June 1961
50 Cents
55c in Canada

QST

devoted entirely to

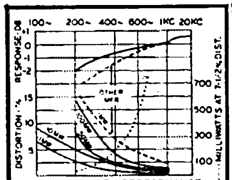
amateur radio

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

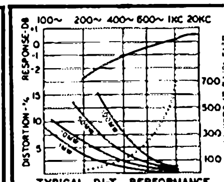
NEW* Revolutionary† DO-T and DI-T TRANSISTOR TRANSFORMERS

FROM STOCK — Hermetically Sealed to MIL-T-27A Specs.

DO-T: 5/16 Dia. x 13/32", 1/10 Oz.; DI-T: 5/16 Doa. x 1/4", 1/20 O



TYPICAL DO-T PERFORMANCE
SOURCE: RATED PRI. IMP. AND D.C.
LOAD: RATED SEC. IMP.



TYPICAL DI-T PERFORMANCE
SOURCE: RATED PRI. IMP. AND D.C.
LOAD: RATED SEC. IMP.

DO-T No.	Pri. Imp.	D.C. Ma.‡ in Pri.	Sec. Imp.	Pri. Res. DO-T	Pri. Res. DI-T	Mw. Level	DI-T No.
DO-T1	20,000 30,000	.5 .5	800 1200	850	815	50	DI-T1
DO-T2	500 600	3 3	50 60	60	65	100	DI-T2
DO-T3	1000 1200	3 3	50 60	115	110	100	DI-T3
DO-T4	600	3	3.2	60		100	
DO-T5	1200	2	3.2	115	110	100	DI-T5
DO-T6	10,000	1	3.2	790		100	
DO-T7	200,000 500	0 0	1000 100,000	8500 —		25	
	Reactor 2.5 Hys./2 Ma., .9 Hy./4 Ma				630		DI-T8
DO-T8	" 3.5 Hys./2 Ma., 1 Hy./5 Ma.			630			
DO-T9	10,000 12,000	1 1	500 CT 600 CT	800	870	100	DI-T9
DO-T10	10,000 12,500	1 1	1200 CT 1500 CT	800	870	100	DI-T10
DO-T11	10,000 12,500	1 1	2000 CT 2500 CT	800	870	100	DI-T11
DO-T12	150 CT 200 CT	10 10	12 16	11		500	
DO-T13	300 CT 400 CT	7 7	12 16	20		500	
DO-T14	600 CT 800 CT	5 5	12 16	43		500	
DO-T15	800 CT 1070 CT	4 4	12 16	51		500	
DO-T16	1000 CT 1330 CT	3.5 3.5	12 16	71		500	
DO-T17	1500 CT 2000 CT	3 3	12 16	108		500	
DO-T18	7500 CT 10,000 CT	1 1	12 16	505		500	
DO-T19	300 CT	7	600	19	20	500	DI-T19
DO-T20	500 CT	5.5	600	31	32	500	DI-T20
DO-T21	900 CT	4	600	53	53	500	DI-T21
DO-T22	1500 CT 600	3 5	600 1500 CT	86 —	87	500	DI-T22
DO-T23	20,000 CT 30,000 CT	.5 .5	800 CT 1200 CT	850	815	100	DI-T23
DO-T24	200,000 CT 500 CT	0 0	1000 CT 100,000 CT	8500 —		25	
DO-T25	10,000 CT 12,000 CT	1 1	1500 CT 1800 CT	800	870	100	DI-T25
	Reactor 4.5 Hys./2 Ma., 1.2 Hys./4 Ma.				2300		DI-T26
DO-T26	" 6 Hys./2 Ma., 1.5 Hys./5 Ma.			2100			
	Reactor .9 Hy./2 Ma., .5 Hy./6 Ma.				105		DI-T27
DO-T27	" 1.25 Hys./2 Ma., .5 Hy./11 Ma.			100			
	Reactor .1 Hy./4 Ma., .08 Hy./10 Ma.				25		DI-T28
DO-T28	" .3 Hy./4 Ma., .15 Hys./20 Ma.			25			
DO-T29	120 CT 150 CT	10 10	3.2 4	10		500	
DO-T30	320 CT 400 CT	7 7	3.2 4	20		500	
DO-T31	640 CT 800 CT	5 5	3.2 4	43		500	
DO-T32	800 CT 1000 CT	4 4	3.2 4	51		500	
DO-T33	1060 CT 1330 CT	3.5 3.5	3.2 4	71		500	
DO-T34	1600 CT 2000 CT	3 3	3.2 4	109		500	
DO-T35	8000 CT 10,000 CT	1 1	3.2 4	505		100	
DO-T36	10,000 CT 12,000 CT	1 1	10,000 CT 12,000 CT	950	970	100	DI-T36
*DO-T37	2000 CT 2500 CT	3 3	8000 Split 10,000 Split	195		100	
*DO-T38	10,000 CT 12,000 CT	1 1	2000 Split 2400 Split	560		100	
*DO-T39	20,000 CT 30,000 CT	.5 .5	1000 Split 1500 Split	800		100	
*DO-T40	40,000 CT 50,000 CT	.25 .25	400 Split 500 Split	1700		50	
*DO-T41	400 CT 500 CT	8 6	400 Split 500 Split	46		500	
*DO-T42	400 CT 500 CT	8 6	120 Split 150 Split	46		500	
*DOT-43	400 CT 500 CT	8 6	40 Split 50 Split	46		500	
*DO-T44	80 CT 100 CT	12 10	32 Split 40 Split	9.8		500	
DO-TSH	Drawn Hipermalloy shield and cover 20/30 db						DI-TSH

‡ DCMA shown is for single ended useage (under 5% distortion—100MW—1KC) . . . for push pull, DCMA can be any balanced value taken by .5W transistors (under 5% distortion—500MW—1KC)

† DO-T & DI-T units designed for transistor application only. Pats. Pend.

* DO-T37 thru DO-T44 newly added to series.

And Special Units to Your Specifications

UNITED TRANSFORMER CORPORATIO

New compact beauty...
New transistorized dependability...
for the Stradivarius of electronic keyers

Again, the "Stradivarius of electronic keyers" advances the art of CW with a clean, compact new design that's completely transistorized... costs less to own... brings you new technical skill and personal enjoyment whatever your level of experience.

HA-4 Features

- Employs digital techniques. Advanced circuitry assures constant ratio of dot-to-space-to-dash over entire speed range. Dots and dashes self-completing.
- Employs eight transistors and ten semi-conductor diodes. Transformer operated. Employs a high-voltage transistor to key the transmitter.
- Monitor or sidetone may be heard via built-in speaker.
- Semi-automatic position permits manual control of dash length for retention of individual characteristics, or straight key operation.

FRONT PANEL: Function control: AC off, Auto keying, Semi-auto, Hold. Speed control: Two ranges; 8-18 and 18-50 WPM. Volume control.

REAR CHASSIS: Term. strip for key connections; weight (dot duration); hi/lo speed range switch; term. strip for transmitter connection.

The new ideas in communications are born at...

hallicrafters

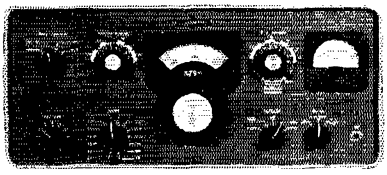
Chicago 24, Illinois

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

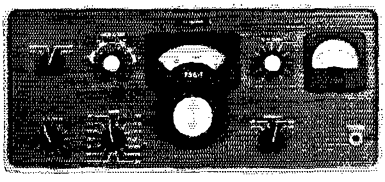
Why does *Collins S/Line* provide much better SSB performance?

(Here are 10 good reasons)

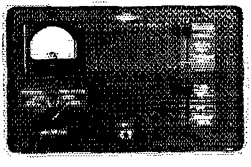
1. **RF FEEDBACK** RF feedback around driver and PA stage improves linearity, reduces distortion products, giving cleanest signal on the air. 2. **FREQUENCY STABILITY** Optimum frequency stability is achieved by using a crystal controlled high frequency heterodyning oscillator and a Collins PTO low frequency variable oscillator. Each PTO is individually temperature compensated. 3. **MECHANICAL FILTERS** Collins Mechanical Filters provide unsurpassed performance in *both* transmitter and receiver because both skirts of the Filter are steepsided. S-Line filters are 2.1 kc wide at the 6 db point and 4.2 kc wide at the 60 db point. No other type filter in this service approaches this performance. Clean signals are assured without additional audio filters.



4. **LIGHTWEIGHT** Modern, compact, the S/Line is easy to move and assemble, light enough to carry along on a field day, weekend trips, or vacations. 5. **ONE KC DIVISION ON ALL BANDS** Now, you can meet anyone on sked without retuning. Quickly legible 1 kc calibrated dial eliminates frequency searching. 6. **MORE QSO'S PER KC** The Mechanical Filter limits the bandwidth to that required for good communication. 7. **DUAL OR SINGLE PTO CONTROL** A flick of a switch selects a single control for transceiver operation, or separate controls to transmit and receive. Highly stable, permeability-tuned oscillator gives positive indication and the best frequency calibration available. 8. **OPERATING AND FRONT PANEL SIMPLICITY** Front panel switching and simplified controls offer an ease of operation and optimum operating efficiency bonus. A gear reduced, 20-kc-per-dial-turn knob allows easy and accurate tuning. This dial lights up for easier reading.



9. **AUTOMATIC LOAD CONTROL** Automatically keeps the signal level adjusted to its rated PEP. Result: an increase in average talk power. Makes distortion negligible. 10. **COMPLETE STATION COMPATIBILITY** The Collins S/Line equipment, handsomely packaged, comprises a complete amateur station. Individual units on which a system can be built include: 32S-1 Transmitter, 75S-1 Receiver, 30S-1 Linear Amplifier, 516F-2 Power Supply, and a 312B-4 Speaker Console.



These 10 advantages help make Collins S/Line the most advanced system available to amateurs. Your nearest Collins distributor will describe further features of this remarkable system. See him at your earliest convenience.

CREATIVE LEADER IN COMMUNICATION

COLLINS

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

QST

JUNE 1961

VOLUME XLV • 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

STAFF

JOHN HUNTOON, W1LVQ
Editor

RICHARD L. BALDWIN, W1IKE
Managing Editor

GEORGE GRAMMER, W1DF
Technical Editor

DONALD H. MIX, W1TS
BYRON GOODMAN, W1DX
Assistant Technical Editors

EDWARD P. TILTON, W1HDQ
V.H.F. Editor

LEWIS G. McCOY, W1ICP
E. LAIRD CAMPBELL, W1CUT
Technical Assistants

ROD NEWKIRK, W9BRD
Contributing Editor, DX

ELEANOR WILSON, W1QON
Contributing Editor, YLs

SAM HARRIS, W1FZJ
HELEN HARRIS, W1HOY
Contributing Editors, V.H.F.

LORENTZ A. MORROW, W1VG
Advertising Manager

EDGAR D. COLLINS
Advertising Assistant

Chris Dunkle and Associates
740 S. Western Ave.
Los Angeles 5
California Representative

DAVID H. HOUGHTON
Circulation Manager

I. A. MOSKEY, W1JMY
Assistant Circulation Manager

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.

Second-class postage paid at Hartford, Conn., and at additional mailing offices.

Copyright 1961 by the American Radio Relay League, Inc. Title registered at U. S. Patent Office. International copyright secured. All rights reserved. *Quedan reservados todos los derechos.* Printed in U. S. A.

