between 0 and 60. Now suppose R_1 is 50. Then E_1 is $E = IR = 100$ volts. 100 volts across the 20-ohm resistor causes a 5-ampere current through it. We then know that $I_3 = 2 + 5 = 7$ amp. But this current flowing through 12 ohms must mean a voltage drop of 84 volts. Therefore E_1 must be $120 - 84 = 36$ volts. This corresponds to an R_1 of 18 ohms. What we have done is merely go around a circle, arriving at a value for R_1 different from the one we first assumed. This immediately tells us that our original assumption of 50 ohms was wrong, otherwise we would have gotten the same answer as we had started with. But — and here is the important thing — notice that 18 ohms is much closer to 30 than our assumed 50 was. Let's see what happens when we assume the value of 18 to be the correct answer:

$$R_1 = 18 \text{ ohms}$$
$$E_1 = 2 \times 18 = 36 \text{ volts}$$
$$I_2 = \frac{36}{20} = 1.8 \text{ ampere}$$
$$I_3 = 2 + 1.8 = 3.8 \text{ amperes}$$
$$E_3 = 12 \times 3.8 = 45.6 \text{ volts}$$
$$E_1 = 120 - 45.6 = 74.4 \text{ volts}$$
$$R_1 = \frac{74.4}{2} = 37.2 \text{ ohms.}$$

Notice that this value is still closer to the correct value. If we now assume this value to be correct and go through the same procedure once more, our next approximation is 25.68 ohms. Once more, we repeat and get 32.61. If we did this long enough, we would eventually reach something like 29.99999 . . . ohms. But let's look over the answers we got so far:

50
18
37.2
25.68
32.61

We see that the answers keep swinging back and forth around some central value, and we begin to suspect that maybe eventually they will get very close to it. We take a stab in the dark and guess that the final answer might be around 30 ohms. Try this value in the above procedure and lo and behold, the answer comes out 30 also. You've just made a lucky guess and got the right value.

Now this method isn't really very short either. But suppose you had a nice digital computer which was programmed to repeat this procedure. The whole thing uses only addition, subtraction, multiplication and division, things even the simplest computer can do. If you started the computer and let it run for a short while, it would eventually give you the answer. This technique is therefore quite useful in computer work.

Method Four: Thevenin-Norton Conversion

Suppose you have a black box with two terminals, and you know that it contains a battery and a resistor. You are told to find out what is in it. You take a series of measurements: When you short the two terminals with a wire, you measure the current in the wire to be 10 amperes. You measure the open-circuit voltage to be 120 volts. Then you connect some arbitrary resistor across the terminals and measure the voltage across it. Suppose you connect 12 ohms and measure a voltage of 60.

Now, from the above measurements you can find a circuit which will satisfy these conditions, and therefore a circuit which might be in the box. The first thing that pops to mind is a 120-volt battery with a series resistor of 12 ohms, so you answer that that is the circuit inside the black box.

But hold on there. There is another circuit that would work just as well. It consists of a "constant current source" of 10 amperes with a 12-ohm resistor in parallel, like Fig. 3. This is completely

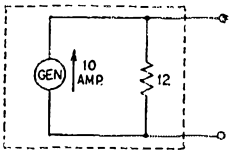


Fig. 3

identical with the former circuit with the battery and series resistor. Under open-circuit conditions,

the current source pushes 10 amperes through 12 ohms and therefore has an open-circuit voltage of 120 volts. When the terminals are shorted, the whole 10 amperes flows through the external circuit. With a 12-ohm load, the 10 amperes divides equally between the internal and external 12-ohm resistors, and produces an external current of 5 amperes and a voltage of 60 volts. These two circuits are named the Thevenin circuit (voltage source — series resistor) and Norton (current source — parallel resistor).

From the above you can see that the Thevenin and Norton circuits are equivalent as far as the two terminals are concerned, provided only that appropriate voltage and current sources are chosen. Examination of the two circuits above yields the formulas

$$E_{\text{Thevenin}} = R \times I_{\text{Norton}}$$

$$I_{\text{Norton}} = \frac{E_{\text{Thevenin}}}{R}$$

where R is the value of the resistor, the same in both equivalent circuits.

Now let's go back to the Quist-Quiz problem, Fig. 1, and replace the 120-volt source and the 12-ohm resistor by its Norton equivalent, a 10-ampere current source and a parallel 12-ohm resistor. Redraw to get Fig. 4, which can be simplified by combining the 12- and 20-ohm resistors into one, to get Fig. 5.

Fig. 4

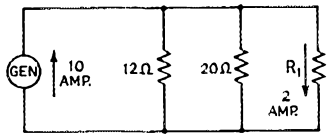
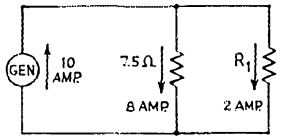


Fig. 5



Now, obviously, the current through the 7.5-ohm resistor is $10 - 2 = 8$ amperes, and the voltage across it is $8 \times 7.5 = 60$ volts. This 60 volts is also across the unknown resistor, and therefore its resistance is $R = E/I = \frac{60}{2}$ or 30 ohms, which is the answer found above.

The method of Thevenin-Norton transformation is often quite powerful, since it enables the simplification of a circuit by eliminating some components. For example, a long ladder-network can be simplified by successive transformations from Thevenin to Norton and vice versa, each time combining two series or two parallel resistors into one.

Method Five: Superposition

Suppose you have a complicated network consisting of several resistors and voltage and/or current sources. The principle of superposition states that if you take that network and put in each of the sources in turn and measure all the currents and voltages, then when you put them in all at once you will just get the sum of all of the previously-measured values.

Let's apply this to our problem. We have to remember one important fact: When we remove a voltage source we replace it by a short circuit, and when we remove a current source we leave an open circuit. This follows from the fact that a voltage source has a theoretically zero resistance because it can pass any required current as demanded by its load — don't forget we are talking about *ideal* sources, not existing ones. Similarly, a current source has a theoretically infinite resistance because the voltage across it depends only on the external circuit it's connected to.

Now we can try this method on our problem. Since our unknown resistor passes a constant 2-ampere current, let's imagine that there is a 2-ampere current source in series with it, and draw it as shown in Fig. 6. We assumed current

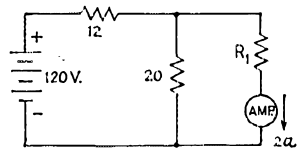


Fig. 6

to flow from plus to minus, and will therefore have to be consistent throughout the rest of the solution.

We now eliminate first the voltage source by disconnecting it and replacing it with a short, and we then try removing the current source. The two resulting circuits are those in Fig. 7. By a

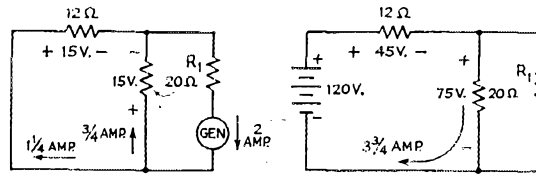


Fig. 7

simple application of Ohm's Law, we obtain the currents and voltages in each circuit independently. These are also shown in Fig. 7. We then superimpose one circuit on the other and add currents and voltages to get the final values, Fig. 8. Knowing now the voltage and current through

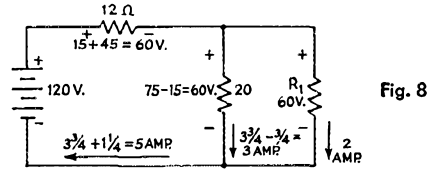


Fig. 8

the unknown resistor, we easily determine its resistance to be 30 ohms.

Method Six: Wye-Delta Transformation

Wye-Delta transformations do not simplify the problem here involved, but they are often useful and are therefore here mentioned.

Both the Wye and the Delta circuits are essentially three-terminal circuits consisting of three resistors each. As can be seen in Fig. 9, their

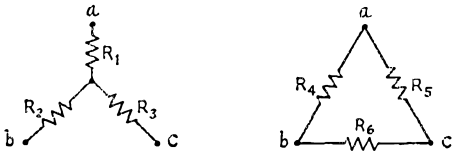


Fig. 9

names come from their similarity to the letter Y and the Greek capital Delta. The resistor values of the two are related by the equations below:

$$R_1 = \frac{R_4R_5}{R_4+R_5+R_6} \qquad R_4 = \frac{R_1R_2+R_2R_3+R_1R_3}{R_3}$$

$$R_2 = \frac{R_4R_6}{R_4+R_5+R_6} \qquad R_5 = \frac{R_1R_2+R_2R_3+R_1R_3}{R_2}$$

$$R_3 = \frac{R_5R_6}{R_4+R_5+R_6} \qquad R_6 = \frac{R_1R_2+R_2R_3+R_1R_3}{R_1}$$

Using these equations, we can easily transform one circuit into the other, and then substitute one for the other in the over-all circuit. Let's try this for the network of the problem. Examination of Fig. 1 shows the basic Wye configuration of the three resistors, which can be converted to the Delta form as in Fig. 10. The only trouble is that,

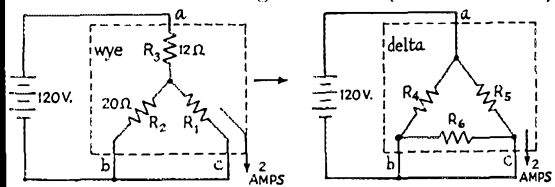


Fig. 10

since we don't know the value of R_1, we consequently don't know the values of the three resistors of the Delta. This complicates the problem. As a matter of fact, application of the above equations yields the following values for R_4, R_5, and R_6:

$$R_4 = \frac{240+32R_1}{R_1}$$

$$R_5 = \frac{240+32R_1}{20}$$

$$R_6 = \frac{240+32R_1}{12}$$

On the other hand, several other things simplify out. First of all, we see that R_6 is shorted externally, and therefore carries no current. We can therefore remove it from the circuit. Second, we notice that terminal c of the original circuit carries 2 amperes, so that terminal c of the transformed circuit, and therefore resistor R_5, also carries 2 amperes. Moreover, the voltage across R_5 is 120 volts. We therefore find R_5 from the current and voltage, and set it equal to the expression above:

$$R_5 = \frac{E}{I} = \frac{120}{2} = \frac{240+32R_1}{20}$$

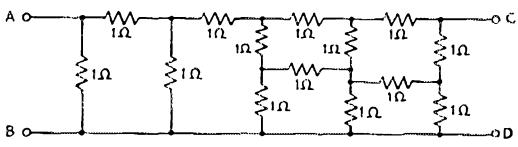
and therefore, $2400 = 480 + 64R_1$

$$1920 = 64R_1$$

$$R_1 = 30 \text{ ohms.}$$

Conclusion

As we have emphasized before, the foregoing arithmetical acrobatics aren't at all necessary to correctly solve the Quist-Quiz problem. But they may come in useful when solving some future Quist-Quiz, or even the two puzzles in the following examples. Good luck! QST

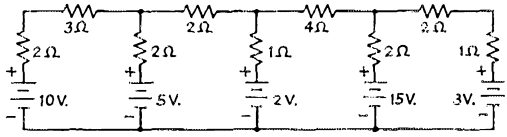


Example 1, Above

When 10 volts are applied to the two terminals A-B, what is the voltage across terminals C-D?

Example 2

What is the current in the 4-ohm resistor?



Strays

W3EFY suggests that the U. S. Post Office's Directory of Post Offices is practically indispensable for a QSLing ham. The 800-page directory lists, by states and possessions, all the U. S. post offices together with their counties. To obtain it, send $2.25 and a request for the directory, POD Publication 26, to the Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C.

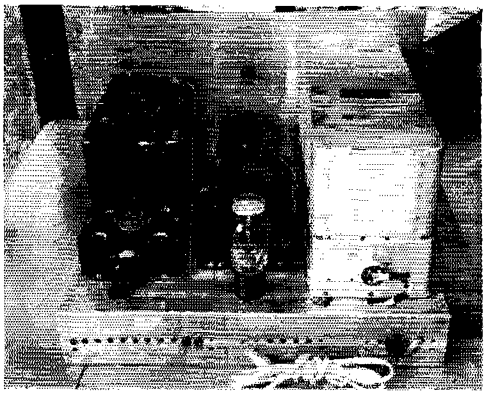
—···—

One thousand sheets of note paper, each printed "from the Desk of W3DUG" — wasn't that a nice Christmas present from the XYL? But Simon Dean didn't think so — his call is K3DUG!

—···—

K1GCX says W7TCL's letter in the December issue of *QST* made him think of the time he couldn't get a reply to CQ on 40 c.w., called QRZ? and was immediately pounced upon by two stations.

The receiver (left), transmitter (right), and power supply (center) are mounted on a 12 × 17 × 3-inch chassis.



BC-696 and BC-454 in a Low-Cost Installation

BY DAVID L. CABANISS,* W1TUW

A Complete 80-Meter C.W. Station Using Surplus Units

In this one-package station, two popular items found in surplus are combined. The automatic change-over system described provides semi-break-in operation with good keying characteristics, and may be adapted to other transmitter-receiver combinations.

Too often, the ham who has been in the game but a short time fails to realize the importance of coordinating his equipment into a single smoothly working unit. As a result, the transition between transmitting and receiving operations is often not only a delayed process, but awkward and distracting as well. While a full break-in system is something to strive for in c.w. operation, an automatic change-over system will provide most of the advantages of break-in and will be much easier to install, since little if any modification of existing equipment is required. Such a system has been incorporated in the 80-meter c.w. station shown in the photographs.

This station is built up around two units in the popular "ARC-5" series of transmitters and receivers still generally available in surplus at a fraction of their original cost. The transmitter is the T-19/ARC-5 (BC-696) covering 3 to 4 Mc., and the receiver is the R-26/ARC-5 (BC-454) covering 3 to 6 Mc.

Modification

Both transmitter and receiver require the conventional reconnecting of all heaters in parallel to operate from a 12-volt source. The receiver modification consists of installing a gain control, b.f.o. switch, and a headphone jack on the small front panel. This modification, including the rewiring of the heaters, is described in *QST* for January, 1959.[1] In addition, a connection is made to the arm contact of the gain control, and this lead is brought out through the front panel when the gain control is installed.

In the transmitter, the keying relay should be removed, and the relay connection to the cathodes of the 1625s should be brought out through the side of the chassis. (Save the relay, as it can be used later.) A 15,000-ohm 10-watt screen-voltage dropping resistor should be connected at the power connector at the rear of the chassis, between the screen-voltage terminal (Pin 6) and the plate-voltage terminal (Pin 7, center). The antenna relay should also be removed, and the connection to the loading coil brought directly to the antenna change-over relay (discussed later).

The connections to either the socket of the 1629 tuning eye or to the crystal socket, should be removed, and a VR-150 voltage-regulator tube installed. The oscillator plate lead (which has previously been disconnected at the keying relay) should be connected to Pin 5 on the VR-tube socket. Then this pin should be connected to Pin 2 on the power connector. (This has also been disconnected previously at the keying relay.) Pin 2 of the VR-tube socket should be grounded to the chassis.

Power Supply

A single power supply serves for both transmitter and receiver. Its circuit is included in Fig. 1. A three-section filter is used to bring the hum down to a level suitable for receiver operation. The transformer T_1 was taken from an old tele-

* 165 Matthews St., R.F.D. 3, Bristol, Conn.

[1] McCoy, "Getting Started with the BC-454," *QST*, January, 1959.

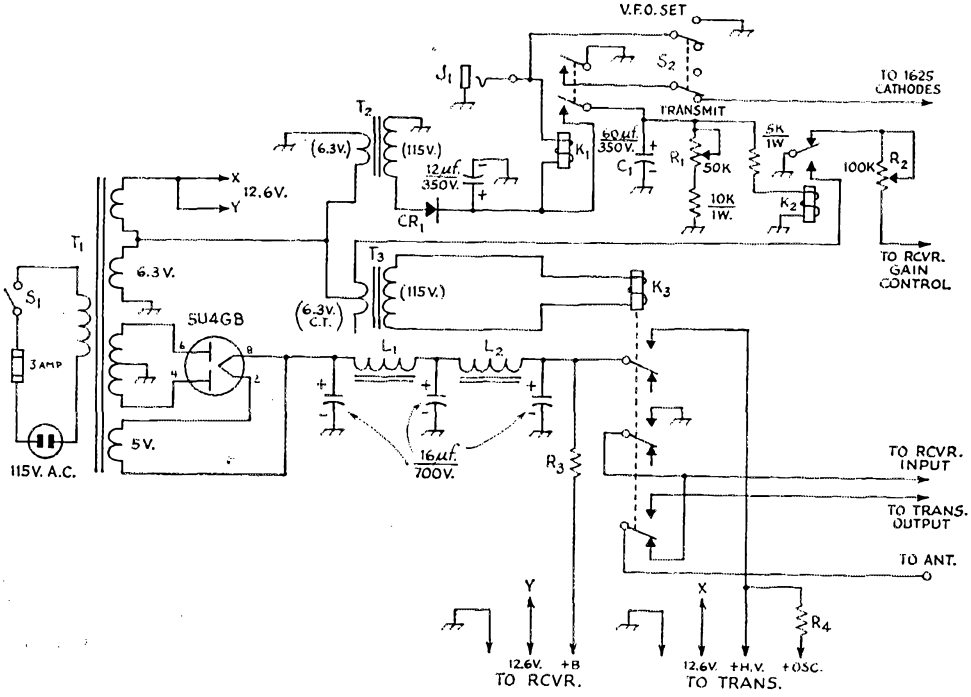
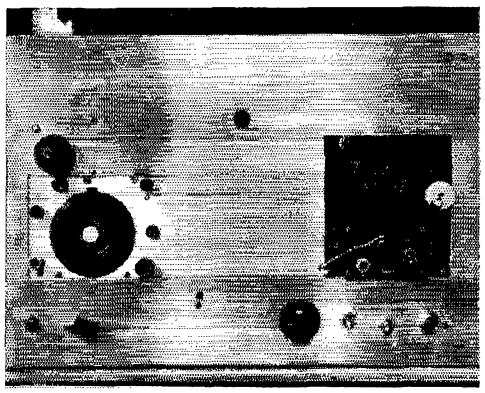


Fig. 1—Circuit of the automatic change-over system. Capacitors are electrolytic, and resistances are in ohms.

C_1—See text.
CR_1—100-ma. 130-volt selenium rectifier.
J_1—Open-circuit jack.
K_1—Double-pole 28-volt d.c. keying relay (see text).
K_2—10,000-ohm s.p.d.t. relay (Sigma type 10000-S/SIL or similar).
K_3—115-v. a.c. 3-pole double-throw change-over relay (P & B type KA14AY or similar).
L_1, L_2—4-hy. 250-ma. filter choke (Stancor C1412 or similar).
R_1—50,000-ohm potentiometer.
R_2—0.1-megohm to 0.5-megohm potentiometer.
R_3, R_4—See text.
S_1—S.p.s.t. toggle switch.
S_2—D.p.d.t. toggle switch.
T_1—Power transformer, television-replacement type, 900 volts, c.t., 250 ma.; 5 volts, 3 amp.; 6.3 volts, 2 amp.; 6.3 volts, 4 amp. (Triad R-71A or similar).
T_2—6.3-volt 1.2-amp. filament transformer (Thordarson 21F09).
T_3—6.3-volt c.t., 1.2-amp. filament transformer (Thordarson 21F09).

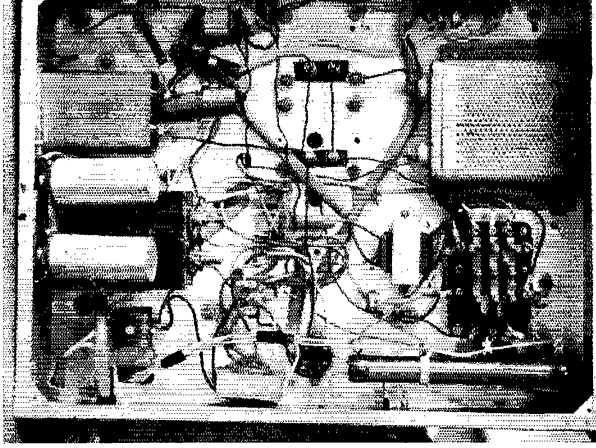
vision receiver. It has two 6.3-volt heater windings which should be connected in series to provide the necessary 12.6 volts for the transmitter and receiver. Similar transformers are available as standard catalog items with high-voltage windings delivering from 600 to 900 volts, center-tapped. More output will be obtained with the higher voltages, of course. One of the heater windings also supplies primary power for relays in the keying system. The heater winding having the higher current rating should be used for this purpose.



Panel cutouts provide access to the transmitter and receiver controls.

Resistor R_3 drops the voltage from the supply to a suitable value for the receiver. It should be a 20-watt unit having a resistance of 1000 to 2000 ohms, depending on the output voltage of the supply. A value should be selected that will limit the voltage at the input terminal of the receiver to about 250 volts when the receiver is operating. A 2000-ohm unit with a slider is suggested. R_4 is the series resistor for the VR tube controlling the oscillator plate voltage in the transmitter. This should be a 25-watt unit having a resistance of between 5000 and 10,000 ohms. Its value should be adjusted so that the VR tube will just stay ignited when the key is closed. Here again, a resistor with a slider for adjustment will be most convenient.

As shown in the photographs, the main power-



Bottom view of the 80-meter c.w. package. The antenna change-over relay is at the lower right.

supply components are mounted on the chassis, between the transmitter and receiver.

Keying and Control Circuit

As many others have pointed out, it is virtually impossible to key a v.f.o. without either chirps or clicks, or both. In this installation, the transmitter is keyed in the cathode circuit of the amplifier and the oscillator runs continuously during transmitting periods. However, the oscillator is turned off automatically during receiving periods.

The keying circuit is included in Fig. 1. The lead previously brought out from the 1625 cathodes in the transmitter is connected to one contact of K_1 through one pole of S_2, as shown. The lead previously brought out from the receiver gain control is connected to the normally-open (back) contact of K_2 through a 100K variable resistor, R_2, also as shown in Fig. 1.

The coil of K_1 is energized from a d.c. supply which includes T_2, a reverse-connected filament transformer, whose primary power is supplied from one of the 6.3-volt windings on T_1. When closed, the key completes the d.c. circuit causing K_1 to close. With S_2 in the transmit position, one pole of K_1 keys the 1625 cathodes, while the other pole simultaneously closes the coil circuit of K_2 which also operates from the d.c. supply. The opening of the back contact on K_2 reduces the receiver gain. The simultaneous closing of the front contact of K_2 causes the coil of K_3 to be energized through T_3, another reverse-connected filament transformer, which also receives the primary power from a 6.3-volt winding on T_1. The contacts of K_3 transfer the antenna to the transmitter, short the receiver antenna terminal to ground, and apply high voltage to the transmitter. This completes the action of the circuit when the key is closed.

When the key is opened, K_1 will open immediately, opening the cathode circuit of the 1625s and disconnecting the coil of K_2 from the d.c. supply. However, K_2 will not operate immediately because of the charge on C_1. This delay keeps all circuits in the transmit condition so long as normal keying is continued. After a suitable pause in keying, however, K_2 will operate, restoring receiver gain, and K_3 will then return the antenna to the receiver, unground the receiver input and cut the high voltage from the transmitter.

The selenium supply for K_1 and K_2 delivers about 150 volts, no load. This voltage drops to about 25 under the relay load. The output voltage of T_3, which supplies the 115-volt a.c. antenna change-over relay K_3, is increased by feeding the 6.3-volt input into only half of the primary of T_3. This assures rapid and positive relay operation.

The v.f.o. may be set to frequency without keying the amplifier by turning S_2 to the v.f.o.-set position. This turns on the oscillator, while the amplifier cathode circuit is open.

Receiver gain is a function of both R_2 and the gain control previously installed. With K_2 in the transmit position, the receiver gain control should be set to the transmitter signal. Then, with K_2 in the receive position, R_2 serves as the normal gain control. This system of control has been in use now for several months and has been flawless in its operation. Essentially the same system can be applied to almost any other transmitter-receiver combination. As the photographs indicate, most of the components used in the control circuit and power supply were found in the junk box or in surplus. Components listed under Fig. 1 are suggested substitutes where equivalent surplus items cannot be obtained. QST

Strays

FEEDBACK

The article "After Sunspots — What?" in the March *QST* said the first WAC on ten was accomplished by W6FQY. The first WAC on ten was actually made by W3FAR who received his award on June 25, 1936. Our apologies.

— • • • —

In Fig. 1, page 17, May 1960 *QST*, the value of C_2 for a 21 Mc. filter is incorrect. The capacitor should be a 200-μf. 500-volt mica.

— • • • —

KN8OUO explained to his mother that he could go on phone when he received his General license. Next day, when he brought home a pair of earphones for his rig she reminded gently:

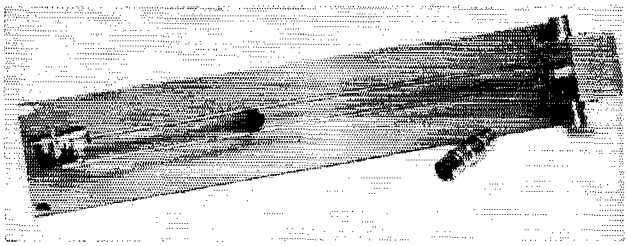
"But you can't use those til you get your General license, can you dear?"

— • • • —

K2QWF wants to organize a net for men in the U. S. Coast Guard Auxiliary, especially in the New Jersey-Connecticut area. Anyone interested, please get in touch with him.

— • • • —

WA6DOU reports that W6LRT and K6LRT are both named Blankenship, although they are not related.



The standing-wave bridge built by W8FKC. Parallel line is a balun with an adjustable short (small black knob) for adjustment of the resonant frequency. Device in foreground is a laboratory standard 50-ohm load, though a suitable substitute can be made readily from low-cost components.

A Simple Balanced Bridge for 200 to 1300 Mc.

U.H.F. Coaxial S.W.R. Bridge

BY R. W. BURHANS,* W8FKC

A STANDARD laboratory instrument for measuring impedance and standing-wave ratio in the u.h.f. region is the slotted line, a device not generally available to amateurs. (A rare piece of surplus, the TS-56 A/AP, covering 300 to 1500 Mc., is sometimes found in amateur shacks.) Use of slotted lines is tedious and time-consuming compared to the s.w.r. bridge used at lower frequencies. The main goal of most amateurs is to adjust an unknown load such as an antenna to allow it to be fed through line having a low s.w.r. A balanced bridge is one of the simplest methods of doing this job, but there is little in amateur journals on the use of the s.w.r. bridge technique above 150 Mc. This need not be the case. A recent short article in a trade journal[1] suggests the use of a coaxial balun transformer feeding opposite arms of a symmetrical resistance bridge.

The major problem with a coaxial bridge circuit at u.h.f. is the elimination of residual phase unbalance in the bridge circuit itself. Most of those who have tried resistance bridge techniques as applied to h.f. have given up this approach at u.h.f. A balun transformer has the interesting property of providing equal amplitude, but out of phase voltages at its balanced end from a single coaxial source. This is precisely what is needed to feed a resistance bridge with coaxial line terminations.

The circuit diagram of the bridge is shown in Fig. 1. The author chose a 1:1 balun, whose length is adjusted to a quarter wavelength for the frequency in use by means of a sliding short across the line. This allows the bridge to be used over a wide frequency range merely by moving the position of the short. The balun can be any maximum length. Making it 16 inches overall permits operation down to about 200 Mc. Increasing the length to 21 inches will extend the range down to 144 Mc. Spacing of the balun, *S*, should be less than 0.1 wavelength at the highest frequency to be used. The one shown is spaced ¾ inch. This is a bit wide at 1300 Mc., but the bridge has a residual s.w.r. of only 1.05 at this frequency, when comparing equal terminations. At 220 and 432 Mc., the bridge gives essentially a *perfect null*; i.e., s.w.r. of 1.00 with equal terminations.

Conventional baluns of coaxial line (see ARRL *Handbook* or *Antenna Book*) may be used in making a bridge of this type for use on one band. If provision is made for detaching the baluns, additional ones can be made up for other bands, but the sliding-short type used here is a more convenient and flexible approach. The balun made with a half-wave loop of coax gives a 4:1 impedance step-up, but it can be used in the same manner as the 1:1 balun shown.

The main construction feature to observe is to make the construction and wiring as symmetrical as possible. The bridge, exclusive of the balun, is built in a small Minibox, with the balun emerging from one side through holes insulated with sheet polystyrene. The holes should be at least 3 times the diameter of the balun tubing.

The balun is made of ⅛- or ¼-inch copper tubing. The impedance of the coaxial portion is not important, and it can be made by pulling any well-insulated wire through the length of the tubing. A length of small coaxial line, with its outer shield removed if necessary for fitting it in the tubing, may be used. Preferably the wire and its insulation should make a smooth fit inside the copper tube. The tubing that comprises the line should be kept bright, so that the sliding short will make good contact.

To use the bridge with full accuracy it is necessary to obtain a good coaxial standard. A fairly good one is the General Radio 874-WM which is a ½-watt 50-ohm termination good to about 5000 Mc. If this termination is used, General Radio coaxial fittings are necessary, or suitable adapters must be made for the bridge. (Type N or BNC fittings can be used on the bridge itself instead of the modified GR 874 B

* R. D. 1, Scotland Drive, Chagrin Falls, Ohio.

[1] Rice, "Use of a Precision Coaxial Terminating Resistor in a UHF SWR Bridge," *Electrical Design News*, June, 1959, p. 40.

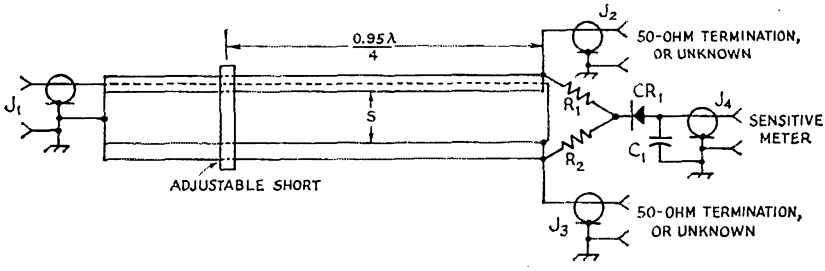


Fig. 1—Schematic diagram of the u.h.f. s.w.r. bridge. Balun, left, can be any length. Spacing, S, should be less than 0.1 wavelength at the highest frequency at which the bridge will be used. See text for other mechanical details.

C_1—100-$\mu\mu$f. button mica.
CR_1—IN21B diode.
J_1, J_2, J_3, J_4—Coaxial fitting. J_2 and J_3 should preferably be type N or BNC.
R_1, R_2—50-ohm ± 1 per cent carbon.

connectors used by the author.) A reasonably good termination can be made by soldering a ½-watt, 5 per cent, 51-ohm carbon resistor in a type N or BNC cable fitting.

Operation

A signal generator or suitable low-power oscillator is coupled to the coaxial end of the balun and a termination plugged into one side of the bridge, leaving the opposite arm open circuited. The output of the signal generator is adjusted to give a deflection on a suitable indicating instrument such as a 100-μa. meter, with a transistor current amplifier if needed. A modulated signal source and an a.c. v.t.v.m. can also be used for indication. The sliding short is adjusted to give a maximum on the indicator. After this the short is locked in place and the termination moved to the opposite arm of the bridge. The indicator should read the same if the bridge is operating properly. If another matched load is now plugged into the open terminal a low reading or null will be indicated on the meter. The depth of the null is a measure of how low the s.w.r. is.

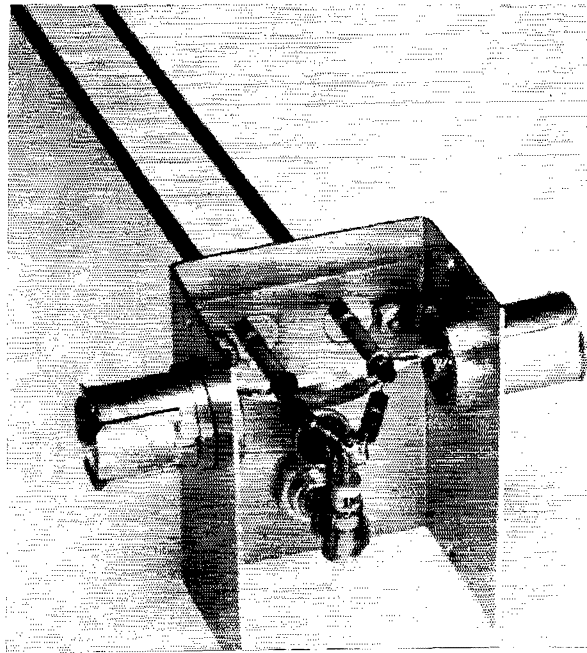
An unknown impedance such as an antenna system can now be connected to the open arm of the bridge. Since the bridge is balanced, either side can be used as the measuring terminal, with the opposite side as the standard. The unknown load is then pruned or adjusted to give the lowest possible reading on the indicator. The s.w.r. found by comparing the full-scale reading V_o (with one arm open circuited) with the null reading V_r (with the load connected). The s.w.r. is:

$$s.w.r = \frac{V_o + V_r}{V_o - V_r}$$

A plot of this equation is the same as the familiar graph of the reflection coefficient found in the *Handbook* and used with reflectometer-type s.w.r. devices at lower frequencies, if the full-scale reading is set at 1.0.

Bridge devices have their limitations, but they are certainly among the quickest and easiest s.w.r. measuring instruments to use. This particular model suffers from some hand-capacity effect, as the balun is hot for r.f. where it emerges from the box. This can be cured with a simple trough shield with an open top. Even without a shield, the bridge gives accurate s.w.r. indication. Performance of the bridge was compared with a TS-56 A/AP slotted line. Over the range of 320 to 1300 Mc. the bridge gives the same s.w.r. value as the slotted line with a precision of about ±.05 when comparing the same load. This is more than sufficient for most amateur work with antennas, feed systems, and input-output circuit matching.

The author has found this device handy for adjusting the input and output circuits of cavity-type parametric amplifiers, for checking s.w.r. of noise generators, and for the usual antenna matching problems. QST



Interior view of the u.h.f. s.w.r. bridge, inverted from the position of the other photograph. Coaxial fitting supporting the crystal diode is used to connect a meter for reading diode current.

Those who lack space for a horizontal antenna for 80 or 40 meters may be able to take advantage of this method of feeding the towers that support their higher-frequency beams or wire antennas.

80-Meter Operation with Shunt Drive

BY GENE HUBBELL,* W9ERU

Feeding Grounded Towers As Radiators

With the diminishing sunspot activity, the higher-frequency bands are going dead earlier in the day, and the natural result is a swing to greater use of 40 and 80 meters. The big trouble for most hams wanting to use 40 and 80 meters is a lack of space for horizontal antennas. As a result, many more vertical antennas are being used. Many hams have towers or pipe masts to support rotary beams for 10, 15 or 20, or some combination of these bands. If such a tower or support is insulated at the bottom and is unguyed, the beam and rotor cables may be decoupled by a trap tuned to the operating frequency, and a tuning network inserted between the base and ground. If, as is more often the case, the tower is grounded and guyed with uninsulated guy wires, a somewhat different approach is necessary. This article is to describe how we fed two grounded towers at W9ERU for work on 80 meters.

First Test

Tower Number One was a 64-foot self-supporting TV tower, tapering from about eighteen inches on a side at the bottom to about four inches at the top. The base was a large Y-shaped affair of 6-inch channel iron, held in the ground by three pipes running into concrete extending some four feet into the ground. The tower was guyed by one set of 3 wires, broken up with large egg insulators, to take the strain of a horizontal dipole, which was all this tower held up.

* Box 273, R.R. 4, Rockford, Ill.

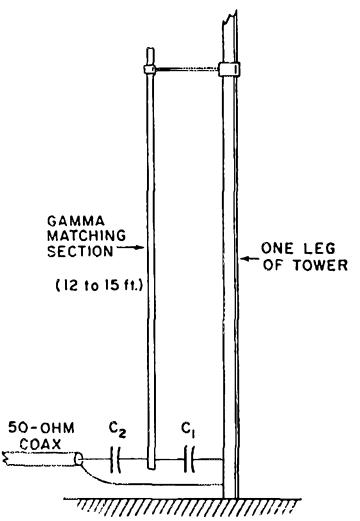
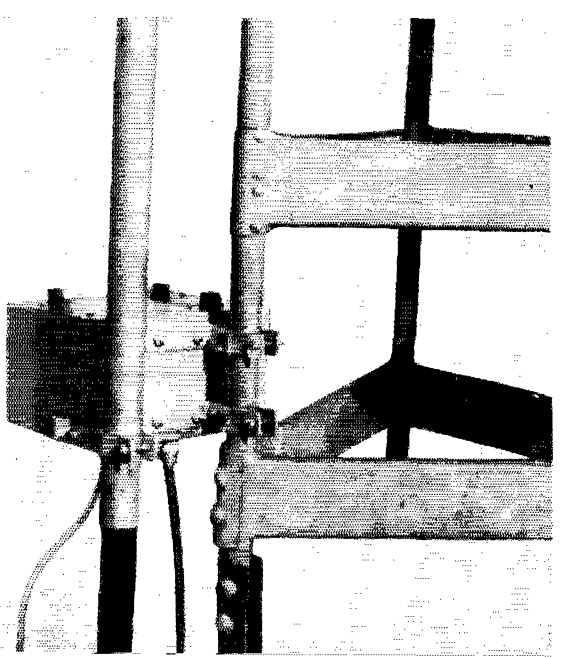


Fig. 1—Dimensions and values used by W9ERU in shunt-feeding a 64-foot tower. Capacitor types and ratings are discussed in the text. Capacitor connections shown are made as close as possible to bottom ends of tower leg and matching section.

C_1—400 to 500 $\mu\mu$f. C_2—250 to 350 $\mu\mu$f.

Now, this tower resembled, to some extent, one half of the driven element of the 20-meter beam in use at W9ERU; that is, it was approximately resonant at the desired frequency, was grounded at the base, and would have to be shunt fed. So the same feed system was tried that worked very well on the rotary beam — a modified gamma, or omega match. This type of feed system is illustrated in Fig. 1. A crude temporary lash-up proved that it would work, and a more finished job was installed. With this arrangement the s.w.r. was found to be reasonable (2 to 1 or less) over about 100 kc. of the 3.5-to-4-Mc. band,



A close-up view showing the mounting of the tuning box. The polystyrene aircraft insulator supporting the gamma matching section may not be needed if the clamping arrangement is sufficiently rigid.

and adjustments could be made to place this 100 kc. anywhere in the band. After proving the worth of this installation, we felt it desirable to use the circuit of Fig. 2 so that the antenna could be used at both ends of this band. When operating on the low end of the band a small relay is actuated, which adds capacitance as shown. The extra capacitance is required for work at the low end of the band. The relay and capacitors are mounted in a weatherproof metal box at the base of the tower as shown in the photographs.

Ground System

The second installation at W9ERU was made on a 60-foot fold-over tower which holds up a full-size, three-element 20-meter beam with a 20-foot boom. This tower is about 12 inches on a side and is set in a block of concrete 2 feet square and 3 feet deep. It is guyed four ways at the hinge point near the midpoint of the tower, and these guy wires are insulated at top and bottom. A single set of capacitors was used and this tower was found to give satisfactory performance as a vertical radiator, but with considerably less band width for a satisfactory s.w.r. The narrow band width (about 25 kc.), was attributed to the fact that its resonant point is farther from the operating frequency than the first tower.

In an effort to improve the bandwidth a ground system was installed. This system consists of fifteen 66-foot lengths of No. 12 tinned copper wire connected to four ground rods, each 4 feet long, driven in at the base of the tower. The ground rods, tower legs and all inner ends of the ground wires were connected together. No detectable change was noticed when the ground system was installed — at 3.5 Mc., that is. On 20 meters there was a distinct difference in the performance of the beam — but that is another story. Either the tower was well grounded in the first place, or the radial ground system was not large enough to make any substantial change.

Forty Meters

While both of these installations were made for use on 80 meters, there is no reason why such a system could not be made to work on 40, and it should result in good low-angle radiation so long as the tower and beam represent $\frac{5}{8}$ wavelength or less. With lengths over $\frac{5}{8}$ wavelength, a considerable lobe of high-angle radiation appears and results would probably not be too good. So far no effort has been made to use either tower at W9ERU for 40-meter work, mostly because of bad weather and existence of a 60-foot vertical radiator already in use on this

(*Continued on page 140*)

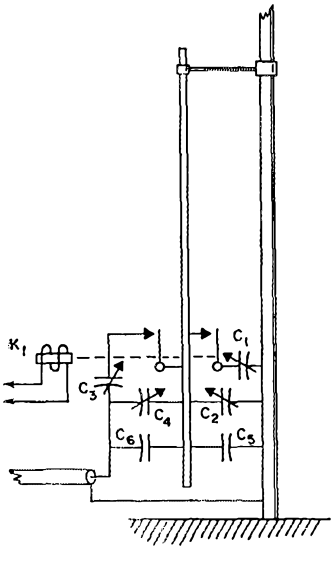
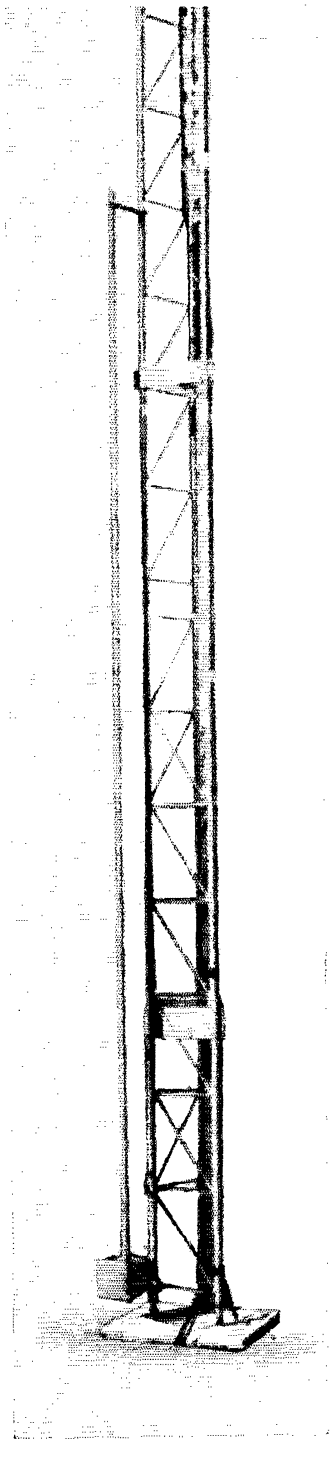
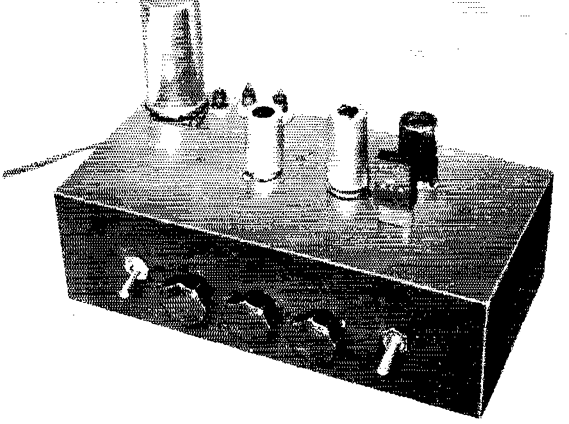


Fig. 2—This arrangement, left, makes it possible to adjust for low s.w.r. at two points in the band. See text for capacitor types and ratings. Capacitor connections shown are made as close as practicable to bottom ends of tower leg and matching section.

C_1, C_2, C_3, C_4—120-$\mu\mu$f. variable.
C_5—300-$\mu\mu$f. fixed.
C_6—200-$\mu\mu$f. fixed.
K_1—Antenna change-over type relay.



Lower portion of one of W9ERU's towers showing the gamma matching section.



The 3-band crystal converter is assembled on a 5 × 10 × 3-inch chassis. The 6AK5s are on either side of the 6J6, with the crystal to the right. The dual filter capacitor is in the rear left-hand corner. Controls along the front, from left to right, are those of the power switch (S_1), C_1, C_2 and C_3, and the injection-frequency switch (S_2).

Improving the Performance of the Low-Priced Receiver

A Single-Crystal Converter Covering 3 Bands

BY ARTHUR S. GILLESPIE, JR.,* W3JHT

The crystal-controlled converter has long been the least costly answer to the problem of receiver stability at the higher frequencies. This one does the job with a single crystal for three bands. If you own a receiver that's good on 40 and 80, but shaky and unresponsive on 20, 15 and 10, this simple addition will be a revelation.

While many low-priced amateur receivers perform satisfactorily at 80 and 40 meters, they perform very poorly at 20, 15, and 10 meters. Sensitivity, image rejection, and bandspread fall off with increase in frequency, and poor receivers are inclined to drift considerably at the higher frequencies. These problems can be greatly reduced by the use of a good converter working into one of the receiver's low-frequency ranges where stability is satisfactory. While well-designed and constructed tunable converters may function satisfactorily, they must be carefully constructed, are comparatively expensive, and freedom from drift is hard to obtain. In using a crystal-controlled converter, the over-all stability and bandspread on the higher-frequency bands are the same as those for the receiver when the latter is operating at low frequencies and, as a rule, the gain is increased tremendously. Image problems are usually completely eliminated.

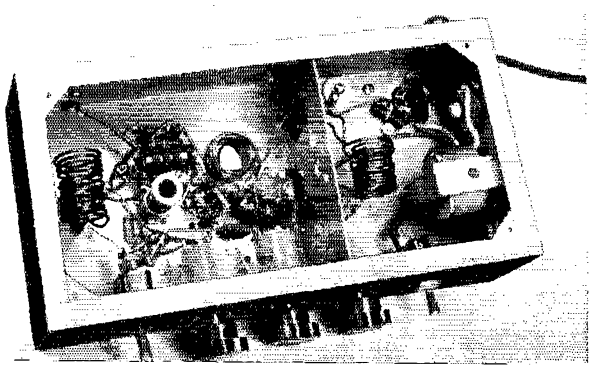
* 141 Michigan Ave., New Kensington, Penna.

Some years ago, W3FQB described a tri-band converter using a single 6-Mc. crystal.[1] A similar converter was built at W3JHT about a year ago and used with some success. While the converter functioned adequately on the 14-Mc. band, its output was somewhat less than that needed on the 21- and 28-Mc. bands. Extensive experimentation showed this deterioration in performance at high frequencies was due to a lack of sufficient signal injection at 12 and 18 Mc. from the 6-Mc. crystal. Our converter is similar to the W3FQB converter, but stronger injection signals, as well as a choice of injected frequencies, are provided.

Circuit

The circuit of the converter is shown in Fig. 1. Type 6AK5s are used in the r.f.-amplifier and mixer stages. One section of a 6J6 is used as a crystal oscillator employing a 6.2-Mc. crystal, while the other section is used as a doubler, tripler, or quadrupler, depending on the setting of capacitor C_3. S_2 picks off the injection signal from either the oscillator section or the multiplier section of the 6J6. By such a system injection frequencies of 6.2, 12.4, 18.6, or 24.8 Mc. can

[1] Montgomery, "A Tri-Band Crystal Converter," *CQ*, June, 1951.



This interior view shows the chassis divided into two compartments by a baffle shield. The r.f.-stage and power components are to the right. The compartment to the left contains the tuned circuits for the mixer and oscillator.

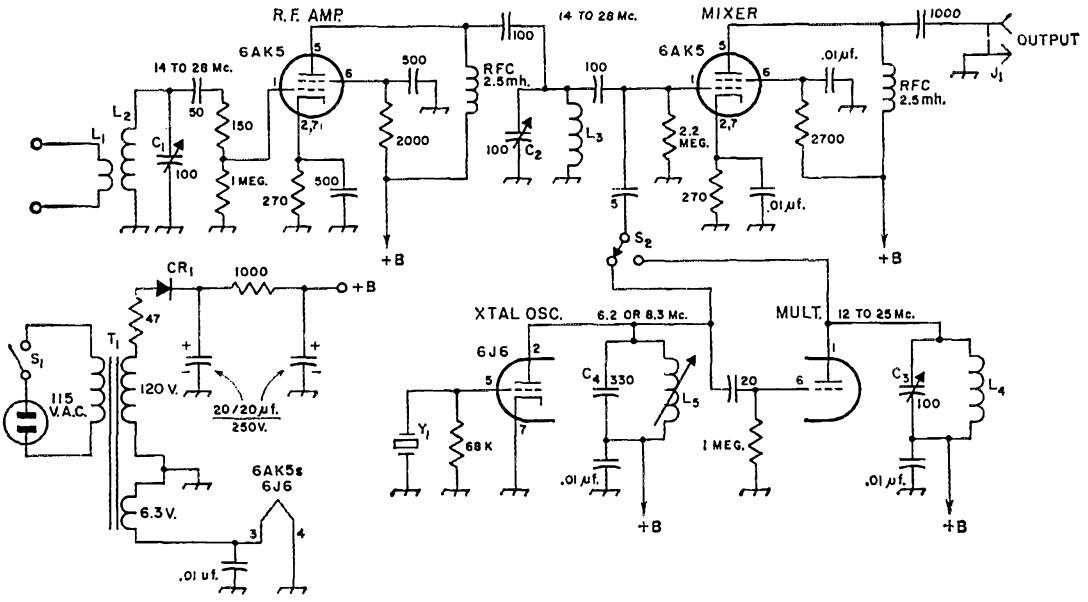


Fig. 1—Circuit of the 3-band crystal-controlled converter. Unless otherwise indicated, capacitances are in μμf. and resistances are in ohms. Fixed capacitors of 500 μμf. or more are disk ceramic except when marked with polarity which indicates electrolytic. Fixed capacitors of less than 500 μμf. should be mica or stable ceramic. Resistors are ½ watt.

C_1, C_2, C_3—100-μμf. variable (Hammarlund APC-100-B or similar).
C_4—330-μμf. mica or stable ceramic.
J_1—Phono jack.
L_1—4 turns No. 14, ¾-inch diam., ⅜ inch long.
L_2, L_3—11 turns No. 14, ¾-inch diam., ⅝ inch long.
L_4—13 turns No. 14, ¾-inch diam., 1⅜ inches long.
All above are self-supporting.
L_5—12 turns No. 24 enam., ½-inch diam., 11/16 inch long on iron-slug form (National XR-50 form).
S_1—S.p.s.t. toggle switch.
S_2—S.p.d.t. toggle switch.
CR_1—20-ma. selenium rectifier.
T_1—Power transformer: 120 volts a.c., 20 ma.; 6.3 volts, 0.8 amp.

be selected, while only a single crystal is required. A variety of tuning arrangements are provided for each band. Some of these combinations are:

Band (Mc.)	*Injection Freq. (kc.)*	*Receiver Tuning (kc.)*
14	6200	7800–8150
14	12,400	1600–1950
14	18,600	4600–4250
14	24,800	10,800–10,450
21	12,400	8600–9050
21	18,600	2400–2850
21	24,800	3800–3350
28	18,600	9400–11,100
28	24,800	3200–4900

It should be noted that when the injection frequency is higher than the operating-band frequency, the receiver tunes backwards. Generally the lowest tuning range available gives the best performance.

Command Receivers

In the event that an ARC-5 receiver capable of tuning the 3–6-Mc. range is available, an 8.330-Mc. crystal could be substituted for the 6.2-Mc. crystal in the converter and all three bands could be covered, since this receiver has a little overlap at the ends of its tuning range. Tuning would be in the forward direction on all bands. No circuit values need be changed, but the slug in L_5 would be adjusted so that the circuit L_5C_4 tunes to 8.330 Mc. Injection frequencies of 8.330 Mc., 16.660 Mc., and 24.990 Mc., selected by the proper settings of S_2 and C_3, would be used for tuning the 14-, 21-, and 28-Mc. bands, respectively. Either of the two crystals (6.2 or 8.330 Mc.) are available from surplus suppliers for less than a dollar.

While power could be taken from most communications receivers, our receiver was already burdened with a Q multiplier and crystal calibrator, so it was decided to include an integral power supply.

Construction

The converter is built on a 5 × 10 × 3-inch chassis. Placement of the parts is not critical except that the input and output sides of the r.f. stage must be carefully isolated. Coils L_2 and L_3 should be at right angles to each other. A shield cut from sheet aluminum is notched to fit close against the ceramic tube socket of the r.f. amplifier tube. The shield runs between Pins 1 and 7 and Pins 4 and 5. Plastic tape stuck to the metal prevents shorting of these pins to ground. The shield should touch all four sides of the chassis box including the bottom plate. Self-oscillation

(*Continued on page 144*)

Transmitter Hunting on the 4-Mc. Band

D. F. Loop for 75

BY F. J. M. MARSHALL,* VE4CX

In many sections of the country transmitter hunts are regularly-scheduled events during the summer months. Why not build this simple loop for 75 and get in on the fun?

Most readers of *QST* are familiar with the tremendous interest and keen competition in hidden-transmitter hunts in various sections of the country. Success in these hunts depends to a large degree upon the equipment used, particularly the effectiveness of the directional loop employed. The 75-meter loop shown in the accompanying sketches is relatively simple and inexpensive to make and has proved to be highly effective.

The loop circuit is shown in Fig. 1. The loop is tuned by capacitor C_1 and the output is fed through a length of coax cable to a box enclosing L_1, L_2, R_1 and S_1, and thence through coax cable to the receiver input. A coax cable is also brought from the whip antenna to the box as shown. The whip serves as a sensing antenna, and its signal is coupled into the receiver through L_1 and L_2.

* 370 Centennial St., Winnipeg, Manitoba, Canada.

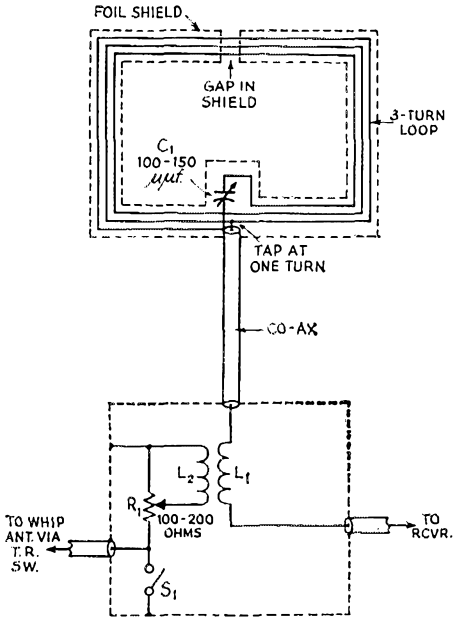


Fig. 1—Loop and sensing circuits. C_1 is an air trimmer having a maximum capacitance of 100 to 150 $\mu\mu$f. (Hammarlund APC-140 or similar, see text.) R_1 is a composition (noninductive) potentiometer having a maximum resistance of 100 to 200 ohms. S_1 may be of the toggle or rotary type. L_1 and L_2 each consist of 4 turns of hookup wire about 1 inch in diameter, the two coils being taped together. The dashed rectangle below the loop indicates a small box mounted so as to be convenient to the operating position.

The loop consists of 3 turns of approximately No. 14 wire, wound on a rectangular frame made of 1 × 2 furring strip as shown in Fig. 2. After the sides of the frame have been glued and nailed together, a table saw is used to cut 4 slots, as shown in Fig. 2B, running around all four sides of the frame. A space is routed out at the center of the bottom side of the frame as shown in Fig. 2D. This provides a means of shifting the wire from one slot to the next in winding the loop, and space for making connections. A pair of holes should be drilled for the leads to the tuning capacitor.

The loop is shielded against capacitive pickup by wrapping the four sides with aluminum foil. The foil is a single piece 8 inches wide and long enough to extend around the perimeter of the frame. After the loop has been wound, place the frame, bottom down, at the center of the strip and glue or cement the foil to the bottom of the frame. Then, bring the foil up along the sides and across the top, cementing the foil on as you go. Before cementing the two ends across the top of the frame, cut the foil so that there will be a gap of about ½ inch at the center.

Now, starting at the bottom, carefully wrap one side of the foil around the frame. To make a neat job, make diagonal cuts in the foil at the corners. When one side of the foil has been wrapped on all four sides of the frame, wrap the other side of the foil around the frame (in the opposite direction, of course). The seam that remains can be closed with solder. If you have some aluminum flux, you will be agreeably surprised how easily the job can be done. As an alternative, the foil can be held in place by a complete wrapping of tape around all four sides of the frame. If the soldering method is used, the ends of the foil at the gap on the top side of the loop should be held secure with tape. On the bottom side of the bottom strip of the frame, carefully cut an opening in the foil corresponding to the routed-out area.

For C_1, I was able to find an old i.f. transformer that had a tuning capacitor of the right value and whose width was a hair greater than the width of the frame. Slits about ¾ inch long were cut upward from each of the four bottom corners. Two opposing sides were then bent outward to form flanges while the other two sides were fastened to the edges of the frame with

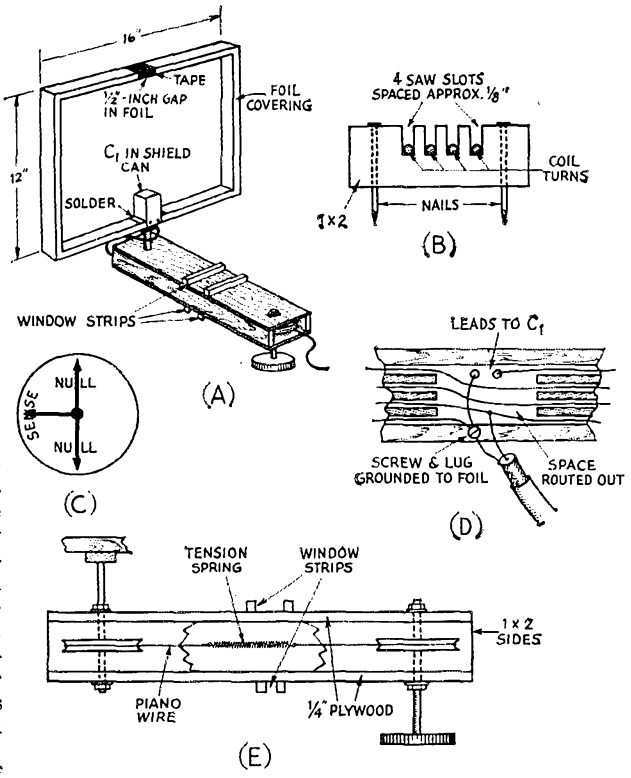


Fig. 2—Construction details of the loop. A shows the complete loop assembly. B shows the turns of loop wire lying in saw slots cut in the wood frame. The four sides of the loop are fastened together with nails as shown. C is a sketch of the indicator which should be cemented to the loop-control disk. D shows the method of making connections at the center of the bottom side of the loop. A small space is routed out to the depth of the saw slots. E shows the mechanism used to turn the loop. The top window strips should be spaced to fit the car window frame and the lower pair to fit the glass.

screws as shown in Fig. 2A. If you are not so lucky, a 140-$\mu\mu$f. APC type trimmer may be mounted in almost any type of shield can you may have or be able to get. The shield can may then be mounted on a bridge of aluminum sheet spanning the bottom strip of the frame and fastened in the same manner as shown for the i.f. can. Before mounting the can, connect insulated leads to the tuning capacitor and fish them down through the holes in the frame as you place the can in position on the frame.

Fig. 2E shows one method of mounting the loop and orienting it from a control inside the car. The wood box is made long enough so that the loop will clear the roof of the car in all positions. The box encloses a pulley drive system. No exact details are given since these will depend to a large extent on the parts you can come by most conveniently. The assembly is mounted by lowering a window of the car and clamping the box between the edge of the glass and the upper side of the window frame. The top pair of transverse strips should be spaced to fit the frame, while the lower pair is adjusted to make a simultaneous fit to the glass.

Adjustment

With S_1 closed, set R_1 at maximum resistance (arm at grounded end, shorting out L_2). With the car in a clear area (possibly a field or pasture), tune in a signal of known direction. Peak up C_1 for maximum signal. Rotate the loop. You should get two sharp nulls 180 degrees apart. These nulls should occur with the plane of the loop at right angles to the direction from which the signal is coming. Now rotate the loop 90 degrees so that one end is pointing toward the transmitting station. Open the switch and slowly advance R_1. If the signal becomes slightly stronger, reverse the direction of the loop so that the opposite end is pointing toward the transmitting station. You should now find a point on R_1 where the signal drops to a minimum.

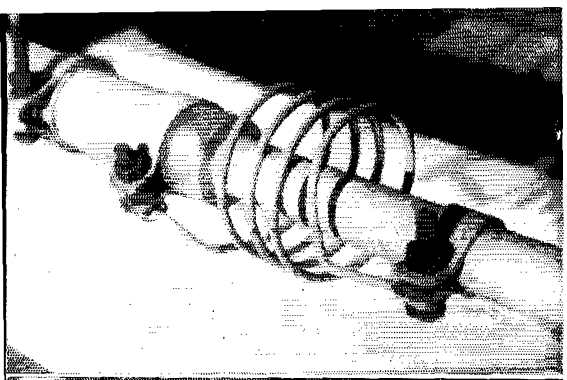
Set R_1 at this point, reverse the position of the loop again to the maximum-signal point and note the position of the control dial. Cement an indicator like the one shown in Fig. 2C to the dial so that the null arrows are at right angles to the plane of the loop and the sense arrow points toward the transmitting station.

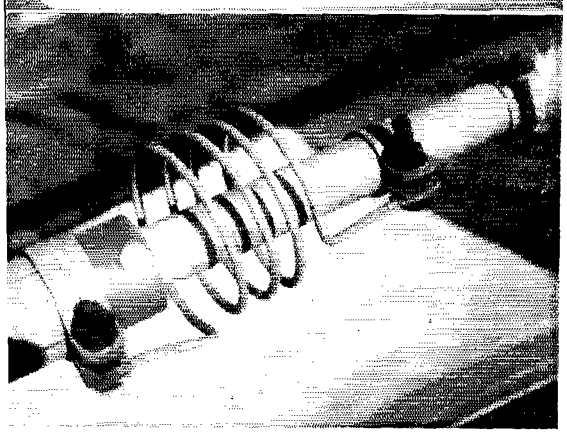
In operation, the loop is first swung with S_1 open and the loop turned for maximum signal on "sense." This establishes the general direction of the transmitter. Then, with the switch closed, the loop is rotated to either of the two nulls which are very sharp. This will give you a pretty good bead on the fox. After a bit of practice, you will find that you have a distinct "edge" on the next transmitter hunt.

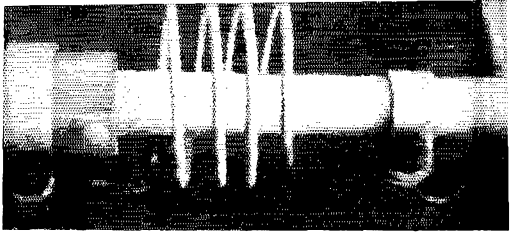
There are a few refinements that will be of appreciable assistance. An S meter is a very handy thing to have with this gear. Failing this, try installing a cutout switch on your a.v.c. system, and if your car receiver does not already have one, install an r.f. gain control.

A stationary ring around the indicator dial, with a mark indicating the heading of the car, will give a more accurate indication of the difference between the direction of the signal and the direction in which the car is heading.

If you are a real keen type, you might have enough enthusiasm to undertake the installation of a motor-driven loop, strapped to the roof like a luggage carrier, with a Selsyn indicator inside the car. Surplus aircraft indicators of this type are available and you may be able to steal the small amount of a.c. power required from your transistor power supply. QST







Congealed smog? This pride-shattering sight is the result of two and a half years' exposure.

"What's Up Top?"

BY JOHN G. TROSTER,* W6ISQ, ex-W2ISQ

Maybe taking this trouble periodically won't affect the way you get out. On the other hand, it's unlikely that mechanical deterioration can occur without an accompanying drop-off in electrical performance. The unquestionable reward is the satisfaction of knowing things are in tiptop shape.

"SAY, when was the last time you pulled down your rotary and took a look at it?" asked old pro W6MBA.

"Ohhhhh — coupla years ago," I answer. "But it must be O.K. because I can still work out fairly well, especially if no one else is calling."

"Well, it's a good idea to take a look at an antenna once in a while, clean it up a bit and make sure all the screws are tight," says MBA.

Now this man knows whereof he speaketh. Working 270-plus countries is not at all bad. Maybe I'd better spend an hour or so next Saturday and take a look.

So down comes the beam for a quick check — and up go my eyebrows in a long arch. Coils and elements are heavily pitted and corroded with a whitish powder and the bolts are rusted to a rich dark brown color. This must be congealed smog!

We learn that r.f. travels in the outer shell or skin of a radiator. It would seem probable that the cleaner the antenna surface, the better it would serve the intended purpose. Anything in the nature of corrosion would tend to decrease efficiency. Actually, I suppose there would be no noticeable difference to a listener between a kw. signal into a corroded antenna and a kw. into the same array all polished and gleaming. On the other hand, for a low-powered station even a few watts dissipated by an unkempt antenna might produce a noticeable effect.[1]

Frankly, I don't know how badly a corroded antenna will inhibit r.f. radiation, if indeed it does at all. But I do know this — which is much more important and to the point for most hams — a corroded antenna looks horrible. What's more, it completely shatters the pride of the owner! Clearly, a situation like this should sound the clarion call for action.

If it has been six months or more since you inspected your antenna, and especially if you've been through a long, hard winter, you owe it to your clear conscience to give your antenna an inspection.

Therefore, since antenna work-over weather is here for the rest of the country (it's always antenna work-over weather in W6), a brief review of dos and don'ts associated with refurbishing your beam might inspire you now.

Trap-Antenna Precautions

There is one thing to be sure of before taking apart any trap-tuned antenna. If you intend to work over the coils — and it's probably a good idea, especially if they are open wound — make certain that you know what frequencies the various traps should be tuned to before you completely dismantle the coil-capacitor assembly.

If your antenna is "store-bought", the resonant frequencies of the traps are always available in the directions for assembly or from the manufacturers. Also be sure that proper lengths of elements are available.

The reason for these precautions is that for proper operation a trap may have to be tuned to a frequency quite different from the ham band

* 45 Laurel St., Atherton, California.

[1] A paragraph of food for argument among the theorists! — *Editor.*

it is trapping for. Furthermore, unless the coils are tuned to this designed frequency, the beam won't resonate where it should within the band, and all your cleaning and polishing will have been in vain.

One additional word on the subject of trap frequencies. Don't rely on the frequency you may measure with your grid-dip meter, before you disassemble the trap coil assembly, to provide you with the proper resetting frequency. Out of curiosity I checked the frequencies of the open-wound coils on my tri-bander and, sure enough, they were off — not badly, but they weren't where they had been when I tuned them "on the nose" a few years ago.

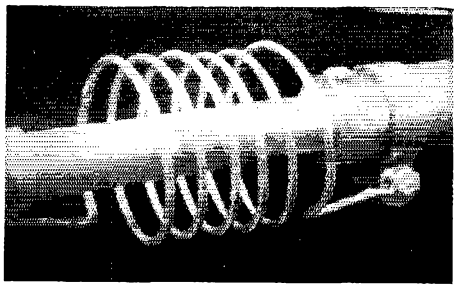
These coils may be detuned by a number of things. Weathering and corrosive effects account for much of the trouble. But I was to find out later that open-wound coils can be seriously detuned if they are bumped on the roof or against the chimney during assembly and erection. Anything that changes the positions of the coils relative to the tuning capacitance may cause some frequency change. I suppose a good heavy California sparrow could almost tune me up on 40 meters if he lit just right!

The moral here, however, is that if you recall banging your antenna (especially the coils) while you were assembling and raising it, chances are you may have detuned it some. This possibility alone might merit a quick check next Saturday.

Cleaning the Metal

The first mechanical step is to clean the corrosion off the coils and tubing. I began by using trisodium phosphate, which as a liquid is used to clean aluminum screens. I used the prescribed solution and also experimented with about every liquid concentration from almost a paste to practically pure water. Best results were obtained using a solution a little stronger than recommended on the package for screens. I found, too, that the corrosion just didn't dissolve and disappear in this elixir. It took some pretty heavy applications of elbow grease and steel wool. But the gleaming results were worth every groan. Be sure to hose off the coils and tubing and wipe them dry.

One word of caution about trisodium phosphate. In low concentrations, this chemical may be used as a water softener, but in the solution you would be using for removal of corrosion it is caustic and could burn you. Be sure, therefore, to wear rubber gloves to preclude any possible burn. Gloves also help save the hands from steel wool slivers.



Like new. Aluminum coils and elements after cleaning and painting with zinc chromate and aluminum paint. Those new bolts are cadmium-plated.

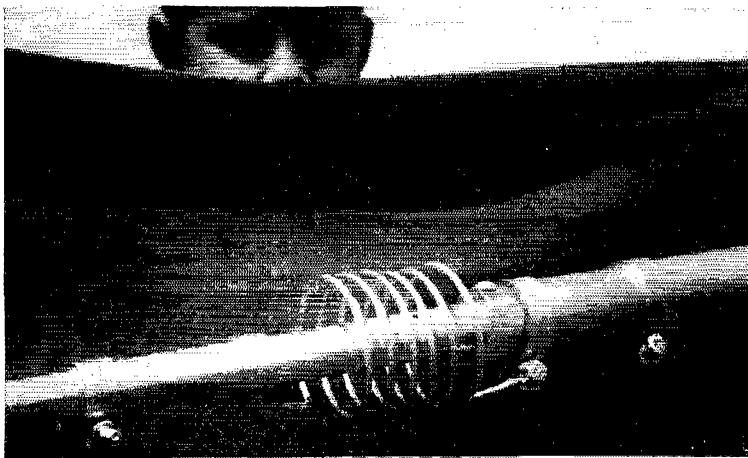
Corrosion-Proofing

If your tubing is not pitted and is in pretty good physical shape, you may wish to stop at this point and reassemble the antenna. However, in my case, the aluminum was so badly pitted that it seemed a fine idea to paint the coils and elements with something to keep them from corroding again. Zinc chromate is recommended for this sort of thing, so I applied a liberal coat to all coils and tubing.

Next morning I realized there had been a slight mistake. Zinc chromate doesn't carry electrons as aluminum does! So I spent several sad hours scraping long ribbons of zinc chromate from elements and coils, followed by vigorous steel-wooling where good bonding was necessary. This was harder work than the first steel-wooling session; so, if you decide to use a protective coat of something like zinc chromate, either be very sure you don't paint over an overlapping joint or junction point, or do your painting after you reassemble and retune your beam.

Another word of caution. Don't breathe too heavily around zinc chromate; it's dangerous to inhale it.

Zinc chromate is a sort of greenish yellow — or maybe it's yellowish green. Some jealous people might say the color blends splendidly with Los Angeles smog. However, aluminum still looks more attractive in a sparkling, conventional sort of way; so it was decided to paint the coils and elements with aluminum paint.



Assistant steel-wooler and painter holds backdrop to better display workmanship.

After my experience with the zinc chromate I decided to take advantage of the positive metal-to-metal bond available after a thorough cleaning job, and paint on the aluminum after assembly and tuning. There is one thing to beware of in painting with aluminum. Unless allowed to dry thoroughly, the paint tends to skid or crinkle as tight-fitting elements or coils are slid into adjustment. This is one more reason for delaying the painting until after complete assembly.

Odds and Ends

One last important item: Replace rusted or missing screws and bolts with high-quality stainless-steel or cadmium hardware, available at auto accessory shops. Also replace any damaged coupling clamps with aluminum ones of your own fabrication, or hose clamps.

Just before assembling the pieces, recheck the frequencies of the traps according to instructions (probably for the *n*th time). Then, after the beam is correctly and completely assembled and the final touch-up painting is completed, make one last check of all element dimensions. These little extras at this time are excellent peace-of-mind insurance.

Actually, all the cleaning, painting reassembling, and other jobs can be done in a few evenings after work — that is, unless you goof here and there as I did. However, if you will follow a few of the precautions outlined here, your job should go smoothly.

In the future, I intend to concentrate on preventive maintenance. A Saturday afternoon inspection every six months or so should catch any mechanical or electrical problems before they require full-scale treatment. For those of you who do not choose to paint your aluminum, a thorough steel-wooling every six months or so certainly would be in order.

I still don't know whether a corroded antenna will really dissipate r.f. to a significant degree. Maybe I'll never know. But I do know that the old beam is now sparkling like new again (go 'way, birdie). And even though no one else in the world knows or cares — I do! And that's important to any ham.

I guess it works all right, too. Worked VS9OC on the first short call after the beam went back up. Report: 599X. Guess W6MBA was right. It's what's up top that counts.

"Say, when was the last time *you* pulled down your rotary for a quick check?" QST

Strays

Elburn Byrd, WØVQE, lives on his farm alone and without a telephone. But when late spring snowstorms blocked all roads to his solitary home, he wasn't worried . . . until a heart attack began to develop as he was caring for his livestock.

"I finished the morning chores, however, and returned to the house, but as I kept feeling worse, I finally decided that I must have help as soon as possible.

"I turned on my equipment and tuned for a familiar voice on 40 meters and immediately heard KØBFH, Nina, at Wichita, Kansas. I broke in and asked her if she would put a long distance call through to a service station in Gilead, owned by a brother-in-law of my sister.

"Within a few minutes he was on the line. As my nephew was there at the station, he, my brother-in-law and the service station owner arrived in little over an hour with the aid of a neighbor and his tractor. In a few minutes, I was in the hospital at Fairbury.

"*I firmly believe that I owe my life to amateur radio.*"

WØVQE, now home from the hospital, says he must take it easy for a while and so will take the opportunity to get in plenty of air time. He has been helper as well as helped on the air, spending a day and night at his set just last summer to relay messages during the Yellowstone Park earthquake.

—•••—

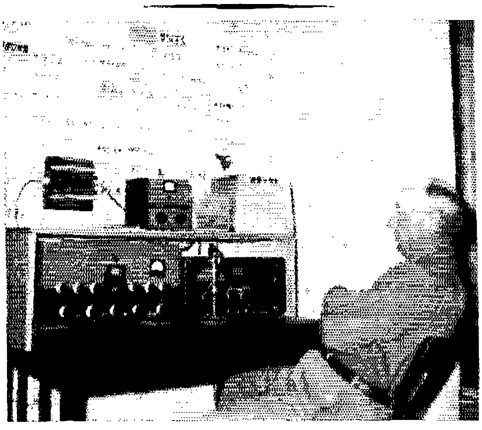
An unhappy footnote to the above story — on May 9 we learned that WØVQE has joined Silent Keys.

K2TDI, who has been reading the D-A-N-G-E-R strays, suggests that hams brief some member of the family on artificial respiration and safe ways to separate high voltage lines from a victim.

—•••—

In Selma, N. C., Jack Hatley of Wendell was conducting Civil Defense radio school one night. Explaining some technical functions of a radio transmitter, Hatley pointed to an ARRL *Handbook* on the instructor's desk and remarked: "This is the radioman's Bible."

"Yes," sighed a student, "and I got left back there in Genesis!"



WØVQE at his rig.

Hints and Kinks For the Experimenter

STAND-BY NOISE IN THE GSB-101

THE Gonset GSB-101 Linear Amplifier may cause noise in the receiver during standby periods, since the pi network is working at the operating frequency and there is high voltage present on the final tubes. This noise can be

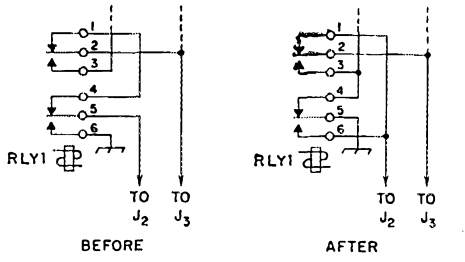


Fig. 1 — GSB-101 relay change eliminates noise generated in the final amplifier during standby.

easily eliminated by making a simple wiring change to the antenna relay as shown in Fig. 1. With this change, the output tank circuit is grounded during receive, preventing any noise from feeding through to the receiver.

— *John Hunt, WA6HXE*

NBFM WITH THE NC-300

THE diagram in Fig. 2 shows the circuit of the n.b.f.m. adapter built by W7LHL and myself.[1] The unit is built into a Bud CU2104 Minibox with an 8-prong octal plug mounted at one end. The unit is inserted into the NC-300 receiver's accessory socket. To receive n.b.f.m., turn the NC-300 mode switch to ACC. Limiting can be controlled by the receiver's r.f. gain control. The accompanying photograph shows the adapter mounted in the NC-300.

— *Len Garrett, W7JIP*

[1] "A new approach to F.M. Reception," *QST*, September, 1946.

FARM CATALOG ITEMS

THE Farm Catalogs of Sears Roebuck and Montgomery Ward offer many items of interest to the amateur. In addition to the electric fence wire (see Hints & Kinks, *QST*, January 1960) the catalogs list a variety of gasoline-engine-driven 117-volt a.c. generators. Another item of interest to the mobile ham is a 117-volt generator driven from the engine fan belt and designed for use in cars and trucks. Then there is the aluminum irrigation pipe for antenna masts and booms.

— *T. James Barnes, K9TFJ*

LIQUID TAPE

A CORROSION-RESISTANT liquid plastic distributed by General Electric can be used to protect couplings, fittings, antenna hardware, etc. The compound has the consistency of thick syrup and is dabbed on the object, or if the item is small enough it can be dipped into the substance. In a few hours the compound shrinks to a tight smooth coating and takes on the appearance of black plastic tape. This "Liquid Tape" can probably be obtained from local General Electric distributors. — *Richard W. Kitson, K1GSD*

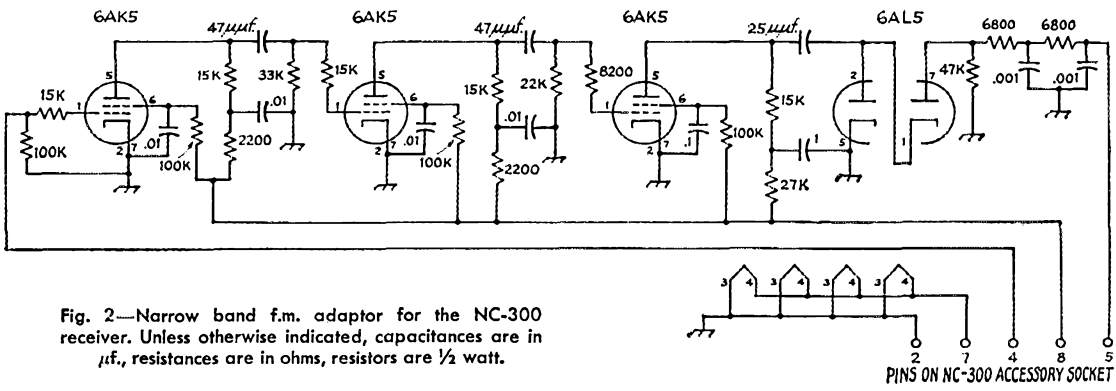


Fig. 2—Narrow band f.m. adaptor for the NC-300 receiver. Unless otherwise indicated, capacitances are in μf., resistances are in ohms, resistors are ½ watt.

• Recent Equipment —

The Hammarlund HQ-180 Receiver

THE HQ-180 is the latest in a long line of Hammarlund general-coverage receivers dating back to the HQ-120 of the period just before World War II. The 180 continues several of the features that were responsible for the wide acceptance of the general design, and adds new ideas to adapt it fully to present-day needs.

Eighteen tubes are used. Coverage is from 540 kc. to 30 Mc. in 6 ranges, with double conversion up to 7.85 Mc. and triple conversion on the two top ranges. The intermediate frequencies are 3035, 455 and 60 kc. The first i.f. (3035 kc.) has a permanently-connected crystal filter, which imparts a degree of selectivity where it will do the most good, early in the i.f. system. This is helpful in keeping down cross-modulation and other overloading problems on the higher bands.

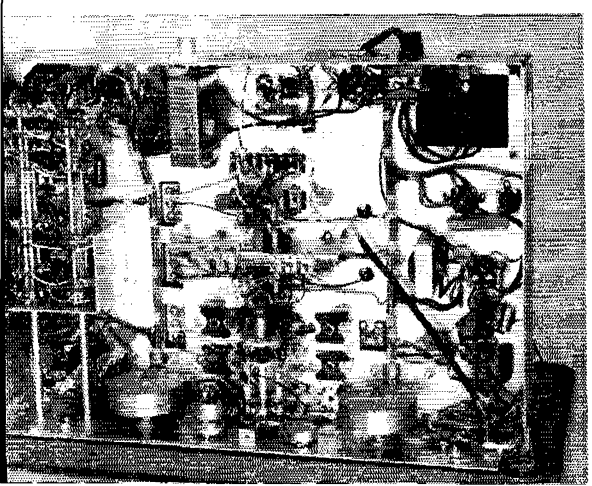
Operating features include fast-attack a.v.c. with adjustable decay, continuously-variable noise limiter, adjustable slot filter, 100-kc. crystal calibrator, provision for VOX operation, sideband selection, and automatic clock-timer. The friction-drive dials have the solid feel and easy readability that have characterized the HQ line of receivers in the past. The amateur bands from 3.5 to 21 Mc. are broken down to 5-kc. divisions and the 28-Mc. band to 10-kc. divisions. Because there are six positions on the band switch (rather than the four or five more commonly used) the general-coverage dial has a tuning rate that makes it fairly easy to handle, even with the high selectivity of the receiver. This feature is important to v.h.f. operators who usually tune 4000-kc. segments when using converters. The frequencies do not break so as to permit tuning the entire 4000 kc. on one tuning range starting at 7 or 14 Mc., however. A reset knob on the bandspread dial enables the operator to achieve close to frequency-meter accuracy, when bandspread ranges are used in conjunction with the crystal calibrator.

The block diagram in Fig. 1 shows the tube line-up of the receiver. The r.f. amplifier, V_1, is a 6BZ6, with its grid and plate circuits both tuned. The r.f. stage has a panel-controlled antenna trimmer. The a.v.c. to this stage has a delay that prevents it from operating on extremely weak signals, thus preserving signal-to-noise ratio when it is needed most. The first mixer, V_2, is a 6BE6, with injection supplied by a separate 6C4 oscillator, V_{12}, 455 kc. above the signal on the four low ranges, and 3035 kc. above on the two top ranges.

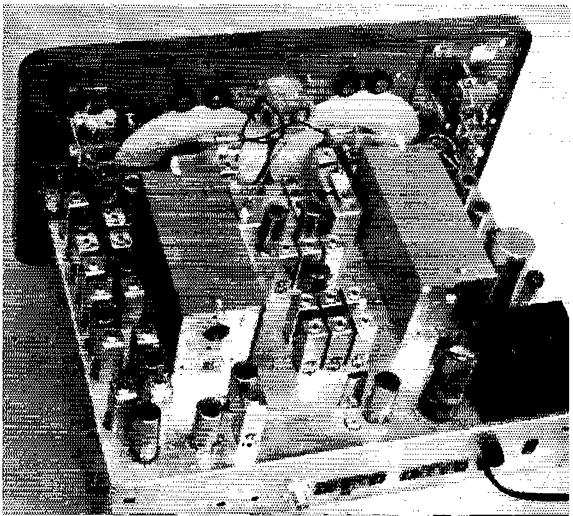
Converter V_3 and the 455-kc. gate, V_{18}, are both connected to the plate circuit of the first mixer, V_2. When operating on the higher ranges (7.85 to 30 Mc.) the 3035-kc. i.f. signal from V_2 is fed into a crystal filter and then to V_3, a 6BE6, where it is converted to 455 kc. On the lower ranges (0.54 to 7.85 Mc.) the 455-kc. signal from V_2 is amplified in the 455-kc. gate tube, V_{18}. With this arrangement (V_3 and V_{18} in a common circuit) there is a possibility of several spurious responses, particularly on the higher ranges, where the first i.f. is 3035 kc., to signals that are 455 kc. either side of the h.f. oscillator (V_{12}) frequency. However, the ability of the receiver's front-end circuits to suppress these spurious responses is high — comparable to the image rejection of receivers having first intermediate frequencies of 1300 and 1750 kc., respectively. Also, there is extra protection since the r.f. gain control is applied to the 455-kc. gate, V_{18}.

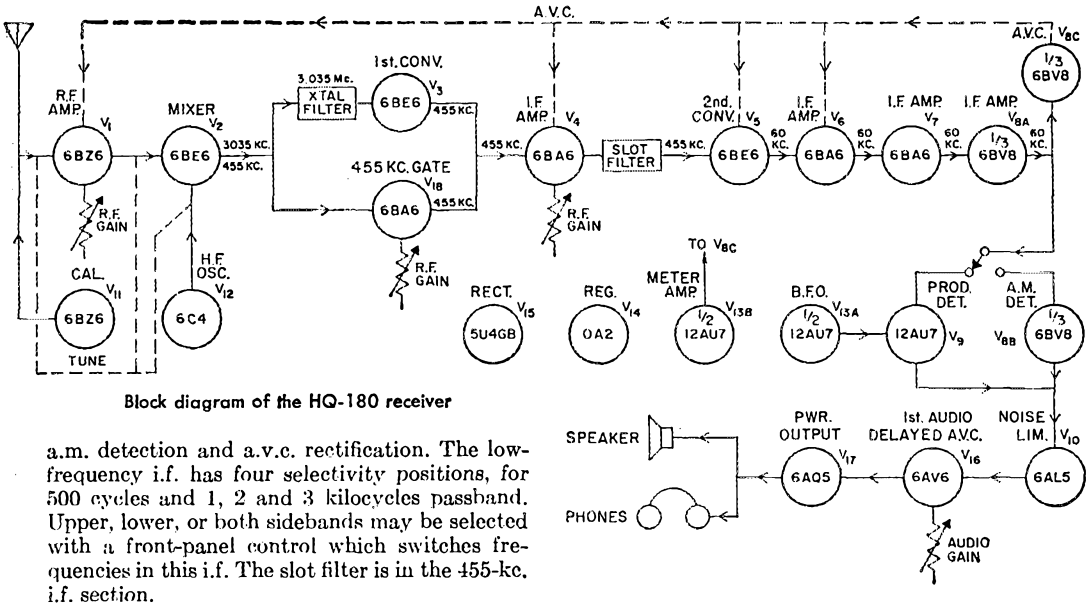
After amplification at 455 kc. by a 6BA6, V_4, a third 6BE6, V_5, converts the 455-kc. signal to the third i.f. of 60 kc. V_5 is followed by three i.f. amplifiers, two of which, V_6 and V_7, are 6BA6s, while the third is the triode section of a 6BV8, V_{8A}. V_{8A} is coupled to the detectors through chokes that apparently are self-resonant at 60 kc. The diode sections of V_8 are used for

The various circuits of the Hammarlund HQ-180 are well isolated from one another. As seen in the bottom view, the i.f. portion of the receiver is at the left. Switch at the far left provides four degrees of selectivity. Adjacent to it is the sideband switch. R.f. components occupy the middle of the chassis.



The r.f. section of the HQ-180 occupies the center of the chassis. Audio tubes and circuits are at the right in this view, with the i.f. system on the left. Dials are rim-driven white plastic.





Block diagram of the HQ-180 receiver

a.m. detection and a.v.c. rectification. The low-frequency i.f. has four selectivity positions, for 500 cycles and 1, 2 and 3 kilocycles passband. Upper, lower, or both sidebands may be selected with a front-panel control which switches frequencies in this i.f. The slot filter is in the 455-kc. i.f. section.

Detection for c.w. and s.s.b. is handled by a 12AU7 product detector, V_9. The detectors are followed by a 6AV6 audio voltage amplifier, V_{16}, and a 6AQ5 power output tube, V_{17}. A 6AL5 double-diode noise limiter, V_{10}, a 12AU7 combined 60-kc. b.f.o. and S-meter amplifier, V_{13}, and a 6BZ6 calibration oscillator, V_{11}, complete the tube complement, except for the rectifier and voltage-regulator tubes.

Though a high degree of stability is assured through the use of ceramic sockets, coaxial trimmers, temperature compensation, and voltage regulation, there is some warm-up drift. If you have early morning schedules and want your receiver completely stable for the first turn of the dial, the Telechron clock-timer is a helpful accessory. Put the receiver in the standby position, set the timer for an hour before your sked time, and leave it on "auto." Use it as an alarm clock, if you like: leave the send-receive switch in the "receive" position, with the audio turned up to whatever level is required to drag you out of dreamland.

In appearance the HQ-180 is almost identical to the HQ-160, with the grey-finished mesh case and die-cast aluminum panel that have been featured in Hammarlund receivers for some years. The case has a lift-up lid, for access to the top of the receiver, and if the case must be removed, three screws in the back and one in the bottom will do it. The approximate dimensions of the HQ-180 are 11 inches high, 19 inches wide and 13 inches deep.

A receptacle is provided at the chassis rear for connecting to the contacts of an external relay for remote control of stand-by and receive. Also located on the rear apron is a terminal for connecting −100 volts bias (taken from the exciter or transmitter) for silencing the receiver while transmitting. Antenna connection is by means of a coaxial fitting or the familiar 3-terminal strip. These connectors are wired in parallel; converter users should disconnect the strip from the inside, if i.f. pick-up is bothersome. Power consumption is 120 watts. — *E. P. T. & E. L. C.*

Globe Electronics "Deluxe" Transmitters

Globe Electronics of Council Bluffs, Iowa, has recently introduced deluxe versions, including circuit as well as appearance changes, of their Globe Scout and Globe Chief Transmitters. Incorporating new cabinet styling with a modern "low look," these transmitters should blend in with most home furnishings — even in the living room — without objections from the XYL. Both are available in either wired or kit form and are furnished with instruction manuals which include operating instructions, operating hints, a trouble-shooting chart and schematic diagrams. The kit versions of the transmitters contain 3-color diagrams to simplify construction.

Globe Chief Deluxe

The band-switching Globe Chief Deluxe covers 80 through 10 meters with generous overlap for operation on MARS frequencies, and is capable of about 90 watts input on all bands. Although it was designed primarily as a crystal-controlled c.w. transmitter, there are provisions for convenient addition of accessories such as a v.f.o. and screen or plate modulators.

The tube line-up of the "Chief" is a 6AG7 oscillator, parallel-connected 807 amplifiers, and a 5U4GB full-wave rectifier. The 6AG7 Colpitts oscillator uses 80-meter crystals for operation on 80 meters and 40-meter crystals for the remaining bands. The 807 r.f. amplifiers, which are operated Class C, run straight through on all bands except 10 meters where they function as doublers. The r.f. amplifier output circuit is a pi network designed to match nonreactive loads of 50 to 300 ohms.

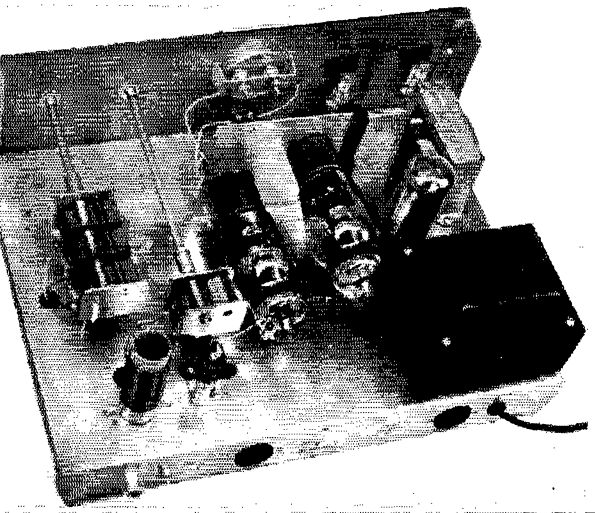
The Globe Chief Deluxe offers a choice of two modes of keying — cathode, or a form of blocked-grid keying. A jumper plug at the rear of the chassis changes keying modes. This connector, and a second socket also located on the rear chassis apron, provide a means for connecting an external modulator, v.f.o., or other accessories. They also allow for connecting an external power supply for mobile or emergency use.