INDEXED BY
Applied Science and Technology Index
Library of Congress Catalog Card No.: 21-9421

—CONTENTS—

TECHNICAL —

A Compact High-Power Linear — *Floyd K. Peck, K6SNO* — 11
Noise Factors Affecting V.H.F. Communication — *James C. McLaughlin, W8TBZ, Robert W. Hobbs, W8PIL* — 15
The HBR-16 with an Eddystone Dial — *Alex Stewart, ex-4HP* — 18
HBR-16 Product Detector Circuit ... *Ted Crosby, W6TC* — 21
Low-Pass Filter for 6-Meter Operation — *John Lange, W9ARA* — 23
New Apparatus:
Bayroy Coaxial Relay — 25
Screws — Nuts — and Things — *Wm. A. Deane, W6RET* — 30
Coaxial Transformer for Voltage-Fed Antennas — *W. Pete Czerwinski, W2JTJ* — 36
Technical Correspondence — 38
Keyboard-Controlled C.W. Station — *John B. Nelson, W6EAR* — 40
Recent Equipment:
Model HA-10 Warrior Linear Amplifier — 44
Heathkit Transistor-Diode Checker Kit — 45
Hammarlund I.F. Noise Silencer — 46

BEGINNER & NOVICE —

Construction Techniques ..... *Lewis G. McCoy, W1ICP* — 26

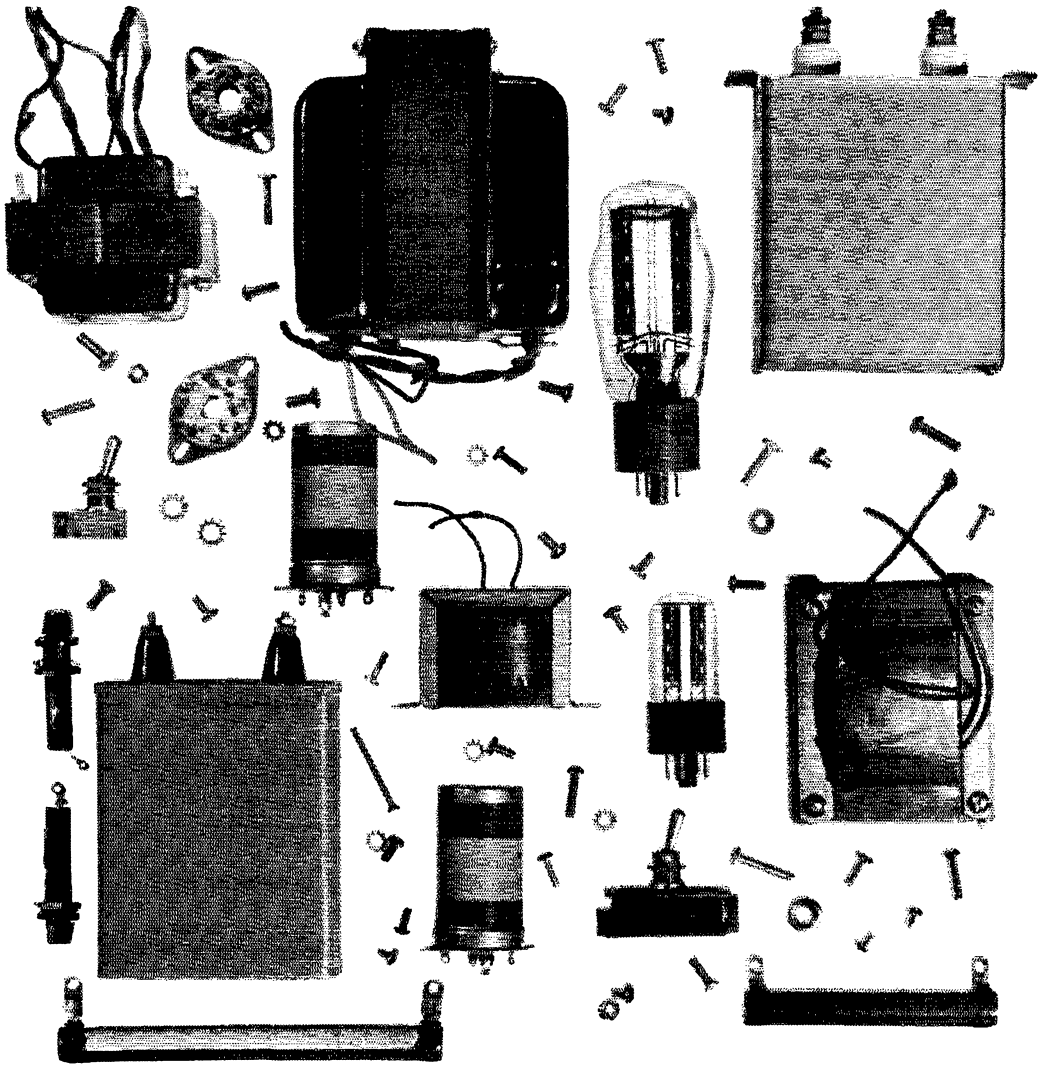
OPERATING —

1961 ARRL Field Day Rules — 50
VE/W 1960 Contest Results — 52
V.H.F. QSO Party Announcement — 62
1961 V.H.F. Sweepstakes Summary — 63

GENERAL —

Board Meeting Highlights — 9
Naval Reserve Communications Divisions — 22
Short QSO Anyone? ..... *John G. Troster, W6ISQ* — 48
Ham Radio & the Coast Guard — *Stephen M. Aug, K2EOF* — 72

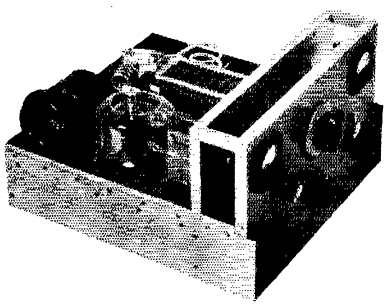
Coming Conventions — 10
Rocky Mountain Division Convention — 10
In QST 25 Years Ago — 10
Our Cover — 10
Hints and Kinks — 38
IARU News — 49
World Above 50 Mc. — 53
How's DX? — 57
YL News and Views — 68
Happenings of the Month — 70
Feedback — 70
Hamfest Calendar — 71
Correspondence from Members — 74
Operating News — 76
Station Activities — 84
Silent Keys — 142
ARRL QSL Bureau — 144
Index to Advertisers — 158



YOU'LL PART WITH ALL THESE PARTS

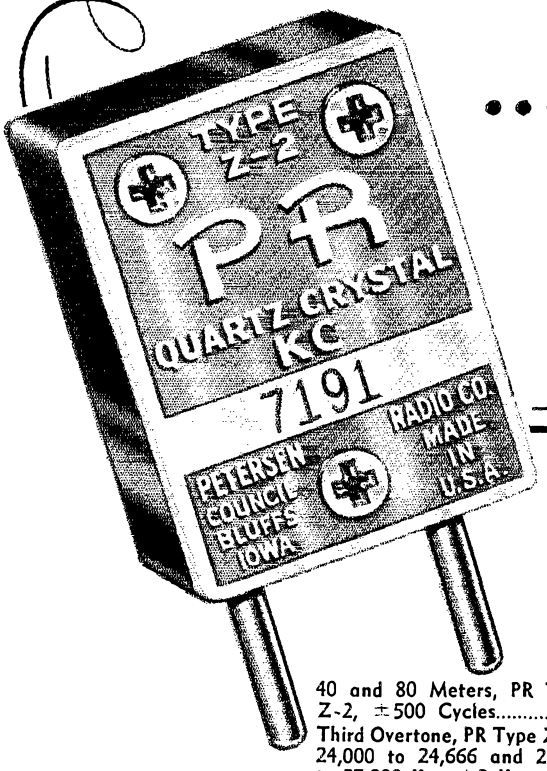
when your transmitter is built with a new Eimac zero-bias triode.

Look to the right and you'll see an amazingly simple transmitter. Look closely and you'll also see the secret behind its simplicity: Eimac's new 3-400Z zero-bias triode. This one tube eliminates *both* screen grid and bias power supplies. (And all the parts you see on the page!) Designed for grounded grid service, it's rated at 400 watts plate dissipation and a 3-1000Z version is rated at 1KW. Product distortion figures for each: better than −35db below maximum output! For more data write: Amateur Services Dept., Eitel-McCullough, Inc., San Carlos, Calif.



Unconditionally Guaranteed

. . . the Mark of the Maker's Confidence in His Product



PRs are built to PERFORM . . . under good conditions and bad. They have that extra measure of stability and dependability BUILT-IN . . . that *plus* of rugged precision that guarantees years of unfailing service. Thousands of pre-war PRs are still performing . . . *still right on the kilocycle!* No wonder PRs can be UNCONDITIONALLY GUARANTEED.

40 and 80 Meters, PR Type Z-2, ±500 Cycles.....**$2.95** Net

Third Overtone, PR Type Z-9A, 24,000 to 24,666 and 25,000 to 27,000 Kc., ±3 Kc.....**$4.95** Net

6 Meters, PR Type Z-9A, 50 to 54 Mc., ±15 Kc.....**$6.95** Net

Citizens Band, PR Type Z-9R, .005% .....**$2.95** Net

PR Crystals

Since 1934

USE PR AND KNOW WHERE YOU ARE

PETERSEN RADIO COMPANY, INC.
2800 W. BROADWAY • COUNCIL BLUFFS, IOWA

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

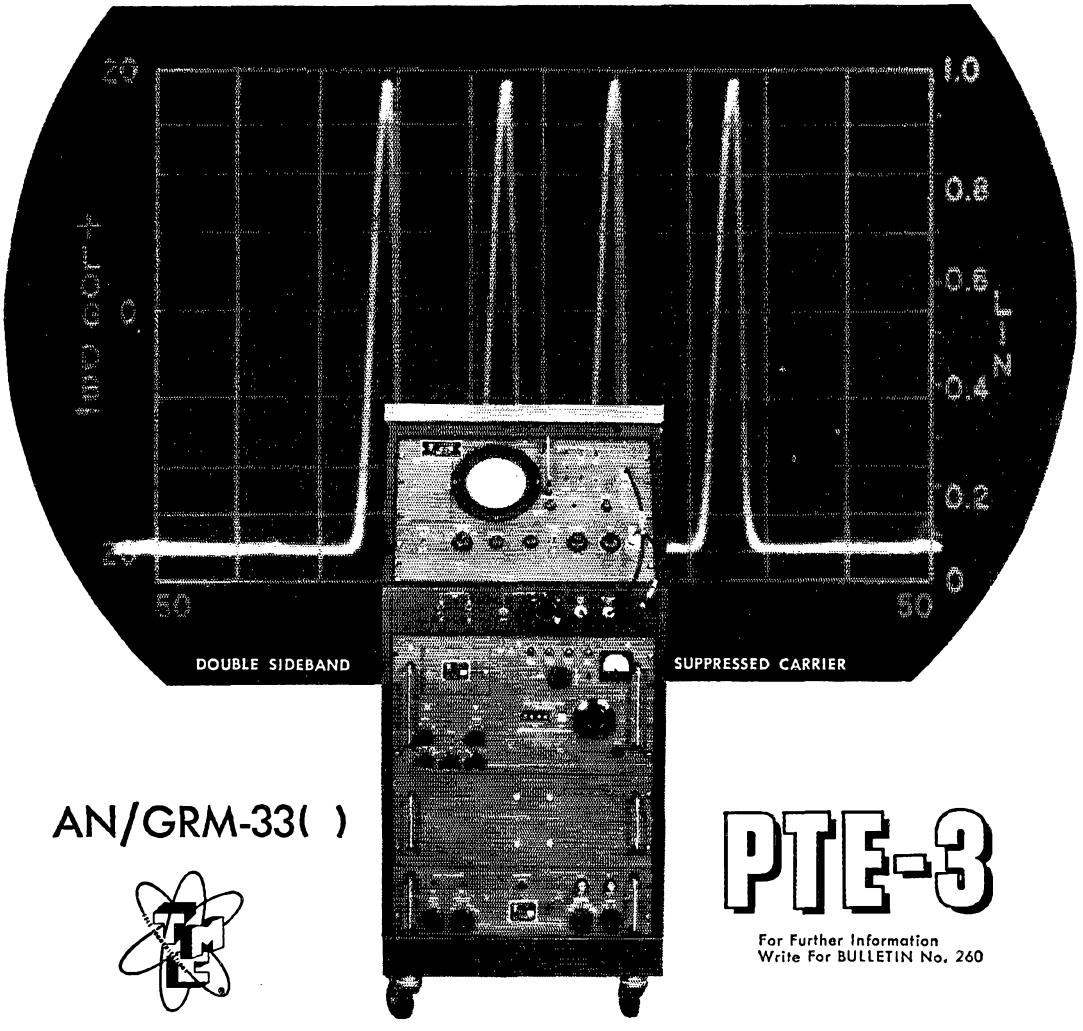
Section Communications Managers of the ARRL Communications Department

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 areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS. SCMs desire applications for SEC, EC, RM and PAM where vacancies exist. OES, v.h.f. bands appointment, is available to Technicians and Novice, as well as to full-privilege amateur licensees.