There are five operating controls on the Globe Chief Deluxe, including a function switch which is labeled A.C. OFF, STANDBY, TUNE, STANDBY, and OPERATE. With this switching arrangement, it is not necessary to go through any operating positions while the unit is warming up after being turned on. In the TUNE position a blocking bias is applied to the 807s, cutting their plate current to a low value. However, the oscillator circuit is still functioning in this position so the oscillator can be adjusted. When the function switch is advanced to the OPERATE position, all operating voltages are applied and the transmitter is ready for use after the amplifier plate circuit and loading are adjusted. When the switch is in this position 115 volts a.c. is connected to one of the accessory sockets for controlling external circuits or an antenna relay.

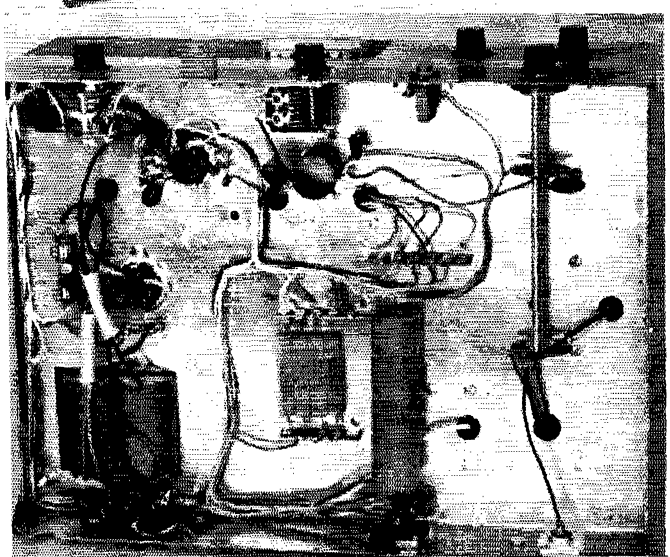
A variable capacitor (labeled OSCILLATOR TUNING) tunes the oscillator plate circuit to the proper frequency. A two-section rotary band switch selects the proper taps on the oscillator and final amplifier coils. The r.f. amplifier plate-circuit adjustments are handled by the PLATE TUNING and ANTENNA LOADING capacitors.

A choke-input power supply furnishes all necessary voltages for the transmitter. When the function switch is placed in either of the STANDBY positions, the power transformer's center tap is opened, removing the high voltage.

The transmitter is enclosed in a perforated gray wrap-around cabinet (not shown in the photographs) which measures 6¼ inches high, 11 inches deep and 15¼ inches wide. Shipping weight of the Globe Chief Deluxe is about 30 pounds.



The 807 final amplifiers in the Globe Chief Deluxe are mounted horizontally from a vertical bracket. The 6AG7 oscillator tube is partially visible behind the bracket that supports the 807s. The three-section variable capacitor at the left, totaling about 1300 $\mu\mu$f., is the antenna loading capacitor. The final amplifier plate-tuning capacitor and coil are in the left foreground in this view. Power-supply components, including the 5U4GB rectifier tube, are grouped at the right. The pilot lamps mounted on the front panel are behind translucent tape, colored red (plate) and green (power on). Rear apron connectors include, from left to right, the coax antenna connector, ground stud, auxiliary socket for screen modulator and keying mode selection, auxiliary socket for plate modulator and antenna changeover relay, and the a.c. line cord.



Panel controls and sockets are visible in this bottom view of the Globe Chief Deluxe transmitter.

From left to right are the function switch, crystal-v.f.o. socket, oscillator tuning, key jack, plate tuning, band switch, and antenna loading. Oscillator coils and capacitor are at the top center of the photograph. The fuse at the left side of the chassis is in the power transformer's primary circuit.

Globe Scout Deluxe

Although the Globe Scout Deluxe is housed in a cabinet of the same size and shape as the "Chief", it operates on one additional amateur band, 6 meters, and contains a built-in plate modulator for phone operation. Inputs up to the maximum ratings of the 6146 final amplifier, 90 watts on c.w. and 67.5 watts on phone, are possible.

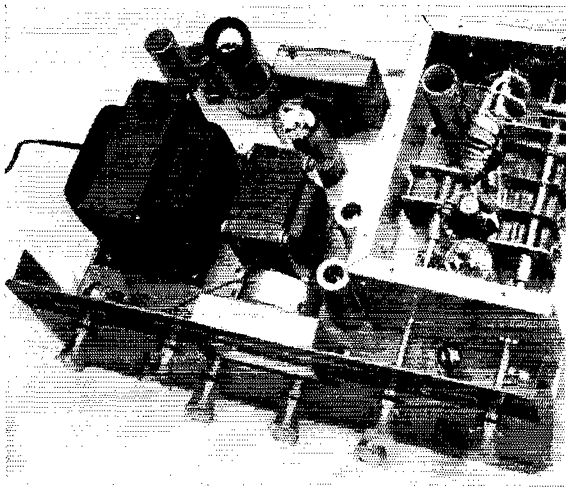
The first tube, a 6CL6, can be driven by a v.f.o. or operated as a crystal-controlled oscillator. It drives the 6146 directly on all bands from 3.5 to 21 Mc., inclusive. On 28 and 50 Mc. a second 6CL6, used as a buffer-doubler, is cut into the circuit automatically by the band switch. A somewhat unusual switching method, which simplifies tuning by eliminating the necessity for an extra panel control, is used in cutting the buffer-doubler stage in and out. On the four lower frequency bands the oscillator tuning capacitor is connected in the plate circuit of the 6CL6 oscillator tube, as would be expected, but on 28 and 50 Mc. this capacitor is switched over to the buffer-doubler's plate circuit. Broad-banded fixed-tuned circuits, trimmed inside the set but requiring no adjustment from the panel, are simultaneously switched into the oscillator plate circuit to replace the manually-tuned circuits used on the lower frequencies.

Eighty-meter crystals are required for operation on the 80- and 40-meter bands, 40-meter crystals for 40- through 10-meter operation, and crystals in the 8-9-Mc. range for 6 meters.

The 6146 r.f. amplifier works straight through on all bands, including 6 meters. A 6AQ5 clamp tube is connected in the 6146's screen circuit to hold the amplifier's plate current to a safe value under no-drive conditions. A pi-network output circuit, designed to match loads of 50 to 300 ohms, is used on 3.5 through 30 Mc. On 50 Mc. a separate final coil, link, and output loading capacitor are used, but the controls for these components are mechanically connected with their counterpart low-frequency components. Thus the same panel controls are used on all bands. This use of a separate 6-meter output circuit insures higher efficiency on this band as compared with simple extension of the tuning range of the low-frequency circuits. A common antenna connector at the chassis rear is used for all bands.

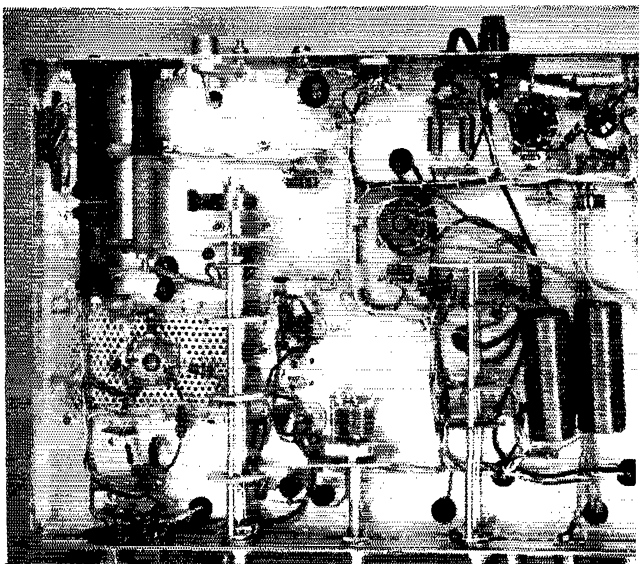
The speech section of the Globe Scout uses a

(Continued on page 136)

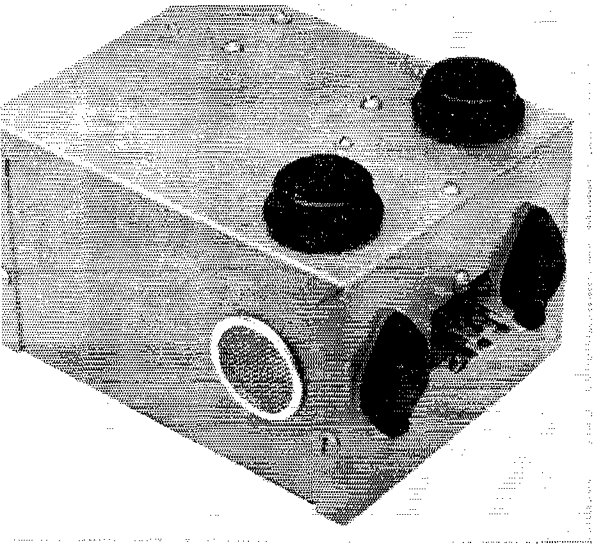


This top view of the Globe Scout Deluxe shows the fina r.f. amplifier and output circuit compartment with the cover removed. The final-amplifier plate-tuning capacitor is at the left and the loading capacitor for 3.5 through 30 Mc. is the three-ganged unit to the right. The small capacitor in line with and behind the three-gang capacitor is the 6-meter loading capacitor.

The shielded meter is partially visible behind the panel at the center. Panel controls, from left to right, are A.C. ON-OFF, AUDIO GAIN, GRID-PLATE METER SWITCH, function switch (TUNE, C.W., STANDBY, A.M.) OSCILLATOR TUNING, BAND SWITCH, PLATE TUNING and ANTENNA LOADING. Also located on the front panel are the microphone connector, crystal/v.f.o. socket, meter, and the power/plate illuminated indicators.



The r.f. output connector, key jack, accessory socket, line cord and fuse are grouped along the rear apron of the Globe Scout Deluxe transmitter. R.f. components and band switch are visible at the left side while the power supply and audio circuits are to the right.



The 50-watt audio system fits into a 5 × 4 × 3-inch Minibox without crowding. The driver and output transistors are mounted on the outside to facilitate cooling. The microphone jack, not visible in this picture, is on the side opposite to the one with the driver transistors and power connector.

Packaged Power in Miniature

Here's a two-stage surprise — the first, a hand-sized box can give out an easy 50 watts of audio; the second, that there's no crowding of components anywhere! Look at the pictures and be convinced.

A 12-Volt 50-Watt Transistor Modulator

BY DAVE HARPER,* W4NIQ

THE aim of most mobile "do-it-yourself" builders is getting the most power in the smallest package, keeping in mind cost and efficiency. With this as a goal, the author began working in late 1958 to adapt an original Delco 12-volt design [1] to a 6-volt, 25-watt modulator.

To make a long story short, the aim was accomplished but required the use of a hand-wound modulation transformer plus numerous other circuit changes. The operation of this unit proved so successful that several fellow mobile operators expressed a desire for a high-power 12-volt unit. One was designed, first using hand-wound transformers, but was later modified to accommodate all-commercial components as shown in Fig. 1.

The unit occupies approximately 61 cubic inches and is capable of over 70 watts of power output with an over-all efficiency of 60 per cent.

* Route 4, Fayetteville, Tenn.

1 "Transistor Application Note 6-B," Delco Radio Division, General Motors Corporation, Kokomo, Indiana.

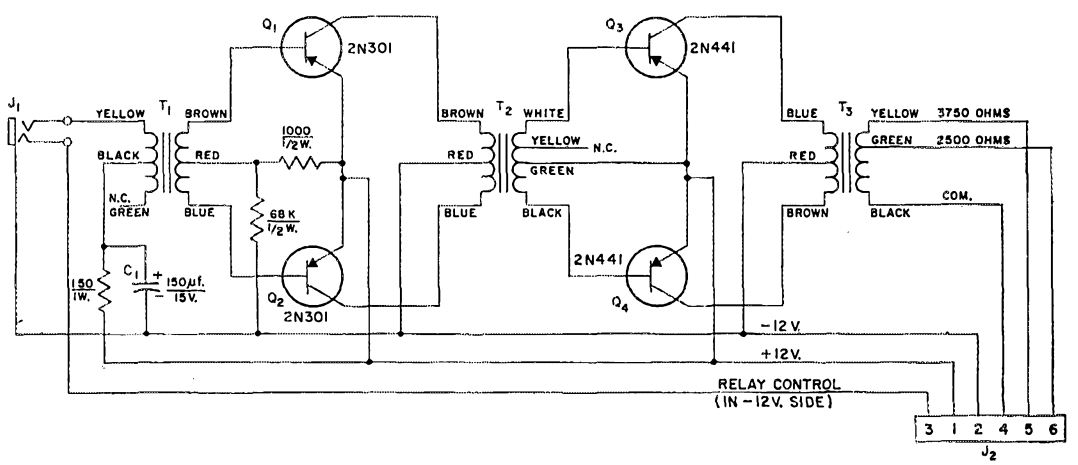


Fig. 1—50-watt transistor modulator circuit diagram.

C1—150 µf., 15 volts (Sprague TE-1163 or equivalent).
J1—3-conductor microphone jack.
J2—6-contact chassis connector, male (Cinch-Jones P-306-AB).
T1—Carbon microphone to push-pull transistors (Thordarson TR-5; 150 to 490 ohms, each winding center-tapped).
T2—Output, 700 to 16 ohms, both windings center-tapped, 0.3 watt (Stancor TA-43).
T3—Modulation, Class B transistors to Class C load, 8 ohms c.t. to 7500 or 5000 ohms, 35 watts (Stancor TA-17).

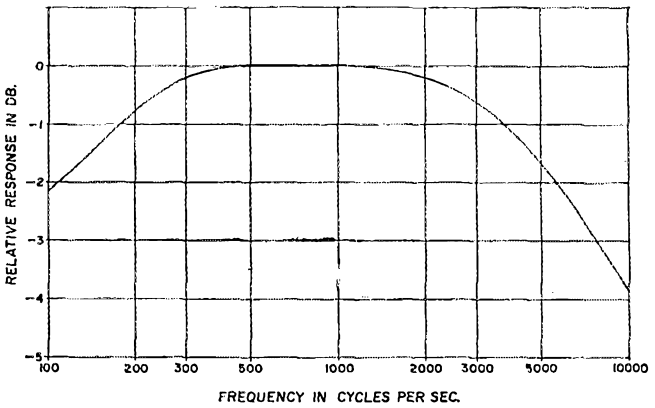


Fig. 2—Frequency-response characteristic of the modulator.

The entire cost of the author's unit as shown was $30.92.

The circuit uses a pair of medium-power transistors operating essentially Class B to drive a push-pull Class B output stage. In order to get the most gain and power from the driver stage, the customary emitter resistors were omitted. This resulted in some change in gain with temperature but it was not found to be objectionable. The small emitter resistor usually found in the power stage was omitted for the same reason. No tendencies toward thermal runaway were experienced in any of the eight units of similar design now in use. The bias network used in the driver stage to prevent cross-over distortion was not duplicated in the output stage because it was found to be effective only at very low levels (below 1-watt output).

As indicated in Fig. 1, neither the positive nor negative 12-volt line is grounded to the chassis. This was done so that either side could be grounded, depending on the battery polarity in the final installation.

As you have probably noticed, there is no gain control in the circuit. The over-all gain will, of course, depend on the gain of the transistors used. A suggestion would be to connect everything as shown in Fig. 1 and then if the circuit has too much gain, use the full primary of T_1 rather than half of it. If the gain is still too high, a potentiometer may be substituted for the 150-ohm resistor; however, a small series resistor should be used to limit the microphone current to a safe value.

C_1 is used to prevent self-oscillation as well as to keep ignition hash out of the input circuit. It should be at least 120 μf., and preferably 150 μf. as shown.

It is not absolutely necessary, but the driver and output transistors should be matched pairs, if possible. This will allow maximum output and efficiency with the least amount of distortion.

It might also be interesting to note that, within limits, the higher the current gain of Q_1 and Q_2, the higher the maximum available power output before clipping or saturation occurs.

As the author has a rather low-pitched voice, special pains were taken to improve the low-frequency response. (The frequency-response curve is shown in Fig. 2.) One of the influencing factors is the amount of inductance in the primary of T_3. This may be increased by removing the

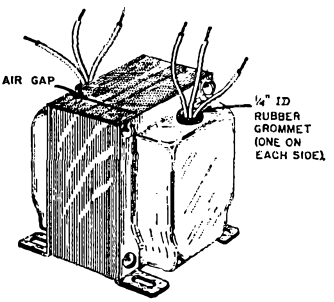
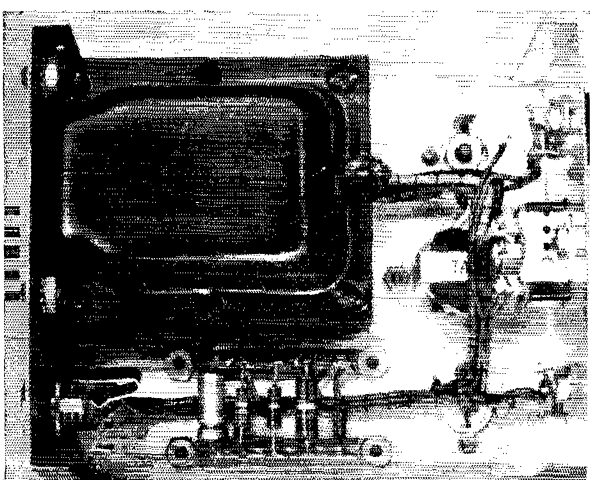


Fig. 3—Output transformer, showing air gap and modification to bring leads out the top of the case.

paper which serves as an air gap between the laminations. See Fig. 3. However, this should



Inside view of the modulator. The microphone transformer is hidden by the input jack at the lower left; only its mounting screws are visible. The driver transformer is just below the cabling to the left of the power connector on the right-hand wall. The microphone jack is insulated from the box, as are all other components.

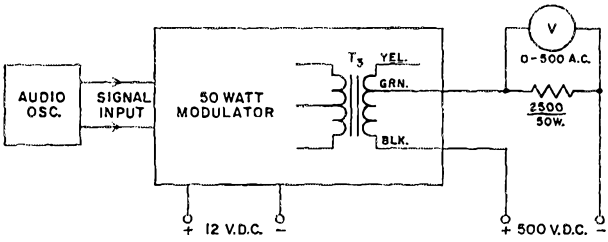


Fig. 4—Test setup for adjustment of output transformer air gap. *V* is a vacuum-tube voltmeter.

not be done unless the following procedure is used: With a test setup as shown in Fig. 4, apply a 1000-cycle sine-wave signal of sufficient amplitude to drive the output to a full 50 watts (353 volts r.m.s. across 2500 ohms). Now apply 500 volts d.c. as shown.[2] If the a.c. output voltage drops more than a few volts, try reinserting a thinner piece of paper between the laminations of T_3. Maximum usable inductance will be obtained when the air gap is adjusted properly. In the author's unit, with no paper, the a.c. output voltage dropped 4 volts.

In order to deliver 50 watts, the output transistors must look into a 4- or 5-ohm load. The TA-17 modulation transformer has an 8-ohm primary with a 5000- or 7500-ohm secondary. Therefore, to reflect 4 ohms in the primary, the secondary must see either 2500 or 3750 ohms as a load. This transformer is rated at 35 watts by the manufacturer but should give good service at 50 watts while being used in intermittent mobile service.

Construction

The unit was constructed in a 3 × 4 × 5-inch Minibox (Bud type CU-2015A). The driver transistors are mounted on either side of the Jones plug on one end of the box while the output transistors are mounted on top near the same end. The modulation transformer is mounted on the opposite end along with the mike jack. See Fig. 3 for modification to bring leads out top of transformer. The input transformer, T_1, is below the mike jack, along with the terminal strips used for mounting the small components. The driver transformer is located between the output transistors. Two 1-inch ventilating plugs (General Cement type 1708-C) were used on either side of the box to facilitate cooling.

[2] Do not leave the d.c. voltage on for more than a few seconds because you will be dissipating 100 watts in the 50-watt load resistor.

Transistor Mounting

All four transistors must be insulated from the chassis. If the output transistors are ordered directly from Delco [3] in small quantities, the mounting kits will be included. Delco also makes a mounting kit (Part No. 7274775) which fits the driver transistors.

If a painted Minibox is used, be sure to clean off the paint under the transistors to insure good heat conductivity. Heat transfer will also be improved if a light coat of silicone grease is applied to both sides of the mica washers before mounting. In the author's unit the transistors were painted flat black, which also helped to dissipate heat.

Heat Sinks

At first it was rather doubtful whether the heat sink provided by the Minibox would be adequate, but after running extensive tests, the results of which are shown in Fig. 5, it was found satisfactory. Actually, the unit was operated at 50 watts with a sine-wave input for 30 minutes with no additional increase in temperature. By calculating the thermal gradient it was found that a mounting stud temperature of at least 80 degrees C. could be reached before damaging the output transistors.

If the unit is to be operated at power levels greater than 50 watts or is to be mounted close to other components which dissipate a large amount of heat, a convection-type heat sink such as manufactured by Delco [4] or Modine [5] should be used for the output transistors. In any case, the power transistors should be placed where free air can circulate.

[3] All standard transistors made by Delco are now available at very reasonable prices directly from Kokomo, Indiana.

[4] Part No. 7270606 (blank) or 7270725 (punched). Also, Insulating Spacer, Part No. 7269634.

[5] Model No. 1E-1155B, Modine Mfg. Co., Racine, Wisconsin.

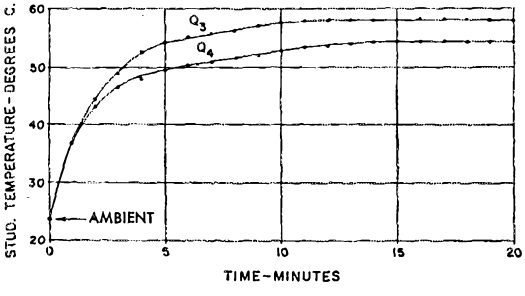
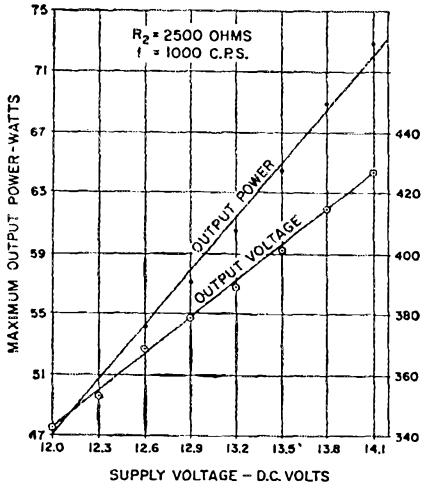


Fig. 5—Rise in stud temperature of the Class B transistors (2N441) over a 20-minute period of continuous operation at 50 watts output.

Fig. 6—Maximum power output (just below clipping level) vs. primary supply voltage. Power is calculated from the a.c. voltages on the right-hand scale. A v.t.v.m. calibrated in r.m.s. was used for measuring the output voltage.



As to the merits of using a painted box or an aluminum one, a test was run on both. The painted box allowed the transistors to operate from 4 to 6 degrees C. cooler.

If one output transistor appears to run quite a bit hotter than the other, it sometimes helps to interchange them. This is usually caused by the fact that very few transistors have exactly the same thermal characteristics and few transformers have a perfectly balanced winding. If you happen to have the transistor with the higher thermal characteristics on the low-resistance side of the transformer winding, that transistor will run quite a bit hotter.

Testing

Test the unit by connecting a 2500-ohm 50-watt resistor between terminals 4 and 6 on J_1 of Fig. 1. A vacuum-tube voltmeter and an oscilloscope should also be connected across the same terminals. With no signal the static d.c. current will be approximately 50 ma. With a microphone plugged in, it will be about 100 ma., total.

To test the unit properly, a 1000-cycle sine-wave signal should be applied through J_1. While watching the scope, increase the input signal until saturation or clipping begins. This will be the point of maximum output before excessive distortion. The output power can then be calculated by dividing the square of the output voltage by the load resistance. The d.c. supply current will be 7 amperes for 50 watts output.

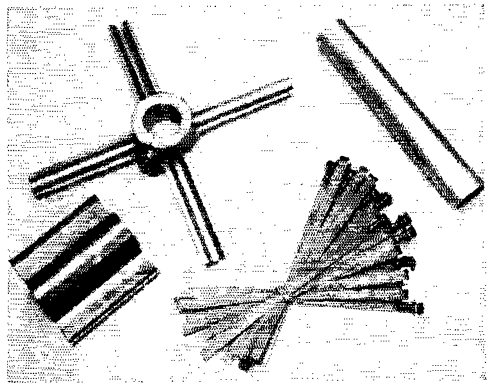
The maximum output will not only depend on the gain of the transistors but also on the supply voltage, as indicated in Fig. 6. Most cars with 12-volt systems will supply about 14 volts with the engine running, so it should not be much trouble to obtain at least 50 watts of output. QST

• New Apparatus

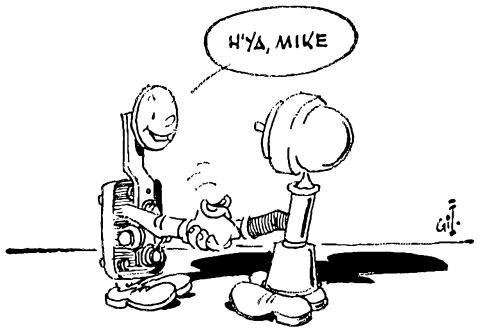
Cubex Quad Foundation Kit

ONE difficult component to obtain or construct when building a quad antenna is the end spider that guides and supports the quad's radial arms. The Cubex Quad Foundation Kit, manufactured by the Cubex Company, 3322 Tonia Ave., Altadena, California, not only supplies the two spider castings that are necessary but also contains a 2-inch (o.d.) by 10-foot aluminum boom, an aluminum mast coupler assembly, 16 radial arm clamps, and the necessary nuts, bolts and washers. A four-page instruction sheet contains information on assembly and lists a bibliography of articles on the subject of quad antennas. About the only other materials necessary for construction of a quad antenna and not furnished in the kit are the radial arms — usually made of bamboo, Fiberglas, or aluminum — and wire for the elements.

The accompanying photograph shows a few of the kit components. From left to right are the mast coupler bracket, spider casting, radial arm clamps and a 2-foot by 2-inch mast stub. The



latter, a part of the mast coupler assembly, is dropped over the supporting mast when assembled to the quad antenna. A pin or bolt run through the mast stub and mast will prevent slippage. —*E. L. C.*



THE SWEEPSTAKES.....
...SAME OBJECTIVES...JUST DIFFERENT MODES.

26th ARRL Sweepstakes Results

Part II — Phone and Club Totals

BY ELLEN WHITE,* W1YYM

PART I of the now-historic 1959 Sweepstakes admirably recanted by W1DGL in May *QST*, can now be completed by this recap on phone and club achievements. A total of 593 logs in 69 sections were received from the A3 brethren. High scores seem to have become almost commonplace but just a few short years ago such magnitudes would have been considered impossible on phone. In fact, the average W1-WØ call-area leader came up with 153,258 points! The tabulations to follow tell the story. Start reading and make your plans for November 1960 accordingly.

Club Scores

Leading a field of 90 competitors, the PVRC crew upped their '58 aggregate by over a half-million points! A total of 58 club members turned to and delivered an average of 101,000 points apiece. As many have said before, victories that are cheap are cheap, those only are worth having which come as the result of hard fighting. Another silver-banded gavel to the Potomac Valley Radio Club.

On the other hand, there are some defeats more triumphant than victories. Lets not forget that a score of almost 5½ million points is a tremendous showing. The Frankford Radio Club thus placed second, with 63 enthusiastic members in the field. Club certificates go to W3JNQ and W3ECR.

The EL-Ray Radio Club moved from 7th to 3rd, by virtue of 1,772,315 points. A tremendous gain of 700,000 points. The Hamfesters Club of Illinois went from fifth to fourth, while the Westpark Radiops went all the way from 10th to 5th. A grand total of 107 club awards are scheduled for mid-June mailing.

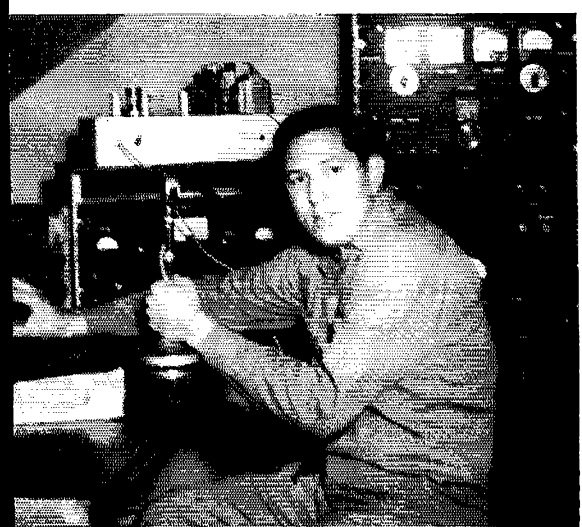
* Ass't. Communications Manager, Phone, ARRL.

73 SECTIONS

K1CTD	W5DQK	W7BSW
W1EOR	W5INL	W8VOW
K2BHP	K5MDX	WØJEE
W3ZKH	W6JVA	WØMLY
W4BVV	W6LNW	WØPRZ

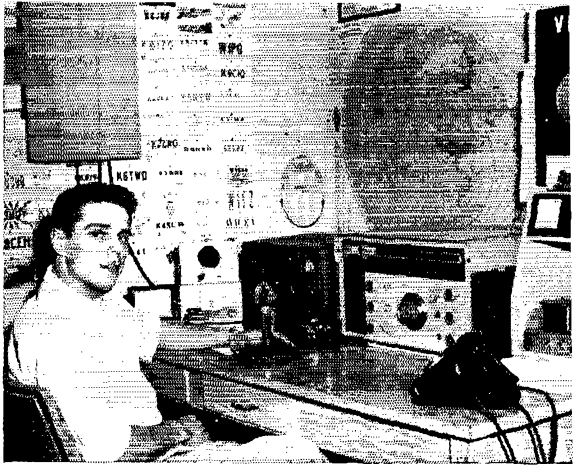
Soapbox

"Thought I would work the SS for a couple of hours and wound up with 28 hours worth. I'll be back next year if I can recover my voice by then." — *W6SIA* . . . "Never heard such QRM. Where were all the Canadians?" — *K2YFE* . . . "The last weekend of the contest was operated during a blizzard with outside temperatures 30 degrees below zero." — *W7TVN* . . . "Sixty watts and a 75-meter doublet just doesn't get it." — *K5MPM* . . . "Where was West Virginia this year?" — *K3DVS* . . . "I had generator troubles and blew up the DX100. QTH was Frazer Mountain, about 15 miles west of Gorman, up 6500 feet." — *K6ICS/6* . . . "Why aren't more sideband stations in the contest?" — *KØJGF* . . . "Great contest, better than ever." — *K2IEG* . . . "I guess it really happens. First weekend I was going to put up an antenna and we had five inches of snow. The second weekend I had relay



Does this look familiar? It should! It's last year's third-place national high and this year's over-all grand scorer, Mississippi winner and holder of the new phone SS record. That's right, K5MDX, the new phone champ at the age of 16.

With just 17 hours of 10-meter operation, VE6TP once again claimed the Alberta award plus top Canadian score. Gene tallied 62,310 points with an NC300-Valiant-Tribander combination.



trouble and was off the air the final day. *Maybe* next year." — *K9GOQ* . . . "A ZL answered my CQ SS and wondered what it was all about." — *K1CPD* . . . "My time was extremely limited this year, with two football games, a church fund-raising drive and numerous other family activities cutting into operating time." — *W5NXF* . . . "I wish more of the Technicians operating 6 would catch on to the SS and join in the fun as K3ASQ and I did this year. Despite the hardships of our hilltop portable site it was a real barrel of fun." — *K2UFZ* . . . "Tried my best to work all sections on 28 Mc, but conditions were not quite as good as last year. I think I'll try all bands next contest." — *VE6TP* . . . "I started out with the idea of working just a few hours because of college exams studies. I couldn't resist that CQ SS though and hope I did better there than in my exams." — *K7BHE* (Top Utah scorer) . . . "The highlight of the contest for me was working W9ECY, my own call prior to receiving WØECY." — *WØECY* . . . "My first SS and between homework football games and dances, I only put in 3 hours." — *K3BKX* . . . "The day before the contest my antenna broke and I nearly fell off the roof fixing it. The morning of the 7th I was sicker than a dog and the rig was in the basement all torn apart. By afternoon though I was better and got the rig on the air." — *K8HFX* . . . "This was my second SS and I'll be looking forward to providing Maine contacts for those needing them in the fall of 1960. Let's not forget that when stations are 3 and 4 deep it saves time for everyone to use standard phonetics." — *W1DIS* . . . "This was another rat-race and had I not lost my voice (because of a cold) early on the Saturday evening of the second weekend I'm *sure I would* have done much better." — *K5MID* . . . "Finally found time out from basketball to get in my first SS on the second weekend. Although confined to ten meters and ending up with what is probably a record low score, I loved every minute of it." — *W4HSR* . . . "Sure fun to be back after a 7-year absence. I was the SCV phone winner in 1952. I used 11 test clips to hay-wire an antenna tuner to load on 75 during the last 4 *hours (to work the rare California sections).* Then there were none to be heard." — *W6CFM* . . . "During the second weekend every other station that called me had been worked earlier. Why don't some people keep duplicate sheets?" — *W6USV* . . . "The contest provided an excellent opportunity to check out the new Cheyenne mobile rig. After 5 hours and ¾ tank of gas sitting on top of Flagstaff Mountain, Colorado, I think the rig really proved itself." — *KØTEP/Ø* . . . "Looking only for sections, I had ample opportunity to do a lot of listening. I could pick out the various segments used by contest and non-contest groups and it was rare to hear a VFO move into the other's area of operation. To see this type of sharing was to me the most educational part of the contest." — *W9EPI* . . . "I enjoyed the contest to the fullest extent this year and look forward to 1960." — *WØJEE* . . . "Contest conditions were just right and I had very little trouble with WIs and VEIs this year. This is the third consecutive year I've worked all sections." — *W7BSW* . . . "Very fine 10-meter conditions, especially to the east coast. I worked 165 W2 stations alone. Please indicate *both* SS numbers on QSLs. It takes almost as long to answer the cards as it does to work the contest." — *W3IWL* . . . "This was my first contest venture. I hope to make West Virginia more available in the future." — *K8KZF* . . . "My license came the day before the second half of the SS and that being the only thing doing on the bands I decided to give it a try." — *K1KTH* . . . "As a DX competition winner I learned humility with 25 watts in this SS, plus laryngitis." — *W3ECR.*

PHONE SCORES

Twenty-Sixth Sweepstakes Contest

Scores are grouped by Divisions and Sections. . . . The operator of the station first-listed in each Section is award winner for that Section unless otherwise indicated. . . . Likewise the "power factor" used in computing points in each score is indicated by the letter A or B. . . . A indicates power up to and including 150 watts (multiplier of 1.5, phone). B over 150 watts (multiplier of 1). . . . The total operating time to the nearest hour, when given for each station, is the last figure following the score. . . . Example of listings: K3DVS . . . 65,391-310-71-A-27, or, final score 65,391, number of stations 310, number of sections 71, power factor of 1.5, total operating time 27 hours. . . . Multioperator stations are grouped in order of score following single-operator station listings in each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

K3DVS	65,391-	310-71-A-	27
K3ALU	63,360-	320-66-A-	36
K3BUZ	39,732-	310-43-A-	39
W3ZJD	37,449-	219-57-A-	25
W3ECR	28,056-	167-56-A-	7
W3RAE	23,220-	180-43-A-	27
W3MQC	19,680-	160-41-A-	14
K3DCB	12,075-	161-25-A-	20
K3AHY	9630-	107-30-A-	15
W3IAR	9009-	91-33-A-	28
K3HLN	9006-	80-38-A-	34
K3EYL	8732-	118-37-B-	13
W3QEZ	8613-	87-33-A-	16
K3BKL	7395-	86-29-A-	21
W3DYL	7301-	79-31-A-	9
W3DHM	6834-	67-34-A-	—
W3IIO	2706-	41-22-A-	4
W3HGZ	1938-	34-19-A-	6
K3ECP	1800-	100- 6-A-	27
K3AWD	1782-	33-18-A-	16
W3JXI	774-	22-12-A-	2
K3BSK	435-	15-10-A-	6
K3ANU	405-	15- 9-A-	1
W3WNE	128-	21- 2-A-	5
K3EWY/3	105-	7-- 5-A-	2
W3LEZ	90-	6- 5-A-	1
W3YLL	36-	4- 3-A-	1
K3CRG	1-2	2 2-A-	1
W3TQU (K3s BZE 1PJ)	28,755-	213-45-A-	27
W3ICC/3 (6 ops.)	1800-	100- 6-A-	35

Md.-Del.-D. C.

W3ZKH	132,276-	604-73-A-	40
K3CMV	95,475-	485-67-A-	35
W3AYD	26,291-	216-61-B-	21
K2ZVF/3	5772-	52-37-A-	19
WØBPO/3	2280-	40-17-A-	11

Southern New Jersey

K2UQD	78,390-	402-65-A-	38
K2YIB	45,018-	248-61-A-	29
WA2AXP	38,304-	225-57-A-	25
K2ZZT	21,312-	149-48-A-	15
W2BLV	18,054-	102-59-A-	13
K2UTR	10,989-	99-37-A-	19
K2EY	10,317-	91-38-A-	—
K2SNK	8442-	101-28-A-	7
K2DEI	5040-	58-31-A-	6
W2YNR	1260-	28-15-A-	4
K2UDA (K2s CSJ UDA)	3249-	57-19-A-	3

Western New York

K2BHP	119,793-	551-73-A-	39
W2VDX	75,375-	375-67-A-	33
W2RTK	36,801-	212-58-A-	18
K2DJD	35,825-	210-57-A-	28
K2MAF	24,327-	160-51-A-	30
K2DBB	23,856-	142-56-A-	22
W2EWO	3347-	49-23-A-	3
K2BBJ	1406-	43-19-B-	8
W2UMS	832-	26-16-B-	9
K2UFZ (K2UFZ, K3ASQ)	396-	44- 3-A-	27

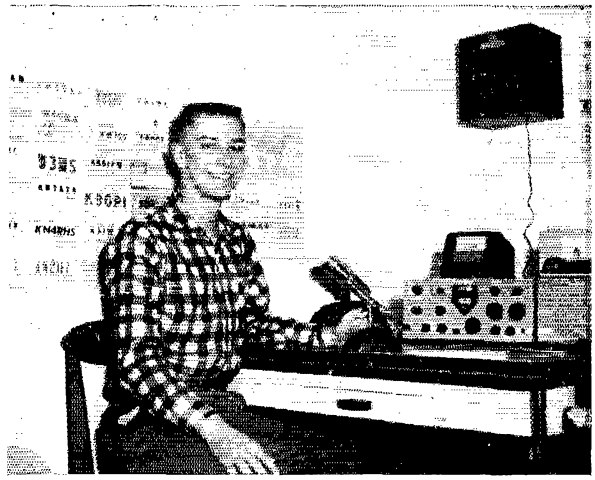
Western Pennsylvania

K3ARP	46,080-	241-64-A-	38
W3YZR	40,117-	233-58-A-	23
W3LWW	34,884-	238-51-A-	37
W3LIV	31,845-	193-55-A-	34
W3ROA	29,205-	178-55-A-	30
K3CMN	23,850-	150-53-A-	15
K3BKX	1608-	35-16-A-	3
W3IHZ	624-	16-13-A-	—
K3HWT	126-	7- 6-A-	1

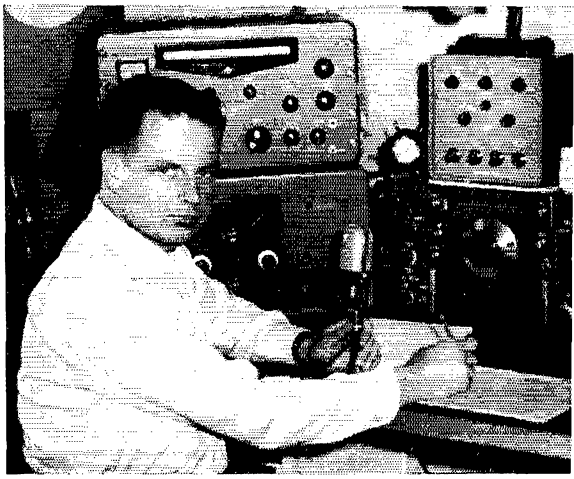
CENTRAL DIVISION

Illinois

K9BGL	108,009-	547-66-A-	40
W9NZM	89,673-	425-71-A-	39
K9MDH	70,889-	415-59-A-	26
K9HTK	51,220-	402-65-B-	37
W9RHV	39,501-	209-63-A-	32
W9YWX	39,336-	299-66-B-	27
K9KHZ	38,220-	196-65-A-	25
W9FVU	22,848-	119-64-A-	17
W9IVG	19,208-	172-56-B-	22
W9ECY	18,360-	128-48-A-	30
W9VBV	15,792-	168-47-B-	14
K9OUY	12,000-	100-40-A-	10
W9UXM	10,605-	101-35-A-	14
W9PNY	10,530-	117-30-A-	15
K9QGR	10,260-	90-38-A-	16
K9MPC	8466-	85-34-A-	—
W9AIT	7298-	70-35-A-	10
W9TQF	7104-	64-37-A-	7
K9MHR	5256-	73-24-A-	15
W9JMY	4623-	68-23-A-	8
K9LTL	3131-	51-27-A-	8
W9PSP	3306-	58-19-A-	9
W9HJN	2376-	36-22-A-	7
W9ISF	2340-	39-20-A-	30
K9JDV	2142-	34-21-A-	6
K9PEK	2037-	50-14-A-	10
W9KLV	1716-	26-22-A-	10
K9PYB	1344-	28-16-A-	4
W9FDY	1224-	24-17-A-	4
K9RQU	1193-	27-15-A-	3
K9TSE	495-	15-11-A-	5
W9QDM	330-	15-11-B-	4
KN9RVG	243-	27- 3-A-	15
W9OYW	231-	11- 7-A-	3
W9LYA/9	225-	25- 3-A-	13
K9HAI	216-	12- 9-B-	1



Colorado generated plenty of enthusiasm and top single-operator score from among the 37 entries came from KØJGF. Although a Freshman at the University of Colorado, Bill has found time for WAS WAC CP-20 AADX and about 80 countries towards DXCC.



W6LNW broke the 200-K mark for his Los Angeles award, top W6 showing and second-high national score. Jack has been hamming for about 10 years and this is his second SS attempt. W6LNW attributes the "most" to a five-element wide-spaced 10-meter beam.

K9OWQ.....108- 12- 3-A-10
K9ISP.....96- 8- 4-A- 1
K9JXZ.....96- 12- 4-H- 1
K9OCU.....83- 6- 5-A- 1
W9YYG/9....72- 6- 4-A- 1
K9LDN.....30- 5- 2-A- 8
KN9UFT.....15- 5- 1-A- 2
K9KDI.....3- 1- 1-A- –
W9VOK.....2- 1- 1-B- 1
K9KKK (K9s KKK MMA)
82,269- 423-66-A-30

Indiana

K9CUY...83,496- 400-71-A-36
W9QAX...82,566- 417-66-A-37
K9GMD...66,150- 475-70-13-40
K9MMH...61,031- 335-61-A-28
W9UEM...28,980- 161-60-A-21
K9GCE.....7047- 81-29-A- 8
W9URQ....3510- 65-27-B-12
W9FJI.....30- 5- 2-A- 1
K9OJI (K9s MRI OJI)
37,584- 222-58-A-32
W9EPI (W9s EPI INL)
6256- 68-46-B-21

Wisconsin

W9MIJ...43,200- 290-50-A-20
K9MTM...28,116- 215-66-B-39
K9HJS....21,080- 150-47-A- 8
K9JIG/9..17,100- 114-50-A-17
W9CJO....14,520- 110-44-A-23
K9GOQ...13,734- 164-42-B-12
K9MZJ....13,176- 123-36-A-17
W9VZP....11,193- 91-41-A- 8
W9DOS....9047- 82-37-A-15
W9SFK....8800- 111-40-B- –
W9ONY/9..7920- 80-33-A-11
K9MZX....7020- 65-36-A- –
W9QGR....6090- 70-29-A- 7
K9CJK.....6048- 84-24-A- 8
W9JBF.....5859- 63-31-A- –
W9GIL.....5217- 71-37-B- 4
W9ABU.....3375- 46-25-A-11
W9ULA.....2438- 33-25-A- 8
W9IKY.....1778- 40-15-A- 4
K9ELT.....1056- 22-16-A- 1
W9GAA.....798- 19-14-A- –
K9CZC.....375- 25- 5-A- 2
K9ORR.....18- 6- 1-A- 1
W9YT (5 oprs.)
9120- 121-38-B- 9
K9MAW (K9s MAW MKV MWK)
3591- 64-19-A-40

DAKOTA DIVISION

North Dakota

WØWFO.110,268- 519-72-A-37
WØJWL...53,592- 407-66-B-29
KØPJI.....4320- 61-24-A-12
WØHSC (4 oprs.)
101,205- 527-65-A-38

South Dakota

WØPRZ..123,151- 846-73-B-38
KØTKN...19,074- 145-44-A-24
WØWUU....3674- 84-22-B- 7

Minnesota

KØBIT...112,608- 828-68-B- –
KØDYN...54,432- 284-64-A-25
KØAUI....20,592- 160-44-A-20
WØQZR/Ø (6 oprs.)
63,083- 329-65-A-37

DELTA DIVISION

Arkansas

K5EJQ....40,326- 259-52-A-16
K5TWZ...35,805- 223-55-A-11
K5GOE.....1539- 28-18-A- 2
K5QHT.....351- 13- 9-A- –

Louisiana

W5INL...139,613- 640-73-A-34
W5KC....137,241- 663-69-A-34
W5HMU...86,430- 441-67-A-37
K5LXZ....74,115- 405-61-A-33
K5MPM...32,781- 226-49-A-20
W5ZGP....27,360- 192-48-A-20
W5QFS....26,828- 184-49-A-18
K5UNP.....7376- 77-33-A- 8
W5LDH....5616- 60-32-A- 5

Mississippi

K5MDX.212,868- 972-73-A-37
W5DQK.171,258- 784-73-A-38
K5HN....15,369- 109-47-A- 5
W8RMF/5..4416- 64-23-A-14

Tennessee

K4LTA...87,887- 427-69-A- –
K4PUZ...73,815- 354-70-A-26
K4BEM...60,299- 330-61-A-30
W4OGG...39,000- 200-65-A-17
K4RSY....32,781- 223-49-A-20
K4SXK....12,663- 105-42-A-20
K4CVQ.....2537- 45-19-A-12
W4HSR.....1980- 33-20-A-11

GREAT LAKES DIVISION

Kentucky

W4NWT...43,584- 229-64-A-27
W4VJV....27,318- 241-58-B-19
K4VUD.....4068- 59-24-A- 7
W4OMW....2016- 32-21-A- 5

Michigan

W8SH....66,300- 325-68-A- –
W8FEV...48,192- 252-64-A-39
K8RFC/8.47,259- 267-59-A-36
K8IAB....41,934- 244-58-A-33
K8IDZ....32,753- 200-55-A-29
K8JGZ....21,879- 143-51-A-34
K8MJZ....18,028- 128-47-A-25
K8DJR....16,500- 125-44-A-11
W8HNI....10,118- 118-43-B-15
K8HFX.....9935- 90-37-A-16
K8GIV.....4389- 78-19-A-10
W8FDE.....2808- 52-18-A- 7
K8HLR.....2280- 40-19-A-10
K8BND.....1680- 36-24-B- 2
W8MZH.....216- 9- 8-A- 2
K8PBQ (5 oprs.)
58,218- 314-62-A-34

Ohio

W8AJW..122,256- 568-72-A-38
W8VOW..97,017- 443-73-A-39
K8AAG...52,943- 272-65-A-34
W8CVW...39,878- 205-65-A-27
K8JOR...36,855- 195-63-A-38
W8IKM...35,340- 190-62-A-24
W8BIM...29,748- 222-67-B-27
W8LOF...26,087- 171-51-A-16
W8BMX...25,920- 180-48-A-25
W8NCV...15,028- 146-52-B-29
K8LCL....14,280- 119-40-A-14
W8KZH....14,255- 111-43-A-18
K8HZN....12,150- 112-36-A-13
K8JNZ....11,662- 119-49-B-17
W8BKO....8272- 88-47-B-11
W8SJU.....7680- 80-32-A-19
K8CLH.....7200- 100-24-A-11
W8NPF.....6876- 98-36-B-19
W8TLT.....6750- 75-30-A- 8
K8KNJ.....6510- 70-31-A-23
K8DWQ....3168- 48-22-A-11
W8LUZ.....2622- 46-19-A- –
W8UNE....2243- 33-23-A-16
K8LCN.....1935- 43-15-A- 8
W8PLQ.....1776- 37-16-A- 3
K8IFV.....1530- 30-17-A- 6
W8CZM.....840- 40-14-A- 7
K8KYF.....798- 19-14-A- 3
W8WSJ.....705- 24-15-B- 6
W8IMF.....444- 19- 8-A- 6
K8LWF.....396- 12-11-A- 4
K8IZL.....378- 18- 7-A- 5
K8BPY.....330- 15-11-B- 4
W8LOF.....232- 32- 4-B- –
W8DOG.....210- 10- 7-A- 5
W8LDR.....96- 8- 4-A- 2
K8DJM.....54- 6- 3-A- 1

HUDSON DIVISION

Eastern New York

W2AKN...59,073- 342-58-A-26
W2TGD...40,499- 276-49-A-35
K2UDJ.....3900- 52-25-A- 5
W2JGF.....1425- 25-19-A- 5

N. Y. C.-L. I.

K2TAP...100,683- 520-66-A-38
K2IEG....77,472- 538-72-B-32
W2WPH...48,000- 250-64-A-21
W2MGV...43,380- 242-60-A-34
K2TAQ....39,564- 240-56-A-25
K2UZV....37,080- 309-60-B-28
W2OTZ....31,936- 250-64-B-31
W2OQI....29,070- 255-57-B-40
K2JWD....22,913- 163-47-A-11
K2YGN....20,064- 152-44-A-16
WA2HPC.18,753- 133-47-A-16
W2NNB....17,136- 119-48-A-22
K2KHR....17,082- 146-39-A-17
W2BVV....16,776- 117-48-A-18
W2OME...13,110- 95-46-A-20
WA2EER.10,761- 107-34-A-20
W2JGQ.....9690- 95-34-A-23
W2YHP.....8925- 85-35-A-18
W2JFU.....8811- 91-33-A-12
K2DBO.....8448- 88-32-A- –
W2JRF.....7650- 75-34-A-14
K2EWD.....5655- 65-29-A- 9
K2AAW.....5208- 62-28-A- 9
K2YKQ.....3816- 53-24-A- 8
K2EAF.....3366- 51-22-A- 6
K2CTK.....2267- 50-22-A- 7
WA2UDH...2240- 54-20-A-12
W2INT.....2346- 51-23-B-15
W2NNH....2237- 41-19-A-18
W2TBU....1112- 28-13-A- 6
W2MQB.....882- 32-14-B- 3
W2YKQ.....819- 21-13-A- 2
K2OHW.....532- 19-14-B- 3
WA2IEC.....300- 24- 5-A- 9
WV2GGA....288- 32- 3-A- –

W2EZL.....174- 15- 4-A-10
K2LGS.....120- 10- 6-B- 2
W2KLS.....108- 6- 6-A- 6
W2KVL.....105- 7- 5-A- -
K2TXD.....18- 3- 2-A- 1
WA2COG.....12- 2- 2-A- 1
WV2DXH.....12- 4- 1-A- 2
W2BYN.....8- 2- 2-B- -
K2MFQ (K2MFQ, WA2BCG)
15,048- 152-33-A-25
K2UBJ (K2UBJ, WA2BEL)
96- 8- 6-B- 1

Northern New Jersey

K2LXL...108,468- 524-69-A-29
W2PEV...62,370- 330-63-A-27
W2OXG...46,110- 266-58-A-18

WA2EDG..34,800- 200-58-A-25
K2JTU....18,928- 182-52-B-32
K2HLC...16,692- 108-52-A-24
K2RBD...11,070- 123-30-A-21
WA2BDO...8436- 116-37-B-19
K2YFE.....7182- 87-28-A- 7
W2GND....4455- 69-22-A- 4
K2JLX.....4278- 46-31-A- 5
W2JKH.....3888- 82-16-A- 4
K2GDR....2688- 56-16-A-16
K2HFL.....2100- 100- 7-A-37
W9HEL/2..1782- 28-22-A-15
K2CVT.....324- 12- 9-A- 2
K2PQR.....300- 20- 5-A-16
W2TJD.....280- 14-10-B- 2
K2UBK.....162- 18- 3-A- 3

K2YNT (6 oprs.)
18,144- 146-42-A-26

MIDWEST DIVISION

Iowa

WØMLY..154,614- 706-73-A-36
WØAXE..106,128- 542-66-A-40
KØMMS..100,902- 502-67-A-37
WØETN...40,032- 210-64-A-34
KØLZJ....31,171- 258-61-B- -
WØWWM..18,906- 137-46-A-15
WØSQN...16,128- 128-42-A- 9
KØHC....14,100- 100-47-A-11
KØHFW....6920- 88-40-B- 7
WØMHC (4 oprs.)
72,828- 360-68-A-32

Kansas

KØRNZ..176,577- 847-71-A-40
KØQPO...57,267- 303-63-A-25
WØMXG...37,824- 197-64-A-17
KØVVR...34,452- 299-58-B-26
KØGIC...31,122- 200-52-A-20
KØQWN....6237- 77-27-A-11
KØTRL.....4602- 60-26-A-11
KØQGJ.....2993- 48-21-A- 3
WØIFR.....2028- 39-26-B- 2

Missouri

WØJEE..108,624- 496-73-A-32
KØJF1....50,958- 308-57-A-22
KØRPS.....8085- 79-35-A-19
KØCQA/Ø....168- 8- 7-A- 1

CLUB SCORES

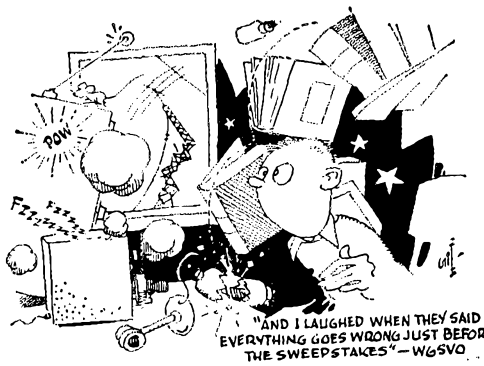
Club	*Score*	*Valid Entries*	*C. W. Winner*	*Phone Winner*
Potomac Valley Radio Club	5,859,377	58	W4KFC	.....
Frankford Radio Club	5,424,420	63	W3JNQ	W3ECR
El-Ray Radio Club (Mass.)	1,722,315	42	W1DDF/1	W1EEE
Hamfesters Radio Club (Ill.)	1,475,057	24	W9IRH	K9MDH
Westpark Radiops (Ohio)	1,254,637	28	W8ETU	W8AJW
Sioux City Amateur Radio Assn. (Iowa)	1,102,338	20	WØFZO	WØAXE
Ohio Valley Amateur Radio Assn.	842,726	10	W8LQA	.....
South Jersey Radio Assn.	792,372	21	W2EXB	K2UQD
Milwaukee Radio Amateurs' Club	688,090	19	W9QYW	K9MTM
Chicago Suburban Radio Assn.	677,424	18	K9KYR	W9FVU
Connecticut Wireless Assn.	563,478	10	W1BIH	.....
Order of Boiled Owls (N. Y.)	527,725	4	K2DGT	.....
Columbus Amateur Radio Assn. (Ohio)	497,686	12	W8IBX	W8VOW
Wisconsin Valley Radio Assn.	380,459	13	W9RQM	K9HJS
Buckeye Shortwave Radio Assn. (Ohio)	459,873	5	W8DQG	.....
Suffolk County Radio Club (N. Y.)	437,145	28	K2JQO	W2MGV
Denver Radio Club	432,455	22	WØMYB	KØOER
Richmond Amateur Radio Club (Va.)	423,285	10	W4BZE	K4HUU
Amateur Transmitters' Assn. of Western Pennsylvania	407,457	7	W3GJY	.....
Westside Amateur Radio Club (La.)	398,272	5	W5BUK	.....
Central Michigan Amateur Radio Club	377,731	6	W8PXA	.....
Tri-County Radio Assn. (N. J.)	377,510	10	W2JIB	.....
Kenmore West Senior High School Radio Club (N. Y.)	372,703	3	K2MWK	.....
San Diego DX Club	368,217	3	.....	.....
Lake Success Radio Club (N. Y.)	365,007	9	W2TUK	.....
Columbus Amateur Radio Club (Ga.)	361,530	4	K4BAI	.....
Manchester Radio Club (Conn.)	361,040	4	W1MHF	.....
Short Skip Radio Club (Pa.)	345,042	13	W3YLL	K3DVS
Niagara Radio Club (N. Y.)	344,730	8	K2MWM	.....
Garden State Amateur Radio Assn. (N. J.)	328,529	6	W2OIB	.....
West Seattle Amateur Radio Club	313,064	10	W7YGN	.....
San Bernandino Valley Contest Assn.	305,438	3	K6GLC	.....
Larkfield Amateur Radio Club (N. Y.)	301,899	10	W2OWO	.....
Canton Amateur Radio Club (Ohio)	301,650	11	K8BXU	W8IKM
Pikes Peak Amateur Radio Assn. (Colo.)	296,156	19	WØAX	KØTBE
Montrose County Amateur Radio Club (Colo.)	273,859	11	WØWME	KØEGJ
Radio Amateurs of Greater Syracuse	260,093	3	K2UZJ	.....
Amateur Radio Society of CCNY	253,423	5	K2IYC	.....
Tusco Radio Club	249,470	5	K8GID	.....
Massillon Amateur Radio Club (Ohio)	244,895	7	K8EKG	.....
Fordham Radio Club (N. Y.)	238,520	3	K2IAD[1]	.....
Waupaca Amateur Radio Club (Wis.)	225,802	7	K9LWV	.....
Four Lakes Amateur Radio Club (Wis.)	225,400	3	.....	.....
Saint Clair Amateur Radio Club (Ill.)	219,783	11	K9JMA	K9BGL
Radio Club of Tacoma	217,926	14	K7GPG	W7BSW
Kanawha County Amateur Radio Club (W. Va.)	216,938	4	K8HID	.....
Watchung Valley Radio Club (N. J.)	214,471	11	K2QYI	.....
North Penn Amateur Radio Club	212,350	6	W3JSA	.....
West Suburban YMCA Radio Council (Ill.)	211,755	8	K9IND	.....
Starved Rock Radio Club (Ill.)	201,722	9	W9ARV	W9RHV
Lynchburg Amateur Radio Club (Va.)	187,171	3	W4DVT	.....
Huron Valley Amateur Radio Assn. (Mich.)	184,476	3	K8GWZ	.....
Casper Amateur Radio Club (Wyo.)	183,778	3	.....	W7LKQ
Waterbury Amateur Radio Club (Conn.)	182,144	6	K1ACC	.....
Bayonne Amateur Radio Club (N. J.)	180,768	4	K2OQA	.....
Ford Amateur Radio League (Mich.)	164,358	4	K8KCO	.....
Springfield Amateur Radio Club (Ohio)	162,503	5	K8DEO	.....
Cuyahoga Falls Radio Club (Ohio)	154,283	3	.....	.....
Oxford Circle Radio Club (Pa.)	153,378	3	.....	.....
Detroit Amateur Radio Assn.	152,683	8	W8MGQ	.....
Atlanta Radio Club	144,717	3	W4ZKU	.....
Fenwick High School Radio Club (Ill.)	138,335	3	K9RHN	.....
South Lyme Beer, Chowder & Propagation Society (Conn.)	130,033	3	W1TS	.....
Mohawk Amateur Radio Club (N. Y.)	129,688	6	W2III	W2WPH
Bayside Amateur Radio Club (N. Y.)	125,004	6	K2HGR	.....
Amateur Radio Club of University of Arkansas	124,190	4	.....	.....
Atlanta Teenage Amateur Radio Club	118,636	4	K4EEK	.....
Five Towns Radio Club (N. Y.)	117,404	9	K2CTK	K2TAP
Eastern Pennsylvania Amateurs	111,202	3	.....	.....
Chicago Radio Traffic Assn.	105,327	5	W9REC	.....
Stark County Amateur Radio Club (Ohio)	102,053	7	K8IDH	.....
Horseshoe Radio Club (Pa.)	99,564	5	.....	W3LIV
Philadelphia Wireless Assn.	96,585	6	W3NHX	W3RAE
Three Half-Baked Virginia Hams	93,549	4	.....	.....
Mira Costa High School Amateur Radio Club	91,229	6	K6SVY	K6YNB
Bucks-Mont Teenage Amateur Radio Club (Pa.)	68,743	7	W3IIO	W3IIO
A. B. Davis High School Radio Club (N. Y.)	68,120	3	.....	.....
Syracuse Very High Frequency Club (N. Y.)	65,631	5	K2PKK	.....
Bronx High School of Science Radio Club	56,293	5	WA2DDW	.....
Schenectady Amateur Radio Assn. (N. Y.)	51,103	3	W2BBW	.....
Hartford County Amateur Radio Assn. (Conn.)	49,388	5	K1CSH	.....
Dayton Amateur Radio Assn. (Ohio)	40,508	4	.....	.....
Radio Amateur Megacycle Society (Ill.)	39,833	6	K9QPJ	.....
Town of Barnstable Radio Club (Mass.)	38,703	4	K1BIF	.....
Green Bay Mike and Key Club (Wis.)	35,488	8	K9OCO	W9IKY
Exeter Amateur Radio Society (N. H.)	27,363	6	W1ZQR	W1OQG
Forest City Amateur Radio Club (Ohio)	15,462	5	.....	W8SJU
Albany Park Amateur Radio Club (Ill.)	8,755	3	.....	.....
Boys' Life Radio Club (N. J.)	7,467	3	.....	W2GND
Nutley Amateur Radio Club (N. J.)	4,294	4	W2TJD	.....

[1] K2JVB, opr.

Meet Andy, W5IWL, topping all Oklahoma phone SS entries these past five years. Andy likes to prove that homebuilt gear (bandswitching 813) can bring home the bacon—plus top West Gulf entry. Antennas for the lower frequencies were end-fed wires, plus a new tri-band beam for 20–15–10.

PHONE WINNERS, 26TH A.R.R.L. SWEEPSTAKES CONTEST

Section	*Call*	*Score*	*Transmitting Equipment*	*Receiving Equipment*	*Bands Used*
E. Penna.	K3DVS	65,391	Apache	HQ110	75, 40, 20, 15, 10
Md.-Del.-D. C.	W3ZKH	132,276	Viking II	NC300, DB23	75, 40, 20, 15
S. N. J.	K2UQD	78,390	Viking I	HQ140X, DB23	40, 20, 15, 10
W. N. Y.	K2BHP	119,793	DX100	NC183D	75, 40, 15, 10
W. Penna.	W3YZR	40,117	Valiant	NC300	75, 40, 15, 10
Illinois	K9BGL	108,009	Viking II	NC300	75, 40, 20, 15, 10
Indiana	K9CUY	83,496	Viking II	HRO50	75, 40, 20, 15, 10
Wisconsin	W9MIJ	43,200	DX100	HQ110	75, 10
No. Dakota	W0WFO	110,268	Viking I	SX101	75, 40, 20, 15, 10
So. Dakota	W0PRZ	123 151	32S1	75S1	75, 40, 20, 15, 10
Minnesota	KØBIT	112,608	Ranger-4-400As	75A4	40, 20, 15, 10
Arkansas	K5EJQ	40,326	Apache	NC88, conv.	40, 15, 10
Louisiana	W5INL	139,613	Ranger, 4-400	NC303	75, 40, 20, 15, 10
Mississippi	K5MDX	212,868	6C4-5763-6146-4-400A	HQ110; HC10	75, 20, 15, 10
Tennessee	K4LTA	87,887	Viking I	SX101	75, 40, 20, 15, 10, 6
Kentucky	W4NWT	43,584	7C5-2E26-812A	HQ160	75, 40, 20, 15, 10
Michigan	W8SH	66,300	32V3	NC183D	75, 40, 20, 15, 10
Ohio	W8AJW	122,256	32V1; Communicator	SX101; Communicator	75, 40, 20, 15, 10, 6
E. N. Y.	W2AKN	59,073	DX100	HQ110	75, 40, 20, 15, 10
N. Y. C.-L. I.	K2TAP	100,683	Globe King	SX96	40, 10
N. N. J.	K2LXL	108,468	DX100	HQ150	75, 40, 20, 15, 10
Iowa	WØMLY	154,614	32V2	75A4	40, 20, 15, 10
Kansas	KØRNZ	176,577	Viking II	NC300	75, 40, 20, 15, 10
Missouri	WØJEE	108,624	Ranger	75A2	75, 40, 20, 15, 10, 6
Nebraska	KØWHX	20,447	Challenger	HRO50T1	40, 20, 15, 10
Connecticut	W1EOR	144,540	6146-4-250As	NC300	75, 40, 15, 10
Maine	W1DIS	79,462	DX100-Viking KW	75A4	75, 40, 20, 15, 10
E. Mass.	W1ONK	117,150	Ranger	75A1	75, 40, 20, 15, 10
W. Mass.	K1CPD	82,800	Apache	NC183	75, 40, 15, 10
N. H.	K1DFM	65,100	DX100; Valiant	SX43; HQ170	74, 40, 20, 15, 10
R. I.	W1BFB	62,275	Ranger-813	NC300	75, 40, 20, 15, 10
Vermont	K1GAR/1	34,278	6CL6-12BY7-5763-6146s	SX96	75, 40, 20, 15, 10
Alaska	KL7CDF	352	KWM1, Courier	KWM1	20, 15
Idaho	K7BWV	25,185	DX100	75A4	75, 40, 20, 15, 10
Montana	W7CBY	75,330	32V3	BC342, conv.	75, 40, 20, 15, 10
Oregon	W7UGQ	86,180	Viking I	75A2	75, 40, 20, 15, 10
Washington	W7BSW	158,337	Valiant	NC300	75, 40, 20, 15, 10, 6, 2
Hawaii	KX6CS	36,000	AP67	G66B	15, 10
Nevada	K3DMW/7	47,555	Ranger	HQ100	20, 15, 10
Santa Clara V.	K6VGW	74,372	DX35	HQ140XA	40, 15, 10
East Bay	W6VNH	94,785	Apache	Mohawk	40, 20, 15, 10
San Francisco	K6ELE	38,903	32V1	75A4	75, 40, 20, 15, 10, 6
Sacramento V.	W6SIA	108,572	6CL6-6AQ5-5763-2E26-4-125A	75A1	75, 40, 20, 15, 10
San Joaquin V.	K6OOW	83,605	Viking II	HQ145	75, 40, 15, 10
No. Carolina	W4AWM	29,070	Viking II	S76	75, 40, 20, 15, 10
So. Carolina	K4YYL	35,730	DX40	HQ145	75, 40, 20, 15
Virginia	W4BVV	75,446	DX100	NC98	85, 40, 20, 15, 10
W. Virginia	K8KZF	23,180	DX100	SX100	75, 20, 15, 10
Colorado	KØJGF	65,250	KWM1	KWM1	20, 15, 10
Utah	K7BHE	46,269	Ranger	NC183D	40, 15, 10
New Mexico	K5OWK	33,516	Apache	SX101	40, 20, 15, 10
Wyoming	W7LKQ	84,105	Cheyenne	Comanche	75, 40, 20, 15, 10
Alabama	K4TPV	42,048	Viking II	SK101	40, 20, 15, 10
E. Florida	K4KXX	156,449	Valiant	NC300	20, 15, 10
W. Florida	K4ZAC	13,607	Apache	NC300	20, 15, 10
Georgia	W4FGH	129,582	813; 6146 SSB	HQ170; 75A2; 75A3	75, 40, 20, 15, 10
West Indies	KG4AM	15,168	GSB100-GG RK65s	75A3	40, 20, 15, 10
Canal Zone	KZ5LC	65,928	5100	75A4	20, 15, 10
Los Angeles	W6LNW	201,480	Valiant	HRO60, HC10	75, 40, 20, 15, 10
Arizona	W7CAF	139,194	DX100	75A4	75, 40, 20, 15, 10
San Diego	W6JVA	124,064	DX100	HQ129X	75, 40, 20, 15, 10
Santa Barbara	W6UWL	16,298	Ranger	NC300	75, 20, 15, 10
No. Texas	K5IID	118,800	Valiant	SX96; SX99	75, 40, 15, 10
Oklahoma	W5IWL	140,907	5763-5763-5763-6146-813	NC300	75, 40, 20, 15, 10
So. Texas	W5PZG	86,415	6AG7-2E26-813	Homebuilt (20-tube triple conv.)	40, 20, 15
Quebec	VE2JR	45,441	Apache	Mohawk	75, 40, 20, 15, 10
Ontario	W8JKD/VE3	12,740	6AG7-6146-813	HQ129X	75, 40, 20, 15
Manitoba	K4DJG/VE4	576	Challenger	CR91A	15, 10
Alberta	VE6TP	62,310	Valiant	NC300	10



WØZLN (12 oprs.)
43,587- 256-58-A-39
KØRIP (KØs MYW QNS RIP)
31,350- 194-55-A-32
WØQON (14 oprs.)
14,544- 157-48-B-25
WØFLN (W9s ATU NAX, KØVBT)
10,815- 103-35-A-17

Nebraska

KØWHX..20,447- 162-43-A- –
KØDLL.....1782- 33-18-A- –

NEW ENGLAND DIVISION

Connecticut

W1EOR..144,540- 660-73-A-35
K1EFI....96,255- 467-69-A-28
W1HR....19,875- 125-53-A-15
W1LKG...13,974- 137-51-B-20
W1WHL..12,204- 113-36-A- 7
W1BFS.....7860- 66-40-A-16
W1QUJ.....5508- 51-36-A- 8
K1EKC.....4244- 62-23-A- 7
W1HDQ²....42- 7- 3-B- 1

Maine

W1DIS....79,462- 592-67-B-36
K1EJA....21,609- 180-42-A-22
W1UZG....19,998- 154-44-A-16
K1KSG.....4382- 66-23-A-24

Eastern Massachusetts

W1ONK..117,150- 550-71-A-36
W1FRR/1
94,254- 683-69-B-40
W1YQF...72,758- 391-65-A-39
W1EEE...61,539- 422-73-B-28
W1PKV...52,470- 265-66-A-34
W1MQV...50,505- 259-55-A-22
W1HBQ...34,440- 220-56-A-21
K1HTK...34,272- 204-56-A-25
K1JFM...33,936- 202-56-A-32
K1DPI....26,664- 202-44-A-13
W1EJE....15,900- 100-53-A-26
K1BZL....13,635- 100-45-A-25
W1KXW...13,104- 105-42-A-17
W1LQQ.....5760- 64-30-A- 4
W1BU⁸.....5368- 122-22-B- –
W1ELV.....4212- 55-26-A- 5
K1GNV.....3432- 44-26-A- 6
W1OTH.....2552- 41-21-A- 7
K1DCB.....1938- 34-19-A- 7
W1GUF.....912- 19-16-A- 2
K1KTH.....684- 19-12-A- 7
W1MEG.....528- 16-11-A- 2
W1WYX.....312- 13- 8-A- 5
W1SBP.....240- 15- 8-B- –
W1VTT.....60- 6- 5-B- 2
K1MMR (4 oprs.)
10,005- 115-29-A-23

Western Massachusetts

K1CPD...82,800- 401-69-A-32
K1CTD...71,175- 325-73-A-19
W1DGJ...40,260- 220-61-A-25
W1DXS...31,020- 220-47-A-29
W1RMR...25,905- 157-55-A-20
W2EJC/1..12,300- 100-41-A-11
W1JYH...12,000- 100-40-A- 4
W1BYH.... 75- 5- 5-A- 1

New Hampshire

K1DFM...65,100 350 62-A-40
K1CSJ....28,440- 239-60-B-24
W1FZ.....11,040- 115-48-B- 8
W1ASZ.....9438- 121-26-A- 7
W1OQG.....252- 12- 7-A- 2
W1ZQR.....180- 10- 6-A- 5
K1KLA.....48- 4- 4-A- 1

Rhode Island

W1BFB...62,275- 367-65-A-25
K1DWI...34,155- 207-55-A- –
W1YRC....4929- 53-31-A- 3

Vermont

K1GAR/1..34,278- 197-58-A-33
K1GBF....31,605- 245-43-A-17
W1UFV/1...9324- 84-37-A-13
W1EIB.....672- 24-14-B- 3
W1HFS.....210- 10- 7-A- 1

NORTHWESTERN DIVISION

Alaska

KL7CDF....352- 16-11-B- 3

Idaho

K7BWV...25,185- 187-46-A-18

Montana

W7CBY...75,330- 419-60-A-30
W7FIN...53,016- 378-47-A-20
W7JHL...34,020- 203-56-A-16
K4KNC/7..26,861- 182-47-A-23
K7EGG...20,511- 159-43-A-14
W7TYN...16,254- 130-42-A-12
K7CTI.....1479- 30-17-A- 3
K7GPW.....935- 28-17-B-20

Oregon

W7UGQ...86,480- 432-67-A-35

Washington

W7BSW..158,337- 723-73-A-36
W7UWT..100,674- 503-68-A-33
W7DQM...93,150- 453-69-A-25
W7DNU...82,269- 417-66-A-34
W7GRM...39,936- 256-52-A-18
W7NLB...33,825- 208-55-A-15
W7RXS...13,734- 109-42-A-10
K7HLN...13,264- 121-37-A-11
K7AYC...10,234- 120-43-B- 7
W7AZI.....7613- 73-35-A-10
K7HTU.....2541- 39-22-A- 5
W7WLX....2451- 43-19-A- 3
K7ATD....1296- 27-16-A- 4
K7GPK.....1193- 27-15-A- 8
W7OS.....900- 21-15-A- 5
K7HNU.....558- 16-12-A- 1
W7LCS.....54- 6- 3-A- 3
K7CYZ.....48- 16- 1-A- 9

PACIFIC DIVISION

Hawaii

KX6CS...36,000- 242-50-A-21
KH6CTH..10,601- 97-37-A- 6
KH6CYH...2730- 37-26-A- 4

Nevada

K3DMW/7
47,555- 325-49-A-24
W7JLV....20,862- 183-57-B-24

Santa Clara Valley

K6VGW....74,372- 399-63-A-39
K6ONL...70,800- 402-59-A-28

East Bay

W6VNH...94,785- 445-71-A-39
K6PJY.....8721- 86-34-A- 6

San Francisco

K6EIE....38,903- 228-57-A-30
K6JSJ....22,185- 148-51-A-19
W6EYY....8046- 75-36-A- 4

Sacramento Valley

W6SIA...108,572- 535-69-A-28
W6QIV....90,180- 501-60-A-31

San Joaquin Valley

K6OOW...83,605- 440-65-A-24
W6USV....56,070- 316-60-A-19
W6TZN...39,911- 276-49-A-18
W6TKF....29,733- 192-53-A-12
K6RAU (K6s DUU RAU RLX)
44,655- 229-65-A-18

ROANOKE DIVISION

North Carolina

W4AWM...29,070- 179-57-A-14
W4AHY...27,924- 184-52-A-33
K4IFX.....12- 2- 2-A- 1
W4BUU.....5- 2- 1-A- 2
K4MWB.....3- 1- 1-A- –

South Carolina

K4YYL...35,730- 200-61-A-36
K4MUP....2852- 62-23-B- 6
W4NNF.....158- 8- 7-A- –

Virginia

W4BVV...75,446- 350-73-A-40
K4HUU....39,948- 350-67-A-40
K4LPR....62,250- 449-70-B-39
K4OJE....34,596- 186-62-A-26
K4ASM.....8073- 70-39-A- 9
W4KAO....6396- 78-41-B-10
W4MZR....1734- 34-17-A- 4
K4ZHA (K4s IKF TSU ZHA)
26,010- 171-51-A-25

West Virginia

K8KZF...23,180- 153-51-A- –
W8UYR...19,272- 150-44-A-20
K8KLI....3600- 50-24-A- –
K8OLY....2610- 45-20-A-12
W8MLX....216- 9- 8-A- 2

ROCKY MOUNTAIN DIVISION

Colorado

KØJGF...65,250- 377-58-A-22
KØOER...61,958- 381-55-A-33
KØTBE...52,104- 335-52-A-32
WØTIV...47,439- 253-63-A-21
KØLMD...46,170- 271-57-A-33
KØPGM...15,045- 276-55-A- –
WØBWJ...36,966- 203-61-A-25
KØSUB...30,456- 199-54-A-23
KØDCW...23,958- 183-44-A-12
WØECY...23,280- 196-60-B-23
WØZFU...16,830- 110-51-A-12
WØICR...15,480- 120-43-A- 9
KØALH...11,058- 99-38-A-16
WØYJO...10,500- 100-35-A- 7
KØEGJ....9870- 94-35-A-26
KØTMM....9108- 92-33-A-13
KØOAZ....6272- 57-37-A-13
WØVDY....5400- 72-25-A- 7
KØCEN....5394- 58-31-A-14
KØMNQ....4554- 69-22-A-12
KØTJU....4056- 52-26-A- 4
WØNIT....3509- 69-29-B-12
KØKET....3382- 59-19-A- 5
KØRQF....3339- 55-21-A- 6
KØSIS....3135- 49-22-A-23
K6JQC/Ø...2370- 40-20-A- 3
KØLZF....2079- 33-21-A- 5
KØGAS....1995- 35-19-A- 6
KØTEP/Ø...1485- 29-18-A- 5
WØBON.....624- 16-13-A- 1
WØCND.....528- 16-11-A- 3
KØOOT.....308- 14-11-B-12
KØRNT.....2- 1- 1-A- 5
WØYQ (18 oprs.)
171,146 -811-71-A-39
KØRJA (KØs RGV RJA)
21,930- 175-43-A-24
WØRQI (WØs RQI SIN, KØAOA)
19,941- 200-51-B- –
KØRGV (2 oprs.)
348- 18- 8-A- 3

Utah

K7BHE...46,269- 295-53-A-30
W7ZKL...27,029- 246-37-A-16
W7QWH..18,870- 185-51-B-12
K7CQS....3861- 50-26-A-12
W7FHX....702- 18-13-A- 6
W7CXZ (W7CXZ, K7BLR)
87,234- 434-67-A-31

New Mexico

K5OWK...33,516- 200-57-A-20
W5NXF...30,600- 256-60-B-16
W5ONK...18,256- 164-56-B-16
K5DAB....2548- 50-26-B- 4
K5RHR.....231- 11- 7-A- 3

Wyoming

W7LKQ...84,105- 407-70-A-39
W7RZZ....62,570- 358-59-A-25
K7IAY....37,103- 244-51-A-25
K7GYT...36,720- 240-51-A-23

SOUTHEASTERN DIVISION

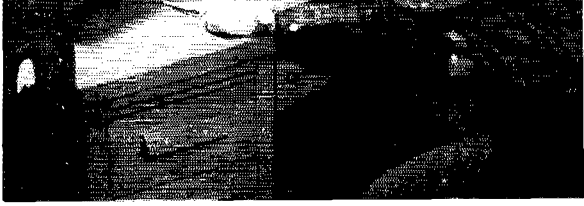
Alabama

K4TPV...42,048- 221-64-A-28
W4CWO...12,771- 99-43-A-16
K4DRF....11,718- 113-36-A-13
W4KAC....3270- 56-30-B- 4
W4WLM....1938- 38-17-A- 4

Eastern Florida

K4KXX..156,449- 747-71-A-34
K4QHG..132,405- 737-65-A-37

(*Continued on page 138*)



A clean sweep of the sections with 660 QSOs brought W1EOR the Connecticut sheepskin and highest New England score. John parlayed the 75-40-15-10 combination into 144,540 points. This nifty shack is augmented by doublets and beams 70 and 85 feet high.

1960 ARRL Field Day Rules

Annual Test for Emergency-Powered Stations, June 25-26

JUNE is busting out all over . . . and that means it's Field Day time, the biggest operating activity of the year for all active amateurs in the 73 ARRL Sections.

The theme as always is get out in the field and test out your emergency rig and emergency power facilities. Clubs and groups will set up and operate multi-transmitter stations independent of normal power facilities, to gain experience in functioning under actual emergency conditions. You can enter as a club or group portable; unit or individual portable; mobile; emergency powered home station, such as might be found at civil defense and amateur club stations; or as a home station. Whatever class you choose to enter, you can be sure that all will be looking for your signal come Field Day.

The rules and entry classifications are unchanged from last year. Pick any 24-hour period from the Field Day timetable. To raise contacts call "CQ FD" on c.w. or "CQ Field Day" on phone; then swap signal reports and ARRL sections or specific locations.

Here are examples to assist score calculations:

Example 1

Assume a 25-watt rig wholly on batteries, not originating or relaying any messages, and not having more than two operators.

40 points (40 stations worked)
× 3 (power below 30 watts)

120
× 3 (*all* radio equipment independent of commercial mains)

360
× 1.5 (If Class B or C and everything on batteries)

540 claimed score

Example 2

Same as Example 1 but one Field Day Message to the SEC or SCM is originated and passed in good form.

65 points (40 QSOs + 25 points for FD message)
× 9 (3 × 3 — power multiplier multiplied by independence-of-mains multiplier)

585
× 1.5 (everything on batteries)

877.5 claimed score

(*Copies of all messages originated and relayed must accompany Field Day reports.*)

Example 3

The Podunk Hollow Radio Club (or any group of three or more licensed operators), portable at its FD site, operates two transmitters simultaneously. Each rig runs 75 watts input and batteries or generators furnish power. One message is started in good form (25 points), 1 is received and relayed onward (2 points), and 230 stations are contacted.

257 points (230 QSOs + 25 +2)
× 2 (power input over 30 and under 150 watts)

514
× 3 (all gear independent of mains)

1542 claimed score

(*No battery multiplier for either clubs or groups.*)

Mobiles are an important part of Field Day too, and clubs should strive to get all member-owned mobile units on the air during Field Day and report their mobile scores for the mobile aggregate scores to appear in the final results. Mobile units are the key to any emergency communication.

Log forms and summary sheets are now available on request from ARRL. Your best bet is to send for some, but the sooner the better. You may also use the summary on the next page, or prepare a facsimile. The log and summary sheets have been revised this year, so please follow the new format. All reports should include starting and ending time of operation, bands used, dates and contact times, calls of stations worked, signal reports sent and received, and locations of stations worked, as well as power sources and inputs, location and call of station, number of transmitters in simultaneous operation, number of persons participating, club name (if any), and score computations. Results must be postmarked no later than July 25 for listing in *QST*.

Portable stations are reminded to be sure they comply with FCC regs in signing portable. C.w. stations follow their calls with a slant bar followed by the numeral of the area in which they are operating; phone stations follow their calls with their geographical location. See Sec. 12.82 2(b) of the Amateur rules for details (in License Manual).

Check these FD rules, which follow below, very carefully: a scan of last year's FD results (December 1959, *QST*) may give you some hints. Then get ready to join in on the pinnacle of operating joy . . . Field Day 1960!

Rules

1. Eligibility: The Field Day is open to all radio amateurs in the sections listed on page 6 of this issue of *QST*.

2. Object: For portable and mobile stations to work as many stations as possible; for home stations to work as many portable and mobile stations as possible.

3. Conditions of Entry: Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Contest Committee.

4. Entry Classification: All entries will be classified according to number of transmitters in simultaneous operation. They will be further classified as follows: "A," club or nonclub group portable *stations*: "B," *unit or individual* portable stations; "C," mobile stations; "D," home stations operating from emergency power; "E," home stations operating from commercial power sources. Thus a club or group running three transmitters simultaneously will be in the 3A classification, or a mobile station with one transmitter will be in the 1C classification.

Portable stations are those installed temporarily, for FD purposes, at sites away from customary fixed-station locations. Portable equipment or units must be placed under one call and the control of one license, for one entry. All control locations for equipment operating under one call must lie within a 1000-foot diameter circle.

Group participation is that portable-station work accomplished by three or more licensed operators.

Unit or individual participation is that portable-station work accomplished by either one or two licensed operators.

Mobile stations are complete installations including power source and antenna, mounted in or on vehicles and capable of being used while in normal motion. If they utilize antenna supports not normal or suitable for use during motion, installations must be classified as portable instead of mobile. Each mobile entry call must be different from any other FD station participating.

Home Station participation is that work by fixed amateur stations not operating portable or mobile.

A transmitter used to contact one or more stations may not subsequently be used under more than one other station call during the Field Day period.

5. Field Day Period: All contacts must be made during the period indicated elsewhere in this announcement. An entry may be operated no more than 24 consecutive hours of the 27 hours available.

6. Bands: Each phone and c.w. band is regarded as a separate band. The following (and additional u.h.f.-s.h.f. bands) constitute separate bands: *A1*: 1.800-1.825 "east" or 1.975-2.000 "west," 3.5-4.0, 7.0-7.3, 14.0-14.35, 21.0-21.45, 28.0-29.7, 50-54 and 144-148 Mc. (A2, radio-teletype and frequency-shift keying are grouped with A1, in the bands where they are allowed). *A3*: 1.800-1.825 "east" or 1.975-2.000 "west," 3.8-4.0, 7.2-7.3, 14.2-14.35, 21.25-21.45, 28.5-29.7, 50.1-54, and 144-147.9 Mc. All forms of voice transmission will be grouped with A3, in the bands where they are allowed. (In Canada and Cuba, their respective phone bands apply.)

The use of more than one transmitter at one time in the same band is not allowed.

7. Exchanges: Signal reports and ARRL section (or specific location) must be exchanged in proof of contact.

8. Valid Contracts: In Class A, B and C, a valid contact is a completed exchange with any amateur station. In Classes D and E, a valid contact is a completed exchange with any station in Class A, B or C. Cross-band contacts are not allowed. Contacts by mobile stations may be made in motion or from any location(s). A station may be worked more than once only if the additional contacts are made on different bands.

9. Field Day Message: A Field Day Message is one originated by a Class A, B, or C station and addressed to the SEC or SCM (see address in *QST*, p. 6) stating the number of operators, the field location, and the number of AREC members at the Field Day station. Only one Field Day Message may be originated.

Entries must be accompanied by this summary sheet. You may obtain the summary shown here plus log forms free on request from ARRL. Or you may use the very one shown here or prepare a facsimile. Attach logs of all Field Day contacts and copies of all messages originated and relayed with your entry. For those that request the summary form from ARRL, note the following typographical error. Next to the Class A box should read: Unit or group portable.

FIELD DAY TIMETABLE

Time	*Start* June 25	*End* June 26
AST	5:00 P.M.	8:00 P.M.
EST	4:00 P.M.	7:00 P.M.
CST	3:00 P.M.	6:00 P.M.
MST	2:00 P.M.	5:00 P.M.
PST	1:00 P.M.	4:00 P.M.

(Operate no more than 24 *consecutive* hours out of the total 27-hour period)

10. Scoring:

Points: Each valid contact counts 1 point.

Message Credit: Credit for handling messages may be obtained only as follows: 25 points for originating one Field Day Message to SEC or SCM. In addition, each Field Day Message received for relay will score 1 point when received by radio and 1 point when sent onward by radio. No FD Message may pass through the same station twice. There will be a deduction of 10 points for omission of handling data or for defects in form. Copies of all messages originated and relayed must accompany Field Day reports.

Multipliers:

Power: Output-stage plate input 30 watts or less: 3. Output-stage plate input between 30 and 150 watts: 2. Output-stage plate input between 150 and 1000 watts: 1. The plate input of a grounded-grid amplifier is its plate input plus the plate input to the driver stage.

(*Continued on page 142*)

ARRL FIELD DAY SUMMARY

STATION CALL..... FD LOCATION.....
(indicate / where applicable)

CLASS OF ENTRY (check only one)

- [ ] A. Club or group portable.
- [ ] B. Unit or individual portable.
- [ ] C. Mobile
- [ ] D. Home -- Emergency power.
- [ ] E. Home -- Commercial power.

ENTER NUMBER OF TRANSMITTERS IN *SIMULTANEOUS OPERATION* IN THIS BOX: [ ]

If club entry, name of club.....

If Class B entry, call(s) of operator(s).....

Number of people participating at this station.....

Period of FD operation: Starting time..... Ending time.....

POWER SOURCE (check)

[ ] Generator. [ ] Commercial Mains. [ ] Battery. [ ] Other.

Description of power source (generator type etc.).....

Bands	Nr. stns. worked	Multiplier	Score	Transmitter	Input
3.5 Mc. CW		X			
3.5 Mc. A3		X			
7 Mc. CW		X			
7 Mc. A3		X			
14 Mc. CW		X			
14 Mc. A3		X			
		X			
		X			
		X			
FD message points	2	X			
TOTALS	1	X	CLAIMED SCORE	Enter total number of stations worked here (should equal box 1 minus box 2)	

This certifies that the station whose call appears above was operated in accordance with the current Field Day rules and that, to the best of my knowledge, the points and score as set forth in the above summary are correct and true.

..... (Date)

..... (Signature of club secretary or licensee of station whose activities covered in this FD entry)

VE/W Contest—1959 Results

BACK last September 26 and 27, the Montreal Amateur Radio Club sponsored their annual VE/W Contest. This 1959 fracas was another big success with a total of 403 logs submitted, representing all Canadian sections and practically all U. S. sections.

This year the cup which goes to the over-all winner was returned to the States with K6SXA pacing all entries with 222 VE contacts in all nine areas for 144,256 points. Eighteen and a half hours of work did the trick for Jim.

Top valid Canadian entry was way out in British Columbia where VE7EH recorded 569 W contacts in 59 ARRL sections for 100,713 points.

Other top Canadian scores included VE3BFF 83,616; VE3AD 83,144; VE3DDU 80,352; VE3CFU 79,560; VE4SL 78,192; VE3CGL 65,934; VE2ASW 63,896.

The following tabulation was prepared by the MARC Contest Committee. The figure after the call is the final score. The amateur heading each ARRL Section listing earns a certificate.