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	1416-6th Ave.	Williston
South Dakota	WØRRN	J. W. Sikorski	1960 S. Menlo Ave.	Sioux Falls
Minnesota	WØKJZ	Mrs. Lydia S. Johnson	1258 Van Buren St.	St. Paul 4
DELTA DIVISION				
Arkansas	W5SMN	Daniel B. Patterson	Courthouse	Berryville
Louisiana	W5FMO	Thomas J. Morgavi	3409 Beaullieu 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	2,209 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	K2MFF	J. Sparks Remeczky	30 Kelly Parkway	Bayonne
MIDWEST DIVISION				
Iowa	WØBDR	Russell B. Marquis	807 North Fifth Ave.	Marshalltown
Kansas	WØFNS	Raymond E. Baker	1014 Lincoln St.	Neodosha
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	W1CHR	Henry B. Sprague, jr.	Cartbridge Rd.	Weston
Maine*	K1JDA	Herbert S. Merrill	93 Depot Rd.	Portland
Eastern Massachusetts	W1ALP	Frank L. Baker, jr.	91 Atlantic St.	North Quincy 71
Western Massachusetts	W1BVR	Percy C. Noble	8 St. Dennis St.	Westfield
New Hampshire	W1HQ	Ellis F. Miller	Box 395	Wolfeboro
Rhode Island	K1AAV	John E. Johnson	30 Fruit St.	Pawtucket
Vermont	W1EIB	Miss Harriet Proctor	P. O. Box 9	East Middlebury
NORTHWESTERN DIVISION				
Alaska	KL7DG	John P. Trent	P. O. Box 82	Kodiak
Idaho	W7GGV	Mrs. Helen M. Maillet	Route 1, South	Pocatello
Montana	W7SFK	Ray Woods		Heaby
Oregon	W7AJN	Everett H. France	3335 S.E. 116th Ave.	Portland
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	W7VIC	Charles A. Rhines	Box 1025	Elko
Santa Clara Valley	K6DYX	W. Conley Smith	67 Cuesta Vista Drive	Monterey
East Bay	W6OJW	B. W. Southwell	200 South Seventh St.	Dixon
San Francisco	K6ANP	Leonard R. Geraldi	1500 Cayuga Ave.	San Francisco 12
Sacramento Valley	W6BTY	George R. Hudson	2209 Meer Way	Sacramento
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	W4QDV	Robert L. Follmar	1057 Dune St.	Norfolk 3
West Virginia	W8JM	Donald B. Morris	1111 Alexander Place	Fairmont
ROCKY MOUNTAIN DIVISION				
Colorado	WØNIT	Donald S. Middleton	920 West Adams St.	Pueblo
Utah	W7QWH	Thomas H. Miller	1255 East 17th St.	Salt Lake City 5
New Mexico	K5IQL	Newell F. Greene	504 West Second St.	Roswell
Wyoming	W7AMU	L. D. Branson	342 South Elk	Casper
SOUTHEASTERN DIVISION				
Alabama	K4AOZ	William D. Dotherow	572 Park Ave.	Birmingham 16
Eastern Florida	K4SJH	Albert L. Hamel	1300 N. E. 42nd St.,	Pompano Beach
Western Florida	W4BKH	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	Hrb. Truman Rio Piedras, P. R.
Canal Zone	KZ5TD	Thomas B. DeMeis	P. O. Box 1111	Balboa
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	W5BNG	L. L. Harbin	4515 Calmont	Fort Worth 7
Oklahoma	W5DRZ	Adrian V. Rea	917 Osage	Muskogee
Southern Texas	W5QEM	Roy K. Eggleston	1109 Vernon Drive	Corpus Christi
CANADIAN DIVISION				
Maritime	VE1WB	D. E. Weeks		Harvey Station, 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	VE6TG	Harry Harrold	1834-5th Ave.	N. Lethbridge, Alta.
British Columbia	VE7FB	H. E. Savage	4553 West 12th Ave.	Vancouver 8, B. C.
Manitoba	VE4JY	M. S. Watson	249 Lanark St.	Winnipeg
Saskatchewan	VE5HR	H. R. Horn	2121 Ewart Ave.	Saskatoon

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

MANUAL SWEEP CONTROL



AN/GRM-33( )

PTE-3

For Further Information
Write For BULLETIN No. 260

SINGLE SIDEBAND ANALYZER

Manual Sweep Control, a new feature, has been added to our versatile side band analyzer PTE-3. Minute inspection of every segment of the entire sweep is possible with this device.

The operator may control directly without time lag, interference or delay, his inspection and analysis of these critical areas of the sweep which need special attention. A distortion "pip" requiring attention may be held stationary while adjustments are made to terminal equipment to reduce or eliminate the effect of the distortion.

In addition to SSB analysis, the PTE-3 is ideally suited to Production Line testing and analysis of equipment for "noise", "distortion", hum, location and identification of spurious frequency interference, carrier suppression and setting of tone and carrier levels.

Thus, in communication sites, in laboratories or factories, TMC PTE-3 is your most helpful operational and analytical tool.

THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, NEW YORK
and Subsidiaries
OTTAWA, CANADA • ALEXANDRIA, VIRGINIA • GARLAND, TEXAS

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

Secretary . . . . . JOHN HUNTOON, W1LVQ

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

• • • • •

Secretary & General Manager Emeritus . A. L. BUDLONG, W1BUD

• • • • •

General Manager . . . . . JOHN HUNTOON, W1LVQ
Communications Manager . . . FRANCIS E. HANDY, W1BDI
Technical Director . . . . . GEORGE GRAMMER, W1DF
Assistant Secretaries . . . . . PERRY F. WILLIAMS, W1UED
GEORGE STEVANS, JR., K1LVW RAYMOND HIGGS, W6OGI/1
38 La Salle Road, West Hartford, Connecticut

• • • • •

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

DIRECTORS

Canada

NOEL B. EATON VE3CJ
R.R. 3, Burlington, Ontario
Vice-Director:

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 W9GPT
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 . . . . . WØBUO
1011 Fairmount Ave., St. Paul 5, Minn.
Vice-Director: Martha J. Shirley . . . . . WØZWL
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
414 Weber Bldg., 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: Harry J. Dannals W2TUK
RFD 1, Arbor Lane, Dix Hills, Huntington, L. I., N. Y.

Midwest Division

ROBERT W. DENNISTON . . . . . WØNWX
Box 631, Newton, Iowa
Vice-Director: Sumner H. Foster . . . . . WØGQ
2315 Linden Dr., S.E., Cedar Rapids, Iowa

New England Division

MILTON E. CHAFFEE W1EFW
28 Reussner Rd., Southington, Conn.
Vice-Director: Bigelow Green W1EAE
12 Gloucester St., Boston 15, Mass.

Northwestern Division

R. REX ROBERTS W7CPY
837 Park Hill Drive, Billings, Mont.
Vice-Director: Robert B. Thurston W7PGY
7700 31st Ave. N.E., Seattle 15, Wash.

Pacific Division

HARRY M. ENGWICHT W6HC
770 Chapman, San Jose 26, Calif.
Vice-Director: Ronald G. Martin W6ZF
1573 Baywood Lane, Napa, Calif.

Roanoke Division

P. LANIER ANDERSON, JR. W4MWH
428 Maple Lane, Danville, Va.
Vice-Director: Joseph F. Abernethy W4AKC
768 Colonial Drive, Rock Hill, S. C.

Rocky Mountain Division

CARL L. SMITH . . . . . WØBWJ
1070 Locust St., Denver 20, 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
Box R, San Gabriel, Calif.
Vice-Director: Howard F. Shepherd, Jr. W6QJW
127 South Citrus, Los Angeles 36, Calif.

West Gulf Division

ROEMER O. BEST W5QKF
P.O. Box 1656, Corpus Christi, Texas
Vice-Director: Ray K. Bryan W5UYQ
2117 S.W. 61st Terrace, Oklahoma City 19, Okla.

Board Meeting Highlights

THE Board of Directors of the American Radio Relay League held its 1961 meeting on May 5 at Anaheim, California. It is the second time in League history the meeting has been held on the west coast (San Francisco was the location in 1939). The Board reviewed the progress of the League, studied and discussed reports of the officers and its several committees, and made numerous policy decisions to guide League and amateur affairs during the coming year.

In the regulatory field, the League will seek from FCC a change in rules to permit "slow scan" facsimile/TV in the voice portions of our 10- and 15-meter bands, with band width restricted to that of normal A-3 emission. FCC will also be requested to eliminate the present requirement of double identification when using radioteleprinter emission. The Board endorsed FCC's proposals in Docket 14025, to permit Conditional Class exams for civilians overseas, and in Docket 14026, to permit world-wide maritime-mobile operation on 14 Mc. FCC will be consulted to determine whether mobile logging requirements can be simplified. The Board renewed its stand in favor of obtaining additional privileges in 1800–2000 kc. and also reciprocal amateur licensing agreements. The Board endorsed the provisions of two bills now in the Congress to amend the Communications Act, one to eliminate the requirement of notarization of FCC station license applications, the second to eliminate the present 30-day limit on applications for renewal of station licenses.

On the administrative side, the Board amended the By-Laws to provide that only amateurs holding licenses of General Class or higher are eligible for election to the ARRL Board; to provide that only elected directors may vote on a proposal to hold a special meeting of the Board; to clarify the President's delegation of certain responsibilities to the General Manager; and to establish the Public Relations Committee as a standing committee of the Board. A proposal to make terms of directors four years instead of two was rejected. The Housing Committee was authorized to continue its progress in the construction of a new Headquarters building. A special committee was appointed to study the matter of ARRL legal counsel. Director Denniston was newly elected to the Executive Committee of the League for a one-year term, and Directors Kahn and Meyers was re-elected for a similar term.

The Board made a strong recommendation to all U. S. amateurs to avoid use of the band segment 14,335–14,350 kc. so that single sideband DX might work us successfully there. The Headquarters was instructed to use GMT exclusively in ARRL publications and literature.

The article in each issue of *QST* adjudged best by the Merit & Awards Committee will henceforth receive a handsome plaque containing the actual printing plate for the cover of that issue. The Membership & Publications Committee will study the possibility of producing a v.h.f. handbook and a 10-year index for *QST*.

The League will seek a commemorative stamp for amateur radio in 1964, the 50th anniversary of ARRL's founding. The Board commended the Washington, D. C., Foundation of Amateur Radio Clubs on its establishment of a scholarship; Byron Goodman, W1DX, on completion of 25 years on the Hq. staff; Claude M. Maer, WØIC, for long and meritorious service as a director; the Field Engineering & Monitoring Bureau of FCC for continued cooperation with the amateur service; SCMs and appointed officials of the League organizational family for their continued fine efforts; and gave especial thanks to Director Meyers and his Southwestern Division organization for warm hospitality to directors and their wives during the Board's visit to southern California.

Minutes of the meeting will appear in July *QST*. QST

COMING A.R.R.L. CONVENTIONS

June 16–18 — Rocky Mountain Division, Ogden, Utah.
August 5–6 — Oklahoma State, Tulsa.
August 26–27 — Central Division, Springfield, Ill.
September 15–17 — New York State, Niagara Falls.
September 29–30 — Ontario Province, Windsor, Ontario, Canada.
October 7–8 — Midwest Division, Omaha, Nebraska.
October 13–14 — Great Lakes Division, Cleveland, Ohio.
October 13–15 — West Gulf Division, Kerrville, Texas.
October 28 — Kentucky State, Lexington Kentucky.

ROCKY MOUNTAIN DIVISION CONVENTION

Ogden, Utah — June 16–18

The Ogden Amateur Radio Club, assisted by the Utah Amateur Radio Club (Salt Lake City), is sponsoring this year's Rocky Mountain Division ARRL Convention on June 16–18 in Ogden at the Ben Lomond Hotel. The FCC, Armed Forces, OCDM, MARS and others are to be represented and will have speakers on the program. It is expected that Thiokol will give a presentation on the solid fuel missile engines and the Minuteman. Several special interest meetings are also being scheduled together with activities for the XYLs and YLs.

The theme of the convention is "The Role of the AREC and the Amateur in Civil Defense and Other Emergencies." Ed Tilton, W1HDQ, *QST* v.h.f. editor, will be the guest speaker at the banquet Saturday evening.

Accomodations have been arranged for those wishing to stay in Salt Lake City during the night. Convention pre-registration is $4.00 ($5.00 at the door), with Saturday night banquet tickets $3.00 ($3.50 at door). Pre-registration closes June 5. Inquiries about the convention and requests for hotel reservation should be sent to Capt. L. B. Blaylock USN Ret., (K7OIP), Municipal Building, Ogden, Utah or Col. J. H. Sampson, USA Ret., (W7OCX), 3618 Mt. Ogden Drive, Ogden, Utah.

June 1936

. . . There were two editorials twenty-five years ago. One pointed out that phone was causing a great deal of interference to broadcast reception and thereby giving amateur radio a bad name. The other reported that many amateurs bemoaned the swift rate at which amateur radio was progressing technically, especially since some of the new devices were so complicated as to defy home construction. (No doubt the amateur of 1986 will look back on 1961 as the days when the technical side of ham radio was *really* easy to master! — *Ed.*)

. . . The technical fare twenty-five years ago included a 50-watt audio amplifier/modulator with beam-tube output, a 200-watt, 3-stage transmitter with an improved Tri-Tet oscillator, a high-output crystal oscillator using a 6L6, dope on adding a.v.c. to the ham superhet, and the usual collection of hints and kinks for the experimenter.

. . . J. H. Dellinger had further information on high-frequency radio fadeouts.

. . . There was more information on the work done by amateurs in various natural disasters around the country.

OUR COVER

In January *QST* we ran a picture of an HBR-15 receiver built by K7WD, and we asked that others who had built one of these receivers originated by W6TC send us a QSL. In response to that Stray we have received 67 QSL cards, 3 ordinary postal cards, 1 message via W1AW, 17 photographs, 10 letters, and a couple of phone calls. We know there are many more who built one of these receivers but didn't bother to write in - so who says amateurs don't build their own gear any more?

Our cover this month combines some of the QSLs that we received in response to the Stray together with the Eddystone dial version of the HBR-16 built by Alex Stewart and described starting on page 18 of this issue. Alex very kindly shipped his receiver to West Hartford so that we could have our staff photographer make this cover shot.

(See page 71)

Strays

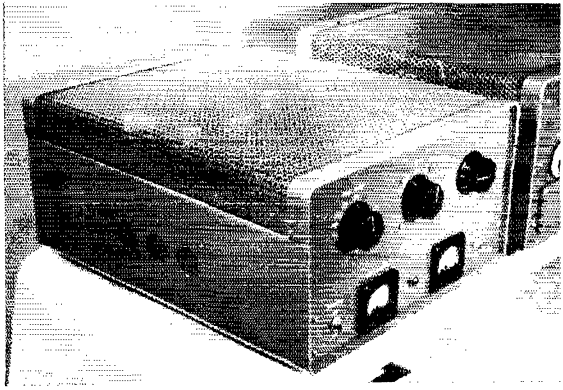
The Dade Radio Club, which lays claim to being the oldest active amateur radio organization in south Florida, wishes to extend its hospitality to any amateurs passing through Miami. This invitation is extended not only to U.S. amateurs but also and especially to overseas hams. Phone JE8-6314 for information and assistance.

—•••—

W4RLS (J. Foy Guin, jr., 500 North Jackson Ave., Russellville, Ala.) would like to compile a list of hams who are also attorneys. After he gets the list compiled, he'll send a copy to anyone who furnishes him with an s.a.s.e.

—•••—

Ever stop to think what a valuable asset you have in your file of old issues of *QST*? Not just last year's, or the year before, either. Member George Cowperthwait, Ballston Spa, N. Y., writes that he built a capacitance-measuring bridge described in the September, 1930, issue of *QST*, and he still uses it regularly. Anyone still using an item built from an earlier issue?



The high-power grounded-grid linear in its homemade cabinet. Controls across the top are for the plate tank capacitor, band switch and loading capacitor. Filament and plate-voltage switches flank the grid and plate milliammeters below. The construction of the cabinet was described in an earlier issue as footnoted in the text.

A Compact High-Power Linear

BY FLOYD K. PECK,* K6SNO

A Class-B linear amplifier in the kilowatt category, complete with power supply, in a space barely exceeding 1 cubic foot. The grounded-grid configuration is used with four parallel-connected 811As.

HAVING decided to go all the way with single sideband, the old Class-C amplifier and modulator were sacrificed to the junk box. Then it was decided to see what could be salvaged for a linear amplifier that would give the most output with the available parts. We had a couple of 811As in the old modulator, and a couple of spares, and they were selected for duty as linear amplifiers. Since the exciter was in the 100-watt-output class, it was decided to take maximum advantage of this output and drive the four 811As as grounded-grid amplifiers. The power supply for the old a.m. rig delivered 1250 volts d.c. at 300 ma., so it fitted our requirements pretty well. The complete circuit of the unit is shown in Fig. 1.

Reducing the Size

As first built, the linear was housed in a cabinet 20 inches wide, 13 inches high and 15 inches deep. It was built on a 17 × 13 × 3-inch chassis. In our project to build the compact linear in a cabinet 14 inches wide by 8 inches high and 17 inches deep,[1] the same chassis size was used but the layout was reoriented. The power transformer used is 7 inches high, so it was necessary to submount it since only 5 inches of clearance was available above the chassis. A 5½ × 6-inch opening corresponding to the base dimension of the transformer was cut in the rear, right-hand corner of the chassis, and brackets were made to provide support 2 inches below the chassis. This allows ample clearance for a.c. and high-voltage terminals below chassis.

The 866A rectifier tubes must also be mounted so that their bases are below chassis level. A 5-inch space for the 866As and 812As is provided when ceramic plate caps are used if the bases are submounted so that only the glass portions of the tubes extend above the chassis. The sockets for the four 811As are mounted on a 6 × 6-inch sheet of ⅛-inch aluminum suspended 1¼ inches below the chassis. Eight ¼-inch holes were drilled in the chassis in a 2-inch circle around each tube position to provide natural convection for cooling the tubes.

Pi-Network Tank Circuit

A conventional pi-network tank circuit is used, and it was built around the Illumitronic 500-watt coil. The markings on the coil indicate tap points for the band switch, so that no calculations are necessary if a 1250- to 1500-volt power supply is used. About half the turns can be removed from the close-wound end of the coil, which allows it to be physically shortened to mount horizontally within a space of 5 inches. The band switch is a very sturdy one obtained from a surplus BC-375E antenna-tuning unit.

The input tuning capacitor C_1 is also of the surplus variety, made by Cardwell and having a maximum capacitance of about 500 $\mu\mu$f. The output (loading) capacitor is a three-section broadcast-receiver type of 365 $\mu\mu$f. per section, with the sections connected in parallel. In the 3.5-Mc. position, the band switch connects a 1500-$\mu\mu$f. silver-mica fixed capacitor in parallel with the variable loading capacitor.

* 1352 Koch Lane, San Jose, Calif.

[1] See Peck, "Homebrew Custom Designing," *QST*, April, 1961.

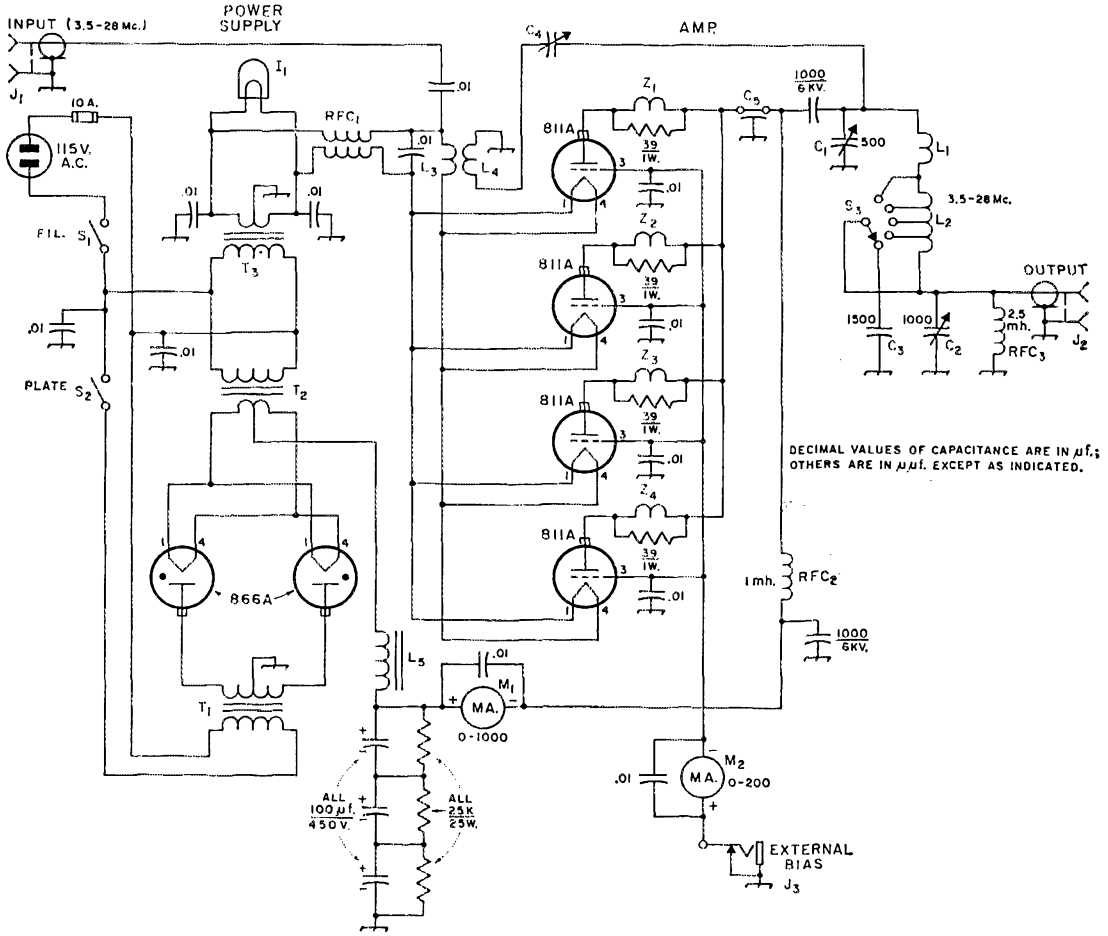


Fig. 1—Circuit of the high-power grounded-grid linear and its built-in power supply. Capacitors not listed below are disk ceramic, except those marked with polarity which are electrolytic. Resistances are in ohms.