Maritime

VE1EK	53,568
VE1ADH	48,645
VE1OZ	41,328
VE1IM	36,064
VO2AW[1]	22,755
VO2NA	12,804
VE1UD	11,400
VE1UW	10,560
VE1CZ	6708
VE1DB	4836

Quebec

VE2ASW[2]	63,896
VE2BK	45,240
VE2BAT	37,620
VE2AYY	34,870
VE2ATU	30,670
VE2AGN	23,760
VE2HN	22,608
VE2JY	22,344
VE2AWO	21,762
VE2WA	16,560
VE2DR	13,728
VE2SS	13,344
VE2RL	2679
VE2ABE	650
VE2ABV	120
VE2AJD	75

Ontario

VE3BFF	83,616
VE3AD	83,144
VE3DDU	80,352
VE3CFU	79,560
VE3CGL	65,934
VE3DXP	49,952
VE3CLF	49,818
VE3BOG	49,324
VE3BTN	49,296
VE3EMA	49,152
VE3BLU	46,534
VE3DGW	37,260
VE3PV	35,775
VE3BWL	27,200
VE3MI	22,410
VE3CVV	22,072
VE3ATZ	22,050
VE3DYJ	20,757
VE3DLS	18,036
VE3BUR	17,784
VE3CWA	13,344
VE3LC	9170
VE3AYX	7067
VE3IA	5160
VE3CJD	5076
K4CLI/VE3	5046
VE3DJR	4680
VE3CVU	4140
VE3CTN	3978
VE3DEL	1900
VE3BUU	433

Manitoba

VE4SL	78,192
VE4IM	63,840
VE4SX	31,824
VE4EF	18,492
VE4GB	5600
VE4CF	2376
VE4MH	1632
VE4MD	1467
VE4HS	30

Saskatchewan

VE5KY	37,152
VE5AH	27,852
VE5DZ	21,266
VE5PR	17,100
VE5NQ	10,890

Alberta

VE6AD	53,784
VE6TP	31,200
VE6SF	28,905
VE6TY	24,600
VE6WG	10,579

British Columbia

VE7EH	100,713
VE7ASP	67,600
VE7AOI	52,896
VE7ABE	32,640
VE7AGC	30,498
VE7JN	18,720
VE7AC	16,758
VE7JQ	9828
VE7AER	9672
VE7AJ	1428
VE7BAV	1288
VE7ANQ	700
VE7OJ	196

Yukon/N.W.T.

VE8MX	44,414

E. Penna.

W3GOQ	56,045
W3AIZ	49,385
W3SOH	46,298
W3ADE	36,822
W3ARK	32,165
W3EFY	26,425
K3DHX	17,328
W3JXA	12,455
W3YLL	7310
W3NF	3577
K3ATX/3	814

Md.-Del.-D.C.

W3KLA	80,413
W3MSR	32,490
K3APM	30,703
W3IWJ	21,660
K3CXX	16,678
K3GIT	15,920
K3DEI	9819
K3CHP	9603
W3HRE	5415
W3MCG	2112
W3JSL	1877

S.N.J.

W2EXB	32,923
W2QDY	28,014
K2SJL	5198
W2BEI	1955
W2UAP	324

W.N.Y.

K2MWK	97,957
WA2BEX	85,286
K2MWM	25,017
K2HVS	24,837
K2IMK	15,704
K2KKH	10,180
K2ZRE	9819
W2MTA	8935
K2SSB	4657
W2KAT	3466

W. Penna.

W3NCF	45,486
W3NKM	45,324
W3DQN	15,704

Illinois

W9WNV	95,521
W9LNQ	56,533
W9PNE	52,634
K9KYR	51,172
W9YYG	33,140
K9JLR	31,624
K9BJM	25,992
W9BZW	19,494
W9MAK	15,270
W9QQG	12,180
W9YDQ	12,130
W9QXO	11,697
K9RUN	10,394
K9ORC	5632
K9IMW	4874
W9ZTK	4874

Indiana

W9IOP	64,818
K9KJD	48,139
K9JRG	38,988
K9MMH	34,602
K9LIO	33,356
K9WCS	13,285
K9ICG	11,552
K9KBW	6823
K9KJE	6498
K9PYO	1083
K9RIT	217

Wisconsin

W9UNJ	35,577
W9RKP	35,089
K9ELT	27,725
W9CHD	21,985
K9LWV	11,696
K9MKC	6498

No. Dak.

KØOSW	15,162
KØMPH	13,808
KØOSV	12,996

Minn.

WØYCR	58,482
WØPBI	38,663
KØIKL	25,396
KØQLM	16,606
KØSNC	11,859
KØRGP	2274
KØSNG	542

Ark.

K5JPB	51,984
K5QHS	19,061
K5TYW	5559

La.

K5ESW	114,365
W5KC	82,850
K2QWE/5	45,811
W5BUK	42,887
K5LXZ	37,526
K5SYJ	15,162

Miss.

K5HN	98,445
W5AMZ	21,660

Tenn.

K4LTA	80,900
K4PHY	49,385
K4LPW	49,096
K4RIN	27,292

Ky.

K4YFB	33,356
W4OMV	8953

Mich.

W8APN	59,457
K8KVV	53,717
K8KCO	33,356
K8QIH	33,140
W8MISK	26,858
K8LJB	24,043
W8PXA	12,725
W8SPO	5686
K8IUZ	4332
K8LWP	1083

Ohio

W8AJW	74,077
W8QHW	72,200
W8DWP	49,223
K8HVT	37,526
W8YPT	36,551
K8EGY	29,183
K8HBN	26,911
K8KFP	26,554
K8MTK	24,259
K8BXU	22,418
K8EZJ	19,169
K8IPS	14,783
W8YGR	12,021
K8KOP	4332
K8MMO	2130
W8BDO	1588
K8KMY	379

E.N.Y.

K2HVN	42,886
W2TER	29,458
K2YIG	10,234
WA2EKE	3249
WA2BPQ	2277
K2KUA	1462

N.Y.C.-L.I.

K2UVV	19,819
WA2AZE	14,621
WV2DQM	11,209
WA2BVH	5632

(*Continued on page 156*)

[1] Labrador winner. [2] K2VTX/VE2, opr.

The following entries were received too late to be ruled valid entries: VE2UN (VE2BN, opr.) 125,888; VE3UOT 123,656; VE3DH 37,800.

MARC thanks the following amateurs for submitting check logs: VE3JF, VE3DU, VE6IN, W1EFW, W3MDO.

Happenings of the Month

C.W. SEGMENTS ON 6 AND 2

CONCLUDING nearly two years of proceedings, the Federal Communications Commission has now disposed of the question of exclusive c.w. band segments at 6 and 2 meters by an order which establishes such A1 segments as 50.0–50.1 and 147.9–148.0 Mc., effective June 6. The report and order in Docket 12485, reproduced below, gives a brief history of the matter and the reasoning behind the Commission's conclusion:

Before the
FEDERAL COMMUNICATIONS COMMISSION

In the Matter of

Amendment of Section 12.111 of the Commission's Rules, Amateur Radio Service, to provide that only A1 emission may be used in the lower 100 kc. of the 50 and 144 Mc. amateur bands. } Docket No. 12485

SECOND REPORT AND ORDER

By the Commission: Commissioner Lee absent.

1. In response to a petition filed by the American Radio Relay League, Inc., a notice of Proposed Rule Making was issued in the above-entitled proceeding on June 11, 1958, proposing establishment, within the 50–54 Mc. and 144–148 Mc. amateur bands, of band segments in which only amateurs utilizing type A1 emissions would be permitted to operate. It was further proposed that these sub-bands should be 50.0–50.1 Mc. and 144.0–144.1 Mc.

2. On December 3, 1958, a Report and Order was issued in this proceeding in which the Commission concluded that the public interest would be served by establishment, as proposed, of 100-kc. segments of the 50–54 Mc. and 144–148 Mc. amateur frequency bands wherein operation may be conducted only if type A1 emission is used. However, the Commission concluded that the public interest would not be served by utilizing the lower 100 kilocycles of these bands, as proposed for establishment of such segments, but in view of the comments received the Commission concluded the public interest would be served by establishing these segments at 50.9–51.0 Mc. and 147.9–148.0 Mc.

3. On January 9, 1959, pursuant to requests filed by the League and other interested parties, the Commission issued an Order which postponed until further notice the effective date of the amendments ordered in the above-referred-to Report and Order and extended until March 10, 1959, the time for filing petitions for reopening or reconsideration.

4. In response to the January 9, 1959, Order, a substantial number of petitions were filed, some of which sought to reopen the proceeding for acceptance of additional comments, and others which sought reconsideration by the Commission on the present record.

5. On April 29, 1959, the Commission adopted a Further Report and Order [FCC 59–412, published in the Federal Register May 5, 1959, (24 FR 3612)] in this proceeding which:

(a) Denied those petitions which sought reconsideration upon the record then before the Commission; and

(b) Reopened the record for the reception of additional comments which petitioners alleged would demonstrate that the "A1 only" segments should be established at the low frequency ends of the respective bands. In reopening the record the Commission stated in part:

"In view of the fact that evidence of the type petitioners allege will be adduced is, in some cases, not contained in the present evidentiary record, the Commission believes that the proceeding should be reopened for the receipt of additional evidence."

6. The time for filing comments has expired. A substantial number of additional comments have been received in response to this Further Report and Order. The arguments expressed in these comments were of three general types: some argued that the lower 100 kc. of the 50–54 Mc. and 144–148 Mc. amateur bands be restricted to A1 emission; others, that these segments should be established elsewhere in these bands; and still others that no "A1 only" segments should be established. These latter comments were not considered germane since the question of whether or not these segments should be established had already been determined and was not in issue here. Accordingly, the Commission herein has given consideration to only that evidence which relates to the location of the segments within the subject bands.

7. The considerations which influenced the Commission's previous determination that the "A1 only" segments should be 50.9–51.0 Mc. and 147.9–148.0 Mc. were: a) the majority of amateurs; i.e., those using A3, would not be faced with having to shift from the parts of the bands where they most frequently operate; b) permitting A3 emission in the lower 100-kc. segment of the 50–54 Mc. band would minimize interference to TV Channel 2; and c) since the propagation characteristics of these segments were not sufficiently different, the two factors set forth in a) and b) should be controlling. With some minor exceptions, the A3 comments generally reiterated these conclusions and argued that the A1 segments should be anywhere except in the bottom 100 kc. of the bands.

8. The comments in support of establishing the "A1 only" segments at the low frequency ends of the respective bands, including comments by the League, adduced the following evidence on these points:

(a) Amateurs experimenting with weak signal communication techniques and investigating various propagation phenomena have designed and constructed high gain, rotatable directional antennas. Such antennas achieve high gain and better signal-to-noise ratios at the expense of bandwidth. Most such antennas have been designed for operation at the low ends of the respective bands and represent a very considerable investment in time as well as money. There would be little incentive to modify these antennas for operation at 50.9–51.0 Mc. because this segment offers much reduced opportunity for interesting work in the field of ionospheric propagation. Thus, the upheaval involved in moving to higher segments in these bands would, on an individual basis, adversely affect the A1 operators more seriously, while such a transition for the A3 users could be more easily accomplished.

(b) As regards interference to and from TV Channel 2, while it is true that more such interference will be experienced from operations higher in the 50–54 Mc. band, raising the operating frequency in the order of 100 kc. should have no significant bearing on the overall interference situation. Even in areas where Channel 2 television signals are usable, there is little difference in the interference caused at 50.5 Mc. as compared to that at 50.0 Mc.

(c) There is a significant difference in the propagation characteristics of frequencies in the 50–54 Mc. band particularly for investigation of the F_2 layer ionospheric mode of propagation. Frequencies near 50 Mc. are more favorable than those higher in the band. Even during periods of exceptionally high sunspot activity, the maximum usable frequency (m.u.f.) is only occasionally as high as 50 Mc. During the recent sunspot maximum and the last preceding one, amateur observations have shown that only rarely has the m.u.f. penetrated to the 51–52 Mc. region. Thus, the establishment of the "A1 only" segment at 50.9–51.0 Mc. would not provide anything approaching optimum frequencies for experimentation with ionospheric propagation in the 50–54 Mc. band.

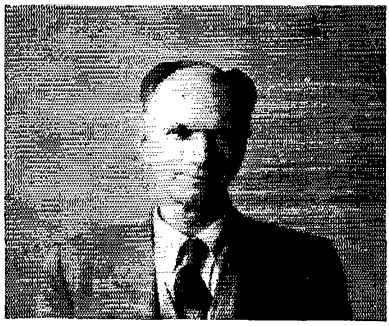
9. The Commission has given careful consideration to all comments filed in this proceeding and has evaluated them as to the soundness of the reasons expressed in the various arguments. Although some of the comments submitted were mere expressions of preference, by far the majority contained well reasoned, sound arguments having considerable merit.

(Continued on page 150)

I.A.R.U. News

JOHN M. MOYLE, VK2JU

John M. Moyle, VK2JU, noted Australian amateur and the representative from the Wireless Institute of Australia chosen to accompany the Australian government delegation to the Geneva radio conference, passed away in March after a short illness. For many years active with the WIA, Mr. Moyle had served on various com-



mittees, as a WIA Federal Councillor (director), as Vice-President attending the Federal Convention, and finally two years as President of WIA's VK2 Division. He drew high praise for his vigilant efforts in representing the Australian amateur's position at Geneva, particularly the work with his delegation and others on the 14 Mc. allocation proposal.

Born February 28, 1908, Mr. Moyle was educated at Scotch College in Melbourne. His experiences in the communications and broadcasting field developed from his background as an engineer, musician, writer, and editor of the Australian publication, "*Radio and Television Hobbies.*" First licensed in 1932 under the call of VK3JC, his amateur interests were particularly in v.h.f. Mr. Moyle was a Senior Member, Institute of Radio Engineers of Australia. During World War II, Mr. Moyle served with the RAAF as Squadron Leader in charge of Technical Administration in the Directorate of Telecommunication and Radar.

FOLKESTONE CONFERENCE

Delegates from the European societies will gather at the Grand Hotel in Folkestone for another in the series of Region-I IARU conferences which started with the 25th Anniversary Conference of IARU at Paris in 1950.

The conference will be opened by the Mayor of Folkestone at 2:30 P.M. on June 13. Three main committees will be established (Administrative and Operational, Technical and v.h.f.) to discuss such things as the coordination of band usage, the results of the Geneva Conference, and rules for the international v.h.f. contests so popular in Europe.

Thursday of the conference week has been left free for morning shopping and an afternoon visit to Canterbury. After final plenary discussions on Friday, the conference will conclude with an official dinner.

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below. Cards for territories and possessions not listed separately can be mailed to the bureau in the parent country: e.g., cards for French Cameroons (FE8) go to REF in France; cards for VP8s go to RSGB in England. W, K, VE and VO stations only may send foreign cards for which no bureau is listed to ARRL.

For service on incoming foreign cards, see list of domestic bureaus in most *QST*s under "ARRL QSL Bureau."

Algeria: G. Deville, FA9RW, Box 21, Maison-Carree, Alger
Angola: L.A.R.A., P.O. Box 484, Luanda
Argentina: R.C.A. Carlos Calvo 1424, Buenos Aires
Australia: W.I.A., Box 2611 W, G.P.O., Melbourne
Austria: Oe. V.S.V. P.O. Box 15, Klosterneuberg, 2
Azores: Via Portugal
Bahamas: C. N. Albury, Telecommunications Dept., Nassau
Barbados: Arthur St.C. Farmer, Storms Gift, Brandons, Deacons Road, St. Michael
Belgian Congo: U.C.A.R. QSL Bureau, P.O. Box 3748, Elisabethville
Belgium: U.B.A., Postbox 634, Brussels
Bermuda: R.S.B. P.O. Box 275, Hamilton
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: D. E. Yong, VP3YG, Box 325 Georgetown
British Honduras: L. H. Alpuche, VP1HA, P.O. Box 1, El Cayo
Bulgaria: Box 830, Sofia
Burma: B.A.R.S. % Tara Singh, 187 Eden St., Rangoon, Burma
Canton Island: **Charles Singletary, KB6BH, % FAA, USPO 06-50,000,** Canton Island, **Phoenix Group,** South Pacific
Ceylon: P.O. Box 907, Colombo
Chile: Radio Club de Chile, Casilla 761, Santiago
China: M. T. Young, P.O. Box 16, Taichung, Formosa
Colombia: L.C.R.A., P.O. Box 584, Bogotá
Cook Islands: **Bill Scarborough, % Radio Station Rarotonga**
Costa Rica: Radio Club of Costa Rica, Box 2412, San Jose
Cuba: Radio Club de Cuba, QSL Bureau, Ayestaran 629, Altos Cerro, Habana
Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol
Czechoslovakia: C.A.V., P.O. Box 69, Prague I
Denmark: OZ2NU, Borge Petersen, P.O. Box 335, Aalborg
Dominica: VP2DA, Box 64 Roseau, Dominica, Windward Islands
Dominican Republic: Jose de los S. Perkins, P.O. Box 157, Ciudad Trujillo
East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony
Ecuador: Guayaquil Radio Club, Casilla 784, Guayaquil
Ethiopa: Telecommunications Amateur Radio Club, P.O. Box 1047, Addis Ababa
Fiji: S. H. Mayne, VR2AS Victoria Parade, Suva

Finland: SRAL, Box 306, Helsinki
Formosa: Hq MAAG, APO 63, San Francisco, California
France: R.E.F. BP 26, Versailles (S & O).
France: (F7 only): F7 QSL Bureau, MARS, Headquarters U. S. European Command, APO 128, New York, N. Y.
Germany (DL2 calls only): G. E. Verrill, G3IEC, 10 Seahorse St., Gosport, Hants, England
Germany (DL4 calls only): DL4 QSL Bureau, % DL4HAB, 50th Comm., APO 109, N. Y., N. Y.
Germany (DL5 calls only): Via France
Germany (other than above): D.A.R.C., Box 99, Munich 27
Gibraltar: E. D. Wills, ZB2I, 9 Naval Hospital Road
Ghana: 9G1AB, John Burton, Telecommunication School, Post & Tellecommunication Dept., Accra
Great Britain (and British Empire): A. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent.
Greece: George Zarafis, P.O. Box 564, Athens
Greece (Unlisted SV0s only): USASG, APO 206, New York, N. Y.
Greenland (OXs only): Via Denmark
Greenland: (KG1s only): MARS Director, Directorate of Operations, Hq. 8th Air Force, Westover A.F.B., Mass.
Grenada: VP2GE, St. Georges
Guam: M.A.R.C., Box 145, Agana, Guam, Marianas Islands
Guantanamo Bay: Guantanamo Amateur Radio Club, Box 55, NAS, Navy 115, F.P.O., New York, N. Y.
Guatemala: C.R.A.G., P.O. Box 115, Guatemala City
Haiti: Radio Club d'Haiti, Box 943, Port-au-Prince
Honduras: O. A. Trochez, P.O. Box 244, Tegucigalpa, D. C.
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong
Hungary: H.S.R.L., Postbox 185, Budapest 4
Iceland: Islenzkir Radio Amatorar, Box 1058, Reykjavik
India: P.O. Box 543, New Delhi
Ireland: I.R.T.S. QSL Bureau, 39 Booterstown Ave., Blackrock, Co. Dublin
Israel: I.A.R.C., P.O. Box 4099, Tel-Aviv
Italy: A.R.I. Viale Vittorio Veneto 12, Milano, Italy
Jamaica: Ruel Samuels, VP5RS, 34 Port Royal Street, Kingston
Japan (JA): J.A.R.L., Box 377, Tokyo
Japan (KA): F.E.A.R.L., A.P.O. 994, % Postmaster, San Francisco, Calif.
Kenya: East Africa QSL Bureau, Box 1313, Nairobi
Korea: Korea Amateur Radio League, Central Box 162, Seoul, Korea
Kuwait: William N. Burgess, 9K2AZ, % Kuwait Oil Co. 14 — 5th St. North, Kuwait, Persian Gulf
Lebanon: R.A.L., Ahmadi, B.P. 3245, Beyrouth
Liberia: (EL1s only) HARC, P.O. Box 32, Harbel
Libya: 4A2TZ, Box 372, Tripoli
Liechtenstein: via Switzerland
Luxembourg: R. Schott, 35 rue Batty Weber, Esch/Alz. Luxembourg
Macao: Via Hong Kong
Madagascar: P.O. Box 587, Tannarive
Madeira Island: P.O. Box 257, Funchal
Malaya: QSL Manager, Box 777, Kuala Lumpur
Malta: R. F. Galea, ZB1E, "Casa Galea," Railway Road, Birkirkara
Mauritius: **Paul Caboche, VQ8AD, Box 467, Port Louis**
Mexico: L.M.R.E., Liverpool 195-A, Mexico 6, D.F.
Midway Island: KM6BI, AIRBARSRON Two Detachment, Midway Navy #3080, F.P.O. San Francisco, Calif.
Monaco: **3A2CN, Anderhalt Pierre**
Montserrat: VP2MY, Plymouth
Morocco: A.A.E.M., P.O. Box 2060, Casablanca
Mozambique: Liga dos Radio-Emissores de Mocambique, P.O. Box 812, Lourenco Marques
Netherlands: V.E.R.O.N., Postbox 400, Rotterdam
Netherlands Antilles (Aruba): Verona, Postbox 392, San Nicolas, Aruba
Netherlands Antilles (Curacao): Verona, Postbox 383, Willemstad, Curacao
New Guinea: Via Papua
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington C1
Nicaragua: **Club de Radio Experimentadores de Nicaragua, Apartado Postal 925, Managua**
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 898, Oslo
Okinawa: O.A.R.C., P.O. Box 739, APO 331, % Postmaster San Francisco, Calif.
Pakistan: Box 4074, Karachi
Panama, Republic of: L.P.R.A., P.O. Box 1622, Panama
Paraguay: R.C.P., P.O. Box 512, Asuncion
Papua: VK9 QSL Officer, P.O. Box 204, Port Moresby
Peru: R.C.P., Box 538, Lima
Philippine Islands: P.A.R.A. QSL Bureau, 67 Espana Extension St., Quezon City
Poland: PZK QSL Bureau, P.O. Box 320, Warsaw 10
Portugal: Rua de D. Pedro V., 7-4°, Lisbon
Roumania: A.R.E.R., P.O. Box 95, Bucharest
Saar: via Germany — D.A.R.C.
Salvador: YS1O, Apartado 329, San Salvador
Singapore: via Malaya
South Africa: S.A.R.L., P.O. Box 3037, Cape Town
Southern Rhodesia: R.S.S.R., Box 2377, Salisbury
Spain: U.R.E., P.O. Box 220, Madrid
St. Vincent: VP2SA, Kingstown
Sweden: S.S.A., Stockholm 4
Switzerland: U.S.K.A., Knutwil
Syria: P.O. Box 35, Damascus
Trinidad: John A. Hoford, VP4TT, Box 554, Port-of-Spain
Tunisia: Francois DeVichi, 5 Rue Can Robert, Tunis
Uganda: P.O. Box 1803, Kampala
Uruguay: R.C.U., P.O. Box 37, Montevideo
U.S.S.R.: Central Radio Club, Postbox N-88, Moscow
Venezuela: R.C.V., P.O. Box 2285, Caracas
Virgin Islands: Richard Spenceley, Box 403, St. Thomas
Wake Island: T. D. Musson, P.O. Box 127
Yugoslavia: S.R.J., P.O. Box 324, Belgrade

QST

June 1935

. . . The editor touted the 5-tube single-signal receiver as *QST's* chief contribution to the QRM battle — and said better equipment made operating even on more crowded bands better than the good old days of early hamdom. . . . Men were investigating space then, too. A second editorial mentioned a stratosphere balloon radio test and asked hams to listen in for signals. Now, of course, it's satellites, not balloons. . . . The banner story was by Ross Hull, shedding new light on u.h.f. transmission . . . other technical articles discussed 20-watt phone operation on 110-volt d.c. mains . . . automatic biasing . . . overmodulation . . . a new hot-cathode gaseous discharge amplifier and oscillator . . . a new 100-watt type zero-bias transmitting tube . . . and a portable receiver plus three pages of hints for the experimenter.

. . . A stray reported that W3MG asked a novice where he was keying his transmitter and got the reply — "in my bedroom." . . . A dentist's wife, listening at home to her husband's QSO on his phone station in his office, suddenly heard "Put up your hands and give us your dough . . . Lock him in that closet . . . What if he croaks? . . . Let him croak!" . . . Mrs. W9SZW called police, then rushed to her husband's office and found him bound and gagged in a closet, his mike still open and his contact still standing by!

Strays

W9PRH says he has just met a new amateur who has what is probably the only amateur license in the country that will never reach its expiration date . . . which is 3 A.M. Feb. 29, 1965.

—···—

Hams are not well-known for their thoroughness in reading instruction books, as any member of the ARRL Technical Staff can verify. Example: "Do you have any information on the use of the Heathkit v.f.o. on 50 Mc.?" Answer: "Yes, you will find it in the first paragraph on the first page of your instruction book!"

Technical Correspondence

THE HBR-16 RECEIVER IN RETROSPECT

10126 Colwell Drive
Sun Valley, Calif.

Technical Editor, *QST*:

Slightly more than six months have elapsed since the article on the HBR-16 Communications Receiver was published (October, 1959, *QST*). Recent developments have been such that a follow-up seems to be in order.

Those who know me would have been much surprised had I not eventually come up with a modification or two for the betterment of the HBR-16. The Stray which appeared in the April 1960 issue of *QST* (page 35) was an example. The fact that those of us directly involved did succeed in lousing up that portion of the Stray pertaining to C_7 and C_8 was unfortunate; our intentions were of the best, nevertheless! And "corrections on our corrections" did appear in the May issue of *QST* (page 44).

An *RC* network, readily identifiable as the 250-$\mu\mu$f.–56K–250-$\mu\mu$f. arrangement located between the detector-transfer switch, S_{7B}, and Pin 3 of the accessory socket, J_3, was used as the i.f. filter in the original HBR-16 design. I now suggest that this filter be modified as follows: First, substitute a 2.5-mh. r.f. choke for the 56K resistor. Second, eliminate entirely the upper 250-$\mu\mu$f. capacitor, which in the original circuit was connected between S_{7B} and chassis ground. The modified version of the filter will now consist of the 2.5-mh. choke and the one remaining 250-$\mu\mu$f. capacitor, the latter being connected between ground and the end of the choke that goes to Pin 3 of J_3. So modified, this i.f. filter not only will be more effective but in addition will provide noticably better high-frequency audio response when the receiver is tuned to a phone signal. The 2.5-mh. choke should be mounted directly to S_{7B}.

Despite checking and double-checking, errors in schematics do get into print, and the HBR-16 diagram was no exception. Specifically, the 22K resistor associated with the 6BE6 product-detector No. 1 grid was shown with one end connected to the 6BE6 cathode. Instead, this resistor should be connected between the 6BE6 No. 1 grid and chassis ground. Wired as shown in the *QST* schematic the product detector does work, in a rather mediocre sort of way, but when wired as outlined above its performance has never failed to impress those hearing it for the first time.

The power transformer I used in the original HBR-16 was a junk-box item which had been kicking around here for a long, long time. As I remembered it, it was a Stancor PC-8405, and it was so identified in the original parts list. However, following the receipt of several letters complaining about "abnormally high plate voltage" at the output of the filter, a recheck showed that the transformer actually used was a Stancor PC-8404, which has a higher current rating. If it is necessary to reduce the plate voltage, I suggest inserting a 1000-ohm, 25-watt adjustable wire-wound resistor (such as the Ohmite "Dividohm") between Pin 8 of the 5V4G socket and the first 2.3-hy. filter choke, L_5. The slider should be adjusted to the position which delivers the specified 250 volts (plus or minus 10 per cent of this figure is perfectly satisfactory).

— *Ted Crosby, W6TC*

SUNSPOT CYCLE

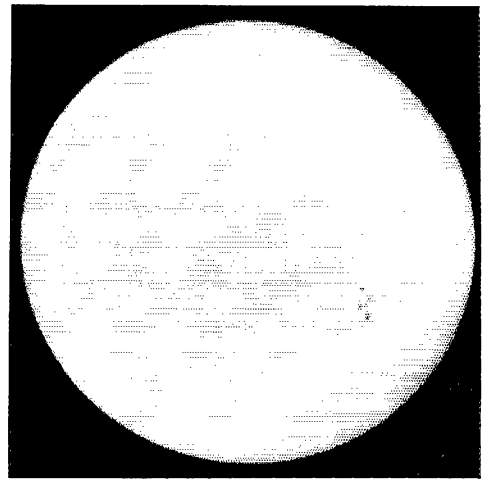
R. R. 1
Ridgeville, Indiana

Technical Editor, *QST*:

The accompanying photograph of the sun and sunspots, taken by me April 3, 1960, reveals the source of the disruption to short-wave radio communications which began the evening of March 31 and lingered until April 3, 1960. Now that we are approaching a minimum in the sunspot cycle the plight of the higher-frequency amateur bands — and also the lower frequencies — has become a subject of much conjecture.

The enormously large group of very active sunspots at such a recent date as April 2 tends to substantiate the fact that we are on the threshold of a sunspot minimum. Long study of the sun has revealed to astronomers that sunspots are never seen at the sun's poles, and rarely within 5 degrees of its equator. They occur mainly in two zones between 10 degrees and 30 degrees of north and south solar latitude. The spottedness waxes and wanes, a maximum being reached about every 11.1 to 11.15 years, on the average, but there is no definite period, intervals between maxima having varied from 7½ to 16½ years. The rise to maximum is usually more rapid than the fall, taking about 4½ years; minimum spottedness is reached about 6½ years later, when no spot may be visible for weeks.

"Spoerer's Law" states that the two sunspot zones on the sun simultaneously move slowly from high north and south latitudes toward the solar equator, this gradual shifting of the zones continuing throughout the cycle. The shift follows a pattern that is related to the half-cycle period (that is, the period half way between a maximum and minimum — the part of the present cycle we are now entering). At the end of a sunspot maximum the zones are near the equator; the new half-cycle begins when spots break out in high solar latitudes, some time before the actual minimum is reached. The new spot zones then gradually decrease in latitude until at the end of about eleven years they in turn arrive near the equator; high-latitude spots then appear again, heralding the beginning of the second half of the cycle.



Sunspot group photographed by W9EQL on April 3, 1960, at 1420 CST.

The photograph of the solar disc shows the location of this most recent major sunspot to be within 5 degrees of the solar equator, as close to the equator as spots are ever found. This is proof that the sunspot minimum is on the way.

Large sunspots can appear at any part of the cycle. Their occurrence might provide some very interesting experiences during sunspot minimums. So if you're ambitious and curious don't sell that tri-band beam. I'm putting one up this summer!

— *Wayne L. Norton, W9EQL*

WHISTLERS

30 Forest Ave.
Newcastle-on-Tyne
Northumberland
England

Technical Editor, *QST*:

Congratulations on your March edition. . . . The excellent article by Will Johnson, W1FGO, kept me sitting up late. But why all the sky wire? You don't always need it.

His article took me back to one fine July afternoon, warm but cloudy, in 1941. There arose a grumbling of thunder to

the south, and in sheer curiosity I connected the end of my aerial to the audio-amplifier input which we used for gramophone records. It was a battery unit of good gain but there was no (a.c.) electric supply around to cause trouble. Static noise came every few seconds, but after every three or four minutes came the whistler, succeeding a static discharge, and sliding down the musical scale for several seconds before abruptly ceasing — sometimes two of them, separated by perhaps a hundred cycles. And they were about good loudspeaker strength. I listened to them from 3 to 5 P.M., when the weather cleared.

The summer thunder was local (I think about three miles away) and the QTH was Edinburgh, from where I last worked W1FGO.

The aerial was a simple inverted L, 30 feet long, 20 feet high, running southwest, and the ground was the water drain. After reading his article, I am tempted to try it again.

— *Bob Rule, G3LDR*

COILS FOR THE H. F. CRYSTAL FILTER

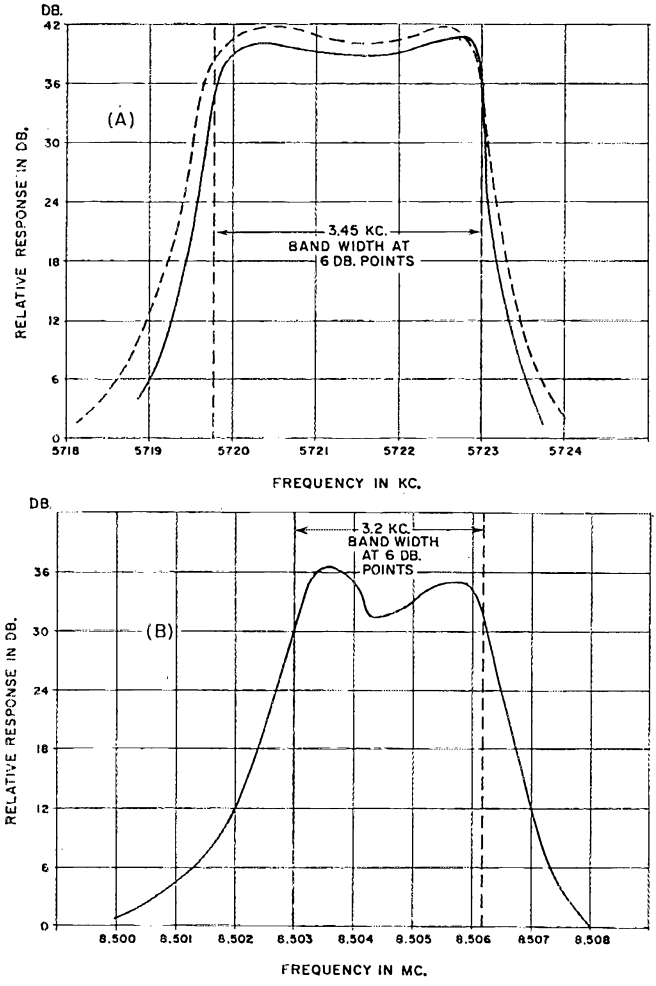


Fig. 1—(A) Comparison of filter performance using bifilar coil wound on slug from TV horizontal-oscillator coil, solid curve, and bifilar coil wound on toroidal core, dashed curve. (B) Filter using 8.5-Mc. crystals with bifilar winding on TV-coil slug. See letter by W3NMP for details of coils. The measurements resulting in these curves were made through an i.f. system, using a v.t. voltmeter with an r.f. probe for determining relative output voltage.

119 East 31 St.
Erie, Penna.

Technical Editor, *QST*:

While attempting to build a high-frequency crystal filter as per W3TLN (Vester, "Surplus-Crystal High-Frequency Filters," *QST*, January, 1959), I found that the annular high-frequency forms he suggested were very difficult to acquire. However, just to get some idea of how the crystals in that configuration would react I wound a temporary coil, bifilar, on one of the slugs used for tuning the low-frequency sweep oscillator in a defunct TV set. This slug, 5/16 inch in diameter and ⅞ inch long, was first covered with three layers of 0.01-inch plastic electrician's tape and the coil was then wound with 27 double turns of No. 31 Formex covered wire. One end of one winding and the opposite end of the other were then connected together for the center tap.

Fig. 1A shows the band pass of a filter using this coil as compared with a filter using a toroid coil form ⅞ inch o.d. by ½ inch i.d. wound with 46 bifilar turns with No. 31 wire. The same set of crystals was used in each filter. This was at 5.722 megacycles.

Another filter was tried at 8.5 Mc., using the same type slugs with 22 double turns, and the band-pass characteristics are shown in Fig. 1B.

The lack of toroidal forms may have kept others from trying this filter. But the TV slug seems to work as well at least in these two cases. Incidentally, no attempt was made to make any adjustment for optimum band-pass shape at 8.5 Mc., but the 5.722-Mc. coil was trimmed for best band-pass shape.

On a related subject, here is an idea that might help in selecting matched germanium and silicon diodes. The normal ohmmeter reading does not seem to be accurate enough, but the forward current flow through a diode from a 1½-volt flashlight battery source will show up minute differences in the forward resistance of various diodes. Out of a group of 20 I found four in which the current flow varied only 5 per cent. Used in a ring modulator, these provided approximately 40 db. of carrier suppression with no attempt made at balancing the modulator.

— *C. C. Jackson, W3NMP*

15-METER OPERATION WITH COAX-FED 40-METER DIPOLES

128 John St.
South Amboy, N. J.

Technical Editor, *QST*:

Several Novice signals have been noted recently in that portion of the spectrum ranging from 7033 to 7083 kc. In some instances these off-frequency emissions probably result simply from neglecting to change the band switch from the 40-meter position when switching to 15-meter operation. In other cases, however, they occur when simple one- and two-stage transmitters are being operated on 15 meters in conjunction with coax-fed 40-meter dipoles. Most of the currently popular Novice transmitters employing tube line-ups such as a 6CL6-6DQ6 or 6AG7-807, do not have

(*Continued on page 142*)

V.H.F. QSO Party Announcement

June 11–12

SUMMER operating activities commence with the June V.H.F. Party, scheduled for June 11 and 12. This gala operation, open to all amateurs who can work any band or bands 50 Mc. or above, gets under way at 2 P.M. your local standard (*not* daylight) time Saturday, and continues until 10 P.M. local standard time Sunday.

To raise other participants just call "CQ VHF QSO Party" or "CQ Contest." The only exchange required during contact is ARRL Section (see page 6, this *QST*). Score one point for completed exchanges made on either 50 or 144 Mc.; two points for exchanges on 220 or 420 Mc.; and three points for exchanges on higher v.h.f. bands. To derive final score, the sum of these points is multiplied by the number of different ARRL Sections worked per band. You may work the same stations on different bands to increase both your contact points and multiplier.

A certificate will be awarded to the top scorer in each ARRL section, as well as a certificate to the highest scoring Novice, and multiple-operator station in each section from which at least three entries in that special category are submitted. There will no longer be a special Technician award certificate offered.

Please follow the new log and summary form shown here. Reports should include your call and ARRL section, as well as times, calls, and sections of stations worked. *Your entry must be postmarked by July 1, 1960 for QST listing.* Free log forms are now available on request from ARRL.

SUMMARY OF CONTACTS, V.H.F. QSO PARTY

STATION........................ARRL SECTION..

Freq. Band (Mc.)	Date Time	Station Worked	Section	Record of new Sections for each band					Contact Points
				50	144	220	420	other	

(Enter below on last sheet used)

Band	Contacts	Points	Mult.
50 Mc.			
144 Mc.			
220 Mc.			
420 Mc.			
Other			
TOTALS			

Check one: [ ] Single operator
[ ] Multiple operator

Calls of operators having a share in above work..........................

Power input..........................

Transmitter..........................

Receiver..........................

Antenna..........................

CLAIMED SCORE: .... X ...... = ...
(Points) (Mult.) FINAL SCORE

I hereby state that I have abided by the rules specified for this contest and that, to the best of my knowledge, the points and score as set forth in the above summary are correct and true.

....
Signature Call Address

Rules

1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, June 11, and ends at 10:00 P.M. Local Standard Time, Sunday, June 12. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; *there is no fractional breakdown* of the 1-, 2- or 3-point units.

3) Fixed-, portable- or mobile-station operation *under one call*, from one location only, is permitted. A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.

4) Scoring: *1 point* for completed two-way section exchanges on 50 or 144 Mc.; *2 points* for such exchanges on 220 or 420 Mc.; *3 points* for such exchanges on the higher v.h.f bands. The sum of these points will be multiplied by the number of *different* ARRL sections worked per band; i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted. Cross-band work does not count. Contacts with aircraft mobile stations cannot be counted for section multipliers.

5) A contact *per band* may be counted for each station worked. Example: W2BLV (S.N.J.) works K1CRQ (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W2BLV 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W2BLV contacts other Connecticut stations on these bands, they do not add to *his section multiplier* but they do pay off in additional contact points.)

6) Each section multiplier requires completed exchange with *at least* one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

7) Awards: A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In addition, the high-scoring multi-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received. Certificates will also be given to the top Novice in each section where three or more such licensees submit logs.

(*Continued on page 142*)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Wie:

We haven't heard much from W2HSZ's old pal Count U.R. Kuntries lately, have we? No doubt that talented peer is up to something super in his supersecret subterranean laboratories. Meanwhile, however, K4CQA/8 has word from the Count's nephew, a precocious lad who recently was conducted to a Conditional by his illustrious uncle. This *wunderkind* tackled ham radio with the customary family eclat. We can title his following testimony "I was a Teen-Aged Magnetic Storm," or, less abstractly,

Der Kaput DX Hund

Ess vas mitten der Schveepstäken und Weltwide Kontesten der Hammer gotten gehooked und gebitten. Iss ben mit einen grosser kilovatten geblesst in der superbloopenstagen und longen viren antenner das iss ein radiaten der Morser mit shparkers und skhveelen und shkreechen. Iss also mit shingle-sidebenders shpeaken. Ja, und im Himmel geplotzen! Diesen Hammer iss ben grosser chaser von veaken sounden likeweissen Hammers in allen shpotten in der Welt. Ach, *das* iss Hammen va iss Hammen!

Iss often hearen veaker fainter shparken gekracklen mit dotten und dashen. Gerünnen und gekommen closer so looken und finden maybe einen even rarer DXer! Und ven iss finden der choicer shparker standen bei, iss der Hammer chümpen on der keyer und donner und blitzen outpounden. Odder kilovattens iss mit aller kinder kallen und kallen outpouren, und schmearen der bander mit klicken und schwishen und schlürpen. Sickenen!

Der veaker DXer iss mit geblitzen kilovattersenders geschmeared, so ven der grosser Hammer standen bei und vaiten und hopen hearen de kallen back, iss nicht knowen if hookenupper mit odder DXers gefinischt. Drei blitzers later ven hookenuppen iss senden RST reporten mit nummers meanen *nix* just *hopen QSL getten. Boom!* Donner und blitzen retürnen from odder kilovatters DXen. Senden und pleaden mit QSZ RSTs und den shaken und listenen. BOOM! Dozen von timen iss holleren und schrieken for QSLen und prayen der veaker shparker sehtill hearen und der QSL outmaken. *BOOM-BOOM-BOOM!!* QRMen und QRNen und QSBen und QRJen — geklobbert.

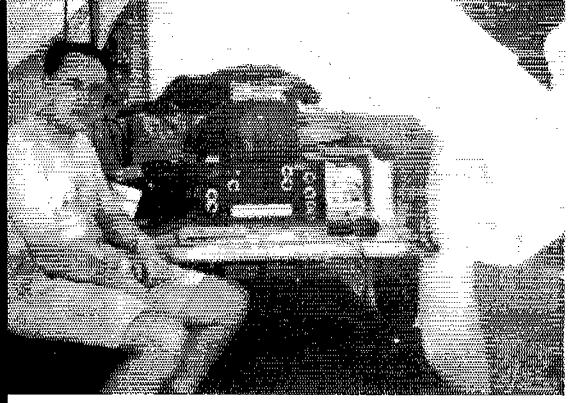
Bah! Vas ein Hammer chasen der DXers howlen und shkreamen in der vindt und finden only mit boomers getten geklobbert. Den siezen und gebeaten und gebiten der dumkopf mailman for QSLs lacken. Ach! — windenuppen klink. So dreiundseibzig, OMs. Auf wiedersehen DX. Iss back mit gut oldfashen Ragchüen und Trafikhandlen.

Vas:

Come to think of it, a good net is just the thing for that boy. . . . June rhymes neatly with moon, spoon and croon but the month is no great shakes in the DX department. Time for ARRL's annual Field Day, anyway, so we can expect a thinning out and an easing off of pile-ups action — *ever so slightly*. With 10 and 15 socked in on a shortskip kick and 40-80-160 hosting QSOs between Tø thunderstorms, good old 20 resumes its eminence as our DXiest summertime slot. . . .

20 c.w., first off, and W1s BPW OPB (115/90), RAN, K1s HRM JFF JTL, W2s AXR GVZ JBL (150/147), K2UYG, WA2s EFN (42), KMY, W3INH (111/80), W4s IUO (157), ORT (146/88), PLL, K4s DFT IEX ZYI, KN5WZJ (just lookin'), W6s JQB KG, K6s CJF (85/63), LAE (178/160), STZ SXX (37/23), W7s DJU (120/108), POU (59/26), W8s KX YGR, K8NHC, W9s JJN ZYD (84/64), K9GDF (51/32), KØs DQI JPJ JPL OSV (51/25), OSW (55/23), PYB QJG (70/16), WQI (122/22), A. Hovey, A. Rugg, VEs 1ON (125/92), 2BCL and 3ES give us the word on **AC4**AX, **BV1**USB, **CEs** 2AT 4AD 9AF, **CM8**RM, **CNs** 2BK 8DJ, **CO7s** AH AI NR, **CP3**CD (14,030 *kc.*) 1400 *GMT*, **CRs** 6CA 9AH, **CT3**AV (35), **CX2**AZ (35) 2, **DMs** 2ATH 2BEL 3YVL, **DUs** 1MPH (100) 15, 1OR (75) 15, 7SV (80) 4, **EAs** 6AZ (61), **8CP** 8BW (34) 14, 9AP (10) 16, **EL4**A, **ET3**CE (90) 14, F2CB/**FC**, **FAs** 3BA (42), 3DU (77) O, 9AV (30), **FB8s** XX (79) 13-14, ZZ, **FF7**AG (5) 22 of Mauretania, **FG7s** XF (12), XG (30) 1, **FK8**AH (30) 6, **FO8**AC (30) 8, **FQ8s** AG (80) 6, AJ, **FR7**ZD, **FY7**YF (6), GB3LAS/**GD**, **GC2**FZC, **GD3s** FXN JZK (40), LZK, **HAs** 1KSA (30) 15, 5BT 5FO 5KDQ 5KFR, **HB4**FD, **HCs** 1JU 1LE 2IU 2OM, **HK0**AI (25) 12, **HL9**KR 30, **HR1**MM 22, **HZ1s** AB (22), HZ, IT1AGA, **KAs** 2EE 2JM 2KS (43), 5MC (60), **KC4**USV (10) 6-11, **KGs** 1BB 1BO (90), **6A**JK (90) 8, **6F**AE (36), **KR6s** GF (5) 15, MD (20) 15, MG 13, **KV4**AA (82) 20, **LAs** 1NG/p (20) 1, 3SG/p (50), 4CG/p O, LJ3F, LUØAC (60), **LZs** 1KPZ (70), 2FA 2KAG (37), 2KBA, **OD5s** CN CQ (44) 3, LX, **OQs** 5KJ (19) 23, ØAI, **OX3**UD, **PJ2s** AL (21) 21, AV (70), **PZ1**AP, SL3AB of Sweden's military, SP1LH/mm, **ST2**AR, **SU1**MS (40) 22, SV1DK/*mm* (42), **TFs** 2WEN (55) O, 2WEZ 3KC (35) 1, 5TP, **TI2s** DN LA PZ (15), **UA9s** CF CL CM DG DN DT EM FZ (31), JR KDD KEC KJA KOD KPN KXA SA UR (37), **UAØs** GK JF KAE (24), KCO KDA KFC KUV KZA RF RK SH (8), **UB5s** KAA KAB KAD KIA KNB KWI MZ SD, **UC2s** AA (36), AC (36), CC KAO KAR KIM KWZ, **UDØs** AM 23, KAB, **UF6s** FB 4, KAF (162), **UG6s** AG AW, **UH8**KAA (54) 14, **UI8s** AG 4, AK KAA KAB KBA KNA, **UJ8**KAA, **UL7s** IF (51) 5, HB KAA KAD (54), KAG, **UM8**KAB, **UN1s** AE 22, AN AP (63) 12, KAE, **UOSAA**, **UP2s** AC (32), AT NM 23, **UQ2s** AB (27), AD AE/mm, BP (37), CF DO KBA (92), **UR2s** AO KAA KCA, **UT5**BB (72) of the Ukraine, VE6AAE/**SU** (50), **VE8s** AY DX EM MO RX, **VKs** 1ATR of Canberra, 9RO (45) 6, **ØPM** (76), **VPs** 1JH 1SS (20) 2, 2KD 2SL 23, 2VA 4, 3VN 3YG (6), 5BH/mm, 5BL (26), 5ME 5RH 23, 6LN 7NE 8EH 9BO 9DL 9EO, **VQs** 2IE (40) 15, 2W (60) 22, 3CF 4EK 4GT 6GM (95) 22, 8AM (41), 8BB, **VRs** 2DK (50), 6, 3Z now QRT, **VSs** 1KM 4BA (90) 15, 6AE, 9AD (40) 11-13, 9AKE (60) 20, 9ARF (65) 15, 9OC (31) 3-4, **VU2**AZ (95) 15, W2AYN/**EP** (80) 20, **YN4**AB (10), **YOs** 3FD 3JS 3RI 4KCA 4WD, **YV5s** AEZ AK ALD DE EZ HT, **ZB1**FA (22), **ZC4**IP 23, **ZD2s** GUP (60) 21, IHP JKO, **ZEs** 5JU (44), 8JJ 8JN 8JO KJV

*4822 West Berteau Ave., Chicago 41, Ill.



ZS6IF/8 and family scored 1358 QSOs with 62 countries early this year during a rugged week-long visit to Basutoland. The operating tent sheltered a 50-watter and modified HRO. A ground-plane did the radiating on 20 meters, a doublet on 15, and power was supplied by an 800-watt 110/220-volt gasoline unit. A view of the encampment shows the chow and sleeping tent at right, as well as some of the abundant animal-infested scenery. *(Photo via W4PLL)*

8JY, **ZPs** 3GN 5LS (6), **ZS7M** (70) 15, **4X4s** II JR JU (8) 6, MB (72), **5A5TA** (55) 16, **7G1A**, **9M2s** FR (16) 16, GR (32) and **9N1GW** (90) 15. "Poor old twenty is going, *going . . .*" cheers K4DFT. W7DJU and other observers find 14-Mc. skip too long at night and too short in the daytime.

20 phone is getting heavy play from 10- and 15-meter A3refugees. W1RJJ, W4IUO, K4ZYI, tuner KN5WZJ, K6LAE, W8YIN*, K9MLE*, KØDQI, A. Hovey and VE7CQ recommend **BV1USC***, **CR7IW** (180) 15, **DUs** 18A (185) 15, 6IV (185) 15, **EA0AC*** (305) 13-14, **EL3D** (185) 6, **HC1JU**, **HH2JP**, **HKs** 1AG 3LX ØAI*, **HS1B*** (320) 16, **I5GN** (105) 15, **JZØHA*** (294) 14, **KC4s** USA* USB* USN* USV*, **KC6AQ*** (302) 13, **KX6CA** (240) 7 **KW6DB**, **LA3SG/p*** (310) 19, **OE1RZ*** (295) 20, **PJ2AO** (218) 20, **TA3GI*** (190) 16, **UQ2AN*** (328) 19, **VK9TK** (180) 7, **VPs** 2SL 3MC 4LP 5GH/mm, **VQ2SB** (185) 15, **VS9AC**, **XW8AL** (170) 15, **YN1BS***, **ZE7JZ** (175) 15, **ZSs** 3AS (180) 5, **7P*** (320) 16, **9M2s** DT (180) 15, DW (130) 15, FX (130) 15, GA (180) 15 and choice **9N1GW***. Those stars (*) represent single-sideband users, here and in succeeding voice paragraphs.

15 phone continues to reward the 21-Mc. faithful with occasional dillies. W1BPW, K1s IMD JFF, K4s UWC* (over 100 s.s.b. on 15), ZYI, W5ERY, K6LAE, K9s KNM MLE*, KØQJG, A. Hovey, A. Rugg, EL4A and other competitors come up with **CE4BP**, **CN8s** FT HQ*, **CO8BS**, **CP5s** EH EL, **CR6s** CA (190) 1, CN, **CT1TX**, **CX6AS**, **EDs** 1D (220) 2,23, 2F 4D* 6C, **FE8AR**, **FFs** 7AB **8CP**, **FG7XF**, **FM7WQ** **FS7RT***, **FY7YG**, **GC3KAV**, **GD3s** GMH* UB, **HCs** 1AGI 1FW* 1KV 5CL 5IS, **HIs** 2WF 2Z, **HI8s** JBD TBW, **HKs** 3AK 3SO* 4AQ, **HPs** 1AC 2MD, **HRIs** HP UA*, **HV1CN***, Ks 200R/**KP4** 4AAV/-VO2 4UKW/VE8, **KGs** 1FD* 1FR* 4AE* 4AK 4AM* 4AS 6FAE*, **KJ6BV**, **KM6s** BI* BO*, **KR6DU***, **LA3SG/p***, **OAIs** EU* HK, **OQ5s** DX WK, **OX3s** DL KW, **PJs** 2CE 2CM 2CO 3AI, **PZ1AA** 1, **SV1AL**, **TGs** 5HC 9AD* 9AL, **TIs** 2CNP* 2RO 5JG, **UAs** 1DZ* 4FE* ØLA ØOM, **VPs** 1JH 2AB* 2DA 2DJ 2KW 3HAG 4LG 4MM 7AK 5JW 5RB 6AL 7BF 7BI 7NT* 8CX, **VQ2AB***, **VR2BC** (240) 3, W9QNI/VO2, XE1s AU JP ZM, **XZ2SY**, YNs 1LC 6AH 6AQ 6HH 9DL, **YS1JR**, **YV5s** AGD AGJ EW*, **ZD2FNX**, **ZL2AVA***, **ZP5s** JE* LZ, **ZSs** 3S 3X* 5JY/8* 5JY/9*, 4X4DK, 5A2TZ* and **9G1BF***. "Very surprised at the intermittent lack of signals on the 10- and 15-meter phone bands," comments W1PNR. We'll wager there are a lot of front-end receiver tubes being replaced these days to no avail. But there still are good openings ahead.

15 c.w. emphasizes this: So long as sufficient DX stations are active on a band, there will be plenty of DX worked. W1BPW, K1s HRM JFF JTL, W2s CVW (106/97), GVZ PQW, WA2KMY, K3HZL, K4s DFT ZYI, W6s KG UFJ, K6s CJF LZE SXX, W7s DJU POU, W8s KX (184/168), YGR, K8NHC, W9ZYD, K9GDF (51/32), KØs IQI JPJ JPL OSV OSW QJG WQI, A. Rugg, EL4A and VE7CQ manage stuff like **BV1US** (70) 13, **CEs** 1AD 3AG (72), **CNs** 2AY 8DJ, **CR6CA**, **CT1NT**, **CXs** 1FB 2BT, DM2BCO, **DU7SV** (75) 2, **EL4A**, **FA8TT**, **FG7XG**, **FF8BF**, **FQ8AF**, **GD3UB**, **HAs** 1KSA 1PZ 5DH, **HC2IU** (60) 22, **HKs** 3GD 19, **ØAI** (50) 3, **HL9KJ** (75) 4, **HP1AC**, **HZ1HZ** (35) 14-21, **IT1AGA**, **JAs** 5FQ 7AD ØLV, **KAs** 2KS (35) 0, 5MC, **KG6s** AIH FAE (26), FAF, **KM6BQ** (55) 0, **KV4CG**, **KX6BQ** 21, LA4CG/p (50) 21, **LUs** 2ZI (75) 0, ØAC (LU4AC), **LX1AS** 20, LZ2KBA, **OAs** 3D 4HY, **OEs** 1FF 1RZ 3VP 3WB 6RS, **OQ5s** IG (51) 14, RH (100), **PJs** 2AL 2AN 2ME 3AK, **SPs** 6LZ 8HR, **ST2AR** (37) 20, **SVØWQ**, **TFs** 2WEZ (36) 19, 3MB, **TI2CMF**, **UA9s** JR 7, KOD, **UAØs** AG GF (30), KCA KCO KZA LA (44) 3, **UB5s** KAB 13, KFF WF, **UC2s** AA AX WP 9, **UL7KAA**, **UP2s** AC AT, **UQ2s** AD AS, **UR2KAE**, **VKØPM**, **VPs** 1JH 3YG 5FP 5ME 18, 7NE 7NT 9EO, **VQs** 2GW (85) 17, 3CF (38) 23, 4FK 20, gone **VR3Z**, **VS9AD**, **VU2MD** (25) 19, **WP4AVF**, XE1s AX PJ, YO2BU (70), **YVs** 4AU (20), 5GO 6BR, **ZB1s** FA (48) 19, JW (100), **ZC4IP**, **ZD2s** IHP 17, JKO (39) 17, **ZEs** 5JU 7JV 8JJ 8JO, **ZL1AH**, **ZPs** 5CG (20) 3, 5OG 9AY, **ZS7R** (50) 19, **5A5s** TA (42) 17-23, TZ, **9K2MA** or 9K2AM and **9M2FR**.

15 Novice lads KN1MOD (19 worked), WV2s GKX HVR, KN3KLN (14/7), KN4MPE (49/19), KN5-WZJ, WV6FVC. KN8QMK, KN9s SRR and UIY (*where* are the Sevens and Zeroes?) beefed up their logs with **CE4EC**, **CR6s** CA CW, **EI3R**, **FB8XX**, **HC2IU**, **HK1HI**, K5TJG/**KH6**, **KG4AH**, **KZ5s** DTN PRN, **KR6AC**, **LUs** 2HBS 3ADF, OE3OT, OK2KCZ, **SP6YC**, **UAs** 1NA 3KWA 4KHA 9DN, **UB5KAA**, **UN1AB**, **UP2AC**, **VE8s** BY MC, **VP2KA**, **WH6s** DEH DJV DKN DMU DMV, **WL7s** DFS DHK DJN DJU, **WP4s** AQY ARZ AUK AUL AUT AVF, **YU3YU**, **YVs** 3AS 4AC 4CI 5AFJ, **ZL1CA**, 4X4IM and a flock of DJ/DL F G GW GI GM HB9 II KP4 LA ON4 PAØ and SM items. To paraphrase a few KN/WN/WV remarks, "Nuts to the sunspot sag — full DX speed ahead!"

10 c.w. enjoys its well-earned summer vacation right now but W1s BPW OPB, K1JFF, WA2KMY, K4s DFT IEX ZYI, W6s KG NKE UFJ, K6s CJF SXX, W8YGR, W9OGY, KØs DQI OSV OSW QJG WQI and observer Andy Rugg keep alert for further action by **CEs** 1AD 3AG, **CR6CA**, **CXs** 2AZ (38) 21, 2BT 2CZ 2JI (110), 4BC, **DU7SV**, **EAs** 8BF (95) 16, 9AP (40) 16, **EIs** 4J 9J, FG7XF (112) 19 **FK8AH** (40), **HA1KSA**, **HCs** 1JU 2IU 15, **HK3TH** (55) 23 **HZ1HZ** (105), **JAs** 1BRK 1CE 1LZ 1VX 3FV 4LG 6AA (50) 23, 7JU (40) 23, 8CE (50) 22, **KA0IK** (40) 22, **KG6FAE**, **KM6BQ** (60), KX6BQ (60), **OA4JR** (50) 17, **OEs** 1BZ 1SB 1WG 2JZ 3AT, **OQ5s** IG (100) 19, KJ, **ST2AR** (10) 15-22, **RC2ASW**, **UAØKFG**, **VK3MR**, **VPs** 1JH 3YG 5FP (50), 5ME (46) 17-22, **6YB** (60) 15, 7BT 7NT, **VQs** 2IE 4FK, XE1s AAI H PJ (10), **ZC4IP**, **ZE8JO**, **ZLs** 1AH 2AXU, **ZP9AY**, **ZS10** and **5A5TA** 17.

10 phone is an automatic South American beam deal, according to W6NKE. W1PNR, K1JUR, W2JAJ, W4IUO, K4ZYI, WA6DNM (30/16), K8KZF, K9QJG, A. Hovey, EL4A and VE2BCL* watch for QSLs from **CEs** 1AD 3AGI 3CU, **CN8s** JD JF* (634), MT, **CT1s** HB IQ JG QF, **CR6AT**, **CXs** 2CN (403) 13, 5BR (452), 6BA (470), 6BM 8BM, **CN8MT**, **EA8DC**, **EL4A**, **FF7AG** (400) 16, **GD3UB**, **HCs** 1JR 1JU* (667), 4IE (470), **HIs** 7CJY 8JBD, **HKs** 3LX **ØAI**, **HP1s** AC HP, **HR1HP**, IT1SMO of IE1SMO renown, **JAs** 1AAT 8BP, **KA2CB**, **KG4AB**, **KJ6BV**, **KM6BI**, **KR6s** CE IW MA USA, **KX6BT**, **OA4s** AI DE IGY IY* (633), **OQ5FV**, **PZ1AX**, SV1AI, **TGs** 5HC 7SS, **TI2s** LE RO, UA4KYA, **UB5s** FG NE, **RAs** 1ADH 1AFD 2AAB 6LW, **RB5s** BZC KIA, VE8OX, **VK4FH**, **VPs** 1JH 2AR 2GAQ 3HAG 3MC 6EB 6TR (440), **6YB** 7BZ 8EM 9FI 9WB, **VQs** 2VZ 3PBD, XE1IQ, **YNs** 1CI 4LB, **YVs** 3CE 5AJK, **ZDs** 1AW 2JKO, **ZE7JV**, **ZLs** 1AIX 1APQ 1GH 1TC 3VI, **ZP5CF** and **ZS3RO**.

40 c.w. static sessions require patient persistence. W1BPW, W2WAS, K2YXC, K4ZYI, K5s JVF LZD, W6s JQB KG, K6s CJF KDS, W7s DJU LZF, W8YGR, W9s NN JJN ZYD, KØDQI and tuner A. Rugg are rewarded with **CM2s** AE WS, **CN8BK**, **COs** 2AD 2UZ (5) 5, 7AA 8EM (36), **DU7SV** (25), **EAs** 8BF 7, 8CG (28) 7, 9AP, EI9Y, EL4A, **FF8BF** (28), **FK8AH** (12) 13, **HA5KDQ**, **HCs** 2IU (4) 9, 4IE, IT1AGA, KA2KS (15) 12, **KG1BX**

(7) 12, **KM6s** BM BQ, **KX6**BQ, **KZ5**LC, **LZ2s** KBA KGZ, **PY1**ADA, **SPs** 6FZ 8CK 9KAD, **ST2**AR, **UAs** 1DZ (15) 4, **ØK**CK **Ø**KCO **Ø**KFG (25), **Ø**KZA, **UB5s** KAA (3) 4, KAD KAW KED UG, **UC2**AA (1) 5, **UQ2**AB, **VPs** 1JH (10) 5, 5FP 6AF 7BB/mm near Samoa, **7N**T, **VQ4**GC (70) 23, **VR2**DK (2) 11, **VS1**KB (12) 15, **XE2s** HU OK 6, **YNs** 1RA 4, 4AB, **YO3**CN, **YVs** 1DA 4BE 3-5, 4CI (32), 5GO, **ZC4**IP, **ZE2**KL, **ZP9**AY (8) 9, **ZSs** 1O 4, 4UP and **5A5**TA. Then, too, there is the usual crop of friendly VK/ZLs and such **JAs** as 4CX 4YC 5MZ 6AFL 7LK 7MU 7NX 7RM 7SM 7UZ 7WB 7XF 8EX 8GU 8HO 8LN 8MH 8OP 8OW 8PO 8SI 9MI 9MO 9MT ØMO 9OP 9OS 9SI and ØRC for your breakfast pleasure . . . . . Novicewise, WV2KAR, KNs 4IIN and 8OOK ganged up on **KZ5**MQN, **VK3**XB, **VP7**NY and **WH6**DIG. "I think we Novices could catch as much DX on 40 as on 15 if more DX would come up to our part of the band," writes KN8OOK.

80 c.w. has good quiet spells even in midsummer but it takes a hearty 3.5-Mc. appetite to stick with it on the long haul. W1RAN, K4ZYI, W6KG, K6KDS, W9JJN and listener A. Rugg dig out CE3AG 8, **DL1**s FF JW, **F8**VJ, G2DC, **JA1**s CE CIU COR, **KP4**AOO, **KZ5**LC, **LA7**Y, **PJ2**AE, **SP2**WT, **UAØ**KZA 12, **UB5**WF, **VPs** 1JH 3YG 5FP and **YV5**DE among the atmospherics.

160 c.w.'s informal March 11th-13th get-together dreamed up by Ws 1BB 2EQS and others came off in lively fashion. Added to transcontinentals was the trans-oceanic availability of G3PU, other Europeans and VP2VA. W1BB and cohorts agree that February 14th conditions were the best in several years on 160, with **DL1**FF, **Gs** 3PU and 6HB working numerous W/Ks. Just before the late-season mantle of QRN and QSB took over 1.8 Mc. the hunt centered on **HC4**IE, **VP5**FP and **ZB2**A. ZL1AV of *Vasme III* is said to be game for some 160-meter sport and may be available on top band from various Caribbean and Pacific points as the year rolls on.

Where:

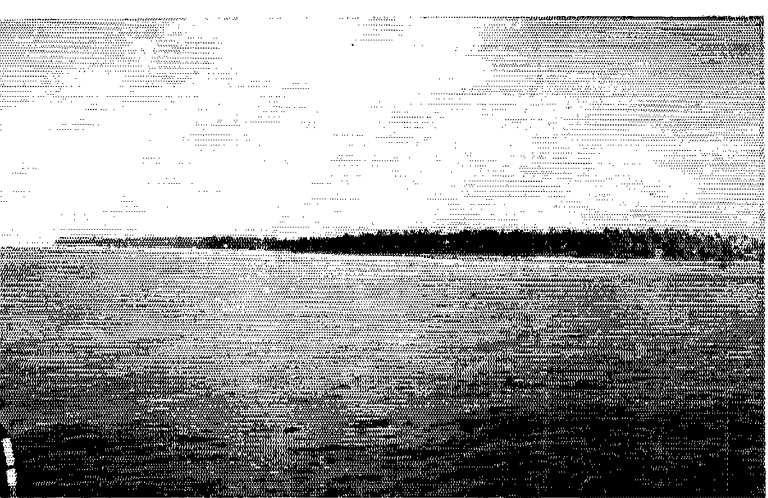
Asia — From HL9KS staffer W1HEG: "HL9KS does its best to QSL 100 per cent but, since the station really is a club effort, we have left the sending of cards to each individual operator." . . . . . KL7DIR, ex-K6EWZ-K4LWL-W2IQU, still is receptive to QSL inquiries concerning his three-year Izmir stint as TA3MP . . . . . "Quite a few cards are arriving daily from the W/K boys," observes NZ2OM, now in Mississippi (see revised address following) . . . . . From one of JT1AB's Czechoslovakian representatives, W8KX learns that International Reply Coupons are not convertible in Mongolia. Outbound Czech mail, by the way, costs one IRC by the low road, 2½ by air . . . . . "I've finally received the official logs for the last few days' operation of the real YA1PB," announces KH6OR who trusts this will speed finis to his QSL efforts in Paul's behalf. "These cover his operation on phone and c.w. from July 31 to August 7, 1959. Cards will be provided upon receipt of stamped self-addressed envelopes from those who scored legitimate QSOs." . . . . . KA2s GI and ZZ undertake renovation of the KA QSL Bureau, modernizing the former system of filing and handling incoming cards. "These stations are keeping us the busiest: KAs 2AA 2CB 2DE 2FF 2GI 7MD 7HH 8LF 8RB and 9MF. Cards are forwarded every two weeks." . . . . . WGDXC understands that W8PQQ inherited a handsome stack of VU2ANI QSLs for forwarding.

Africa — "I will answer all QSLs for my CN8JX activity upon my return to the States," writes W7GGO who closed his Morocco logs in early April . . . . . W6ZRK advises, "Still have several hundred EL8C cards which I'll be glad to send to those who contacted him but never received confirmations. He's now EL2AD." Self-addressed stamped envelopes, of course. Bob has no QSL commitments with EL8D . . . . . W1RAN had good luck confirming a ZD7SA QSO through the assistance of K9PJN. W9FJY requests your patience regarding ZD7SA QSLs, for logs must come from St. Helena by slow sea mail . . . . . Concerning his latest Basutoland trumph, ZS6IF writes W4PLL: "In a few days cards started coming in by the hundreds. After the fun of reading all the nice remarks on the QSLs we had the not-so-nice job of filling in over 1000 cards and mailing them out. But this, after all, was the purpose of the trip." . . . . . EL4A relieves W7PHO of QSL-aid responsibilities as of April 1, this year, and instructs all contacts to QSL direct henceforth . . . . . W8KX reports that VQ6CM's recent QSO eruption ran him right out of QSLs. A fresh order from the U.K. is slow arriving.

Oceania — K6QPG/KW6, now back in Sixland, remarks: "Got loads of QSLs just as I was leaving Wake, and I'll surely QSL 100 per cent eventually." Same goes for Mary's OM, KW6CQ. The departure of this pair leaves Wake Isle much rarer than it's been for quite a while . . . . . ZK1BS stresses that his own address is the correct one for the Cook Islands QSL Bureau . . . . . Complications for W4KWC, Stateside QSL agent for FO8AC. Firstly, Ed has a new mail QTH (which follows). Secondly, though all cards received for the FO8AC logs he has on hand have been answered, some 450 QSLs have piled up for recent QSOs not yet on record. "Looks as though I will get logs only about every three months from now on. Please be patient, and *please* include s.a.s.e." . . . . . Through W1OHA, VR3V (G3MKG) assures eventual QSL for each contact. "Sorry about delay in the sending of my cards but odd jobs have kept me busy. And it's a big job sorting out 'pirate' cards from the rest." . . . . . W9ZRC helped distribute a few dozen Chathams QSLs for recent ZL3VH/3 activity. Pye pointed out that surface mail from New Zealand costs one IRC, regular air mail three. U. S. currency just won't do . . . . . In WIA's *Amateur Radio* we see VKØs BH and GE listed at Mawson Base, Antarctica; AB at Wilkes Base; ED, Davis Base; and WH on Macquarie. VK9s BW and EP are QRT.

Europe — Regarding last month's EI0AA foray to the Blaskets, EI6X writes: "All QSLs should go through the bureau unless accompanied by s.a.e. and IRCs. In the latter case, QSL via EI4R." . . . . . "The SVØ listings in any call book are practically worthless because the calls are reissued so quickly," testifies SVØWZ/Crete (W7FTU). "As soon as one man returns to the States another gets his call. In my own case I've rescued a few cards from the base post office which were heading for the previous holder of my call. I know some have already gone to his Stateside address — he may yet make DXCC without a QSO. It's a sorry situation." To increase your chances of getting a QSL through to him, Sarge recommends the SVØWZ/Crete entry to follow . . . . . No, those UT UV and UW fellers don't represent "new ones" if you've already worked UA1-6 and Ukraine. G8PL and VE3ES encountered UT5s BA BB and BZ in Kiev, UT5CA in Kharkov, all former UB5s not necessarily bearing their old suffixes . . . . . This month's Luxembourg invasion by DLs 1JW 3HD 4ZW 4ZX 6EN and 6EQ (see LX3 listings to follow) will result in 100-per-cent QSL response to all valid cards received, says DL4ZX/LX3ZX (KØHUL). His XYL, DL4ZW/LX3ZW, may be the first feminine LX licensee, for all we know . . . . . "I've begun operating I1DFB in Leghorn," notifies KØLRS, "and will be active on all DX bands, particularly in the contests." For I1DFB QSOs since November, 1959, W/Ks can reach Dave through U. S. Army Engineer Dis. Southern, APO 19, New York, N. Y. Non-W/Ks are re-

ZM7DA's triumphant Tokelau team included (left to right, en route) VR2DA (ex-VK2PA), Mrs. W5PQA, OM W5PQA and Mrs. VR2AR. More than 3000 contacts with some 70 countries were logged. The shoreline is that of Nukunonu islet, Tokelau group, some 980 miles northeast of Fiji. *(Photos via W7PHO)*



UA4FE radiates a consistent signal from Penza on several DX bands. W9WHM obtained this picture after a contact on 21-Mc. phone.

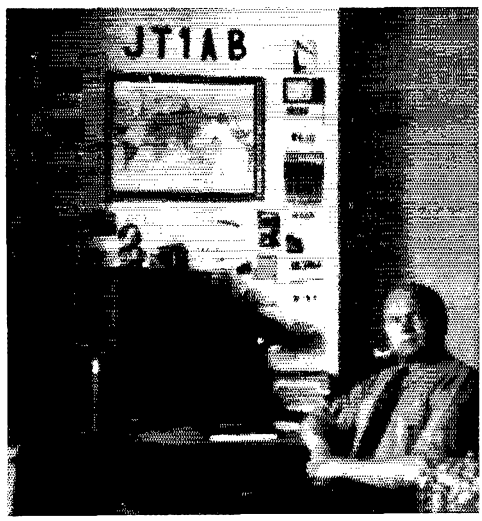
quested to use: 4 via Selvastrelle, Tirrenia, Pisa, Italy.

Hereabouts — The late W5KF had no connection with VP2 QSL responsibilities, assures W5LEF . . . . . VE8TG states that QSOs involving his call between April 7 and June 16, 1959, are not valid. Paul reports the VE8 bureau hard at work keeping the DEW Line gang happy . . . . . K4SXO, laboring QSL-wise for VP2s KW ML and SL, emphasizes the necessity for s.a.s.e. and GMT usage. Really, OMs, DXers discourteous or careless enough to use non-GMT reference on DX-destined QSLs are foolishly pressing their luck . . . . . W3AYD commenced clearing VP5AB's ARRL Test QSLs in mid-April . . . . . Any rarish overseas readers need QSL assistance? Ks 2RBH 3HMP 4HDR and 9KNM are available for franchising. As K4HDR figures it, the Stateside-manager arrangement is the only workable answer to the QSL problem of modern amateur radio "DX for the masses" . . . . . W8CUT found VP1SS eager to QSL his QSOs for this year's ARRL Test. Ray's QTH follows . . . . . VP9RR returned to the mainland as K4OXD/4 last month and welcomes QSL inquiries at the QTH following . . . . . Praised be W1s DGL AOH OPB RAN RJJ TS UED WPO, K1s IMD JTL, W2s AXR GVZ JBI, PQW WAS, K2UYG, W3SOH. W4s IUO NYF PLL, K4IEX, W6KG, K6s BX CJF STZ, W7s LZF UVR, W8s BIE BUM CUT KX YGR, K8KZF, KN8OOK, W9s NN ZYD, VE3ES, A. Hovey, A. Rugg, FEARL(M) *News*, International Short Wave League, Japan DX Radio Club, Malayan Amateur Radio Transmitters Society, Northern California DX Club, Ohio Valley Amateur Radio Association, Southern California DX Club, Universal Radio DX Club, VERON of Holland, West Gulf DX Club, Willamette Valley DX Club and Newark News Radio Club for the following specific recommendations. Good luck! . . .

CX2SX (via CX6BA)
DL3RO/EP, P. O. Box 709, Tehran, Iran
EA8BW (via EA8AH)
EI0AA (see text preceding)
ex-EL8C (via W6ZRK)
FE8AR, P.O. Box 1042, Yaounde, French Cameroons
FO8AC, c/o E. Brittain, W4KWC, Rte. 1, Hampton, Ga.
FQ8HA, A. Le Querre, Box 409, Fort Lamy, Tchad, Fr. Eq. Afr.
GB3BMC, Langton St. Methodist Church, Bristol, England
GB3MAC (via RSGB)
GD3JZK (to G3JZK)
ex-GW3JET (to AP2CR)
HCIJU, Box 2951, Quito, Ecuador
HK3TH, G. Tietjen, Box 11114, Bogota, Colombia
HL9KS, Sig. Sec., Hq. Det., KMAG, APO 102, San Francisco, California
HL9KU, USOM/K, APO 301, San Francisco, Calif.
HP9FC/VQ8 (via VE7AM)
I1DFB (see text preceding)
I5TUF (via I5GN)
JA8MS, Momoto Saito, 2 Ku-Kusanru, Wakkanai City, Hokkaido, Japan
K4AMG/KL7, Wm. Rose, Navy 127, Box 7, FPO, Seattle, Wash.
ex-K6QPG/KW6 (to K6QPG)
ex-KA2AP (to W1KKZ)
KC6AQ, Roman Catholic Mission, Koror, W. Carolines
ex-KL7DDD, 5520 Dorchester Ave., Chicago, Ill.
ex-KW6CQ (to K6QPG)
KX6BT, 1957-3, AACS Det., APO 435, San Francisco, Calif.
KZ5MQN, M. Walsh, Box 1061, Cristobal, C.Z.
LA6CF/mm (via W6/K6 ARRL Bureau)
LX3s EN EQ HD JW ZW ZX (via DL6s EN or EQ)
OD5CT, L. Rundlett (W3ZA), P.O. Box 341, Beirut, Lebanon (W/K/VE/VOs via W2JXH)
OD5LA, c/o U. S. Embassy, Beirut, Lebanon
OK1MG, A. Kriz, P.O. Box 17A, Kladno, C. S. R.
OQ5FH, M. de Roeck, P.O. Box 614, Jadotville, Belgian Congo
OY5S, S. Poulsen, P.O. Box 27, Torshavn, Faeroes Islands
SV0WZ/Crete, c/o RAAG QSL Mgr., Box 564, Athens, Greece (or to W7FTU)
ex-TA3MP (to KL7DIR)
VE8RX, G. Kondo, Box 65, Ft. Smith, N.W.T., Canada
VK1ATR, D. Robertson, 128 Schlich, Yarralumla, Canberra, Australia
VK5BA/VR4 (to VK5BA)
VK9HC, c/o Cable Stn., Cocos-Keeling, Indian Ocean
VK9RM, R. Murphy, The Hill, Goroka North, T.N.G.
VK9YT, C. Zimmer, Lamekot, P.O. Kavieng, T.N.G.
VK0IT (via VK3KB)
VO2AW, Don Welling, Box 272, Goose Bay, Labrador, Canada
VP1SS, R. Squires, Box 44, Belize, Br. Honduras
VP5BH/mm (via W4OMW)
VP5RH, c/o PAA, Patrick AFB, Fla.
ex-VP9RR, R. Russell, K4OXD/4, USNAS Glynco Ga. Communications, Brunswick, Ga.
VQ8BB, ex-VQ8BBB (via VQ8AF)
VS1KM, J. Dart, RAF Stn., Changi, Singapore 17
ex-VS4BD-VS5BS-ZC5JN (to G3JFC)
ex-VS7PS (to G3BGL)
ex-VS7RF (to ZE8JF)
VS9AKE (via RSGB)
WP4AVF, Box 148, Ramey AFB, P. R.
XE1PQ, J. Ponce de Leon, Box 13331, Mexico, D. F., Mexico
ex-XW8AM (to OD5CT)
XZ2OM, Capt. A. Myint, BAF1064, OMR. No. 117, Sqdn. 3401, Keesler AFB, Biloxi, Mississippi
XZ2SY (via W4ANE)
YN1RA, 2a Ave. SE-650, Managua, Nicaragua
YO3CN, P.O. Box 79, Ploesti, Roumania
YV4BE, F. Dieppa, Ribas 27, La Victoria, Venezuela
YV5AF, J. Cardenas, P.O. Box 2299, Caracas, Venezuela
YV5AMI, Box 2224, Caracas, Venezuela
ex-ZD9AC, N. Meyer, "Dunmar", Goya Rd., De la Haye, Bellville, Cape, S. Afr.
ZL5AA (via ZL2GX)
ZS6AKV, 10 Boulogne Rd. Richmond, Johannesburg, S. Afr.
ZS7P, c/o P.O. Box 3650, Johannesburg, S. Afr. (or via W6BAF)
ex-ZS8R-ZS6AVM, V. Parkhouse, ZS7R, P.O. Box 98, Mbabane, Swaziland
3A2BB (to G3IEW)
ex-4S7JM (to VS1KM)
9M2GR, J. Willis, Minden Bks., Penang, Malaya
9N1FB, F. Vogel, c/o U. S. Embassy, Khatmandu, Nepal

Whence:

Asia — The Land of Morning Calm (well, usually) is heard from via W8NYG of the HL9KJ staff: "I'm taking the long way back to the States via India, Greece and



JT1AB helps JT1AW take up DX representation of the Mongolian Peoples Republic where JT1s AA and YL left off. (*Photo via Ws 9FVU and 1WPO*)

VU2ANI's Andaman Islands DXpedition over January of this year netted some 3350 contacts with 126 countries. These photos, provided through W7PHO, show VU2NR seated at the operating position with VU2s AK and RM, plus a coastal view with the solitary shack discernible near center.

Europe after leaving HL9KJ in late April. W9ACC probably will take over our Advisory Group station. There now are six authorized HL9 stations; the newest, HL9KU, was licensed in January. HL9KU, the U. S. Operations Mission, has an Apache feeding a triband vertical." W1HEG of HL9KS adds his two cents: "We have been off the air for several months because of repairs and wind damage to our 20-meter beam. HL9KS now has a doublet for 14 Mc. and a three-element rotary for 15 and 10 meters, running 500 watts to a BC-610. Our usual frequency is 14,060 or 14,210 kc., mostly on week days around noon Korean time, also for several hours each week end." . . . . . Ex-TA3MP, now KL7DIR, remarks, "I've read with much interest the comments regarding Turkey and amateur operation. I'm afraid it will be a long, long wait for the day that any official 'green light' is hung out by Turkish authorities. This is not a new subject by any means." . . . . . W3ZA of previous Far East DX fame adds OD5CT to his lengthening list of calls with a KWM-1 and Conset tribander in Beirut. "Hope to be seeing all my old friends again. I also visit EP ET2 ET3 HZ 15 JY MP4B MP4Q ST SU TA VS9 YI YK 4W1 9K2 and other regions periodically, so I may be on with s.s.b. from some of the rarer spots. It all depends on my ability to get permits." W3ZA/EP and W2AYN/EP are recent proof of Rundy's DX pudding . . . . . AP2CR writes K6BX: "I work fairly regularly on 20-meter s.s.b. and am the only sideband station in Pakistan. In fact, barring KAs, I think I can lay claim to being the first amateur sideband station in Asia, active since 1953. In all this time I've worked only one other AP. I really am not a DX hound — I prefer to use ham radio as a friendly contact with the outside world — and I have a mere sixty countries on two-way sideband." . . . . . VU2RM of VU2ANI glory joined the benedicts in March . . . . . W7DJU and others were struck by the all-band versatility of UAØKZA in this year's ARRL Test — 10 through 80 meters. Anyone catch him on 160? . . . . . KH6IJ/1, a ham of many talents and a scholar as well, turns up interesting paragraphs in J. E. Murray's 1907 *Handbook of Wireless Telegraphy — Its Theory and Practice*, pp. 162-168: "The British government installed a Lodge-Muirhead wireless system [spark] between the Andaman Islands and the Burma mainland (305 miles) in December, 1904, and in the month of May, 1905, handled 14,000 words of traffic. . . . The receiver used was a coherer of carbon steel operating conventional earphones." VU2ANI & Co. followed ancient footsteps . . . . . Asian addenda courtesy clubs FEARL(M), OVARA, VERON and WGDXC: DL7AH drew a blank in efforts to obtain Iran authorization. . . . 9N1GW (W2CBD) formerly signed EK1GW, SV9WX (1952) and KR6GW. . . . It's Uncle Sugar for AP2BH, likewise for KA2s LN and AP (W1KKZ).

Africa — "ZS6IF now is planning a trip to Bechuanaland possibly this August," hints W4PLL . . . . . "ZD2CKH closes shop to rejoin his family in the U.K.," reports W9JFT. "He figures to be in new ZD1 diggings come September, ducktalk a possibility." Ed also confirms the passing of ZD3E, a loss that leaves Gambia excessively rare and saddens many a 10- and 15-meter buddy . . . . . EL4A reached his goal of 12,000 QSOs in his first year of Liberia hamming. "In my next year I'll try to make it another 12,000. It really isn't too difficult; just work about 35 stations a day every day. Contests easily help you keep up the pace." Ken has a 180/111 DX score now, plus a fast 50 countries as EL4A/mm aboard a LeTourneau riverboat . . . . . From W3SOH: "ZS7R (formerly ZS8R and ZS6-AVM) is very active on 20 c.w. with 50 watts, an S-76 and dipole. He also works 15." . . . . . Ex-CN8JX wants his many on-the-air friends to watch for him from North Dakota as W7GGO/Ø on 7 through 28 Mc. beginning in July . . . . . ST2AR's nearest local QRM comes from ET2 neighbors. W8KX finds Eric still hankering for a Nevada QSO after 202 countries and seven long years . . . . . EL3A, who will be touring the U. S. until next spring, is enjoying visits with W6QS, W7DLF and other Statesiders. Bob hopes to augment his Liberia layout with sideband gear and a new triband beam . . . . . K2YFE notes that OQ5CJ's DX aspirations are sometimes thwarted by a mains supply that dries up at 2000 GMT nightly. Most of us W/Ks take our steady power sources strictly for granted.

Oceania — "VK5BP/nt will operate in September from Alice Springs in Australia's rare Northern Territory," learns W4ORT. "VK5NQ tells me the operators will be VK5s BP DY NO and himself. They'll have to travel at least 70 miles by very bad roads to reach Alice Springs." VK5s NO and NQ are father and son . . . . . Via W8YIN: "VK4DD declares there will be no DXpeditions to Willis Island because of rigid security regulations there. None of the island's scientific weather observers is a ham, and there will be no rotation till 1962." . . . . . K6QPG/KW6's Wake Island hamming career, now DX history, includes a DXCC membership, YLCC, WAS and enough QSLs to qualify for many other certifications. Mary and OM KW6CQ deeded their beam to KW6CB but toted the rest of their station to the mainland. Toughest DX from Wake? Europe by far, says K6QPG . . . . . "ZL3VH hopes to go to Tokelau later this year for a lagoon survey. If the trip comes off he will be there for about three months. Pye hopes to have an Apache for the purpose but he's building a rig with an 829B final for 100 watts c.w. on all favorable bands." This from W9ZRG . . . . . The 1959 VK/ZL DX Contest c.w. outcome lists the ten U. S. highs in this order: Ws 6GHM 6IBD 6KG 6LDD 8BHW 2EQS, K5KBH, Ws 3DBX 4BJ and 6NKR. Other W/K call area leaders are Ws 1JYH 9WNV and 9YCR (no Sevens applied). Other toppers by continent: CE3AG, ZS6NE, JA1VX, VR1B and DL1KB. On the home front VK2ADE leads the field; VKs 3DQ 4TY 5BS 7JB and 9XK are frontrunners in their call areas. New Zealand's big gun is ZL1AH, with ZLs 2GS 3OB and 4GA heading their districts. The meager Stateside phone turnout is paced by K5s MDX KBH and W2WZ; 9M2DQ achieved the highest non-VK/ZL score. VK5MS and ZL1-ACI take Down Under phone honors . . . . . In WGDXC's *Bulletin* we see that K6CQV/KS6 anticipates an 18-month Pago Pago sojourn.

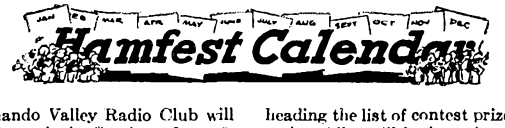
Europe — An impressive array of Luxembourg representatives is prepared to do battle with pile-ups on the 13th-16th of this month. DLs 1JW 3HD 4ZW 4ZX 6EN and 6EQ will swell the grand duchy's ham population by operating as LX3s JW HD ZW ZX EN and EQ on 15 through 80 meters. Main c.w. frequencies will be 14,080 and 21,080 kc., while phone (s.s.b.) work will concentrate on 14,300 and 21,400 kc. DL4ZX/LX3ZX (KØHUL) writes, "Two stations will be operated on a 24-hour basis. One station will comprise an HT-32 and SX-100, the other a homebuilt transmitter and Geloso receiver. Stations calling are requested to call on a frequency other than that used by the LX stations." And Earl doesn't mean just a smidgin difference . . . . . Last month's Blasket Islands EIØAA proceedings were planned and manned by EIs 2X 3B 4AD 4R 5AB 6X 7BD and 9AD. A DX-100, SB-10, two HROs, a three-element beam and vertical were enlisted to carry out what EI6X claims is "the first DXpedition to take place in EI-land." The fad rolls on! . . . . . Next month Gs 2AGK 3FLY 3LGW and s.w.l. Malcolm Keen will put GB2CHS on DX bands from a British radio exhibition. Under the same circumstances last year this team worked 138 stations in 43 countries over a 24-hour period. Item via W1TS . . . . . K2UYG hears that illness and a rebuilding spree have cur-

I5GN's OM-and-XYL duo is widely worked on 20-meter phone. Pat and Jere are especially popular with the single-sideband crowd. *(Photo via W1QPN)*

tailed the DX activity of OY7ML but a new 813 linear may already be on the firing line . . . . . LA6CF/mm will ply the West Coast-Far East sea lanes aboard MS *Bonnemille* for the next 18 months or more. "QRV all bands, phone and c.w., between Los Angeles and Manila. Will be on the Coast for about one out of every five months, so I hope to meet many American amateurs." . . . . . VERON mentions moot Franz Josef Land activity by UA1KAC . . . . . WGDXC lists San Marino as an August DX target for roving DL9PF.

Hereabouts — You've probably been reading about Project Hope and its seagoing complement dedicated to world wide health and good will. Well, W8OLJ will be aboard SS *Hope* with a full-fledged amateur radio installation. It's not unlikely that W8OLJ/mm will find it very possible to try a rare land-based activation now and then . . . . . By golly, Ws 3SOH 1EQ and K6LGF come through with "DXCC2" qualifications Nos. 26, 27 and 28 (see p. 59, July 1959 *QST*). No "WAS-DXCC" nibbles so far (per p. 83, March 1960 "How's") . . . . . The Big Question at the well-attended DX session of the Grand Rapids Michigan State Convention in April was, "How do we get QSLs from ——, —— and ——?" W8KX reports approbation of W2SAW's enclose-the-proper-foreign-postage approach . . . . . Now that 40-meter DX is back in vogue, and seeing as how most of the foreign DX world is restricted to a few kilocycles near 7000 kc., W7DJU and others would appreciate the gracious upward QSY of electronic-key scopewatchers and RCC enthusiasts when long and short skips conflict. But this will probably have to work itself out. (Surprising how many erstwhile rag-chewers join the hunt when a good one shows up!) . . . . . OVARA and listener A. Fallert inform us of the sudden passing of W8EZF, an ardent DXer and one of the club's VP5BH (Caymans) and KC4AF (Navassa) DXpeditionary aces . . . . . RSB's Bermuda Field Day occurs on the 11th-12th of this month, so you'll soon be running into a bunch of VP9s going like crazy . . . . . W6NTR, a "How's" contributor of the old school, bravely tackles DX editorial duties for *Western Radio Amateur* out his way . . . . . K6CJF finally was "first Six!" for somebody — WP4AVF . . . . . W9LNQ, a prime DX mover among Chicago's Hamfesters Radio Club, loyally pens Jeeves a contrib while hospitalized on a liquid and *QST* diet. *That's* team play . . . . . W6JQB, some 75 miles from the nearest TV station and shadowed by a 9000-ft. mountain, finds it no easy matter to keep his herringbones at home . . . . . "Please cast my vote for a later ARRL Test opening date," requests W8KX, plagued by propagational vicissitudes in this year's classic. Well, OM Sol is a tough feller to figure, Walt, and the other factors involved are legion . . . . . W4AZK has *six* bands worth of beams on one pole and rotator, 7 through 144 Mc. Creak-creak but as yet no *crunch* . . . . . K6BX suggests you check with Casa do Radio Amador Gaucho, P. O. Box 1119, Porto Alegre, RS, Brazil, for data on the Club's *C-20-S* certification now available to W/K/VE/VOs who confirm QSOs with a certain assortment of thirty PY stations . . . . . Beedle-beedle boys will be interested in OVARA's RTTY stalk-sheet: G3CQE, 21 Mc.; HL9KT, 21,090 kc., 0200 GMT; K6CQV/KS6; KH6BGS, 14,118; OA5G, 14 Mc.; PA0FB, 21,090 and 14,100; TG9AD, 14 Mc.; ZK1BS, 5-6 GMT; and ZL3HJ, 14 Mc. CR9AH and VQ6FM express interest in the mode.