C_1—500-$\mu\mu$f. 2000-volt variable (Johnson 154-3/500E20 or similar—see text).

C —Triple section broadcast replacement variable, 365 $\mu\mu$f. per section, sections in parallel.

C_3—2500-volt mica.

C_4—Neutralizing capacitor—approx. 6 $\mu\mu$f. 0.06-inch spacing or greater (Bud CE-2028).

C_5—V.h.f. bypass (4-inch length of RG-58/U as connecting lead).

I_1—6.3-volt panel lamp.

J_1, J_2—Coaxial receptacle (SO-239).

J_3—Closed-circuit jack.

L_1, L_2—Pi-network inductor (Illumitronic/PiDux No. 195-1) approx. inductances in use: 0.4, 0.7, 1, 2.2 and 4.5 μh., respectively, for 10–80 meters. L_2 wound with No. 8 wire, L_1 wound with ½-inch copper strap (see text).

L_3—6 turns No. 14, ½-inch diam., close-wound.

L_4—5 turns insulated hookup wire wound over L_3.

L_5—Filter choke: 5–8 h., 300 ma. (Stancor C-1722 or similar).

M_1—0–1000-ma. d.c. meter.

M_2—0–200-ma. d.c. meter.

RFC_1—Bifilar filament choke (B & W FC-15).

RFC_2—R.f. choke: 1 mh. 600 ma. (National R154-U).

RFC_3—2.5-mh. r.f. choke, 50–100 ma.

S_1, S_2—S.p.s.t. toggle switch.

S_3—Band switch (see text).

T_1—1250-volt (d.c.) 300-ma. plate transformer (Stancor PT-8313 or similar).

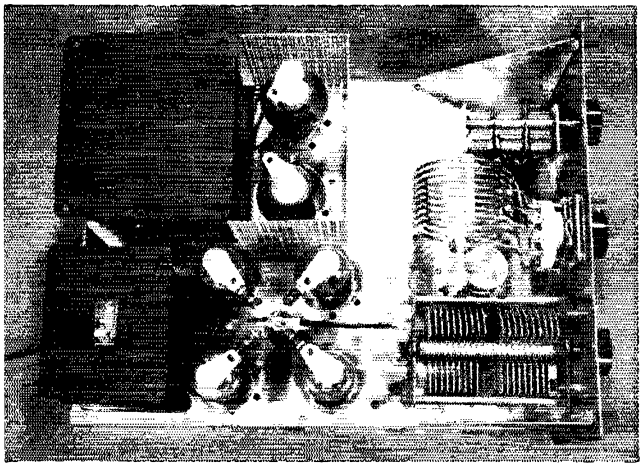
T_2—Filament transformer: 2.5 volts, 10 amp. (Stancor P-3024 or similar).

T_3—Filament transformer: 6.3 volts, 16 amp. (Triad F-22A or similar—see text).

Z_1–Z_4 incl.—Parasitic suppressor—7 turns No. 18 wire, wound on and connected across a 39-ohm 1-watt resistor.

Filament Supply

The filament requirements for the 811As are 6.3 volts at 16 amperes. The old transformer from the modulator, designed to handle a single pair of 811As, proved incapable of supplying the required voltage through the filament chokes with four tubes in the circuit. The secondary, which turned out to be wound with No. 16 wire, was removed, the turns being carefully counted as they were unwound. A new secondary was wound with No. 14 wire and the number of turns was increased by 10 per cent. The measured voltage



Components on top of the chassis are easily identified. The power-supply filter choke and submounted high-voltage transformer are at the left-hand end of the chassis. Tubes enclosed in the perforated shield above the four 811As are the 866A rectifiers. To the right are the plate tank capacitor, the pi-network inductor with its switch, and the loading capacitor. The neutralizing connection runs from a stator terminal on the tank capacitor, through a clearance hole in the chassis to the neutralizing capacitor below deck. *(Photos by Greg Bethards.)*

at the sockets was then 6.4 volts with a line voltage of 117. There were some qualms about the ability of the primary to hold up under these conditions, but the transformer has operated for over two years with no trouble.

Bias

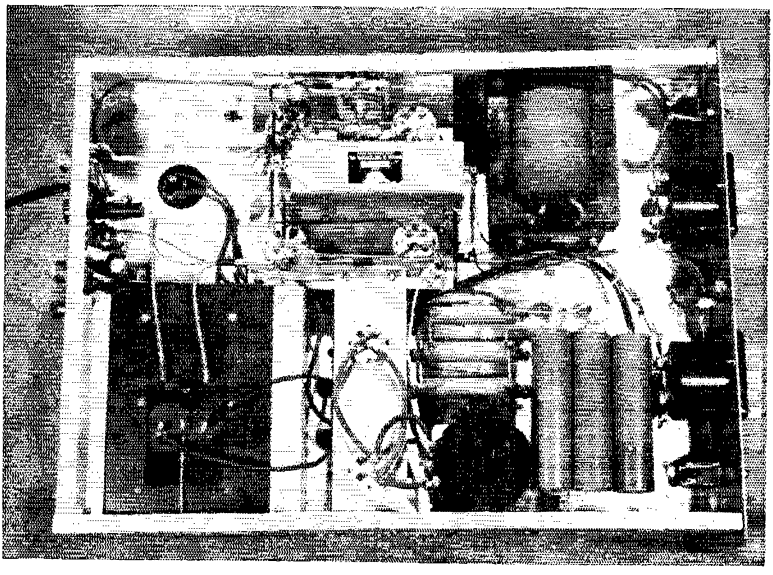
The amplifier operates at zero bias, but the control system is set up so that a relay applies about 100 volts of negative bias from the exciter in the stand-by condition to cut off plate current completely. Without the stand-by bias, the idling current for the four tubes will be around 110 ma. Complete cutoff on stand-by allows these tubes to operate easily without forced-air cooling and, incidentally, is good insurance against "diode hash" noise while receiving.

Stabilizing

With a parasitic suppressor in the plate lead to each tube, there was no trace of instability in the amplifier, except on 10 meters, without neutralization. To assure yourself that the amplifier is stable, apply the plate voltage without bias, switch from band to band with no load applied and swing the input capacitor through its full travel. There should not be the slightest flicker of either the plate- or grid-current meters with no excitation applied. To correct the instability on 10 meters, a 6-turn coil (L_3), ½ in diameter was inserted in one of the common filament leads from the filament choke. A 5-turn coil (L_4) of hookup wire was wound over this. With a 6-$\mu\mu$f. variable neutralizing capacitor (C_4) from L_4 to the plate tank circuit, neutralization on 10 meters was easily obtained.

Adjustment

Many articles have been published on the proper loading of linear amplifiers. In nearly all cases, the use of an oscilloscope is recommended. By all means, use a scope for initial tuning if you can possibly get your hands on one.



This bottom view shows the submounting of the plate transformer, filter choke, and the rectifier and amplifier tubes. The filament choke (enclosed in a metal box), the neutralizing capacitor and neutralizing coils L_3 and L_4 may be seen in the upper center of the chassis.

Another indispensable piece of equipment is an s.w.r. indicator. In case the scope is not always available, the output indication obtained from the s.w.r. meter can be used to get fairly near to optimum loading.

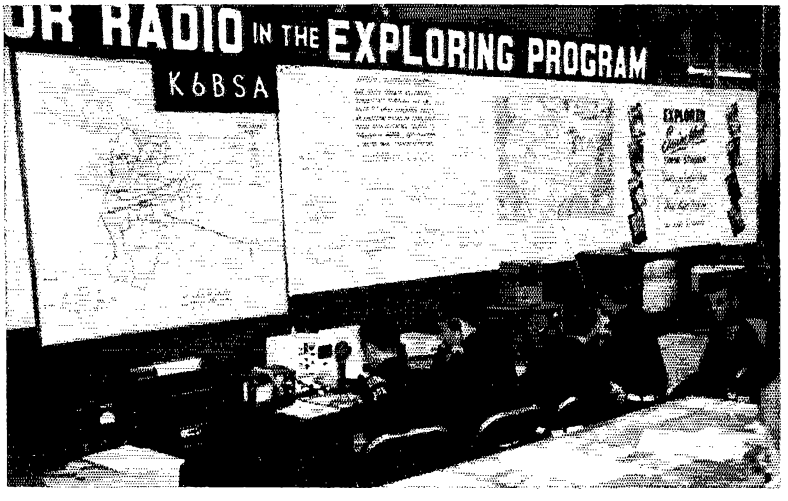
The following procedure has been checked by a scope to verify the results and was found to be quite satisfactory for this amplifier: Gradually apply carrier from the exciter up to about one half the rated output of the 100-watt-class exciter. Tune the linear amplifier pi-network input and loading capacitors to obtain maximum indication of output with the s.w.r. indicator in forward position. Increase the exciter output on up to full output and again retune the amplifier for maximum indicated output. Many will say that this is the proper loading point for the amplifier, but this has not been found to be true in all cases.

Having proceeded as stated above, reduce the inserted carrier until the plate current drawn by the four 811As is 200 ma. Then, note the grid-current reading and the ratio of the plate-to-grid current. In this case, with 200 ma. of plate current, the grid current was 40 ma. (a ratio of 5 to 1). Then increase excitation to get 300 ma. of plate current, at which point the grid current should be 60 ma. In the event you reach a point where this ratio changes, further load changes in the amplifier will be required. For example, if the plate current goes to 500 ma. and the grid current required is greater than 100 ma., the amplifier is no longer linear. It has been found that both underloading and overloading will cause this condition. Readjust the output capacitance and reresonate the input capacitor until a linear relationship is attained. Then set the audio gain control so the plate meter of the amplifier never indicates more than 50 per cent of the maximum on voice peaks for single-sideband, suppressed-carrier operation. At this point the signal will be as good as the output of the exciter. No amplifier can improve upon that.

While the power supply for this particular amplifier does not allow it to be driven to a full kilowatt p.e.p., there is room for a 1500-volt (d.c.) transformer that will permit greater output.[2] If a 1500-volt transformer is used, another 100-μf. 450-volt electrolytic capacitor and 25K 25-watt bleeder resistor should be put in series with the three shown for the 1250-volt supply. QST

[2] It should be borne in mind that with a grounded-grid amplifier, the p.e.p. input to the driver must be added to that of the final in determining the legal input. In the case of a 100-watt-class driver, the maximum input level will just about be reached when the four 811As are driven to maximum rated p.e.p. at a plate voltage of 1250 (875 watts). —*Ed.*

Strays



Boy Scouts in the Los Angeles area had a chance to exhibit Scout lore and Explorer specialties at the 2nd Annual Sports, Vacation, and Travel Show held at the L. A. Sports Arena from March 17 through March 26. Through the efforts of W6QGV, W6QJW, W6MLZ, and the Los Angeles Area Council of Radio Clubs, an electronics exhibit was set up at the show. FCC assigned the special call K6BSA. W6MLZ and W6QJW, ARRL Southwestern Division Director and Vice-Director, obtained the loan of enough equipment to put the station on all bands, all modes. The L.A. Area Council provided enough operators to keep the station on the air 10 hours a day for 10 days. The Aerospace Electrical Society — which has been very active locally in fostering scientific training among young people, in particular having donated over a dozen Gonset Communicators for the use of Explorer posts — contributed $200 to help defray various necessary expenses. During the 10-day period of operation, it is estimated that some 200,000 people viewed this exhibit. Over 2000 pieces of literature (from ARRL Hq.) describing amateur radio were handed out, and more than 1000 QSOs were made. The already warm ties between Scouting and amateur radio were improved. In short, thanks to the cooperation given enthusiastically on all sides, the exhibit was a great success.

Noise Factors Affecting V.H.F. Communication

BY JAMES C. McLAUGHLIN,* W8TBZ, AND ROBERT W. HOBBS,** W8PIL

V.h.f. DXers are constantly fighting something even tougher than QRM — noise. The tables in this article will tell you what kind of noise is the limiting factor in your particular situation. The best and worst times of day for cosmic noise are also tabulated. Add to this the information on path attenuation and predicting signal-to-noise ratio, and you have must reading for every v.h.f. enthusiast.

Cosmic, Receiver and Transmission-Line Noise — All Out To Get Your Signal

V.H.F. amateur radio communication is limited by several factors not significant at h.f. These factors include scattering-type propagation, noise generated by the receiver and cosmic noise picked up by the antenna. This article will discuss the noise limitations and should help the amateur to minimize the noise in his receiving system.

Many v.h.f. men have noticed that connecting the antenna to a 6-meter receiver increases the noise output much more than if the same thing is done at 2 meters or above. This means that at 6 meters the noise coming down from the antenna system is more than that generated in a typical receiver; on higher frequencies, the converse is true.

The noise coming from the antenna may be thought of as having three components. One component is proportional to the temperature of and loss in the transmission line. The other two components are both generated far from the antenna system. One comes from radiation in the region of the center of the galaxy and will be called the galactic component. The other may be considered an average radiation from many extraterrestrial and upper atmosphere noise generators; this will be called the background component. Together, the galactic and background components make up what is often called cosmic noise.

The galactic component is stronger than the background component, and its source is much more localized in space. This means that an antenna pointing in a certain direction will be receiving only the relatively weak background component most of the time. However, at some time of day (for most bearings) the motion of the earth relative to the "fixed" galaxy will cause the stronger galactic noise source to pass through the antenna beam. When this occurs, the noise is at a maximum for the day, and v.h.f. communication is at its worst. Table I shows the time of day when noise input to the antenna is a maximum as a function of the month and the direction in which the antenna is pointing.

Times are given in EST; they can be converted in the usual way for use in other time

* Radio Observatory, Dept. of Electrical Engineering, The Ohio State University, Columbus 10, Ohio.

** Warner and Swasey Observatory, Case Institute of Technology, Cleveland, Ohio.

Table I—Time of Day (EST) When Cosmic Noise Is at a Maximum

	Antenna Heading							
Month	*N*	*NE*	*E*	*SE*	*S*	*SW*	*W*	*NW*
Jan.	—	0330–0700	0500–0800	0630–1000	1000–1400	1300–1600	1500–1900	1800–2130
Feb.	—	0130–0500	0300–0600	0430–0800	0800–1200	1100–1400	1300–1700	1600–1930
Mar.	—	2330–0300	0100–0400	0230–0600	0600–1000	0900–1200	1100–1500	1400–1730
Apr.	—	2130–0100	2300–0200	0030–0400	0400–0800	0700–1000	0900–1300	1200–1530
May	—	1930–2300	2100–0000	2230–0200	0200–0600	0500–0800	0700–1100	1000–1330
June	—	1730–2100	1900–2200	2030–0000	0000–0400	0300–0600	0500–0900	0800–1130
July	—	1530–1900	1700–2000	1830–2200	2200–0200	0100–0400	0300–0700	0600–0930
Aug.	—	1330–1700	1500–1800	1630–2000	2000–0000	2300–0200	0100–0500	0400–0730
Sept.	—	1130–1500	1300–1600	1430–1800	1800–2200	2100–0000	2300–0300	0200–0530
Oct.	—	0930–1300	1100–1400	1230–1600	1600–2000	1900–2200	2100–0100	0000–0330
Nov.	—	0730–1100	0900–1200	1030–1400	1400–1800	1700–2000	1900–2300	2200–0130
Dec.	—	0530–0900	0700–1000	0830–1200	1200–1600	1500–1800	1700–2100	2000–2330

Table II—Time of Day (EST) When Cosmic Noise Is at a Minimum

Month	Antenna Heading N	NE	E	SE	S	SW	W	NW
Jan.	1030–1430	1530–1930	1830–2200	2130–0000	0000–0300 2000–2230	0300–0545	0530–0730	0630–1000
Feb.	0830–1230	1330–1730	1630–2000	1930–2200	1800–2030 2200–0100	0100–0345	0330–0530	0430–0800
Mar.	0630–1030	1130–1530	1430–1800	1730–2000	1600–1830 2000–2300	2300–0145	0130–0330	0230–0600
Apr.	0430–0830	0930–1330	1230–1600	1530–1800	1400–1630 1800–2100	2100–2345	2330–0130	0030–0400
May	0230–0630	0730–1130	1030–1400	1330–1600	1200–1430 1600–1900	1900–2145	2130–2330	2230–0200
June	0030–0430	0530–0930	0830–1200	1130–1400	1000–1230 1400–1700	1700–1945	1930–2130	2030–0000
July	2230–0230	0330–0730	0630–1000	0930–1200	0800–1030 1200–1500	1500–1745	1730–1930	1830–2200
Aug.	2030–0030	0130–0530	0430–0800	0730–1000	0600–0830 1000–1300	1300–1545	1530–1730	1630–2000
Sept.	1830–2230	2330–0330	0230–0600	0530–0800	0400–0630 0800–1100	1100–1345	1330–1530	1430–1800
Oct.	1630–2030	2130–0130	0030–0400	0330–0600	0200–0430 0600–0900	0900–1145	1130–1330	1230–1600
Nov.	1430–1830	1930–2330	2230–0200	0130–0400	0000–0230 0400–0700	0700–0945	0930–1130	1030–1400
Dec.	1230–1630	1730–2130	2030–0000	2330–0200	0200–0500 2200–0030	0500–0745	0730–0930	0830–1200

zones. These times are for the United States and will be different for places with other latitudes. For mid-latitudes in the United States the maximum noise source never passes across the northern horizon. Hence no times are given.

The background component is not really uniform, since there are regions which are radiating less than other regions. Therefore, times of the day when the noise is at a minimum also exist. Table II indicates when they are.

Both galactic and background components behave the same in that their strengths fall off rapidly with an increase in frequency. Doubling the frequency will decrease the cosmic noise some 5.8 times, so at 144 Mc. the background has shrunk to a small fraction of its value at 50 Mc. Table III gives the noise power density of the extraterrestrial components as a function of frequency. Note that the units used are watts per c.p.s. Multiplying these values by the bandwidth of the receiver in c.p.s. gives the noise power contribution in watts $\times 10^{-21}$.

Table IV gives the noise contributed by the transmission line as a function of line loss. Since line losses increase with frequency, so does this component of noise. An average temperature of 63 degrees F. is assumed. In winter, with a cold transmission line, these values may be some 10 per cent less.

Table V converts receiver noise figure to the units given in Tables III and IV. Using typical values for noise figure and transmission-line loss it is easy to see that cosmic noise is the limiting noise factor at 6 meters. At 2 meters, on the other hand, receiver noise becomes very important as does, in many cases, noise from the transmission line.

Summing the contributions from Tables III, IV and V will give the noise power which must be overcome by the signal. Then with a knowledge of the path attenuation, transmitter power and receiving and transmitting antenna gains it is possible to make a good estimate of the signal-to-noise ratio of a circuit.

Fig. 1 is presented to give the amateur some idea of the path attenuation he may encounter.

TABLE III

Frequency (Mc.)	*Cosmic Noise Power Density (10^{-21} Watts/C.P.S.)* Average	Maximum	Minimum
50	84.	248.	50.
144	3.7	9.5	3.3
220	2.1	6.6	1.2
430	0.4	1.2	—

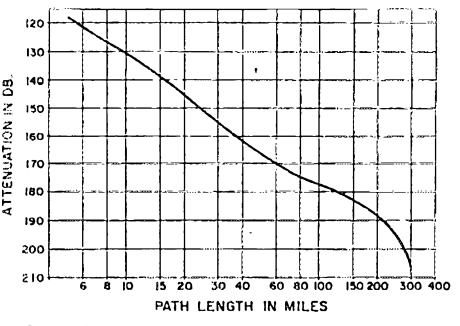


Fig. 1—Path attenuation as a function of the distance between two isotropic (same field in all directions) antennas 30 feet above ground and separated by smooth terrain. The curve shown is good for 6 and 2 meters.

TABLE IV

Transmission-Line Loss and Equivalent Noise Power Density at 63° F.

Loss (db.)	*N.P.D.* (10^{-21} *Watts/C.P.S.*)
0.1	.09
0.2	.18
0.3	.27
0.4	.35
0.5	.44
0.6	.52
0.7	.60
0.8	.67
0.9	.75
1.0	.82
2.0	1.48
3.0	2.00

Of course, many amateurs are not separated by smooth earth, and some stations have antennas more than 30 feet above the ground. To calculate path attenuation for these more general cases, some additional reading [1] will be required.

Consider two 6-meter stations that *are* separated by smooth ground and have 30-foot high antennas. The rest of the circuit specifications are as follows:

Distance between stations	250 miles
Transmitting antenna gain	9.0 db. over dipole
Line loss	0.3 db.
Receiving antenna gain	12.1 db. over dipole
Line loss	1.0 db.
Receiver noise figure	4 db.
Receiver bandwidth	3000 c.p.s.
Transmitter power output	250 watts

TABLE V

Receiver Noise Figure (db.)	*Equivalent Noise Power Density* (10^{-21} *Watts/C.P.S.*)
2	2.34
3	3.98
4	6.05

First, find and total the noise contributions. From Table III the average cosmic noise power density at 50 Mc. is 84×10^{-21} watts /c.p.s. The 1.0-db. receiving transmission-line loss converts to 0.82×10^{-21} watts/c.p.s. with the aid of Table IV. Table V says that a receiver noise figure of 4 db. is equivalent to a noise power density of 6.05×10^{-21} watts/c.p.s. Adding these three figures gives 90.87×10^{-21} watts/c.p.s., and multiplying this times the receiver bandwidth yields 2.73×10^{-16} watts as the noise power at the receiver.

Next, figure the net path attenuation from transmitter to receiver. There are three losses involved: path — 194 db. from Fig. 1, transmitting transmission line — 0.3 db., and receiving transmission line — 1.0 db. The gains are those of the transmitting antenna + 9.0 + 2.2 (2.2 db. is the gain of a dipole over an isotropic radiator) db., and the receiving antenna + 12.1 + 2.2 db. Adding up the losses and the gains and subtracting the gains from the losses gives a net path attenuation of 169.8 db.