Ten Years Ago in "How's DX?" — The "DX fist," primarily a prewar phenomenon, is given last rites in your June 1950 column curtain-raiser . . . . . W2NSD and 75-meter phone friends find CN8MI, JA2AZ, LX1JW, TA3GVU, TG9AD and ZS1JZ workable . . . . . Eighty c.w. turns up EK1AO, FA8s CR IH, SP5ZPZ, SV0WH, VP5BF and W4BRB's 79th 3.5-Mc. country . . . . . EA6AF, FK8s AB AC AD, HL1BQ, MD7DC, OX3AB, VS6AE and W6VKH/KG6 keep the 7-Mc. pot a-boiling . . . . . Twenty c.w. has CR10AA, FE8AB, FG8AD, FM8AD, HL1US, MD4GC, PJ5FN, PKs 1RI 1TM 2ZZ 3JT, VKs 1AJT 3AMR/9, VRs 1A and 5PL on display, while 14-Mc. phone followers collect Iwo's JA0IJ, LX1SI, M1B, PJ5RX, PKs 3LC 4ZZ 7HR, VR5s GA PL, YK1AC, YO7WL, ZC6s DH DO and UNJ . . . . . Ten phone is still productive: AP2G, CR5UP, HZ1AB, MD7HV, MF2AA, MI3SC, MP4s BAB BAO, MS4A, PKs IUA 4DA 4KS, SV5UN, UB5UV and VS7PS abound . . . . . The HC8GRC Galapagos go of HC2JR & Co. amassed 2116 QSOs with 68 countries and 44 states on 3.5 through 28 Mc. . . . . Madagascar amateur radio prosperity is said to be just around the corner . . . . . Jeeves and associate enjoy a real *cool* Field Day, and there are photos of JA2FM and FK8AB for your pleasure. QST



California — The San Fernando Valley Radio Club will hold its fourth annual hamfest picnic Sunday, June 5, at Victory Van-Owen Park, Valley Plaza, near Victory and Laurel Canyon Boulevards in North Hollywood. The program includes games, contests, T-hunts on 6N2, code sending by foot (left) and tube identification sessions. Those attending are requested to bring their own picnic lunches, but other refreshments will be served free. Admission for all events, including refreshments, is $1.00. The official club station W6SD will be on 6, 2 and 80 meters starting at 10 A.M. to guide those mobiling in. A full program is planned to keep harmonics busy while OMs and XYLs enjoy contests and eyeball QSOs. For additional information, contact George Rudelis, K6RVB, hamfest chairman, 507 Zelzah Ave., Encino, Calif.

Hawaii — The first hamfest in the State of Hawaii will be held at Hilo on the Island of Hawaii July 2-4 under the sponsorship of the Hilo and Kona Amateur Radio Clubs. Registration will be Saturday, July 2. For further information, write to Haruwo Yamamoto, KH6AU, P.O. Box 1659, Hilo, Hawaii.

Illinois — The Western Illinois Radio Club of Quincy will hold its hamfest Sunday, June 19 at Eagles Alps Picnic Grounds four miles north of Quincy. There will be a complete program and equipment display with an Elmac AF-68 heading the list of contest prizes. Registration begins at 0900 and mobiles will be in action on 3940 kc. and 29600 kc. on all highways leading to Quincy. Food and refreshments will be available on the grounds for those who do not wish to bring a picnic lunch. Tickets are $1.75 in advance or $2.00 at the gate, donation. For tickets, contact Hall Smith, K9KOJ, 713 Washington Street, Quincy.

Kentucky — The Breaks Ham Fest will be held Sunday, July 10 at the Breaks Interstate Park between Haysi, Va. and Elkhorn City, Ky., on Highway 80. No further information available at this writing.

Maine — The doors open at 9 A.M. Sunday, June 19, for the Augusta Radio Club hamfest at the Calumet Club at West River Rd. and Highway 104 North. There will be an informal get-together Saturday evening at the Calumet Club when members of the Augusta Radio Club, their families and visiting hamfesters can get a good start on a good time. Reservations at $3.00 or tickets at the door for $3.50 include a turkey dinner served at half an hour past noon on Sunday. Tickets for children under 12 are $2.25. Bring gear to swap and sell. Net meetings include Barnyard Net, 9:30 to 10:15 A.M.; Sea Gull, 10:30 to 11:15 A.M.; Mars 11:30 to 12:15 P.M and RACES conference from 9:30 to noon. All reservations must be made by June 8 and money must be in by June 10 or the price will be the same as tickets

bought at the door. Any Augusta station will take a reservation, but all money must be sent to Wilfred (Chummy) Lemieux, 151 Cony St., Augusta.

Nebraska — The Tri-City Amateur Radio Club will hold its hamfest picnic Sunday, June 12, at Riverside Park in Scottsbluff. Attractions include a transmitter hunt on 75 and 10 meters, code contests, a swap table, horse shoe pitching contest, the largest free zoo in Nebraska for the harmonics and card-playing for non-ham XYLS. There are prizes for all contests. WØVQN will be operating on 3850 kc. from the site by 0800 to guide mobiliers to the park. The picnic opens at 9:30 A.M. Bring enough fried chicken, table service, bread and butter for your own family plus a covered dish. It will be served as one big covered dish family dinner. There will be a refreshment table where you can buy cold pop and candy. The cost is 50 cents per person or $1.00 for a family. The Tri-City Club will furnish free drinks for noon dinner.

Nebraska — The Dawes County Amateur Radio Club will hold its annual ham family picnic at Nebraska State in Chadron on Sunday, June 5. The party starts at noon with no charge to visiting hams or their families. Each family will bring its own food which will be put on tables and served family style. Coffee and soft drinks will be furnished by the club. There will be a swap table and a hidden transmitter hunt. For further information contact Lynn Bilyeu, KØDF, 406 Henkens Dr., Chadron.

New Mexico — The annual picnic and gathering of the Totah Amateur Radio Club, Inc., will be held at Pine River Dam (Vallecito Res.) about 20 miles northeast of Durango, Colo., over the Fourth of July weekend. An old-fashioned blueberry flapjack breakfast with bacon and eggs and plenty of hot campfire-style coffee starts things off Sunday, July 3. The chef is one of the outstanding blueberry chefs of New Mexico. At sun-down Sunday, a chuck wagon beef Bar-B-Que will be served with open kettle cooked beans. There are plenty of camp sites for camping out overnight, horseback riding, boating, water skiing, rocks for rock-hounds, fishing and plenty of room for just plain relaxation. There will be 110 volts a.c. available for those camping overnight. Bring along any surplus gear you might want to swap. Who knows? — you might get a bargain. Mobiliers will find help on 7225 kc. and 29.600 Mc. in locating the camp site. Those who are not mobile simply follow the CQ signs. Further information may be secured from W5POI, W5SGC, W5CIN or drop a postcard to P.O. Box 24, Farmington, New Mex.

New York — The annual dinner of the Crystal Radio Club of Valley Cottage will be held at 7:30 P.M. June 18 at the Hi Ho Restaurant in Nyack. Tickets are $3.50 per person. Contact Ralph Quelch, WA2AOH, P.O. Box 162, Stony Point, N. Y., for tickets or further information.

North Carolina — The Tar Heel Emergency Net plans a picnic meeting Sunday, June 12 at Guilford Battleground Park in Greensboro. All members and former members are invited, along with any amateur interested in the net.

North Carolina — The Forest City Amateur Radio Club will hold its hamfest Sunday, June 19, at the Forest City Municipal Park. All amateurs are cordially invited. No details are available at this writing.

Ontario — The Ontario VHF Association will hold a roundup Saturday, June 18 at the Clover Leaf Hotel in West Toronto, south of Queen Elizabeth Way at the Highway 27 cloverleaf. The program includes talks on aspects of v.h.f. work, entertainment, and dancing, plus a make-up demonstration for the ladies. The $4.50 (Canadian funds) tickets may be obtained from Tony Sheppard, VE3DIR, 2 Brooklawn Ave., Toronto. Out-of-town reservations must be in by June 11, but tickets are available at the door. Registration starts at 1 P.M. and dinner is at 6:30 P.M. The cocktail hour starts at 5 P.M. The club suggests that U. S. visitors get some Canadian funds from their bank before they arrive rather than getting upset at premiums on U. S. funds after they are in Toronto!

Pennsylvania — The Penn-York Hamfest Assn. will hold its second annual hamfest on Saturday, June 18, in the Legion Hall at Elkland. The program includes speakers, contests, dinner and special non-ham entertainment for the ladies. For further information, write the Penn-York Hamfest Assn., c/o C.A.R.A., P.O. Box 301, Corning, N. Y.

Pennsylvania — The Uniontown Amateur Radio Club's W3PIE Eleventh Annual Gabfest will be held Saturday afternoon and evening, June 18, on the club grounds on the Old Pittsburgh Rd., just off Rte. 51 two miles north of Uniontown. Refreshments will be available and the affair is strictly stag.

Pennsylvania — The Eastern Pennsylvania Section Picnic will be held Sunday, June 19 at Pavillion No. 7 in Hershey Park, Hershey. The day opens at 9 A.M. and includes ARRL speaker plus many other events. Bring the family and a basket lunch or buy lunch in the park. Registration is $1.00 per amateur call — reservations should be made in advance to Katie Gibson, K3BHU, Pine Grove, Pa.

Saskatchewan — The Regina Amateur Radio Assn. is sponsoring the official ARRL hamfest for the Province July 1-2 at Regina. The club promises something for everybody with contests, meetings and talks. For further information, contact A. Bill Nagy, VE5DG, 1421 Retallack St. Regina.

Strays

W6WFR and a friend were operating s.s.b. mobile the other night when they broke in on some a.m. buddies to say hello. After a considerable number of repeats, the a.m.ers managed to copy. After a short QSO, W6WFR told them his rig was a KWM-2 and signed. Then he heard the following exchange.

A: "Man what a signal! What was he running?"

B: "A KWM-2 mobile in a V.W. (Volkswagon)."

A: "What is a KWM-2?"

B: "Well, KW is for kilowatt, M is for mobile and 2 is 2000 watts P.E.P."

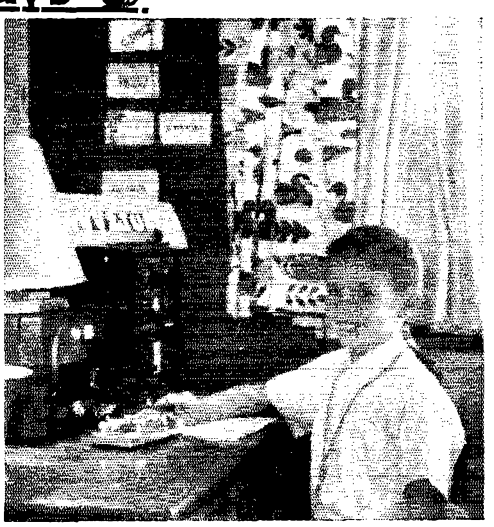
A: "Yeah, but he was mobile in a V.W. What does he use for power?"

B: "Well, they make a transistor power supply for that rig."

A: "Oh."

—•••—

K9UZR points out that Wisconsin hams applying for call-letter license plates are required by Chapter 341.14 (2) to have transmitting and receiving equipment installed in the vehicle.



Nine-year-old Robert Holstein has more on his mind than schoolwork—Bob's call is WV2JUS and he's hard at work on getting his General.

CONDUCTED BY EDWARD P. TILTON,* W1HDQ

As we near the normal *QST* deadline we are still several days away from the date tentatively set for the launching of the first earth satellite of the ECHO series. If the satellite goes into orbit early in the morning of May 5, as planned, we may be able to get a last-minute report on it somewhere in these pages. Meanwhile, all we can do is wait and wonder.

There probably never was an opportunity more heavily laden with question marks than this one, but the best available information on the possibilities for long-distance communication on the v.h.f. bands by reflection from such a satellite is just borderline enough so that we cannot afford not to give it a try. The objective of the first shot will be to put a 100-foot aluminized plastic balloon into orbit some 1000 miles out in space, at an angle of 48 degrees to the equator. All the usual hazards normally encountered in orbitting a satellite will be present in this try, and there will be some new ones. Assuming that all goes well, and the balloon goes into orbit according to plan, what does this first reflection satellite offer the amateur v.h.f. enthusiast as a means of working DX beyond his previously established limits?

Dozens of carefully organized scientific experiments will be throwing r.f. at the balloon, on frequencies all the way up to thousands of megacycles. The sponsors of these experiments will not be limited to 1000 watts input to the final stage. Low-noise receivers will be no problem for them; masers and parametric amplifiers will be all over the place. If a 50-foot dish is needed, most of the experimenters will have it, or something better. How about the amateur v.h.f. or u.h.f. worker, who is unlikely to have any of these?

We have managed to acquit ourselves creditably in the past, in spite of technical and financial limitations. We could do it again. The least we can do is try, and there are indications that a good many will be trying.

If we examine the problem in terms of the standard radar equation (for this is essentially a radar problem) we find that with something approximating optimum amateur gear for 144 Mc., 1000 miles is just about the maximum distance at which we can hope to get back a signal. We should hear our own signal reflected from the balloon, when it is directly overhead!

Now let's look at the fudge factors. Our calculation was made on a basis of 500 watts output. We can get some more. Assumed antenna gain is 10 db. That can be improved upon. Receiver noise figure used was 3 db. Maybe we can do better than that, though the external noise may make the effective noise figure worse, rather than better.

Take a piece of string scaled to represent a 2000-mile length, with respect to a globe you may have handy. Doubling it back on itself and standing it perpendicular to the globe surface represents the case where you hear your own echo. Now, every time you gain a little on the parameters outlined above you can spread out the two ends of the string, for you have stretched the 1000-mile limit. Maybe the balloon won't be quite 1000 miles up. Same result: you spread the ends of the string.

Wavelength is one of the factors in the radar equation. Decrease it, and the numbers look more encouraging. If you can keep the same radiated power, receiver noise figure and antenna *size* (not number of elements) and go higher in frequency, you're working in the right direction. 220 could be a little better than 144. 432 would be definitely better, except for that 50-watt limit. On to 1296 Mc. then, which is where a number of avid amateurs are going. Here, if you can get high power out (possible, but not easy), get down to under 2-db. noise figure (a parametric amplifier will do it, though the pump is rough for amateurs), and build an efficient 1296-Mc. array as big as a 64-element 2-meter collinear, you just might have it made.

It would help to be able to move the array in elevation as well as azimuth. With a satellite 1000 miles up most paths involve some high-angle aiming. One solution is for one end of the circuit to be aiming straight up, with the other fellow far enough away so that he sees the balloon at an angle within his normal antenna pattern.

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

50 Mc. WAS

1 WØZJB	19 W3OJU	38 W7ILL
2 WØBJV	20 W6TMI**	39 WØDDX
3 W6CJS	21 K6EDX	40 WØDO
4 W5AJG	22 W5SFW*	41 K9DXT
5 W9ZHL	23 W6ORE	42 W6ABN**
6 W9OCA	24 W9ALU	43 W6BAZ
7 W6OB	25 W8CMS*	44 VE3AET
8 WØINI	26 WØMVG	45 W9JFP
9 W1HDQ	27 WØCNM	46 WØQIN
10 W5MJD	28 W1VNH	47 WØWWN
11 W2IDZ	29 WØOLY	48 K9ETD
12 W1LL	30 W7HEA	49 WØFKY
13 WØDZM	31 KØGOG	50 W8LPD
14 WØHVW	32 W7FFE	51 WØZTW
15 WØWKB	33 WØPFP	52 W6GCG
16 WØSMJ	34 W6BJI**	53 W2RGV
17 WØOGW	35 W2MEU	54 W1DEI
18 W7ERA	36 W1CLS	55 W1HOY
	37 W6PUZ	56 W6ANN

57 W1SUZ		
58 W1AEP*		
59 W5LFH		
60 W6NLZ**		
61 W7MAH		
62 W8ESZ		
63 W2BYM		
64 W7ACD		
65 K6PYH*		
66 W4HOB		
67 KØJJA		
68 K6BNQ**		
69 W9OWI*		
70 W6EDC**		
71 K6VLM**		
72 K6GOX**		
73 WØEDM		
74 W9JCI		
75 WØLLU*		

* 49 states ** 50 states

VE7CN	45	VE1HS	41	ZS2JV	26	IA7Y	20
KL7AUV	44	ZS3G	32	LU9MA	26	VQ2PL	18
VE1EF	42	SM6ANR	30	CT1CO	24	JA8AO	18
XE1GE	39	CO2ZX	30	CO6WW	21	JA8BU	17
VE2AOM	38	SM7ZN	29	LA9T	21	JA1AAT	17
KH6UK	37	PZ1AE	28	LU3DCA	21	JA1AUH	16
EI2W	37	SM6BTT	28	SM5CHH	20	VP5FP	7

It can be seen that communication by reflection from a 100-foot balloon in space is no project for the average v.h.f. man. It may, by now, have turned out to be beyond the best of us, but from what we hear in the last few days before the scheduled firing, the v.h.f. fraternity will be in there trying.

Here and There on the V.H.F. Bands

The fourth and presumably last balloon of the *Shotput* series was fired from Wallops Island, Va., April 1. Once again several 2-meter men were on the job to see what could be done in the way of reflection work. K2LMG, South Lansing, N. Y., made recordings of the signals of W2AZL, Plainfield, and K2GQI, Keyport, N. J., between 1903 and 1905 EST, with signal strengths of 12 to 16 db. above the noise level. At this time the balloon was falling back into the upper atmosphere and disintegrating. Dave's calculations point to a target area nearly 100 times the reflecting area of the balloon, indicating a high degree of ionization surrounding the balloon during its descent. The total distance travelled by the 144-Mc. signals was computed by K2LMG to be 1160 to 1340 miles.

Other reports, via W4LTU, show that W8KAY, Akron, Ohio, heard W4LTU, W2AZL heard K2LMG, and W3GKP, Spencerville, Md., heard K2IEJ, Oceanside, N. Y., all on 144 Mc. Next step: the shot into orbit. If all goes well it may have happened before you read this.

Big events have a way of happening just after copy deadlines, so that the report in *QST* reads like ancient history when the dates are given. The aurora of March 31 is a prime example, but events of that night are too significant to go without reporting, simply because they happened a long time back. Last month we credited the aurora of March 15 with being one of the most widespread on record. It will have to move over, in this respect, for the session of the 31st. Sections of the country rarely affected by aurora were in this one to the hilt.

W4LTU, hearing reports of large solar flares, put a chart recorder on the 7335-kc. signal of CHU, Ottawa. The largest flare, March 30, took out the signal for several hours, and then when the storm commenced March 31, CHU was gone for a couple of days. Walt found the aurora going strong on 144 Mc. at 1745 EST the 31st, and he stayed with it until 0210 April 1, logging 25 states on 144 Mc. and working among others, W4EQM, Langdale, Ala., W5FYZ, Minden, La., and WØLFE, Bowling Green, Mo. The aurora was visible well past the zenith. The buzz was in evidence again at 1810 the following day, when W4LTU checked first, and it stayed in until 2320, when Walt closed down. Distances were shorter this time, however. There were a few scattered 144-Mc. aurora signals between 2145 and 2240 April 2, and some W9s came through after midnight, staying in until 0300 EST. There were traces of aurora the night of the 4th.

In addition to W4LTU, W5FYZ worked KØITF, Kansas City, Mo., K9AAJ, Quincy, Ill., and K3HDW, Greenbelt, Md. K9AAJ was worked again at 0722 April 1. K2IEJ, Oceanside, N. Y., reports working W4FWH, Doraville, Ga. W2ESX, Moorestown, Pa., says that all the hard-to-get states were in there, and that the boys who don't work aurora for all it's worth missed the chance of their lives to add to their 2-meter states totals. WØBFB, Mitchellville, Iowa, heard stations all the way from Colorado and Wyoming to Massachusetts and Georgia! John worked K7HKD/7, 10 miles west of Cheyenne, Wyo., WØENC, Rapid City, S. Dak., and heard W4FWH, WØIC W6QDH/Ø W1JDF and W1IZY. W4LNG, Atlanta, worked W8BKI, Charleston, W. Va., and W4HJQ in Kentucky, and heard about 10 other states These were Ruddy's first aurora contacts on 144 Mc. since September, 1958.

On 50 Mc., this aurora produced the combination of buzz and relatively clear-voice signals characteristic of the type of propagation discussed in January *QST*, in connection with the work of KG1FN. Signals sounding like sporadic-*E* skip were in for hours, along with the fuzzy ones. Some contacts made would normally pass for double-hop E_s, but it would appear that they were auroral in nature. W1SUZ reports that K2CBA, Troy, N. Y., worked a Wyoming station, and several W7s and VE4s were being called by W1s and 2s. Many stations were worked at distances normal for sporadic-*E* skip in nearly all parts of the country.

This would appear to have been the setup to have produced some DX for KG1FN, but unfortunately, the Fletchers Ice Island station had closed down on 50 Mc. just a few days before. They were active from Feb. 18 to March 28, running automatic keying continuously, except for listening breaks and occasional interruptions. KL7AUV, Anchorage, Alaska, was the only station heard on 50 Mc., though there was evidence of DX possibilities almost every evening, from as early as 1800 and until after midnight Alaskan time. Channel 2 TV was heard regularly around midnight, as were many signals between 49 and 50 Mc., presumably the FAA stations in Alaska. These are on 49.1, 49.3, 49.5 and 49.7 Mc. Signals heard on 49.6 and 49.605 Mc. were identified as coming from a meteor-scatter test station of NBS, located at Point Barrow.

Many hours were spent by U. S. amateurs watching for signs of KG1FN, but the only report we have thus far does not check with the KG1FN log, now in our hands. Experience on 50 Mc. in the far north is so meager that no definite idea of the DX season, if any, has been formed. Amateurs operating in Alaska, Northern Canada and other far-north areas could do a real service if they would set up on 50 Mc., operate and listen there regularly, and report their results or lack of results in detail. It is not known at this time whether the Fletchers Ice Island station will be reactivated on 50 Mc., but if it is the call will be KL7FLC. The base was changed from the Greenland to the Alaskan Air Command some time back.

The 50-Mc. sporadic-*E* season is apparently off to a good start. Many newcomers to the band fear that with the waning sunspot cycle they will have no opportunity to work DX. Not so; there is no well-established relationship between solar activity and sporadic-*E*, and if anything the *E* DX is better after the sunspot peak. W6TNJ, Long Beach, Cal., reports a fine opening April 13. It began with Texas and Oklahoma in the early afternoon. Then, as often happens, there was a quiet period until about 1900, when Texas, New Mexico, and double-hop to Tennessee, the Carolinas and Georgia came through. If an early start means anything, we should be in for some real fun on 6 this summer.

Meanwhile, intercontinental DX on 50 Mc. is by no means dead. Nobody really knows the shape of a sunspot cycle curve until after a cycle is over, and the effect of solar activity levels on at least north-south 50-Mc. DX is by no means clear. There is plenty yet to be learned about the what and when of v.h.f. DX. Keep your eyes and ears open for unusual happenings, and when you run across something, report it. In no other way can the amateur record of aiding in the extension of propagation knowledge be maintained. The IGY and IGC programs are over — but the opportunity for amateur contributions continues. Observe and report!

Don't be too sure that DX will always follow familiar patterns. Who knows how many chances we miss (on all amateur bands) because we bear down only when we *think* something interesting may turn up? LU8BF cites an example. He says that DX is workable to the north almost every night, from about 2230 to 0100 LU time (EST plus 1 hour), with Mexico, Central America, the other countries of South America, and the Caribbean Islands expected at these times. But on the morning of April 6 the band *opened* at 0110 LU time, and to Southern U. S. A. K5IUN, McAllen, and K5DGK, Ingram, Texas, were heard, and K5OOJ, San Antonio, and K5UDU, Corpus Christi, were worked in a 35-minute session. This sort of thing could happen for at least a couple of years more, despite the fact that we are now well over the peak of the sunspot cycle.

In Australia there has been a surprising resurgence of 50-Mc. DX, after a nearly dead period earlier this year. The various scatter links to the north and the Russian video were heard well from early April on, by VK3ALZ, Victoria. On April 15 the band was open to JA, 0800 to 1200 GMT, and on the 16th it was open two hours earlier. On Sunday the 17th, signals below the band edge were in all day, with sporadic-*E* skip bringing in other VK areas as well. Monday found the band open to Japan from 0600 to 1300 GMT, and to Hawaii (K6BKG/KH6) 1045 to 1200 GMT Three modes of propagation: *F*, sporadic-*E* and *TE*, seemed to be in almost simultaneously, and the areas represented by commercial and experimental stations heard outside the band edge indicated that far more coverage should have been possible, if only there had been 50-Mc. activity in the right places in the Middle East, Northern Africa, the Pacific Islands north of the Equator, and even the Canal Zone.

Here's a real DX shot for 144-Mc. men: CT3AE, Madeira Islands, has been working for some time on a first-class 144-Mc. setup. He expects to have high power, a 30-element array and a low-noise converter in cooperation by June. It would appear that José might have a good chance of getting into the duct area known to exist at low latitudes across the Atlantic. He is probably not in the best possible spot, but is by no means the worst, either. Reception of Channel 7 from Lisbon is frequent — almost regular — in the Madeiras, and signal levels run into the thousands of microvolts on occasion. As this is nearly 700 land miles, it can be seen that v.h.f. ducting is no stranger to these latitudes. Such reception has been possible several days a week since CT3AE began checking last September.

220 Mc. and Up

A fine opportunity to get things started on 1215 Mc. is offered by the APX-6 transponder unit, now available at low cost on the surplus market. Through the cooperation of W6NIMU, who supplied the step-by-step procedure he followed in converting the units to amateur service, we have been playing with these gadgets recently at Headquarters. Conversion is relatively simple, and while the end result is not red-hot DX gear, the APX-6 does help one to get acquainted with u.h.f. techniques the easy way. It has a lighthouse tube oscillator capable of delivering 2 watts output, a crystal mixer, another lighthouse tube local oscillator, and a wideband i.f. amplifier on 60 Mc. The r.f. head must be modified for d.c., in place of pulsed high voltage used in i.f.f. service for which the APX-6 was designed. More on the conversion soon in *QST*. Side opportunity: both the transmitter and local oscillator tune more than 300 Mc., starting at about 900 Mc. Nice start for the pump for a parametric amplifier!

Is this a first? On March 25, K2DZM and K2PCG worked two way on 220-Mc. s.s.b. K2DZM uses a W2EWL exciter for the s.s.b. generator, with a 2C51 oscillator-tripler driving a 6AK5 buffer for heterodyning. The mixer is a 6J6, with the 144-Mc. s.s.b. signal fed to the grid and the 206-Mc. energy going to the cathode. A 6AK5 — 6360 — 5894 line-up runs at about 150 watts peak on 220 Mc. K2PCG has a similar s.s.b. exciter. His heterodyne unit is a 2C51 oscillator-quadrupler and a 418A amplifier. The mixer is a 6AK5, with the s.s.b. signal on the grid and 206-Mc. injection to the screen. A 6AK5 amplifier drives a 6360 to 3 to 4 watts peak. This is soon to be driving a 4X150A. Look for these boys when tropospheric propagation is hot this summer and fall. They'd like to see what s.s.b. will do on 220 when the band is open.

W8PT, Benton Harbor, Mich., has an ideal spot for his 220-Mc. beam: 10 feet from the edge of a steep drop of 175 feet down to Lake Michigan. With this for a take-off, it is no small wonder that Jack does well on 220 with stations in the Chicago area. He has a Channel 2 problem where 50 and 144 Mc. are concerned, the signal coming from Chicago being subject to the propagation vagaries of an over-water path. Result: while W8PT has a kilowatt on 144 and 300 watts on 50 Mc., he's spent most of his time recently on 220, where there is no trouble with Channel 2.

Clubs and Nets

The National Capital V.h.f Society, of the Washington area has obtained a trophy to be awarded to the first amateur who works 48 states (any 48) on 144 Mc. The cup is 20 inches high and of attractive design. It will be engraved with the name and call of the winner. More details on the award at a later date.

220- and 420-Mc. STANDINGS

220 Mc.

W1AZK	9	3	412	W5RCI	8	5	700
W1HDQ	11	5	450	W6NLZ	3	2	2540
W1OOP	12	4	400	K6GTG	2	2	240
W1RFU	15	5	480	W6MMU	2	2	225
W1UHE	11	4	385	K7ICW	1	1	250
W2AOC	13	5	450	K8AXU	8	5	680
K2AXQ	8	3	230	W8IJG	9	5	475
K2CBA	10	4	325	W8LPD	6	4	480
K2DIG	4	3	140	W8NRM	8	4	390
W2DWJ	14	6	740	W8PT	10	5	550
W2DZA	12	5	410	W8SVI	6	4	520
W2NTY	8	4	200	W9AAG	9	4	600
W3AHQ	4	3	180	W9EQC	8	4	740
W3FEY	8	4	296	W9JCS	5	2	340
W3LCC	8	5	300	W9JFP	9	4	540
W3LZD	15	5	425	W9OVL	6	3	475
W3RUE	6	4	225	W9UED	4	4	605
W3UJG	11	5	400	W9ZIH	10	5	500
W3ZRF	5	4	112	KØDGU	5	3	425
K4TFU	8	4	400	KØITF	6	3	515
W4UBY	7	5	320	KH6UK	1	1	2540
W4UMF	11	5	420	VE3AIB	7	4	450

420 Mc.

W1HDQ	8	3	210	K2UUR	6	3	110
W1RFU	7	4	410	K3EOF	6	3	250
W1OOP	9	3	390	W3FEY	5	2	225
W1UHE	6	4	430	W4HHK	3	3	520
W2AOD	6	4	290	W4VVE	6	4	410
W2BLV	11	5	360	W5RCI	5	3	600
W2DWJ	6	4	196	W7LHL	2	1	180
K2CBA	5	3	225	W8HCC	3	2	355
W2DZA	5	3	130	W8NRM	3	2	390
W2NTY	3	2	100	W9GAB	7	4	600
W2OTA	6	3	150				

2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked.

W1REZ	32	8	1300	W5SWV	10	3	600
W1AZK	27	8	1205	W5UNH	6	3	1200
W1KCS	24	7	1150	W5YYO	5	3	1330
W1RFU	23	7	1120				
W1AJR	21	7	1130	W6WSQ	14	5	1390
W1MMN	21	7	1090	W6NLZ	12	5	2540
W1HDQ	21	6	1020	W6DNG	9	5	1040
W1IZY	20	7	1180	W6AJF	6	3	800
K1CRQ	19	6	800	W6ZL	5	3	1400
W1AFO	17	6	920	W6NIMU	3	2	950
K1AFR	17	6	675				
W1CLH	17	5	450	W7VMP	15	5	1280
				W7JRG	12	4	1040
W2NLY	37	8	1390	W7CJM	5	2	670
W2CXY	37	8	1360	W7LHL	4	2	1050
W2ORI	37	8	1320	W7JIP	4	2	900
K2GQI	33	8	1200	W7JU	4	2	353
W2AZL	29	8	1050				
K2IEJ	27	8	1060	W8KAY	38	8	1020
W2BLV	27	8	1020	W8SDJ	35	8	990
W2AMJ	25	6	960	W8PT	34	8	985
W2DWJ	23	6	860	W8IFX	34	8	980
K2HOD	23	7	950	W8LOF	33	8	1060
W2PAU	23	6	753	W8RMH	32	8	910
W2SMX	22	6	940	W8SVI	30	8	1080
K2CEH	22	8	910	W8SFG	30	8	1000
W2LWI	21	6	700	W8EHW	29	8	860
W2ESX	20	6	750	W8LPD	29	8	850
W2RXG	20	6	700	W8WRN	28	8	680
W2WZR	19	7	1040	W8BAX	28	8	960
W2UTH	19	7	880	W8NOH	26	8	975
W2RGV	19	6	720	W8IDX	26	8	720
K2RLG	17	6	980	W8ILC	25	8	800
				W8JWV	25	8	940
W3RUE	30	8	975	K8AXU	24	8	960
W3TDF	29	8	1050	W8GFN	23	8	540
W3GKP	29	8	1020	W8LCY	21	7	610
W3KCA	28	8	1110	W8BLN	21	7	610
W3SGA	27	7	700	W8GTK	17	7	550
W3EPH	22	8	1000	W8NRM	17	7	550
W3BYF	22	6	660				
W3LNA	21	7	720	W9KLR	41	9	1160
W3NKM	20	7	730	W9WOK	40	9	1150
W3LZD	20	7	650	W9GAB	34	9	1075
				W9AAG	32	8	1050
W4HJQ	38	8	1150	W9REM	31	8	850
W4HHK	36	9	1280	W9ZIH	30	8	830
W4ZXL	34	8	950	W9LVC	27	8	950
W4LTU	31	8	1160	W9EQC	27	8	820
W4AO	30	8	1120	W9OJI	26	8	910
W4MKJ	28	8	850	W9ZHL	25	8	700
W4UMF	28	8	1110	W9BPV	25	7	1030
W4VLA	26	8	1000	K9AQP	24	7	900
W4EQM	25	8	1040	W9PBP	24	8	820
W4WNH	24	8	850	W9LF	22	7	825
K4EUS	24	6	765	W9KPS	22	7	690
W4JCJ	23	6	725	W9CUX	21	7	800
W4VVE	21	6	720	W9OEV	20	7	750
W4TLV	20	7	1000	W9PMN	19	6	800
W4IKZ	20	6	720	W9ALU	18	7	800
W4OLK	20	6	720				
W4AIB	19	7	840	WØBFB	32	9	1180
W4RMU	18	7	1080	WØSMJ	29	9	1075
W4CPZ	18	6	650	WØIHD	28	8	1030
W4RFR	18	7	820	WØQDH	24	9	1300
W4MDA	17	6	750	WØRUF	23	7	900
K4YUX	16	8	850	WØINT	21	6	830
W4LNG	15	6	1080	WØUOP	21	7	900
				WØTGC	21	7	875
W5RCI	34	9	1215	WØRYG	20	8	925
W5DFU	28	9	1300	WØIC	16	7	1240
W5AJG	25	8	1360	WØIFS	16	6	110
W5LPG	25	7	1000				
W5PZ	24	8	1300	VE3D1R	30	8	1330
W5KTD	23	8	1200	VE3AIB	28	8	1340
W5JWL	21	7	1150	VE3BQN	19	7	790
W5FYZ	15	5	1040	VE3DER	17	8	1340
W5VKH	15	5	720	VE3AQG	17	7	1300
W5MIL	12	5	700	VE3HW	15	7	1350
W5FSC	12	5	1390	VE2AOK	13	5	550
W5HEZ	12	5	1250	VE3BPB	14	6	715
W5CVW	11	5	1180	VE7FJ	2	1	365
W5NDE	11	5	825				
W5VY	10	3	1200	KH6UK	1	2	2540

Growth in v.h.f. activity in and around Phoenix, Arizona, has been phenomenal in the past couple of years. On 50 Mc. alone, there are some 125 stations operating, whereas there were only about 20 in 1958. K7ALE writes that the Phoenix V.h.f. Radio Club serves the American Red Cross, maintains an active net on 50.34 Mc., with up to 90 stations on its checklist, cooperates with local agencies in traffic-control work on special occasions, builds equipment for handicapped amateurs without charge, and has otherwise served community aims in its relatively short existence.

The Lynchburg Amateur Radio Club, Lynchburg, Va., is promoting a wideband f.m. net on 145.26 Mc. There are presently 11 base stations and 11 mobiles in the area, and more are on the way. One of the fixed stations has a mountain-top location, providing contact with mobiles out to 100 miles or more. The frequency is nearly always monitored, and contacts can be made readily at most times.

As has been stated frequently, the release of much commercially-made gear designed for the 150-Mc. region is making a boom in amateur f.m. imminent. As this work will be almost entirely fixed-frequency, it is important to get some kind of over-all plan for frequency usage under way. The LARC group therefore proposes to gather information on nets now operating, or in prospect, in order to compile a comprehensive directory of wideband f.m. activity around the country. If you have a net running, or planned, send the following information to Tom McKee, K4ZAD, 508 Oakridge Ave., Lynchburg, Va.: Name of f.m. net, and frequency or frequencies used; approximate number of base and mobile stations, by county areas; name of a person who can be contacted for liaison purposes; mention of other f.m. activity nearby.

Persons sending in information will receive a copy of the completed f.m. directory. Others may obtain it by sending a stamped self-addressed envelope to the above address.

While we're in Virginia, we include mention of the Central Virginia 6-Meter Net, operating nightly on 50.1 Mc. (of all frequencies!). W4SNH, Petersburg, says that the gang in that area would like to expand their 6-meter coverage to nearby counties.

K5TIQ sends along revised information on the 6-meter award made available by the Cowtown 6-Meter DX Club. To qualify, operators within 100 miles of Ft. Worth must work 10 stations in the group. Those farther need work only 6. Send contact data to K5TIQ, 3800 E. Orchard St., Ft. Worth 19.

The SPARC 50-Mc. transceivers (July, 1959, *QST*) got another workout in the 5th Annual Peach Blossom Women's Golf Tournament at Spartanburg, S. C., May 7 and 8. Coverage of activities on holes 3, 6, 10, 13 and 15 was done, as in the past, using the portable rigs working into K4LNO's base station. Two-man teams worked each portable, and three handled the base station. This is a prime example of a public-service use of amateur radio, in a way that builds much-needed good will for our hobby.

K5RJI, Tulsa, Okla., reports on progress with the Northeast Oklahoma V.H.F. Society. The group has been growing nicely, and is now incorporated. A relay station is being set up south of Tulsa, so that Oklahoma City may be worked regularly. As part of a drive to get every member equipped for 6-meter mobile, a minimum of three transmitter hunts will be conducted yearly.

OES Notes

K1AII, Plymouth, Mass. — Have 1 kw. to p.p. 4-250As, feeding 12-element array on 50 Mc. Would like DXschedules for the summer months.

K1CBR, Warwick, R. I. — R.f. feedback in a Ranger converted for 50 Mc. (as per April, 1959, *QST*) cured by insertion of series-tuned traps in the 12AU7 audio plate lead and in the center tap of the modulation transformer. Coils were 13 turns of No. 20, ¼-inch diameter, spaced wire diameter, tuned with an 18-$\mu\mu$f. variable to ground. One trap may do the trick, but with two they can be stagger-tuned to be effective over a wider bandwidth.

K1CIG, Manchester, N. H. — Activity developing on 220, with W1PZU W1HMT W1WYZ and K1API on, and more coming.

W1CXX, Auburn, Maine — Auroras of March 15 and 31 best on record, bringing on 50-Mc. signals from the Carolinas, Iowa, the Dakotas and Minnesota.

W1FOM, Southington, Conn. — 50 Mc. and Up Society meets each Thursday at 2000. Net frequency is 50.5, but callers on any frequency are welcome.

W2LWI, Wappingers Falls, N. Y. — Working W4LTU and VE2LI on 144 Mc. regularly on sked since February. Distance about 275 miles easy way. Now running 800 watts input to p.p. 4-65As, c.w.

K3EHP, Philadelphia, Pa. — Seven call areas and VE4 heard on 50 Mc. March 31 via aurora on 50 Mc.

W4ADH, Louisville, Ky. — Six-meter net operates Monday, Wednesday and Friday, 2130.

K4BUS, Chester, Va. — Want skeds for ECHO satellite work, when and if one is put into orbit. Will be transmitting on 144.068 last 30 seconds of each minute and looking for m.s.-style QSOs.

W4FNR, Ft. Lauderdale, Fla. — Worked LU1DCK on 50 Mc. at 1732 EST March 19. Spent most of February in Brazil working on communications for presidential visit.

W4FWH, Doraville, Ga. — Will be on Brasstown Bald Mountain, highest point in Georgia, for June V.H.F. Party, operating on 50, 144 and 220 Mc.

Frequency checking at 144 Mc., with help and ideas from W4NWK. BC-368A is zeroed with 10-Mc. WWV and output taken off at 140 Mc. BC-221 and 63A outputs are then combined in a 1N72 crystal mixer to give frequencies in the 144-Mc. band, continuously variable, with high accuracy.

W5UQR, Slidell, La. — Worked HC1JW and HC1FS on 50 Mc. April 2, at 1310 and 1340 CST, with very strong signals. LU3DCA LU1MBJ and LU9MA worked at 2133, 2215 and 2219 April 5. Signals fair to good.

WA6CLT, Marina, Cal. — Stations in New Mexico worked via E_s propagation April 17, beginning at 1600 PST. At this time signals peaked with the beam at 160 degrees. Band folded in about an hour, but reopened around 1720. This time the signals peaked with the beam at 50 degrees. W5ZU, worked at 1727, was 3 S units stronger on this beam heading than he had been earlier on the true heading. W6QEX, Watsonville, about 20 miles to the north, also noted this directional anomaly.

K6HCP, San Jose, Cal. — Now running 750 watts s.s.b. on 50 Mc. Would like scatter skeds. A.m. power 500 watts.

W6PBC, Belmont, Cal. — W6AJF W6VSV K6ONM W6PBC and W7LVO/7 working on parametric amplifiers for 1296 Mc.

K7EZP, Forest Grove, Ore. — Promotion of n.f.m. on 50 Mc. by K7CKE has sold several of the local gang. K7IMH K7BDU and W7IHBH now have f.m. conversions working, and have had great success in eliminating TVI, including that on Channel 2.

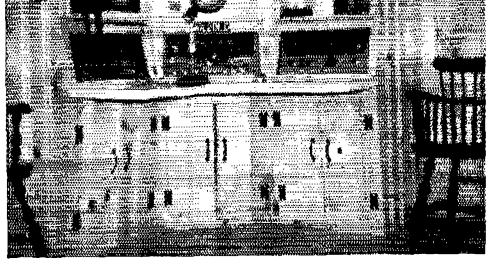
W7QDJ, Clearfield, Utah — Worked WØIC and WØAZT via 50-Mc. aurora March 31. K7IDD, Salt Lake City, heard W7JRG, Billings, Mont., on 144. Now running 100 watts on 220 and 50 watts on 432 Mc.

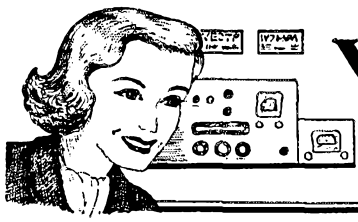
K9MGV, Lebanon, Ind. — Worked LU3EX and LU3DJD, 1635 to 1648 CST, April 12, on 50 Mc. Florida and Cuba stations heard before and after the LUs. Also heard other LUs and CX.

WØGEV, Calmar, Iowa — Heard W5SBJ on 50 Mc. during March 31 aurora, while beaming NNW. QST

Strays

WA2DLD kept peace and quiet in the family by building a console, below, which matched the decor of the knotty pine playroom. Is yours as neat?





YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

THE letter from OM WA2FCC printed in the April column prompted some challenging rebuttals. Recalling that after a study of YL photographs appearing here each month, the gentleman concluded that it seemed to him about 99% of the pictures show a YL arrayed in front of a microphone — not a bug or key. "How dismal."

Momentarily releasing their grip on devices that make dots and dashes, a number of "proud female brasspounders" were incited to words. Here are the stories of two of them:

639 Russell Ave.
Johnstown, Pa.

YL Editor, *QST:*

Probably this letter is just one of many flowing your way filled with indignation at the OM amateur who inquired if any of us were ever caught with a key in hand.

I wonder if said amateur is aware of the large percentage of those YLs who have been pictured at the mike are also crack c.w. operators. Is he aware that the stalwarts (YLs, I mean) of the traffic nets, W3CUL, WØLGG, WØKJZ, and W4RLG make that regular BPL via c.w.? And by golly if he ever tries a YL/OM contest, or monitors an Anniversary Party, he'll hear fists that aren't on the end of an OM's arm and that some OMs wish they owned. If he wants fast code, we have some gals who will not only QRQ but will probably make him breathe hard to send to them (I am not in this class).

If he checks further, he'll find at least two of us who'll work him in either Continental or Morse at his pleasure. (In this, K4JYQ, Bea, is far better than I in using Morse on c.w. She has one beautiful fist and it is a pleasure to read her.)

Apologies for my outburst but let it be known that not all YLs who get their General Class licenses marry a mike. By the way, I'll be rather curious to learn just how many *OMs* write you about that letter. It could be a revelation.

— *Louise Morcau, W3WRE*
99.99% c.w. YL (.01% RACES phone to hold license only)

P.S. Enclosed is a picture of me (see page 77) with four of the 67 keys in my collection. All four are rare old wire instruments that were given to me at the Pittsburgh Hamfest last August. For the record, the keys form only a part (one-third) of my other hobby — the rest being instruments of wire telegraphy and a select collection of vacuum tubes.

— • • • —

Oxford, Nebraska

YL Editor, *QST:*

This YL doesn't work c.w. exclusively but about 90% of my operating is c.w. I use both a bug and a hand key and have a 25 w.p.m. code proficiency certificate. During the winter months I send code practice at slow speeds, 5 through 13 w.p.m. Some of my wallpaper includes ORS, OPS, RCC (earned on c.w., of course), Traffiker Club 1000, and NEB C.W. net certificates.

I have been on the air less than three years, and from the moment I first touched a key, I have loved c.w. Ragchewing on c.w. is my favorite type of operating and I do a great deal of it, quite often getting into three and four hour two-way QSOs.

Please tell WA2FCC that here's one YL who gets along very happily and peacefully with a bug.

— *Zita Deselms, KØKUA*

P.S. Am sending a picture along (see page 77) to prove my point. If WA2FCC will notice, there is an outline of a mike behind my bug and hand key.

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

WORTH QUOTING:

"An interesting item, possibly, is my sked of about 13 years with W2LLZ, Butch, and his wife, W2OVV, Mina — nearly daily, through thick and thin, QRM, c.w. s.s.b., and a.m. on all bands. This has a fascinating continuity and has been fun to see if we can make it every day. Butch is a superior operator and it has been a wonderful experience. Sometimes the contacts last 60 seconds — othertimes 60 minutes. I assure you there is no perfect frequency for coast-to-coast QSOs and no perfect time. One must continuously adjust to changing conditions."

— *Lenore Conn, WGNAZ*

— • • • —

"An example of how ham radio is gaining in popularity is the fact that one of the largest high schools in San Jose is offering amateur radio as an accredited course this coming semester."

— Feb. 1960 *SPLATTER* of the BAYLARC (reprinted from Quement Industrial Electronics of San Jose, Calif.)

— • • • —

"The ham spirit grows deeper as the years go by and life is too short."

— *Ann Ogilvie, VE1TK*

— • • • —

"Santa Claus brought me the most beautiful autumn haze mink stole I ever did see. All these years I didn't believe in Santa Claus, and now I find I've been married to him all along!"

— *Harriett Wachst, K5BJU*

CLUBS:

Women Ham Operators of Texas — Operating K5LZW portable at the Southwestern Exposition and Fat Stock Show at Ft. Worth, the club handled some 700 messages for the public. Members participating were K5s CRH, GXG, LQK, MJW, MTS, PIO, and VLW. In March K5MTS, Dorothy, K5CRH, Marie, and K5PIO, Margie, were awarded certificates of honor for outstanding service to the Ft. Worth area from the Kilocycle Club.

Los Angeles YLRC — Amid hearts and flowers the eighth annual YL-OM Valentine Day dinner attracted a record attendance of 116. K6ANG, Billie, chairmanned the party.

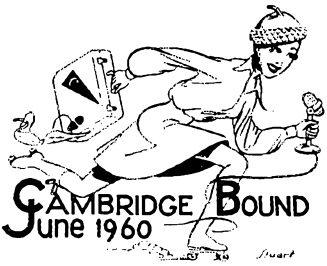
Special guests included Mr. Bernard Linden of the FCC and W6MLZ, ARRL Southwestern Director.

Women Ham Operators Inc. of Tarrant County — New officers are Pres. K5MTS; V.P. K5LQK; Secy. W5IHB; Treas. K5PIO; Pub. W5IHB.

Camellia Capital Chirps — Some 70 YLs attended the Second Annual California YL Get-Together at Sacramento, held in conjunction with the celebrated Camellia Festival of that city. Club members operated station WA6DGH/6 set up in the Hotel El Mirador for the purpose of publicizing the festival. With civic officials observing, the operators contacted KH6AUJ, Dottie, in Honolulu; KL7BJD, Mary, in Anchorage, K6QPG/KW6, Mary, on Wake Island, among other stations. On Camellia Cheer-up Day the Camellia Queen and Chirps K6DPM, K6HHD, K6ENK, and WA6DGH presented camellias to patients at Arcade Hospital. The proceedings were televised. On March 12 the Chirps provided communications for the Children's Camellia Parade. The next all California YL get-together will be held in San Diego.

CAMBRIDGE BOUND JUNE 1960

June 17–19, 1960



Last call for registration and reservations for the Third International Convention of the YLRL, June 17–19 the "hub of the universe" will be the hub of YL hamdom!

The Women Radio Operators of New England is hostess club. Convention site will be the Hotel Commander in historic Harvard Square, Cambridge, Mass., ten minutes by subway from Boston. YL registration fee of $10.00 includes coffee hour, luncheon, and banquet on Saturday. OM registration for the banquet is $5.00. The Sunday picnic at W1HOY's home in suburban Medfield is included in all tickets. For both registration and room reservations contact Eunice Gordon, W1UKR, 55 Malibu Drive, Springfield, Mass.

The April column carried full particulars on the three-day program, including the forum, speakers, banquet, tours, cocktail hours, etc.

CU in Cambridge!

COMING GET-TOGETHERS AND EVENTS

Third International Convention of the YLRL — June 17–19 at Cambridge, Mass. (See above.)

1960 AWTAR — The fourteenth annual air derby of women pilots will start at Torrance, Calif., July 9 and will terminate July 13 at Wilmington, Del. Carolyn Currens, W3GTC, chairman of the AWTAR radio net, invites YL participation in the net. (See March column.)

Jestarcminda — FIELD DAY JUNE 25 and 26. Nothing in the rules to prevent YLs from going all out FDing too!

KEEPING UP WITH THE GIRLS

NETS:

Loaded Clothes Line YL Net — New officers are Pres. and NCS KØEVG; V.P. and ANC W5YSJ; Secy.-Treas. K5KVJ; Pub. KØEPE. The invitation is standing to let the washing go on Monday morning and tune up on 7235 kc. at 9:00 A.M. MST. If you are mike shy, try the Friday slow speed code net on 14,100 kc. at 11:00 A.M. MST. A certificate is offered for 10 contacts made off net time. Send K5GYZ confirmation of QSOs, 215 E. Frazier St., Roswell, N. Mex.

KØKUA does most of her brasspounding on 80 meters, with an occasional flip to 40 and 20. (Photo by WØKQC)

TYLRUN — Office changes: K5JXD replaces K5ALF as Pres. and K5OPS replaces K5PFF as V.P. New publicity chairman is K5OPT. A certificate is offered to any amateur who contacts 25 of the 141 TYLRUN members. Send list of contacts, QSLs, return postage, and 10¢ to new custodian Ethel Chastain, K5OPS, 4338 Seabrook, San Antonio, Texas. Stickers issued for each additional 25 members worked.

Floridora YL Nets — Marge, K4RNS, supplied the following schedule:

Monday 7225 kc. phone 0900 EST K4HSC Mgr.
Tuesday 3950 kc. phone 2000 EST K4BAL Mgr.
Thursday 50.3 mc. phone 2000 EST K4PPX Mgr. (Southern Fla.)
Thursday 50.3 mc. phone 2000 EST K4ANR Mgr. (Central Fla.)
Friday 7185 kc. C.W. 1330 EST rotate NCS
Sunday 7225 kc. phone 0900 EST K4UIZ Mgr.

WRONE — W1HOY, Helen, is NCS of a new net on six meters which meets Wed. at 2:00 P.M. ES Ton 50.04 Mc. K1JFQ of N. H. is alternate NCS. K1IZT, Blanche Randles, replaces K1EAV as custodian of the WRONE certificate.

W3WRE with four of sixty-seven brasspounding keys in her collection.

Using a home-brew 45-watt rig set on a kitchen table, KN3IGL, Agnes Lois Morrison of New Wilmington, Pa. pounds brass on 40 meters. KN3IGL and KØKUA, whose photo appears this month too, have something besides c.w. in common—they both operate gift shops as a vocation.

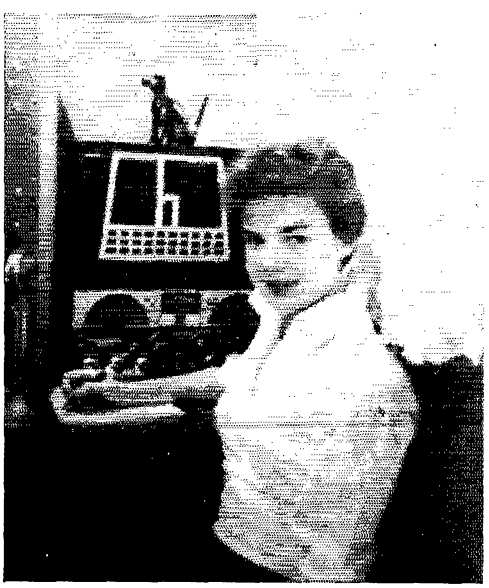
(See Jan. column for rules.) Send QSLs to K1IZT at 62 Linda Ave., Framingham, Mass.

TEEN ITEM

Last month's column carried a request from W8WUB for all interested in forming a teen-age YL net to contact her. This month in response to our request for her own ham "biography," W8WUB volunteered the following, thus revealing how enmeshed in ham radio a pretty sixteen year-old teen-ager can be.

"I became interested in ham radio through my dad, W8PFL, and my older brother W8PGA. I received my novice ticket in 1955 when I was eleven years-old, my general ticket in 1957 and have been very active ever since. While I work both phone and c.w. most of my activities at present are on 80, 20, and 10 phone. I am a member of MARS and worked as part time NC on the W. Va. Phone net last summer. A member of the YLRL, the Huntington RC, and the Huntington High School RC, I organized the latter club last year after the local newspaper ran an article on my hamming activities and several of the students showed interest in becoming hams. My certificates include RCC, WAS, ARRL section net certificate, Grandmothers Club Award, Worked W. Va. Certificate, and I have 81 countries worked toward DXCC.

"In addition to my dad and brother who are hams, my mother, Ethel, is W8WUE, and my younger sister, Martha, age twelve, is KN8RXK. My twin sister Carolyn is ex-KN8CHX. I hold skeds every day with my grandfather, WØFXV, my Uncle, WØKCP, and my Aunt, KØAUG, who live in Warroad, Minnesota, and with another Aunt, K5WKK, and my cousin, K5WFD, in New Roads, Louisiana. You can see that if the whole family decided to get on the air at the same time there wouldn't be too many frequencies left for anyone else!"



W8WUB at the rig.

MISCELLANY:

G6YL received DXCC #4774. . . . K2MGE, Dorothy and her OM K2HEA are the new conductors of the Sideband column in *CQ* magazine. . . . KN4JST, Alexis, made a transistor receiver for her project for the science fair at her school. . . . KA2HA, Hilda, and K6OPG/KW6, Mary, are returning to the U.S. from Japan and Wake Island respectively, after serving tours of duty with their OMs. . . . Bona fide members W3CDQ, Liz, and W3AKB, Fran, served at the registration desk for the Quarter Century Wireless Association (Washington chapter) fifth annual banquet at Olney, Md. . . . W4YEK, Nita, was one of some 100 Georgia amateurs who handled heavy traffic following the severe Georgia ice storm early in March. . . . W6FEA, Gertie, is president of the California American Legion net. . . . K4DNL, Olivia, thanks all of the "forgotten OMs" who made it possible for her to get the first Seldom Heard OM certificate. . . . W3CDQ, Liz, and K4LMB, Ethel, boosted ham radio in a demonstration on WTOP-TV in the nation's capital. . . . Twin girls were born to W4GGQ, Betty, and W4IYT, Editor of *FLORIDA SKIP*. The baby girls named Ann Marie and Mary Ann were adopted by the Floridora YLs and nicknamed "Flora" and "Dora". . . . K4RNS, Marge, operated the Daytona Beach ARA station K4BV from the Daytona Beach Hobby show in March. . . . K5BJU, Harriett, accepted the task of Nominations Chairman for the YLRL. She'll have help from W4UF, Dot, and K1ADY, Mary. . . . Two new members of the WAYLARC are former Texans — Mary, K5SPD/3, now of Pt. Deposit, Md., and Lillian, W5EGD/3, now of Baltimore. Lillian was president of GAYLARK until her move. Mary, a new OPS, made BPL for Dec. . . . In 15 of the allotted 35 hours of the YL-OM contest W3TSC, Camille, made 226 contacts on c.w. . . . Sixteen members of the PARKA attended the April meeting in Anchorage. Evelyn Wikoff, W4VCB, newest PARKA member, is now operating portable KL7 from Adak, where she and her OM W8UTB will be stationed for 18 months.

—•••—

Active YLs W4LZI, Frances, and K9PDS, Gerry, have twenty-three children between them. W4LZI, a member of the Floridora YLs, has eleven, and K9PDS, of the Chicago YLRL, has twelve harmonics. Who said something about being too busy for ham radio?

—•••—

K4LMB, Ethel Smith, who founded the Young Ladies Radio League back in 1939, proudly reports a new ham in the family — her Mom. At the age of 70, after just a few weeks' code practice, Mrs. R. Nell Smith passed the novice exam with proficiency to spare. QST

Strays

WV2FYE called CQ DX and was answered by G2FHT . . . she thought. But on second hearing, it was G3FHT so she apologized for calling him G2. A moment later, she definitely heard G2FHT, so she hurriedly apologized for calling him G3. "Then I realized both G2FHT and G3FHT were calling me at the same time, so I worked them both," she reported.

Correspondence From Members-

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

ARRL — IGY

¶ Upon the closure of your IGY and IGC programmes, I should like if I may as a foreigner to express my appreciation of your organization.

I am, of course, quite incapable of assessing the scientific value of the results achieved by Mr. Mason P. Southworth and his staff; however, in the field of the other and wider aspect of the IGY, namely international co-operation in a common aim, I write with the assurance that you have been completely successful. — *Raymond G. Cracknell, ZE2JV, Salisbury, Southern Rhodesia.*

MR. RAPP

¶ "Larceny Rapp" did it again! I just finished reading April *QST* when it occurred to me that I had not seen Mr. Rapp's annual "April Fool" article. I looked through the table of contents, and when I couldn't find it, the truth suddenly dawned on me!

I picked up an envelope from my outgoing mail and tore up my order for a dozen assorted authentic reproductions of rarest QSL cards with genuine forged signatures. I am thankful that Mr. Rapp's contribution to my junk box for this year was nothing more expensive that a stamped envelope!! — *E. L. McMurty, W9ICF, Waterloo, Illinois.*

TOGETHERNESS

After reading the "Correspondence" in April *QST*, I fear for the whole amateur cause. The April issue contained about seven articles or letters from various hams bearing complaint against other members of the fraternity.

I think we are aware of the numerous "battles" being waged on the ham bands. Some of these are: s.s.b. *vs.* a.m., a.m. *vs.* c.w., ragchewers *vs.* traffic men, ragchewers and traffic men *vs.* chess players, etc. To quote the saying of a very important American, "A house divided against itself cannot stand." This is exactly what is developing on the bands now. I wonder how many a.m. boys ever talked to a sidebander or vice-versa? What difference does it make if the fellow across the street likes a.m. or s.s.b. while you are a c.w. lover? There are two ends to almost every band, so why can't we each go our separate ways? We could still do this and be friends.

As I said at the beginning, this is not a complaint but a suggestion. Let's not let the fraternity draw so far apart that we cannot meet the challenge of the next radio conference, or similar ominous threats to our hobby, as one firm group. Perhaps we could require cross-mode-contacts. Anything to promote "Togetherness" is what we need — please fellows, before our hobby shatters into a broken dream. — *Ted Huddle, K8OEQ, Seth, West Virginia.*

CHEATING? NOPE!

¶ Saturday night I supervised the Novice exam of my good XYL and twelve-year-old YL — no prouder ham ever trod the streets of hamdom than this OM. Then it struck — April *QST* came on Monday ("Those Mail Order Exams").

This is to defend those who still have some moral principle and have pride in the fact that their deeds are as good as their word and sworn statements. Never once did it occur to me to call in an outside witness, much less someone to supervise the test — after all, I meet all the requirements set up by FCC, can send respectable code at 5 w.p.m. and can receive the same. Besides what the heck good is a husband or Pop who would cheat (and jeopardize his own coveted ticket) for the sake of a couple of w.p.m. code or some questions on an exam that costs nothing and can be taken in a short time? Rest assured — not this old bird.

During the sending test, I transmitted at 6-2/5 w.p.m. Both gals copied more than 2 minutes solid. The YL sent at 7 w.p.m. and the XYL at 10. During the written exam the only words spoken were to explain the meaning of the word "minimize" to the YL. Cheating? Nope — learning! . . . I'll still push my cap back, snap my suspenders, and say "Line up, you kids, Pa's about to make some more hams." The only trouble is that I'm about to run out of kids; the only other harmonic is a 16-year-old YL who is a rifle-shooter and has no time for radio.

Ah, yes. Just to prove what a dog I really am, my "boss," K9RXS, just passed his General on the first trip (many don't) and I didn't flunk him on his Novice test either — hi! — *Floyd H. Barnes, K9BUI, Rochelle, Illinois.*

¶ . . . have read "Those Mail Order Exams" and take exception to the remark, "You can't tell me any man would dare to give his wife a failing grade, or any son would flunk his father."

I know that a man would flunk his wife — because mine did. I am also proud to say that I passed the next test — on my own, with absolutely no help. Of all the "hams" we know I doubt if any would not have the courage to flunk his wife, father, or even his mother-in-law! — *Barbara Schroeder, WA2ALJ, Poughkeepsie, New York.*

CURRENT FLOW

¶ I read with interest the correspondence from J. O. Camden, VE3GZ, in the April 1960 issue, and while I agree with him 100% that we should watch our technical terminology, I feel that if he is going to raise the issue, he should carry it all the way.

The phrase I am referring to is where Mr. Camden has just stated that beginners in the field want to have all electrical units moving, and then terms current as a flow. This just has to be the most frequently misused term in electrical terminology. The truth of the matter is that *current does not flow.* Current is, instead, the flow of electrons. It is also to be noted that this flow of electrons is in the opposite direction to the conventional flow of current.

I am not advocating that the term "current flow" be eliminated as it is recognized by all and I use it frequently myself.

Maybe I am joining the ranks with Mr. Camden as a real nasty old man for raising this minor point, but I feel that the term is so misused that few of us in amateur circles actually realize our error in terminology. — *James H. Harlow, W3YWU, Easton, Pa.*

SK, JACK BINNS

¶ While reading a Boston newspaper a month or so ago, I came across a small item telling of the death of Jack Binns. Those old timers who were on the air in the early 1900s will no doubt remember him. He was the epitome of early wireless telegraph operators. The small death notice was in sharp contrast to the two inch headlines of 1909!

The new c.w. amateurs would be interested to know he was the first ship wireless telegraph operator to utilize the art of brass-pounding to save lives at sea. The distress call had then been established as CQD (come quick danger). There were no particular wireless telegraph laws at this time as wireless telegraph communication was in its infancy. However, some coastal stations did exist and some ships carried wireless. Binns was on watch on the *S.S. Republic*, a British ship of moderate deep sea tonnage. Captain Silby was on the bridge groping his way through thick fog. Suddenly the bow of the *S.S. Florida* hit the *Republic* on the side very close to Binns' wireless room. Binns immediately sent the CQD on the large British pump-handle key. I believe it was WSC, Siasconsett, that picked up the distress call and put into action the rescue. Eventually all hands on both

(*Continued on page 144*)

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

U. S. Signal Corps 100th Anniversary. Signaling as a way of transmitting information by a pre-arranged system, extending where the unaided voice cannot reach, has been developed from ancient times. In 550 B.C., Sun Tzu, said to be a contemporary of Confucius, wrote about the use of the drum, bell, or flag to control large forces. The Greeks were good at inventing signaling systems. Genghis Khan in the twelfth century used messenger posts and pigeons. Our amateur radio, and military communications as well, with formal message procedures, modern electronic transmission and reception techniques, are miraculous in their effectiveness, the result of continuing developments in a long line of historic achievement. Morse invented the telegraph in 1844. The use of lights, torches, the telegraph and telephone, photography and radar as elements of communication may be ascribed to the U. S. Signal Corps, whose 100th anniversary is commemorated this month. Today's Signal Corps is identified by the use of every modern means.

In 1856 Maj. Albert Myer, an Army surgeon, submitted a communications plan to the War Department based on visual signalling. This was adopted in 1859. On *June 21, 1860*, he became the Army's first Chief Signal Officer. For 100 years the Signal Corps has grown in stature and performance. Its laboratories, noted for research and development, has collaborated operationally with amateurs on numerous occasions. Following official discussions initiated by the Signal Corps with the League, an official Plan for Cooperation between the Signal Corps and the Amateur was published in October 1925, *QST*. This was subsequently revised several times. Post-war February 1949 *QST* detailed the post-war training program with cordial invitation to interested amateurs to participate in MARS networks.

On *June 21, 1960*, we amateurs and ARRL extend our congratulations and well wishes to the present CSO, to the Signal Corps and its MARS group for continued success!

FCC Suspends Technician License for 21 Mc. and 28 Mc. Work; also for Operation at other than Specified Location. Monitoring activities of the FCC make it readily feasible to apprehend all sorts of nonconformities with license privileges, as exercised by the various classes of licensees. In the following instance the Technician Class operator license of John W. Kelly (K6QMD) San Francisco, Calif. was ordered suspended 7 January 1960 and the 3 months suspension became effective February 2.

FCC took under consideration the suspension of the Technician Class Amateur Radio Operator license of John W. Kelly (K6QMD) San Francisco, California, *it appearing* that at various specified times between Jan. 4 and Sept. 25, 1959 (five dates designated) the named licensee operated K6QMD using type A-3 emission in the 21 Mc. band . . . also between Jan. 11 and 29, and particularly on January 11, 1959, K6QMD was operated on 28 Mc. A-3 emission, likewise in violation of Sec. 12.23 and 12.28 of FCC rules; *and it further appearing* that on two given dates the above-named licensee operated K6QMD at a location other than specified in the license, a violation of Sec. 12.28 and 12.93 of FCC rules. The Federal Communications Commission ORDERED (7 Jan. 1960) that the Technician Class Amateur Radio Operator License of John W. Kelly BE SUSPENDED for a period of 3 months.

Novice Class Licenses Suspended for Omitting N from Call and Using 3.8 and 28 Mc. Phone. Additionally note, that in the following two instances of suspensions, the FCC Order indicates failure to keep a proper log as additional reason for the Commission's action and penalty prescribed.

FCC took under consideration the suspension of the Novice Class Amateur Radio Operator License of Earl W. Crane, jr. (KNØUMD) Minneapolis, Minn., *it appearing* that on various occasions Nov. 1959 to Feb. 1960, and particularly Feb. 4, 1960, the said licensee operated KNØUMD in the 28 Mc. band using A-3 emission, a violation of Sec. 12.23 (e) (2) and Sec. 12.28 of FCC rules; *it further appearing* that licensee transmitted call letters not assigned by proper authority to identify his radio station, in violation of Sec. 12.158; that he failed to properly identify at the beginning and end of each transmission (violating Sec. 12.82); and that he failed to keep an accurate station log additionally violating Sec. 12.136 of FCC rules. The Federal Communications Commission ORDERED (8 Mar. 1960) that the Novice Class operator license of Earl Crane, jr., Minneapolis, Minn., BE SUSPENDED *for the rest of the license term.* This action was effective from March 30, 1960.

FCC took into consideration the suspension of the Novice Class Amateur Radio Operator License of Charles E. Jefferies (KN9SMV) Goshen, Indiana, *it appearing* that on various occasions Sept. 1, to Jan. 31, 1960, and particularly on Jan. 27, 1960, the licensee operated KN9SMV in the 3.8 Mc. amateur band using A-3 emission contrary to

the terms of his license and violating Sec. 12.23 (e) (2) and 12.28 of FCC rules; *it further appearing* that the licensee identified with call letters not assigned by proper authority, a violation of Sec. 12.158; that he failed to properly identify by giving his call at the beginning and end of transmissions (a violation of Sec. 12.82); and that on Jan. 27, 1960, and on other occasions he failed to maintain an accurate station log, violating Sec. 12.136 of FCC rules. The Federal Communications Commission ORDERED (18 March 1960) that the Novice Class operator license of Charles E. Jefferies, Goshen, Indiana BE SUSPENDED for the rest of the license term. This action was effective from April 8, 1960. —*F.E.H.*

A series of coincidences led to the procurement of a rare drug for a stricken Peruvian child on March 14. K5KYO answered a call from OA4M on 15 meters requesting assistance in locating the drug. A friend visiting K5KYO station at the time happened to be acquainted with the doctor in Memphis who had developed the drug, and a quick telephone call put the doctor in touch with OA4M, with the information that the drug could be obtained in Lima with proper government release. The coincidences? K5KYO and his friend had just been discussing the particular type of infection involved before they heard OA4M's call. The consul-general in Lima, who had to be contacted to obtain release of the drug, was a cousin of K5KYOs friend's wife. All four of K5KYO's friend's children had been treated for the same infection by the same doctor. K5KYO hardly ever works 15 meters. Yes, old man coincidence was hard at work that night. — *KN5YSA.*

— • • • —

On March 30, amateurs assisted the Union Pacific Railroad by maintaining communications over a flooded section of road from Omaha to Fremont, Nebr. in which communications lines had been washed away. The amateurs aided the railroad both in dispatching trains and also sending men and supplies to the flood area. The following amateurs are mentioned by the railroad as having taken part: *KØs* IJF JFN RJE EVB KQE, *WØs* VKN YMU UVU KXH OKO VFT AZC NVE.

— • • • —

On April 2 at 0630 members of the Santiam Radio Club of Lebanon, Ore., were called upon to provide communications in connection with the search for a missing plane between North Bend and Lebanon. The club station was inoperative, so a call was sent out for amateurs in the area to assist. Stations in Eugene, Springfield, North Bend and Salem responded. The plane was spotted from the air shortly afterward and amateur radio was used in the rescue effort until both occupants of the plane were rescued and taken to the hospital. Stations taking part were *K7s* AIA JID HLH AMH IBB CVX AJB, *W7s* DIC DZT AVK WTM RLJ AMF QYS NES DKC WKP VWG DHW TAZ RCL VLE CPA ISO FSU QVY QOZ PUH MW MCQ BSY ZHX GDL. — *W7JDX, SCM Oregon.*

AREC members affiliated with the Mountain Rescue Council of Oregon rendered outstanding communications service on March 21 in a search for a girl lost in the mountains while skiing on the slopes of Mt. Hood. Both the Mountain Rescue Council and the Mt. Hood Ski Patrol make regular use of the AREC and have a permanent Communications Committee under W7WFO. Mobile stations used were W7RCL and W7GNC. Other stations participating included *W7s* UQI NJS MW WFO TOV GNN FSU ZB HRG and K7DIW. — *W7JDX, SCM Oregon.*

— • • • —

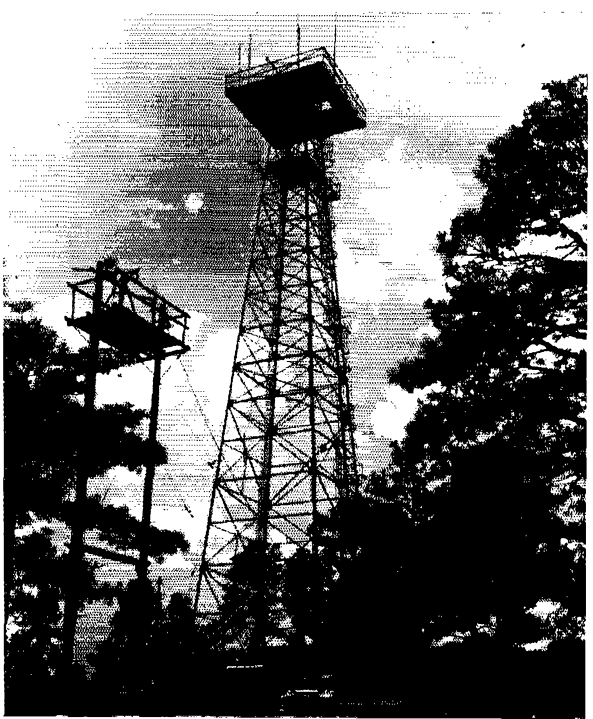
On the week end of Mar. 17-20 the Orlando Radio Club, W4PLB, together with c.d. radio officers and equipment, were called upon to work around the clock supplying needed communications between local flood disaster areas and Red Cross headquarters. The operation was under the direction of W4NKD, EC for Orange County, Fla. The c.d. mobile van was moved to Westside Manor where some 200 flood victims were being evacuated. The communications van maintained contact on two and ten meters with the Red Cross, the Legion home and the Orange County sheriff's office. A number of mobiles assisted. Messages concerned welfare and requests for food, blankets, typhoid shots and other medical supplies and materials. Twenty-nine AREC and RACES members of Orange County are to be congratulated on the part they played in this emergency. — *W4IYT, SEC Eastern Florida.*

— • • • —

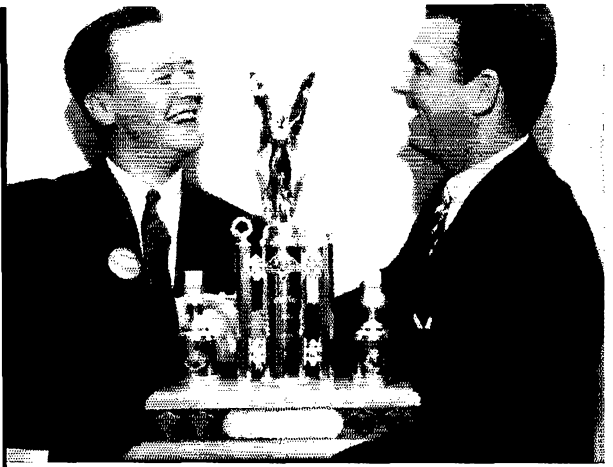
On Mar. 31, EC W3CHC alerted the Lycoming County (Pa.) AREC because of high water and flooding. The West Branch Emergency net on 50.54 Mc. went into action. W3NEN acted as liaison between AREC, C.D. and RACES. K3IPX and W3CHC set up a station at the Naval Reserve in Williamsport and routed traffic concerning weather, road conditions and closed bridges. W3HCW did especially fine mobile work, reporting water heights at various bridges in the area. The AREC was secured at 0015 Apr. 1. The following additional amateurs took part: *K3s* KZN EVS HZK EJK ARR ADZ, *W3s* NVC KNG, W2GHS/3. — *W3CHC, EC Lycoming County, Pa.*

— • • • —

We received 32 SEC reports for February, representing 11,881 AREC members. Three sections not reported for January put in an appearance in February, giving us 35 sections heard from so far in 1960. The Feb. 1960 reporting record is a decided improvement over the same month for 1959 — five reports and almost 3000 AREC members. Sections heard from in February: Ga., S. Tex., Md.-Del.-D. C., NYC-LI, Mich., E. Mass., Maritime, Wash., Kans., Colo., San Joaquin Valley, Oregon, Wyo., Ala., Ind., N.C., Nevada, Santa Clara Valley, E. Pa., E. Bay, S. Dak., N. Tex.,



The Los Alamos (N. Mex.) Amateur Radio Club recently acquired this 165-foot tower and a shackful of equipment from the Atomic Energy Commission for civil defense use. It will have been used during Operation Alert. Equipment includes a kilowatt transmitter, two 250-watt two-meter rigs, four transmitter-receivers and four fixed high-frequency transmitters.



We're reminded of Field Day 1960 coming up by this handsome trophy presentation for the 1959 Field Day activities of VE3NAR/3. VE3DAR, left, Field Day co-ordinator and past president of the Nortown Amateur Radio Club accepts the Canadian Marconi Trophy from H. E. Buchanan of the Canadian Marconi Company. The Nortown outfit topped all other Canadian entries.

Utah, Minn., Me., Va., N. Mex., Okla., *Wis., N.N.J.*, Vt., E. Fla. New sections in italics.

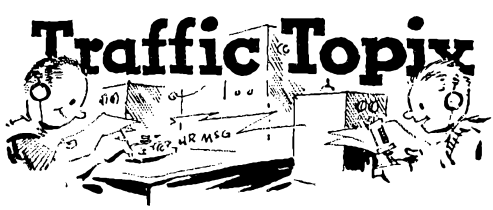
RACES News

South Carolina held a statewide RACES meeting on March 27 at Columbia attended by 83 amateurs and state c.d. officials. Among them were state c.d. director Charles B. Culbertson; Deputy Director A. V. Thomas; OCDM Region III Director of Communications Curtis Steed, W4POI; and State RACES Officer Carlton Commander, W4ZRH. After the luncheon, the state c.d. director presented 52 citations to those who fulfilled vital c.d. communication missions during Hurricane Gracie and the oil fire in North Charleston.

Latest action in the RACES group was when the Aiken County RACES net was alerted March 22 by RO W4AIB when a forest fire threatened outlying areas of the city. The net was operated for a little over two hours with ten 2-meter units participating. Four mobiles were activated, three of which were dispatched to the fire area while one was held in reserve.

—•••—

We regret to announce that our long-time RACES co-ordinator at OCDM Operational Headquarters, Jim MacGregor, W8DUA, has left OCDM for another government assignment in foreign climes. Mac, a good amateur himself, had become an old friend, and we're sorry to lose him. His successor is Leo Haijsman, W8KA, another old timer, as his call indicates, who comes to OCDM from FCC. Well qualified for the RACES work, we expect that Leo will have little difficulty getting right into the swing of RACES goings-on at the higher level although, like Mac, RACES is only a part of his job with OCDM.



Some of you traffic bulletin editors have been quoting this column. We like it. The traffic net bulletins are getting more numerous and better written all the time, and we'd like to reciprocate by quoting some of *your* words of wisdom, as space permits. This month's quote is from a little sheet called "NJN," written by W2RXL, manager of the New Jersey Net: "PRONTO is the word. The purpose of a set net procedure and the 'Q' signals is for the NCS to say in a few words what he wants done and to be understood, PRONTO, by all the net members present. Any time wasted on the net is wasted for every net member present. We believe the better operators (1) copy all net transmissions, (2) are severely critical of their own station operating, and (3) practice the Golden Rule."

March net reports:

Net	*Sessions*	*Check-ins*	*Traffic*
Hudson	31	411	204
Interstate S.S.B.	—	1440	351
Eastern Area Slow	31	168	58
TCPN, 1st Call Area	31	——	1837
Early Bird Transcon	13	——	750
Twenty Meter S.S.B.	24	640	2198
Mike Farad	23	520	559
Eastern States	31	385	359
Morning Calif.	31	215	487
7290	47	1619	882

—•••—

National Traffic System, March reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN	28	1636	1.025	58.4	98.2
CAN	31	1241	.745	40.0	100.0
1RN	60	901	.422	15.0	80.7
2RN	62	722	.522	10.5	99.0
3RN	62	707	.409	11.4	96.2
4RN	60	1013	.406	16.9	87.5
RN5	62	913	.387	14.7	90.1
RN6	62	1366	.485	22.0	95.5
RN7	62	802	.320	12.9	49.4
8RN	61	434	.218	7.1	90.7
9RN	60	1174	.605	19.5	64.2
TEN	62	986	.538	15.9	80.2
ECN	19	53	.155	2.7	78.9[1]
TWN	54	556	.327	10.3	84.1
Sections[2]	1198	9918		8.3	
TCC Eastern	106[3]	454			
TCC Pacific	122[3]	1821			
Summary	1943	24697	EAN	11.5	CAN
Record	1450	20030	.980	13.9	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: VN & VFN (Va.); Gator, FPTN, GSSN, TPTN, FMTN, QFN (Fla.); QMN (2 Mich. Nets); WVN (W. Va.); TLCN (Iowa); GSN (Ga.); CPN & CN (Conn.); BUN (Utah); KYN (Ky.); HNN (Colo); GSPN & NHN (N. H.); WIN & WSSN (Wis.); MSPN Noon, MSPN Evening, MSN & MJN (Minn.); MDDS (Md.-Del.-D. C.); SCN (Calif.); SCN (S. C.); NJN (N. J.); NEB (Nebr.); AENT, AENP Morn, AENP, AENO, AENB (Ala.); Tenn. C.W. & Tenn. Phone; S. Dak. 40 Phone, S. Dak. 75 Phone, S. Dak. CW; Iowa 75 Phone.

[3] TCC functions reported, not included as net sessions.

Several managership changes to announce. In RN6, W6RSY takes over the helm from K6HLR. In TEN, KØKBD is resigning. In ECN, VE3AUU wishes to be relieved. In PAN, W6PLG has resigned and a new PAN manager will soon be appointed. In CAN, W9DO is bowing out. Most of these managers have been on the job for quite some time and deserve a rest; besides, in most cases their personal affairs demand it. We're chewing away on replacements as quickly as possible, in order to maintain continuity. Being an NTS net manager is an honor, not a chore, and there is no dearth of "takers" for these jobs. Our task is to select the best man from among those available.

W1BVR has awarded 1RN certificates to *K1s* BYV MMQ HK IJV, W1CHR and VE2AZI/W1. WA2CIG has received his 2RN certificate. W3UE reports that the 3RN roster won't stabilize very well, but the net is running fine. RN5 certificates have been awarded to *K5s* MBK JGZ PXV and W5VVQ. W8DSX sent us a tape of 8RN in session. TWN moved its early session to 7060 kc. for the summer; second session remains on 3570. Arizona representation is picking up.

Transcontinental Corps. TCC-Central is absent from the roster for the second consecutive month. W1SMU reports two of his best men, W8PGW and K2SSX, have had to curtail their activities. W6EOT says that when the sunspots go out, so do the bands, but most of his skeds are still operating 100%.

March reports:

Area	Functions	Successful	Traffic	Out-of-Net Traffic
Eastern	106	93.4	1545	454
Pacific	122	98.4	3642	1821
Summary	228	96.1	5187	2275

The TCC roster: Eastern Area (W1SMU, Dir.) — *W1s* AW NJM OBR WEF SMU, K1MMQ, *K2s* SSX UTV, W3WG, K4KNP, *W9s* DO DYG, VE2AZI/W1. Pacific Area (W6EOT, Dir.) — W5ZHN, *K6s* YBV LVR YLS GID QJB, *W6s* EOT QMO ELQ HC, WA6ATB, *W7s* GMC ZB BDU, *W0s* ANA KQD, *K0s* DTK EDH EDK CLS/6.

A.R.R.L. ACTIVITIES CALENDAR

June 1: CP Qualifying Run — W6OWP
June 11-12: V.H.F. QSO Party
June 17: CP Qualifying Run — W1AW
June 25-26: Field Day
July 7: CP Qualifying Run — W6OWP
July 16-17: CD Party (c.w.)
July 18: CP Qualifying Run — W1AW
July 23-24: CD Party (phone)
Aug. 3: CP Qualifying Run — W6OWP
Aug. 16: CP Qualifying Run — W1AW
Sept. 1: CP Qualifying Run — W6OWP
Sept. 16: Frequency Measuring Test
Sept. 17-18: V.H.F. QSO Party
Sept. 21: CP Qualifying Run — W1AW
Nov. 12-13, 19-20: Sweepstakes Contest

A.R.R.L. AFFILIATED CLUB HONOR ROLL

We're pleased to present herewith the first 1960 listing of those clubs that have *100% of their club members also ARRL members.* Our Honor Roll is based on returns from the annual Club Report. The Board requires 51%-or-above ARRL membership in *any* club to be affiliated; when a club comes up with 100% League membership we think such special recognition is deserved.

As additional questionnaire forms are received indicating 100% ARRL membership, these clubs will be noted and included in an additional listing later this year. Clubs reporting favorable results of ARRL membership drives being conducted currently can also be included if they qualify. Each club listed below and in the subsequent listing will receive a special certificate recognition as a 100% ARRL club. This certificate will look good on the clubroom wall and makes a permanent record of the high standing of the society in its support of the League.

Aeronautical Center Amateur Radio Club, Inc., Oklahoma City, Okla.
Amateur Radio Club of Central Missouri, Inc., Sedalia, Mo.
Bandhopper Radio Club, Inc., Ferguson, Mo.
Central Kansas Radio Club, Inc., Salina, Kans.
Chicago Radio Traffic Assn., Chicago, Ill.
Chisholm Trail Amateur Radio Club, Inc., Duncan, Okla.
Coshocton County Amateur Radio Association, Coshocton, Ohio
Enid Amateur Radio Club, Enid, Okla.
Helix Amateur Radio Club, San Diego, Calif.
Keystone Amateur Radio Club, Springtown, Pa.
Lower Columbia Amateur Radio Association, Inc., Longview, Wash.
Manatee Amateur Radio Club, Inc., Bradenton, Fla.
The Mike & Key Club, Inc., of Greenville, S. C.
Mummy Mountain Radio Club, Scottsdale, Ariz.
Norfolk County Radio Association, Norwood, Mass.
Order of Boiled Owls, West Hempstead, N. Y.
Orlando Amateur Radio Club, Inc., Orlando, Fla.
Ottawa Radio Club, Inc., Ottawa, Ill.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for March traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
K2UTV	101	2536	2494	40	5171
W3CUL/4	129	1291	1234	11	2665
W9BDR	24	1166	969	97	2256
W0LGG	438	597	584	22	1641
W0SCA	29	805	802	2	1629
W7BA	18	751	712	37	1518
W8UPH	15	701	630	68	1414
W6YDK	629	358	311	39	1337
K6MCA	228	561	501	30	1320
W4PL	25	645	598	39	1307
K1FDP	129	543	519	69	1260
K1MMQ	263	541	422	27	1253
W3IVS	49	593	547	46	1235
W0LCX	30	596	550	46	1222
W6GYH	131	444	146	10	1031
W6EOT	6	515	476	16	1013
W7DZX	5	501	484	13	1003
K4KNP	12	492	432	0	936
K4GFR	568	180	145	26	919
W9DYG	26	142	394	43	905
K4QLG	584	148	90	58	880
K6YBV	35	435	398	10	878
W6RNV	35	466	300	75	876
W0OHJ	5	430	416	14	865
K6EA	93	370	334	13	810
K4SJH	61	486	329	17	793
K9AIR	273	110	276	7	766
W9JOZ	17	363	360	6	746
WA2CIG	37	351	336	12	736
VE2AZI/W1	86	334	289	22	731
K1CAL	5	362	341	12	720
W6WPF	2	347	333	14	696
W0GGP	28	635	16	10	689
W9DO	19	324	16	327	686
W6BHG	78	333	269	3	683
K0DTK	22	329	310	9	670
K0KBD	29	327	295	16	667
K6LVR	5	329	325	2	661
K2SSX	22	312	317	6	657
K2YZI	22	321	299	10	652
W4FPC	19	51	530	39	639
W3CUL	60	291	264	21	636
K6BPL	36	296	248	48	628
K1USM	18	293	279	14	604
W9TT	34	294	109	162	599
W5ZHN	57	281	198	56	592
W6QMO	34	283	202	66	585
W6PMO	575	0	0	0	575
W7BDU	1	282	277	4	564
W3HNK	14	267	267	7	555
K6ZCR	54	251	196	51	552
W7ZB	25	244	239	27	535
K4EJI	32	249	222	20	523
W4ZKU	26	232	215	44	517
W1SMU	17	219	277	3	516
W1AWA	7	241	263	3	514
W9IDA	11	265	230	7	513
W9IMN	124	203	54	131	512
K2UCY	26	229	223	32	510
Late Reports:					
K0FCT (Feb.)	550	386	184	264	1384
K1FDP (Feb.)	101	525	565	61	1252
W1AWA (Feb.)	17	281	243	6	547
K6WAH (Jan.)	32	250	195	55	532
W9SCT (Feb.)	37	255	243	4	529
K0KBD (Feb.)	24	281	201	10	516

More-Than-One-Operator Stations

K6WAH	59	638	432	225	1354
KL7CUD	565	6	565	2	1138
W6ZJB	355	320	246	40	961
W4LEV	96	401	410	16	923
Late Report:					
K1KBO (Feb.)	264	462	444	18	1188

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

W4SHJ	244	W9DGA	130	WA6EEO	116
K0YSP	243	W6DEF	129	W0VPQ	113
W9GJs	234	WA2CCF	128	K2UQY	111
K0LTJ	195	W8DAE	127	K1HMQ	109
K4CNY/4	160	W9QQG	122	W3TN	109
K5MXO	154	W2EW	120	K0SGJ	109
K1HCH	140	K4BQP	120	K6PXQ	104
K2DEI	140	W0OMM	120	W8NOH	102
K1NR	138	W8BZX	119	K8ONQ	102
K7BKH	134	W2VDT	117	Late Report:	
				W4SRK (Feb.)	156

More-Than-One-Operator Stations

VE3NAR	212	W0YQ	140	K0GIW/0	119
W4RNX	150			W1AW	102

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: W1OBR, WA2CIG, WA2CNS/VE8, K2DEI, K2VCO, K4FMA, K4GBS, K4GFR, K4ODS, K4VHC, WA6CDD, K6PXQ, W0GGP.

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.

The Radio Club of Georgia Military College (High School Division), Milledgeville, Ga.
The Reading Radio Club, Inc., Reading, Pa.
The Royal Order of the Left Foot, Stevens Point, Wis.
Sheridan Radio Amateur League, Inc., Sheridan, Wyo.
South Lyme Beer, Chowder and Propagation Society, South Lyme, Conn.
Southwest Missouri Amateur Radio Club, Inc., Springfield, Mo.
State Line Radio Club of New York and New Jersey, Montvale, N. J.
Sunrise Radio Club, Inc., Cambria Heights, N. Y.
Tehama County Amateur Radio Club, Red Bluff, Pa.
The Totah Amateur Radio Club, Inc., Farmington, N. Mex.
Tri State Amateur Radio Society, Evansville, Ind.
Vanderburgh Amateur Radio Emergency Service, Vanderburgh Co., Ind.
Wichita Amateur Radio Club, Haysville, Kans.
Windblowers V.H.F. Society, Wyckoff, N. J.

CLUB COUNCILS AND FEDERATIONS

Chicago Area Radio Club Council, Lou Knoelke, K9GTS, Secy., 631 Ferdinand, Forest Park, Ill.

Council of Amateur Radio Clubs of Delaware Valley, Lloyd W. Sherman, W3CDY, Corr. Secy. & Treas., 42 Ashley Rd., Newtown Square, Pa.

Federation of Eastern Massachusetts Amateur Radio Associations, Eugene Hastings, W1VRK, Secy., 28 Forest Ave., Swampscott, Mass.

Federation of Long Island Radio Clubs, Morris Brody, W2ARW, Pres., 235-03 130th Ave., Laurelton, N. Y.

Hudson Amateur Radio Council, Inc., % Frank Hunter, W2KYV, 115 Emerson Drive, Great Neck, L. I., N. Y.

Indiana Radio Club Council, Al Walters, W9MNO, Secy., 6819 Osborne Ave., Hammond, Ind.

Los Angeles Area Council of Amateur Radio Clubs, Inc., Robert F. Dailey, W6UKC, Secy., P.O. Box 25, Whittier, Calif.

Michigan Council of Clubs, Roland R. Beineman, W8QBA, Secy., 136 Guild St., N.E., Grand Rapids, Mich.

Ohio Council of Amateur Radio Clubs, Karl H. Kanalz, W8THX, Secy., 225 Tibet Rd., Columbus 2, Ohio.

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. The notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reasons of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate for Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Yukon*	June 10, 1960	W. R. Williamson	Mar. 17, 1949
West Indies	June 10, 1960	William Werner	Aug. 10, 1958
Quebec*	June 10, 1960	C. W. Skarstedt	Dec. 15, 1959
Santa Barbara	June 10, 1960	Robert A. Hemke	May 9, 1960
Western Pennsylvania	June 10, 1960	Anthony J. Mroczka	Aug. 7, 1960
Western New York	June 10, 1960	Charles T. Hansen	Aug. 10, 1960
North Dakota	June 10, 1960	Harold A. Wengel	Aug. 11, 1960
Kentucky	June 10, 1960	Robert A. Thomason	Aug. 16, 1960
Wyoming	June 10, 1960	L. D. Branson	Aug. 22, 1960
Canal Zone	July 11, 1960	Ralph D. Harvey	Oct. 1, 1960
Nevada	Aug. 10, 1960	Charles A. Rhines	Oct. 10, 1960
Northern New Jersey	Aug. 10, 1960	Edward Hart, jr.	Oct. 10, 1960
Arkansas	Aug. 10, 1960	Elmon M. Goings	Oct. 15, 1960
Santa Clara Valley	Aug. 10, 1960	William C. Smith	Oct. 15, 1960
New Hampshire	Aug. 10, 1960	Robert H. Wright	Oct. 26, 1960
Kansas	Aug. 10, 1960	Raymond E. Baker	Oct. 29, 1960

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Eastern New York	George W. Tracy, W2EFU	Feb. 10, 1960
Maritime	D. E. Weeks, VE1WB	Feb. 15, 1960
Alaska	John P. Trent, KL7DG	Mar. 10, 1960
North Carolina	B. Riley Fowler, W4RRH	Apr. 11, 1960
Washington	Robert B. Thurston, W7PGY	Apr. 30, 1960
Louisiana	Thomas J. Morgavi, W5FMO	May 31, 1960
Ontario	Richard W. Roberts, VE3NG	June 15, 1960

In the Ohio Section of the Great Lakes Division, Mr. Wilson E. Weckel, W8AL, and Mr. Charles C. Miller, W8JSU, were nominated. Mr. Weckel received 865 votes and Mr. Miller received 496 votes. Mr. Weckel's term of office began Mar. 28, 1960.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made June 17 at 2130 Eastern Daylight Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted June 1 at 2100 PDST on 3590 and 7129 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EDST. Approximately 10 minutes' practice is given at each speed. Reference to texts 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 April *QST*
June 2:	*It Seems to Us*, p. 9
June 6:	*Slow-Scan Image Transmission*, p. 36
June 9:	*The Field Day Tranquilizer*, p. 26
June 14:	*Forty Feet Without Climbing*, p. 33
June 17:	*Using a Broadcast Set* . . . . p. 18
June 21:	*Larsen E. Enterprises, Inc.*, p. 51

RTTY CONTEST NOTES

"Another Anniversary RTTY SS Contest is now history, and the growth of RTTY continues" . . . so states W6AEE, contest editor for the RTTY Society of Southern California, in reviewing the results of the February 12-14 contest. Higher scores were made this year partially because of the greater number of RTTY stations taking part. A total of 153 stations were noted on.

Top score was turned in by Skipper, W2RUI, with a total of 9120 points, followed by W3PYW 8112; W2JAV 7770; W6FYM 6808; W2TKO 6512; W9QNO 6426; TG9AD 5845; W9PRX 5752; K8NVU 5610; and W8CAT 4340, rounding out the top ten. Thirty-five stations turned in scores over 1000 points. W3CRO worked UB5HL for a RTTY to c.w. contact.

From the comments received many stations took part in this SS for their first contest activity of any type. All say they enjoyed the contest.

W6AEE thanks all for their comments and suggestions.

W1AW OPERATING NOTE

The complete summer schedule of the ARRL Headquarters station appeared on page 101 of last month's *QST*. See that issue for information on when to visit W1AW, have a QSO, or copy the various bulletin transmissions that are made daily on phone and c.w.

BRIEFS

The Third National Northwest Chapter QCWA QSO Party, held February 12-14, had 257 members participating. Top ten scores were as follows: W5KC 89; W7LQ 85; W8ZL 80; W9CAS 75; W9UX 75; W4HZ/3 72; W7FL 71; W1WY 69; W3DWY 65; W8DLD 60. This 1960 affair was so successful, it has been decided to make this an annual event.

—•••—

The Okinawa ARC, KR6ZZ, couldn't work anybody Field Day last year, for the stateside boys didn't think the contact would count. Well it does, as do all contacts. KR6ZZ will be out again this year, so be on the lookout for 'em.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....299
ZL2GX.....299
W6AM.....298
W3GHD.....298
W8HGW.....297
W2AGW.....296
KV4AA.....296
W2HUQ.....295
W8JIN.....295
W6SYG.....295
W4BPD.....295
W6EBG.....294
W6CUQ.....294
W8BRA.....294
W1ME.....294
PY2CK.....294
W3JNN.....294
W6ENV.....293
W9YFV.....293
W5ASG.....293
W4DQH.....293
G3AAM.....292
W7GBW.....292
W7GUV.....292
W7AMX.....292
CE3AG.....292
W8BKP.....292
G2PL.....292
W9RBI.....292
W3KT.....292
W9NDA.....291
ZL1HY.....291
W6ADP.....291
W8UAS.....291
W1GKK.....291
W6TT.....290
ZS6BW.....290
W3BES.....290
W8DMD.....290

Radiotelephone

PY2CK.....294
VQ4ERR.....291
W8GZ.....290
ZS6BW.....290
W1FH.....288
W8BF.....287
W8HGW.....286
W9RBI.....286
W3JNN.....286
W6YY.....286
W8PQQ.....285
W8KML.....284
W6AM.....284
4X4DK.....282
ZL1HY.....280

From March 1, to April 1, 1960 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

W9GRF.....200
SM3ADP.....122
W6VVR.....120
K5MZD.....119
JA2LC.....114
JA3BG.....114
K3BUV.....113
W3PN.....113
W6WGC.....110
W5QK.....111
VE3PV.....111
G3HHT.....109
W6OES.....108
CN8LC.....105
HA8WZ.....105
JA0AA.....105
KA2HB.....105
ZL2JO.....105
KL7RZ.....104
W0VKB.....104
DJ4OP.....104
G3ANV.....104
G5JR.....104
K4LTA.....103
FQ8HA.....103
HA1KSA.....103
HA5DU.....103
HA5KDQ.....103
ON4TK.....103
SM6BTZ.....103
W2DTL.....102
K4OWT.....102
K5EJQ.....102
W9WJB.....102
DJ2XP.....102
W1ICV.....101
W3AQZ.....101
K6JC.....101
W7DH.....101
F8SH.....101
ON4SH.....101
W1LKG.....100
K4SQX.....100
K4ZKZ.....100
W5LEF.....100
W5RVL.....100
VE3AML.....100
CN8FQ.....100
DL9XY.....100
HA8WS.....100
ZS6FR.....100

Radiotelephone

WØJWL.....144
OQ5PD.....142
XW8AL.....135
W2HMJ.....129
I1AM.....125
W5IYU.....115
CX3CJ.....113
ZL3AB.....111
OQ5JW.....108
K6ERV.....107
W8BKO.....106
OE6AI.....106
ON4WW.....104
DJ3CP.....103
KR6QM.....102
OD5HZ.....102
K1BEB.....101
K4ZAJ.....101
W1ICV.....100
K1IXG.....100
W2RXG.....100
W4DLG.....100
W8JDV.....100
WØAGX.....100
VE3PV.....100
OE6WF.....100

Endorsements

WØDU.....283
W4QCW.....280
W8EWS.....280
W7ENW.....279
W6KSM.....270
W9ABA.....270
W2AYJ.....261
W2SAW.....261
K4LNM.....261
W6CAE.....260
W1ZZK.....254
W4AZK.....253
W6WO.....252
W1HA.....251
W2BBS.....250
W5HJA.....250
W6ID.....250
K4AIM.....248
W5CE.....244
W6BUO.....241
W9JUV.....241
KP4CC.....241
W2CWK.....240
W2FBS.....240
W4GRP.....240
K5LIA.....240
W5LGG.....240
W7EJD.....240
WØMLY.....240
VE7MD.....240
W1LZE.....237
W3GEN.....236
W1RB.....235
W7BGH.....234
W1AEW.....232
W1PFA.....230
W4THZ.....230
VE3JZ.....230
WØIEV.....229
W5DA.....226
W9KA.....224
W2ICO.....222
W3AYS.....221
GI3IVJ.....221
W6ATO.....220
K6KII.....220
I1XK.....220
KØHGB.....215
W1NHJ.....212
W4PLL.....212
W1BGW.....211
W2JY.....210
W2RDD.....210
VE6JR.....210
K5BGB.....209
ZL3AB.....205
W2BTA.....203
W2UWD.....203
W6RAN.....202
K2JGG.....202
W6RCD.....201
WØVBK.....201
W1ACB.....200
K4HFS.....200
W6EAY.....200
G6VQ.....200
PY4OD.....200
W6RAN.....199
W6IPH.....198
K5KBH.....195
W8ZCQ.....193
W1HGT.....192
W9UX.....192
G6RC.....192
W1AW.....190
W1YPK.....190
W4DKP.....190
W6OUN.....190
K9CJK.....190
WØAIH/VE3.....188
W8LY.....183
WØEWH.....183
W4YWX.....181
W8KZT.....181
KØDQI.....181
W1BGY.....180
W1VAN.....180
K2DGT.....180
K2VUI.....180
W7NRB.....180
W7ZAS.....180
W8JXY.....180
W9WHY.....180
W4YWX.....174
W8YPT.....172
DL1DC.....172
G2YS.....172
SP8CK.....172
W6HYG.....171
K2HXL.....170
W2ZY.....170
W4SHX.....170
KP4RK.....170
W9MBF.....165
W6MVL.....164
DL1IN.....164
K5JZY.....162
W9KQD.....162
XZ2TH.....162
W4JJL.....160
W5PSB.....160
K6CWS.....160
K9IYW.....160
WØSLB.....160
W4IUO.....157
W9CMQ.....155
W5IJ.....153
K6GCF.....152
W2LNB.....151
W9SD.....151
WØYZB.....151
DL9PF.....151
W1GVZ.....150
K2PFC.....150
W2QDY.....150
K2UKQ.....150
K6OWQ.....150
W9FYM.....150
KØESH.....150
F3ZU.....150
OZ7GC.....150
K2ZKU.....149
W6PHF.....149
W4JZQ.....148
K9PJN.....145
W1YXD.....144
W5IL.....141
W4SNR.....140
W8DWP.....140
K8IQQ.....140
KØPIE.....140
WØAUB.....140
VE3CIO.....140
W1UOP.....137
DL3AR.....137
OE6AI.....137
K1DJN.....135
ZS6ASW.....135
EA4GA.....134
W4MS.....133
K1IVT.....132
G8CD.....132
VE1WL.....132
W4UWC.....131
W4WHN.....131
K5IIX.....131
K1BEB.....130
W1PPN.....130
W1YQF.....130
K2DNA.....130
K2IXP.....130
K8LSG.....130
K9PPX.....130
VE1DB.....130
K2IQP.....122
W3LSG.....121
OH2NQ.....120
VE2AFC.....120
W5OJL.....118
DL1TS.....117
W1ONP.....115
K2CMN.....112
9G1BQ.....112
K5ESW.....111
WA2DIG.....110
K2QJL.....110
W6IBQ.....110
KØHWB.....110
KØLEQ.....110
EA1FD.....110
OX3RH.....110

Radiotelephone

W6GVM.....261
W8UAS.....260
W2JT.....255
W2ZX.....254
W9RNX.....251
I1AMU.....251
I1AOF.....241
K4AIM.....240
W6SYG.....240
W9YSQ.....234
WØJYW.....224
VK5AB.....222
W1DCE.....210
W1FZ.....210
W8WT.....210
W1LLF.....203
WØIEV.....203
W1GKK.....200
W3GEN.....194
W4QCW.....192
W3CGS.....191
W5ERY.....191
W1YPK.....185
GI3IVJ.....181
W4SKO.....169
W1AUF.....164
W2RGV.....163
K5JEA.....161
DJ2YL.....154
W3AYD.....153
K0CTL.....151
W2HQL.....146
W4YQB.....143
W1YXD.....142
G3MCN.....142
W6LHI.....140
W8JXY.....137
W1UOP.....136
W1FAB.....133
W3VSU.....132
W3UMU.....130
W5CE.....130
VE3ES.....130
W4MS.....129
W7ZAS.....126
F3KE.....124
SP8CK.....124
W5DA.....123
W3QIR.....120
W2CCO.....115
K2IQP.....112
VE1OC.....112
VE7MD.....112
ZL3IE.....112
DL3RK.....111
K2OEA.....110
W6HYG.....110

U.S.-Canada Area and Continental Leaders

KH6IJ.....259
KL7PI.....231
WØELA.....285
VE1PQ.....246
VE2WW.....271
VE3DIP.....250
VE4XO.....180
VE5JV.....200
VE6NX.....256
VE7ZM.....282
VE8AW.....195
VO1DX.....220
4X4DK.....287

Radiotelephone

W2BXA.....272
W4DQH.....274
W5BGP.....260
KH6OR.....254
W7PHO.....278
KL7AFR.....190
WØAIW.....268
VE1DR.....140
VE2WW.....213
VE3KF.....224
VE4RP.....102
VE5RU.....178
VE6TF.....160
VE7ZM.....260
G2PL.....266

• 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. PAM: TEJ. RM: AXA. The Annual Net and Section Picnic will be held June 19 at the Hershey Park. K3ATX spent a few weeks in Cuba looking up some 6-meter buddies. As if ZAT hadn't enough trouble harboring a case of mumps, his high-voltage transformer went west also. BYB, as ex-OO, is now active on 6 meters together with his daughter K3BCI. EFY merited the W-Conn. Award and had it presented him by his local Junior Chamber of Commerce. MAV has a new HT-37. Appointments: CHC as EC for Lycoming Co., K3CPL as EC for Lebanon County, NNC as OO, ZRR, IWO and K3JHE as OESs, EML as ORS, ITI and K3CAH as OPS. It's been a busy month for appointments but there still are plenty left for any interested active amateurs. K3CNN got a CP-20 sticker. New officers of the Lancaster Radio Transmitting Society are K3DAY, pres.; RLT, vice-pres.; OY, secy.; K3DHV, treas. Present officers of the Philadelphia Electric Employees RC are W2YRW, pres.; EML, vice-pres.; QGJ, secy. The Keystone ARC's new officers are GSB, pres.; AUF, vice-pres.; RCE, treas.; PDJ, secy. New General Class licenses are K3s GQJ, EJK, JFQ and HYQ. K3ANS has enrolled at Penn. State University. FAF built and is using a kw. on 6 meters. FKE made W-Conn, REF and DUF Awards. BUR is on 6 meters with a TBS-50. CMN got the DUF Award and added 6 new countries for a total of 77. DVB is on 2 meters and also has been elected vice-pres. of the Delaware Valley Assn of ARCs. Albright College ARA's station call is K3KML and the operators are looking for skeds with other college stations. BNR has been mobiling in the Mojave Desert and keeping a regular sked with his father, AMC. The West Philadelphia Radio Assn has changed its Field Day sites this year because the aquatic sports overriding the FD activities. A word on Field Day, your SCM will be out on a Field Day setup and will accept any FD traffic sent our way. My thanks to all who took time out to fill out the questionaire. We have granted the request of the 80 per cent who requested an early picnic this year. See you all at Hershey June 19. Traffic: (Mar.) W3IVS 1235, CUL 636, HNK 555, MFW 267, FAF 117, FKE 104, BFF 93, AXA 73, KMD 67, K3DCB 60, ZLP 58, ZRQ 51, W3NF 49, K3HEX 48, ANU 44, W3NNL 39, K3JQS 28, AMC 16, BUR 16, ITI 16, JSX 16, K3BHU 15, W3TEJ 15, K3ANS 10, W3ADE 8, K3CAH 7, W3CHC 6, PVY 6, DUI 5, EML 5, OY 4, BNR 2, DVB 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—SEC: PKC. MDD Traffic Net meets on 3650 kc. Mon. through Sat. at 1915, MEPN on 3820 kc. Mon., Wed. and Fri. at 1800 and Sat. and Sun. at 1300, MSN and MDDS (slow speed) Nets on 3650 kc. at 1845 and 2030, Washington Area Traffic Net on 51.9 Mc. daily at 2030, all EST. New appointments: TSG, TMZ, WG, ZGN and KØPIV/3 as ORSs; K3BYD, K3ADS/3, K3IZM and K3EJF as OESs; K3HTE and TMZ as OOs. A Section Net certificate was issued to TSG. K3ADS/3 lends a flurry of OES activity with a report on an aurora opening on 50 Mc. The 6-meter m.c.w. activity in the section points to the possibility of a v.h.f. c.w. net. AHQ leads the section again in OO activity and fills in with OBS skeds and Weather Bureau Net work. K3AMC has traded in his a.m. equipment for s.s.b. gear. K3ANA is moving into Maryland. BPE is organizing an AREC Net in Montgomery County and wants more volunteers. BUD has to travel on his new job and has turned the MDDS over to ZNW. K3BYD likes OES work. EOV is looking for a tower. K3BYB keeps up his v.h.f. traffic activity. CDQ gave 4 Novice class exams in addition to her work at the WRC code class. CN checks into the morning nets. CPM finds OO work interesting. CVE is getting out a new AREC Manual for PG County. Other ECs may get some good tips from this. ECP received another ARRL Public Service Award for hurricane work. EFZ was visited by ØNL en route to HH2OT, where he will be active. EFZ found out that high winds and his rotary don't mix. EIS is busy with OO work and contest activity. K3EJF has a 2-meter ground plane 700 feet above sea level. EKO says the aurora stopped his traffic work. EQK has a new 500-watt rig. FYS helped break a million points during the DX Test at MSK. K3GBV has new v.h.f. gear. The Free State ARC is now ARRL affiliated. K3IYT has a new 6-meter mobile. ENU had antenna trouble during the winter storms. K3GKF likes 80-meter DX. K3GZK helps keep the MSN going. HCE is planning a 32-element 2-meter beam. HKS reports from Delaware. K3HPG is performing a good OBS service for the Hagerstown Area. K3HVG kept an active station going at his H.S. Science Fair. IWJ likes 2-meter m.c.w. IFW acted as BCEN control when JME lost his tower in a storm. JWN has been doing well as MDD Net Control. JZY was snowed in for three weeks. OO KA operated as KS4AZ from Swan Is. and provided a new country for many of the boys. KLA is a busy OO. MCG finds time between rockets to turn in a good traffic count. K3KMA is using an SW-58 for a receiver. Contester MSR is moving to a better QTH. KØPIV/3 reports that his father is now KN9YTY FB. TMZ is back in CD activities. TN makes BPL again. Congrats! TSG likes traffic and certificate-hunting. UE is looking for more help in 3RN. K3WBJ keeps a steady traffic flow from Walter Reed. WG is welcomed into section activities. ZAQ is doing good job as OO. ZNW is busy with the AREC Net. The Washington RC heard an interesting talk by 4GEB on his transistorized double conversion superhet. Traffic: (Mar.) W3UE 381, JWN 212, MCG 200, TSG 194, WG 150, TN 144, K3WBJ 119, W3AHQ 83, EKO 57, K3AMC 39, W3EOV 31, IWJ 30, ECP 28, JZY 26, ZNW 20, BKE 15, BUD 14, HCE 13 CN 7 KØPIV/3 7, W3BPE 4, EFZ 2, K3GZK 2, HVG 2. (Feb.) W3TSG 236, WG 90, MCG 66, K3BYB 32, W3IWJ 29, JZY 12, CN 7, EFZ 4.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW; RMs: W2BZJ, W2HDW and W2ZI. Appointments: W2IU as ORS and OPS. IU is ex-W9NH and is now located in Absecon, NJ Phone and Traffic Net totals for March: Sessions 31, attendance 893, traffic 207. The DVRA has elected K2CLD, pres., W2ZI, vice-pres.; K2AAR, secy.; and W2WOA, treas. K2DEI made BPL again. George is now eligible to receive the League's BPL medallion. W2RXL NJN Mgr., reports 31 sessions and a traffic total of 424. W2RG QNIed every session on NJN. The SJRA again has been declared unofficial winner of the 1960 V.H.F. Sweepstakes. K2YIB was the SJRA's contest chairman. K2SMZ and K2TYW are running tests on 220 Mc. WA2-BLV, K2CPR and W2EIF, Official Observers, are doing fine jobs. W2ZX edits the DX portion of the SJRA's *Harmonics*. K2UBW advises that the Garden State Amateur Radio Assn. plans a N.J. QSO Party for Sept. K2CPR, Pennsauken, has received the "Worked all Connecticut Award." W2UA, Moorestown, has returned home from Europe. His daughter, K2INQ, had skeds with him via F3AD. The Burlington Co. Radio Club meets the 1st Fri. K2MOV is president. The Levittown, N. J., Radio Club continues to do a fine job with code and theory classes. K2JGU, Glassboro, has a new rig on 50 Mc. and hopes to have a beam soon. All clubs are urged to make Field Day plans to insure a successful demonstration this year. ECs and assistants are needed in Gloucester, Cape May and Mercer Counties. Your help is solicited. Traffic: K2DEI 232, W2RG 163, W2ZI 62, W2TLO 53, W2SXV 40, K2JJC 22, K2SOX 20, K2JGU 14, K2SNK 14, W2BZJ 8, K2CPR 6, W2REI 5, W2IU 2.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—RMs: W2RUF and W2ZRC. PAM: W2-PVI. New SEC: W2LXE. 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 3509.5 and 3993 kc. at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, IPN on 3980 kc. at 1600. Send your Field Day message to W2PE. Let's have a big FD turnout. I am happy to announce the appointment of W2LXE as SEC. He also is the new Radio Officer of Erie County. K2RWV has been appointed OPS and K2MTU has been endorsed as Cortland

(Continued on page 90)

WHAT DOES AMATEUR RADIO MEAN TO YOU?

RECENTLY, Bill Halligan, W9AC, asked Leal Tucker, W4ERK, what ham radio meant to him. We felt that his reply was so interesting and sincere that we asked Leal for his permission to publish it verbatim. . . .

"YOU asked me what amateur radio has meant to me. Would it amaze you if I replied, 'My Life'? In the opinion of several doctors, this is the truth. I was the victim of a coronary thrombosis several years ago which left me incapacitated. Without going into all the details, I purchased an S-40B short wave receiver and with it a book, 'How to become an Amateur'. After five months of studying code and the technical requirements of a 'ham', I received my general class license. It was then that a new world opened for me. Life was no longer a hum-drum existence. The friendly conversations with people from all parts of the world encouraged me to take a different outlook on life, and I have regained a better state of well-being, which I had lost due to the lack of accomplishment.

"FRIENDS have been made in abundance and I am proud and happy that my inner-self has talked for me and given me this privilege. This was a friendly test of whether or not I could make my contacts know how glad I was to talk to them. Believe me, Bill, I was glad to talk to them, too.

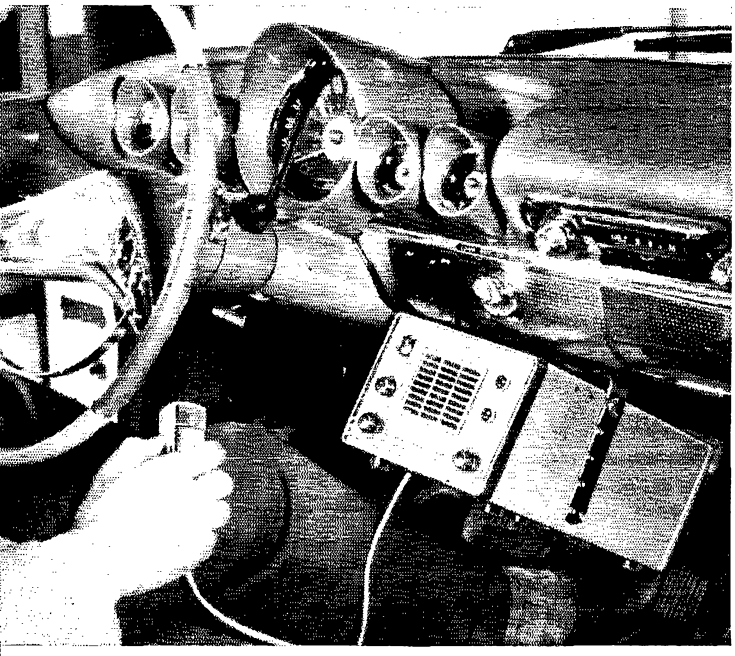
"I AM fully aware that hams, trained in the field of electronics, deserve a great deal of credit for their endeavors in the promotion of the art. Inasmuch as I am not an electronics engineer, I believe I am unqualified to offer anything beneficial in the technical field.

"HOWEVER, amateur radio is sort of an apprenticeship — a lesson in what is expected of me in life. Should not all of us be considerate, kind and helpful in every day life? Isn't this the measure of conduct of a good amateur?"

— LEAL TUCKER, W4ERK

Bill Halligan Jr. W. S. Halligan W9AC for **hallicrafters**

Viking transmitters and accessories... 1st choice of amateurs the world over!

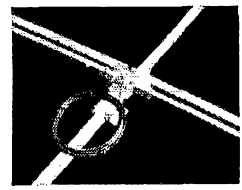


NEW... FOR 10 METERS!

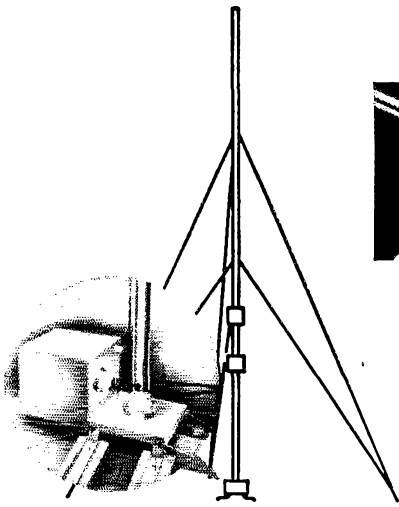
10-Meter Messenger

Ideal for fixed or mobile operation, the new 10-meter "Messenger" is a complete 10-tube (including rectifier) crystal-controlled transceiver! Superhet receiver offers excellent sensitivity and selectivity—with effective ANL, AVC, and Squelch circuits. 10 watts input delivers a solid signal. Wide range pi-L network output circuit—self-contained power supply. Pre-tuned for 29.4 to 29.7 mcs—covers any 5 frequencies within a 300 kc segment of the 10-meter band. Compact . . . lightweight . . . easy to install. 5⅝" high, 7" wide, and 11⅜" deep. For 6V D.C. and 115 volts A.C., 12V D.C. and 115 volts A.C., or 115 volts A.C. only. Complete with tubes, microphone, power cords, and crystals for one frequency covering 29.640 kc, national calling and emergency frequency. For complete details write for specification Sheet 737.

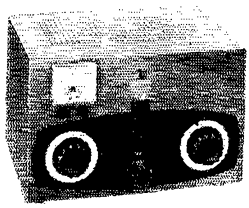
Cat. No.	Amateur Net
242-201..115 V only	$129.75
242-202..115 V & 6 V	$139.75
242-203..115 V & 12 V	$139.75

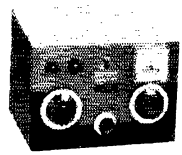


138-420-3



137-102





250-30-3

250-23-3

PRE-TUNE BEAMS—Rugged semi-wide spaced beams—pre-tuned for 20, 15, and 10 meters. Low SWR. With 3 element beams, boom and balun. For 52 ohm coaxial transmission line.

Cat. No.	Amateur Net
138-420-3..20 meter beam	$139.50
138-415-3..15 meter beam	$110.00
138-410-3..10 meter beam	$ 79.50

"MATCHSTICK"—A fully automatic bandswitching vertical antenna system—may be mounted on roof top, ground, or in any limited space location. Completely pre-tuned—low SWR on all bands 80 through 10 meters. Low vertical radiation angle for DX. Impedance: 52 ohms. Complete with 35' mast, base tuning network, relays, control box and 9 Dacron guy ropes.

Cat. No. 137-102.."Matchstick".....Amateur Net $129.50

"MATCHBOXES" — Provide completely integrated antenna matching and switching systems for kilowatt or 275-watt transmitters. Bandswitching 80, 40, 20, 15, and 10 meters. No "plug-in" coils or "load-tapping" necessary.

275 Watt "Matchbox"—Designed to match a 52 ohm coaxial link line to reactive and nonreactive loads ranging from 25 to 1500 ohms for balanced lines; and 25 to 3000 ohms for unbalanced lines. For transmitters with a maximum power input of 275 watts.

Cat. No.	Amateur Net
250-23-3..With directional coupler and indicator	$86.50
250-23....Less directional coupler and indicator	$54.95

Kilowatt "Matchbox"—Handles unbalanced line impedances from 50 to 2000 ohms, and balanced line impedances from 50 to 1500 ohms. For transmitters with a maximum power input of 1000 watts.

Cat. No.	Amateur Net
250-30-3..With directional coupler and indicator	$149.50
250-30....Less directional coupler and indicator	$124.50

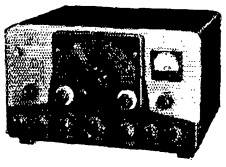
COMING SOON... the all new Viking filter-type sideband transmitter with 60 db sideband suppression!

The world at your finger tips!

VIKING "KILOWATT" AMPLIFIER—The only power amplifier available which will deliver full 2000 watts SSB* input, and 1000 watts CW and plate modulated AM. Continuous coverage 3.5 to 30 mcs. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

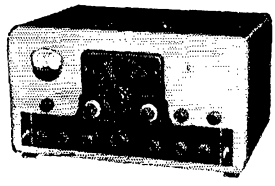
Cat. No.		Amateur Net
240-1000	Wired and Tested	$1595.00
251-101-1	Matching desk top, back and 3 drawer pedestal, FOB Corry, Pa.	$132.00

*The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions, this results in peak envelope power inputs of 2000 watts or more, depending upon individual voice characteristics.



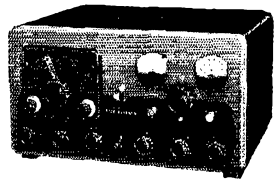
"RANGER" — 75 watts CW and 65 watts phone input. Bandswitching 160 through 10 meters. Built-in VFO or crystal control. With tubes.

Cat. No.		Amateur Net
240-161-1	Kit	$229.50
240-161-2	Wired	$329.50



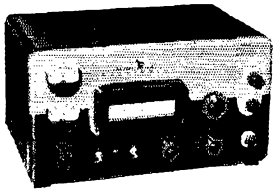
"VALIANT"—Instant bandswitching 160 through 10. 275 watts input CW and SSB (P.E.P. with aux. exciter) 200 watts phone. With tubes.

Cat. No.		Amateur Net
240-104-1	Kit	$349.50
240-104-2	Wired	$439.50



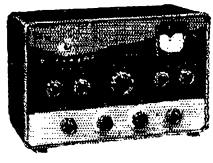
"FIVE HUNDRED" — 600 watts CW input; 500 watts phone and SSB (P.E.P. with aux. SSB exciter). Bandswitching 80 through 10. With tubes.

Cat. No.		Amateur Net
240-500-1	Kit	$749.50
240-500-2	Wired	$949.50



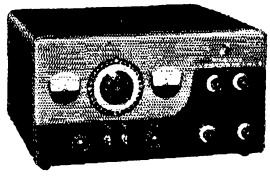
"THUNDERBOLT" AMPLIFIER—2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear. Continuous coverage 3.5 to 30 mcs. With tubes.

Cat. No.		Amateur Net
240-353-1	Kit	$524.50
240-353-2	Wired	$589.50



"6N2"—Instant bandswitching coverage of both 6 and 2 meters. Power input rated at 150 watts CW, and 100 watts AM phone. With tubes.

Cat. No.		Amateur Net
240-201-1	Kit	$129.50
240-201-2	Wired	$169.50

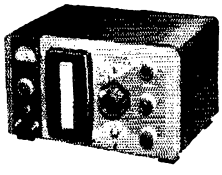


"6N2" THUNDERBOLT AMPLIFIER—Input rated 1200 watts P.E.P.* SSB and DSB, Class AB_1; 1000 watts CW, Class C; 700 watts AM linear, Class AB_1. Continuous coverage 6 and 2. With tubes.

Cat. No.		Amateur Net
240-362-1	Kit	$524.50
240-362-2	Wired	$589.50

"COURIER" AMPLIFIER — Class B linear rated 500 watts P.E.P. input with auxiliary SSB exciter; 500 watts CW; 200 watts AM. Continuous coverage 3.5 to 30 mcs. With tubes.

Cat. No.		Amateur Net
240-352-1	Kit	$244.50
240-352-2	Wired	$289.50



New Catalog

Your complete guide to amateur radio's most exciting equipment. Write today for your free copy.

FIRST CHOICE AMONG THE NATION'S AMATEURS

Viking

E. F. JOHNSON COMPANY • WASECA, MINNESOTA

Station Activities

(*Continued from page 86*)

County EC. All active clubs are requested to send me an up-to-date listing of officers. I would like to publish a club directory in answer to many requests. Many thanks to K2DG and W2OE, who filled in for W2RUF during her recent illness. WA2CIG and K2SSX made BPL again. Congrats! The ARATS elected W2VRG, pres.; WV2DSE, vice-pres. and treas.; W2QUP, secy. The RAWNY elected W2CUU, pres.; W2GIH, vice-pres.; W2TKO, treas.; and W2JPE, secy. The Radions reports that WA2DGN, WA2ANN, W2EBE and K2RDD are building equipment. WA2KRG, got his ticket. WA2CQH is on 6 meters with an HW-29 and reports much activity. Sorry to report that W2VEY, of Lyons, passed on to Silent Keys. K2JXF got his 35-w.p.m. CP; he's also building a kw. s.s.b. rig. WA2FML has a new competitor in the shack—WV2KTN, his dad. K2QDT is going s.s.b. WA2BEU received 25-w.p.m. CP. K2PBU reports that Gloversville has organized a ham club. The station call is WA2KMF. The SIARC is helping a handicapped student to get a receiver. We get many reports from all over the state from fellows on v.h.f. They all have the same plea, *rotate your beams* and listen for signals from all points of the compass. A big gang from central N. Y. is trying to get into Buffalo on 6 meters and 220 Mc. WA2GCH, editor of the *CVARC Bulletin*, has published a North Country call book with K2QPV. Either one of them is on 3900 kc. at 0700-0800 Sun. for additions and comments. W2QCI publishes an informative paper called *QLF* in the Lockport area. K2PFC has received the W-Conn Award. Traffic: WA2CIG 736, K2SSX 657, W2-EZB 411, K2RTN 253, K2UZJ 124, W2RUF 123, K2IYP 92, W2OE 78, WA2DSC 72, WA2BEU 67, K2JBX 61, K2QDT 56, K2JXF 48, K2OFV 42, W2FEB 36, K2GWN 34, K2DG 29, WA2JKL 29, K2RWV 28, W2RQF 25, K2AOQ 23, W2QQK 23, K2PBU 17, W2PVI 17, W2PGA 16, WA2IZK 15, K2YMH 14, WA2JXN 13, WA2FML 12, K2RTQ 9, K2MIY 8, W2ZRC 7, WA2DAC 5, W2ZDL 4, W2BLO 2, W2EMW 2.

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 PFN meets Mon. through Fri. at 1800 EST on 3850 kc. New appointees are UGV as ORS and RTV as OES. It is with deep regret we record the death of 5BUS, who was formerly 3WMJ of this section. The Willimantic Conn. Junior Chamber of Commerce has presented to ZHQ and IJA the W-Conn. (Worked All Connecticut) Award. The Penna. C.D. Net (c.w.) meets every Sun. at 0900 EST on 3503.5 kc. and is asking all county representatives to check in. New officers of the Conemaugh Valley ARC are LSE, pres.; PHN, vice-pres.; JLM, rec. secy.; KUQ, corr. secy.; WRC treas.; MIM and TIF, trustees. JUV is on 10-meter phone. ZIJ is going 6-meter mobile. BWU and UFR continue to have a five-state sked on 6 meters Sun. at 0800 EST. ROA now has 139 countries verified. GJY now has 209 countries confirmed. KN3ISO received his Technician class license. The Horseshoe ARC reports via *Hamateur News:* KQD is the winner of the ROA Placque; the club purchased some Pak-Fones and is converting them to 146.97 Mc. The Huntingdon County ARC reports: K3IGF passed the General class exam; new Novice is KN3LAO; K3AYV is the new club trustee. The Etna RC reports via *Oscillator:* The club has given K2MIR an Honorary Life Membership for his work with the Fordham RC; K3AGE got married; KN3ISZ passed the General class exam: K3EVR has an HT-37; GJY is putting together a Viking II. K3DMT is organizing 6-meter mobiles in the Pittsburgh Area for training and utility under emergency conditions. Many thanks to K3KMO (formerly W4UWA) for sending along the Nittany ARC (K3HKK) *Newsletter*. New officers of the Nittany ARC are UTI, pres.; KXS vice-pres.; K3KMO, secy.-treas.; SUC, comm. mgr.; K3IQU, act. mgr. Congratulations to the Butler Senior High School ARC on becoming affiliated with the League. OEZ is back in the hospital. LGD is on s.s.b. The Greater Pittsburgh V.H.F. Society meets Mon. at 1900 EST on 50.4 Mc. Traffic: (Mar.) W3KUN 301, K3GHH 241, W3WRE 103, LSS 75. MFB 40, UHN 27, K3HWL 16, W3KNQ 13, SIJ 12, K3COT 9, W3BWU 2. (Feb.) W3NUG 30.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP. RM: USR. PAM: RYU. EC for Cook County: HPG. Section net: ILN, 3515 kc., Mon. through Sat. at 1900 CST. AREC and RACES turned out in full force along the Mississippi River flood area, especially in the Quincy and Meyer, Ill., disaster locality. USR reports that the ILN handled 314 pieces of traffic in 25 sessions and K9QYW, net manager of the North Central Phone Net, advises that the traffic total was 208. The No Name Phone Net's traffic was 252, according to K9IVG. K9-AIR, Scott Air Force Base, is now transmitting with a ten-element 2-meter beam. K9KER, K9MDX, K9JLC and VFF were elected officers of the Vermillion County Amateur Radio Assn. for the coming year. K9KSF is now 4NEC in Clearwater, Fla. K9OCU reports that the MVRC Net meets every Sun. at 0800 CST, and not as previously announced in this column. K9MXR is operating on 220 Mc. K9QYY reports that Winnebago and Boone Counties have inaugurated a new RACES Net on Mon. at 1930 on 29.6 Mc. LGH is sweating out his last few cards for his DXCC certificate. JJN is looking for TM on an old AR-60 receiver. The Rock Island County RACES put on a demonstration at the Annual Midwest Sports Show which was open to the public. ERU and his XYL enjoyed a 31-day, 10-nation trip. K9AMJ's new line-up includes a Heathkit Apache, a Mohawk, a Seneca and an 80-ft. tower. K9LTU is working s.s.b. with a new SX-101A. The Wheaton Community High School Radio Club has been approved by the Leagues Executive Committee as a duly affiliated society. K9HNM finally made WAS. K9CIS has received his Ranger Kit and is waiting for help in assembling it. The new officers of the St. Clair County Radio Club are JMY, K9LTL, K9TDL, K9BTR, K9UWP and QDM. HPG has been visiting the Chicago Area clubs and giving talks on League affairs. K9EAB has received a Worked All Connecticut Award presented by the Willimantic Conn. Jr. Chamber of Commerce. The CD OPAL 60 had a fine turnout of amateurs throughout the State and the preliminary reports from the officials indicate fine results. Those clubs and members participating are too numerous to list and the praise is given to amateur fraternity as a whole. K9INV and K9PDS are the proud parents of a new harmonic (boy). The Chicago YLRL announces a new certificate called the Dark Eyed Queen's certificate. For rules, contact any member of the club. HSY/m encountered a bad automobile accident while mobiling and shouted his head off on the local calling frequency. Not being able to raise anyone he had to use the land line—a twist on an old story. Traffic: K9AIR 766, W9DO 686, IDA 513, IMN 512, USR 371, QQG 355, K9IVG 166, W9MAK 134. K9HNM 101, UGY 71, W9JXV 67, K9OAD 66, W9SXL 35, K9CWF 34, W9-FAW 33, K9RAS 28, KN9UJT 27, K9JMA 24, QYY 24, LLA 16, W9TZN 14, PRN 12, K9BIV 10, MDK 10, QYN 10, W9WPC 8, LGH 7, K9MXS 7, LXG 6, W9SKR 6, K9CRT 5, OCU 5, W9JJN 4, K9KHZ 3, ISP 2, MLI 2 W9PNY 2.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ. PAMs: BKJ, MEK, RVM and UKX. RMs: DGA, JOZ, TT and VAY. Net skeds: IFN, 0800 daily and 1730 M-F on 3910 kc.; ISN (s.s.b.), 1830 daily on 3920 kc.; QIN, 1900 daily and RFN 0700 Sun. on 3656 kc.; QIN (training) 1800 M-W-F on 3745 kc.; CAEN daily at 1900 on 1805 kc. New appointments: K9OFH is EC for Adams County. EHZ is OO Class III and IV. FWH is OPS. K9PDE is now ORS and MGV is OES. New officers of the Central Indiana Mobile RC are, VGG, K9CRF and JMD. VRH is activities manager. QAJ has organized an AREC net in Owen County on 50.45 Mc. Stations in surrounding counties are invited to check in each Mon. at 1900. K9CRS received a certificate of appreciation from KG1FR and the Greenland ARC for traffic handled to the States. K9VXH is a new ham in Portland. Fishers RC (high school) prepared an amateur demonstration for the PTA, 6, 7 and 8 grades under the leadership of K9GEL. The CAEN publishes a monthly newsletter; K9ORZ is editor. K9PNT is on 6 meters with a Harvey-Wells TBS-50D and an S-106. EHZ edits and publishes a CD bulletin for Northwestern Indiana. K9QWA has a new G-50 and eight-element beam on 6 meters. The *BISON*, monthly publication sponsored by the Indiana Radio Club Council, is doing very well under the management of IHO. FJI has resigned as publisher after an FB job. The new publishers are RTH and K9RXK. IXD collects and edits the material for publication. For further details contact IHO. K9-PSN is new on 6 meters with a modified DX-40, A Hammerlund HQ-129X and a ten-element Taco beam. *Amateur radio exists as a hobby because of the service it renders.* March net reports: IFN reported by RVM totaled 493; MEK reports ISN at 208; QIN totaled 448, as reported by VAY; TT reports RFN at 156; JOZ reported QIN (training) at 85 and CAEN totaled 52 as reported by UKX. Stations making BPL: JOZ, TT, GJS and DGA. Traffic: (Mar.) W9JOZ 746, TT 599,

(*Continued on page 98*)

FROM HEATH ...9 NEW RADIO AMATEUR KITS

GC-1

$109.95

$11.00 dn.,
$10.00 mo.

TEN-TRANSISTOR "MOHICAN" GENERAL COVERAGE RECEIVER KIT (GC-1)

An excellent portable or fixed station receiver! Many firsts in receiver design for outstanding performance . . . ten transistor circuit . . . flashlight battery power supply . . . ceramic IF transfilters. The amazing, miniature transfilters used in the GC-1 replace transformer, inductive and capacitive elements used in conventional circuits; offer superior time and temperature stability, never need alignment and provide excellent selectivity. Other features include telescoping 54″ whip antenna, flywheel tuning, tuning meter, large slide-rule dial and attractive, rugged steel case in gray and gray-green. Covers 550 kc to 30 mc in five bands. Electrical bandspread on five additional bands cover amateur frequencies from 80 through 10 meters. Operates up to 400 hours on 8 standard size "C" batteries. Sensitivity: is 10 uv, broadcast band; 2 uv, amateur bands for 10 db signal to noise ratio. Selectivity: 3 kc wide at 6 db down. Measures only 6½″ x 12″ x 10″. 20 lbs.

Heathkit XP-2: plug-in power supply for 110 VAC operation of GC-1. (optional extra). 2 lbs. **$9.95**

HD-20

$14.95

100 KC CRYSTAL CALIBRATOR KIT (HD-20)

Align or check calibration of your communications gear with this versatile ham aid. Provides marker frequencies every 100 kc between 100 kc and 54 mc. Transistor circuit is battery powered for complete portability. Accuracy is assured by .005% crystal furnished. Measures only 2½″ x 4½″ x 2⅝″. 1 lb.

7 more kits on following pages

HEATHKIT®. . . WORLD'S FINEST HAM GEAR

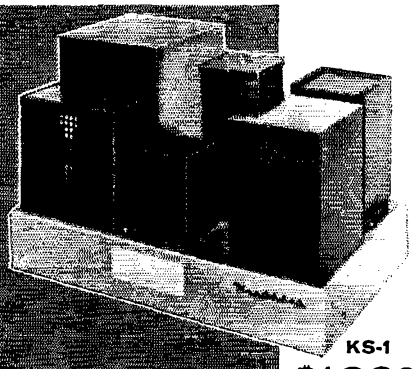
KL-1
$399.95
$40.00 dn.
(Write for time payment details)

"CHIPPEWA" KILOWATT LINEAR AMPLIFIER KIT (KL-1)

Here is a top-quality kilowatt rig with all the features you've been looking for. Operates at maximum legal power input on all bands between 80 and 10 meters, in SSB, CW or AM linear operation. Premium tubes (4-400A's), forced air cooled with centrifugal blower. Grid neutralized, continuous plate current monitoring, extensive TVI shielding. Features both tuned and swamped grid circuits to accommodate all popular exciters. Operates class AB1 for SSB and AM linear service and high efficiency class C for CW service. Convenient panel controls include power switch, tune-operate switch, HV on/off switch, final bandswitch, meter switch, grid bandswitch, grid tuning, mode switch, plate tuning, plate loading and bias adjust. Accessory connectors are provided on the rear apron of the chassis for complete compatability with all control circuitry in the Heathkit "Apache" Transmitter. Two meters provided; one monitors final plate current; the other indicates switch selected readings of final grid current, screen current, and plate voltages. Send for complete specifications now. 70 lbs.

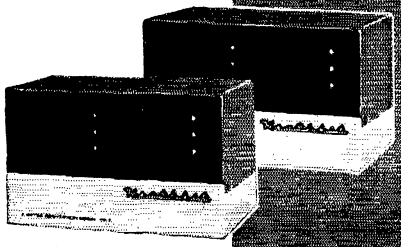
A PERFECT COMPANION FOR THE "CHIPPEWA" KILOWATT POWER SUPPLY KIT (KS-1)

Ruggedly constructed for heavy-duty use in medium to high power installations, the KS-1 fills the requirements of a top-notch power supply with economy and safety. Features an oil-filled hermetically sealed plate transformer, "potted" swinging choke input filter and 60-second time delay relay. Line filters minimize RF radiation. Maximum DC power output is 1500 watts. Nominal voltage output, 3000 or 1500 volts. DC current output, average 500 ma, maximum 1000 ma. Control circuitry is arranged to allow remote installation. The KS-1 employs two 866A half-wave mercury vapor rectifiers in a full-wave, single-phase configuration. Power requirements: 115 V, 50/60 cycles, 20 amperes; 230 V, 50/60 cycles, 10 amperes. 105 lbs.



KS-1
$169.95
$17.00 dn.,
$15.00 mo.

XC-6
$26.95



XC-2
$36.95

6-METER CONVERTER KIT (XC-6)

Extends frequency coverage of the Heathkit "Mohawk" and most other general coverage receivers into the 6 meter band. Converts 50-54 mc signals to 22-26 mc. 3-tube circuit provides two RF stages and low-noise triode mixer. Calibration accuracy assured by .005% overtone crystal supplied. Provision for external RF gain control. 6 lbs.

2-METER CONVERTER KIT (XC-2)

This top-quality 2-meter converter may be used with receivers tuning any 4 mc segment between the frequencies of 22 and 35 mc when appropriate crystal is used. Converts 144-148 mc signals to 22-26 mc with .005% overtone crystal supplied. High quality parts used throughout. Silver plated chassis and shields. 7 lbs.

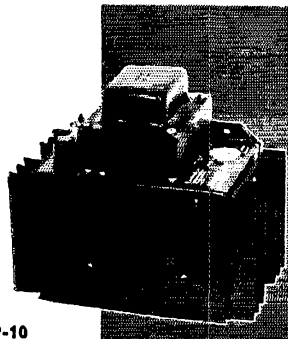
IN KIT FORM TOPS IN TRANSMITTING POWER

TWO BRAND NEW MODELS
HEATHKIT 10 & 6 METER TRANSCEIVER KITS

Complete ham facilities at low cost! The new Heathkit transceivers are combination transmitters designed for crystal control and variable tuned receivers operating on the 6 and 10 meter amateur bands (50 to 54 mc HW-29 and 28 to 29.7 mc for HW-19) in either fixed or mobile installations. Highly sensitive superregenerative receivers pull in signals as low as 1 microvolt; low power output is more than adequate for "local" net operation. Other features include: built-in RF trap on 10 meter version to minimize TVI; adjustable link coupling on 6 meter version; built-in amplifier metering jack and "press-to-talk" switch with "transmit" and "hold" positions. Can be used in ham shack or as compact mobile rigs. Not for Citizen's Band use. Microphone and two power cables included. Handsomely styled in mocha and beige. Less crystal. 10 lbs.

VIBRATOR POWER SUPPLIES: VP-1-6 (6 volt), VP-1-12 (12 volt). 4 lbs. Kit; **$8.95** each, wired; **$12.95** each.

HW-19 (10 meter)
HW-29 (6 meter)
$39.95 each



HP-10
$44.95

NEW! IMPROVED DESIGN
TRANSISTOR MOBILE POWER SUPPLY (HP-10)

Brand new power supply for mobile gear; features all-transistor circuit, instant starting, high efficiency, rugged construction. Operates from 11 to 15 VDC input; at 12 VDC, provides 600 VDC @ 200 ma, or 600 VDC @ 150 ma & 300 VDC @ 100 ma simultaneously, at 120 watts. Negative 150 volts @ 30 ma also provided. Max. ambient temp., 150 @ 120 watts ICAS. Input current requirements: 2 amps, idling; 13 amps, full output. Includes heavy filtering of input and output leads, remote relay control of primary power, silicon rectifiers, and extruded aluminum heat sinks for efficient cooling of power transistors. Measures 8" x 7½" x 6⅛". 10 lbs.

ORDER DIRECT BY MAIL OR SEE YOUR HEATHKIT DEALER*
*The convenience of Local Heathkit Sales and Service costs but a few dollars more.

HEATH COMPANY
a subsidiary of DAYSTROM, INCORPORATED
Benton Harbor 8, Michigan

All prices and specifications subject to change without notice. Please include postage on orders to be shipped parcel post. 20% deposit is required on all C.O.D. orders. All prices are NET F.O.B. Benton Harbor, Mich., and apply to Continental U.S. and Possessions only. Dealer and export prices slightly higher.

HEATHKIT®

FREE CATALOG!
Describes over 150 easy-to-build electronic kits in HI-FI, Test, Marine, and Ham radio fields. To get yours, fill in this coupon and mail today!

ITEM	MODEL	PRICE

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

AN APPEAL TO INTELLIGENCE

A product that is consistently advertised in *QST* month after month, year after year, has to be good. Over 10,000 GOTHAM antennas have been purchased by *QST* readers. Even the "price-is-no-object" customers choose GOTHAM antennas on the basis of performance and value. Select your needs from this list of 50 antennas:

Airmail Order Today—We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6–10 TWO BANDER.....	☐	$29.95
10–15 TWO BANDER.....	☐	34.95
10–20 TWO BANDER.....	☐	36.95
15–20 TWO BANDER.....	☐	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is broad banded. It does not have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

☐ 6-10-15 $39.95 ☐ 10-15-20 $49.95

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

☐ Deluxe 6-Element 9.95 ☐ 12-El 16.95

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

☐ Std. 3-El Gamma match	12.95	☐ T match	14.95
☐ Deluxe 3-El Gamma match	21.95	☐ T match	24.95
☐ Std. 4-El Gamma match	16.95	☐ T match	19.95
☐ Deluxe 4-El Gamma match	25.95	☐ T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

☐ Std. 2-El Gamma match	11.95	☐ T match	14.95
☐ Deluxe 2-El Gamma match	18.95	☐ T match	21.95
☐ Std. 3-El Gamma match	16.95	☐ T match	18.95
☐ Deluxe 3-El Gamma match	22.95	☐ T match	25.95
☐ Std. 4-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 4-El Gamma match	27.95	☐ T match	30.95

FREE! FREE! FREE!

Valuable catalog of 50 different antennas, with specifications and characteristics. Gives bands and frequencies covered, element information, size of elements, boom lengths, weight, feed line used, polarization, and other valuable information. Send card today!

FREE! FREE! FREE!

CITIZENS BAND ANTENNAS • Any of our ten meter beams or the V40 vertical is perfect for the CB operator.

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

☐ Beam #R6 (6 Meters, 4-El)....$38.95
☐ Beam #R10 (10 Meters, 4-El).. 40.95
☐ Beam #R15 (15 Meters, 3-El).. 49.95

15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

☐ Std. 2-El Gamma match	19.95	☐ T match	22.95
☐ Deluxe 2-El Gamma match	29.95	☐ T match	32.95
☐ Std. 3-El Gamma match	26.95	☐ T match	29.95
☐ Deluxe 3-El Gamma match	36.95	☐ T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

☐ Std. 2-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 2-El Gamma match	31.95	☐ T match	34.95
☐ Std. 3-El Gamma match	34.95	☐ T match	37.95
☐ Deluxe 3-El Gamma match	46.95	☐ T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-TI2TG)

FACTS
ON THE GOTHAM
V-80 VERTICAL ANTENNA

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph 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:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE NOVICE WHO OPERATES 40 AND 15.....$14.95

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

Address.....

City.....Zone.....State.....

(*Continued from page 90*)

GJS 474, ZYK 462, MM 344, VAY 190, DGA 155, SWD 123, K9IXD 116, UJZ 115, W9CLY 93, BDG 79, BKJ 77, MEK 73, EJW 64, RTH 63, RVM 63, K9ORZ 59, KN9-TCG 56, W9EHZ 55, K9LZJ 55, W9WID 47, MJJ 34, VNV 34, K9TYM 33, GBB 32, W9DOK 31, K9LBD 31, MAN 29, BSU 25, RMQ 22, W9EGV 19, K9UAN 17, W9YJI 16, YYX 15, K9AYI 14, W9ENU 14, DZC 13, FWH 13, BDP 12, FYM 12, K9GEL 11, LZN 10, W9SNQ 9, K9-ILK 8, AHD 7, W9OCC 7, IMU 6, K9MWC 6, W9ZGC 6, K9KKG 5, W9NTR 5, WUH 1. (Feb.) K9GBB 94, PHP 36, JKK 18, W9QWI 18, K9RMQ 14, LZN 12, W9TQC 3, WTY 1.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH, PAM NRP, GFL and K9IQO. RM SAA and K9ELT. K9GYG is the new EC for Waushara County and K9UTN is EC for Vernon County. K9UXP, K9TNL and KN9UEF are new in Eau Claire. BEN certificates went to K9DAF and K9PDJ, WSSN certificates to K9-JIG and K9ORR. Officers of the newly-organized North Shore Radio Amateurs Club of Milwaukee are VGZ, pres.; VZK and K9JZE, vice-pres.; WZL, secy.; CJO, treas. Licensed since 1928, MWQ has held an Advanced Class license since 1935 and received his Extra Class ticket in 1960. The Wis. Teen-Age Net meets Mon. through Sat. at 0630 on 3995 kc. Net manager K9OSC welcomes all amateurs to the net. K9TQZ is new at Sturgeon Bay. DTV, starting a 4-year hitch with the Navy, has KKK running his business. SZR reports YT's new beam was hit by lighting during the first storm of the year. New officers for the Rock River Radio Club are K9RHA, pres.; K9OGT, vice-pres.; ZWV, secy.-treas. K9GDF received his WAS certificate. Activity of the Four Lakes ARC of Madison is at a high level issuing its newsletter and a RACES project. The Badger V.H.F. Club of Milwaukee has affiliated with ARRL. Congrats. New officers of the Northwoods Radio Assn. include K9JJR, pres.; TSI vice-pres.; AMN secy.-treas. YBA, OKH and K9ACB, of Whitewater, now are on RTTY. K9RIY received his MARS license. July 10 is the date for the BEN Picnic at Fond du Lac. Members of *all* nets are invited. The Fond du Lac Club gives Nov. 6 as the date for its annual banquet. K9ALP now is active from Northwestern U. Our section is in need of more ECs, OBSs and OPSs. The OM-XYL team of VHP and VIK now have their own stations for traffic work. Traffic: (Mar.) W8DYG 905, CXY 478, K9PDJ 294, W9SAA 113, KQB 80, NRP 51, VHP 47, YT 44, CBE 40, K9JQA 36, W9LFK 36, K9GDF 35, ELT 34, JIG 33, ORR 27, W9VIK 20, SIZ 13, WJH 12, K9DOL 9, OSC 9, W9IKY 8, MWQ 8, K9OPF 8, RRS 5, CJL 4, W9GIL 3, CCO 1. (Feb.) K9PDJ 262, LWV 7.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: KØKBV. PAM: KØKJR. RM: KTZ. The North Dakota 75-Meter Phone Net reports: For Feb., total number of check-ins 653, lowest number 14, highest 41, formal traffic handled 76, informal 56, relays 9. For Mar., 27 sessions, total check-ins 845, lowest 9, highest 39, formal traffic handled 77, informal 75, relays 9. The Larimore High School has organized a radio club to be called the Larimore State High School Radio Club. The officers KØVDP, pres.; KNØYJA, vice-pres.; Diane Gilderhus, secy-treas.; and KNØYNP, act. mgr. A new call in Bismark is KØYST. The North Dakota Weather Net reported increased activity during the month of March. Highest number of check-ins was 15, lowest 7, total messages 264. Traffic: KØMHD 422, RLF 112, TYY 98, ITP 79, BHT 43, GRM 43, GGI 36, WØFNZ 31, ADI 30, KØDWW 30 PHC 16 TNI 16, KJR 12, DNJ 10, YCL 10, IHM 8, GQD 6, KØATK 5, RRW 5, PVH 4, WØBHF 2, KØOMA 2, WIM 2, WØCDO 17.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: SCT. The Sioux Falls Amateur Radio Club's emergency truck was dispatched to Dell Rapids to make hourly transmissions of river stages during flood conditions to the Weather Bureau and Flood Control Center. The Mitchell ARC meets regularly the 1st and 3rd Thurs. of each month. KØQMM is secretary. Newly-appointed ECs: EUJ, QDU and EXX. KØLKH is pres. of the newly-organized Gettysburg ARC, with M. Williams vice-pres.; and W. Deigel secy.-treas. KØTGX received his General class ticket. Newly-licensed: KNØ-ZLK, Colman; KNØYWP and KNØZLF, Sioux Falls; KNØZIU and KNØZIIF, Lead. ZWL reports the Weather Net discontinued Apr. 16 for the fifth year of operation during the "heavy weather" season. The Huron ARC promoted a full-page article and pictures in the daily paper. Please send me copies of any publicity you may receive. Traffic: (Mar.) WØSCT 398, ZWL 338, KØBMQ 218, WØDVB 185, UAJ 95, KØVYY 55, AIE 52, WØCTZ 30, KØDUR 18, SEJ 13, DHA 8, QMM 8, LKH 7, QPK 6, WØDIY 4, RWM 4, KØDYR 3, WØNNX 2, YVF 2, KØCWJ 1. (Feb.) WØSCT 529.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—KØWFW invites all mobiles to participate in the transmitter hunts sponsored by the new Twin City Mobile Radio Club. KØIZF, president of the Messabi-Iron Range Club, states that the club offers an "Honorary Member" certificate to any amateur who works ten club members. Division Director BUO and his XYL, KMP, and SCM KJZ attended the Mesabi Club meeting at Eveleth. HPS and PYC, XYL-OM team who have an electronic shop in Orr, have applied for OES appointment. The section traffic meeting held in St. Paul was attended by 35 LOs, NCSs and interested traffic-handlers. RIQ and OPX were house guests of URQ and KJZ. KØSNC has a new DX-100 on the air. OOs LST, WMA and WAS reported 9, 1 and 1 violations, respectively. Forty-three qualified net members received Section NTS certificates. NYM reports that the Little Falls H.S. has a 250-watt c.w. rig on the air with KØQEK, QEJ, MPG, QFW, OIU and QVC active. EC MEQ reappointed KØHSK, who is building a crystal-controlled 6-meter mobile transmitter, as Asst. EC. UYR was blessed with a daughter. TKX houses the SRAC station. KNØTXP is assembling a Heath Mohawk receiver. UWG and KØDHI conduct code classes for the Winona Club. KØGIW, operated by 3 operators, made BPL during their demonstration at one of the popular super markets. A 6-band phone c.w. mobile transmitter receiver was stolen from URQ's car Mar. 18. HKF now resides in West St. Paul. After being inactive for 13 years, ZBE can be heard on 10 meters. SPMRC's secy. is KØIYW. Congrats to KØUXU on passing the General Class exam. BWM went s.s.b. KLG purchased an HQ-180C receiver. ISJ, of Duluth, spent a week end in the Twin Cities. RM KØIZD won a Blue Ribbon in a science building contest. The MARC's picnic will be held July 31, and St. Cloud's on Aug. 14. TJA is the new RO for Southern Minn. ECs FIT, FYT and LUP renewed their appointments. KØCPW is the new EC and RO for Olmstead County. FGP will enter the hospital for more eye surgery. Traffic: WØTUS 334, KØQEK 306, WØVPO 303, KØSNC 301, WØIDV 275, KJZ 218, KØGIW 141, WØISJ 108, KLG 108, WMA 102, PET 89, RIQ 82, LST 79, UMX 78, TWG 77, KØLWK 74, QBI 68, WØHEN 66, KØIZD 65, WØBUO 60, OPX 59, KØEPT 57, WØKYG 40, KØVCC 38, QVF 34, WØSBB 32, ICG 30, THY 30, UXT 30, KØMAH 27, WØNNG 25, KØJYJ 23, WØPML 20, NYM 19, KØKYK 17, WØMNY 16, OJK 16, OET 15, KØIKU 14, WØMGT 11, RGP 11, FGP 10, RHN 10, KØQLM 9, WØWAS 9, DYC 8, KØQYY 8, WØOPB 5, UCV 5, UYR 3.

DELTA DIVISION

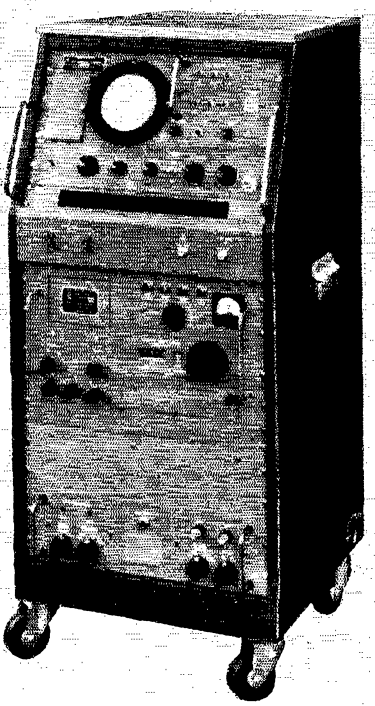
ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR. PAM: DYL. RM: K5TYW. The amateurs of this section has suffered a great loss in the recent death of FMF. Owen was loved and respected by amateurs everywhere. He was a past SCM of this section. We are most happy to hear SZJ on the air again after a year's absence. GWB is back on after being shut down for the winter. K5ISN and PBI have a new KWM-2. They will be operating from VE2-Land soon. K5JEU has a 20-A and LA-1 on the air. CYN has a 10-B driving a pair of 837s. K5ICA is returning to Lake Hamilton from Miami, where he has been operating an HT-32 driving a Viking KW. The hams at Lake Hamilton have started a radio school at the junior high school. Fine results are reported. BYJ, who is attending college out of the State, was home for a few days recently Traffic: K5IPS 117, W5SZJ 66, BYJ 5, K5GXR 4, TYW 4.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—That was a nice blowout held by the Lake Charles and Lafayette Clubs. K5VDF was master of ceremonies, VAQ comic award routine, BSR presented the Hurricane Audrey Award to club station DDL and IIY, who has been a ham since 1918, talked on old spark days. New officers of the Jefferson ARC are WZE, pres.; K5IZD, vice-pres.; K5HEK, treas.; K5SGJ, secy.; JHK, EPC and EKL, board members; SGK, publicity; MXQ, in charge of activities and entertainment. K5LKC received some MARS surplus which will get her on 2 meters. K5SBF got a BC-221 and is ready for some frequency measuring. 4LDM/5 is active on RN5, UTL, TNX and LAN, not to mention MARS, and turned in a good traffic count. CEZ is concentrating on building a mobile rig. K5CTR is ready for 2 meters with his new exciter. The Ouachita Valley ARC sponsored a ham picnic at the Fairgrounds in West Monroe May 1. JYD blew into

(*Continued on page 98*)

PTE-1 AN/GRM-33

SINGLE SIDEBAND ANALYZER

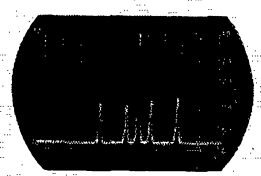


We assembled several of these for use in our own labs and test department. Actually they are the test section in the TMC GPT-10K and GPT-40K transmittters. When YOU saw them...

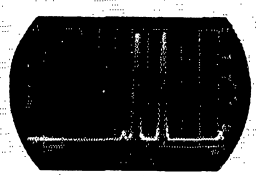
YOU WANTED 'EM!

...so now we're in full production

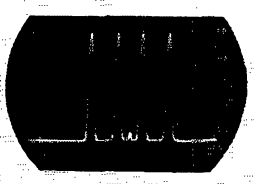
The PTE-1 Single Sideband Analyzer is a must for tuning and aligning single sideband exciters and transmitters. It presents a visual indication of distortion products, hum and noise. The PTE-1 consists of TMC's FSA Spectrum Analyzer (AN/URM-116), TMC's VOX Variable Frequency Oscillator (0-330/FR and TMC's TTG Two Tone Generator (C-579/URT).



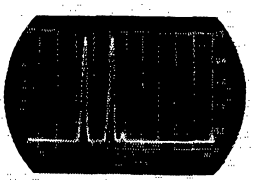
AMPLITUDE MODULATION



UPPER SIDEBAND SUPPRESSED CARRIER

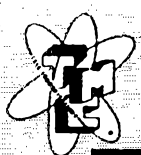


DOUBLE SIDEBAND SUPPRESSED CARRIER



LOWER SIDEBAND SUPPRESSED CARRIER

VOX BULLETIN—134
TTG BULLETIN—230
PTE—BULLETIN—231



The TECHNICAL MATERIEL CORPORATION

IN CANADA
TMC Canada ltd., Ottawa, Ontario

Main Office: MAMARONECK NEW YORK

town and blew right out. She will return home about the first of May to keep the bands hot again. A single sideband dinner was held at the Jung Hotel in New Orleans, which turned out to be an old-timers convention. Among those present were AU, EM, AXU, NO, CZ, HR, JW, BZ, AXD and CJO. FMO has succumbed to s.s.b. again and built the single sideband package using a Collins mechanical filter and a Collins PTO. It is working on 75, 40 and 20 meters so far and a GSB-1 was added to the receiver. Eyeball QSOs were held during March with QH, CEW, HRC, DMA, BSR, EGU and AUX. Traffic: (Mar.) W4DLM/5 177, W5MXQ 133, K5AGJ 67, TAN 8, DMA 4, CTR 2.

MISSISSIPPI—SCM, Floyd S. Teetson, W5MUG—The Delta Division SCMs and Director held a meeting in Memphis recently. Many problems were discussed with solutions for a few. DEJ reports that Meridian has the new club frequency of 3818 kc., and that club activity is increasing. Baldwyn is forming a new club with K5ZEA as pres. and K5ANE secy. Congratulations, fellows. Mississippi was well represented in the DX Contest. CKY reports 448,800 points and 105 countries. Congratulations, Bob. DLA is sporting new shoes with a GSB-100. Traffic: K5QNF 42, W5JHS 32, K5IIN 31.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4EJN. RM: FX. PAMs: UOT and PAH. UVP lost his 6- and 2-meter beams in the ice storm. KN4-RML passed the General Class exam and his dad, KN4RMR, passed the Conditional Class. K4KTC is operating mobile with a Heath citizen band transceiver converted to 6 meters and is working on a p.p. 4-65A final for 6 meters. ZBQ says he will be on 80-meter RTTY soon. K4FNR says he missed BPL when his rig broke down. WBK reports that K4EQK is recovering from an eye operation. DE advises that a Delta Division Convention has been approved for Chattanooga in April, 1961. FX reports that March was a record-breaker for the C.W. Net in everytring except traffic and that the net needs more traffic for the smaller cities. New appointment: K4OUK as EC. Renewal: K4KYL as OES. Thanks to TDZ and K4RIN for OO reports; to K4KYL for the OES report; and to FZ, UOT and PAH for net reports. Traffic: (Mar.) W4PL 1307, VJ 165, OGG 158, EIN 121, K4JNK 112, W4CXY 106, K4-FNR 92, W4FX 92, PQP 67, K4AMC 45, W4PFP 35, UIO 34, K4MUQ 27, W4UVL 20, K4OUK 17, W4PAH 14, UVP 12, TZG 10, DFR 7, JVM 6, K4LPW 6. (Feb.) W4HPN 18, SGI 6, TDZ 4.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert Thomason, W4SUD—Asst. SCM: W. C. Alcock, 4CDA. SEC: 4BAZ. RM: K4CSH. PAMs: SZB and K4HCK. V.H.F. PAM: K4-LOA. Our own K4BUB was the leading Official Observer for the fourth call area during 1959. Carl hasn't missed an OO report for the past two years. Liaison between our section and regional nets is very poor. One station acting as liaison between two nets is giving one net the coverage of the other and vice-versa. Each active net member should assume the responsibility of liaison one night a week. Most needed at present are KYN to 9RN, KYN to KPN and MKPN, KPN to Inter-state S.S.B. and others. CDA is planning a trip to Miami, ironically just after purchasing his first TV. KN4KWE has dropped the "N" and is active on KYN. K4PGH reports school is holding his traffic count down. K4DFZ is helping his physics class by building a transmitter. K4ZQR has a new Heath 6-meter transceiver. BAZ reports he has gout in the left ankle. ADH has been active with scatter c.w. contacts on 50 Mc. Earl hopes to add another four elements to his beam fed by a pair of 100THs. K4HTO is doing well at M.I.T. and hopes to schedule the OM, JUI, on 20 meters. K4BPY reports aurora conditions were good on 6 meters during March. OO reports were received from K4BUB, ZQR and IFB. Traffic: K4PGH 289, W4ZDB 261, BAZ 176, SUD 143, CDA 80, K4KWQ 67, CC 59, QCN 51, HCK 23, W4NUQ 18, WVU 18, K4JOP 17, W4UVH 17, K4DFO 15, VDO 15, DFZ 14, W4KKG 12, K4JLX 11, QHZ 10, SBZ 8, W4SZL 8, ADH 7, K4KIS 7, KWE 7, W4SYE 7, K4FRY 6, LHQ 6, W4YYI 6, JUI 5, K4ZQR 4, QCQ 3, IFB 1.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: YAN. RMs: SCW, OCC, QQO, FWQ. PAMs: AQA, K8CKD, K8JUG, ATB, NOH (v.h.f.). EC appointments were made to ALG and PDF, ORS to EGI and K8OTJ, OPS to ALG, OO to VPC. OES to PYQ, TIN and K8HNQ. OO EMD turns in 312 violations for the month. After the Saginaw Hamtest, FX had to get police to get his car out of the city parking lot. MGQ got a parking ticket. PYQ skeds PT on 220 Mc. and NZ working on 220 Mc. JYJ got the Cosmo Caulkins Award and LINE is "Man of the Month" at Saginaw. New officers: Kent RC—K8NTE, pres.; K8JHA, vice-pres.; K8IWI, secy.; K8HQT, treas. Up Flint way: K8IFH got the "Michigan A.P.BC Award," WXO got the

(*Continued on page 102*)

HAMMARLUND HX-500

SSB TRANSMITTER

- A 100-watt SSB transmitter for amateur and commercial use on the 3.5, 7, 14, 21 and 28 to 30 MCS bands.
- Separate dial scale for each band, or portion of 10 *k* band.
- All crystal included for all amateur bands — nothing extra to buy.
- Frequency readability to 200 cps, or better.
- Stability after warm-up better than 100 cps.
- Provides choice of upper, lower, double sideband, CW, FM, FSK for RTTY plus 40 cycle identification keyed shift.
- ALC adjustable to prevent overdrive.
- 50 ohm fixed pi output.
- Built-in antenna changeover with receiver antenna input connection.
- Adjustable RF level controls output power when employed with high power linear.
- Carrier suppression 50 db or better.
- Unwanted sideband suppression 50 db or better.
- 3rd and 5th order distortion products down 30 db or better.
- Spurious frequencies down 50 db or better.
- T.V.I. suppressed.
- VOX and anti-VOX controls conveniently located on front panel.
- Key and mike input provided on front panel.
- RF level meter range 60 db with adjustable sensitivity control.
- Self-balancing diode balanced modulator.
- Overall audio response 300 to 2300 cps.
- Shaped CW keying.
- FM-FSK center frequency adjustment on front panel.
- 60 kcs filter type SSB generator.
- Provision for metering final plate current.
- Unitized construction.

$695.00 Amateur net.

ASK YOUR DEALER—
OR WRITE FOR DETAILS

Established 1910

HAMMARLUND
MANUFACTURING CORPORATION, INC.
460 W. 34th STREET, NEW YORK 1, N. Y.
A DIVISION OF TELECHROME

For the BIGGEST STOCKS, BEST TRADES, BOLDEST

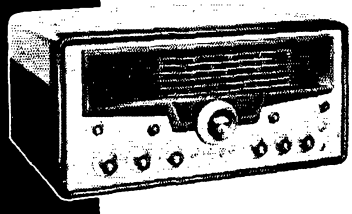
RADIO

hallicrafters

HT-37 TRANSMITTER

only $10 down **$450.00**

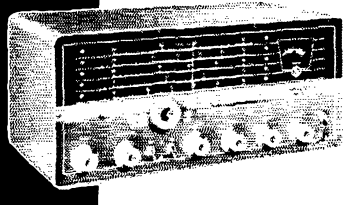
New Hallicrafters masterpiece provides high performance SSB — minus the usual high cost! Same power, same rugged VFO and VOX, and essentially the same performance characteristics as the world-famed HT-32A. Power: 70-100 watts (P.E.P.) CW and SSB. 17-25 watts, AM carrier. High stability VFO with double reduction disc drive and fixed temperature control. A host of other dazzling features! 18¼" x 9½" x 16¾" d. Ship wt. 69 lbs.



SX-101A "IDEAL" RECEIVER

$399.50
$10 down

New type product detector . . . 2 position AVC full bandspread on 10 meter band . . . band-to-band equalization . . . these and dozens more precision features in this new 5-band beauty! 20" x 10½" x 16" d. Ship. wt. approx. 75 lbs.



NEW SX-111 RECEIVER "BUY"

$249.50
$10 down

Top performance at a near-bottom price! Covers 80, 40, 20, 15 and 10 meters in 5 individual bands with a sixth band tunable to 10 mc for crystal calibration with WWV. Sensitivity 1 Uv on all bands. 5 steps of selectivity. 18 11/16" x 8 3/16" x 10 3/16" d. Ship. wt. 40 lbs.

Send for
RADIO SHACK BARGAIN CATALOGS
issued all year long!

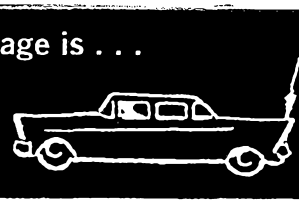
48 or more giant rotogravure pages each issue, filled with famous Radio Shack bargain exclusives in ham equipment, hi-fi, records, optics, sporting goods, etc. Mail the coupon today — save all year long!

3 RADIO SHACK STORES
730 Commonwealth Avenue, Boston
167 Washington Street, Boston
230 Crown Street, New Haven

OPENING JUNE —
Radio Shack-Stamford
High Ridge Road at Bull's Head

BARGAINS in the whole ham world, the message is . . .

SHACK

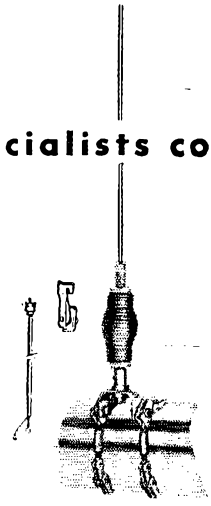


NEW from a/s the antenna specialists co.

Citizens Band or 6 or 10 Meter Band
102-INCH MOBILE WHIP PACKAGE

Sensational new A/S "mobile" antenna package, Model MB-24, includes a 102" stainless steel whip for 27 mc (and can be cut to shorter lengths for other frequencies) plus double bumper mount, 20 feet of RG-58/U cable with PL-259 connector and a whip hold-down clip. Complete — nothing else to buy! No holes to drill! Ship. wt. 10 lbs.

$19.95

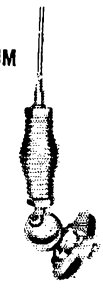


Amateurs and Citizens Band 24-50mc
COMPLETE! WHIP, BASE AND SPRING

Yes, whip, base and spring — all three — completely packaged at Radio Shack's lower-than-amateur-net price! Fits all cars, mounts on any body surface. 96" stainless steel whip, cast aluminum swivel base, 100° turn spring, removable adapter. Save! Ship. wt. 6 lbs. each.

$8.75 RUSTPROOF CADMIUM
Compare at **$14.95**

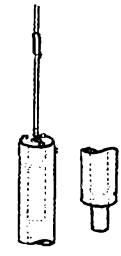
$11.97 BRIGHT CHROMIUM
Compare at **$24.95**



Citizens Band 18', 27mc
A/S ALUMINUM COAXIAL ANTENNA

Easy-to-install antenna of solid, rustproof aluminum for roof or side mounting. Jointed vertical radiator bolts to 2" dia. skirt. Underside of top radiator element accepts PL-259 connector, insert at top of skirt threaded to accept ¾" mounting pipe. Two insulating spacers included. No guy wires needed! Ship. wt. 7 lbs.

$19.95



RADIO SHACK CORPORATION, **Dept.** 6D
730 Commonwealth Avenue, Boston 17, Mass.

Please "QUOTE BIG" on my model_____

I would like to trade for the following HALLICRAFTERS:
- ☐ HT-37 Transmitter, Order No. 45DX349, @ $450.00
- ☐ SX-101A Receiver, Order No. 45DX303, @ $399.50
- ☐ SX-111 Receiver, Order No. 45DX325, @ $249.50
- ☐ Send — FREE — new Radio Shack 1960 Bargain Catalogs

Send the following A/S antennas:
- ☐ Model MB-24, 102-in, Order No. 29DX090, @ $19.95
- ☐ Whip, Base, Spring (Cadmium), Order No. 29DX065, @ $8.75
- ☐ Whip, Base, Spring (Chrome), Order No. 29DX764, @ $11.97
- ☐ Aluminum Coaxial Antenna, Order No. 29DX089, @ $19.95

Name _____ ☐ check

Address _____ ☐ money order

City _____ Zone____ State_____ ☐ c.o.d.

Station Activities

(*Continued from page 98*)

Army MARS "Member of the Month" Award. At Holland: UGG gave a good antenna talk, GCW now is on 6 meters. Three new clubs are the Ford AR League (not affiliated), Mich. Tech. ARC, Houghton, FLO, secy.; and the Twin Sault RC, K8JUX, secy.; both affiliated. BFF reports the moon eclipse caused a complete v.h.f. blackout up to 7000 Mc. K8LYY heard 30 states in all call areas on the 2-meter aurora of Apr. 1. K8BGZ wishes that more 6-meter operators would work c.w. K8HNQ, RHD and RPH are forming an EC 6-meter net for Petoskey. K8OTJ says 420 Mc. is picking up around Bay City, using BC-788 units. He also reports that the L.P. Slow-Speed Net meets Tue., Thurs. and Sat. on 3717 kc. at 2000 EST. K8AEM is using an r.f. regenerative receiver transmitter on 50 Mc. mobile with good results. K8GJD has 70 countries toward DXCC. SWF worked YV5AHW. Both K8KCO and K8EWI are using "TO" keyers. K8LPV gives up on d.s.b. K8IAX got sore hands from mounting the power supply. The Straits Area RC is getting GQN ready for Field Day. FSZ has a Navigator as a v.f.o./exciter. HKT has 10-meter phone trouble. ALG reports a local front-page write-up on communication with the Arctic Ice floe. EGI still is using an SX-11. Traffic: (Mar.) W8OCC 316, NOH 299, JKX 182, FWQ 156, K8OTJ 127, CWI 122, W8FX 122, RTN 117, YAN 59, K8JUG 56, GJD 51, W8QQO 49, K8BZL 46, W8TIJ 46, K8KMQ 37, W8ELW 32, ILP 32, JTQ 32, SWF 29, K8NAW 25, W8EU 15, K8EWI 15, HLR 15, LPV 15, IXA 12, AEM 11, W8TBP 11, K8DMP 10, W8PAX 10, KN8QLL 9, W8FDO 8, FSZ HKT 8, QIX 8, ALG 7, DSE 6, AUD 5, K8EFY 5, LOS 2, KCO 1. (Feb.) W8SCW 36, JTQ 30, K8AEM 22, KVV 13, W8AHV 10, K8CKD 5, KVM 5, YFE 3.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: HNP. RMs: DAE and VTP. PAMs: HZJ, WYS and K8HGD. I want to thank all my friends for reelecting me as their SCM. The Stark County RC's 1960 officers are K8GVV, pres.; K8DHJ, vice-pres.; and K8HZN, secy-treas. Mt. Vernon ARC's 1960 officers are K8AKK, pres.; FEM, vice-pres.; K8LFA, secy.; and OPU, treas. The club station is K8EEN with an all-band trap antenna, a DX-100 and an SX-28. The Coshocton County ARA's 1960 officers are K8BEN, vice-pres.; and K8NYN, sec.-treas. Those taking part in collecting March of Dimes funds were HEL, WMJ, K8s, BEN, BZO, CLC, NYN and KN8NSG. K8NYN received his General class license. Toledo RC's 1960 officers are GJS, pres.; K8LMI, vice-pres.; BGU, secy.; K8GOP, corr. secy.; and DN, treas. K8EJN received his WAC. K8KPK received his General class license. K8NXO received his Technician class license. GAC attended Ohio Bell school. NKG is on 2 meters. K8EKG received WWNY and Colonial Awards. NPP/Ø is operating 14-Mc. s.s.b. from Kansas. K8MPV has a new HQ-129. KN8NXO has a new Heath 6-meter transceiver. K8NXN was in the hospital for surgery. The Lancaster and Fairfield County ARC will hold its hamfest June 11 at the county fairgrounds in Lancaster starting at 9 A.M., EST. This will be a family picnic type affair. BZX, IBX and K8EKG received their W-Conn Awards. Ashtabula organized a radio club and elected KN8NSM, pres.; K8IMX, vice-pres.; K8OGP, secy.; K8HRS, treas.; with K8HYC, trustee. The Columbus ARA's *Carascope* tells us that Mr. Ederle, of Ohio State U., spoke on propagation and THU spoke on mobile whip antennas, the code and theory school has 59 students, K8IXY is home from the hospital, K8HNL is back from Florida. Those who made BPL in March were UPH, DAE, BZX and K8ONQ. Toledo's *Ham Shack Gossip* informs us that NBD was named as its "Ham of the Month." Those getting in on the 2-Meter St. Lawrence Seaway Net are ARF, GGH, NWC, SUT, VOZ, K8s, BAT, CJS, JLA, KDT, KFY, KGL, LCW, LFX, NPB, NYR, NZA, QAY, QOX, KN8s, PMI, RRY and SDY. The Toledo Mobile RA held its annual auction with more than 80 in attendance. A Post Office Net was started on 3870 kc. at 1700 EST. Employees with the Post Office are requested to check with PZD if interested or if more details are wanted. K8BTQ moved to Canton. LHY is on 75-meter phone. NP has a new Tribander. K8EML now is operating a Pacemaker. OUU has a new Gonset G SB-100. K8NWZ received his general class license. YGR hooked VK5BR/VR4 on 21 Mc. THJ is back in Picua. WKN is on 2 meters. K8SNG and KN8SVM are new hams. IBX received WBCN, OVA and WPX awards. New appointments made in March were K8DHJ as ORS; K8MTI and K8LCA as OOs; ERW, VTL, K8s, BNL and LGA as ECs. K8SUS is ex-W4FAN and K9DYE. Traffic: (Mar.) W8UPH 1414, DAE 468, BZX 275, K8ONQ 141, W8ZYU 141, K8DHJ 124, W8DQG 109, SZU 44, LT 41, OUU 36, BEW 33, AL 32, CXM 32, YGR 25, WE 24, ZAU 21, K8MHU 19, NXN 15, W8NI/8 12, K8JSQ 12,

(*Continued on page 104*)

Take your Hobby with you this Summer!

the hy-gain Trap Traveller

The hy-gain Trap Traveller is a new idea in travelling convenience — a perfect mobile antenna to spice up your vacation travelling with contacts while it streamlines the appearance of your automobile. Of the highest efficiency for the 10, 15 and 20 meter bands, the Traveller extends to over eight feet, but telescopes down to fit in any garage that will house your car. It's convenient, attractive and completely weatherproof.

Complete Trap Traveller whip and coil, designed for 52 ohm coax.

Model T3TBW $29.95

the hy-gain Micro Dipole

Wherever you stop, wherever you stay — motel, hotel or camping out — the hy-gain Micro-Dipole allows you to operate your portable ham station at top efficiency on 10, 15 and 20 meters. The complete travelling kit weighs only nine pounds and gets you on the air in less than three minutes. No tools required.

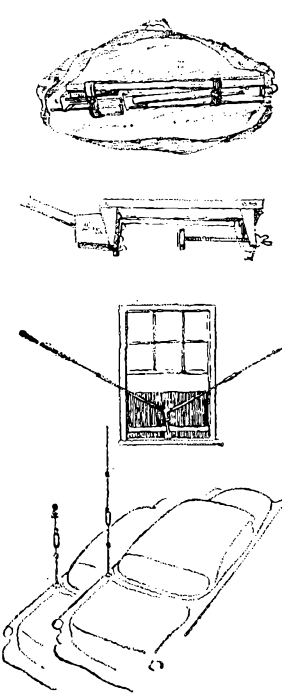
Complete Micro-Dipole.
Model T3TDK $44.95

Universal Mounting Clamp attaches to almost anything.

Model UB $9.75

Attractive Scotch plaid fabric and simulated leather carrying case.

Model TCC $8.95



hy-gain antenna products
1135 NO. 22nd ST.
LINCOLN, NEBRASKA

PERFORMANCE PROVEN MOST RECENTLY BY THE ZM7DA DX-PEDITION.
SEE YOUR FAVORITE HAM JOBBER FOR MORE COMPLETE INFORMATION.

W8LZE 12, K8MMO 10, MFY 8, BNL 7, W8WYS 7, K8HSU 5, W8IBX 5, BLS 4, EEQ 2, K8HDO 2, NCJ 2, MAZ 1 W8PZS 1. (Feb.) K8MMO 11, MFY 8, EKG 4, W8AEB 4, K8BXT 3, W8AQ 2, K8JSQ 1.

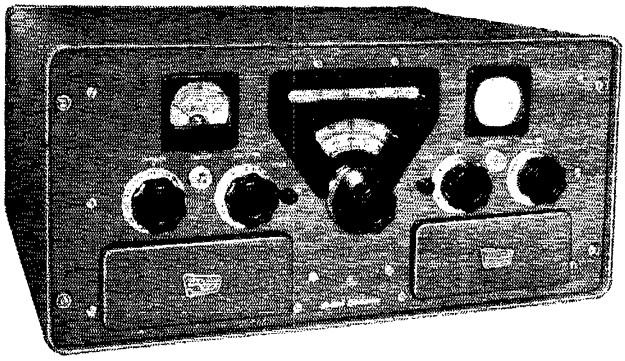
HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: W2PHX .PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; ESS on 3590 kc. at 1800; ENY (emerg.) on 29.490 (Thurs.) and 145.35 Mc. (Fri.) at 2100; MHT (Novice) on 3716 kc. Sat. at 1300. Appointment: K2BIG as ORS. Endorsements: K2EHI as OO and OPS. Around the bands: K2BFU, K2ETC and W2HUR are on 10 meters and W2AXM is on 2 meters. We are told that W2NVO is in Europe. K2BIG lost his 10-meter beam in a recent wind storm. Congratulations to K2MBU on winning a prize at the Science Fair. The Yonkers Club had a talk on "Dew Line" by a tel. co. representative at its March meeting. Schenectady Club celebrated its 30th anniversary with an "Old Timers Nite" and a display of antique gear. W2VEF reports a new WAS. The RPI Club, W2SZ, with rigs on all bands, offers message service to all students on the campus. W2LWI is running 800 watts to 4-65As on 2 meters and keeping tropospheric skeds with W4LTU and VE2LI. It's nice to hear from K2DGD in Bolivia. Cliff expects to return to the States late next year. K2CVG reports little activity on 220 Mc. and would like to see more interest in the Poughkeepsie Area. The speaker at the March meeting of the New Rochelle Club was W2NSD. The club sponsors classes for General Class licenses and new Novices graduated include WV2JZA, JZD, JZE, JZH, JZI and JZC. Congratulations. K2JQB is on the Hanifest committee of the HARC. K2BVC is a new General and new Technicians are WA2DUL and WA2-EFI. WV2IMG reports 7 states on 2 meters. Traffic: (Mar.) K2UTV 5171, K2VZI 652, K2BIG 270, K2MBU 148, W2ATA 80, W2PHX 79, K2RKY 63, K2LKI 48, K2AYB 39, W2EFU 33, K2HNW 25, K2BIO 18, WV2IMG 18, WA2ALO 1, WA2AUC 1. (Feb.) WA2AUC 7, WA2-EKE 5.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2-VDT. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. nightly at 1930 EDT and Sat. and Sun. at 1915 EDT. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EDT. NYC-LI AREC, 3908 kc. at 1730 EDT. V.H.F. Traffic Net, 145.8 Mc. Tues., Wed., and Thurs. at 2000 EDT. BPL cards were earned by W2EW and W2VDT, both on originations plus deliveries. Our traffic nets are looking forward to the return of our teenage BPLers from their school classes. W2BO returned to the air with a B&W kw. linear amplifier. Five new states raised the WAS total at K2MIG to 44. K2KXT will be spending the summer in Arizona. K2RBW and WV2IMO played Monopoly on 2 meters. K2SJP is using a Lettine 242 on 6-meter mobile. W2-LGK, Queens EC, is looking for any Queens operators who would like to organize AREC c.w. nets. The present Queens AREC nets are 29.5 Mc. at 2030 Mon. and 145.8 Mc. the same time and day. Your SCM would like to extend an invitation to any section members to organize a section AREC c.w. net. Anyone interested? K2UVV earned his WAS. A new HQ-110 is in operation at WA2EUL. A new kw final is under construction at NYU, W2DSC. K2EEK is now using a Clegg 62TIO with Filter King converters for 2 and 6 meters in front of his 75A-4. K2MFQ has upped his power on 144 Mc. A few new countries were added at K2UYG during the DX Contest. The DX Test helped K2VUI to reach DXCC 190. A new call in Islip is WV2LLP, who is on the air with a DX-40 and an SX-99. WA2CZG sends in an impressive list of DX worked on 40 meters. KØYOS, ex-K2ESZ, sends regards from Kansas City. New officers of the Amateur V.H.F. Institute are K2ZLE, pres.; W2EW, vice-pres.; K2UHF, rec. secy.; K2KQL, corr. secy.; and W2AUF, treas. Perseverance will win out—it took 37 postcards and 15 radiograms for WA2-BST to get a certain QSL card! A DX-40, an SX-99 and a TA-33JR are in operation at WA2EQN. W2UFU would like to hear from anyone interested in working with television on 420 Mc. New officers of the Tu-Boro RC are K2JVQ, pres.; W2CKQ, vice-pres.; W2YSM, secy.; W2AZC, treas.; and W2LGK, communications. WA2ISQ is on the air with a Heath Cheyenne and an NC-125. K2RVM is active on 50 Mc. with a Communicator III. W2BZU/4 is operating from his retirement home in Florida. K5YHN/2 is active with a Gonset Commander in his mobile. WA2GZD is on the air with a TCS-12 and an S-38E. Joel plans on adding a new SX-110. The James Monroe HSRC, WA2EPS, is active on 40-meter phone and c.w. Officers of the club are WV2IRF, pres.; WA2GZD, vice-pres.; and WA2CFH, trustee. W2YSM is using a Viking I and an NC-173. W2MES is now up to DXCC-110. Your SCM's luck was

(*Continued on page 106*)

THOSE "DISTINCTIVELY NEW" SIGNALS...