Now the transmitter output power must be reduced by the path attenuation to get the signal power at the receiver.
Solving,

$$\textit{Path atten.}\ (\text{db.}) = 10 \log_{10} \frac{\textit{Transmitter Power Output}}{\textit{Signal Power at Receiver}}$$

gives 2.61×10^{-15} watts as the signal power at the receiver. The signal-to-noise ratio equals this figure divided by the noise power at the receiver. Therefore,

$$\text{S.N.R.} = \frac{2.61 \times 10^{-15}}{2.73 \times 10^{-16}} = 9.56 = 9.8 \text{ db.}$$

A major portion of the information given in this paper was derived from *Celestial Radio Radiation* by Drs. J. D. Kraus and H. C. Ko, published by the Radio Observatory, Dept. of Electrical Engineering, Ohio State University. This work was done while the authors were research assistants at the National Radio Astronomy Observatory.[2] The authors wish to express their appreciation for the encouragement of Dr. John W. Findlay, Chairman of the Research Equipment Development Department and Assistant to the Director at the National Radio Astronomy Observatory. QST

[1] See the October 1955 issue of the *Proceedings of the IRE*, in particular, page 1488. Also, National Bureau of Standards Technical Notes No. 15, *Prediction of the Cumulative Distribution with Time of Ground Wave and Tropospheric Wave Transmission Loss, Part I — The Prediction Formula;* and No. 12, *Transmission Loss in Radio Propagation II.* These last are available for $1.50 and $3.00, respectively, from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

[2] Operated by the Associated Universities, Inc., under contract with the National Science Foundation.

Strays

During June the Third Army MARS training program (Fridays at 1900 EST, 0000 GMT, 5850 kc.) will be devoted to radioteletype.

—•••—

WA2GWF suggests that those hams who put on too much weight emptying beer cans for a beer-can vertical will be glad to know that *Metrecal* cans also work fine.

—•••—

Congratulations to Richard S. Morse, W1AFZ, who was recently nominated by President Kennedy to be Assistant Secretary of the Army for Research and Development.

—•••—

A new magazine is on the market — *TVI!* (TV International — world-wide TV news.)

The HBR-16 with an Eddystone Dial

BY ALEX STEWART, ex-4HP *

(With an assist from W6TC)

The substitution of a different tuning dial may seem like a simple thing to do in almost any constructional project. It isn't quite so easy, though, when an Eddystone dial is to be fitted to the HBR-16 — not, that is, if the original receiver size and performance are to be maintained. Here's a scheme used by the author with the advice of W6TC.

ABOUT two years ago, after an interval of some forty years, I renewed my subscription to *QST*, just to see what was going on in this former hobby of mine. That did it — I was hooked again.

What a mysterious world I found myself reentering. The old galena crystal had not only given way to a quartz of a different kind, but receivers had shrunk from table-top size down to wee boxes crammed with all sorts of esoteric componentry. Gone were those helpful hints on the best kind of oil to use to keep that old 1-kw. condenser from blowing its stack of reclaimed glass photographic plates, or how to mold and cast your own rotary spark gap. Instead, I found myself reading about communications receivers using single conversion, double conversion, and even triple conversion. Notch filters, *Q* multipliers, and something called "s.s.b." were among other strange items to compound my confusion. Things had surely changed since I last whiffed a shackful of pure ozone.

With 90 per cent of my old hobby now away over my head, I realized I'd have to start over from scratch. And being the type of person who learns most easily by doing, I decided to build a communications receiver.

Admittedly, rushing pell-mell into any such seemingly difficult task did at first glance seem to be rather ridiculous. But, in a back issue of *QST* I had run across an article describing the construction of a receiver which the author claimed to be not only very much worth while, but well within the construction capabilities of most any Tom, Dick and Harry as well — the "HBR-16 Communications Receiver," described in the October, 1959 issue of *QST*.[1] This was for me.

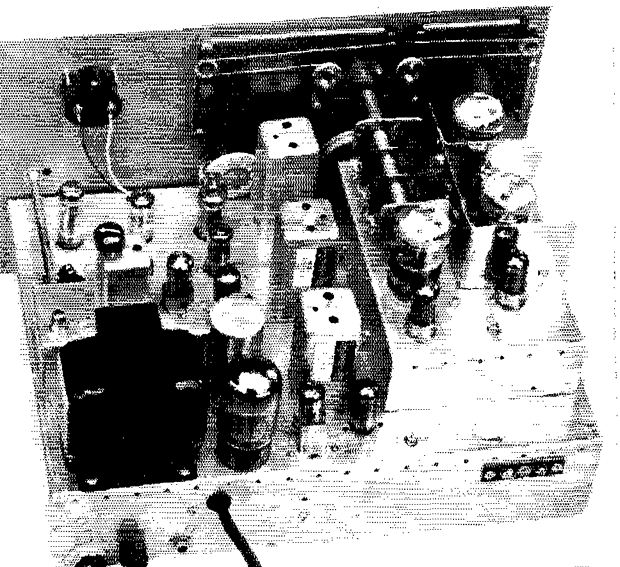
Meanwhile, an advertisement for the new Eddystone dial had caught my eye, so I screwed up enough courage to write to the creator of the HBR-16, Ted Crosby, W6TC, and casually inquired if it might be possible to incorporate the Eddystone dial into his receiver.

How naive can you get? Little did I realize how complicated (for me) this seemingly simple alteration could actually be. Ted's reply gave me a fast run down on several methods already used by others who had substituted the Eddystone dial, and he carefully detailed for me his objections to each. He further stated that if some way could be found to keep the front-end leads as short and rigid as in the original version of the HBR-16, the Eddystone dial would be a worthwhile improvement.

Several letters and several false starts later, Ted finally came up with what seemed to be the answer — a completely new subchassis-mounted front end which would include all of the components and wiring of that portion of the receiver between the L_1 antenna coil and the first-mixer

* 420 Croton Drive, Alexandria, Va.

[1] Crosby, "The HBR-16 Communications Receiver," *QST*, October, 1959.



The drive shaft of the Eddystone dial is high up on the assembly, so the tuning capacitor can no longer sit on the chassis as in the original HBR-16. To make the dial and capacitor line up, the receiver front end is separately mounted on the subchassis shown at the right in this rear view.

section of the 1600-kc. transformer, T_1. Not only would such a modification solve the mechanical problems but it would at the same time provide even shorter leads and better front-end isolation than had been possible in the original SCN dial design. On paper, that is. The practical application of the idea still remained to be accomplished.

My cut-and-try efforts toward the completion of the receiver were strung out over a period of about six months, accompanied by a continuous flow of good, solid advice from Ted at every step. I now wonder how he found the time for it, as I have since learned that he was at the same time receiving and answering literally hundreds of letters from other interested parties.

The Eddystone Dial

Before proceeding further it should be made clear that the contemplated modifications were to be tailored to the original small Wyco cabinet. Quite a sizeable order, since the dial has an overall height of 5¾ inches between the upper edge of its escutcheon and the lower rim of its flywheel. Some way had to be found to fit this 5¾ inches of dial between the flange which runs across the top front edge of the cabinet, and the upper surface of the main chassis. In the original HBR-16 design only five inches of vertical panel space is available. In my own receiver, the first half inch of additional space was achieved by dropping the main chassis down onto the floor of the cabinet while the remaining one-quarter inch was secured by filing that much off the cabinet flange.

A better way of doing it has since been worked out, and is recommended. The dial escutcheon should be mounted so that its upper and left-hand edges are one-half inch in from the corresponding two edges of the panel. A slot 2¼ inches long by ¾ inch wide should be cut in the main chassis directly underneath the final location of the flywheel. The flywheel turns in this cutout, protruding about ¼ inch below the under side of the main chassis. This extra space between escutcheon and the two edges of the panel also makes a decided improvement in the external appearance of the receiver.

As a preliminary, install all of the chassis-mounted parts with the panel off. The hex nuts that secure the panel-operated controls to the chassis proper also serve as spacers when the panel is finally attached. A second set of identical hex nuts is used for fastening the panel to the chassis. The resultant space between the main chassis and the panel accommodates the half-inch flange which extends across the lower front edge of the Wyco cabinet. When inserting the receiver in the cabinet, a slight tilt of the entire assembly to swing the top of the panel forward will keep the upper portion of the Eddystone dial assembly clear while the lower cabinet flange goes in the "slot." As a precaution against binding between the chassis and the cabinet flanges when the forward tilt is attempted, file about 3/32 inch off both side flanges for a distance of four inches from the bottom end. A similar 3/32-inch slot in the upper 1½-inch section of the left-hand front flange will provide additional clearance for the plastic drive wheel for the dial pointer.

The Front-End Subchassis

A 2 × 5 × 7-inch chassis is used as a subchassis for the front end. For best mechanical stability a steel chassis is to be preferred. Study of the accompanying photographs will give the builder a close-enough approximation of the proper parts placement. The subchassis is attached to the main chassis by four 6-32 spade bolts and nuts. Making the four main-chassis holes for these spade bolts slightly oversize will give some leeway in mounting — sometimes of great help when attempting to align the antenna trimmer and 1461-BS capacitor shafts in final assembly. The subchassis should end up mounted 3/16 inch from the left-hand edge and 1⅝ inches from the front edge of the main chassis. The original three-stud mounting arrangement for the 1461-BS is used, but in this case this capacitor ends up about ¼ inch above the top surface corner of the subchassis. The antenna trimmer, C_{11}, is mounted in the left-hand corner of the subchassis, giving practically a no-lead connection to the L_1 coil socket. The relatively small space available makes the Hammarlund MAPC-15B a "must."

The no-lead connection plus the fact that the MAPC-type variable has no metal frame (which always adds some stray capacitance) explains why it is possible to use one more turn of wire in the secondary winding of the six-meter L_1 coil for this receiver than in the original SCN dial model.

The shield between the plug-in coils and the 1461-BS should be ½ inch from both coils and capacitor. Closer placement tends to lower the *Q*s of the coils and increases the minimum capacitance.

The small shield between the first oscillator and first mixer, visible in the underside view, is not essential and should be eliminated.

The 1461-BS should be mounted so its shaft will be 5 3/32 inches from the left-hand edge of the panel. So mounted, it will line up with the drive shaft of the Eddystone dial, provided the dial has been panel mounted as previously described.