ARE COMING FROM 100Vs

If you've been listening on the bands you know that 100Vs are now being delivered. Their outstanding signals are setting new standards for natural sounding communications quality.

A new audio limiter followed by a perfectly tailored audio filter makes a "barefoot" 100V sound like a "well mannered" half KW.

To all who patiently waited—our humble thanks! The 100V had to meet all of our rigid specifications before a single unit was shipped out for sale.

Granted—it took a lot of time—but Central Electronics refused to use The Ham as a proving ground for new ideas.

Once you personally use the new 100V, you'll agree there's nothing so versatile, so beautifully built and so easy to operate.

COMPARE THESE SPECIFICATIONS:

COMPLETELY BROADBANDED — ONLY ONE TUNING CONTROL, THE VFO.

100 WATT OUTPUT 80 through 10 meters — PLUS generous "out of band" coverage.

OPERATES ON SSB, DSB, AM, PM, CW and FSK. NINE CHOICES OF EMISSION at the flip of a switch.

2" MONITORING SCOPE--AUDIO LIMITING--NEW "TAILORED AUDIO FILTER"--NEW ADJUSTABLE POWER OUTPUT CONTROL
UNWANTED SIDEBAND SUPPRESSION 50 DB OR BETTER
CARRIER SUPPRESSION AT LEAST 50 DB
THIRD ORDER DISTORTION PRODUCTS DOWN 40 DB

Price . . . $795

OTHER FINE MULTIPHASE GEAR
20A 10B 600L MM-2 GC-1 Model A & B Slicer

For further information, write for the new four page 100V brochure.

THE SSB PIONEER

MULTIPHASE EQUIPMENT

Central Electronics, Inc.

1247 W. Belmont Ave. Chicago 13, Illinois
A subsidiary of Zenith Radio Corp.

with him at the SSBARA dinner when he won a Gonset G-63 receiver. Good luck with Field Day plans. Your messages will reach me at W2YKQ/2. Traffic: (Mar.) W2VDT 278, W2EW 226, W2BO 134, K2UFT 116, K2MIG 103, K2KXT 96, WA2GPT 50, K2QBW 49, W2DUS 40, K2LHA 34, W2GP 30, W2UAL 25, K2JLD 24, W2OME 20, WV2IMO 18, K2YQK 18, K2CMJ 16, K2JVB 16, K2KVL 16, W2PF 15, K2BH 14, K2SJP 14, K2RHG 13, W2LGK 12, W2OKU 12, W2EC 10, WA2EGK 10, WA2BST 9, K2AZT 7, W2JGY 6, K2RKL 6, K2THY 6, K2DEM 5, K2IUT 4, K2MFQ 4, WA2GZD 3, WA2EUL 2, W2ZRA 2, K2PJL 2, WA2CSE 1, WA2DXH 1, WV2KWZ 1, K2MEM 1. (Feb.) K2DEM 35, K2JLD 22, W2LGK 14.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr., W2ZVW—SEC: WA2APY. EM: W2RXL. PAMs: K2SLG, W2REH, and K2KVR. K2UQY made BPL with a new Globe Scout. K2CEP made Extra Class. K2UKQ has all the parts for a quad. K2SRD has 80, 40 and 10 dipole fed with the same coax. Watch out for those pink tickets for harmonics! NJN held 31 sessions, had 701 attendance and handled 424 messages. W2HXP, EC, has been working on a generator for the a.c. and mobile 10-meter rig. W2BVE, at Rutgers is now going to find more time for studies. Officers of the Rutgers University ARC are W2BVE, pres.; K2SLI, vice-pres.; W1BPW, act. mgr., K2JLQ, treas. K2JOQ is back in New Jersey after a saint as /8. K2PVH is using a new 100V. W2RZO is so busy with unimportant things, like council meetings, that he can't get to radio club meetings. The NJ 6 and 2 Net held 10 sessions; 130 answered the roll call and handled 16 messages. K2CBG has a new Hy-Gain 10-40-meter vertical. K2EQP still is slaving over a hot s.s.k. W2CVW worked 4 new countries in the DX Contest. K2AGJ now is working DX on sideband. K2THC has a busy traffic schedule. K2BWQ was again in the hospital. K2UCY, again BPL, sure works hard. W2VMQ needs more KZ 5s for 25. WA2CCF received 1st-class radiotelephone operator's and amateur General class licenses. W2EWZ improved his note on DX-40 by building a separate power supply. The NJPN held 31 sessions; 893 stations reported and handled 207 messages. K2GIF now is working on uncompleted antennas. K2QGD has a new NC-109. K2PTI moved into a new shack, but now has to move the antennas. W2CFB is busy making his station a good OO. OO K2OPI, with the aid of W2LHS and W2SLZ, used DF to find a 2-meter Gonset which had accidentally been left on. It took 55 minutes. K2TWZ is trying 2 meters with a Gonset, but prefers 6. W2CQB is the new prexy of the GSARC. K2UBW is making a Monmouth County call book. Traffic: K2UCY 510, K2THC 244, K2ZIIK 221, WA2APY 181, W2RXL 180, WA2CCF 177, WA2COO 130, K2UQY 114, K2VVL 112, W2EBG 90, K2VNL 90, K2MFF 70, W2ZVW 51, WA2IAT 40, K2GIF 35, K2CBG 26, K2LWQ 26, W2DRV 24, K2PVH 24, W2BSC 22, WA2GUI 18, WA2AKM 17, K2SLG 13, K2VAB 12, K2AGJ 10, W2BVE 10, K2JTU 9, K2LXL 8, W2AZZ 6, K2EQP 6, K2TWZ 4, K2UKQ 4, W2EWZ 3, K2QGD 3, W2RZO 3, W2CFB 2, W2CJX 2, K2UBW 2, K2SRD 1.

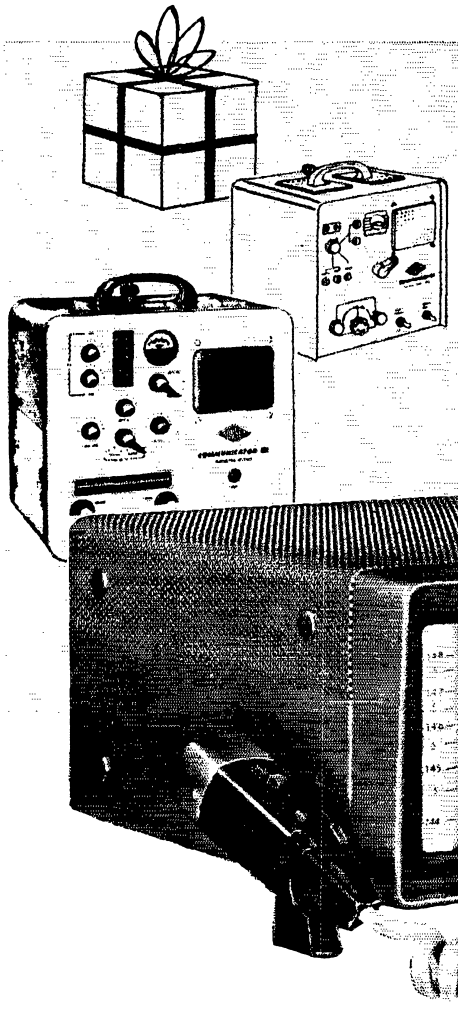
MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—KØBXO reports that the Woodbury County AREC in cooperation with the Sioux City Clubs, handled emergency Red Cross messages during the recent flood there. ERG and KØEMH, of South Sioux City, were fixed stations. New officers of the Central Iowa Club are KØEAA, pres.; TFW, vice-pres. EFL was reelected secy.-treas. The Iowa 75 Meter S.S.B. Net had 28 sessions with 17 messages handled and 649 QNS. The 75 Meter Phone Net had 27 sessions with 103 messages and 1732 QNS. The 160-Meter Phone Net handled 35 messages with 756 QNS. The Hamilton County Net reports 166 stations QNI. The Central High Club of Sioux City, LNI, operated fixed portable from Elk Point, So. Dak., during the ARRL DX Contest. The O'Brien County Amateur Radio Assn. is working toward getting a 6-meter net organized. VRA and KØLXL renewed their EC appointments. KØVDY received an OES appointment. KØOTT is a new General class licensee in Sioux City. KNØZDE, of Fort Dodge, now has his ticket. NYX renewed his ORS appointment. KØEAA is now on s.s.b. with a Heathkit s.s.b. adapter to his DX-100. IFX received a TLCN certificate. Traffic: WØBDR 2256, LGG 1641, SCA 1629, LCX 1222, KØAUC 122. WØBLH 119, IFX 78, NTB 57, KØMMZ 47, WØQVA 37, KØEAA 26, WØBTX 23, KØHBD 20, GXP 15, WØJPJ 11, KØJCQ 10, SEW 10, WØYDV 10, KØAPL 9, KAQ 9, WØFMZ 8, QVZ 7, NGS 6, KØDKA 5, JGM 5, WØREM 5, KØLBP 4, WØNYX 4, WØHTP 3, KØGEY 2, WØEEG 1.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: IFR, Asst. SEC: LOW. RM: QGG. PAM: VZM. V.H.F. PAM: HAJ. 1UB was presented with the W-Conn. Award by the Williamantic Junior Chamber of Com-

(*Continued on page 108*)

A dozen years ago.. Gonset wrapped VHF into a tidy "package" and "Communicator"—the most widely used, commercially-produced 2-way equipment in amateur VHF history—came into being.



Down through the years, in step with VHF technology advances, Gonset has continued to set the pace with other, improved Communicators--Model II . . . Model III and now . . . again **"packaged"** for fullest operating flexibility and convenience . . .

COMMUNICATOR

New . . . brilliantly new . . . throughout. Handsome, industrial-designer styling provides finger-tip operating convenience—an outer housing with desirable "form factor" which facilitates carrying . . . lends itself to horizontal or vertical mounting. Now . . . **for a new decade, an even finer VHF "package", *Communicator IV!***

ADVANCED DESIGN FEATURES . . .
For the receiver . . . latest, frame-grid VHF tubes in front-end for excellent noise figure . . . . triple conversion with crystal controlled first conversion—ANL—Squelch.

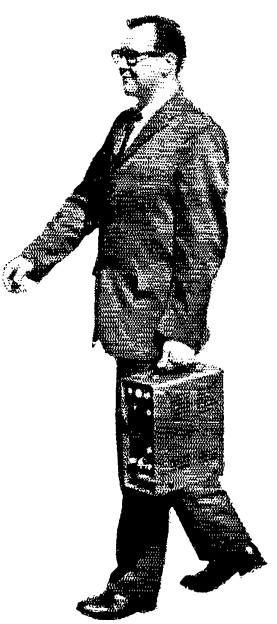
For the transmitter: 20 watts input . . . . broad banded RF driver stages minimize tuning controls. P-P 6BQ5 modulators delivering more than 10 watts of audio. P-t-t-operation . . . high quality ceramic microphone supplied.

For the power supply: 12V DC/117V AC merely by changing cables. Transistorized DC supply eliminates vibrators.

Highlights: Frequency range, 143.7 to 148.3 mc. *Receiver noise figure*, 4 to 5 db. Sensitivity, 0.4 μv 10 db S+N/N. Noise figure 4 to 5 db. Receiver tubes: 6ER5 RF, 6ER5 1st mix. 6J6 xtl osc. and multiplier. 6AV6 2nd mix. 6C4 tunable osc. 6BE6 3rd conv. 6BA6 1st I-F, 6BA6 2nd I-F, 6AV6 det.—AVC rect, 1st aud amp. 6AL5, ANL, squelch, OB-2 volt. reg.

Transmitter tubes: 6360 fin. amp. 12BY7A xtl osc—tripler. 12BY7A, tripler, 12BY7A doub-driver. 7059 speech amp.-phase inv. 2—6BQ5's P-P modulators.

Dimensions: 5"H, 9½"W, 13"D. 21.8#.



SEE COMMUNICATOR IV AT YOUR GONSET DISTRIBUTOR SOON.

GONSET *Division of Young Spring & Wire Corporation*
801 SOUTH MAIN ST., BURBANK, CALIFORNIA

EXPORT SALES: WESTREX CORP., 111 EIGHTH AVE., NEW YORK 11, N.Y.

merce. TOL now is driving his 600L with 100 volts with a very nice signal. KØTNW made 66 contacts in connection with the AREC; attended two club meetings and gave one Conditional Class exam. He plans to set up in July for the Boy Scout Camporee. KØJMF, LAD and OOH are holding code and theory classes at the National Guard Armory in Topeka. The WARC, of Wichita, has issued the following WAK certificates: KØAYS, WØMXG, IFR, KØEQY, BCZ, JWD, WØPLN, CKV, KØIRL, IKZ, RFR PIE and JVX. Asst. SEC, LOW and Colby Area hams, WOB, VDF, VGE, KØIFI, RXR, RXS, RXT and RXV held a monthly meeting of the Wheat Belt Radio Club with about 70 in attendance and received a nice write-up in the *Colby Tribune* on their ability in emergency communications. Newton Club pres., was selected as the Newton Ham of the Month. KØEHI has received recognition for his work in participation of Moonwatch was presented with a pin and certificate from IGA. Your SCM sends thanks for the radiograms, cards, etc., received while he was in the Company Hospital at St. Louis. Traffic: (Mar.) WØOHJ 865, BLI 408, KØHGI 165, WØSAF 147, ABJ 119, QGG 104, TOL 102, SYZ 97, KØJVX 80, WØUTO 75, FNS 70, KØBXF 54, WØIFR 41, KØHVG 35, W5RDP/O 26, WØVXM 26, GJG 18, KØLJH 18, 1QA 18, SMQ 17, WØRJF 16, KØTNW 13, KMZ 11, IZM 10, EFL 9, WØWFD 9, FDJ 8, FHT 7, KØGIG 7, QWN 7, QKS 6, WØLOW 3, KØJID 2, KØGEL 1, QOB 1. WSTC 1. (Feb.) KØLVW 67, JVX 26, QWN 14, KQA 9, GEL 6, WUG 2.

MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØLTP. RMs: OUD and QXO. PAMs: BVL, OMM and KØKLQ. Net reports: MON, no report received. MEN (3885 kc. Mon., Wed. and Fri., 1800 CST) 13 sessions, QNI 407; QTC 106; NCS; OHC 4, DFK 3, OVV 2, OMM 2, KØOLW 1. Officers of the HARC (Kansas City) are CH, pres.; KØAEU, vice-pres.; KØLIQ, secy.; KØAWT, treas.; UHB, act. ch.; MWU, tech. ch. The HARC reports a very interesting lecture and demonstration of RTTY was given by ATM, pres. of MARTS (Midwest Radio Teletype Society) at the March meeting. UHB gave a talk and demonstration to the patients and staff of the Veterans Administration Hospital Kansas City during which actual contacts were made with his ham gear and a window sill vertical on 28.5 Mc. with stations in W6-Land. Dedication ceremonies of the SWMARC station (Springfield), EBE, were held Mar. 20 at the Red Bross Bldg., Springfield. This station has been set up in memory of the late EBE by contributions of the club members. Formal dedication ceremonies were performed by YWS followed by a history of the club and a background of EBE's club activities given by HUI. The SEC reports a very interesting evening spent at a club-organizing and ARRL affiliation meeting with the group at Mexico. RCV and SZT are on the same eight-party land line. They have set up a continuously operating 144-Mc. link to circumvent delays experienced on the land line. KØUVL is reporting as a new member of MON. KØJPL, FNN and KØLTK report interesting DX on 14 and 28 Mc. GBJ has a new HQ-170. KØSGJ would like a sked with a Spanish-speaking ham. Traffic: (Mar.) KØKBD 667. LTJ 355, WØOMM 348, KØONK 298, WØOUD 184, VPQ 150, KØSGJ 134, QCQ 111, LTP 106, WØBVL 89, KIK 80, KØBLJ 76, WØZBR 76, OVV 76, ARO 62, BCK 62, BUL 62, WAP 62, TPK 51, WØZBR 76, OVV 75, ARO 62, BCK 62, BUL 62, WAP 62, TPK 51, KØOEP 21, MMR 19, WØGBJ 14, PXR 9, KØIHY 2. (Feb.) KØFCT 1384, KBD 516.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—The Nebraska 75-Meter Emergency Phone Net QNI 557, QTC 56. KØDGW reports the Morning Phone Net had QNI 832, QTC 195. NIK reports the Western Nebraska Net had QNI 817, QTC 792. NYU reports the Nebraska Section C.W. Net had QNI 280, QTC 193, with 31 sessions. On Mar. 20 the N.E. Nebraska Radio Club organized a net with KØLDO, in Omaha, as net manager. The following Saturday it was declared an emergency C.D. net with stations at C.D. Hq. in Lincoln and Dodge County; also the National Guard Hq. This net operated continuously with no interuptions until Apr. 3, handling all communications for c.d., Red Cross, National Guard, state and county officials. The following stations participated: KØLDO-NC, YSK, APS, GHM, NBO, HQZ, VNI, LFJ, JAJ, ZUT, DHO, AZH, WOU, EXK, TNF, FXH, NVE, FDG, UVU, UVO, VBR, ADK, AZC, OKO, RCH, RMO, VFT, PQR, DIK, ZPG, YMU, PQP, AGP, QHG, IYB, UEV, YDN, NZ, MKP, LPF, AQQ, ERW, SPD, OSO, LEF, TKK, RYG, MAO, KVM, SPV, PNV, DFF, BHY, GCJ, UIO, KØHKE, HMZ, QGV, ORM, LQE, ABT, ISH, RBJ, OFM, IWQ, CBP, JJY, JFN, HQE, DUU, SCN, DVW, EVB, HJK, RGE, DEG, YZM, JLQ, SNU, GZD, KKJ, HUH, KXV, HPT, TOM, BRS, AIR, PCY, W3AYY, W5KBF, W8-TWS, W8AEC, W4OXA, W9IDA, W9JXV, W9DKA and W9KOY. This net was 100 per cent s.s.b. except for some mobile stations. Traffic: WØGGP 689, KØQFK 278, WØNYU 200, KØDGW 184, RRL 138, WØZJF 128, KØIJW

(Continued on page 110)

WHITE HOUSE ARMY SIGNAL AGENCY
THE WHITE HOUSE
WASHINGTON 25, D. C.

30 March 1960

Mosley Electronics Incorporated
4610 N. Lindbergh Blvd
Bridgeton, Missouri
ATTN: Mr. George E. Mobus

Dear Mr. Mobus:

It is with pleasure that I forward our commendations and appreciation to the Mosley Company for the service rendered this Agency during the recent South American trip of the President of the United States. The flexibility of your company to meet special requests is to be admired in this modern day of fixed contracts and production schedules.

The performance of the special TA-33 Beam Antenna was exactly as represented. Our operations and installation personnel expressed complete satisfaction regarding ease of assembly, matching, radiation pattern and the quality of workmanship especially the performance in high winds and adverse conditions.

May we in this Agency extend our personal thanks for your consideration and expediting actions which assisted greatly in making our mission a success.

Yours truly,

Alton R Hart W4FB

ALTON R. HART
Chief Engineer
White House Army Signal Agency

(Advertisement)

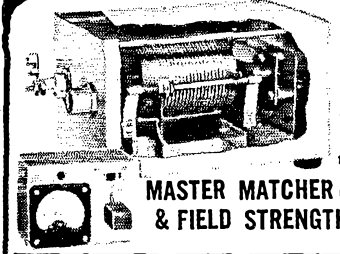
114, KKJ 112, KUA 85, SCM 85, ULQ 84, WØNIK 54, KØTUH 54, KJP 52, UQN 48, LZS 44, V1A 42, WØRJA 35, OCU 33, KØROP 33, CYN 32, WØPZH 31, KDW 25, KØMZV 24, WØOKO 24, KØKTZ 23, WØBOQ 19, YFR 17, KØMSS 16, SBP 14, KØUWK 14, WØVEA 14, ZOU 11, HOP 8, VZJ 8, HTA 7, EGQ 6, KØLFJ 6, WGP 6, CDG 4, WØLJO 4, KØODF 4, WØPDJ 4, KØMRS 3, KJL 2.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—SEC: EOR. RM: KYQ. H.F. PAM: YBH. V.H.F.: PAM: FHP. Traffic nets: CPN, Mon.-Sat. 1800, Sun. 1000 on 3880 kc.; CN daily 1845 and 2200 on 3640 kc.; CVN, Mon., Wed. and Fri. 2030 on 145.98 Mc.; CTN, Sun. 0900 on 3640 kc. AW made BPL. VW spent Jan. and Feb. in Florida. FYF has gone s.s.b. with a GSB-100. The Tri-City ARC has moved its meetings to the Jordan Firehouse in Waterford. K1DIJ is on 50.15 Mc. with 45 watts. OHR lost part of his G4ZU beam during the DX Contest. FHP advises that CVN had 86 stations check in during 12 sessions. Traffic totaled 13. High QNI goes to FHP, 12; KN1KGI, 11; HJG, K1AQE, 10; KN1KEA, K1DDY, 7. Seventy Connecticut hams gathered at Forestville for the Seventh Annual Net get together. New officers of the Stamford ARC are TLZ, pres.; K1JJV, vice-pres.; NER, treas.; K1DIJ, secy. Programming an IBM 305 RAMAC computer cuts down hamming time for BFS. K1EJO has a new HT-32A. K1JWC was appointed chairman of the Candlewood ARA Field Day project. The Stratford ARC elected SBR, pres.; K1IPW, vice-pres.; KZX, secy.; RFJ, teas. K1HKH has a new final using a pair of 813s. KN1NKX is active on 2 meters. AMJ is QRT until his new home is finished. New Novices in Waterbury are KN1NVY and KN1NZM. KN1KMT dropped the "N." EQC is back on 2 meters after an absence of two years. KN1OAO and KN1OAP are new Novices in Stratford. New officers of the Manchester RC are YMS, pres.; HAC, vice-pres.; K1LNJ, secy.; K1JTX, treas.; K1EFJ, *Short Skip* editor. KYQ reports the first session of CN handled 334 messages during 31 sessions. Average attendance was 16 stations. The second session handled 95 messages and had an average attendance of 5 stations. High QNI goes to K1GGG, K1JAD and RFJ. ZTQ has a new final tube for his Globe King rig. DNJ has a new s.s.b. rig. FOM is about ready to fire up a 4X250 on 220 Mc. LGE worked Ohio, Va. and W. Va. during a recent 2-meter opening. YOL has moved to Washington, D. C. YBH advises that CPN handled 291 messages during 31 sessions, and had a daily attendance of 29 stations. High QNI were K1AQE, YBH, 31; FHP, LWW, VQH, 30; K1BSB, DAV, 29; K1AAE, IHG, TVU, 28. New appointments: K1IVR, NWE, ZKQ as OOs; HJG as OES. Appointments renewed: ROX as ORS; FOM as OES; FPF as EC; GIX and RAN as OO; GIX as OBS and OPS. Reports received: OES from FOM, FVV, LGE and YOL; OO from K1EFI, K1IFJ, K1IVR, TYQ and VW. Traffic: (Mar.) W1AW 381, OBR 372, YBH 229, EFW 208, K1JAD 173, W1NJM 163 ROX 127, CHR 91, K1HWF 89, W1BDI 51, TYQ 50, K1CAK 46, W1FHP 41, RFJ 39, K1AQE 28, HAN 20, GGG 16, BSB 14, W1CJD 14, CUH 14, K1LAH 12, W1VIY 11, K1CBV 10, DGK 10, W1RRE 7, HJG 4, JZA 4, WAZ 4, BFS 3, FYF 3. (Feb.) W1NJM 210.

MAINE—SCM, Jeffrey I. Weinstein, W1JMN—SEC: JMN. PAM: BXI. RM: EFR. The Sea Gull Net meets Mon. through Sat. at 1700 on 3940 kc.; the Pine Tree Mon. through Fri. at 1900 on 3596 kc.; the Maine Slo-Speed Net Tue., Thurs. and Sat. at 1730 on 3726 kc. New appointments: BX and JDA as OBS, MJN as OO, GVQ as ORS. Your SCM expresses his sincere thanks to all the amateurs who helped make the March State of Maine QSO Party such an overwhelming success. The turnout of stations in the contest clearly indicated that amateurs in Maine want more competitive activities to help build their operating skills and abilites. This Party will be a regularly-scheduled event. Congratulations to the Spud Pickers Amateur Radio Club on becoming an ARRL affiliate. I had the privilege of personally presenting the club charter to K1HLE, pres. K1GPW is pres. of the newly-formed Skowhegan Radio Club. K1BXI reports that the club is issuing a certificate to any station in New England that works 6 Skowhegan stations. Details can be obtained from any station in Skowhegan. CXX is doing well on 6 meters, and sending in fine monthly OES reports. BPM has WAS worked on 20-meter phone. SWX has a new HQ-170. DPG is now on s.s.b. with an HT-32. BDQ is highly pleased with his DX-100. KN1NSM is a new Novice in Westbrook. I hope to meet all of you at the Augusta June 19. The Augusta Radio Club is putting on the shindig again this year. Don't forget to send a Field Day message to your SCM for extra credit. JMN will be on during the Test; see you then! Traffic: (Mar.) K1KSG 49, W1EFR 32, K1DPM 32, K1BZD 28, K1GVQ 25, W1GRG 22, K1MJN 16, K1BDQ 14, W1JMN 14, W1SWX 7, W1OTQ 5,

(*Continued on page 112*)



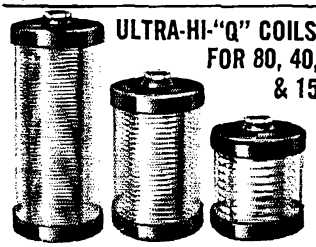
6 or 12 volt models

Complete **$24.95**

Automatically tunes entire band by remote control.

MASTER MATCHER & FIELD STRENGTH METER

ULTRA-HI-"Q" COILS FOR 80, 40, 20, & 15 METERS



Your Choice **$5.25 ea.**

The coil with the highest "Q" ever obtained. Tested and found to have a "Q" of well over 515. Use with 36" base sect. 60" whip. 3" Dia.

NEW! SLIM-JIM ALL-BAND BASE LOADING ANTENNA COIL

96" WHIP

FOR 10, 11, 15, 20, 40, 80 METERS

SIZE 1⅜" x 19"

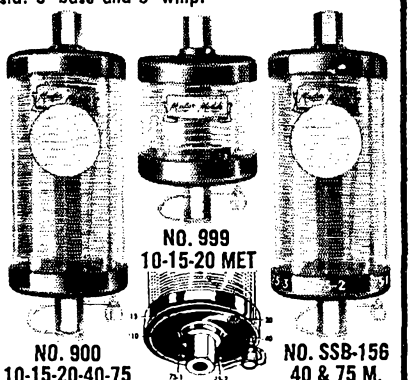
Positive action, just slide whip in or out to loading point and lock nut into position.

NO. B-1080

$17.95

MULTI-BAND ANTENNA COILS

New Plug-in type coils, designed to operate with std. 3' base and 5' whip.



NO. 900 10-15-20-40-75

NO. 999 10-15-20 MET

NO. SSB-156 40 & 75 M.

- Rigidly tested & engineered—found to have "Q" of 525
- Handles 500 Watts input
- Operates into a 52-ohm cable
- Positive contact—noisefree, troublefree operation
- Weathersealed
- Factory pre-tuned—no adjustments needed.

YOUR CHOICE EA **$14.95**

FIBRE-GLAS WHIPS

The Feather-Weight Antenna with Spring-Steel Strength!

Completely weather proof, breakproof antenna with special flexibility that prevents accidental shorting-out against overhead obstructions which can cause loss of signal, serious damage to equipment.

FG-60 60" $4.95
FG-72 72" $4.95
FG-84 84" $5.15
FG-96 96" $5.25
FG-103 103" $6.95

Leaders in the Design and Manufacturing of

Communication Equipment & Antennas

FOR LAND, SEA AND AIR

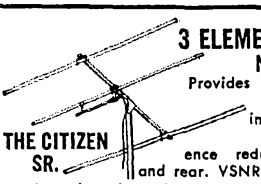
MONOPOLE ANTENNA

Folded radiating element for installation requiring a ground plane configuration and a wider useful range.

11 Met. . $24.50
10 Met. . 24.50
6 Met. . 16.95
2 Met. . 14.95

SR-600

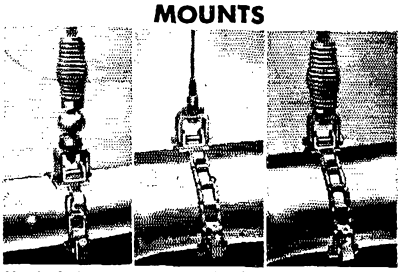
3 ELEMENT 11M. BEAM NO. SR-500



THE CITIZEN SR.

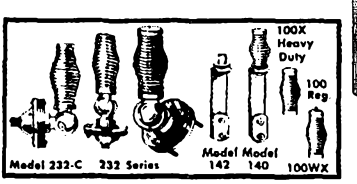
Provides a power gain of approx. 2½ (8DB) in forward direction. 10 to 1 interference reduction from sides and rear. VSNR-1. 1 to 1 at band center when fed with 52 OHM coax. . . **$36.00**

MOUNTS



No.444 $17.80 No.445 $7.95 No.446 $13.45

Adjustable to any bumper. No holes to drill.



MASTER-MAGIC WAND

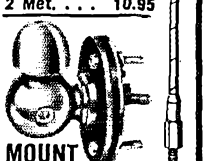
New easy-to-install, single band, top-loaded plastic covered fiber glass antenna provides maximum performance at the most useful radiation frequencies.

10 Met.- 5 Ft. L $8.95
11 Met.- 5 Ft. L. 8.95
11 Met.-35 In. L. 8.95
11 Met.-45 In. L. 8.95
15 Met.- 5 Ft. L. 8.95
20 Met.- 5 Ft. L. 8.95
40 Met.- 6 Ft. L. 9.95
80 Met.- 6 Ft. L. 9.95

SKYMASTER COAX ANTENNA

Gets your signal through where others fail. Concentrates signals at the lowest angle, provides omni-directional pattern for best coverage. Matches RG 59/U Cable. SM-700

11 Met. . . . $17.95
10 Met. . . . 17.95
6 Met. . . . 15.95
2 Met. . . . 10.95



MOUNT

Smaller version of Master Mobile Mounts, less spring. Swivels, mounts in all positions. ⅜"-24 thread for Magic Wand, and all Master Antennas.

No. J-11 **$2.95**

11M. CITIZEN BAND ANTENNA

40" base loaded S.S. whip antenna. Fitted with a ¼" dia. brass slug for all-purpose mounts. Low standing-wave ratio on most of band when fed with a 52 ohm coax.

8B-27 **$12.95**

CITIZEN BAND ANTENNA 26.960-27.225 MC

VSWR under 1.5:1 at resonance. Complete with 50' RG 58/U Cable. Swivel type antenna base for flat or peaked roof installation.

GP 27-11 **$34.50**

WRITE FOR FREE CATALOG

All products are for Universal Use-Mobile, Home, Marine, C.A.P., Civil Defense, Emergency, etc.

ELECTRONIC INDUSTRIES ASSOCIATION EIA EST. 1924

Master Mobile Mounts, Inc.

4125 W. JEFFERSON BLVD. • LOS ANGELES 16, CALIF.

AT LEADING RADIO JOBBERS EVERYWHERE

K1DYG 4, W1SWX 3, W1TKE 2. (Feb.) K1MJN 18.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—BL is our State Radio Officer, AOG our SEC. LVK Medford and BHD Everett are new ECs, K1JIU is ORS, K1JML and K1KUY are OESs. Appointments endorsed: 1PZ Shirley, SPL Sector 1-C, QQL Sector 1-F, BCN Sector 2-C, BEI Medfield, HRY Wellesley as ECs; K1ADH, CZW and HIL as OPSs; K1ADH, SPL and BCN as OBSs; SMO, FJJ, CZW and MIX as ORSs; NF, THO and LGO as OOs, THO as PAM for 6 meters. Heard on 75 meters K1s ABQ, LNV, IMU, W1s MSF and GFO. K1IOE is starting up a Chess and Checkerboard Net on 146 Mc. On 2 meters: K1s NOA, JBL, MPF, NPL, LLU, BPJ, KN1NNN, KN1NCY, W1ZSD, UVC, HU and XFD. K1AFF's son is K1NPS/VO1. OFK is Net Manager of the Eastern Mass. 2-Meter Net, which had 31 sessions, 550 stations check in and 330 messages in March. AKY is not feeling well so is taking it easy. The Braintree Club held a social meeting. K1KUY and KZU set up a station for a science fair at the high school on 2 and 6 meters. Framingham Club held a "Novice Night" with QVK, HZA, HJP, and K1HTK helping out. K3BYJ/1 is living in Walpole. CTW spoke at a QRA meeting. KN1NOA and RJS are on. KN1NIZ is the 10-year-old sister of K1-HYF. YYI and VIN have been reappointed Radio Officer and Alternate RO. K1MHC and KSJ have formed a Mass. 2-meter informal net on 146.250 Mc. Tue. and Fri. at 1900 and Sun. at 1400. The El Ray Radio Club had a talk and slides by Ray Ellis on his trip to Russia. K1MBU is new in Attleboro. To all ECs: AOG, our SEC, would like to receive your monthly reports. Give him your support. The South Shore Club held an auction with quite a crowd present. On 6 meters: IFD, IHO, JHY, K1s BIO, CKT, CWE, DOM, EBS, EGN, GKA, HRM, HSR, HDJ, IFQ, ISL, ISA and JML. KN1NVE, Dennisport is on several bands. AYG is working out of Groton, Conn., most of the time. LVF is in Mississippi with the Air Force. HIL is on s.s.b., 80-10 meters. AOG has a certificate for All Mass. Counties. TJW is getting back on 2 meters and has a new 60-ft. tower. W-CONN awards have been issued to TY, NJL and IIG. K1ADH is busy at school. K1BNA gave a talk on Silk Screen QSL cards to the Chelmsford Club. He is on 80 and 75 meters. K1KHQ is on 15 meters. UJA has a new Apache. KN1MXF is new. K1DIO heasd VE1BC and K2GTO on aurora on 6 meters. K1JIU worked every continent in one day. K1LKI has a 35-ft. tower and a three-element beam. BGW made WAC on RTTY and WAZ on c.w. K1HWB has a vertical on the air. K1JXU is on 10 meters. LJS, Radio Officer and EC for Sector 2-B, is doing a fine job. TZ held a meeting of all Radio Officers in Sector 2-D. Area 1 held a meeting at Topsfield which was well attended. The T-9 Radio Club met at WNK's QTH. NJL is going on 6 meters. The Concord C.D. group rode in plows during the recent blizzard. NOR is Radio Officer, K1LJK EC and K1KUG asst. EC for Rehoboth. K1BYV is asst. mgr. of the Eastern Mass. Novice Net on 3733 kc. K1KAW has a new dipole for 80 meters. AAR has a beam for 6 meters. K1GTX is home and feeling better. OFK had the mumps. PEX has a Heath Seneca. QFO was sick. K1BYV is E. Mass. Net representative to late 1RN on Wed. LGO is busy at school. K1JCU is K1JBL's son and has a homebrew 6/6 beam. LMZ has a new 4X250B in a silver-plated coax tank circuit and worked 5 new states on aurora on 2 meters. K1KEC is now Tech. Class. AHE has the rig all set for 220 Mc. KN1MVN, Sudbury, is on 2 meters. K1MMQ reports the Hudson Traffic Net had 31 sessions, 411 QNIs, 204 traffic. EMNN, on 3733 kc., had 8 sessions, 35 QNIs, 8 traffic. POL is home from the hospital. K1JXU has an SX-101,100-watt rig on 10 meters. K1HWB is on several bands. K1DSS has an Eico 720 transmitter and an HQ-120 receiver. K1MHC is a new OES. The 6-Meter Cross Band Net handled 287 messages in Feb., 301 in Mar. K1KAS is Tech. class. OFK is the new EC for Somerville. K1IMP has been endorsed as OO. Our Mass. Phone Net is very active and for Jan., Feb. and Mar. call-ins were 424,475 and 499; traffic 364,348 and 348. As NCS AWA handled 51, ZOP 25 on one night. RQZ is back on with 2-B net. Traffic: (Mar.) K1MMQ 1253, W1AWA 514, PEX 432, EAE 247, K1GNR 170, W1ZSS 157, K1-BYV 149, JAW 125, W1OFK 112, K1DIO 69, DGI 65, W1AUQ 64, HGO 61, K1JCC 59, W1AKN 54, W1DOM 51, K1IXT 51, BGK 48, W1NJL 39, K1DTJ 36, W1KXT 35, SIV 31, K1GYM 26, W1RQL 25, K1JIU 22, W1TWG 21, K1JBL 18, JOV 16, MHC 14, NPL 13, W1VYS 13, KN1-LLU 12, K1LLX 10, W1AAR 8, K1CMS 7, LKI 6, W1MIX 6, K1LJK 5, W1BGW 4, K1EJW 4, LCQ 3, W1ALP 2. (Feb.) K1KBO 1188, W1AWA 547, K1HCH 481, HWB 77, CMS 16.

WESTERN MASSACHUSETTS—SCM, Percy O. Noble, W1BVR—SEC: BYH. RM: DVW. PAM: DXS. The WMN meets on 3560 kc. at 7 P.M. Mon. through Sat. The MPN meets on 3870 kc. at 6 P.M. daily. Out of

(*Continued on page 114*)

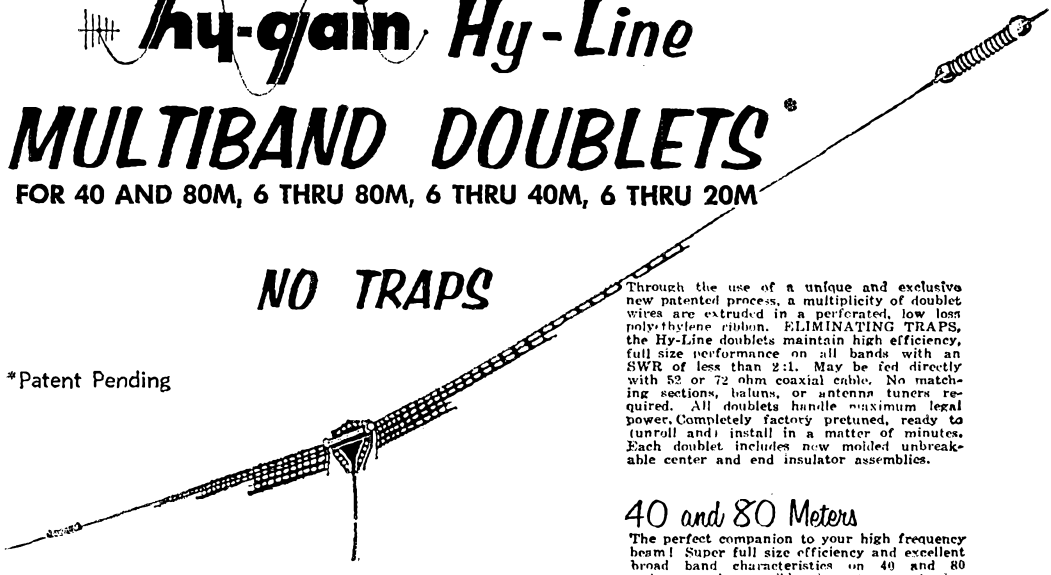
hy-gain Hy-Line

MULTIBAND DOUBLETS*

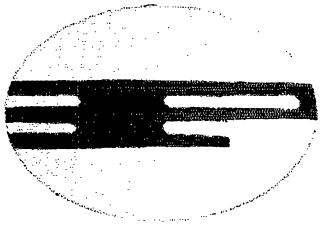
FOR 40 AND 80M, 6 THRU 80M, 6 THRU 40M, 6 THRU 20M

NO TRAPS

*Patent Pending



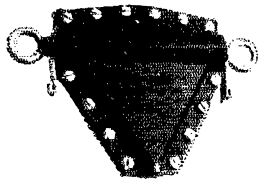
Through the use of a unique and exclusive new patented process, a multiplicity of doublet wires are extruded in a perforated, low loss polyethylene ribbon. ELIMINATING TRAPS, the Hy-Line doublets maintain high efficiency, full size performance on all bands with an SWR of less than 2:1. May be fed directly with 52 or 72 ohm coaxial cable. No matching sections, baluns, or antenna tuners required. All doublets handle maximum legal power. Completely factory pretuned, ready to (unroll and) install in a matter of minutes. Each doublet includes new molded unbreakable center and end insulator assemblies.



40 and 80 Meters

The perfect companion to your high frequency beam! Super full size efficiency and excellent broad band characteristics on 40 and 80 meters made possible by stagger tuning principle. Actually four individual extruded line doublets (two on 40 meters and two on 80 meters) in simultaneous use maintaining low SWR and best possible band pass. Complete with center and end insulators (less feedline), net weight only 4¾ pounds. Overall length 130'.

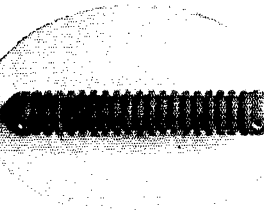
MODEL NO. 2-BD $34.95



6, 10, 15, 20, 40 and 80 Meters

At last a highly efficient all-band doublet that operates as well on the high frequencies as it does on 40 and 80 meters. Overall length 130'. Net weight only 5 pounds. Complete with new molded plastic center and end insulators.

MODEL NO. 6-BD $37.50



6, 10, 15, 20 and 40 Meters

For the ham who doesn't have space for the 80 meter section, 6 through 40 meter coverage in an overall length of 64'. Complete with new molded plastic center and end insulators. Net weight only 3½ pounds.

MODEL NO. 5-BD $29.95

6, 10 15 and 20 Meters

Only 32' long! Installs almost anywhere - rooftops, attics, etc. Excellent for portable or temporary operation. Rolls up into a small package for easy handling and transportation. Complete with new molded plastic center and end insulators. Net weight only 2¾ pounds.

MODEL NO. 4-BD $21.95

Center Insulator

Supplied in all Hy-Line Doublets, the new center insulator is also available separately. Molded of high impact cycolac plastic with all hardware iridite treated in accordance with military specifications. Furnished with silicone grease for weather proofing. Accepts either ¼" or ⅜" diameter coaxial cables. Weight only 6 oz.

MODEL NO. CI $3.95

End Insulator

Supplied in all Hy-Line Doublets, the new 7" end insulator is molded of high impact cycolac plastic with aluminum bushings. Heavy serrations increase leakage path to approximately 12". Weight only 2½ ounces.

MODEL NO. EI $1.00

hy-gain antenna products
1135 NO. 22nd ST.
LINCOLN, NEBRASKA

"The World's Largest Manufacturer of Amateur Communication Antennas"

AVAILABLE ON COMMERCIAL FREQUENCY COMBINATIONS
WRITE FOR DETAILS

27 WMN sessions held, DVW attended 27 and K1IJV attended 24. K1IJV has been designated assistant to the RM for establishment and operation of the new Novice Net (WMNN). The WMN still needs stations from the Worcester Area. The MPN handled 348 messages during the month with an average attendance of 16.1 stations. WEF is now a regular on TCC. About ten Pittsfield hams donated blood for AZW, who underwnet a serious heart operation at Boston. STR is building the sideband package described in June '58 *QST*, new power supply and linear amplifier. The operators at YK (Worcester Tech.) are building a kw. linear amplifier, and they also have a kw. on 6 meters. HRC reports he is active on 7-Mc. c.w. The PAM says that the MPN would like outlets to all parts of West. Mass. K1ECI and K1DPP have new HQ-170s. GUI has a home-brew electronic keyer in operation. The YL of NEV threatens to get her ticket if she gets any more gear as presents from the OM. BNO travelled 400 miles to bring home a new Gonset GSB-100. K1DVI is giving modulation reports on 10 meters with the aid of a new Panadaptor. The Montachusett Club is conducting a very successful code and theory class at the Maverick Street Recreation Center in Fitchburg. Some ORSs and OPSs are not sending in monthly reports. That was one of the agreements on the application blanks. Remember? Traffic: K1CAU 720, W1DXS 248, DVW 152, LDE 148, BVR 137, K1IJV 87, W1WEF 58, ZPB 30, AGM 25, YK 5, OSK 2.

NEW HAMPSHIRE—SCM, Robert H. Wright, W1RMH—RMs: K1BCS and K1IIK. PAM: HQ. V.H.F. PAM: TA. The GSPN meets at 1900 Mon. through Sat., and at 0930 Sun., on 3842 kc. The NHN c.w. meets nightly at 1830 on 3685 kc. Welcome to new hams, KN1NTH, of Bradford, and KN1NSL, of Canterbury. The GSPN will hold a get-together June 5 at the QTH of KYG at Mirror Lake. All appointees, please check your certificates for endorsement and if needed send them along to me. I am still looking for someone to fill the SEC position for the State. Officers of the Manchester Radio Club for 1960 are K1CIG, pres.; ELH, vice-pres.; K1AEJ, secy.; YHI, treas. 220 Mc. should be well represented from the Manchester Area, with K1CIG, W1PZU, HMT, WYZ and K1API, either on the air or building gear. AWZ was given life membership in the Manchester Radio Club in appreciation of his contributions and help to the club. I hope everyone, especially all the clubs, have their Field Day plans all made. Traffic: (Mar.) K1FDP 1260, HK 226, JDN 69, GQH 34, W1TA 33, CUE 22, K1DKD 18, W1HQ 17, AIJ 16, KYG 16, K1EH 13, W1JNC 13, K1EEN 11, MID 5, W1BYS 3, K1CIG 3. (Feb.) K1FDP 1252.

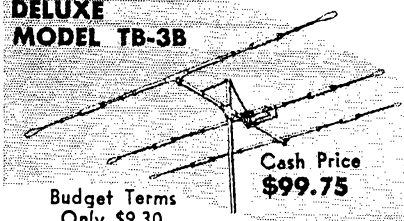
RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ; RM: SMU; PAM: YRC; V.H.F. PAM: KCS. Endorsements VBR as EC and OPS. Appointments K1HZN and LRR, as OESs LPL as OO, KN1KDI passed the General class exam and is active on 80 through 10 meters week ends. The NCRC of Newport held its QSO Party Mar. 29 and it was a huge success. MUZ, of the Bristol Club, visited the Newport Club and gave a lecture on a receiver which he designed for the v.h.f. amateur. The W1AQ Club of East Providence has started to prepare for Field Day. A site has been chosen and K1LII reports that the emergency generator is operating. The RIN reports 23 sessions were held and 140 pieces of traffic were handled. High QNI station was TGD with 100 per cent. The RISPN is looking for new stations. Contact the PAM or SCM for information. Congratulations to the Lincoln Amateur Radio Assn. on becoming affiliated with the ARRL. LARA is secy. K1DWH will answer any questions about the new club. Congratulations to SMU, who was appointed TCC Eastern Director. Traffic: (Mar.) K1LSM 604, W1SMU 516, JXD 344, K1NR 160, BBK 56, W1TXL 23, TGD 13, WED 13, VBR 8, K1AAV 4. (Feb.) K1CBR 8, W1YRC 2.

VERMONT—SCM, Harry A. Preston, Jr., W1VSA—SEC: EIB. RM: K1BGC. PAM: HRG. Vermont frequencies. C.w., 3.520, phone 3855. RTTY 3620 kc. Nets: Cw., Mon., Wed. Fri. at 1830; VEPN, Sun. at 1730; VTPN, Sun at 0900; GMN, Mon.-Sat. at 1730. RACES VTPN, Sun. at 0900; GMN, Mon.-Sat. at 1730. RACES organization in the Bellows Falls to Brattleboro Areas recently assisted community area officials by supplying communications on the high water conditions of the Connecticut River. Two and 6 meters, headed by K1-DTZ, were activated. RACES is an amateur organization of amateurs, by amateurs, for amateurs. Join the civil defense RACES organization to assure your area of vital communications. Impress your local officials on the importance of communication from their area to the outside world. The Middlebury Mike and Key Club supported with communication facilities the motor sports car club of Vermont in its latest rally. VE2AZI/W1 has become a member of the Transcontinental Corps. SAT has a new 2-meter Gonsel III with v.f.o. and also a G-50. VE2AZI/W1 made the BPL in March. Traffic:

(Continued on page 116)

Satisfaction IS OUR MOST IMPORTANT PRODUCT

DELUXE MODEL TB-3B



Cash Price **$99.75**

Budget Terms Only $9.30 Per Month
Rated 1 KW
Has Adjust-A-Gam* Feed System
*Pat. Pend

YOU ARE ASSURED of complete satisfaction when you buy from Hornet!

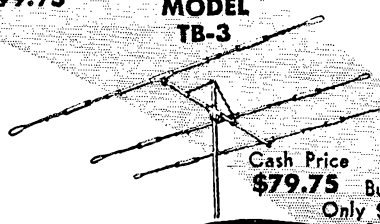
- YOU MUST be satisfied with the quality of material and construction.
- YOU MUST be satisfied with the performance of the antenna.

Set your own standard of comparison. If you are not satisfied, you may return the antenna as set forth on the order form below, without further obligation.

THIS COMPLETE ASSURANCE OF SATISFACTION HAS ALWAYS BEEN OUR POLICY—AS IT IS TODAY!

This is why we say "Satisfaction is our most important product."

MODEL TB-3



Cash Price **$79.75**

Budget Terms Only $7.45 per Month
Rated 1 KW

AND IT'S SO EASY TO BUY

- Use the order form below
- Check the model of your choice
- Mail coupon

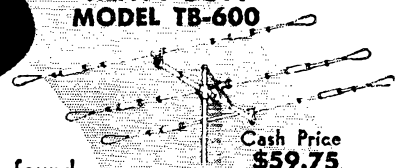
HORNET ANTENNAS

Your antenna will be rushed to you for 'try-before-you buy' evaluation.

Thousands of amateurs who have used this plan have found that there is no better way to investigate value in relation to cost, before buying.

If you desire, use time payment plan—low monthly payments.

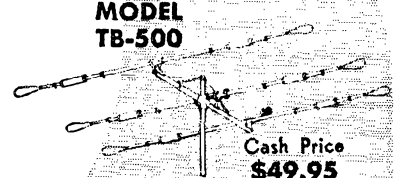
HEAVY DUTY MODEL TB-600



Cash Price **$59.75**

Budget Terms Only $5.50 per Month
Handles 500 Watts

MODEL TB-500



Cash Price **$49.95**

Budget Terms Only $4.70 per Month
Handles 500 Watts

ALL MODELS . . .

- **Are Pre-tuned and Easy to Install**
- **Have Custom Fittings of Cast Aluminum**
- **Use a Single 52 ohm Coaxial Transmission Line**
- **Have completely weather-sealed Frequency-Dividers***
- **Have 6061-T6 Aluminum in the Elements**

*Pat. Pend. Prices subject to change without notice

MAIL YOUR ORDER TODAY — NO MONEY REQUIRED WITH ORDER

HORNET ANTENNA PRODUCTS CO. • P. O. BOX 808 • DUNCAN, OKLA.

Please Rush My Hornet Tribander for a 10-Day FREE TRIAL. If Fully Satisfied, I Agree to Pay as Checked Below. If Not Satisfied, I Agree to Return the Beam Prepaid Within 10 Days Without Further Obligation. ALL PRICES F.O.B. FACTORY.

☐ I prefer the model TB-3B. ☐ I will pay cash within 10 days, if fully satisfied. ☐ I will pay $9.30 within 10 days and $9.30 per month for 11 months.

☐ I prefer the model TB-3. ☐ I will pay cash within 10 days. If fully satisfied. ☐ I will pay $7.45 within 10 days and $7.45 per month for 11 months.

☐ I prefer the model TB-600. ☐ I will pay cash within 10 days, if fully satisfied. ☐ I will pay $5.50 within 10 days and $5.50 per month for 11 months.

☐ I prefer the model TB-500. ☐ I will pay cash within 10 days, if fully satisfied. ☐ I will pay $4.70 within 10 days and $4.70 per month for 11 months.

NAME_____ MY CALL LETTERS ARE_____

ADDRESS_____

CITY_____ STATE_____

ABSOLUTELY NO RISK ON YOUR PART

VE2AZI/W1 731, K1HMQ 266, IRH 33, W1HRG 32, KJG 26, VSA 14, K1KCT 8, BKH 7.

NORTHWESTERN DIVISION

ALASKA—SCM, John P. Trent, KL7DG—BZO reports the following: CUD, The Polar Amateur Radio Klub, Alaska (Parka), had a traffic total of 1138 as a result of messages handled at the Message Center, in the PNA office during the Fur Rendezvous. There is code practice on 3696 kc. Mon. through Thurs. at 8 P.M. thanks to BK, AUV, PJ and ALA. Going sideband has its drawbacks, too. PJ and MF had to modify their kw. finals after getting sideband transmitters. BZO and PJ worked UPIJH, British Hondurarus, during the DX CW Contest. The Annual Hamfest, which has been held in Anchorage for the last few years, will be held in Fairbanks this year. The club in Fairbanks has done a nice job in arranging for out-of-towners to be lodged at the University and also to receive meals at a reduced rate. Let's have a good turnout. The dates are Aug. 12-13-14. A plane can be chartered from Anchorage if there are 44 passengers. The fare would be $20 round trip per person. Make your reservations by contacting BK in Anchorage. There will be no more contact with Fletchas Ice Island as the island is moving north and has been evacuated. KGIFN and Ed Demock were at the meeting of the Anchorage Radio Club and Bob gave an interesting talk on radio and living conditions on the island. The next time they are on the island they will be using the call KL7FLC. If any amateurs in Alaska know of any TVI complaints, get in touch with your TVI committee. Traffic: KL7CUD 1138.

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV— A surprise C.D. Alert Mar. 4 at 0730 MST got hams from 15 counties out of bed to check in. The Teton Valley C.D. Net meets Wed. at 1930 on 3970 kc., alternating c.w. and a.m. Idaho Radio Amateurs, Inc., Boise, published *Ham Hill News* and sent copies to state RACES members who check in to c.d. nets. VQC explained ham communications to the Women's Council of C.D. in Moscow. K7EWE got first prize for his home-brew transmitter at the high school science fair. WBK got his 1st class commercial ticket and a summer scholarship to the U. of Texas. GGV got his WAC certificate and QSL written in Braille. JFA's high school band took four firsts in the District Meet. New tickets: K7LND and KN7LGO (the son of EEQ), both of Nampa, and KN7LGR of Pocatello. GOX is on the air again mobile. DLW, of Logan and DWE, of Rexberg visited the SCM. Farm Net traffic 136: Traffic: GMC 159, EEQ 30, VQC 27, LIQ 18, K7BWV 16, W7GGV 10, ZRQ 9, DWE 7, EMT 5, GHX 4.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI —SEC: KUH. PAM: YHS. RM: K7AEZ. MNP meets Mon.-Wed.-Fri. at 1800 on 3910 kc. TSN meets Mon. through Fri. at 1200 on 7225 kc. MSN meets Tue.-Thurs.-Sat. at 1830 on 3530 kc. K7BKH formed the Treasure State Net. It meets Mon. through Fri. at 1200 on 7225 kc. K7AEZ was appointed RM. K7BKH earned her 9th consecutive BPL. MKE got married. New calls: ZAE at Gildford, K7IQA at Cut Bank and K7IUI at Belt. GCS went into the radio supply business for himself. TPE bought a home in Great Falls. JHR moved from Billings to Ellensburg, Wash. USC returned to Great Falls from Thule AFB. YKP is in radar school at Lowry AFS near Denver. UGM moved from West Glacier to Wolf Point. NZJ built a new 813 final. FGZ built a new 811 final. ZKA built a new mobile receiver. Ham picnics are scheduled as follows: Harlowton, June 5; Wolf Point, June 19; Lewistown, July 10; and Havre Aug. 7. The Glacier Hamfest will be held at Apgar July 16-17. March Traffic: K7EWZ 301, BKH 190, W7TVX 55, K7BYC 36, W7SFK 16, K7AWD 6, W7IDK 6, NPV 6, K7GWA 4, W7TPE 4, K7DNV 2, W7OIP 2.

OREGON—SCM, Hubert R. McNally, W7JDX—New NCS skeds on AREC Net are working out fine. Response and check-ins are setting new records. More AREC members are needed. The AREC gang around Portland helped out in a recent mountain rescue job on Mt. Hood. The RACES gang held a simulated emergency test near Portland. By the time this is read, the big Portland Convention should be history, with everyone having had a good time. New OESs are GUH, K7BRY and K7JSJ. A new OBS is K7EZP. OVA and UGQ, of Salem, won a W-Conn. Award, and received the same through the JCs who backed the award. WPW has resigned as EC of Lane County and is replaced by K7CBJ. QYS will be the new EC for Coos County and DTT is EC for Washington County. The OSN is going along with about the same check-ins as last month. Thanks to all OESs who sent in the finest bunch of reports this SCM has ever received. Keep it up, gang, please. The Southern Oregon Radio Club is now K6LIX. Anyone want to buy ZB's elec. keyer which he can't learn to operate! A nice report was received from NJS, our PAM. Must take a trip to Manzanita again soon! BDU and ZB both made BPL again. Wish we had more c.w. operators for OSN. The Coos

(Continued on page 118)

THE NEW RME 6900

The design and production of communications receivers today is considerably different than in past years for two principal reasons. Costs have risen precipitously; to manufacture a receiver in the face of this and keep the price reasonable requires good tooling, long runs, and little allowance for error. Secondly, there are greater demands placed on receiver operation than ever before, versatility . . . handling ease . . . yes, amateurs have come to ask for parameters of performance almost unheard of in past years.

RME in announcing the new 6900 states without equivocation that this receiver performance is unmatched by anything near its price class. The 6900 is engineered to give optimum service for all modes of amateur communications — not merely one. Engineered under the supervision of Russ Planck, W9RGH, the 6900 has as many advanced pioneering features as its extraordinary namesake, the world famous RME69, which was the first band-switching communications receiver ever produced — over 20 years ago and still widely used today.

What makes the 6900 so Hot? First, meticulous attention to details so that every circuit is performing in an optimum manner. Second, an ingenious function selector, the Modemaster. Every circuit in the 6900 is designed to provide high selectivity; frequency stability, sensitivity and low internal noise. Finally, inclusion of *all* function controls necessary for a modern communications receiver... vernier control knob with overide clutch for fast tuning; RF gain; AF gain; antenna trimmer; band selector, stand-by/receive/calibrate/transmit; ANL; T-notch filter; calibrate adjustment; band selector.

Whether you operate CW; SSB; or AM, you will have the almost uncanny feeling the 6900 was designed solely for you — this is the test of a modern communications receiver that we believe only ours can meet on the operating desk.

- **CONTROLS: 11½" Single Slide Rule Tuning Dial; Logging Scale.**
- **COVERAGE: 80, 40, 20, 15 and 10 on 5 bands plus 10 to 11 mc for WWV or WWVH.**
- **Peak Selectivity plus tunable "T" Notch.**
- **Internal 100 kc Hermetically Sealed Crystal Calibrator.**
- **500 and 4 ohm Outputs.**
- **Noise Limiter for SSB and CW, AM.**
- **Separate Detector for Single Sideband.**
- **S Meter Calibrated in 6 db Steps Above S9 for Better Reading.**
- **Improved Fast Attack AVC Circuit.**
- **Selectable Sideband.**
- **Panel of Attractive Grey "Clad-Rex" Vinyl Bonded to Aluminum with Charcoal Trim.**
- **Front Panel Controls Re-Grouped for Ultimate Operating Ease and Convenience.**
- **SENSITIVITY: 1 mv. 30% Modulation for 100 mw output.**
- **S-N-R: 10 db at 1 mv Input.**
- **SELECTIVITY: 500 cps, 6 db down, in CW mode.**

See your RME distributor or write to **RME** **Electro-Voice®**

Dept. 60Q, BUCHANAN, MICH.

County gang is installing mobile and fixed Motorola equipment for intra-county contacts on 147.5 Mc. Traffic: (Mar.) W7BDU 564, ZB 535, K7CLL 397, AXF 136, W7ZFH 67, DIC 54, K7IWU 40, W7MTW 38, DEM 33, LT 29, AJN 16, K7CNZ 11, W7JDX 9, VIL 9, K7BRY 4, W7GUH 4, K7EZP 3. (Feb.) W7ZFH 41, K7CNZ 6.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—SEC: HMQ. RM: AIB. PAMs: LFA and PGY. Washington Nets: CBN, 3960 kc. 2000 PST.; ESN, 3920 kc. 1700 PST Mon. through Sat.; NSN, 3700 kc. 2100 PST, Mon. through Sat., WARTS, 3970 kc. Mon., through Sat. 1800 PST, WSN, 3535 kc. Mon. through Fri. 1900 PST. New officers of the Richland Club are K7DED, pres.; OBH, vice.-pres.; K7HSA, secy.; YFO, treas. NNF received his DXXC certificate, YFO is QRL with a 5-kw. generator set for the AREC mobile unit. The 2-meter activity around the Richland Area is on the upswing. WXN is moving to the vicinity of Grandview. KN7DOA is planning on trying for his General Class license. K7CHH now has 109/81 for DXXC; he also applied for WBE and two other awards from Czechoslovakia and Finland. The new president of the Apple City Radio Club is K7BVC. CNP moved to Montana. About ten stations are active on 145.62 Mc. in the Wenatchee Area. IEU made a good score in the recent DX Contest. VPW rebuilt his preamplifier. JHS is working on a 40-watt portable c.w. rig for vacation. The following were issued net certificates for WSN: GYF, IEU, and K6GZM. BTB received his WAS, WAC and RCC certificates after 29 years of operating. K7CWO is QRL college and looking for an AF-67 transmitter. AIB worked 9 new countries during March. The Radio Club of Tacoma had an RTTY demonstration by RGD on Mar. 23. K7JDL, K7ATD and RXS made application for MARS membership, K7DGJ is building a 6-meter transceiver, GSP has a new ham shack. AMC turned in a good traffic report for March. QLH installed an antenna tuner in the big rig. K7AJT is having transmitter trouble with the AF-67. UJA recently procured an NC-300. K7ASE is home from Veterans Hospital. K7AWA is working in Walla Walla. PKR has been appointed Asst. Radio Officer for Asotin County. LVW is a newcomer to the Clarkston Area. HDT installed a new Gonset mobile unit. The QCWA is planning an annual QSO party for the second week in Feb. of each year. A total of 257 members were active in the last QSO Party held in February. FRU joined the ranks of Silent Keys on Apr. 4. OEX and PGY assisted FIX in raising his antennas. HSS has a new Valiant. LAS has a new HT-37. EAP is waiting for a new Hy-Gain Tribander. EKT is installing a new mobile unit in the car. The WARTS Net had 1935 station check-ins with 182 messages and 184 contacts for the month of February. Don't forget the Net Picnic to be held at the Cougar Inn, Lake Wenatchee, July 9 and 10. The following renewed their ORS appointments: KZ, JC and DPW. A new OES in the Seattle Area is K7IRK. Traffic: (Mar.) W7BA 1518, DZX 1003, QLH 410, AMC 210, APS 130, GIP 126, IST 119, K7ATD 90, W7AIB 83, ZDQ 30, OMO 29, VPW 29, JHS 26, USO 23, K7CWO 21, AJT 14, W7LFA 13, BTB 12, IEU 9, K7DDQ 7, W7YFO 6, JEY 4, SYE 4, EVW 3, GSP 3, TIQ 2. (Feb.) W7HUT 271.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—The NARA has a 2-meter repeater installed on Slide Mt. and also is preparing for Field Day. GVB was killed near Lake Mead in a truck accident. HJ is going mobile. YJB is building an electronic key. RVJ is on the low frequencies with a Harvey-Wells and on 2 meters with a home-brew 1-watter. KHU made WAC, WBE, S6S and DRD. We welcome the Las Vegas High School Radio Club, K7ADD pres.; as an ARRL affiliate. K7AHA is on from Sparks. BFM is building a 2-meter rig. BJB and his XYL, BIZ, have a new 813 linear final. KL7CJR, ex-W7SHY, is in Fallon. Welcome back, Dan. HRW is building a new shack. VIU has been off the air with a bad final. He attended the Pacific Division Staff Meeting in San Jose. KN7LMM, in Austin, KN7LDV, in Henderson, and KN7LFD, in Reno, are new Nevada hams. Traffic: W7KHU 76.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—W6SAI spoke on quad antennas at the April meeting of the Palo Alto ARA. The club is conducting an intensive and successful membership drive. Meetings are held the 1st Fri. of the month at the Menlo Park Civic Center. W6STY reports that Menlo Park has purchased two Communicators for the civil defense group, which will now be more active. Several stations report booming activity on 6 meters. K6TEH is on 6 meters with a Heath HW-29. K6HCP has completed a 6-meter s.s.b. linear half gallon. WA6CLT, also active on 6 meters, is anticipating orders transferring him to the East Coast. W6PBC, home from a job as advisor to the Government of Thailand, is working on a parametric amplifier for 1296 Mc. W6TTB has a new tower and Tribander. W6CBX is now s.s.b. with an SB-10. W6ZRJ

(Continued on page 120)

The truly versatile...

DRAKE MODEL 2-A RECEIVER

$269.95 AMATEUR NET

gives you so much for so little

Combination Q-Multiplier and Deluxe Speaker
for notching heterodynes or single signal CW
$34.95 AMATEUR NET

MODEL 2-A FEATURES

- Triple conversion with crystal controlled first converter for maximum frequency stability.
- Continuous sideband selection without retuning.
- Reception of SSB, AM and CW with full RF gain, complete AVC action and accurate S-Meter indication.
- Distortion-free product detection.
- High sensitivity, low noise.
- Excellent overload characteristics; insensitive to operation of nearby xmtrs.
- Excellent mobile receiver when used with transistor inverter.
- Convenient tuning rate with deviation scale.
- Compact size.

ALSO A CHOICE OF: Slow or fast AVC; selectivity band width; product or diode detector.

All the advantages of a

"HAM BAND ONLY"

receiver. Superior SSB, AM, and CW in seven band switch positions . . .

PLUS

five extra positions on the band switch for interchangeable plug-in crystals to permit reception of any 600 kc bands in the 3.5 to 30 mc range, such as shortwave broadcast bands, Citizen's band, MARS, WWV, Commercial frequencies, and others.

For complete specifications see Dec. '59 issue of QST, or write to:

Coming soon . . .
2 and 6 meter plug-in crystal converters

R. L. DRAKE COMPANY
MIAMISBURG, OHIO

has been active on 10 meters. W6ZLO is reworking surplus gear. W6HC is busy with advanced studies at Stanford. W6PLG has resigned as PAN manager because of his work schedule. W6RSY is the new manager of RN6. W6DEF has been showing the Red Cross and the Gray Ladies what the traffic nets can do by handling many messages to and from the local hospital. A new OBS is K6DEY. Good luck to all on Field Day and your SCM will be looking for the FD message from your group. Traffic: (Mar.) W6RSY 876, K6CZR 552, K6DYX 162, W6DEF 149, W6AIT 145, W6FON 64, W6YBV 58, W6OII 54, W6HC 43, W6ZLO 39, W6ZRJ 38, K6VQK 36, W6YHM 24, K6GZ 21, K6TEH 12, WA6CLT 1. (Feb.) W6PLG 1.

EAST BAY—SCM, B. W. Southwell, W6OJW—SEC: K6DQM. ECs: W6EFI, K6EDN, K6JNW and K6ESZ. RM: K6ZYZ. E. Bay section appointees are: ORs—K6DMW, K6ZYZ, K6OSO, W6TI, W6HBF, W6TT, K6AHV, W6EY, K6QHC, W6NBX, W6JOH. OESs—W6CAN, W6OHQ, K6OKK, K6QXY, W6NDR, WV6JCD, K6TWT. OBSs—W6LGW, K6GK, K6IGN, W6TI, W6DUB, W6WGM, W6ITH. K6ZBL. OOs—K6ZYZ, W6CBF, W6FZC, K6GK, W6BEZ, W6OJW, W6WOC, W6EY, W6HBF, W6IDY, W6ITH, W6WLL, OPSs—W6AKB, K6DMI, W6EY, W6ITH. If your call is not included in the above list, why not write your SCM; there are appointments open in all categories. WV6FKN is now general and made RCC. The CCRC held its March meeting in San Jose. W6WLI is back in the East Bay section in Alameda. Welcome back Norm. The SARO went on a field trip to Ampex. K6OSO is rebuilding the rig. K6ZRQ is a frosh at U.C. Berkeley. The Richmond Radio Club reconditioned the 75A-4 inhaler and antennas are being readied for Field Day. K6ESZ converted a Heath AT-1 for 160 to 50 Mc. K6QNZ is MARS AA6QNZ. W6JOH is operating the ORC rig, W6OT. K6OSO is FD chairman for the Richmond ARC. The RARC had a hidden transmitter hunt. W6EFI has a new 60-ft. mast for his ten-element 144-Mc. beam. WV6FBS is now WA6FBS. W6JK has a DX total of 223/211. K6DEL has a new rig. WV6GXC is building a 144-Mc. rig. WA6HSQ and WA6HYU are new Technicians. The Southern Alameda County Emergency Net meets on 3985 kc. every Sun. at 9 P.M. PST and invites new check-ins. K6LGE has a new AF-67 mobile rig. WA6AHF has his C.B. rigs in the car and home working FB. K6JZN is building a transistor power supply for the mobile rig. K6QXR is a regular on the American Legion Net. K6AHW is building an electronic organ. WV6IMC worked KN7KBK on 80-meter c.w. with a transistor rig, 1 watt input! WV6FFQ worked TF2WCD on 7 Mc. WV6EJA is a new Tech. class licensee. W6IMC has his new final in operating order. WA6AHF, WA6BRD and W6IPY work for Philco. K6QFT is building a 4X150A all-band rig. W6ZF has his new antenna up. K6ZYZ is QRL school. W6QMO is acting NCN mgr. until June. WV6FJR is now Tech. class. WA6FJR. Congrats. Traffic: (Mar.) W6NBX 401, K6GK 120, W6OT 20, K6ZYZ 18, W6IFZ 8, W6JOH 8, K6ZRQ 8, K6ESZ 2, W6ZF 1. (Feb.) K6OSO 13, W6OT 12, W6JOH 7, W6IFZ 5.

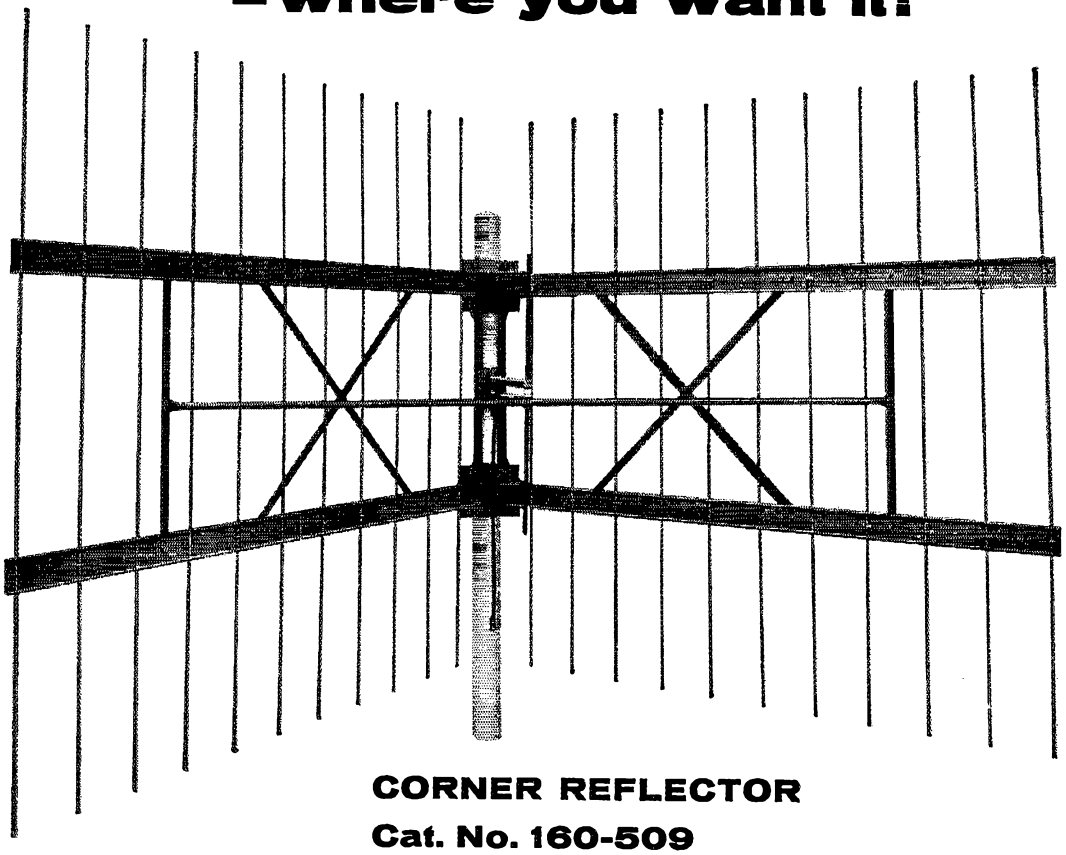
SAN FRANCISCO—SCM, Leonard R. Geraldi, K6ANP—Asst. SCM: W6QMO. PAM: W6PZE. ECs: K6EKC, W6OPL and W6JWF. OOs: W6GQA Class I, K6OHJ, W6OKR and W6PHS. OBSs: W6GGC and W6MXJ. ORS: W6GGC, W6QMO, W6OPL, W6BIP W6GQY and K6QJB. OPSs: W6PZE, W6GGC and W6FEA. The San Francisco Radio Club held its Annual Auction in March. The Far West Radio Club is making preliminary plans for Field Day. The BAYLARC (YL club) had an "eyelash" QSO Party. I attended the Pacific Division Director's meeting, which produced some very worthwhile proposals. the Pacific Division Convention will be held Sept. 2, 3 and 4 at the new Fiesta Bldg. in San Mateo. W6OKR reports that 6 meters has been very dead but activity is picking up, possibly because of upcoming sporadic "E" bringing in the DX. K6OHJ notes a marked increase in phone operation in the Bay Area. W6QMO participated in the c.w. part of the YL/OM Contest. Many hours and hard work were put into the ARRL DX Contest by W6s LTX, WB, GQK, ERS and BYB and K6s OHJ and ANP. This section deeply regrets the passing of K6PQG, Barbara Yoacham, affectionately known as "Babs" to her many friends on 80 and 40 meters. Working only on c.w., Babs was our very able Route Manager and was very active on the Northern California Net (NCN), of which she had been a member for over three years. She will be sorely missed. Traffic: W6QMO 585, W6PZE 47.

SACRAMENTO VALLEY—SCM, Jon J. O'Brien, W6-GDO—Asst. SCM: William van de Kamp, W6CKV. SEC: K6IKV. The RAMS had a very nice day for their annual skating party Mar. 13 at W6DYF's roller rink at Sutter Creek. On Mar. 27 several RAMS mobiled to Vallejo for a breakfast meeting with several Bay Area clubs. K6GOT, EC, and the Yolo County gang are building a radio communications van to include all-band coverage, 160 through 2 meters, with portable beam an-

(Continued on page 122)

POWER

—where you want it!



CORNER REFLECTOR

Cat. No. 160-509

Electrical

- Frequency range . . . . **144-174 Mc**
- Forward gain . . . . . **10 db**
- Nom. input impedance . . **50 ohms**
- Front-to-back ratio . . . . . **20 db**
- Maximum power input . . **500 watts**
- VSWR **1.5:1**
- Bandwidth . . . . . **± 3%**

Mechanical

- Reflector (size per side) . . . . **6' x 6'**
- Reflector material . . . . . **High strength aluminum alloy**
- Radiating element material . . . **Copper alloy**
- Rated wind velocity . . . . **100 MPH**
- Weight . . . . . **75 lbs.**

Communication Products Company, Inc.

MARLBORO NEW JERSEY

tennas. Also the Yolo gang has been holding very successful 2-meter transmitter hunts. K6SXX received his WAS award and is building a d.s.b. exciter for his Valiant. W6QYX is rebuilding his home-brew rig. W6AF is very pleased with the stability of his newly-built v.f.o. and is waiting for two more confirmations for his DXCC. K6IS getting set up for 432 Mc. W6MLN is building a new 220-Mc. rig. W6KME has a new "GD" beam for his 2-meter rig at his cabin at Bull Creek. The Chirps kept busy even after the convention, on Mar. 8. WA6DGH, K6DPM, K6ENK and K6HHD visited the Arcade Hospital and presented camellias to the patients for Camellia Cheer-up Day. This was filmed and shown on the local TV news broadcast that same evening. Then on Mar. 12 the Chirps were on hand to provide communications for the Camellia Children's Parade, during which a few Chirps and their jr. operator were thoroughly soaked by an untimely rainstorm. Traffic: K6YBV 878, K6SXX 319, K6LVN 5.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—K6VSK is on the air with a Seneca. K6ROU has a Hornet Tribander up, and a new HQ-145 receiver. W6OUX is chasing fuses in his power supply. K6QOK found out that filaments must be lit for his mobile rig to operate. W6JUK tore into his HT-32 only to find a bad tube. W6JXY has a pair of 4E27s on s.s.b. W6JPS has a Gonset 6-meter rig. W6FXV has a new Drake receiver. W6JPU has a new Mosley beam on 20-meters s.s.b. W6SMS is working on a new final amplifier using 4-811s. W6PXP has a KWM-2 and is going mobile. K6GOX keeps tripping 15 amplifier circuit breakers. W6UBK has a new SX-101A. K6BGJ is experimenting with sweep generators. K6BKZ has a new ham shack. W6OBQ has a new tower for his beam on 10-15-20 meters. W6ONK is working DX on 15 and 20 meters. K6LKJ is chasing DX on 15 and 20 meters. W6NKZ, W6BAN and W6JPU participated in the RADEF drill in Selma. W6QFR is having trouble loading up his rig on his 56-ft. boat. K6PPI has his problems solved on his HQ-170. The San Joaquin Valley Net and the Stanislaus County Club will hold a picnic in Turlock Sept. 11, 1960. In Feb. the SJVN had 355 check-ins, 40 contacts, handled 10 messages and 6 QSTs. For the month of March, 519 check-ins, 26 sessions and a traffic count of 87. W6QON is building a nice ham shack. The new EC for Alpine, Toulumne and Calaveras Counties is W6EBL. Traffic: (Mar.) W6ARE 8.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: DRC. V.H.F. PAM: ACY. We urgently need an RM. "Operation Whitetop" has come and gone and a complete report has been filed with ARRL. The amateurs are to be commended for the splendid job done in this operation, especially K4MZZ, EKS and K4JIP, who were first on the scene with equipment. The operators from Shelby were K4RXY and K4YJG, who set up 2-meter circuits, and the operators and equipment from Winston-Salem were CPI, EC and RO, RXG, K4GHH, YJG, YSB, K4OGP, DNE and AAS. Also a late report advises that K4GCB, from Elkin, was active. This operation proved that amateurs and others can and will cooperate. Arrangements were made by HUL, State Radio Officer, with QC, net manager of the Tar Heel Emergency Net, to use the net frequency on a cooperative basis, which worked out splendidly. To those men outside the area who acted as NCS goes the thanks of the whole State. To those who monitored and could not be of service, our sincere thanks for not cluttering up the frequency, but standing by in case you were needed. A very commendable job all the way, fellows and girls. Thanks. Have you done any planning for Field Day? If not, be sure to get the old generator and equipment ready. Remember a message to the SCM will net you many points. Traffic has been light this report period. Yes, they are noted, so keep sending the reports. Traffic: W4LEV 923.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—RM K4AVU was M.C. at the SCN meeting in Barnwell of the c.w. net on Mar. 13. K4HDX was appointed manager to succeed K4PIA. AKC reported on League news; GQV discussed traffic and organization; K4BVX represented *Scarab*; FFH is liaison with the S.S.B. Net; K4VVE and KNI were awarded net certificates. In Barnwell the new club call is NOZ; the new YL is K4JIR; ERU won recognition at the Augusta Science Fair, NTO is new manager of the Piedmont Local Area Net (PLAN). With Field Day approaching SEC K4PJE requests that all clubs inform him of new ECs chosen so as to certify them to ARRL. The Camden DX Club members received 14 awards at the State C.D. meeting Mar. 27 at Columbia; a total of 83 RACES members attended; 52 C.D. Citations of Merit were presented to amateurs for outstanding communications during disasters of the past year. The address of *Scarab*, the South Carolina Radio Activity Bulletin, is

(Continued on page 124)

SERIES GATE MODULATOR

FIRST INTRODUCTION AS AN INTEGRAL UNIT

Now you too can punch through QRM, thanks to this versatile new unit. Converts most commercial CW transmitters and linear amplifiers into a first class phone rig without sacrificing CW power capacity.

NEW

PHONEMEN: no power discrimination. Peak envelope phone power input equals CW power input.

An ideal modulator for the home brew transmitter.

SPECIFICATIONS

High gain, crystal or dynamic mike input. Max. voltage output: 400 peak dc volts. Max. instantaneous dc current: 40 ma. Power requirement: 115/230 V 50/60 cps power consumption: 30 watts average.

SIZE 6" x 7" x 5½"

WEIGHT 5½ lbs.

PRICE.....$39.95 net

2 years unconditional guarantee.

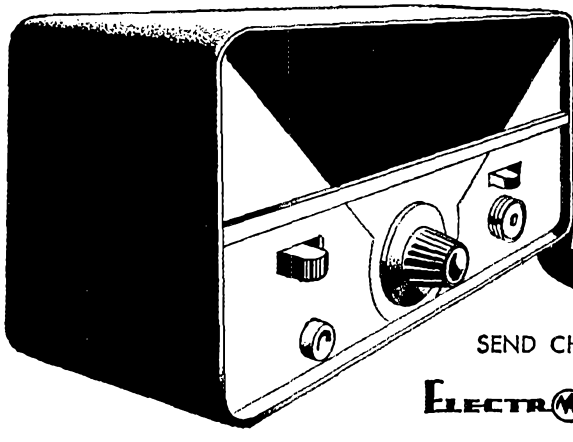
Replacement of parts and labor free. (Tubes guaranteed for 6 months.)

10 DAYS TRIAL: Try the M-100 on the air for 10 DAYS. If it does not measure up to our claims and exceed your expectations, your money will be refunded.

FEATURES

- Extremely economical and efficient method of modulation.
- Modulates any beam tetrode amplifier up to 1 KW.
- Waveform shaped for optimum speech communication.
- Controlled automatic speech clipping.
- Complete elimination of negative and positive peaks overmodulation.
- Compact, small in size, VERY LOW power consumption, IDEAL for mobile use.
- This type of modulation permits phone peak envelope power input to equal full CW power input.
- Built-in 1000 cps tone generator.
- Adjustable carrier level.
- Can be used with either single or parallel final amplifier tubes.

GROUP ORDERS through clubs will receive 15% discount. Units for demonstration purposes are available to clubs free of charge. Technical information forwarded upon request.



CONTROLS

On-off switch
Modulation level control
Carrier level control
Tone switch
CW Phone switch

MODEL M-100

SEND CHECK OR MONEY ORDER TO:

ELECTRO-TONE LABORATORIES

2717 NORTH ASHLAND AVENUE • CHICAGO 14, ILLINOIS

Box 90, Rock Hill, S. C. Traffic: K4AVU 120, W4FFH 99, KNI 85, K4VVE 84, ZHV 77, W4DAW 74, K4PIA 58, HDX 51, W4AKC 37, K4LNJ 37, EGI 33, W4CHD 32, K4WCZ 27, GAT 25, W4VIW 20, PED 15, GQV 12, K4IIE 10.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—SEC: K4MJZ. RMs: K4JKK, K4KNP, K4QER, K4QES, K4EZL and SHJ. PAM: BGP. Activity reporting is about 100 per cent over last month! BGP, EEU, K4LPR and K4RPT attended the I.R.E. Show in New York. BGP was high phone station in our section and fifth in the nation in the Jan. CD Party. The Norfolk gang still holds Sun. transmitter hunts with lots of interest. There is increasing activity in 2- and 6-meter work and the following stations report much doing: K4QIX, DVT, PRO, K4AJL, K4LLL, SNH, K4SSA, K4YCG, KNS, JXD, K4CHA and EBH. YVG reports being rather busy blowing the old horn and finishing up a power go-cart for the "young'un." K4AL, up Richmond way has a new 40-ft. tower. JUJ advises that between YL-OM Phone and C.W. Parties and the ARRL DX Contest he still had time to check into VN fairly regularly. He is sporting a 250 YLCC sticker. ZM had great fun working 218 stations in 72 countries with 125 watts in the DX Contest. LFO talked to the Richmond Radio Club about electronic keyers. Speaking of new radio clubs, your SCM visited and talked to the members and friends of the Lake Drummond Wireless Assn. on the benefits of ARRL membership and also about the NTS. Another new club is coming into being on our Eastern Shore. It's called "VANARC" (Va.-Accomack-Northampton Radio Club). Traffic: (Mar.) K4KNP 936, GFR 919, MXF 365, W4QDY 316, SHJ 315, K4QIX 306, W4DVT 214, K4SGQ 155, K9CVJ/4 151, W4RHA 144, K4VDU 112, QER 108, W4PRO 96, ATQ 82, K4FSS 63, AJL 45, W4VYG 41, BGP 40, K4IIP 35, W4CXQ 34, KX 31, K4AL 30, W4OOL 23, PVA 20, CWT 19, SNH 17, BZE 16, GOF 15, KRX 14, LK 14, K4GKX 13, YCG 13, W4CVO 12, JUJ 12, K4VWK 10, W4ZM 10, KNS 9, LFO 9, OWV 8, JXD 6, AAD 4, K4CHA 4, W4KFC 4, PVA 4, VMC 2. (Feb.) W4PRO 59, K4CAD 20, AL 19, W4OOL 18, K4SSA 17, W4LFO 6, K4TFL 6, W4SNH 2. (Jan.) K4TFL 13. (Dec.) K4TFL 25.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: HZA. PAM: K8BIT. RMs: K8IIID, GBF, PBO and VYR. The WVN CW Net meets on 3570 kc. at 1900 and WVN Phone on 3890 kc. at 1730 and 1830. K8BIT received WACWV certificate No. 18. K8KFK is attending West Va. Tech. Members of the McDowell County Emergency Net are NYH, UEK, K8AKD, K8JQW, K8NNF, K8NIO, KN8ONE, KN8RLJ and KN8RLK. OFE received his DXCC certificate. The East River ARC has started a club net on 29.0 Mc. K8RWF and K8SNW are active on 6 meters. GCZ moved to a good radio location. KN8SPG operates 80, 40 and 15 meters with a DX-40. The Kanawha ARC Radio training courses, including code and theory, are in full swing. K8MQB assists K8BIT as NCS for the WVN Phone Net. K8QYG and K8ELE are swamped for QSL cards, being in two rare counties, Berkley and Webster. UHK is quite active from Barbour County. If interested in West Va. certificates, see Sept. 1958, *QST* page 63. ELX is a new ORS. The Greenbrier ARC members are building 6-meter tranceivers. JZO reports that prizes are rolling in for the 2nd Annual West Virginia Hamfest to be held in Jackson's Mill July 9 and 10. Better mark your calendar and plan to attend. Traffic: K8IIID 173, JLF 151, BIT 75, W8PBO 70, K8JPV 58, W8NYH 49, RJK 34, ELX 25, K8HTS 17, CSG 10, GAG 9, LGX 9, AEN 8, GMG 8, JSX 5, KN8PJC 3, W8WHQ 1.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, WØBWJ—Asst. SCM: Howard Eldridge, KØDCW. SEC: NIT. RMs: EDK and WME. PAMs: CXW and IJR. OBSs: KQD and DCC. Effective Apr. 1, MYB took over management of CCW, and also was appointed ORS. TWN reports a steady increase in check-ins and traffic. Nine Section Net certificates and eleven AMPS Awards were issued to members of HNN. One SNC was issued for CCW, an CEPN qualified six Section Net certificates and four AMPS Awards. Congratulations to KØRTI for being the first BRAT on CCW. He is only 12 years old, by the way. The BARC reports a fine time was had by all at its Dutch Treat Dinner held Mar. 24. Nomination for the busiest ham in Colorado: KØCLJ, chairman of the Denver Radio Club TVI Committee. DRC conducts regular code practice at 1930 each Mon. on 29.6 Mc. KØSLP is the new president of the CUARC at Boulder. It has been agreed that CTNN will be financed by subscription at the rate of one dollar per year. YQ, KØDTK, and KØYSP made BPL. Traffic: (Mar.) KØDTK 970, EDH 412, WØKQD 359, YQ 324, KØEDK 311, WØWME 292, ANA 266, KØYSP 263, RTI 237, RBI 138, DCW 136, MYB 84, BWJ 77, KØQGO 66, IMJ 64, FAM 60, WØIA 22, CBI 15, KØDNP 8, WØFVD 8, KØEVG 6, WØPG 4 KOLCZ 3. (Feb.) KØDTK 410, RQF 24

(Continued on page 126)

Your Ham Headquarters – WASHINGTON to FLORIDA

SPECIALIZING IN THE BEST AT EASY TERMS
HIGH TRADES AND LOW DOWN PAYMENTS
WRITE FOR DETAILS OF OUR TIME PAYMENT PLAN

Newest Mobile SSB Station—for your home or car

COLLINS KWM-2 80-10 METER BAND TRANSCEIVER

Here's superior SSB at home or on the go. The Collins KWM-2 provides ample RF power for a fixed station installation, yet its versatility and light weight make it ideal for mobile use. The KWM-2 features voice or CW operation on all bands between 3.4 and 29.7 mc. Big 175 watts SSB PEP output. Provides SSB generation on upper and lower sideband. All tuned circuits and several tubes function in the dual role of transmit and receive. Stop in and try the KWM-2. Also on display is the Collins S/Line—today's most popular SSB Amateur Radio Station.

NET PRICES	
KWM-2 Transceiver	$1095.00
516F-2 AC Power Supply	105.00
312B-5 PTO Console	333.00
30S-1 Linear Amplifier	1470.00

An integrated Collins amateur radio system built around the KWM-2 Transceiver. Shown are the 516F-2 AC Power Supply with the 312B-5 PTO Console and the 30S-1 Linear Amplifier.

LECTRONIC SUPPLY
61 N.E. 9th STREET • MIAMI 32, FLA. • Phone FRanklin 7-2511

LECTRONIC SUPPLY
1301 HIBISCUS BLVD. • MELBOURNE, FLA. • PArkway 3-1441

LECTRONIC WHOLESALERS, INC.
2345 SHERMAN AVE. N.W. • WASHINGTON 1, D.C. • Phone HUdson 3-5200

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John Sampson, 7OCX. OCX is giving up his OBS appointment to take on the job of Route Manager. K7COK has taken over as NCS on the Beehive Net on Sat. BUN needs another liaison to TWN. OCX has been doing the job all alone and needs a little assistance. The UARC had the first transmitter hunt for the year and K7COM/M won with the shortest distance, 39 miles. UAA/M was second with 40 miles. OCX checked into TWN 53 out of a possible 54 sessions and received the BRAT Award for his efforts. The Ogden ARC had a night for the ladies for its April meeting. MWR now has an OPS appointment. FND dropped his EC appointment. Thanks for your help, Lee. POU was active in the YL/OM contest, the Maine QSO Party and the DX ARRL Contest. Traffic: W7OCX 293, QWH 2, K7DVT 1.

NEW MEXICO—SCM, Newell F. Greene, K5IQI—Asst. SCM: Carl W. Franz, 5ZHN. CUN, PAM: ZU. 10-Meter PAM: LQM. V.H.F. PAM: FPB. RM: ZHN. Morning nets move up one-half hour for the summer. The Breakfast Club meets Mon. through Sat. at 0630 MST on 3838 kc. NM EPN meets at 0700 Sun. and 1800 Tue. and Thurs. Four loyal brasspounders are carrying a heavy load. Why not join them on 3570 kc. Mon., Wed. and Fri. at 1900 MST? Please note that ZHN and LQM are Asst. SCM and 10-Meter PAM, respectively, for the convenience of the Albuquerque Area. Our section needs more phone station appointments, and especially Class I and II Observers. The TWN/2 meets daily at 2000 MST on 3570 kc. LEF still has momentum and is gathering stickers for his new DXCC certificate. K5GOJ is happy gathering BRAT awards for traffic. Traffic: W5ZHN 592, K5LMJ 168, GOJ 81. W5YSJ 55, UBW 51, K5DAB 29, DAA 15, W5GB 15, VC 8.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: CQL. 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. LKQ, EC for Natrona County, held a surprise AREC alert. Fourteen members answered. The Wyoming Hamfest dates are July 16 and 17 at the Pine's Lodge, located 15 miles west of Buffalo, Wyo., on Highway No. 16. There are good accommodations and camping facilities. The Casper Club is planning a Field Day meeting on top of Casper Mountain. Traffic: W7DXV 99, BHH 71, AXG 67, AMU 4, BKI 3, K7IAY 3, IBU 2, W7LKQ 2, K7AUH 1.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ, Asst. SCM: O.K. Gibbs, K4BTO: SEC: JDA. RMs: RLG and OCV. PAMs: PHH, BTO and JJX. New appointments: K4ZBX and RIL as OPS, ZRQ as OO, K4EII as OES, EVU as OBS. We extend deepest sympathy to TOI on the passing of his mother. We welcome K4KQN, EOH and KAC to AENB. Congrats to K4RJM on being 100 per cent in March on AENB. K4CFD had the highest Alabama score in the Jan. CD Party. RNX, AXO, K4OIN, RCE, IKR, BFT, YKM and TDJ are welcomed to AENP. ZXX is getting a new shack. ZSH reports 3 new keys in Tri-Cities (see Feb. 59 *QST*). K4SAV, new net mgr. of AENT, welcomes K4BQU, CZK, ONM, AZI, VRP, CCT, LGV, K5SNO and K5OWC. SAV would like all to check in on AENT with traffic. The net meets at 1630 CST daily on 3905 kc. New officers of the Decatur ARC are PKA, pres.; K4SAV, 1st vice-pres.; K4JSL, 2nd vice-pres.; K4UEC, secy.; BFM, treas. K4HJM operated 39 hours on Operation Iceberg and now has 3 rigs operational. K4BFF is serving with the Navy. Mobile is completing a new club house, and the club's hamfest will be held May 29. K4MBM has 1000 watts s.s.b. on 6 meters. KN4ROR passed the Conditional class exam. AWA is attending Auburn and letting K4HFX hold down the fort. Welcome to Novice KN4UGD, Doris, of Ethelsville. Congrats to RNX on making BPL in March, and for his untiring work during Operation Iceberg. Traffic: (March) W4RLG 309, RNX 208, K4SAV 125, W4PYG 76, USM 69, K4AOZ 63, BTO 61, JDA 61, W4PTR 56, K4HJM 50, W4MI 46, K4PHH 37, ZXX 36, W4CIU 24, K4HFX 23, UEE 22, W4WHW 17, K4JSP 16, HVN 15, W4CEF 12, DGH 10, RTQ 10, OKQ 9, K4RIL 8, W4EOH 6, K4TSN 5, TDJ 2, W4ZSH 1. (Feb.) W4PVG 49, K4ZBX 17, OCV 6, W4EOH 2, K4SPP 2.

EASTERN FLORIDA—SCM, John Porter, W4KGJ—SEC: IYT. RM: K4SJH. PAM: TAS. V.H.F. PAM: RMU. New officers of the Manatee ARC are K4KLR, pres.; AFN and FGK vice-pres.; ENJ act. mgr.; K4BY, secy.-treas.; TAS trustee. Officers of the newly-formed U. S. Fleet Sonor School ARC are K5HJB, pres.; CNZ trustee. The Fort Lauderdale ARC had a booth at the Hobby Show and handled over two thousand messages. K4RNS made WASYL. Marge also is active in local AREC work. K4DAD made WAC. CNZ has a

(Continued on page 128)

EVERY DAY IS BARGAIN DAY

in the world famous

HARRISON TRADE-IN CENTER!

No matter what equipment or model you want, it's a safe bet you'll find it here . . . and for less than you would expect to pay for such good condition gear.

Here, in the world's greatest trading center you always get more real value for your money. Here, at Harrison's, you can save with complete safety because every piece is plainly green-tagged, fully covered by our 90 day Warranty of free service in our Lab.

What's more, if you are not delighted with your purchase, you can:

- **A** Get full credit toward any new equipment for 90 days.
- **B** Get full credit toward other used equipment within 30 days.
- **C** Ship it back for full cash refund within 15 days.

You can spread payments up to 18 MONTHS, on our EASIEST TERMS.

Because we have such brisk turnover, we can give you TOP ALLOWANCE for your present gear!

TNX 73

Bil Harrison

W2AVA

For example . . .

here are just a few of the many "real gone" bargains in "hot" receivers, and transmitters that are "cool," man!

TRANSMITTERS

B & W 5100	$249.00
5100B	299.00
CENTRAL ELECTR.	
10A	89.50
20A, Rack	159.00
20A	189.00
600L, Ampl.	324.00
COLLINS	
32S-1	535.00
32V-2	259.00
32V-3	329.00
GLOBE 65	49.00
65A	54.00
65B	59.00
90	39.00
680	69.00
680A	79.00
CB100 Citizen's Bander	79.00
DSB-100	99.00
LA-1	89.00
GONSET 6 Meter Commun III	199.00
G-28 10 Meter	209.00
HALLICRAFTERS	
HT-30	249.00
HT-32	439.00
HT-33	395.00
HT-33A	569.00
HEATH DX-20	33.50
DX-35	49.50
DX-40	57.50
DX-100	159.00
JOHNSON	
Adventurer	36.50
Challenger	109.00
KW, w/Desk	949.00
Mobile	59.00
Navigator	139.00
Pacemaker	299.50
Ranger	199.00
Thunderbolt	429.00
Valiant	349.00
Viking II	159.00
6N2	99.00
500	545.00

RECEIVERS

COLLINS	
75A3	$385.00
75A4	495.00
75S-1	409.00
DRAKE 1-A	199.00
HALLICRAFTERS	
S-38	29.00
S-38D	34.00
S-38E	39.00
S-76	109.00
S-85	79.50
S-86	79.50
S-102	34.00
SX-62	209.00
SX-71	139.00
SX-96	139.00
SX-99	109.00
SX-100	209.00
SX-101	239.00
HAMMARLUND	
HQ-100	129.00
HQ-110	174.50
HQ-120	99.00
HQ-129X	129.00
HQ-140X	169.00
HQ-145	199.00
HQ-150	199.00
SP-400X	279.00
NATIONAL	
HRO-50T	229.00
HRO-50T-1	275.00
HRO-60	349.00
NC-66	59.50
NC-88	79.00
NC-98	99.50
NC-109	119.00
NC-125	119.00
NC-173	119.00
NC-183D	239.00
NC-300	229.00
SW-54	34.00
TMC GPR-90	349.50

MOBILE

COLLINS	
KWM-1	$465.00
GONSET	
G-66B w/ps	159.00
Super Six	24.50
Tri-Band	19.50
MORROW	
5BR-1	39.00
MULTI-ELMAC	
A-54	59.00
A-54H	64.00
AF-67	109.00

Always plenty of ACCESSORIES at money saving prices.

They move fast (but more come in almost every day), so send $5.00 right away, and state your **second choice**, please! This small deposit (returnable any time you say) will enable us to hold the equipment for you while arranging terms, trade-in.

You make your final decision only when you come in and see it, or you tell us OK to ship.

"Ham Headquarters, USA" . . . Since 1925

HARRISON

225 GREENWICH STREET

NEW YORK 7, N. Y.

• PHONE: BARCLAY 7-7777

(LONG ISLAND—144-24 HILLSIDE, JAMAICA)

WANT TO WIN a hallicrafters "TO" ELECTRONIC KEYER?

Practice on ours, take a simple exam, and you get a Diploma and a chance to win one of these FB keyers, FREE!

new SB-10. LVV had to let DXing lag because of new jets going into service. Pompano Beach may soon have a new radio club. FNR, our leading OES, received the President's Appreciation Medal at a special presentation in the White House for his part in setting up communications for the President's South American tour. K4KEG's Beatnik Party for adults of the South Miami Club was a big success. Have you ever heard CQ on the Bongo drums? K4YWK has a new SB-10 to go with his new Apache. IHW put up a new 10-meter beam just in time to catch a dead band. IYT still is trying to operate with one in each arm and Andy Lee pulling at his leg. Must be great to have twins! It sure would help if you could get reports in the mail not later than the 3rd of each month. We had four make BPL for March. That makes 23 for the year already. If you don't already check into one of our section nets, please do so. We have plenty of vacancies for OPSs, ORSs and OESs. Interested? A post card or radiogram will get you information. Traffic: (Mar.) W3CUL/4 2665, K4QLG 880, SJH 793, W4FPC 639, SDR 333, K4LCD 273, BY 238, KDN 236, LCF 231, EHY 211, SLR 183, W4LMT 162, K4ILB 152, W4GJI 140, K4AX 128, W4IYT 121, K4ODS 120, *BLM* 119, RNS 64, MHX 37, BOO 36, W4FJE 33, SMK 33, FE 30, K4JJZ 27, TDT 21, W4BKC 18, W4GEJ 16, K4MTP 14, AHW 13, W4DPD 7, EHW 7, K4FXG 7, W4CNZ 6, K4DAD 6, W4DQS 6, K4OSQ 6, 1WT 3, W4LHU 2, LVV 2. (Feb.) W4NLX 191, JTA 27, DQS 11, EHW 10, KN4GLI 5.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: HKK. PAM: K4RZF. RMs: AXP and UBR. Quincy: BGO is active on S.S.B. K4EYC, now General Class, works 40-meter phone with a DX-100. KN4QON is a new Novice. Steinhatchee: UZB is serving as liaison between the W. Fla. Phone Net and other Florida nets. He is the only active ham in Dixie Co. Tallahassee: A new 10-meter net meets at 8 P.M. Wed. on 29.0 Mc. The TARC now holds meetings once a month at Dell Electronics. Perry: KQP gave two Conditional class exams this month. Madison: RCO is still QRT rig trouble. PBO reports one new Novice is awaiting his ticket. Panama City: K4CNY keeps the traffic moving. Ft. Walton: K4UBR is back on the air from a new QTH. The EARS held another FB auction. Another code and theory class has been started at Eglin, with an attendance of 30. Pensacola: K4SOI moved to a new QTH and recently made WAS. The PARC and the V.H.F. Club joined to provide communications for the Fiesta Sports Car Races. K4TZS is new General Class. MS is enjoying s.s.b.; he has DXCC 162. PAA is up to 190. K4AGM won a scholastic award at F.S.U. ZPN has a new G-43. K4RMO and K4SOI supplied mobile communications for NAS Scout troop during a simulated search for a lost airman. Traffic: (Mar.) K4CNY/4 478, UBR 132. (Feb.) W4SRK 246. (Jan.) W4SRK 104.

GEORGIA—SCM, William F. Kennedy, W4CEJ—SEC: PMJ. PAMS: LXE and ACH. RM: DDY. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 on Sun.; GSN meets Mon. through Sun. at 1900 EST, on 359 kc., DDY as NC; GTAN meets Sat. at 1000 EST on 729 kc.; the 75-Meter Mobile Phone Net meets each Sun. at 1330 EST on 3995 kc., K4JTC as NC; the Atlanta Ten Meter Phone Net meets each Sun. at 2200 EST on 29.6 Mc., KWC as NC; GPYL Net meets each Thurs. on 7260 kc. at 0900 EST, K4DNL as NC. K4VHC has his antennas back up after an ice storm. K4BVD worked some nice DX in March on 28 Mc. K4PKK reports v.h.f. activity still is increasing in this area with 46 stations in Atlanta on 2 meters and 59 on 6 meters in March. Many are leaving the lower bands for less QRM and lower power on v.h.f. LNG has finished a kw. power supply for high-power v.h.f. operations. The Warner Robbins Amateur Radio Club has been reactivated with K4KLE, pres.; K4KKR, vice-pres.; and Byron Gordon, secy.-treas. We wish the club all the success in the world and everyone will be glad to offer any assistance needed. New 1960 officers of the Savannah Radio Club are K4YSA, pres.; K4MHP, vice-pres.; K4OSL, secy.-treas.; K4JAC, act. mgr. On March 13 the hams of the Augusta Radio Club toured the various facilities at Fort Gordon, Ga. Col. Paul T. Snowden invited the club to visit his home after the tour to see his station, FIT. Everyone was impressed with the emergency generator set-up. Traffic: K4EJI 523, W4ZKU 517, K4ZMT 318, BAI 253, W4DDY 229, K4BQP 180, W4PBK 101, K4VHC 60, W4JWO 41, K4BVD 25, MIH 15, W4MKN 5, BXV 3.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA, CC and AOO made over 2000 contacts each in the ARRL C.W. Test; KD made 1500. K4MEU now is with FAA, San Juan. AUR got back his old KP4VB call. ATM is attending Radar School in Oklahoma City. WP4AQY now is KP4. KD made YLCC-200. Because of propagation, KD skeds his son on 14 instead of 21 Mc. W2KR vacationed in KP4-Land. Hams at the radar tracking station are AMU, ASV, ATP, ASX, AUV and ATO. However, the station is being moved to Ken-

(Continued on page 130)

tucky. JM worked Japan on 50 Mc. BZ, DJ and AMG attended the IRE Show. BZ has a new HQ-170 and a *Hornet* Tribander. AMG has a new R9-er and RME s.s.b. detector. DJ is building a 50 Mc. transistorized receiver. New officers of the PRARC are ALY, pres.; ACH, vice-pres.; ABN, treas.; URO, secy.; DC, CK, MV, AQK and Dr. Asencio, directors. ALY is revising his antenna systems *with a stacked array on 144 Mc.*, a Yagi on a 24-ft. boom for 50 Mc. and a Tribander for h.f. frequencies. AIS has a spiral ray on 144 Mc. ATZ has a new antenna on 144 Mc. The following are active on 144 Mc.: JM, AHQ, ALY, ATZ, AIS, ABN, AQQ and CK. *JM is building a kw. linear for 144 Mc.* AOD QSOed his first LU station on 50 Mc. ALY corrects us that he did not fix AHQ's Challenger; AHQ has one of the best Senecas on 50 Mc. CB was in P.R. from Rio for the IT&T executive meeting. WT, Dña. Maria Luisa was ill during January. ALY hears TI stations coming through on 50 Mc. at noon. Traffic: (Mar.) KP4WT 75. (Feb.) KP4WT 10, AMU 2. (Dec.) KP4WT 42.

CANAL ZONE—SCM, Ralph E. Harvey, KZ5RV—FL, RM, HK and PR received new Mosley Tribanders. HK and EJ have a new jr. operator. A new net has been started in the Canal Zone, called the Houn' Dog Net. It is strictly a ragchewer's net. However, all net stations will stand by for legitimate traffic, either for the Canal Zone, or one of the districts represented in the net. The Net Control Station has QSL cards with the picture of a houn' dog with a QSL card around his neck. These were supplied by W9SFF. UR entertained KØRQV from the *U.S.S. Peterson*. While in Antarctica *KØRQV operated* with the call KC4USP. HG entertained VR6AC, and his XYL from Pitcairn Island. Floyd and his XYL are going to visit the United States, first to Connecticut to obtain the original Bible from the *Bounty* which is in a museum there, and then to Texas and California to visit some of the hams to whom they have talked. OB and his XYL, OA, have left the Canal Zone for a vacation in the United States. AW, the Canal Zone holder of license No. 1, retired recently and will make his home in HP1-Land. Ev hopes to make arrangements to get back on the air, now that he has all the time necessary. New hams: DM, FB, FG, GM, LA, PS, RB and TM. Novices: BBN, DWN, MEN and MQN. Traffic: KZ5OB 71, UR 51, OA 45, AD 43, VF 42, JW 23, SW 21, SD 18, VR 15.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill jr., W6IQB—SEC: W6LIP. RMs: W6BHG and K6HLR: PAMs: W6BUK and W6ORS. The following stations earned BPL in March: K6WAH, K6MCA, W6GYH, W6ZJB, K6EA, W6WPF, W6BHG, K6LVR, W6PMO, K6PXQ and WA6EEO. Congrats, fellows! W6IRI/6 is a new operator at K6WAH. K6SIX worked LU3EX on 6 meters. K6PLW is trying to get on 2 meters. K6MCA is increasing RTTY skeds. K6EA, W6PMO and W6BHG worked like dogs on the Long Beach Hobby Show. K6KYJ has 180 watts on 2 meters. K6LVR is fighting a new electronic *bug!* K6PXQ *is moving to Hawaii.* K6SLM spent the Spring Vacation week in Death Valley. W6RKU has a pair of 4X150As on the air. W6AM has rhombic No. 16 working. FB, Don! W6FB has 600 watts on 75-meter phone and 40 watts on 40 meter c.w. K6COP made the Sigma Xi Sigma Honorary Science Club in college. Congrats, Howard! WA6GCM has a new HQ-145 and Viking II on the air. W9OWZ/6 is now on the East Coast and possibly will be in JA-Land soon. New officers of the Citrus Belt Amateur Radio Club are: WA6INH, pres.; K6UNI, vice-pres.; K6QGR, secy.; WV6IYN, treas.; K6MWJ, asst. mgr.; and K6SJA, custodian. W6CIS has been travelling up and down the State. WA6EEO will be /6 repeating Las Vegas, Nev. stations into So. Calif. WA6GKK is sporting a new NC-300. Support your section nets: On c.w. the Southern California Net, which meets at 1900 PDT on 3600 kc. daily. On phone, the SoCal 6 Net, which meets at 1900 PDT on 50.4 and 51.0 Mc. Traffic: K6WAH 1345, K6MCA 1320, W6GYH 1031, W6ZJB 961, K6EA 810, W6WPF 696, W6BHG 683, K6LVR 661, W6PMO 575, K6HLR 422, K6OZJ 345, WA6CKR 292, K6PXQ 290, KØCLS/6 272, WA6EEO 211, WA6DJB 138, WA6JOX 118, K6PSP 52, K6LJY 50, WA6GKK 39, W6CK 33, K6SIX 31, WA6BGI 21, W6USY 19, K6CDW 18, WA6AYF 12, WA6DWP 10, W6CIS 6, K6COP 4, K6PLW 4, W6UFJ 4, WA6GCM 2, W6NAA 1, W9OWZ/6 1. (Feb.) W6SYQ 181, K6TPL 40, W6CK 35, WA6AWD 5, W6NKR 2. (Jan.) K6WAH 532.

ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: CAF. PAM Copper State Net. 3880 kc.: FMZ. The Tucson Area AREC Net meets on 3880 kc. Wed. at 1900 MST. The Catalina Radio Club tested its 2-meter repeater on Mt. Bigelow. Stations in Phoenix, Wilcox and Benson were copied and repeated to other stations in Tucson. More tests will be made with better equipment and an improved antenna. George McCullough will take

(Continued on page 132)

"CALL ME for Personal Service"

Bob Henry
WØARA
Butler, Mo.
ORchard 9-3127

ON

"CALL ME for Personal Service"

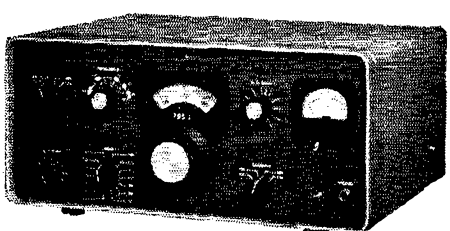
Ted Henry
W6UOU
Los Angeles
GRanite 7-6701

WORLD'S BEST TERMS

Because we finance our own terms . . .

- Only 6% a year finance cost
- 20 months or longer to pay
- Only 10% down (or your trade-in as down payment)
- No finance charges if paid within 90 days
- Reduced charges if paid off ahead of time
- You get more flexibility of financing in the future (such as re-financing) because we handle our own financing

Collins S/LINE



KWM-2 Transceiver	$1095.00
32S-1 Transmitter	666.00
516F-2 AC Power Supply	115.00
516E-1 12V DC Power Supply	262.00
75S-1 Receiver	495.00
312B-3 Speaker	27.50
312B-4 Speaker Console	185.00
F455Q-05 Mechanical Filter	50.00
30S-1 Linear Amplifier	1556.00

Write, phone or visit either store today!
Export inquiries and orders solicited

A-1 Reconditioned Apparatus

Nearly all makes and models. Big savings! Ten day trial—90 day warranty. 90 day full trade back on new apparatus. Write for bulletin.

Butler 1, Missouri
ORchard 9-3127

Henry Radio Stores

11240 West Olympic Blvd.
Los Angeles 64 Ph. GRanite 7-6701

BIG TRADE-INS

"World's Largest Distributors of Short Wave Receivers"

Dale Adams' place as coordinator of net activities. The Tucson Area AREC net on 3880 kc. had 32 check in during March. This will be my last report as your SCM. I want to thank everyone for your help and reports during the last four years. Will see you on the air. 73. Traffic: W7AMM 172, OIF 18, K7CET 12, AWI 7.

SAN DIEGO—SCM, Don Stansifer, W6LRU—Old-Timer W6HU, in Anaheim, is now a Class I OO. He has been on the air for 36 years, and turned in outstanding results on recent Frequency Measuring Tests. W6IEY, in La Mesa, is now an Official Experimental Station. He is active on both 6 and 2 meters and has receiving equipment on 220 Mc. K6RCK, in Santa Ana, reports a recent RACES drill was held there on 6 meters with good results. The El Cajon Valley High School, WA6DJS, has already picked its Field Day site. WA6BUX sold his DX-40 and has a new Apache working into his Triband beam. K6BTO, OES in the South Bay, reports he is building new equipment for 1296 Mc. W6YDK, at the Marine Corps Recruit Depot, had a traffic count for March of 1337 with only one operator. W6KVB, in San Diego, now has an HT-37, an SX-101A and a Triband beam. K6LKD, in Escondido, reports the following members of the Escondido High School Radio Club recently passing the General class exams: WA6s DNX, EII, HHJ and HOW. W6EOT, RM for the section and Director of the TCC, manages to find time between traffic sessions to work DX. The last state for WAS for K6LKD was Vermont, on 80-meter c.w. W6LRU and W6RCD vacationed in Death Valley during the Easter holiday. The Newport Amateur Radio Society reports Field Day activities and planning are in high gear. Traffic: W6YDK 1337, W6EOT 1013, K6BPI 628, WA6ATB 284, K6LKD 264, WA6DJS 85, WA6CDD 82, W6KVB 37, W6ELQ 23, K6RCK 8, K6RYI 5.

SANTA BARBARA—SCM, Robert A. Hemke, K6-CVR—Ed Kemper is doing a nice job of keeping the Poinsettia Club station WA6BMH, on the air. Give him a call any time on 3885 kc. W6OUL is now on 2 meters. WV6HRV and WV6HRX took the Condition class exam. WA6DYD received his General class ticket. K6MQX has a new RME receiver. W6HFY is moving to Los Angeles Area. WV6JJL plans to move to San Joaquin Valley. The Paso Robles Radio Club meets the 2nd and 4th Tue. The club has started to hook ARRL training aids and other interesting film subjects as a regular feature of meeting nights. WA6BLM is having ball working RTTY. WV6JLY, has just received his Novice class ticket. We welcome K6EHK, WA6EUY, W7OOQ, WA6HMH and WA6GUR to this section. WØRSD is now WA6KGO. Traffic: WA6BLM 46, W6FYW 4, W6YCF 3, W6ENR 1.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNJ—SEC: K5AEX, PAM: BOO. K5ETX has resigned as RM. I hope I will have someone in that post by next month. NFO reports that the West Texas hams are cranking up their power units and checking on their emergency gear in preparation for the tornado season. Sure hope they don't need to use it. The NTEN pulled a surprise simulated emergency drill just a few minutes before net time at 0800 Mar. 13. HWN, Tarrant County EC, with the assistance of THI, thought up the drill and set it in motion. The problem was efficiently handled to the satisfaction of all concerned and lasted about thirty minutes. WKH and K5EGB are the proud parents of a new YL born in March. HWN is new president of the Ft. Worth Kilocycle Club. The CTARC recently finished a code class and there will be five new amateurs in Waco soon. I have just been advised that an amateur in Virginia has confessed before the Senate Rackets Committee that he is a part of the "payola" scandal that is sweeping the country. It seems that he has been receiving some sort of renumeration for bragging on the excellent performance of his factory-built equipment. Better be careful how you talk about your equipment; you may be called on to prove you are not getting paid for it. Amateurs in this section were grieved to hear of the passing of AXG Mar. 7. Mr. Abbott, a retired FCC engineer of the Dallas office, gave many of us our radio examinations. Traffic: K5LGI 128, W5BOO 117, PTL 109, K5JSN 52, RAV 26, QOV 2.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—SEC: UYQ. PAMs: K5DLP, EJK, VCJ and HXK. RMs: K5-JGZ, VVQ and JXM. These fellows are doing a good job on 80, 75, 40, 6 and 2 meters. K5QEE and QMJ are both bragging about their new jr. operators. K5BBA earned a YLCC certificate. K5OXP has a Knight R-100. MMD has 120 countries on s.s.b. K5PGC had a very interesting program at the recent club meeting at Bartlesville. The Muskogee Club recently became an ARRL affiliate. The Oklahoma Six-Meter and Oklahoma City Clubs are either in the process of becoming affiliates or already have done so. The SCM visited two clubs this month, the Tulsa Mobile and ACARC at Oklahoma City. Sorry to miss hamfests at Tulsa, Quartz Mountains and Chickasha. Congratulations to PHP and

(Continued on page 134)

the Chickasha group on their very fine AREC Organization. The Chisholm Trail Club had three very interesting tests on 10 meters. KY reports a very interesting trip to Venezuela. VVQ, K5JGZ and MBK were presented RN5 certificates. VAX and VBG have a mobile apiece—"His and Hers." Ham of the month: K5LYM for his faithful work on the Sooner Traffic net. HXT and EHC were judges at the Oklahoma Central State Science Fair. Traffic: K5USA 415, W5QMJ 252, K5CAY 166, JGZ 157, W5VVQ 134, OOF 102, K5BAY 85, W5DRZ 83, EJK 74, FEC 42, K5DLP 33, IBZ 32, ELG 29, AUX 23, QEF 19, W5WAF 19, K5OVR 18, JOA 16, W5GIQ 13, MFX 13, W5UYQ 13, VLW 13, ESB 12, CCK 11, K5OOV 11, QEE 9, W5BBA 8, OTM 8, BNQ 6, K5REH 6, W5VAX 4, VNC 4, EHC 3, WDD 3, KY 2, VBG 2, K5BAT 1.

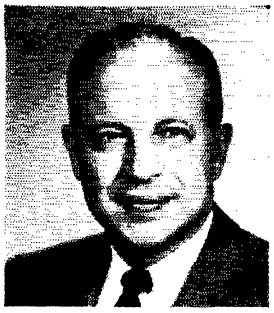
SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF. ZIN won an SX-101A in the Cross Index Contest by working the most towns and cities in the fifth call area. K5MMP is a new OO in Houston. He is in the process of building a new frequency standard with output on 10 and 50 kc., also an audio frequency meter for direct audio reading. It certainly was a pleasure to work ex-5NPA, who is now K6TXR. Let's make it more often, Bill, and I will try to catch you up on the news from Southern Texas. QEM was heard mobile visiting around the Central Texas Area. MSA, TVK and FNT were mobiling in San Antonio for the planning meeting for the STEN Convention. This is to be held in Kerrville Aug. 27 and 28. If you like a good small convention, be sure to attend. The 7290 Traffic Net had 46 sessions, 882 messages and 1619 stations. The new officers of the Houston Amateur Radio Club are SHD, pres.; K5BSZ, vice-pres.; K5KDN, program chairman; LSE, treas.; K5ALF, secy.; and ITA, parliamentarian. Glad to hear that K5JCC is getting his rig troubles worked out. Pete now has 160 countries worked, with 150 confirmed. Mobiles heard on 40 meters lately: K5OCW, K5DKM, K5BHU and OMR. Traffic: (Mar.) K5MXO 310, W5ZPD 97, ZIN 47, BHO 34, (Feb.) W5ZIN 52.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. D. Solomon, VE1OC, and H. C. Hillyard, VO1CZ. SEC: BL. Newly-elected officers of the Keith Rogers Memorial Club are KZ, pres.; ADN, vice-pres.; EC, secy. VO2NA is now Awards Manager for the Goose Bay Club, so applications for the "Worked All Goose" certificates should be addressed to Jack. Incidentally, 139 WAG certificates have been issued to date. The Maritime AREC, under the capable direction of BL, recently held a successful simulated emergency test. (Just a reminder that the AREC Net is held every Sun. on 3790 kc. at 1:30 P.M.) Members of the Armdale Kiwanis Air Cadet Squadron #292 have their own station operating under the call OU. Deepest sympathy is extended to the relatives and friends of GB, who has joined the ranks of Silent Keys. Preparation appear well under way for Field Day. Is your club participating? WO2AB has been transferred to Ottawa. Ex-VO2MK is now VE2YH and operates from Megantic. Ex-VO2HD is now VE3AMQ. Traffic: (Mar.) VE1ADH 42, DB 19, VEØNI 8, VE1OM 6, ES 3. (Feb.) VEØNI 23.

ONTARIO—SCM, Richard W. Roberts, VE3NG—Ray Nason, the Chief R.I. in Toronton, has had an operation and is doing well. CPR has been in the hospital, also. VD still is working with an indoor whip on 20 meters. TM has a new t.r. switch. DUY is active on 15 meters. CFR reports that the London Club is quite active on 10 meters. The club now has more than 120 members. BUR was in Florida. AUU has a king-size c.w. class about to visit the local R.I. There will be no ARRL Convention in Ontario this year. Ottawa may consider one for next spring. Montreal is holding one this fall in Quebec. Let's all go to that big party. The Westside ARC held a very successful dinner. The Scarboro Club also had one the same evening. The Nortown ARC held its Annual Dinner and was presented with the Marconi Trophy for last year's Field Day effort (the first in VE-Land.) Who will take it away from them? K5IJV showed his movies to the Ottawa gang. The *Westside Splatter* is an FB club paper. CVB is the pilot. The Hamilton ARC is getting ready for Field Day. BTL has a pipe line into South America. CYE was in the hospital. The petitions regarding the proposed changes or additions to our frequencies are almost complete and are in the hands of the people at Ottawa. We now can only await the word. The OARA is active on the license plate deal and hopes to have news soon. DOY is active in Sudbury. NZ is getting thawed out at Stroud. Gord and Vi Austin ex-VE3GH and ex-VE3DEX, are now VP5GH and VP5VI. The members of the Ontario Phone Net thanks ANS for his help in getting the net started each evening. Traffic: VE3NAR 336, NG 166, DPO 141, DCX 139, CFR 71,

(Continued on page 136)



IT'S ANTENNA AND TOWER TIME AT WRL

LEO I. MEYERSON, WØGFQ, Says

Whether it's a complete antenna system, accessories for your present gear, or anything in amateur radio line . . . you'll make your best deal with WRL, the world's largest distributor of amateur radio equipment. 23 hams serve you here, from the center of the U. S. A. with immediate shipment of the gear you want.

All Ham Equipment

From the nation's leading manufacturers to our huge stock rooms comes late production merchandise to satisfy customer demands. Mobile, sideband, AM or CW; transmitters, receivers, antennas and accessories — they're in stock at WRL.

Consistantly Highest Trades Anywhere

Because of the fast turnover in our Reconditioned Equipment Department and the high demand for that gear, World Radio can offer the country's finest trade-in deals. The next time you're ready to trade, let us make you an offer.

Reconditioned Equipment

More than 800 pieces of used gear in brand new operating condition are available at tremendous savings to you. We invite you to send for our latest Reconditioned Equipment Lists . . . FREE!

FREE 1960 CATALOG

Big 200-Page Book of Bargains Send for Yours TODAY!

ECONOMY PACKAGE

32 ft. Concrete Mount WRL Spire Tower	$49.95
CDR Rotor AR22	33.44
75 ft. Rotor Control Wire	2.30
Hy-Gain TH-2 Thunderbird Beam	59.95
10 ft. Extra Heavy Duty Mast	2.29

COMPLETE, Only $147.93

STANDARD PACKAGE

40 ft. Concrete Mount WRL Spire Tower	$ 72.25
HAM-M Rotor	119.50
100 ft. Control Cable	5.82
Hy-Gain TH-3 Thunderbird Beam	89.95
10 ft. Extra Heavy Duty Mast	2.29

COMPLETE, Only $289.81

DELUXE PACKAGE

48 ft. Concrete Mount WRL Spire Tower	$105.50
Hy-Gain Rotobrake RBX-1	199.95
100 ft. Control Cable	10.80
Hy-Gain TH-4 Thunderbird Beam	117.50
10 ft. Extra Heavy Duty Mast	2.29

COMPLETE, Only $436.04

TOWERS	ROTORS	ANTENNAS
EZ-Way	CDR	Hy-Gain
Spire	Hy-Gain	Telrex
Rohn	Telrex	Mosley
Tri-Ex		
Pipestone		

And All Accessories

"the house the hams built"

WRL WORLD RADIO LABORATORIES Q-6

3415 W. BROADWAY • PHONE 32 8-1851 • COUNCIL BLUFFS, IOWA

Dear Leo: Please send your ☐ FREE CATALOG ☐ RECONDITIONED EQUIPMENT LISTS. ENCLOSED IS MY CHECK FOR THE ☐ ECONOMY, ☐ STANDARD, ☐ DELUXE PACKAGE

NAME: _____ CALL _____

ADDRESS: _____ CITY & STATE: _____

NO 68, AUU 62, BUR 60, RN 34, TM 30, AML 26, DZA 23, DTO 18, DXZ 18, RW 17, EHL 14, DWN 13, ELC 13, VD 6, DLC 5.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—The following interesting note was received from YA, our QSL, Mgr.: "Just returned from two eventful weeks in India. The XYL and I enjoyed every minute and it is amazing how much ground can be covered in such a short time. Went via Dusseldorf, Geneva and Beirut; returned via Cairo and Rome. While in VU2 visited Bombay, Bangalore, Mysore, Calcutta, Madras, Darjeeling, Delhi, Agras and found people everywhere very friendly. Efforts to contact local hams in vain, only disappointment of trip. At Ambassador Hotel in Delhi located an all-wave BCL (made in VU) and by aid of my transistor receiver finally managed to locate the 20-meter band. Bandspread atrocious but buy by squeezing the trans. set between forefinger and thumb was able to hear the big ones coming through: W4FU and W2-VND good sigs. No VEs heard but plenty strong UI8, UM8, UL7 and SPs, VS9OC strong. You guessed it; they were all busy working the ARRL DX Test. VU2VA and 2NR heard on phone, VU2AZ and 2DR on c.w. Took lots of pix." 73. Exams reduced the activity of McGill University station UN. OR did a fine job of raising funds for DY's estate. GQ is visiting in HB-Land. BG reports KN and NB have joined the Professional Loafers Club. In VE, hams are restricted to use P/L English or French. Efforts are being made to amend this ruling by the Montreal Amateur Radio Club. Traffic: VE2WT 251, DR 111, BG 37, AJD 9, EC 8.

MANITOBA—SCM, M. S. Watson, VE4JY—The highlight of the ARLM March meeting was an auction of radio gear which went over with a bang. VE4NS, a recent graduate of the General Hospital School of Nursing, has accepted a position as Public Health nurse at Virden. Congratulations, Ann. CB reports logging 109 contacts in the February YL-OM Contest. Good going, Ethel. A QSL card from 15 ARLM members will get you a Worked All Winnipeg Award. VE4s must get 25 cards. All amateurs were deeply grieved by the sudden death of LF at the early age of 46. President TJ, an active DX fan, reports 63 contacts in February, including DU7SV and ZS5LU. Do not miss the Manitoba Hamfest sponsored by the Brandon Club Sept. 3 and 4, 1960. Your SCM will be on holiday overseas until early in July. IF, former SCM, has kindly consented to act in the interim. Traffic: VE4JY 13, PE 10, QD 6, MN 5, GU 4, AN 2, JP 2.

SASKATCHEWAN—SCM, Harold R. Horn, VE5-HR—Yes, fellow hams, we are very proud of our VE5 automobile license plates now being displayed. Do not forget the hamfest at Regina to be held the July 1st week end. NX, FC, GE and AG passed their Advanced Amateur exams. Congratulations. GW is recovering from an unfortunate accident, but keeps his fist on c.w. DZ is busy keeping skeds with northern VE8s, handling messages from their relations. DZ also finds time for all contests and chases DX on the side. QC has an HT-37. GE is heard on all bands now with a new rig running 75 watts with an 814. HR has a new Apache ready to go. I expect to be on 75 meters soon, fellows, and will be after more news for this column then. BG is attending college at Ames, Iowa. Traffic: VE5CR 20, HQ 7, HF 5, QL 4, DS 3, CD 2.

QST

Recent Equipment

(Continued from page 45)

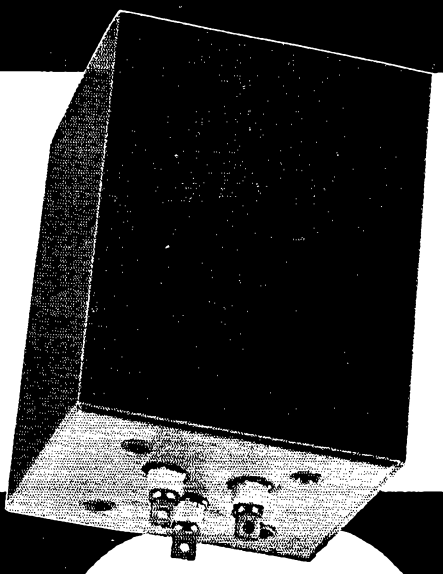
12AX7 speech amplifier and 7027A modulator, choke-coupled to the plate and screen of the 6146 amplifier. The 7027A is a husky audio tube, but in order to do a job of modulating the 60-odd watts phone-input rating of the 6146 and still stay within the 35-watt plate dissipation rating of the 7027A it is necessary to operate the latter as a Class AB_1 amplifier. Since there is only one tube the resulting modulation is unsymmetrical, but the audio quality is quite adequate for voice work.

Front panel controls of the Scout include an a.c. on-off switch which is combined with the speech section's GAIN CONTROL, a METER SWITCH for reading r.f. amplifier grid or plate current, and a function switch which takes care of TUNING, C.W., STANDBY and A.M. OSCILLATOR TUNING and

(Continued on page 138)

AGAIN AVAILABLE AT

HARVEY RADIO



TOROID

LOW PASS FILTER

Low pass audio filter that contains 5 Toroidal coils in an L/C network — Pass band 300 to 2,500 cps ± 3 DB — Extremely sharp cut off at 3,200 cycles — Impedance 600 ohm in and out...

Weighs 3.6 lbs.
Dimensions: 3⅜" x 3⅜" x 5"

- Handle up to 25 to 30 watts of audio
- No maintenance
- Better than a Speech Clipper

AN UNBEATABLE VALUE! WORTH TWICE THE PRICE

You can put it to use in so many ways—

- ★ In single side band applications
- ★ In 500 ohm line from speech driver to modulator
- ★ In 500 ohm receiver output
- ★ As a telephone line filter for broadcast stations

ONLY $9.95 F.O.B. New York

Take advantage of this sensational *below manufacturer's cost* offer. It's the buy of a lifetime you can't afford to miss. Order by mail today.

Send check or money order inclusive of shipping charges to

HARVEY RADIO CO., INC.

103 West 43rd Street, New York 36, New York

PLATE TUNING controls are provided for tuning the grid and plate circuits to resonance and an ANTENNA LOADING control adjusts the pi network. A microphone connector and crystal-v.f.o. socket are also located on the front panel. — *E. L. C.*

Sweepstakes

(Continued from page 65)

W4ZPO...54,900- 304-61-A-26
K4IZL....20,531- 210-49-B-12
W4HVD....5895- 66-30-A- 7

Western Florida

K4ZAC....13,607- 97-47-A-14
W4KPE....10,763- 88-41-A-15
K4BOI (K4s BOE ZRW)
81,351- 420-69-A-37

Georgia

W4FGH..129,582- 626-69-A-37
W4PZV...54,288- 381-72-B-30
K4TBN.....540- 15-12-A- 3
W4JAW.....48- 4- 4-A- –

West Indies

KG4AM4..15,168- 159-48-B-11

Canal Zone

KZ5LC....65,928- 328-67-A-30

SOUTHWESTERN DIVISION

Los Angeles

W6LNW.201,480- 924-73-A-40
K6YNB...84,845- 331-66-A-16
K6LJY....48,174- 261-62-A-39
W6CFM..42,215- 239-59-A-30
K6SQL....39,780- 261-51-A- –
W6UQO...15,053- 114-45-A-19
W6SVO...13,481- 107-43-A-14
W6PFE.....3312- 46-24-A-12
K6ZQS.....1344- 28-16-A- 2
K6PXQ.....360- 12-10-A- 1
W6UFJ.....144- 8- 6-A- 1
W6UGU.....3- 1- 1-A- 1
K6ICS.....3- 1- 1-A- –
K6ICQ (K6s ICQ ICS)
40,590- 232-60-A-23
K6SVY (5 oprs.)
20,010- 153-60-A-21
K6JEN (K6 JEN, WV6IFA)
294- 50- 2-A-35

Arizona

W7CAF..139,194- 731-66-A-31
W7IQS....71,820- 529-70-B-39
K7JSK....41,040- 241-57-A-28
W7ENA...40,356- 227-59-A-22
K7BXV...36,456- 221-56-A-12
K7BHQ...29,376- 204-48-A-18
W7LTQ...26,792- 171-53-A-24
K7CLA...10,044- 94-36-A-12
W7CPY/7.2178- 33-22-A- –

San Diego

W6JVA..124,064- 579-73-A-38
K6LLE....71,232- 375-64-A-23
K6JLJ....35,808- 188-64-A-28
K6LKD....6126- 60-34-A- 6
WA6BFN (WA6s BFI BFN GHO)
46,817- 269-59-A-28

Santa Barbara

W6UWL..16,298- 103-53-A-18
K6LVD....4719- 61-26-A-17
K6ICS/6....975- 25-13-A- 3

WEST GULF DIVISION

Northern Texas

K5HD...118,800- 601-66-A-33
K5TBZ....74,620- 592-65-B-30
K5IFL....60,255- 309-65-A-20
W5KZX...18,480- 178-35-A-15
W5FIX....11,214- 99-42-A-21
K5HTH.....5613- 87-33-A-19
W5SOD.....6480- 68-32-A-13
K5TRX.....3750- 50-25-A- 5
K5JBQ (K5s JBQ JZK KGQ)
45,572- 273-57-A-28
K5KZA (K5s IVF KZA)
23,771- 154-53-A-22

Oklahoma

W5IWL..140,097- 703-67-A-40
K5IWK...65,280- 348-64-A-25
K5BBA...61,479- 312-66-A-31
K5MID...36,190- 332-55-B-20
K5OJD....11,132- 141-44-B-24

Southern Texas

W5PZG...56,415- 415-70-A-37
K5RQI....50,700- 300-63-A-26

CANADIAN DIVISION

Quebec

VE2JR....45,441- 234-66-A-35
VE2BAT...14,625- 128-39-A-29
VE2UN6...12,168- 104-39-A-10

Ontario

W8JKD/VE3
12,740- 130-49-B-24
VE3CKW (VE3s CKA CKW, VO1DS)
31,494- 182-58-A-39

Manitoba

K4DJG/VE4.576- 16-12-A- 4

Alberta

VE6TP....62,310- 337-62-A-17
VE6IN.....4131- 51-27-A- 4

[1] K2KXZ, opr. [2] Hq. staff, not eligible for award. [3] W1FZJ, opr. [4] KG4AP, opr. [5] W2LHL, opr.

ARRL thanks the following amateurs for submitting their logs for checking purposes: W5PGG, W7QOT/7.

The "Tech" Special

(Continued from page 22)

Incidentally, the output reading on the r.f. voltmeter may be large or small, depending on the antenna and transmission line characteristics. The actual reading does not matter a great deal; the important thing is to tune for maximum. With the dummy load mentioned above the reading was approximately ⅓ scale.

The transmitter is designed to work into a 50- or 70-ohm load, so your antenna system should match the line well enough so that the s.w.r. on the transmission line is not over 2 to 1.

The plate current of the modulator, without

(Continued on page 140)

It Doesn't Take An Ink Blot Test To Know The Best Ham Bargains Come From

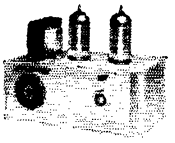
Globe UM-1 Modulator

Wired (with Tubes) $49.95
$34.95 Kit (Less Tubes)

Globe Chief Deluxe

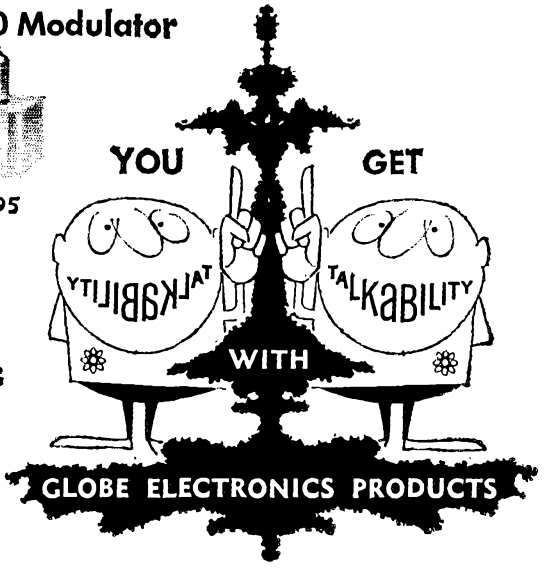
$59.95 Kit
Wired: $79.95

Globe SM-90 Modulator

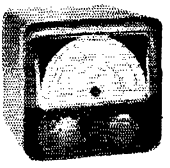


Kit Only $11.95

TOMORROW'S PRODUCTS TODAY



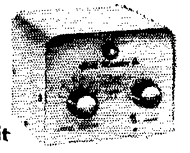
the Globe 755 VFO



Wired: $59.95
$49.95 Kit

the Globe AT-3 Antenna Tuner

Wired $15.95
$11.95 Kit



ONLY 10% DOWN

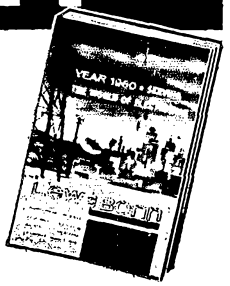
WRITE TODAY FOR COMPLETE AND DETAILED INFORMATION ON THESE GLOBE PRODUCTS

THE Lew Bonn CO.

Distributors of Nationally Known Amateur Equipment

Complete Globe Line Displayed in

FREE NEW CATALOG



Send Merchandise and Catalog Orders To
DEPT. Q6, 1211 LA SALLE, MINNEAPOLIS 3, MINN.
WRITE TO BOB, WØVVL

speech input, should be approximately 25 ma. Because of the nature of speech waveforms, the plate current just "kicks" slightly when you are modulating the transmitter 100 per cent on voice peaks. Beware of any large swings in the modulator plate current as you talk — these mean overmodulation and distortion. And don't assume that you can use the r.f. output meter to indicate modulation, too — the pointer will be rock steady when you're modulating properly. If it flickers, you're hitting the microphone too hard. Keep your volume within proper limits and you'll have a good-sounding 6- and 2-meter phone signal. QST

Feeding Grounded Towers

(Continued from page 33)

band (but fed at the center, 30 feet above ground).

Coaxial feedlines and rotator control lines for tower mounted beams should be carried down the tower and run underground from the base, and should pose no problem when installing the low-band feed system, since they should then be at the same potential as the tower at the same point. Coupling between the tower and metal objects in the near vicinity may affect the tuning of the omega match, but so long as these objects are not moved, the feed system should remain in adjustment. The bottom end of the omega rod is "hot" and care should be taken not to change conditions in the immediate vicinity, say within a two- or three-foot radius.

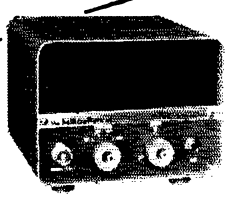
Construction

To try such a feed system, it is necessary to have an s.w.r. bridge, a source of r.f. power, metal tubing and capacitors, with the necessary brackets, insulators and box. Since it is not contemplated that an exact copy will be made, drawings and photographs of interior construction are not provided. For the gamma section, 1½-inch tubing was used, but smaller size could be employed and steel should work as well as aluminum. Double-spaced capacitors were used for the variable units, while 3000-volt mica and 7500-volt ceramic capacitors were used for the fixed units. One of the boxes shown in the photographs is 5 by 6 by 9 inches, while the other is 6 by 6 by 6 inches. It is necessary to insulate from the box those capacitors whose rotors are not shown connected to the grounded tower. The clamp holding the lower end of the omega rod to the box must be insulated too, of course. The clamps holding the box to the base of the tower are bolted solidly to the box. The tuning-capacitor shafts are passed through tight-fitting rubber grommets to prevent water seepage, and small holes (⅛ inch) are provided in the bottom of the box to drain condensation. The whole installation is sprayed with clear acrylic or polystyrene dope to make it as waterproof as possible.

The radiation pattern will differ from a half-

(Continued on page 142)

BULLSEYE BUYS at ARROW!



MODEL HA-1 T.O. KEYER by HALLICRAFTERS

For perfect CW keying at any speed from 10 to 65 w.p.m. Just connect to power line and key terminals — and you're sending clear as tape.

79.95

VIBRO-KEYER

Perfect match for the HA-1 Keyer. Deluxe Vibroplex contacts, sturdy main frame, adjustable trunnion lever.

15.95

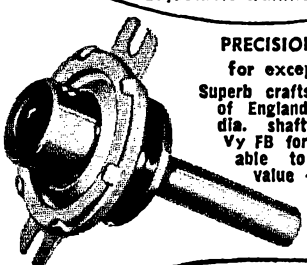
Sub-Miniature 0-200 Microampere Meter

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. 2 for $7.50

1½" square 0-500 microamperes. Bakelite case. By Dejur.

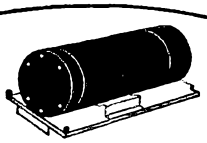
$2.95 ea. 2 for $5.50



PRECISION PLANETARY-VERNIER 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

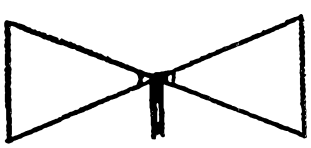


DYNAMOTORS

Brand new, recent military production, high efficiency, compact.

12 Volt Model
Rated output: 625 vdc @ 225 ma. 9" long, 5" dia. wt. 16 lbs. $12.95

6 Volt Model
Rated output 425 vdc @ 375 ma. 7½" long, 4" dia. $11.95



"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

EQUIPMENT COVERS

Heavy gauge, clear plastic, similar in gauge to $35 to $50 plastic auto seat covers.

AS-1001	fits HQ-145, HQ-170, HQ-180 and NC-303	**$4.70**
AS-1002	fits HQ-100 and HQ-110	**$3.70**
AS-1003	fits NC-109 and NC-188	**$3.90**

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.

Amateur Net $1.39

3 for $3.49 10 for $10.75

ARROW Authorized distributor of HEATHKIT equipment

MAIL ORDERS PROMPTLY PROCESSED
SAME DAY SHIPMENT FROM STOCK

TO SAVE C.O.D. CHARGES, PLEASE INCLUDE SUFFICIENT POSTAGE WITH YOUR ORDER. ANY EXTRA MONEY WILL BE RETURNED.

ALL PRICES F.O.B. N. Y. C.
Arrow's Export Dept. Ships To All Parts Of The World!
Prices Subject To Change Without Notice.

ARROW ELECTRONICS, INC.

65 Cortlandt Street, New York 7, N. Y. • Digby 9-4730
525 Jericho Turnpike, Mineola, N. Y. • Pioneer 6-8686

wave horizontal or trap doublet, but if you have these already up, you don't really need this antenna, and you will probably try it only to see if it will work. It will! QST

Technical Correspondence

(*Continued from page 63*)

sufficient isolation to prevent some of the fundamental crystal output from reaching the antenna along with the desired multiplied output frequency. This fed-through fundamental crystal-frequency energy, even though small, will readily be radiated by a 40-meter dipole which is practically cut to frequency for that energy.

The simplest solution here, of course, is to avoid using the coax-fed 40-meter dipole for operation on 15 meters. However, if a separate antenna cut for 15 meters is not practical, try using an antenna tuner as recommended in the ARRL *Handbook* or the ARRL *Antenna Book*. Either method should provide adequate rejection to eliminate radiation of the crystal-frequency energy.

— *Geo. M. Point, K2BEV*

Field Day

(*Continued from page 57*)

Independence-of-Mains: All radio equipment independent of commercial power source: 3. All radio equipment not independent of commercial power: 1.

Battery Power: (applies to Class B and C only): 1.5. The battery capacity or size shall in all cases be adequate to permit one hour's continuous operation of the station. Charging batteries from commercial mains while batteries are connected to transmitter or receiver voids the "independence-of-mains" and "battery power" multipliers.

Multipliers do not apply to Class D and E entries.

Final Score: The final score equals the total "points" multiplied by the "power multiplier" multiplied by the "independence-of-mains" multiplier (multiplied by the "battery power" multiplier, if applicable). Where different multipliers apply during the Field Day period, points are multiplied by the multiplier in effect at the time the points were earned.

11. Club Aggregate-Mobile Scores: Entries under Class C may be combined to form a "Club Aggregate-Mobile Score." The club name must be noted on the individual reports, and the club secretary must submit a claimed aggregate score. Credits to the extent supported by the reports submitted to ARRL will be allowed. Only bona fide members of the club, residing in the club territory, may contribute to the aggregate-mobile club listing.

12. Reporting: Mail reports or entries on or before July 25. Reports must show starting and ending time of FD operating period, bands used, dates and contact times, calls of stations worked, signal reports sent and received, and ARRL sections or locations of stations worked. Reports must also show power inputs and sources of power, number of transmitters in simultaneous operation, location of station, number of persons participating, class of entry, and score computations. QST

V.H.F. Party

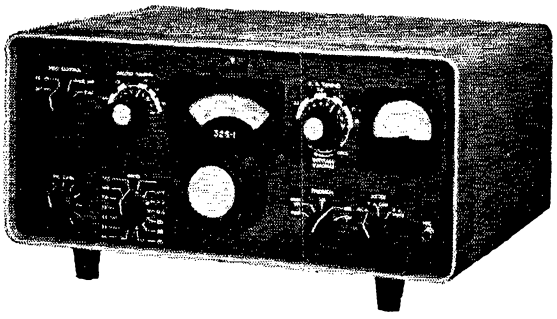
(*Continued from page 64*)

Award Committee decisions will be final.

8) Reports must be postmarked no later than July 1, 1960, to be eligible for awards. Follow the sample log for correct form, or a message to Headquarters will bring printed blanks for your convenience. QST

Strays

After receiving his General license, WA2-GVB's first code contact outside the Novice band was K2GVB.



SELECTRONIC SELECTED SHORT OBJECTS

Collins 32S-1 Transmitter

The Collins 32S-1 is a SSB or CW transmitter with a nominal output of 100 watts P.E.P. for operation on all amateur bands between 3.5 and 29.7 mc. It provides ample RF power for excellent communication on all bands.

Time-proven features of the Collins KWS-1 and KWM-1 have been incorporated into the 32S-1 including Mechanical Filter-type sideband generation; stable, permeability tuned VFO; crystal controlled high frequency oscillator; RF inverse feedback for better linearity; and automatic load control for higher average talk power.

WOW! Why wait ten years? You can buy *this* transmitter, *now!*

Take a tip from the Icl O.T. Buy the matching receiver, too. And take advantage of the transceiver function.

Ted Michalski, W8TQY, (Surface Combustion Corp., Toledo, Ohio) sez, "Dale, I have never gotten more pleasure out of any radio equipment I have ever bought! This Collins S/Line is worth the price."

Would you like a Collins S/Line, too? Tell me what you have, and how you want to trade!

73,
Dale . . . W8GDE

SELECTRONIC SUPPLIES, INC.

3185 Bellevue Road, Toledo, Ohio
801 S. Adams, Peoria, Illinois

FACTORY AUTHORIZED SERVICE
ON RECEIVERS AND TRANSMITTERS

REPAIRS, modernization, calibration and alignment by competent engineers using factory standard instruments. Collins, Globe, Hallicrafters, Hammarlund, Harvey-Wells, National Co. Service representative for Hickok and RCA Test Equipment. Factory parts. All work guaranteed. Our twenty-fourth year.

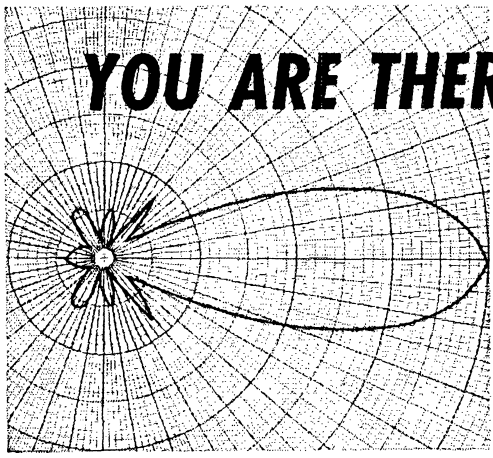
DOUGLAS INSTRUMENT LABORATORY
176 Norfolk Avenue — Boston 19, Mass.

• HAM-SWAP •

The New service for the Radio Amateur

Buy, sell, swap your equipment NOW in its pages! Published twice monthly—national circulation. $1 ad free with $1 year's subscription. Send $1 to . . . . . .

HAM-SWAP, Inc., 35-C East Wacker Drive, Chicago 1, Ill.



with telrex

"TRI-BAND" SYSTEMS

There's long term dependability, scientific leadership, world-wide respected performance plus quality of material too, at a price even the modest budget can afford.

Enjoy superior performance . . .

You're always a "step ahead" with Telrex. Arrays from $5.95 to $12,000. Also available Rotators, "Baluns", Towers. Dollar-for-dollar better in every way. Send for technical bulletins, today!

ANTENNAS SINCE 1921 — Communication and TV Antennas

Telrex LABORATORIES

ASBURY PARK 40, NEW JERSEY, U.S.A.

Single-Crystal Converter

(*Continued from page 35*)

of the r.f. amplifier occurred where the unit was first tested, but careful attention to these shielding details eliminated the problem.

Adjustment

A grid-dip meter is helpful in setting the proper tuning ranges. Circuits C_1L_2 and C_2L_3 are adjusted to tune from 14 to 30 Mc., while C_3L_4 is adjusted to tune from 12 to 25 Mc. Coil adjustment is made by changing the turns spacing until the respective capacitor tunes the proper range. C_4L_5 is tuned to the crystal fundamental, 6.2 Mc., and is adjusted by the coil slug until the crystal oscillates best.

A coaxial-cable connection to the receiver is a must in order to shield out unwanted signals on the receiver frequency.

Use of the converter is the essence of simplicity. After connection to the receiver, an injection frequency and corresponding receiver tuning frequency are selected from the list above, and then signals are peaked by capacitors C_1, C_2, and C_3. These need not be touched again in tuning the whole band except for wide excursions in the 10-meter band where readjustment of the r.f.-stage tuning may prove helpful.

If you feel that your present receiver lacks pep, image rejection, bandspread, or stability on the high frequencies, try this crystal converter. Or, better still, add both a *Q* multiplier and this crystal converter. QST

Correspondence

(*Continued from page 79*)

ships were saved. Binns received enormous publicity throughout the U. S. and England. He was sent ashore to appear at several vaudeville theaters. I saw his show at the old Globe theater in Boston. He had a large spark coil set up on the stage and with a theme of the disaster threaded into the act he sent loud dots and dashes from the stage. The value of wireless telegraphy on ships at sea had been established.

Many c.w. amateurs, I am sure, would enjoy reading *SOS — To The Rescue* by Karl Baarslag. Karl was operating at sea from 1900 on, and gives a most interesting and authentic description of many well-known sea disasters in which the wireless operators played outstanding parts. It is available at public libraries. — *Edward E. Hayward, W1PH, Auburndale, Mass.*

REFUGE

¶ Why all this talk of abolishing the poor Novice?

In these days of one weekend-contest-after-another, where else can us non-contest lovers go, come our precious little weekend operating time? Onto the Novice frequencies, natch! Into this virgin valley, this Utopia of limited low power . . . this happy land of fairly normal QSO's . . . amongst our congenial, if overly-eager fellow men. . . .

Here, we Generals and Conditionals have a fighting chance. Besides, most Novices send slow enough for us Generals to understand.

I, for one, salute the Novice. This is ideal ham radio! — *Mel Kampe, W9SHM, Springfield, Illinois.*

SHADES OF THE PAST

¶ Hurray for K6YNB, true spokesman for us younger

(*Continued on page 146*)

hams. However, I feel that he might have missed a point. It is very possible that some of the OTs doing all of the complaining got their licenses when they were teenagers; perhaps they just don't like seeing that unsavory part of their history laid out so vividly before them again! . . .

Many thanks for a fine business magazine and the work you've been doing for all of us. — *Douglas E. Thompson, K8OTJ, Bay City, Michigan.*

STARTING RIGHT

¶ I received your *Gateway to Amateur Radio* publications. I have started to study the basic theory and find the booklets very easy to understand and well written. These books, no doubt, will help me greatly in passing the exam for hams. I would like to say that I hope you will keep up the good work so that other prospective hams may benefit from your experience. — *Rick Lord, Winnipeg, Manitoba.*

IMPROVING DX

¶ . . . In my humble opinion it is a good time to start thinking about QRP. It can be done in a five-year period. With the better and sharper receivers we have today it's not impractical to reduce power to 200 watts. At the end of the first year reduce the maximum power to 800 watts, the second year to 600, etc. until after 5 years are up maximum power will be 200 watts. Let's face it, power is important only from a competitive standpoint. In radio as in life the biggest noise gets fastest attention.

Another pet idea I have is to keep the first 20 kc on each DX band open from 5 P.M. local time to 5 A.M. No W or VE station would call CQ or CQ DX or QRZ on these first 20 kcs, though they could of course answer the DX. It would help all hams throughout the world. It would give the DX a chance to work a few Central and South Americans which must be quite a struggle now. — *J. J. Lambias, W2WAS, Jackson Heights 72, New York.*

JOIN 'EM UP

¶ . . . Amateurs who don't belong to the League are free loaders. The League is well represented by men such as Mr. Budlong. Without these men amateur radio would be pulled to pieces by political ambition in a short space of time. In other words, ARRL *is* amateur radio . . . — *Bud Dolsberry, WØOAQ, Leavenworth, Kansas.*

101 AND DXCC

¶ Suppose that 101 hams in 101 different DX countries, each worked all the others of the group and exchanged QSLs. If the cards were forwarded to West Hartford each would become eligible for DXCC. Once this happens, then each becomes eligible for DXCC^2. This makes them all DXCC^3 and so on until all become DXCC$^\infty$.

However, if one of the group slipped up and only sent out 99 instead of 100 cards the unfortunate ham would not qualify for DXCC and, in fact would be one card shy of both DXCC and DXCC$^\infty$!

If he then received a card from another country outside of the group he would then become DXCC, promoting the rest to DXCC^2. If, now the missing QSL showed up he would become eligible for DXCC^2 and the rest of them for DXCC^3, this situation would snowball as above with the whole group becoming DXCC$^\infty$ except for our friend with the late QSL who would always be tagging behind one, so that he would end up DXCC$^{\infty-1}$.

I don't know what all this means, do you? — *A. S. G. Grant, VE1EP, DXCC^1, Halifax, N. S.*

THE TOP "50"

¶ The opening of the top of twenty meters is undoubtedly one of the greatest things to come about in amateur radio since the reopening of the bands just after the second World War. At this early date it is still too soon to tell what the full effects will be. It is needless to say that if the amateur radio operators of the United States do not set up and follow a few simple rules they will surely spoil a good thing. There is no reason for us to crowd into the top half of twenty just because it is new and now open to us. We still have the use of the original twenty-meter band and I think that we should when and wherever possible use these frequencies as much as possible.

(*Continued on page 148*)

There are many DX stations throughout the world that are running low power and are restricted to this top portion of the twenty-meter band that may give up or greatly curtail their activity unless they are given a break. They as well as we like to enjoy some plain rag-chewing and don't want to be snowed under all the time answering requests for QSL cards. They have enjoyed in the past having the split band where they could answer stations at their pleasure, picking out stations that were out in the clear.

Now all this will change and the DX station may be plowed under and driven to another band or off the air. Which it will be depends a lot on how we the American hams behave ourselves on the ham bands mainly the top half of twenty. — *Ted Gray, KG6AIH, Agana, Guam.*

SPEED EXPERTS

¶ There have been several letters recently in "Letters" commenting on code speeds which represented widely differing individual opinions on what constituted a norm for "good" c.w. operation speed. How about presenting the opinion of some competent authority on this subject? I do not question the facts stated by K4SCW (*QST* Mar., p. 91), but I do wonder whether his performance is not that of an exceptional individual. My experience leads me to think that merely the ability to move a key or pencil at speeds higher than 40 w.p.m. is unusual. — *Joe Gillson, W3GAU, Wilmington, Del.*

WRITER'S CRAMPS

¶ Jack Chancellor, W9SON's, letter "Helping Hand" (February *QST*) reminded me of the disappointments I went through in getting started more years ago than I like to admit. I decided after a number of such disappointments that if I ever wrote anything I'd answer every single letter.

Some twenty-odd years later I found myself writing a few articles for amateur consumption. Letters came in from all over the world and I set out to answer every one, which I did. The time normally spent in research and writing was wholly consumed in answering the countless quizzes that would make a Univac pant. The net result is that I have practically quit writing because I don't have the time to answer the "fan mail." The little I have done in recent years has been well illustrated, which seems to cut down the quizzes.

W9SON is typically selfish as are most hams, when he complains about refusal to "acknowledge a simple postcard." It's not the cost of the one stamp to answer a postcard but its the n x 4¢ that runs into real money. To W9SON and all other correspondents, do the writer of the article at least the courtesy of sending a stamp along with your inquiry. If you want to get an immediate reply, make that a self-addressed stamped envelope. Such letters always get first attention.

Lest others do not know, authors of ham articles get very little, if anything, for their effort. Is it fair to expect them to dig down in their jeans and pay for the privilege of providing you fellows with interesting, educational and helpful articles? — *Norman R. McLaughlin, W4GJR, Greensboro, N. C*

MORE ON NOVICE

¶ In regard to WA2BMB's letter about getting rid of the Novice license, I'm thumbs down. If there weren't a Novice Class most amateurs would never gain the valuable operating experience that leads to a General ticket.

I have had a lot of fun in the Novice bands and I know a lot of other Novices have too. If WA2BMB doesn't want to go in the Novice band and get "smothered in QRM" let him stay out . . . — *Edwin Petzolt, KN1LNC, Gardner, Massachusetts.*

MARATHON CRAZE

¶ The recent wave of idiot marathons in England appears to have touched off a similar wave of idiocy among certain amateur radio licensees.

In a recent bulletin was an item extolling as great accomplishments a number of 6-meter QSOs lasting more than

(*Continued on page 150*)

twice around the clock. Each group apparently was trying to outdo another in hogging the air in sleepless lunacy.

Nothing could be more damaging to the spirit of amateur radio, such as I have enjoyed for forty years, than this kind of abuse of our privileges, in addition to its being a violation of FCC regulations regarding good operating practice. The type of person who would go in for this kind of marathon could not possibly think of enough intelligent conversation to last twenty to thirty hours or more. . . .

— *Ernie Mann, W2MTD*

SURPLUS GEAR RESULTS

¶ This is a note of thanks. Last night for the first time I established a two-way communication using a transmitter from McCoy's article in the December, 1957 *QST* (also in the 1959 *Handbook*) and a command receiver. The power supply came from a $2 junk television set. The receiver works into an audio filter; this combination works very good — very good for less than $20.

On-the-air signal reports on 40 meters indicate that the transmitter has no chirp, a good tone, faintly discernible clicks (at a DX of one-half mile) and no detectable harmonics — working into a coax-fed dipole.

I'm running it at 375 volts key-down from a capacitive input power supply transplanted from the $2 junk television set.

— *Philip L. Crank, WV2JTK*

REGULATIONS WITH TEETH

¶ Your last paragraph of the editorial in December *QST* hit the nail right on the head.

It is because of the lack, I repeat lack, of tough regulations and the relative ease with which an amateur license can be obtained that the amateur fraternity has sired the characters you described.

I believe that the ARRL should change its policy of trying to maintain regulations that are so loosely worded. When it comes to a test of who is right or wrong between the FCC and the amateur, a Philadelphia lawyer could make any of the characters in your article look like a candidate for the Edison Award.

Personally, I would like to see an automatic 30-day suspension for any infraction of the regulations. Then I know there would be fewer characters for you to write about.

— *A. J. Sivo, W2FYT*

Happenings

(*Continued from page 59*)

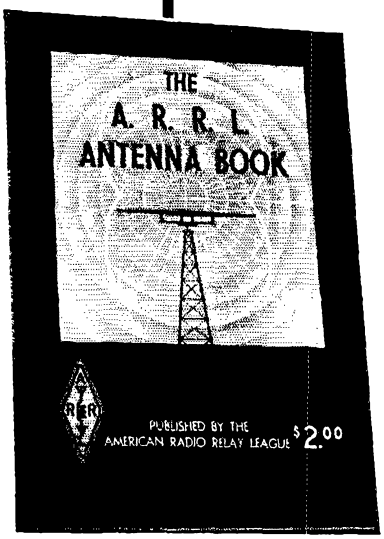
10. In considering the arguments concerning disruption of present operations which would result to one group or the other, depending on the outcome of the proceeding, the Commission does not feel that equipment cost considerations alone is a sufficient argument. In the instant case both sides make the claim of being put to additional trouble and expense should the decision be unfavorable to their interests. This has the net result of cancelling the respective arguments. In any event, it should be emphasized that in any rule change, the most important factor is that of benefit to the service, within the framework of the public interest, convenience or necessity. Thus in this case the prime factors to be taken into consideration are those relating to television interference and to experimentation, including long distance weak signal contacts, domestic and foreign.

11. The Commission is led to conclude that the additional interference to and from television which would be caused, should those amateurs now utilizing A3 emission near the low end of the 50–54 Mc. band move up 100 kc., would be minimal. Such a move amounts to only 2½% of the total band, or only 10% of the lower 1 Mc. where the majority of operations in this band is said to take place. Since a move of this order should not create a serious hardship, it would appear that, here again there is no clear-cut advantage favoring either side. In addition, A3 operators would not be deprived of the use of the 100-kc. segment but merely restricted as to the type of emission permitted in that segment. In the 144–148 Mc. band, television interference is not a factor.

12. With respect to experimentation, one of the principal factors which led the Commission previously to conclude

(*Continued on page 152*)

Summer Time is Antenna Time . . .



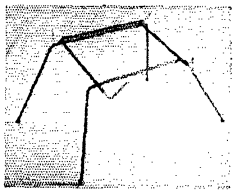
. . . and you'll have an easier time planning and erecting that new skywire this summer if you get your dope from the ever-useful ARRL Antenna Book!

Planning an elaborate beam to snag those rare DX stations? Looking for information on mobile whips? From basic theory to how to build 'em, horizontals, verticals, rotaries, fixed beams, transmission lines, v.h.f., u.h.f., together with dimensions, photos, drawings, radiation patterns, you'll find details in the information-packed ARRL Antenna Book.

$2.00

U.S.A. proper
$2.25 Elsewhere

AMERICAN RADIO RELAY LEAGUE, INC.
West Hartford 7, Connecticut



COMMUNICATOR
OWNERS

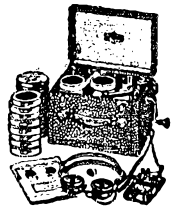
Mount your Model I, II, or III over the transmission hump. No bolts or adjustments. Welded steel rack goes in and out in seconds. $4.95 postpaid.

STRID ELECTRONICS
234 Washington St. No. Easton, Mass.

CUSTOM ENGINEERING

HAMS, EXPERIMENTERS, SOCIETIES, CLUBS
Projects — made from your schematic — Beams, Rec., Trans., etc.
Special-KW Power Supply, 3000 v., @ 500 ma. custom $200.00 F.o.b.
Kits — Wired and tested, prompt delivery, 33⅓% of list price.
Service — Rec., Trans., test equipment repaired. Our low rates include calibration and alignment. All work guaranteed by professional personnel.
MONARCH ENGINEERING 4058 Lehman
Hamtramck 12, Mich. Tel. TR 3-8499

EASY TO LEARN CODE

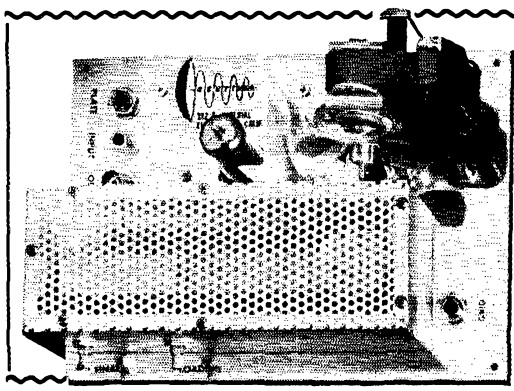


It is easy and pleasant to learn or increase speed the modern way — with an **Instructograph Code Teacher.** Excellent for the beginner or advanced student. A quick, practical and dependable method. Available tapes from beginner's alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready, no QRM, beats having someone send *to* you.

ENDORSED BY THOUSANDS!

The Instructograph Code Teacher literally takes the place of an operator-instructor and enables anyone to learn and master code without further assistance. Thousands of successful operators have "acquired the code" with the **Instructograph System.** Write today for full particulars and convenient rental plans.

INSTRUCTOGRAPH COMPANY
4709 SHERIDAN ROAD, CHICAGO 40, ILLINOIS
4700 Crenshaw Blvd., Los Angeles 43, Calif.



NEW: from Centimeg . . .

TA-4.3 TRIPLER AMPLIFIER for 432 MC

$84.50 (less 2C39A tube—$69.50)

CENTIMEG

Precision engineered in the usual high-quality Centimeg tradition. Excite with any 2-meter transmitter.

Xtal controlled converters; 2 meter, 1¼ meter, 432 MC.

output: 14 MC to 18 MC @ 52 Ω
26 MC to 30 MC @ 52 Ω
30.5 MC to 34.5 MC @ 52 Ω
50 MC to 54 MC @ 52 Ω
Other I.F. frequencies on request.

$69.50 each

Send check or money order to:
CENTIMEG ELECTRONICS
312 E. Imperial Highway
Phone: ORegon 8-4842
El Segundo, Calif.

that "A1 only" segments should be established in the subject bands at all was that, in general, amateurs using telegraphy are more interested in making long-distance contacts than in conducting the more conversational type of communication. Thus, having segments free from domestic telephony would provide increased opportunity for amateurs using telegraphy to experiment and to make long distance weak signal contacts. The comments from both the A1 and the A3 amateurs were in general agreement that frequencies in the low end of the 50–54 Mc. band are more likely to be suitable for F_2 propagation than are frequencies higher in the band. The divergence of opinion lies in evaluating the extent of improved conditions at the lower end of the band. The contention of the A1 proponents has been somewhat substantiated by figures provided to the Commission by the National Bureau of Standards. These statistics show, for three U. S. locations during November, 1957, the percentages of time that the F_2-4000 km. maximum usable frequency exceeded each of the frequencies 50.05 Mc. and 50.95 Mc. Without analyzing the findings in detail, two conclusions may be drawn:

(a) the amount of time in which the m.u.f. exceeded the lower frequency during this month was of short duration;

(b) however, the percentage of time this occurred at 50.05 Mc. was, at a minimum, 2.4 times that at 50.95 Mc.

Hence, it may be fairly stated that the lowest end of the 50–54 Mc. band has better conditions for experimentation than segments farther up the band.

13. In light of the foregoing, the Commission is led to conclude that the establishment of the "A1 only" segment at 50.0–50.1 Mc. would be in the public interest because of the presence of the *combined* factors set forth below:

(a) Those A1 amateurs who have gone to the trouble and expense of constructing specialized antennas for experimenting with weak signal modes of propagation, will not be required to move. This will enable them to enjoy the benefits available during optimum F_2 conditions.

(b) There would be little if any additional mutual interference to and from television which would stem from an upward move of 100 kc. by the telephony group.

(c) Clearing the lower 100 kc. of the band of A3 operations in this country may enhance the ability of those A3 operators who move up in the band to contact foreign stations operating A3 in the low frequency segment.

14. However, with respect to the 144–148 Mc. band the Commission is led to conclude that the "A1 only" segment should be established as originally ordered, i.e.: at 147.9–148.0 Mc. The controlling factor is that in this band there is no difference in the propagation characteristics throughout the band. Thus, the A1 operators cannot claim an experimental advantage. As to those who have specialized antennas tuned to the low end of this band, it should be noted that they may continue to utilize A1 emission on the antenna and equipment design frequency and will be no worse off than they are now. Henceforth amateurs who enter the specialized field involving weak signal communications with A1 emission in the 144–148 Mc. band should design their equipment to operate in the clear segment provided herein for this purpose.

15. In view of the foregoing, it is concluded that the establishment of the "A1 only" segments at 50.0–50.1 Mc. and 147.9–148 Mc. will be in the public interest.

16. *Disposition of petitions.*

In addition to the petition of the League which initiated this proceeding, the Commission has received three other petitions from individual amateurs and groups of amateurs requesting amendments of the rules concerning the types of emission permitted in the 50–54 Mc. or 144–148 Mc. band.

Mr. Ernest H. Adolph, 42 Brooksbie Road, Bedford, Massachusetts, K1DRX, petitioned to amend Section 12.22(d) to permit Technician Class licensees to operate in the 145–146 Mc. band using A1 or F1 emission only and to amend Section 12.111(b) to permit the use of only A1 or F1 emission in the 50.0–50.1 Mc. band;

Mr. Raymond P. Bilger, 142 N. Hawthorne Ave., Langhorne, Pennsylvania, W3TDF, with approximately fifty endorsements by other amateurs, petitioned for amendment of Part 12 so as to permit the use of only types A0, A1, A2,

(*Continued on page 154*)

and F1 in the frequency range 144.0 to 144.4 Mc. The petition would thus delete emission types A3, A4, F2 and F3, presently permitted in this band; and,

Mr. Gordon E. Simkin, 1599 Austin Avenue, Idaho Falls, Idaho (formerly of Loma Linda, California) petitioned for amendment of Part 12 so as to permit A5 emission in the range 51 Mc. to 54 Mc.

With respect to the latter petition, the Commission is unable to conclude that such action would be in the public interest on the following basis:

(a) Present rules relating to television broadcast station assignments below 216 Mc. require a minimum separation of 60 miles between stations proposing to operate on adjacent channels;

(b) There are presently operating on TV Channel 2 (which is adjacent to the amateur band in question) approximately 38 stations whose service areas largely cover the major metropolitan areas of the country; and,

(c) The width of the band in question is insufficient to support more than a few simultaneous television transmissions by amateurs even under petitioner's proposal to limit the bandwidth to one megacycle. Thus, because of the hazard of interference to the reception of television broadcast stations and the reduction of spectrum space within the band for other amateur activities which would result, the Commission finds that permitting the use of A5 emission in the 51–54 Mc. band would not be in the public interest.

That part of Mr. Adolph's petition concerning Technician Class privileges in the 144–148 Mc. band is now moot since the Commission, in its Report and Order in Docket No. 12728 amended the rules so as to largely effect the proposal therein. With respect to the proposals of Mr. Adolph and Mr. Bilger to restrict the types of emission which may be used in segments of the 50–54 Mc. or 144–148 Mc. band, in view of the comments received in this proceeding and the resultant action taken herein, the Commission will not engender further action at this time. After sufficient experience has been gained from operation under the rules as amended hereby, the Commission will entertain further petitions of this nature.

17. Accordingly, IT IS ORDERED, Pursuant to the authority contained in Sections 4(i) and 303 of the Communications Act of 1934, as amended, that Part 12 of the Commission's Rules is amended, effective June 6, 1960, as set forth in the Appendix attached hereto.

18. IT IS FURTHER ORDERED, That the petition of Mr. Gordon E. Simkin for amendment of Section 12.111(h) is Denied.

19. IT IS FURTHER ORDERED, That the petitions of the American Radio Relay League, Inc., Mr. Ernest H. Adolph and of Mr. Raymond P. Bilger for amendments of Sections 12.22(d), 12.111(h) and 12.111(i) of the Rules are granted to the extent that the determinations herein are consistent therewith and are, in all other respects, Denied.

FEDERAL COMMUNICATIONS COMMISSION

BEN F. WAPLE
Acting Secretary

Released: April 29, 1960

APPENDIX

PART 12 IS AMENDED AS FOLLOWS:

Paragraphs (h) and (i) of § 12.111 are amended to read as follows:

§ 12.111 Frequencies and types of emission for use of amateur stations.

(h) 50.0 to 54.0 Mc. using type A1 emission, 50.1 to 54.0 Mc. using types A2, A3, A4 and narrow band F1, F2 and F3 emissions, 51.0 to 54.0 Mc. using type A0 emission, and on frequencies 52.5 to 54.0 Mc. using types F0, F1, F2 and F3 emission.

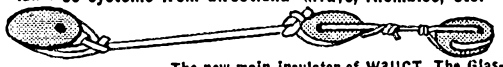
(i) 144.0 to 148.0 Mc using type A1 emission, and 144.0 to 147.9 Mc. using types A0, A2, A3, A4, F0, F1, F2 and F3 emission. QST

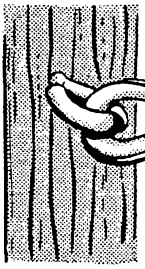
Strays

K8BUG is happy to greet all hams at his Custom Electronics in Dayton, Ohio — except W9DDT!

NON-METALLIC GUY LINE – PERFECT FLEXIBLE INSULATOR — REVOLUTIONIZES HAM RADIO & TV ANTENNA SYSTEMS

Non-inductive, non-conducting, non-absorbing Glas-Line isolates systems from directional arrays, rhombics, etc.





The new main insulator of W3UCT. The Glas-Line is between the two egg insulators running to the lower left. The copper link between the center egg insulator and the upper right egg insulator is for the dead-end feeder of a Zepp antenna.

View of an open thimble and eye bolt for coupling the Glas-Line guy wire to a tree. GLAS-LINE cannot rot, will not shrink, stretch or sag . . . has high breaking strength of over 500 pounds with proper use.

100' SPOOL **$3.75** Plus 50¢ for postage & handling

600' REELS **$17.84** Plus $1.00 for postage & handling

'SUPER' GLAS-LINE
with 1,000 lb. TENSILE STRENGTH with proper use.

100' SPOOL **$6.95** Plus $1.00 for postage & handling

600' REELS **$34.75** Plus $2.00 for postage & handling

Send check or M.O. No C.O.D.'s please.
DEALER & DISTRIBUTOR INQUIRIES INVITED.

THE GLAS-LINE CO.

2751 Nostrand Ave., Dept. 2, Brooklyn 10, N. Y. CL 2-9851

TAPE RECORDED
CODE INSTRUCTION

TAPEDCODE®

ONE OF THE FINEST CODE COURSES AVAILABLE

NOVICE TAPE. Complete basic instruction and practice material up to 8 WPM $6.50
ADVANCED TAPE. Practice material 9 to 18 WPM. Plain language and coded groups $5.50
COMPLETE COURSE. Both above tapes $11.00

Ppd. in U.S., Possessions and Canada — Penna. Residents 4% tax. Dual Track 7" 1200' tape. Recorded at 3¾ IPS.

See Your Local Ham Distributor. If he doesn't carry them, order direct and give us his name

TAPEDCODE **BOX 31E, Langhorne, Pa.**

THE NEW P&H LA-400-C 800 WATTS PEP SSB LINEAR AMPLIFIER

NOW 800 WATTS PEP FOR ONLY $164.95 THE "BEST BUY" YET

NEW modern styling! NEW high efficiency 3 element band-switching pi net. Puts more power into any antenna or load from 50-70 ohms. For SSB, DSB, Linear AM, PM, CW and FSK. All bands 80-10 meters. May be driven to 800 WATTS PEP SSB with popular 100 watt SSB exciters. Uses four modified 1625's in grounded grid. On customers order, will be furnished with 837's. (note: 1625's and 837's are not directly interchangeable, since sockets are different.) Typical P&H Low Z untuned input. TVI suppressed. Parasitic Free. Meter reads grid drive, plate current, RF amps output. Heavy duty power supply using 816's. NEW modernistic grey cabinet measures approx. 9" x 15" x 10½". Panel is recessed. WANT TO SAVE MONEY? BUY IT IN KIT FORM. It's a breeze to assemble and wire. BEFORE YOU BUY — SEE THE NEW LA-400-C AT YOUR DEALERS.

LA-400-C Kit complete with tubes $164.95
LA-400-C Wired and Tested $219.95

P&H ELECTRONICS INC.
424 Columbia Lafayette, Ind

? DO YOU KNOW ?

EVANS ▸ TAKES USED EQUIPMENT IN TRADE HAS LIBERAL TIME PAYMENT PLAN

AND as Northern New England's leading distributor, stocks ALL LEADING LINES. Twelve licensed Hams to serve you with an Engineering Department to maintain equipment purchased from us. Contact us TODAY, let us demonstrate 26 years as . . .

"YOUR FRIENDLY SUPPLIER"

Evans RADIO

CA 5-3358 • ROUTE 3A • BOW JCT.
BOX 312 • CONCORD, N. H.

VE/W Contest

(Continued from page 68)

W2DUN 4332
K2ZYR 4224
W2PVQ 3087
WA2AWH 1949
WV2EFN 217
W2JCA 159

N.N.J.
W2EQS 52,959
K2KFP 44,186
K2THC 30,216
W2OPR 25,775
K2UUT 17,220
W2PTS 14,444
WA2ASM 13,538
WA2CPT 12,346
K2LWO 5957
W2ZVW 3888
K2MFF 2437
WA2CVP 2166
K2PTI 1588
WA2ATH 1408
W2EWZ 271

Iowa
WØVXO 65,630
KØLUZ 64,330
KØAZJ 31,082
KØPTJ 18,573
KØGRS 18,194
KØOVK 11,841

Kansas
KØQEC 37,688
WØVFE 18,195
KØGIC 16,570
KØGZP 11,624
KØQGJ 6444

Missouri
WØQWS 43,898
WØGAX 42,454
KØUDQ 31,900
WØBTD 29,891
WØARO 25,830
KØRAL 18,573
KØGSV 10,992

Nebr.
KØQIX 31,190
KØOBE 30,902
KØMQG 21,227
W6CQF/Ø 12,707
KØPMB 9097

Conn.
W1WY 60,431
W1TS 33,790
K1GMI 11,263
W1IJO 10,108
W1NLM 8676
W1DGL 1762
W1MBX 1300
K1CCB 1083

Maine
W1SWX 9097
K1GOG 2744
KN1KSG 650

E. Mass.
W1MIX 37,905
W1NJL 27,630
W1FJJ 26,534
K1DIR 20,848
W1AQE 9097
W1PLJ 7148
K1CZM 1841
K1AIO 1444

N.H.
W1ZQR 6498
K1MIO 3177
K1IIK 1191

R.I.
K1BBK 15,018

Vt.
K1HMQ 2600

Alaska
KL7MF 4115

Idaho
K7BWV 14,783
K7DAS 10,722
K7GTK 2437
K7CPC 1625

Montana
K7ABV 15,541
K7CTI 12,130
W7EWR 3791

Ore.
W7JLU 15,920
W7IAQ 7960
K7EAU 2599

Wash.
K7CHH 32,057
K7APJ 29,458
W7ECX 18,194
W7IEU 6823
K7EHV 1462
KN7HBN 545

Hawaii
KH6CJG 5957
K7IXE/KH6 2599
KH6CRU 2112
KH6CTH 72

S.C.V.
W6JKJ 34,656
WA6HRS 10,072

E. Bay
K6QIIC 91,272
K6QKR 42,887
W6IPH 14,726
W6KG 10,397
WA6BPE 7310

S.F.
K6NCG 57,760
K6EIE 45,053
W6YC 17,328

Sac. V.
K6SXA 144,256
K6SXX 11,372

S. J. V.
K6ROU 18,519
K6RAU 14,657
WV6FOL 217

N.C.
K4IEX 73,102

S.C.
W4BWZ 43,320
K4MUP 1805
K4DOF 36

Va.
W4HTV 73,103
W4NPT 46,136
W4EUX 39,277
W4FZG 24,259
W4KFC 22,743
W4JAT 13,646
W4DVT 3177

W. Va.
K8ELF 36,064
W8OFE 26,642
K8JLF 5632
K8BIT 3899

Colo.
KØSID 65,792
WØCDP 39,088
KØTMM 11,696

Utah
K7CDV 14,440

Wyoming
W7ABO 2708

Ala.
K4RJM 48,248
W4KAC 17,057

E. Fla.
W4GOG 58,482
K4RAD 56,045
K4KOD 46,786
K4ZRU 38,501
K4IEH 4910

Ga.
W4BEY 56,533
W4EJI 55,089
W4ZKU 40,613
K4BAI 39,963
K4VHC 28,050
K4VTH 19,169
K4UJS 16,299
K4EEK 7328
W4BHG 6931

C.Z.
KZ5JL 1588

Los. Ang.
W6NZW 42,768
W6NKR 33,465
K6KUU 26,570
WA6CGS 16,678
W6CIS 16,464
W6UFJ 12,996
K6CDW 2816

Ariz.
K7CEG 14,151

S. Dgo.
K6VOQ 13,646
WA6CEZ 9350

S. Bar.
W6DOP 31,461
K6KDP 24,259
K6MQK 1625

No. Tex.
K5IID 45,486
W5ZSX 34,115
K5MBB 29,241
W5TPZ 14,404

Okla.
K5OCX 20,216

So. Tex.
W5PSB 82,850
K5QFM 42,742
W5LGG 25,992
K5LGH 23,826
K5JFP 18,519
K5LZB 3574

N. Mex.
K5UYF 60,919
K5RMV 29,891
W5NXF 6209

Strays

W6QVN called CQ on 14 Mc. and K5DXU and K8DXU answered simultaneously. Neither could copy the other so W6QVN relayed the entire QSO.

Silent Keys

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

W1ALW, Frank L. Grover, Norwich, Conn.
W1APV, James E. Lungren, Somerville, Mass.
W1BGS, Mrs. Margaret C. Hassett, Petersham, Mass.
W1CAT, Lawrence E. Rogers, Cranston, R. I.
W1LYK, Edward J. Hudon, Lewiston, Maine
W1NIX, Guy E. Coro sr., Waterville, Maine
W1TYI, Albert W. Zackey jr., West Brattleboro, Vt.
W2AZY, Frederick W. Schill, Ozone Park, N. Y.
W2BSQ, Albert C. Liebel, Jackson Heights, Long Island, N. Y.
W2BUS, Frank Miller, Larchmont, Long Island, N. Y
W2JLC, John Taeschner, Staten Island, N. Y.
K2QNM, Harold P. Towner sr., Wayland, N. Y.
W2SM, James E. Johnston, Bronx, N. Y.
W2TYU, Everett E. Newman sr., Farmingdale, N. Y.
W2VEY, Norman C. Brust, Lyons, N. Y.
W3ADL, John F. Williams, Haverford, Pa.
W3BEN, Bernard Green, Hagerstown, Md.
W3DN, James H. Leach, Silver Spring, Md.
W4BUG, Col. William Wesley Campbell, Dugway, Utah
K4ECG/W8AHW, Floyd H. Woodworth, Englewood, Fla.
W4LMG, Howard G. Ahern, Winter Haven, Fla.
W4NRN, Robert J. White, Elizabeth City, N. C.
W5FMF, Owen G. Mahaffey, Springtown, Ark.
W5HFX, William George Wheeler, Oklahoma City, Okla.
W5KF, Ferris K. McKesson, Albuquerque, N. Mex.
W5PNP, Leroy D. Winburne, Temple, Texas
W5ZCO, Paul Rogers, Vinton, La.
W6BS, Sidney F. Glasson, Oakland, Calif.
W6IDW, Charles L. Watson, Palo Alto, Calif.
W6GRO, Sylvester Keith Shelton, Fresno, Calif.
W6MZC, Richard M. Kendrick, Oakland, Calif.
K6PQG, Mrs. Barbara J. Yoacham, Santa Rosa, Calif.
W6UDN, Robert L. Wellman, Los Angeles, Calif.
W6ZD, William B. Aldwell, Los Angeles, Calif.
W7FRU, George M. Marchand, Seattle, Wash.
K7HGG, Ralph R. Hartung, Downey, Calif.
W7WVB, Paul W. Delano, Centralia, Wash.
W8EZF, Narvel W. Reece, Cincinnati, Ohio
W8MCR, John T. Steele, Carbon, W. Va.
W9ACM, Ted C. Hien, Milwaukee, Wis.
W9AIO, Royal J. Higgins, Chicago, Ill.
W9DWI, George C. Bowen, Milwaukee, Wis.
W9HSG, G. Paul Trinkle, Jeffersonville, Ind.
K9PRR, Walter E. Cable, Elmhurst, Ill.
KØBCQ, Carolyn E. Owen, Denver, Colo.
WØFLE, George J. Goblish, Vesta, Minn.
WØVQE, Elburn Byrd, Gilead, Neb.
DU1CF, Floro T. Cepeda, Mandaluyong, Rizal, The Philippines
EL2D, John B. West, Monrovia, Liberia
KL7BCJ, Landon B. Gilbert, Khantaak Island, Yakutat, Alaska
VE1GB, George A. Walters, Charlottetown, Prince Edward Island
VE3BOJ, A. J. Deschamps, Kirkland Lake, Ontario
VE5OM, Austin Capper, Moose Jaw, Saskatchewan, Canada
VP9Y, James Amos, Pembroke, Bermuda.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(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.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

2ufd 4000v DC capacitors, $5.00 each, or 2 for $9.00. F. G. Dawson, 5740 Woodrow Ave., Detroit 10, Mich.

COAXIAL Cable. New surplus RB-54A/U, 58 ohms impedance —30 ft. prepaid, $1.00. Radio magazines, buy, sell, trade. R. Farmer, 3009 No. Columbia, Plainview, Texas.

ALL types of transmitting and receiving tubes wanted. Also aircraft or ground receivers and transmitters. Hamgear or test equipment. For immediate action for cash write or phone Ted Dames, W2KUW, 308 Hickory St., Arlington, N. J.

MOTOROLA used FM communications equipment bought and sold W5BCO. Ralph Hicks, Box 6097, Tulsa, Okla.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N. Y.

S.S.B. xfrmrs, exact set of 3 (hermetically sealed) for W2EWL Special, brand new, $3.00 postpaid. New compact G-E 100-watt modulation xfrmr, multi-impedance (10 lbs.), $6.25; new Elmac vacuum condenser, 12ufd at 32 kilovolts, $5.50. G-E Pyranols, 4 ufd at 1000 v.d.c. (330 vac) min. 4 for $3.50. Please include postage, no c.o.d.'s Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, N Y.

WANTED: Commercially built Single Sideband transmitting and receiving equipment like Collins or equivalent. Al T. O'Neil. Lake City, Minn.

ANTENNA 80-40-20-15-10, $21.95. Patented. W4JRW, Lattin, Box 44, Owensboro, Ky.

LEECE-NEVILLE 6 volt 100 amp. system—alternator regulator and rectifier, $45; also 12 volt 100 amp. system, $85. Guaranteed no ex-police car units. Herbert A. Zimmerman, Jr., K2PAT, 115 Willow St., Brooklyn 1, N.Y. Tel. ULster 2-3472 or JAckson 2-2857.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

CASH for your gear. We buy, trade or sell. We stock Hammarlund, Hallicrafters, National, Johnson, Gonset, Globe, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H. & H Electronic Supply, Inc., 506-510 Kishwaukee St., Rockford, Ill.

CHESS By Ground Wave. Los Angeles. Join the Chess-Nuts-Net. Poplar 3-4924.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, National, Globe. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halsted St., Chicago Heights, Ill. Tel. SKyline 5-4056.

SSBERS! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operating; promoting advancement of SSB equipment; and disseminating SSB technical information. Read "The Sidebander", official publication of the SSBARA. Dues $3.00 yearly. Write for membership application, sample "Sidebander", to SSBARA. 12 Elm St., Lynbrook, N. Y.

OUTSTANDING QSLS. SWLS. Variety samples 25¢ (refunded). Calibooks (American Calls) $5.00; (Foreign Calls), $3.00. Religious QSL samples 10¢. Sakkers, W8DED, Box 218, Holland, Michigan.

QSL-SWLS, 100. $2.85 up, Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSL. Glossy 2 and 3-colors. Attractive, distinctive, different. 48-hour service. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSLS "Brownie," W3CJI. 3110 Lehigh, Allentown, Penna. Samples, 10¢ with catalogue, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glensdale Ave., Toledo 14, Ohio.

QSL'S New design, lower prices, fast delivery. Catalog 25¢ (coin only), refundable. Dick Crawford, K6GJM, Box 607, Whittier, Calif.

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.

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.

QSLS-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

QSLS Samples dime, Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS. Taprint, Union, Miss.

SUPERIOR QSLS. samples 10¢, Ham Specialties, Box 3023, Bellaire, Texas.

QSLS. 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., New Brunswick, N. J.

PICTURE QSL Cards of your shack, home, etc., Made from your photograph. 1000, $13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLS WAT. Box 1, Brecksville, Ohio.

QSL's-SWL's: That are different, colored, embossed card stock, and "Kromekote." Samples 10¢. Turner, K8AIA Box 953, Hamilton, Ohio.

GLOSSY QSLS. 100. 4 colors, $3.50. Others less, Samples 10¢. Dick, W8VXK. 1018 Arthur, Mt. Pleasant, Michigan.

QSLS, $1.00. Riesland, Del Mar, Calif.

QSLS, Lapel pins, samples dime. Kephart W2SPV, 4309 Willis, Merchantville, N. J.

HI, fellas! Rapidly cleaning up the back-log of orders. I'll be back on faster service soon. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

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, 737 Lincoln Ave., St. Paul 5, Minn.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSLS-SWLS, reasonable prices. Samples free. Robert Bull, W1BXT, Arlington, Vt.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSL'S SWL'S Nicholas & Son Printery, P.O. Box 11184, Phoenix, Arizona.

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: Send 25¢ (refundable) for samples. W6CMN, Schuch, 6707 Beck Ave., North Hollywood, Calif.

QSLS-SWLS. Free Samples. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLS. Quality and economy complete samples dime. QSL Printing, Box 12351, Houston 17, Texas.

QSLS. Reasonable, nice designs, samples dime. W2DJH Press, 31 Warren, Warrensburg, N. Y.

C. FRITZ, Joliet, Illinois for 30 years. Climate forces us to move! Soon to offer unbeatable QSLs from Arizona. Wait for our card of the month deal.

QSLS, Glossy 2 and 3 colors, attractive, different, 48-hour service. Samples 10¢. Free ball point pen with order. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS. 100 for $3.00. Glossy. Distinctive design. Samples free. R. A. Larson Press, 32 Midland Ave., Stamford, Conn.

QSLS. $1.75 per 100 postpaid U.S. only. Glossy, red and green. All orders mailed within 10 days. Free sample. Hobby Print Shop, Umatilla, Fla.

QSLS. Stamp brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS: Cartoons, colors, samples 25¢. Chris, W9PPA, 365 Terra Cotta Ave., Crystal Lake, Ill.

QSLS. Fine quality. Choose your own combination. 6 styles, 10 card stocks, 8 ink colors, cartoons. $2.50 up. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

QSLS, SWLS, samples 5¢. Nicholas & Son Printery, Post Office Box 11184, Phoenix Ariz.

DON'T Buy QSLs until you see my free samples. Bolles, 7701 Tisdale, Austin 5, Texas.

RUBBER Stamps for hams, sample impressions, W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

PRICED Right. QSLs. Dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

QUALITY QSLS, file cards, personalized, "Ham-ized" letterheads. Exclusive, distinctive. Satisfaction guaranteed. Samples 10¢. Jerry, K7DKO, Everson, Wash.

ATTRACTIVE QSLS. Pearce, 192 Osborne, Danbury, Conn.

"PIG-IN-A-POKE"? Not if you visit Ham Headquarters, USA and see and choose from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-in Center. More for your money, because tremendous turnover makes lower overhead! Terms, trades. Send postcard for mouth-watering photograph and price list Q-6. For the best in all new and used equipment, it pays to come to "Ham Headquarters, USA"! BCNU, 73, Bill Harrison, W2AVA, 225 Greenwich St., New York City, N. Y.

KWM1 and a few high plate dissipation tubes wanted. 304T1/TH 4-1000A, 4PR60A, etc. Ted Dames, W2KUW, 64 Grand Place, Arlington, N. J.

WANTED: Gonset Communicators. Two or Six meters. Cash. Graham Company, 505 Main, Reading, Mass.

AMATEUR Call Letters engraved on laminated phenolic. White letters on either black, red, green, walnut or mahogany. 2" x 8" for $1.00 each, postpaid. Specify color. Send order to Don A. Mathews, W6BRY, P.O. Box 761, Dept. O, Paso Robles, Calif.

HAMFEST June 5th Southwest from Ottawa, Illinois, on Illinois State Rte. 71 at the LaSalle County 4-H Home and Picnic Area. Same place as last year. Advance registration accepted if in our hands before May 25th. Advance registration $1.00; at the gate, $1.50. Sponsored by the Starved Rock Radio Club. For info, contact W9MKS, G. E. Keith, Sec'y. RFD #1, Box 171, Oglesby, Ill.

SELL Johnson Courier, $220.00; Jennings Vacuum capacitor UCS 10-375 $\mu\mu$fd. 100,000v, $35.00; Prop pitch motor selsyns indicator, $35; 4-125as, $2.00. W7PSO, 3740 Alpine, Casper, Wyoming.

WANTED: Old OSTs and Handbooks. Must be reasonable. Am building library, not speculating. Cash, or swap ham-gear. WØFIR.

SX-42, FB, $80, SX-28, needs wk, $20; BC221 w/mod, no bk, $20; RDZ (UHF rec) $17; SCR522, $20; APX-6 $10. More free list. K6AHX, 1313 Luneta Dr., Del Mar, Calif.

FOR Sale: Collins 32V3 transmitter, in perfect condition, $425.00. W2PNT Richard Roos, 141-48 78th Road, Flushing 67, L. I., N. Y.

WANTED: 6 to 12 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

SELL: KWS-1 extra good condition. Hy-Gain Triband beam with 100 feet RD8U, Heathkit QF1 built, never used. Heathkit AM2, New 4D32. Virgil Schaffer, 3165 Grove Court, Cedar Rapids, Iowa.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N. C.

FREE Bargain list, Box 575, New York 8, N. Y.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Authorized factory service station for Collins, Hallicrafters, Hammarlund, National, Harvey-Wells. Our twenty-fourth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

EICO 425K oscilloscope for sale. Excellent condx. Best offer. K2QDM, 108-14 65 Road, Forest Hills 75, N. Y.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, $1.50; General, $1.75; Extra, $2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

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.

GREAT surplus values!! BC-603 Receiver New $17.00—R-26/ARC5 Rec 3-6 mc New $12.95, used exc $7.95—R-27/ARC5 Rec 6-9 mc New $12.95, used exc $7.95—BC-659 Transceiver with PE-120 $19.95—T-47/ART-13 Transmitters 34/AP $49.00—Sound-Powered Dynamic Phones Pr. $4.75—Rec. Microwave R-111/APR-5 $39.00—Collins CF1 82-Ω for Ω-5'er compl. w/tubes & instructions $5.95—Collins Mod. Xformer 100 watt 811-PP to 813 final $3.95—RA-62-C Power Supply A-C for SCR-522 VHF 110/60 cyc. New $59.50—Kits only for above, $17.00—Ground-plane VHF antennas 30-200 MC New $9.95—Hi-Mu Electronics—131 Hamilton St., New Haven, Conn. Store hours 10—5. Sat. 9—12.

BOOK Matches with your call. 50 for $2.50. A & B Services, Box 147C, Kittery, Maine.

TOROIDS: Unused 88 mhy like new. Dollar each. Five, $4.00. pp. DaPaul, 101 Starview, San Francisco, Calif.

KWM1 and a few high plate dissipation tubes wanted. 304T1/TH 4-1000A, 4PR60A, etc. Ted Dames, W2KUW, 64 Grand Place, Arlington, N. J.

COMPLETE Station, Collins-built for Navy: TCS 12 and TCS 5 xmtr and rcvr with 117V AC supply, spkr and Heath filter-coupler and manuals. 100 watts on 40-80-160; perfect condx, $125 cash. Phil Wood, K8HRE, Bangor, Michigan.

FOR Sale: Johnson Matchstick with cables, in exc. condx: $70. K2UYG.

FOR Sale: CE20-A, QT-1, VFO excellent, $175; matching table top amplifier pair 815s, complete 2000 V power supply, $50.00. Joe. K3CQY, 409 Falcone Ave., Roseto, Penna.

CRYSTALS Airmailed: SSB, MARS, Marine, Novice, Net, Commercial, etc. Custom finished FT-243 .01% any kilocycle 3500 to 8600 $1.49 (10 or more 99¢), all novice 99¢, 1700 to 30,000 $1.95. All frequencies 60¢ additional for HC-6/U hermetic holders. Builders crystal packages: November QST "Phasing Sidebander" $9.95; June 1958 QST "SSB Package", 5 mixer crystals, FT-243 $9.95, hermetics $12.95, matched filter sets $6.90: Collins low and high frequency hermetics, etc. If you don't see it be specific, write. Airmailing 9¢ per crystal. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

FOR Sale: Two Industrial radio 2 mtter FM pack sets in excellent condx, with handset, less batteries, $45 each. Also Instructograph code machine with ten (10) tapes, $30.00. W4NFS, 1760 Pinetree, Winter Park, Fla.

$420—is that too much for my factory-wired Thunderbolt? Make me a genuine offer and I'll reply promptly. L. A. Morrow, W1VG, 99 Bentwood Road, West Hartford 7, Conn. ADams 2-2073.

BARGAINS: Gonset GSB-100 SSB exciter, demonstrator, $389, also matching linear GSB-101, $389; two new 32S-1 xmtrs left at old price, $590; Collins 30S-1 linear, used 27 hours, $1265.00; used KWM-2s, cash, no trades, $935; Collins 32S-1 xmtr, $539 and 75S-1 rcvr, $399, both used; 100-Vs, old price, $695. Will trade new 75S-1s for 75A-4s, late serial no. Money back guarantee always. Ed Moory Wholesale Radio, Box 506 DeWit, Ark. Phone WHitney 6-2820.

HAVE 10 top brand 6176. Will sell 2.50 each K4LRX.

WANTED: Mosley TA-33 Triband beam or equal. Tower, 40 ft. tiltover. Cash deal. Pick up 150 miles or express collect. K2IQI, Box 528, Lake George, N. Y.

SALE: Mallory Model TV-101 UHF converter, used three months, local station out of business. Moore, 5403 Ventnor Ave., Ventnor, N.J. $20.00.

SELL: All-band transmitter, Hallicrafters HT-20. Almost completely TVI suppressed; 10 through 160 meters. A.M. and C. W. with Heath VFO, A-1 condx. Output 100 watts fone, 135 watts C. W. $225.00. Fred Sipp, W2AAD, Rd. 1, Box 93, Yorktown Heights, N. Y. Phone YO 2-4320.

WANTED Low-priced receiver, Ohio area. State price, model, condition. Beginner. Santorini, 1450 Haines, Columbus 12, Ohio

SPECIAL Three new Navy surplus power supplies, 630 volts, 500 Ma. intermittent; 866As rectifiers, 30 amp. relay, completely enclosed in steel case. $18.95. Mike Newman, K2PXO, 261 Lenox Rd., Brooklyn, N. Y.

WANTED: NC-303 good condition, also DB-20 Preselector and 100-150 $\mu\mu$fd 3000 volt variable capacitor. Manning, Box 563, Riverside, Mich.

HALLICRAFTERS S-40B receiver, 6 extra tubes, gud condx, $60. Want a gud HQ-110. K4VDE, R. Bergen, LaGrange, Ky.

VIKING Valiant Serial #27437, like new, $340; Hammarlund HQ150, Q multiplier, xtal calibrator, in original carton, $235; CE 20A, deluxe 458 VFO, QT1, $185; Millen 90881, 400 W., Class B linear, complete with power supply, $150. W2VSO, 34 Rosemont Terr., West Orange, N. J.

SELL Complete station, factory equipment excellent to near-new 500 watt C.W. 200 AM Viking Ranger, Courier, Hallicrafters SX-96, 10-40 Hy-Gain trap antenna, Johnson TR Switch, SWR unit, Signal Sentry lopass Bud 100 Kc., D-104, misc. gear, package deal: $659. Dave Easton, Main 3-0600, Tucson, Arizona, P. O. Box 11096.

HEART Of the five band, "Box Kite" quad are the Tradex Spiders. No boom. No compromise spacing: 10, 15 and 20 with one transmission line. Light weight. Low SWR and wind resistance. Stays up in hurricane winds. TV rotor holds and turns. Only $19.95 F.o.b. Naples, Fla. Bamboo poles and complete kits available on request. Traer Electronics, Box 215, Naples, Fla.

$5 Dollar reward for first complete schematic and impedance charts for Kenyon MultiMatch driver modulator pair Type T-263, T-496. W3SLG, Mills, Box 244, Rte. 1, Severna Park, A.A. Co., Md.

MECHANICAL Filter wanted: 500 cycle for 75A-4. K1JPR, Norman Feitelson, 22 Darbrook Rd., Westport, Conn.

HALLICRAFTERS SX-62A. Perfect. AM-FM all bands. $175.00. Larry Dent, 2309 Whitmore, Ft. Wayne, Ind.

HT-32, in excellent condx. $425; Collins 75S1, almost new, $375. K1AJC, John Colicci, 27 Stewart, Providence, R. I.

WANTED: 516F-1 AC power supply for KWM-1. K4OXZ.

MORROW "Falcon" receiver, 75,40,20,15,10 meters and B.C.; Morrow Vibrator power supply, RVP-250; Master Mobile antenna tuner and dashboard control; antenna, fiberglass with loading coil and bumper mount. Used, each/all. John Cooper, 298 Norwood Ave., Syracuse 6, N. Y.

MOBILE complete, ready to go, used only 6 months, Palco Bantam 65, Gonset Super 12, Elmac 12V. P.S. Master Mobile all-band ant. and all cables. Best offer. Will sip. W3AHC, 48 Carroll St., Westminster, Md.

HIGHLY Effective review for FCC Commercial Phone exams. Free Literature. Write: "Chief Instructor", Cook's School of Electronics, Dept. "F", Box 10634, Jackson 9, Miss.

FOR Sale: HT-32, 75A4 two filters, 701A GG linear, 1.5 Kw. PS, 54 ft. crank-up tower, TA 32 beam, 2 250THs, 4. 100THs, key, D-104 mike, SW bridge (Universal Service), plus all junk. Price: $1200. Cannot ship, sry Write or call E. D. Perkins, Jr., 1604 Clayton, Tupelo, Miss.

AMATEUR Paradise Vacation. Livingstone Lodge and cabins, Mascoma Lake, Enfield, N. H. Couples, families, 100 acres, bathing, boats, sports, Dartmouth golf course nearby. Tennis. Churches, fishing, etc. 31st year. Amateur rig available. Light housekeeping, $20.00 PPPW. Children half. Literature, Al Q. Livingstone, 12-01 Ellis, Fair Lawn, N. J. W2QPN.

HOUSE Cleaning: Over $6.00 net wholesale value new unused surplus parts—tubes, resistors, switches, volume controls, etc. $1.50 post paid insured. William Hall, Widener, Ark.

KIT Wiring—all types. Details. Write Donald Wilson, West Marshall Drive, Poughkeepsie, N. Y.

SELL: Complete SSB Station, 51SB- souped Viking II, $350; Collins VFO-ganged exciter, $55.00; SP44 Panadapter, $45; Zenith L600 Transoceanic, $50.00; Chester Benson, W9IFB, 333 South 5th, Richmond, Ind.

WANTED: SX-88 receiver. State price and condition. Also need 500-watt audio Multi-Match modulation xfmr. Have one AR88 receiver, less cabinet, for sale or trade. R. M. Jones, W4WR, 1604 North 17th St., Birmingham 4, Ala.

NEW ARC5 (3-4 Mc.) xtmr, $5.00; rotary inductor (3.4-28 Mc.), $1.75; guaranteed tubes 4E27: $7.00; 4-125A, $7.00: WE701-A, $3; 5874, $3.00; 832, $2.00; 803, RK48, WE258B: WE304B; 6A57G, $1.00 each; 826s, 50¢; G-E 0-200 Ma. 4" rectangular, $3.75; Weston model 741 0-50 amps, $4.50. Send stamp for list. All items F.o.b. Plaistow, N. H. Joe Harms, W1GET.

HALLICRAFTERS HT-18 VFO, $50.00. W1MEG, 75 Kendall Ave., Framingham, Mass.

APACHE Transmitter with fan, excellent, $235.00; National Selecto-O-Ject $10.00; Jones MicroMatch MM-1, $12.00; pair new 810 tubes, $8.00 each; pair new 813 tubes, $9.00 each. Walt Kozacko, W1NS, 1711 Central Ave., Needham, Mass.

WANTED: FM adapter for 75A3. W3RTV, 160 Irwin St., Verona, Penna.

SELL: Globe Champ 300; factory-wired and factory-converted to A model: in perfect condition. Can be heard on 40 or 10; $290.00. Don, K2GBN, 174 Ramsey St., Paterson 1, N. J.

WANTED: High power final, supply, etc. K1IIK.

SELLING Out: Must have cash! Complete Collins station, 75S-1, 32S-1, station control, and 110V. power supply, $1000. 3 -el. Hy-Gain 10, 15 and 20 meter beam, $25; Rotor-break, less relay, $20; 120 μfd, 3000V DC cond, $40; four 4 μfd, 5000V DC cond. at $10 each; 220V pri., 3000V swc. @ 1 amp trans. @ $25.00; 110V pri. 5V CT @ 30 amp (10,000)V ins. 3 @ $5 each; 800 Ma. 10 henry choke, $20; B&W model 850 Kw ind., $20; 50-400 μfd, vac. variable, 10,000V with counter dial, $25. Jeannette Clarke, K5IQF, Box 535, Knox City, Texas. Phone 3131.

SELLING Out! Ranger HQ140XA and other station accessories. Charles Coyle, K9PQI, 514 Hillside Ave., Elmhurst, Ill.

GLOBE Scout 680-A and PB-1 for 6M factory w/t. Both, $75. F.o.b. New Orleans. K5SGP, P.O. Box 23253, New Orleans, La.

HRO-60 Spkr xtal cal. coils almost new, sell $350. W1HNB, 614 W. Shaft Road, North Adams, Mass.

SELL: Collins 32S1 with AC power supply, $560; Eldico Kw linear, $325, Telrex 15m, 3-el. full size, still crated, $65.00. F.o.b. HQ100, gud condx. $100.00. W3VDE, 1219 Yardley Rd., Morrisville, Penna.

CLEVELAND Hams interested in 15-20 M traffic schedules. Please write Ray Dopmeyer, KN7JWY, 1911 N. E. 70th, Portland, Oregon.

GLOBE KING 500A, $395; 75A2 clean, $295. W8DXH, Grayling, Mich.

SX-101 MK III, $260; HT-9 150 watt all-band AM xmttr w/ FVO, $125; Heathkit mobile, MT-1, MR-1, MP-1, $255. All in excellent condx. Raffetto, W2YCS, Ridgewood, N. J.

CANADIANS! Selling surplus HQ-129X and spkr. $195; DB23 Preselector, $39; Eldico VFO, $10; Hammond 1500 watt voltage regulator, $49.50 (all original owner). Collins 310C2 VFO, $90. VE5VZ, Box L, Lloydminster, Sask., Canada.

FOR Sale: Johnson Thunderbolt kilowatt amplifier. In top condx, $485. W7YHS, Dr. M. F. Hash, 319 North 26th, Billings, Montana.

SELL: 12 volt D.C. pwr. supply for KWM-1 Model 516E-1 and KWM-1 Mobile Mount model 351D-1, both for $265; Mobile Mount separate, $40.00; DX-20, $30; Gonset 2 meter pwr. amplifier, CD model, $75.00; Johnson Electronic TR switch, $17.00; Shure 505B Ranger hand mike, $10. Sidney Ross, W9ISY, 1844 No. Rutherford Ave., Chicago 35, Ill.

FOR Sale: Collins 75A2A, factory-modified with 3.1 Kc. mechanical filter, also modified for SSB with product detector, $275. Collins 310-B modified for bandswitching and variable output control, completely TVI suppressed, for rack mounting, $150.00. DeLuxe audio amplifier, Hi-Fi, speech, clipping and compression, PPKT66 and LS-30 in output, $70. W2PCJ, 1800 Bedford St., Rome, N. Y.

SELL: DX-40, Johnson VFO, S-76, best offer above $180. K0GER.

NC-300, with xtal calibrator and spkr, just overhauled, $210. Wired for Central "B" Slicer, $50 additional. Will sell separately. Globe DSB100 with Globe 755A VFO and Globe Vox Box and QT, all factory wired, almost new, $125.00. Prop pitch motor, converted with indicator and cable, $25.00. This is pick up only, sry no shipping. K2JKX, 167-16, 73rd Ave., Flushing 66, L. I., N. Y.

COMPLETE Station, HT32 SX101A Matchbox, SWR meter, Deluxe bug with case; D-104 mike, package deal: $8°0.00. Cash. W2SMB, Herb Halbig, 315 Park St., Tupper Lake, N. Y.

WANTED: SW-3 receiver in gud condx. ARRL Handbook 1929 or 1930; QSTs for 1929 and 1930. Advice price and condx. Have CX49A, B&W condnsr with neutralizing condensers, two 250TH with sockets, two 4-125-A, no reasonable offer refused. W3LSS, 58 W. Main St., North East, Penna.

LEARN Code. Qualify for Amateur or Commercial license. Free Book. Candler, Dept. Q-6, Box 9226, Denver 20, Colo.

ANY Reasonable cash offer. Cleaning house. Motorola FMT-30DMS factory modified transmitter and P-69ARS rcvr with Gonset Super-Six converter. Also custom Delco rcvr for 1955 Oldsmobile with all trim and mounting hardware. Bud #LF-601 variable low-pass filter. Will ship any or all prepaid. K8BKF, 1168 Elbur Ave., Lakewood 7, Ohio.

WANTED: SX-42 in gud condx. Mohammed Umaijan, Int. Box 495, Aramco, Dhahran, Saudi Arabia.

SELL: HC-10, new, factory guaranteed. $125. W3VDE, 1219 Yardley Road, Morrisville, Penna.

TV Camera, Sylvania closed circuit cameras, new, $595. Send for complete brochure. Selectronics, 3185 Bellevue, Toledo, Ohio.

WANTED: PR810 sockets, 42" rack, 500 Ma. splatter choke, Chicago SR-500. K0RAX, 4138 Holman, St. Louis 34, Mo.

SELL: Hickok 288X signal generator, $220; QF1, $6.50; Ameco code oscillator, code records, crystals. K1IIK.

SWAP Exacta VX outfit including 135 mm automatic telephoto, 58 mm automatic Biotar, 35 mm automatic Flektagon, supplementary Exa body, filters, master case all in excellent condx for comparable quality ham receiver, etc. Marty Gooen, 173 Henry St., New York 2, N. Y. Tel. ORego 9-3810 ext 849 during day.

SELL 93 issues QST March 1927 to December 1936. No covers seven older copies. Some before 1931 shelfworn–remainder are good. $25.00 plus shipping. Eleven issues April 1943 to September 1944 fair, $2.50 plus shipping. Henry Shaw, 1811 Roberta Ave., Abington, Penna.

TWO Brand new completely wired Heathkit Citizens Band transceivers. Working. A steal at $30 each. Cy Border, W4IXJ, 2410 San Marcos Ave., Ft. Pierce, Fla.

FOR Sale: B&W 5100B xmttr, B&W 51SB sideband generator both for $375 or will trade for good mobile/portable rig. Bernie Swartz, K3CQU, 717 Washington St., Huntingdon, Penna.

WANTED: Vacuum variable, Jennings UCS-200 or 300. W9WUO, Bob Ruffer, 2035 South 24th Ave., Broadview, Ill.

WANTED: High serial numbered Collins KWS-1 and 75A4. KW Matchbox. MicroMatch. Hallicrafters S-27B. W4SHZ, Box 1638, Brookley AFB, Alabama.

FILTER Chokes, 10 hy, 150 Ma., 150 ohms, new, cased, ceramic standoffs, 5½ lbs. postpaid, $2.50. D. Bates, 824 11th St., Portsmouth, Ohio.

WANTED: Hallicrafters Sky Champion receiver Model S-20, not S20-R, Advise condition and price. Write Stark, VE7RS, Box 177, Chilliwack, B.C., Canada.

COLLINS T.C.S. receiver and transmitter, 12 volt pwr. supply, remote control and spkr, mike and all cables. In mint condx. $150. Floyd Rondeon, K9PPI, 2436 Carney Ave., Marinette, Wis.

FOR Sale: QSTs 1929 to 1959, $100. 23 years of this run in binders. Roy Norvell, 9758 Roselawn, Dallas 20, Texas.

CLOSING Shack, going mobile. Globe King 500A, Globe 755A VFO, National HRO50T with AA, AC, B,C,D coils and spkr, Hy-Gain 14AV antenna and radials. All good to excellent condx, $650.00 takes the lot. K2QPW, 568 Bloomfield Ave., Montclair, N. J.

WANTED: Viking Ranger I or II, with VFO. State price, etc. W6OAB.

RANGER, factory-wired, latest model, like new condx, not a scratch, $220.00. Two Heathkit MP-1 transistor power supplies, used very little, $30 each. W8RXY, Lansing, Mich.

FOR Sale, all in gud condx, T.W. Masters TV antenna, $20; Hornet Tribander 10,15,20 meter beam, complete w/coaxial cable, $80.00; V.O.M. Precision model to 60 megohm scale, $10; Tube tester Precision model #180 for $25.00; Super Pro receiver range 1250-50 Mcs., complete w/power supply and 5 ft. rack with fuse box, $140; Measurements Corp. #80 signal generator up to 50 Mcs., $80; Motorola 2-way radio 30 to 55 Mcs. 12V converted for 60 watts output, $100 or will trade for what have you? Bill, K8MQQ/2, 440 Battery Ave., Apt. 3-C, Brooklyn 9, N. Y.

SELL: NC-188 with speaker and QF-1, in exc. condx, $110. DX-40 exc. condx, $60.00. Robert Simmons, K8OVU, Box 176, Scotts, Mich.

RETIRED Hams: I need an assistant for my radio business. Friendly atmosphere of a small TV shop with no rush of business. Charles Casler, Vernon Center, N. Y.

SIXTH Annual Syracuse VHF Roundup, October 8, 1960.

OSLS 10 useable samples, 10¢. Back issues QST, CQ, 75¢. Coon Box 5938, K. C. 11, Mo.

DX! Swap parts, back issues CQ, Readers Digest, National Geographics for DX stamps. W2VMX, 435 Washington Ave., Linden, N. J.

SELL HQ-100C, $120. Stanley Ackerman, W2HVL, 57-47 Marathon Parkway, Little Neck, N. Y.

MOBILE: Complete Heath mobile includes xmtr, rcvr, pwr supply, mntg bracket, spkr, mike. In FB condx, used only 6 mos., works 5 bands. 12V-gd. $245.00 cash. U pay shpg. K7EZX, 1420 S. 6th St., Cottage Grove, Oregon.

S-76 without speaker, $100 or your best offer; Heath grid dipper, like new, $15. Misc. B&W coils, panel meters, write for list. K8RCO, 278 Bell St., Chagrin Falls, Ohio.

SELL: 75A4 serial 1329, excellent condx, $465.00; Eldico 100F xmtr, also excellent condx, $450. Wanted: KWM1. Dr. W. Roger West, W4CPO, 830 West 21st, Norfolk, Va.

VIKING Valiant, factory-wired, in exc. condx, $325 or best offer. W3GXM, 10006 Kinross Ave., Silver Spring, Md.

SELL: BC-779B and RA-94 AC power supply, $80 or best offer. Also AR2 rotor, like new, $25.00; Hy-Lite 3-el. 10-meter beam, $10. K0DTL, Nemo Route, Deadwood, So. Dakota.

SPECIAL: If not sold. Complete Collins "S" Line as per my ad in the April issue, only $900. Check or m.o. R. D. Corbett, W1JJL, 46 Prospect St., Torrington, Conn.

MONARCH 3-speed recorder-changer, base, new cartridge, $15; Bell stereo tape preamplifier, $25; Sperti portable ultra-violet sun lamp, $10.00; IBM electric mill, $75; GE CR05A 5" 'scope, $50. V. R. Hein, 418 Gregory, Rockford, Ill.

SWAP saxophone Conn C melody silver plated Gold Bell with case for Viking Ranger or DX-100. S. J. Stahl, Berlin N. H.

SIX Meter conservative kilowatt final built by W4UCH as shown on page 25, July 1959 QST. Complete with two new 6C21 tubes. Unused since purchase from W4UCH. Six meter final using VT127A tubes with two new spares. "California Kilowatt" final for use with 4-250s, etc. All band. Beautifully constructed with the best of components. Large power supply rated at 3000 volts 500 ma. but with all commercial parts. Many additional parts, meters, variacs, etc. Self-addressed stamped envelope for list. E. A. Knapp, W8MPP, 805 Lucerne Drive, Chagrin Falls, Ohio.

FOR Sale: Temco 500GA transmitter 750 watts, 80 thru 10 meters, $300. Sry, cannot ship. Jack Cook, K0AQO, Freeman, Mo.

TG34A keyer with sixteen McElroy and Codez tapes; all like new. Bound volumes of QST 1949 through 1957, run like new. Make offer. W3RSB.

KWM-1 AC power, DC power, mount, cable, Bassett antenna. Guaranteed in perfect condition, $875. Norman Rowe, K2DFW, 6 Greenbriar Lane, Port Washington, New York. Telephone MA 7-0717.

SWAP: 2000 volt, 600 Ma. power supply plus all parts for linear amplifier. What do you have to trade? KØALL, 2438 3rd Ave., Mankato, Minn.

TAPE play back for sale, Magnecord 816PK eight hour, new, $650. K9OMR, 1011 E. 31st St., La Grange Park, Ill.

SELL: Collins 32V3 with Johnson low-pass filter, in exc. condx, $350; Collins 75A2, exc. condx, $225; BC221 with power, $50. All for $590. W8BNP.

COLLINS KWM-1, serial #745, mobile mounting rack, AC supply, original cartons, like new, $735. WA2BKT, Al Mandel, 1701 Albemarle Road, Brooklyn, N. Y.

$400 for the first KWM-1 to reach Don Taylor, DL4UU, Engineer HQ, USAFE, Dir. of Intelligence (ICO-RCO), APO 633, New York, N. Y.

FOR Sale: Collins 312-B speaker console with wattmeter, $100. W7DEI, Allan Moser, 3637 West Sierra Vista, Phoenix, Ariz.

NEW Telrex 4-element 20-meter beam, model 504. Full length elements, 3-in. boom. 9.7 db gain. $105.00. Shipped f.o.b. Dubuque, Iowa. Bob Loos, KØTEV, 2093 Carter, Dubuque, Iowa.

TRANSFORMERS: 4800V CT 1.2A full-wave 3K VA, 110/220 input, uncased open frame, stud and strap terminals. Fine for KW *final plus modulator supply*. $22.00. Same but 600 Ma., $18. Shipped to you collect or you pick up. K2IUV, 19 Standish Ave., Yonkers, N. Y. Tel. SP 9-6425.

SELL: 2 Deluxe 6 ft. rack cabs, $49.50 ea.; Lear 3.105 Mc. rcvr, $30.00; S-38, $20; 10M whips, $3.00; 21" Emerson table TV, $40. H. C. Conners, KN9RMS, 925 Huber Lane, Glenview, Ill. Tel. PArk 4-8956.

SELL: RME speech clipper, Model 100, in exc. condx, $25.00. Postpaid. WØKZZ, 1422 No. 12th St., Fargo, No. Dakota.

SELL: 6M 12V Communicator III, like new condx, $205. K2BPX, 709 Graisbury Ave., Haddonfield, N. J.

HAMMARLUND HQ-150, $215; HC-10, $125; both clean, unmodified and in excellent condx. In original cartons. F.o.b. All mail answered. A. M. Wickland, 308 Monroe St., Kalamazoo 49, Mich.

RTTY Model 26 complete with keyboard, table, Alltronics-Howard converter and polar relay, $125; Hallicrafters HT-30 SSB exciter, $275. This equipment is in excellent condition. W8YFE, 7013 Crestwood, Dearborn, Michigan. Tel. CR 8-2721.

SELL: Slightly used 4-400, $22.50; Heath kit O-11 'scope, $37.50, in perf. condx. WRL 755 VFO, vy gud condx, $39.50. Globe-King factory converted to 500A, vy gud condx, operates perfectly on all bands. $395. Joe Artioli, K1EBZ, 1070 Parker St., Springfield, Mass.

WESTINGHOUSE 5KVA pole pig, 115/230/2300 volts, 140 lbs., $15.00. Sry, will not ship. Pick-up deal only. W2CWK, Highland Park, N. J.

OLD QSTS, complete run from March 1937 to present time except March, December 1945. Also October, 1934, February 1935; January, February 1936 and nine unused yearly binders. Best offer to: Barnard, 480 Cotton St., Menlo Park, Calif.

FOR Sale; WRL factory-wired DSB-100, VOX QT-1 and 755A VFO, also Johnson Courier. Works for $325. Write for separate prices and details. Jim O'Connell, W9JZK, 922 Ashland Ave., Wilmette, Ill.

SWAP my pair of 813s in 6-ft. rack, 80,40,20 and 10 VFO; spare 805s, 813s and final coils will go. Want: DX-100 or equivalent. Pick-up and delivery. Sry, no shipping. Excellent ELMAC AF-67, $95.00; 110V P.S., $20.00; PMR-6A, $75; reports. Don Williams, K5HQU, Mills Trailer Court, Rte. #2, Box 7, Jackson, Miss.

ELMAC AF-67, $95.00; 110V P.S., $20.00; PMR-6A, $75; 6/110V P.S., $10; Master Mobile coil/mount, $15.00; Leece-Neville 6V 100 Amp. alternator, $45.00; BC-312 110V., $40.00. Ed Wheeler, K4ADD, 2437 Sugar Loaf Lane, Ft. Lauderdale, Fla.

RADAR, Shipboard type SU-1, 115V 60 cyc, tested, working, almost new. Will sell or trade. W2QYW, 138 Hillcrest Ave., Summit, N. J.

SELL: New Heathkit speaker system SS1B and SS-2 walnut formica, finished cabinets wired, $150; Fisher 50 watt amp. model 50AZ, $50.00; Brociner nrc-amp. Mark 30 C, $30.00; new Garrard phono Rc 88 G-E cartridge 4G-052 Diamond needle, $55.00. Louis Kaufman, 1876 Arthur Ave., Bronx 57, N. Y.

PACEMAKER, in like-new condx, used very little, aligned and checked! Sell for $315. W3PBO, 1400 Owens Road, S.E., Washington, D. C.

RTTY—Model 14 tape distributors, brand new, in sealed cartons, $110. W2ZXM.

FOR Sale: Complete 700w, amateur radio station, Hammarlund HQ-170C rcvr, DSB 100 xmtr, Heath VFO, Heath Vox control, pair 813 linear amplifier with 500v. screen supply, bias supply, 2200 volt plate supply and an Eico 5" 'scope. A terrific buy at $595. Howard McDonald, Maple Lane Farm, Shelby, Mich.

SELL: Heath AR-2 wid Q multiplier, gud condx, no shipping, $25.00. Barney Linden, 144-44 72nd Ave., Flushing 67, L. I., N. Y.

SELL KWM-1, AC power supply and speaker, in first class condition. First offer over $650. Pierrard, K5JHP, 439 Joles, Richardson, Texas.

HEATH AR-3, new, $25.00. Will ship. W3LZA, 205 Boden, Carnegie, Penna.

VIKING Adventurer, $40; SX-99, $110, both superb. Bill Hein, KØJGF, RFD 2, Box 201, Loveland, Colorado.

FOR Sale: Three Eimac tubes in their original packing. 2-4X150As; 1-4CX300A. Best offer. Also have parts: transformers, variables, microammeters, etc. B. Matthew, 1400 So. Eleventh, Quincy, Ill.

VALIANT, factory-wired, $365; SX-101 Mark IIIA, $325; both are in perfect condx, used very little. Original cartons and warranty cards. Listen on 15 or 20 meters, write for sked to hear rig on air. Sell both for $680. W4CHG, Frank M. Sikorski, 1380 Park St., Clearwater, Fla.

SWAP New B&W CX95C Butterfly variable for 4-1000A air system socket. Bud 7 ft. cabinet, grey, gud condx, $35.00. Harry Cook, Dell, Ark.

B&W 5100S transmitter; HQ150 with spkr. Only one owner. In fine shape. $600.00. W3FYW.

RME 4350. In excellent condx inside and out. $140.00. Will Boyd, K6MBT/4, 16 Teton Place, Alexandria, Va.

FOR Sale: Used equipment Barker & Williamson (B&W) 5100 transmitter, $275; Hallicrafters receiver SX-71, $125. W9IOI, Mary E. Esler, 514 Wilson St., Little Chute, Wis.

SELL-Trade: Heath grid dipper, $14; Heath Q multiplier with built-in supply, $12; converted BC-454-455 with supplies, $15.00 each; plate modulators: 125 watt, $30; 40 watt, $18; 20 watt, $15. New 304-TL with fil. xfrmr, $15; dual Vibrapack 6v. 400v./120 Ma., $7.00; 15 watt 75-40 meter mobile xmtr, $35; supplies: 750v./250 Ma. 6.3v, $15; 1000v./250 Ma., $18; 2 meter xtal converter, $7; miniature supply for Heath V.F.O., $5.00. Everything in mint condition! Need: Tube tester, Polaroid camera or ??? W8QKU, 2748 Meade St., Detroit 12, Mich.

WORLD'S Finest reconditioned equipment at lower prices. On trial. Trades. World's best terms financed by us: S-38, $29; S-53A, $59; SX-99, $119.00; SX-100, $199; SX-101, $279; HT-32, $479; HQ-100, $129.00; NC-57, $59; NC-300, $249; Viking II, $179.00; 75A-4, $549; KWM-1, $595. Hundreds of other items. Write for list. Henry Radio Stores, Butler, Mo.

FOR Sale: Viking II, in exc. condx. Am moving. First reasonable offer takes it. Patrick Looper, WØZNA, 604 N. High St., Joplin, Mo.

FOR Sale: 32V1-BC348 TG34 all in exc. condx. Trade Bolex 8mm movie camera, Blonder Tongue TV booster. Reasonable offer or trade on SP600, CR88 or low-power transmitter. Claude Sweger, 307 Norris Ave., McCook, Nebr.

KITS Assembled. Write K3JQO, William Casteel, RD #5, Somerset, Penna.

HRO Sr. Four coils covering 1.7-30 Mcs., Heath Q multiplier. An oldie still going strong. To highest bidder! V. L. Spoley, W2ASF, 13 Sunnybrook Rd., Bronxville, N. Y.

SELL: Mobile ten meter 30-watt ST203A xmtr, six volt inp. 500 volt outp. Vibrator power supply, complete, $50.00. Marsh, K2DZR, 16 Dellwood Court, Colonial, N. J.

PERFECT KWS1, $1100; 75A4s, $500; new 100V, $695; first check for $750 takes new GSR-100 and GSB-101. HT32, $425; HT32A, $495; RME 4350A, $199; Johnson Viking 2CDC, $225; Collins 75S1, $425; 32S1, $550; Globe DSB100, $50; Globe 6-2, $100; 2 VFO, $30; AF-67, new, $150. We ship in factory cartons, fully guaranteed as represented. Electronics, Box 3687, Corpus Christi, Texas.

SALE: 75A4, serial No. 1559 vernier dial, $475; Gonset GSB100, $375. Both are in exc. condx. J. P. Keller, W3HYC, 514 Stevens Road, Morrisville, Penna.

COLLINS 12 D.C. power supply, mounting rack and cables, for KWM-1, like new condx. Rex Bassett, W4QS.

BREAKFAST Club Hamfest, July 31st, Terry Park, Palmyra, Illinois. This hamfest is sponsored by Quad-Co Amateur Radio Club, Inc. Dale Elliott, Secretary. Write Box 134, Loami, Ill.

COLLINS 75A4, nearly new condx, serial 5025 with 3.1 Kc. and 500 CPS mechanical filter. Asking $675. What will you bid? Need the cash. Bill Sandusky, K4UWJ, 223-B West Point Ave., College Park, Ga. Tel. PO- 6-7090.

SAVE Almost 2/3rds. Closeout RK 4D32 Raytheon type transmitting tubes. Reg. amateur net, $32.76 each. Now only $12.95. All tubes new, in original factory cartons and fully guaranteed. Only 14 are left! Write Al Coe, Manager Ham Sales, Radio Shack Corporation, 730 Commonwealth Ave., Boston 17, Mass.

SELL: NC-300 w/xtal calib., matching spkr, $245.00; DX-100 in ton condx, $150.00; both for $385.00 plus shipping from Boston. Write to Dave, K1LTA (Ex-K6LWT), 487 Commonwealth, Boston 15, Mass. Tel. CI 7-8093.

100-V, Central Electronics transmitter, brand new condx, direct from factory. Best offer over $695; 15 meter beam, Mosely Model A-315, new, never removed from factory shipping case. Best offer over $37.50. Forced to sell on account of illness. No income. Stan Surber, W9NZZ, Box 227, Peru, Indiana.

ELMAC A-54 mobile with PE-103 traded for DX-40 with VF-1. F.o.b. Lynchburg, Virginia. W4LPP.

SELL Viking II with VFO and Matchbox. Also HQ-140 receiver, all in mint condx, $450.00. Will swap for SSB equipment. A. Ostrochovsky, W2UPY, 70 Rea Ave., Ext., Hawthorne, N. J.

FOR Sale: 75 meter 350-watt linear in 20A cabinet with tubes and power supply, $65; W2EWL exciter, 30-watt, VFO, Vox, power supply, rack mounted, $65, New 4OX300A tubes, $30 each; Eimac airsockets, $10 each; #14 enamel copper wire, 500 ft., $5.00; 200 ft., $2.00; HQ-129X, $120; want two plug-in coils for old HRO, Charles Copp, W2ZSD, 3 West Drive, Port Washington, N. Y.

KWM-1 wanted. If you can beat dealer prices write me, WØZHD, 244 "D", Lincoln, Nebr.

SELL: C.E. 20A, in gud condx, $190.00. Don Hyatt, W5BCS, 517 W. Lindsay, Norman, Okla.

FOR Sale: NC-125, $115.00; Globe Chief, 90A, $45.00; Knight R.F. signal generator, $15.00. Dan Mersel, WA2JHQ, Box 92, Frenchtown, N. J.

COLLINS and Globe Spectaculars!!! Reconditioned! Terms! Trials! Full guarantee: *Globe* Transmitters: Scouts 40A $54.50; 65A $65.00; 66 $75.00; 680A $79.50; Chief 90A $49.95; Hi Bander 6-2 $119.95; Sidebander 100 $79.50; Champ 300A $369.00; King 400C $275.00; King 500 $399.50; 500B $599.50; Linear LA-1 $89.95; 755 VFO $40.00; 6M Converter $19.95; VOX-10 $14.50; FCL-1 speech booster $14.95. Collins Receivers: 75A1 $265.00; 75A2 $325.00; 75A3 $399.00; 75A4 $549.00 to $595.00; 75S1 $429.00; Transmitters: 310B-1 $149.00; 32V1 $275.00; 32V2 $339.00; 32V3 $475.00; KWS-1 $1,199.00 to $1,495.00; KWM-1 transceivers $649.00 up. Leo, WØGFQ, Box 919, Council Bluffs, Iowa—World Radio Laboratories.

ELDICO SSB-100A transmitter, In perfect condx, $275. Arthur Lukach, W2DPP, 35 East 84th St., New York, N. Y.

RENT 3-bedroom summer house with kilowatt rig, gud hunting, swimming and fishing. In Catskills, 100 miles from New York City. $300 per month. W2PLS, Trautwein, 143 Brook Ave., Passaic, N. J. Tel. PRescott 3-5188 evenings.

CALL Letter personalized gifts. Brochure. Chuck, K9TVA, 6429E Glenwood, Chicago 26, Ill.

SELLING: GPR-90 receiver and matching speaker, both in A-1 condx. Serial #1961. Less than one year old. Price: $295.00. Paul McCoy, WØOZU, 1310 Adams Circle, Sterling, Colorado.

CLEANING Shack: Eico equipment: 5" oscilloscope, $25.00; matching voltage calibrator, $5.00; Deluxe signal generator, $20.00; R-C bridge and RCL comparator, $15.00; Gonset Super Six, (6 volt), $25.00; Stancor KW modulation transformer, $40.00; 2-810s, 1-813, $5.00 each; three BC-453s, $10 each; 2-BC type, 118-148 Mc rcvrs, $8.00 each; four 10 watt xtal controlled 2 meter transmitters, $5.00 each. I have flexible cables for BC rcvr tuning control. Write for price. All letters answered. F. R. McLeod, K2JVR, R.D. #5, Bridgeton, N. J.

KWM-2. Serial No. 30 and AC power supply, in exl. condx, used very little. In original cartons. $1050. Sam J. Rhoades, Jr., W5RVX, 4616 S. Columbia, Tulsa, Okla. Tel. RI 2-7772.

FOR Sale: Gonset II, 2 meters, 117 AC-12V DC cable for 12V, 3 xtals, tubeless VFO, S-meter, ground plane antenna, new tubes, $175; Gonset Super 12 converter, $50.00. Seymour Kaftan, 65 E. 52nd St., Brooklyn 3, New York. Call HY 3-5773.

SELL: 20A, allband BC-458 VFO, QT-1, $200; Linear amplifier with 3000 volt 300 mil. power supply, $60.00; NC-300 with squelch, $260; pair brand new 4-65As, $15.00. John Lyon, W9LHG, 603 W. Green, Urbana, Ill.

EICO 720 transmitter, 15 hours use. $70.00 cash and carry. KØUFI, 7275 Teal Ave., St. Louis 33, Mo.

FOR SALE: Viking Mobile $65.00: Morrow Conelrad Monitor, $29.00; Viking Adventurer, $45.00; HQ-110, $199.50; Globe Scout 680A, $85.00; SX-99, $110.00; RME 4350 w/spkr., $185.00; HQ-110C, $209.50; Globe 666, 60 mtr. conv., $39.50; Collins 310B-3 (like new), $149.50; Gonset 60 meter Linear, $122.50; DX-40, $57.50; Viking Challenger, $109.50; P & H LA-400, $145.00; NC-98, $99.50; B & W #370 SSB Rec. Adapt., $90.00; Viking Valiant, $325.00; C.E. 20-A, $199.50; Viking "500" (fact. wired), $699.50; DX-100, $147.50; Viking II, $175.00. Write Art Brown, W9IHZ, Brown Electronics Inc., 1032 Broadway, Fort Wayne, Ind.

200 Watt amplifier for 220 Mc. Completely shielded 4X250M with blower. 110 watts output for $39.00. WA6LEN, 3974 Riviera Dr., San Diego, Calif.

CENTRAL Electronics Model MM-1 multiphase RF analyzer with self-contained audio oscillator and 3" scope. Brand new, factory-wired, in perfect condition, $85. C. H. Brooner, P.O. Box 261, Morton, Ill.

750 mil 15 hy. choke, insulated, 10000 volts, pick up only. $8.00; QSTs 1940 thru 1957 except 1944 and five issues. $10.00 for lot. Cornu quartz prism refraction index 1.5441; value $500.00. For professional spectroscope. Make offer. W2ZK, "Bud" Waite, 46 Monmouth Blvd., Oceanport, N. J.

SURPLUS BC653A xmtrs, 80 meter CW, AM. $9.00 pick-up; $14.00 packed. BC-653A mounts w/plugs, $2.00 pick-up. $3.00 packed, any components of above sold separately. K5ENL, Grandview, Texas.

FOR Sale: AR-3, QF-1, S-77 converted to S40-B. Adventurers screen modulator, VF-1, with cabinets, manuals, all in exc. condx. Bob Ensminger, 712 Locust, Lodi, Calif.

FOR Sale: CE20A, factory wired, in exc. cond. $175. Fred N. Mertin, W5YHT, Rte. 2, Fayetteville, Ark.

FOR Sale: DX35-VFO. $55.00; built-in antenna changeover relay and receiver muting. Shickler, W2ICW, 16-18 163rd St., Whitestone 57, N. Y. Tel. Flushing 7-7146.

10 PER Cent cash discount following items, cash, no trade: 32V2, exc, $295; 75S1, $425; 75A4, $525; 75A4 w/2 fltrs, $595; Eldico SSB-100M w/AC supp, $300; without, $265; Hallicrafters HT-20, $199; HT-33A w/brand new PL172, $595; Demonstrator SR-34AC, $295; SX-101 Mark I, $275, Mark III, $325; Hammarlund HC-10, $99; HQ-110 $199; HQ-160, $275; National HRO7, $99; NC-66 $79; NC-183D $225; NC-300 $275; Johnson Viking 500, fact. wired w/4-400A final, $695; Viking 500 kit wired w/4-250A final, $595; Valiant, $375; Phasemaster IIB, new, nev. used, $399. Write today for new amateur buying guide H-60, complete list of hundreds items top quality equipment. Down-to-earth prices. Burghardt Radio Supply, Inc., P. O. Box 746A, Watertown, So. Dakota.

SALE: Viking Valiant, factory-wired, $300. Nathan Freund, 48-53 44 St., Woodside, N. Y. Tel. S.T. 6-4565.

SELL: NC-300, xtal calibrator, all following 5 mos. old; Valiant xmtr wid Astatic mike, B&W TR switch, low pass, Vibroplex bug, 20 mtr. ground plane ant. Best offer. New Jersey New York call collect: ORange 3-4543, others write Hank Magers, WA2BDV, 8 Prospect Place, West Orange, N. J.

LINEAR, Gonset 500W, $150. Matchbox, $35. Filter LP, 7552, $10. W2DTD.

FOR Sale: 75A4-3 KC filter, No. 4332, same as new. HT-32 mint condx. Prefer to sell together. $1050. W9PTH, 701 31st St., South Bend, Ind. Phone AT 8-8017.

SELL: Adventurer transmitter with plate modulator and power supply, $50.00. W1IPN, Mount Hermon Radio Club, Mount Hermon, Mass.

WANTED: 4 CX-1000A tube and socket; variable vacuum cond.; Collins S-line. Have for sale: Heathkit "Seneca" 2 and 6 meter, perfect, $140. Pr. Int'l. (factory built) Citizen transceivers, $75.00 ea. M. A. Adamson, 4060 So. Penn., Englewood, Colo.

WANTED: Coils for National receiver HRO-50 or -60. Coil E-G-H-J-AA-AB-AC-AD. Westphalen, Apt. 211, 5234 Dorchester Ave., Chicago 15, Ill.

SELL: NC-125, $100; Adventurer with plate modulator, $35. Absolutely like new. Charles Scarborough, K4EZY, 5109 Sylvan, Richmond, Va.

GLOBE King 500B R.F. section with home-built 1500 volt power supply. Value $300. Will swap on gud rcvr 10A or 10B. 150 meg. base station. What offers? Victor Leroi, VE5VL, Sub #1, Saskatoon, Sask.

SELL: HT32, new condx, $465 or best offer. K2MRU, 556 Wittich Terr., River Vale, N. J. Tel. EXpress 1-2166.

SX-101 Mark III, perfect, bought new on February 26, 1960. $275. Trade 32S1 with 516F-2, bought new on February 26, 1960, toward KWS-1 or? Want: E-200C sig. generator. C. Malinowski, 228 Leonard St., Agawam, Mass.

SELL: UTC plate transformer CG-312 3,600-3,000 CT like new, $29; 4-250/5D22 new tubes, $25; used, $15; 4-400 used tubes, $20; National 4-250/400 sockets, $1.50; Thordarson T-21F06 fil. transformers 5 volt 13 amp, $3; CD type 40020 2*ufd* 4,000 volt capacitor, $7; 6.3 at 17 amp fil. transformers, $5; Pentron Mercury tape recorder, 2 track monaural record and playback with 10 rolls 7 inch Audiotape, with case, mike and spkr., $70; R-45/ARR-7 Hallicrafter recvr 55 thru 43 MC, $50; will ship, include instructions and postage, balance refunded. WANTED: 6KC Collins filter, 4CX300 tubes, Drake 1A recvr, cash or trade. U. C. Nolte, 2810 Quay Loop, Holloma AFB, N. M.

HAM-SWAP. Need a new piece of gear? Need to trade or sell the old? Then you need the new Ham-Swap! Published twice monthly. National circulation. $1 ad free with $1 year's subscription. Send your $1 now to Ham-Swap, Inc., 35-A East Wacker, Chicago 1, Ill.

CLEANING Out the shack! Send for list. 115 volt transformers: 1500-1000-0-1000-1500 volts, 450 watts, $23.00; 800 volts, 1.25 amps, $15.50; 6 volts, 10 amps, $2.25; T17 mike, $2.50; Astatic T3, $8; 20 *ufd* 660 Vac (2KVDC) oils, $4.00; Weston #301 meters: 300 mils, 500V DC, 1.5 mils, $365 ea. Lots more. Postage extra. Want 6 meter mobile, scientific and electronic instruments and curiosities, Vidicon or orthicon deflection coils, turntable. W8SUB, 7229 Greenleaf, Parma 30, Ohio.

FOR Sale: KWM-1 and AC supply. Only 21 months old. First time offered. For quick sale will take $625. Gil Spencer, W1ZCH, 470 Stuart Street, Boston, Mass. KE 6-5810.

SELL: NC-300 rcvr, $270; DX-100B mtr with coax relay, $170. Both for $430. Both in like-new condx. Stuart Cohen, 77-26 173 St., Flushing 66, L. I., N. Y.

GOING to college. Must sell for best offer: Vy gud Viking Valiant, xtra clean Collins 75A2 rcvr, Hallicrafters SX-28 rcvr, Telrex 2-el. 20-meter beam; B&W model 75 lowpass, B&W model 380B TR switch, Dunlap Conelrad, Dow-Key 110V AC coax relay. Pete Smith, KØHTR, Clarion, Iowa.

HT-32A, $525; HT-33A Mark I, $600; both units in unopened factory-sealed cartons. Collins 75A3 with 3 Kc filter, $325. Want Mims Rotator, Collins 51J3 or 51J4. Give details and best price. All letters answered, W9YFV, 190 E. North Ave., Elmhurst, Ill.

SALE: S-85 with built-in crystal calibrator and VF-1. $100. Rex Pike, K3BYJ/1, Box 126, Medfield, Mass.

HT-32, in exc. condx, $395 F.o.b. Sry, can't trade or sell on instalments. R. Yeager, 1455 Wilson, Chicago 40, Ill.

WANTED: Teletype or Kleinschmidt printers, perforators, reperforators, transmitter-distributors, #14, #15, #19, #26, #28, TG-7, TT, GRC, TGC, GGC, TS-383, Collins receivers 75A, 51J, R-388, R-390. Cash or trade for new amateur equipment. Write to Tom W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. (RIchmond 2-0048).

SELL: Complete station, Viking II, VFO, mike; NC-183, S-O-J, speaker and misc. parts, $300. Cash and carry. 260 copies of QST and CQ, $30. Will ship c.o.d. W3OVU, R.D. #1, Lewisburg, Penna.

SELLING: Need the money for college. Entire station! Apache, $240; SX-101 Mark III (with R-46B spkr), $325; DX-40, $50; Ameco Deluxe code practice oscillator, $10. All equipment in like-new condx, hardly used! WA2CPL, "Bruce", 119 Guilden St., New Brunswick, N. J.

HORSETRADERS: Have NC-66, 522R, 755A, surplus RD2, weight 200 pounds. Need Regency ATC-1 converter, DB23 apparatus. William Clark, WA6KIC, 711 Post St., San Francisco, Calif.

SELL: NC-300, speaker, perfect, $260. W2EQS.

FOR Sale: KWM-1 AC/12VDC supplies, spkr, rack, cables, $675. Write Box 965, Virginia Beach, Va.

WANTED: Mobile gear or SSB xmtr. Will trade TV align color generators, Seco tube tester, 'scope, VTVM, Telohmike. Floyd Berge, KØQFT, Cando, N. Dak.

HEATH Mohawk, in excellent condx, best offer takes it. K3HMP, P.O. Box 38, Jersey Shore, Penna.

SELL: AR88, SX28A, $95 each, SX-100, $200; CE20A deluxe VFO including 10 meters, $200. W4EEU, 5517 Barnhollow, Norfolk, Va.

HEATHKIT Mobile gear, Cheyenne, Comanche, power supply, speaker, mount and cables. Also Master Mobile Mount base mount and whip, 40 and 80 Hi-Q coils, $275 complete or trade. C. L. Jenkins-McLeansboro, Ill. K9KAJ.

FOR Sale: AF67, Gonset Tri-band, genemotor, whip, $145. W6HOJ, 2006 Hamner, Corona, Calif.

SELL: VHF152 and BC-779A with power supply and spkr, 80 thru 2 meters, in gud condx, $125 both. No shipping, W3DWB, Wayne, Penna. Tel. MU 8-1136.

BC779 w/ps, $85; RBM receiver 500-2000 Kc. $50; 1177 tube tester, new, $18; Viking VFO, $20; QSTs since 1938, 50 eac. Ship F.o.b. Endicott, N. Y. WA2KVD, 3601 Country Club Rd., Johnson City, N. Y.

MOVING: Must sell. Johnson Valiant, Mobile VFO, Matchbox, Gonset Communicator 2 mtrs., VFO, Linear, Regency Converter, Harvey-Wells Z-Match, TBS-50C; SX-100; 522s. Beams, rotors, 'scopes, meters, filters. W1AMK, Tel. FA 5-4795. Roslindale, Mass.

SELL: Elmac AF-67, Morrow 5BR-2 conv. Harvey-Wells VPS-T90 mobile pwr. supply, fiber glass whip, Johnson base, loading coil, all 6/12v in gud condx, $125. K2PVG, 170 Bishop Dr., Framingham, Mass.

COMPLETE Station for sale: professionally wired push-to-talk DX-100; SX-71; T-3 mike and stand; B&W LP filter; Heath SWR meter, Dow-Key relay; coax switch. All for $290. Local S. Jersey-Philly area. K2PDG. Call Tilden 5-6426.

WANTED: RME Preselector DB-23. State price, condx. A. Coverdale, 1000 Stuart Place, Linden, N. J.

SELL: Single sideband SS75, voice control, pair 807 output, $70; HQ129X rcvr, $110; Elmac AF-67 transmitter, $75; Elmac PMR-6A rcvr, $65; James 6/12 volt mobile pwr. supply, $20; Precision E200C signal generator, $25; rack, $15. Robert Loeser, 1005 East Glen Ave., Ridgewood, N. J.

SELL: KWS-1 75A4, Ham-M rotor, Mosley Triband, in exc. condx. First offer over $1,500. H. Davis, K6KIXS, 666 Knoll Dr., San Carlos, Calif.

SELL: HT-32A, $550; HT-33A $640. Both purchased this year and under warranty. Perfect condx, no scratches, nicks, mars, etc. Forced to sell. Peter Corty, 30 Granaston Lane, Darien, Conn.

75A4, serial 2560 includes latest factory modifications. In perf. condx. Factory carton. $550.00. David Talley, W2PF, 130 Martense St., Brooklyn, N. Y.

SX-110, 3 months old, $125. Write for details, Joel Datz, 11 Alward Rd., Boston 31, Mass.

SELL: Globe Scout 680 $70; Heath VFO, $15. Trade; Tecraft 6MT trans. for RME 10-15-20. Wheate, K2LJJ, 3939 Keily Dr., Seaford, L. I., N. Y. Tel. SU 1-9118.

SELL: NC-125, $115; DX-20 w/ant. changeover, $35; Knight VFO, $25. Dave Rogers, 201 Park, Glen Ellyn, Ill.

MALE—Ham operator and know how to teach children at camp in Pocono Mts., Pennsylvania. Own equipment. Please explain qualifications to Pocono Highland Camps, 6528 Castor Ave., Phila. 49, Penna.

SALE Or trade: 75S1 with 500 Kc filter. First check over $450. Consider rcvr in trade. W8OPR.

RME MC-55 80-10 converter, 6-12V, $35 postpaid. SSB: Phasemaster Jr. exciter, signal-splitter, BC-457 VFO. Linear using 2-811As and 1300V supply. Asking $275, pickup deal. Glenn Metzler, K3DHV, R. D. #1, Manheim, Penna.

SELL 101 Mark II, like new condx, $275. New Amperex 4CX-250B, never used, $20. G. Cole, W9DRS, Decatur, Ind.

SIX Meter Gonset Communicator II, 6VDC, in gud condx, $135 plus shipping. Must sell before June 10th. Alex Vance, K9ODJ/1, Loomis School, Windsor, Conn.

100V Brand new, for sale. Take 2-meter transceiver or LA-1 on trade. W4GT, 724 Oakland Ave. SE, Atlanta 15, Ga.

75A4 receiver, serial No. 4185 with 6Kc 3 Kc 500 cycle filters and spkr. Used approx. 100 hours. Condx like new. Best offer over $600 takes it. Reply to M. E. Moore, 6600 Palos Verdes Dr. E., San Pedro, Calif.

10B, 458 VFO (15 thru 160 meters) with CE deluxe cabinet, HQ-129X, CE model A slicer, AP-1 adapter, $250; DX-35, $45. Burton Dennis, 782 Henry St., Aiken, S. C.

FOR Sale: NC-109 and spkr, $120. F.o.b. Tex Dallas, W3RZV, Tamaqua, Penna.

PLATE Xfrmr, Pri: 117 VAC 60 CPS. Sec: 1300 VAC @ 145 Ma. (No C.T.); Has 5 v. fil. winding. Stke #T-1001, $3.95; NC-60 rcvr, brand new condx, $45; Drake 1-A, $249.50 (demonstrator); tubes 813, $10; 4-250A, $30; 4-400A, $35; 3B28, $2.75; 866A, $1.90; 872A, $2.75; 3BP1 w/socket, $1.50. One of the largest diversified tube stocks in the world. Write for our tube price-list. VHF xmtr converts to 1¼ or 2 meters. $15, w/battery. Transistor transformers. Toroidal B&W 120 watts, 500 V. 200 Ma., Model TT-120W, $15.25. Glas-Line (eliminates need for glass "break up" insulators), $3.08 per 100 ft. Wanted: Unused transmitting and receiving tubes. Free, free catalog available. Write for the "Green Sheet". Get your copy today! Barry Electronics Corp. 512 Broadway, Dept. Q6, New York 12, N. Y. Tel. WAlker 5-7000.

SELLING Out: SX-101, Pacemaker, 500 watts, 4-125A final, odds and ends. Jim Cole, W4WRW, 2977 Villa Esta Dr., Chamblee, Ga.

KWS-1, in exc. condx, extras, etc., $1100. W6KCC, Kahn, 710 E. Santa Clara, Santa Ana, Calif. Tel. KI 3-3377.

TELETYPE for sale: Model 15, just overhauled, $150.00. With sync motor. F.o.b. Mill Valley. Mike Lando, K6OFI, 118 La Goma, Mill Valley, Calif.

DRAKE 1-A, C.E., 20A, QT1, VFO, P & H LA400 and TR switch, only $460. Push-pull 811, as 500 watt linear with P.S., $65. Want KWM1. David Dennis, K8ATS, R #1, Adrian, Mich.

POWER Supply 2500/3000V, $75; power supply 1000V, $30; BC221T, $50; pair 833s and husky filament transformer, $45; Mae West liferaft transmitter, $5; Zeiss camera 3.5 lens 500 speed $20 value. (trade?). All letters answered. DeClaive, W6GIB, 6646 Mac Arthur Blvd., Oakland, Calif.

KWM1 mobile tray and cable, new condx, $50.00. Will swap, KWS1 ser. 1575 low hours, 1 yr. old, 3 el. Triband prop itch motor and control panel, for KWM2, power supply and station control. Albert J. Bertolisi, W2ALT, 505 Co. Line Road, Amityville, L. I., N. Y. Tel. MY 1-0351.

500 Watt SSB transmitter. CE20A with deluxe 458 VFO driving Gonset 500 Linear with 4-807s. All instruction books. Best offer over $225 F.o.b. K4JRW, 217 Rodman Road, Norfolk 3, Va.

Index of Advertisers

CHARLES SEWELL, K1DXY/5—Raytheon field engineer—inspects Raytheon radar equipment aboard a B-58 Hustler supersonic bomber.

FIELD ENGINEERING WITH A FUTURE

Deep in the heart of K5-land

Checking the "eyes" of an Air Force B-58 Hustler bomber – its Raytheon navigational and bombing radars – has proved to be both an interesting and *rewarding* assignment for Raytheon field engineer Charles Sewell, K1DXY/5. Formerly a Marine air communications Maintenance Chief, Sewell is now Senior Engineer in charge of Hustler radar systems for the entire Fort Worth-Dallas area, where Hustlers are built.

You too may qualify for Raytheon field engineering opportunities if you have an EE degree or equivalent field experience in ground and bombing radar, electronic countermeasures, fire control or sonar.

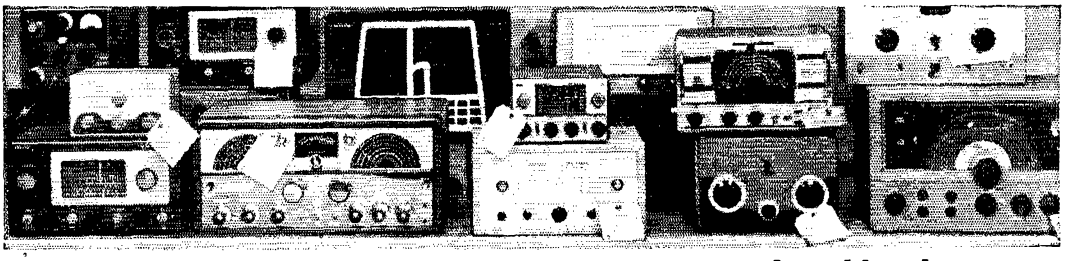
Excellence in Electronics

RAYTHEON

Benefits: attractive salary, insurance, educational programs and relocation assistance. Please write Mr. R. E. Guittarr for details.

RAYTHEON COMPANY
Electronic Services Division
Second and South Avenues
Northwest Industrial Park
Burlington, Massachusetts

Allied's big clearance sale of reconditioned equipment...



Biggest trading in Allied history brings you top values like these...

ALL WITH 90-DAY NEW EQUIPMENT WARRANTY!

Babcock	
D-Xmitter Transmitter	$ 50.00
Barker & Williamson	
5100 Transmitter	239.00
5100B Transmitter	299.00
Central Electronics	
20A Sideband Exciter	179.00
600L Linear Amplifier	325.00
Model A SSB Slicer	39.00
Collins	
32V-1 Transmitter	225.00
32V-2 Transmitter	259.00
KWM-1 W/516F-1 Supply	650.00
KWM-1 W/516E-1 Supply	625.00
Elmac	
AF-67 Transmitter	129.00
A54H Transmitter	85.00
PMR-7 Receiver	119.00
PSA-500 Power Supply	29.95
PSR-6 Power Supply	15.00
Gonset	
Commander Transmitter	69.00
Communicator III 6-Meter	189.00
G11-110VAC Transceiver	69.00
G11-12VDC Transceiver	69.00
Hallicrafters	
SX-28A Receiver	99.00
S-38 Receiver	27.50
S-53A Receiver	59.00
S-85 Receiver	90.00
SX-99 Receiver	$ 114.00
SX-101 MK III Receiver	319.00
SX-104 Receiver	69.95
HT-19 Transmitter	99.00
HT-30 Transmitter	299.00
HT-31 Linear Amplifier	295.00
HT-32 Sideband Exciter	479.00
HT-33 Linear Amplifier	479.00
Hammarlund	
HQ-129X Receiver	129.00
Super PRO-310 Receiver	289.00
Harvey-Wells	
Bandmaster VFO	29.00
APS-50 Power Supply	15.95
APS-90 Power Supply	59.00
Heath	
Mohawk Receiver	269.00
DX-100 Transmitter	179.00
Johnson	
Pacemaker Exciter	325.00
Thunderbolt Linear Amplifier	495.00
Valiant Transmitter	325.00
Viking II Transmitter	179.00
Viking "500" Transmitter with Power Supply	795.00
Knight	
R-100 Amateur Receiver	99.00
T-50 50-Watt Transmitter	35.00
Morrow	
MB-565 Transmitter	$ 179.00
Falcon Receiver	89.00
MB-560A Transmitter	125.00
National	
NC-60 Receiver	49.00
NC-66 Receiver	69.00
RDF-66 Direction Finder	27.50
NC-88 Receiver	85.00
NC-98 Receiver	99.00
NC-109 Receiver	129.00
NC-125 Receiver	114.00
NC-173 Receiver	139.00
NC-183D Receiver	259.00
NC-300 Receiver	259.00
RME	
RME-45 Receiver	85.00
4300 Receiver	169.00
4350 Receiver	189.00
Speaker	7.50
Tecraft	
6-Meter Converter	19.95
CC5-50 6-Meter Converter	32.50
Vocaline	
ED-27-12 Commaire Transceiver	129.00
JRC-400 Transceivers	19.95
W. R. L.	
Globe Chief 90	48.00
Globe Champ 300A	275.00
Globe King 500	295.00

ONLY $5 DOWN (or less) on orders up to $200; up to 24 months to pay. Fast handling—no red tape. Take advantage of these easiest terms now. Handling charges refunded if paid within 60 days.

15-DAY FREE TRIAL. Try any of this equipment under your own conditions; if in 15 days you're not completely satisfied, return it for full refund, less only transportation costs.

90-DAY WARRANTY. Allied reconditioned equipment is covered by the same 90-day warranty against defects in material or workmanship which covers brand-new equipment.

IMPORTANT: Some items above are one of a kind...all items are subject to prior sale...send deposit to hold any item.

Mail, phone or wire your order to Jim Sommerville, W9WHF, Allied Ham Shack

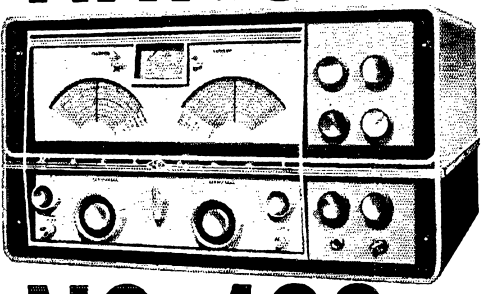
HIGHEST TRADES ANYWHERE

ALLIED RADIO

100 N. Western Ave., Chicago 80, Ill.

BURTON BROWNE, New York

NEW FROM NATIONAL



NC-400

The Most Versatile Communications Receiver Ever Designed

The NC-400 is a modern, multiple purpose, general coverage receiver. Tuning range is 540 kc to 31 mc in 7 bands with dual conversion on all frequencies above 7 mc. Its unique design provides maximum flexibility of operation to satisfy a wide variety of communications requirements.

The NC-400 may be used as a self-contained unit, either manually tuned or crystal controlled on pre-selected frequencies. In addition, external master oscillator provisions make possible use of modern synthesizer techniques for applications where extreme frequency stability is required. It may be operated in space or frequency diversity applications. Provisions are made for interconnection of any required outputs or for feed to external loads or combiners. All frequency determining circuits may be internally or externally controlled. The NC-400 also provides optimum versatility of bandwidth, either through the use of internal IF circuits or the use of optional mechanical filters.

FREQUENCY RANGE:	GENERAL COVERAGE
Band 1	.54 — 1.1 MC
Band 2	1.1 — 2.1 MC
Band 3	2.1 — 4.1 MC
Band 4	4.1 — 7.0 MC
Band 5	6.9 — 12.2 MC
Band 6	11.8 — 20.4 MC
Band 7	19.6 — 31.0 MC

NOTE: Bandspread dial provided with 0-100 logging scale and calibrated for 80, 40, 20, 15 and 10 meter amateur bands.

FREQUENCY STABILITY: Long term stability after warm-up — .002%.

SENSITIVITY: 1 microvolt for 10 db signal/noise ratio.

SELECTIVITY: 4, 8 and 16 kc positions provided with 6 tuned circuits. 3.5 kc wide upper and lower sideband positions provided with 14 tuned circuits. 3.5 kc sharp position activates plug-in crystal filter providing 5 additional degrees of selectivity below 3 kc plus phasing notch. Plug-in accessory available which will provide front panel selection of three mechanical filters without modification of receiver. Proper choice of filters will enable selection of bandwidths from 500 cycles to 16 kc, or will enable filter type of sideband selection from front panel.

SSB PROVISIONS: Separate SSB heterodyne detector uses benefrand converter and separate beat oscillator. Beat oscillator may be crystal controlled. Special "fast-attack-slow release" AGC circuit. Sideband selection accomplished by exclusive, new National passband switching techniques. In the event of commercial-type SSB reception, single sideband mechanical filters may be installed and switched from front panel.

FIXED CHANNEL OPERATION: HF oscillator has 5 crystal sockets for use in fixed channel operation. Channels may be selected by front panel switch. In addition, HF oscillator may be controlled from external master oscillator selected by front panel switch. "S" meter "Tune" position permits rapid tuning of receiver to crystal controlled channel.

DIVERSITY PROVISIONS: Basic receiver may be operated from master oscillator as noted above. An accessory Diversity Modification Kit (NC-400 DMK) allows choice of internal or external control of all oscillators. Rear panel selector provisions make possible use of any receiver either as master control, or slave fed from other oscillator sources. IF, detector and AGC outputs available for feed to external loads or combiners.

POWER REQUIREMENTS: 110-220 volts, 50-60 cycles AC

MANUFACTURER'S SUGGESTED LIST PRICE: $895.

OPTIONAL ACCESSORIES:

1. XCU-400 crystal calibrator. Output frequencies of 100 kc and 1 mc.
2. NTS-2 matching speaker
3. NC-400 DMK diversity modification kit
4. NC-400 FH mechanical filter housing

*Manufacturer's suggested list price. Sold only by National Franchised Distributors.

In Canada by Canadian Marconi Inc., 830 Bayview Ave., Toronto, Ontario.

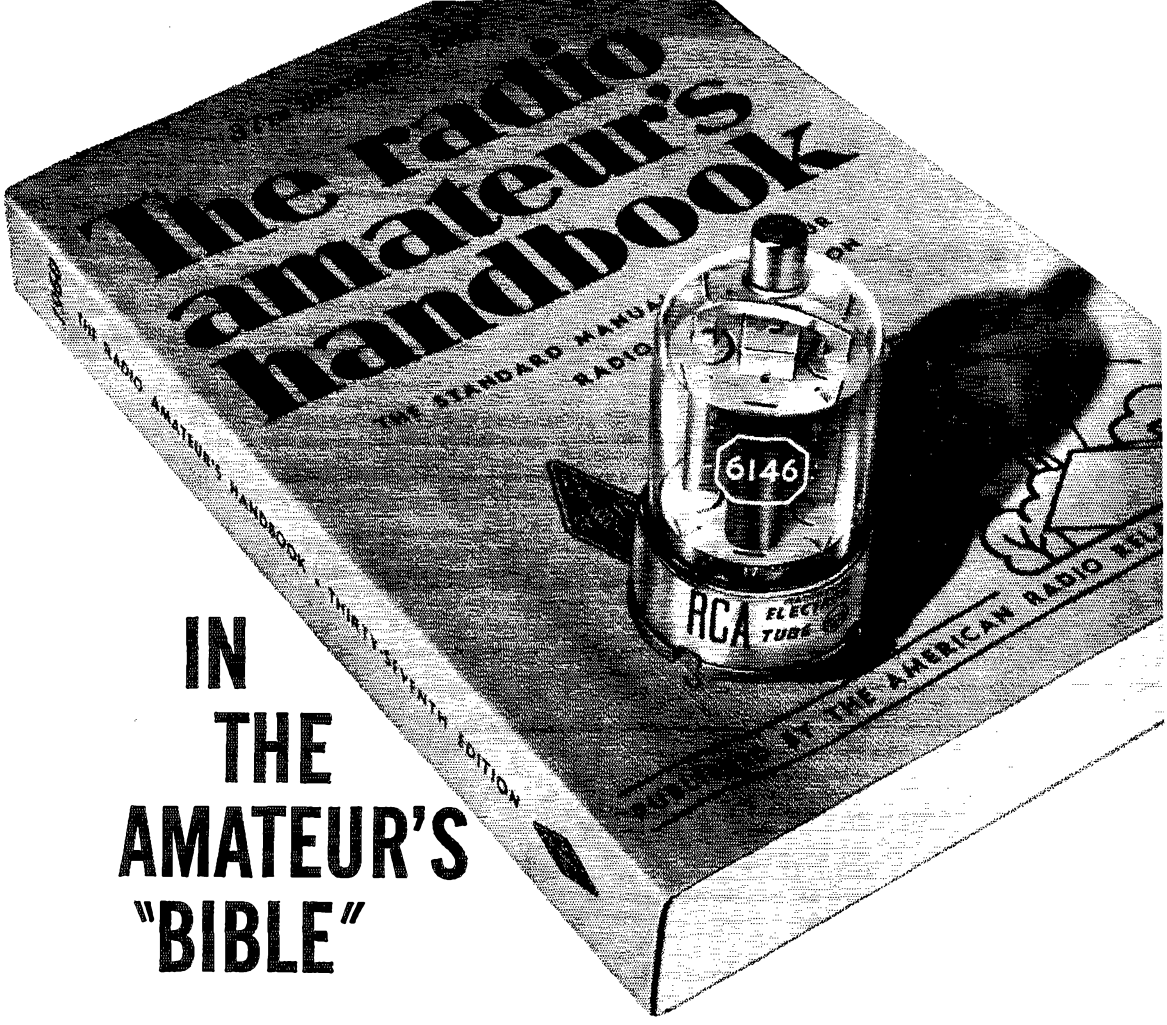
Export by Ad Auriema, Inc., 80 Broad St., New York City.

National

NATIONAL RADIO CO., INC.

MELROSE 76, MASS.

A wholly owned subsidiary of National Company, Inc.



IN THE AMATEUR'S "BIBLE"

...beam power dominates

Over 70% of all the transmitting tube types featured in the HF, VHF, Mobile, and Modulator circuits of the Radio Amateur Handbook are high-perveance beam power types. As the originator of this famous power tube design, RCA is proud to see beam power tubes specified by the Amateur "Fraternity".

Why all this interest in high-perveance beam power tubes?

Take a look at a modern beam power rig. Note the lower-power driver... the minimum number of stages... control simplification... lower plate-voltage ratings... lower voltage-rated (and less expensive) circuit components. Then add it up, and you'll see why RCA Beam Power Tubes are the answer when you're looking for more "transmitter watts" for your dollar.

You can get RCA Beam Power Tubes at RCA Industrial Tube Distributors everywhere. For free technical information on specific RCA Beam Power Tubes listed here, write RCA Commercial Engineering, Section F-37-M, Harrison, New Jersey.

Popular RCA Beam Power Tubes for the Amateur
(listed in order of plate input ratings)*

Type	Max. DC Plate Input (watts)	Max. DC Plate volts	Max. Freq. at Max. Ratings Mc.	Max. Freq. at Reduced Ratings Mc.
5763§ (6417)	17	350	50	175
2E26 (6893)	40	600	125	175
807 (1625)#	75	750	60	125
6524 (6850)	85✦	600	100	470
6146 (6883)	90	750	60	175
829-B†	120✦	750	200	250
7270 (7271)	315	1350	60	175
813	500	2250	30	120
7094	500	1500	60	175
7034/4X105A	500	2000	150	500

* Class C—CW ✦ Twin-unit type, total per tube
() 12.6-volt or 13.5-volt heater-version
† Tapped heater for either 6.3 or 12.6-volt operation
§ 6.0-volt heater type # Has different base from type 807

RCA Electron Tube Division, Harrison, N. J.

The Most Trusted Name in Electronics
RADIO CORPORATION OF AMERICA

Board Meeting Highlights

The Board of Directors of the American Radio Relay League met in annual session at Hartford, Connecticut, May 13, 1960. The Board re-elected all League officers except Vice President Percy C. Noble, whose resignation was accepted with deep regret. Alex Reid, VE2BE, was elected a Vice President, and Noel B. Eaton, VE3CJ, thus automatically assumed the post of Canadian Division Director. Southwestern Division Director Ray E. Meyers, W6MLZ, was newly named to the Executive Committee.

Arthur L. Budlong, W1BUD, tendered his resignation as Secretary and General Manager of the League effective December 31, 1960. The Board accepted with deep regret, offered a rising vote of appreciation for his 37 years of service to the League, and conferred upon him the title of Secretary & General Manager Emeritus effective January 1, 1961. As of the same date, John Huntoon, W1LVQ, was named Secretary and General Manager.

The Board authorized the holding of an ARRL National Convention in San Jose, California, in 1965. It also decided to hold its annual meeting next year on the west coast — at the Disneyland Hotel, Anaheim, California.

The Housing Committee presented initial plans for a proposed new Headquarters building at Newington, Connecticut, and was authorized, in collaboration with the Executive Committee and the Finance Committee, to proceed as necessary toward the construction of such a building. The Board established two new committees — one to make a study of public relations for amateur radio, and another to examine the Articles of Association and By-Laws for possible revision.

In the regulatory field, League officers were requested to continue their efforts to regain operating privileges in the former 160-meter band, to lift the present power limit on the 420-Mc. band, and to achieve some arrangement for reciprocal licensing privileges with other countries. The Board recommended the use of Greenwich Mean Time by all amateurs, and ordered a study of usage of amateur bands between 3.5 and 29.7 Mc. as concerns various modes of emission.

The Board, noting the 25th anniversary of the Federal Communications Commission last year, offered a resolution of appreciation and commendation to the Commission for its cooperative supervision of the amateur radio service. The Board also expressed its particular thanks to vice-directors, assistant directors, SCMs, SECs and QSL Managers for their untiring work and devotion; and to A. L. Budlong, John Huntoon, Goodwin L. Dosland, and Alex Reid for their splendid work on behalf of amateur radio at the Geneva Conference of 1959.

Minutes of the meeting will appear in July *QST*.