As the tuning ratio of the Eddystone dial is

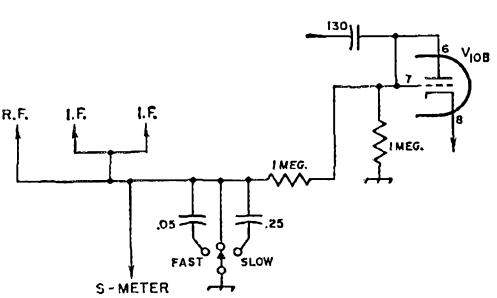
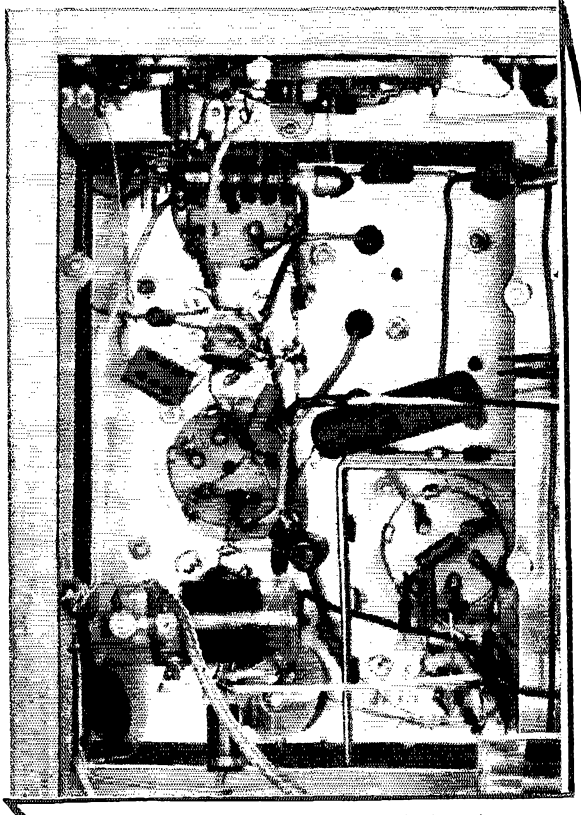


Fig. 1—Suggested modification of the HBR-16 a.v.c. circuit. The 3-position rotary switch selects either fast or slow a.v.c. or "off" (a.v.c. line grounded). Capacitors in the a.v.c. circuit can be tubular paper, 200-volt rating; capacitances are in μf.



The bottom of the subchassis is accessible through a cutout in the main chassis. The general layout of the r.f., mixer and oscillator stages is the same as in the original receiver.

1101, the vernier capacitor in the first-oscillator circuit no longer is needed and has been eliminated.

The 3500-kc. calibration-oscillator tube and crystal sockets are mounted on the main chassis in the space between the subchassis and panel. Place the tube and crystal sockets as close together as possible, to be certain they do not interfere with the shafts for C_{11} and the 1461-BS.

Some Additional Comments

Starting with the second mixer half of T_1 and its associated 100-$\mu\mu$f. APC capacitor, the balance of the main-chassis parts are laid out and mounted exactly as in the original receiver.

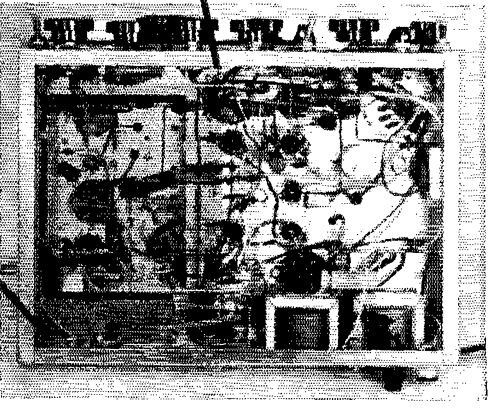
The new front end necessitated some rearrangement of the panel-mounted controls. I used a rotary off-on switch for the calibration oscillator and mounted it in the position formerly occupied by the antenna trimmer. The former calibration-oscillator switch position was used for a rotary fast-slow a.v.c. control, with the a.v.c. off-on switch being separately mounted. Subsequent builders might well combine these functions by using a single three-position rotary switch as shown in Fig. 1. This calls for some further explanation: In the interests of improved a.v.c. control, only one a.v.c. line is now used, with the r.f. stage (V_2) now connected to this "maximum" line rather than to the "partial" line as in the original circuit. With the partial line eliminated, a single one-megohm ½-watt load resistor will suffice for the a.v.c. diode, V_{10B}.

To obtain proper b.f.o. injection in the 6BE6 product detector, I found it necessary to use a 75-$\mu\mu$f. silver-mica padder in parallel with the entire 012-M5 b.f.o. coil. Some time ago it was definitely determined that this coil could not be depended upon to tune down to the required 100 kc. unless 75 to 100 $\mu\mu$f. of additional padder was used. Despite the thorough shielding of the b.f.o. there is some slight leakage, and harmonics can get into and beat with the second oscillator. Thus at certain settings of the b.f.o. trimmer there is a weak heterodyne, which many builders have erroneously assumed to be the proper b.f.o. injection. Under these conditions the product detector gives only a poor imitation of its optimum performance, overloading on all but the weakest signals. Also, as a precaution against possible parasitics in the b.f.o., insert a 56-ohm ½-watt resistor in the 6BH6 grid lead, as shown in Fig. 2. Parasitics are quite likely to occur unless this precaution is taken.

An additional 10-$\mu\mu$f. N750 capacitor between Pins 2 and 4 of the L_3 coil socket will tend to counteract the frequency drift in the first oscillator chassis wiring, this drift being common to all bands. The additional capacitance may or may not call for a change in the size of the N750 capacitor used in the L_3 coils proper. Try it and see.

One of the bonuses of the front-end modification described here is the successful use of the receiver "barefooted" on six meters. Six-meter coil data are given in the accompanying chart. No band-set capacitors are used in the L_1 and L_2 coils; instead, these coils are tuned to resonance by adjusting the secondary turns spacing. The secondary inductance of these coils will be too large for use in the original model of the receiver, and one turn less is suggested if the coils are to be so used. The 1¼-turn position of the tap, as well as the over-all length of the secondary, will apply in either case.

The six-meter L_3 coil can be used in any HBR-16 receiver. It is designed so that the first oscilla-



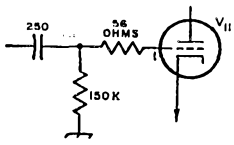


Fig. 2—56-ohm parasitic suppressor inserted in the grid lead (No. 1 Pin) of the 6BH6 b.f.o. tube.

tor covers approximately 24.2 to 25.7 Mc. on its fundamental frequency, with its second-harmonic of 48.4 to 51.4 Mc. providing the necessary 1600-kc. i.f. difference over the 50- to 53-Mc. portion of the band.

The 6th harmonic of a crystal on approximately 8400 kc., when used in the receiver's calibration oscillator, provides a husky signal for alignment purposes over the lowest portion of the band, where most of the six-meter activity exists.

Conclusion

The Eddystone dial version of the receiver is somewhat more involved mechanically than is the original SCN dial model. Some builders will find the additional mounting holes and large cutout for this dial a considerable chore. I used socket punches to make several strategically located openings in the area to be cut out, and completed a rough-edged hole with a hacksaw. Final smoothing of the edges was done with a file. To protect the surface finish of the panel during the more hectic portions of the procedure, use a wooden clamp with a felt liner during the hacking and cutting. The final touches can be given while holding the panel in your lap. Expect a few blisters before the receiver finally is completed!

The more technical portions of this manuscript were "ghost written," and I hardly think it necessary to identify the "ghost." I mention this because I feel it important that you go to the proper party with questions of a technical nature.

Drawn-to-scale blueprints of the Eddystone dial version of the receiver, as well as 8 × 10 glossy photographs, will be available from me. A stamped envelope will bring further details. All of the additional information mentioned in the October 1959 article still is available also; the "hints and kinks" and large schematic serve for both versions of the receiver. A stamped envelope to Ted will bring you the dope on these items.

Happy landing! QST

Six-Meter Coil Data

(Eddystone dial model)

All coils wound with enameled wire. The L_1 and L_2 coils are wound on 1-inch (outside diameter) 5-pin plug-in forms (Millen 45005); while the L_3 coil is wound on the original 1¼-inch outside-diameter 5-pin form (Amphenol 24-5P). The "A" coils' secondary turns should be spaced to the length specified, while the "B" coils are close-wound. The "A" and "B" coils are wound in the same direction.

No APC "band-set" capacitor is used in the L_{1A} or L_{2A} coils. Instead, they are trimmed by adjusting the secondary turn spacing. Taps are counted from the cold ends of the coils.

L_{1A} — 4½ turns No. 22 enam., length 13/16 inch, tapped at 1¼ turns.	L_{1B} — 3⅞ turns No. 26 enam., spaced ¼ inch from L_{1A}.
L_{2A} — 5½ turns No. 22 enam., length 1 1/16 inches, tapped at 1¼ turns.	L_{2B} — 4⅞ turns No. 26 enam., spaced 5/16 inch from L_{2A}.
L_{3A} — 2½ turns No. 22 enam., length ⅝ inch, tapped at 2¼ turns.	L_{3B} — 5⅞ turns No. 26 enam., spaced ⅛ inch from L_{3A}.

C_3 — 50-$\mu\mu$f. air padder.

C_4 — 5-$\mu\mu$f. N750 ceramic in parallel with 33-$\mu\mu$f. silver mica.

HBR-16 Product Detector Circuit

FIG. 3 on page 37 of the December 1960 issue did not show one change that had been recommended earlier by W6TC. This was the substitution of a new i.f. filter arrangement for the original *RC* filter. Also, some additional changes in values will improve the 6BE6's ability to handle large signals. All these are shown in the accompanying circuit, Fig. 1. Concerning the later revisions, W6TC writes, "The tube is no

(*Continued on page 134*)

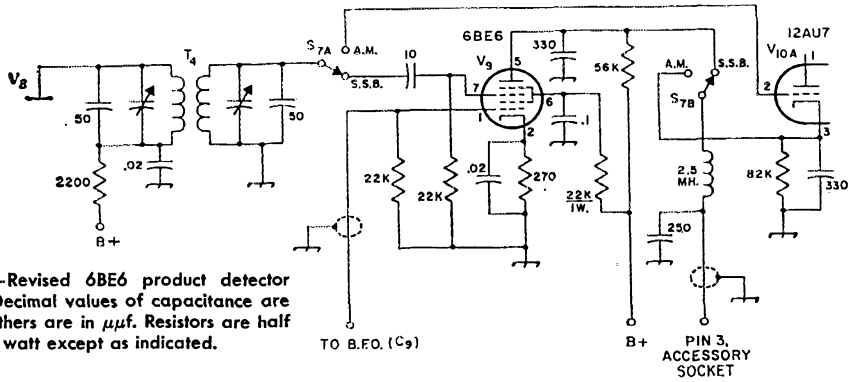


Fig. 1—Revised 6BE6 product detector circuit. Decimal values of capacitance are in μf., others are in $\mu\mu$f. Resistors are half watt except as indicated.

Naval Reserve Communications Divisions

THE relationship between the Navy and amateur radio has been mutually rewarding for many years. Amateurs have served the Navy well whenever called upon, and the Navy has in turn done much to strengthen the position of radio amateurs in this country. A Naval Reserve activity which existed prior to World War II and which did much to supply a reservoir of trained operators was the Naval Communications Reserve, and many a World War II Reserve communicator was a graduate of this system. It was voluntary, and it provided both communications and military training to many a ham. Its passing after World War II was mourned by many an old-time communicator, but now there is a new Reserve activity which should do much to fill the gap.

The Navy has authorized the organization of a number of Naval Reserve Communications Divisions, and seven of these have already been formed. These divisions seek as their primary objective to improve the readiness and the qualifications of attached personnel for active duty with Naval Communications Shore Activities. What this means is that the Navy is looking for communicators or would-be communicators who already are or will be members of the Naval Reserve. These people will train regularly to improve their skills as Naval Communicators.

Who can join one of these divisions? Only those who can join the Naval Reserve and accept Type A mobilization orders. Those reservists who hold Type A mobilization orders are the ones who know ahead of time what their duty station will be in case of national emergency. That is, should the President of the United States declare a state of national emergency, reservists with Type A mobilization orders would proceed immediately to a previously assigned station. In the case of members of a Naval Reserve Communications Division, this duty station would be some Naval Shore Communications activity.

Aside from the educational and training aspects, a member of a Naval Reserve Communications Division usually performs his active duty for training at the naval communications shore activity where he may be assigned in the event of mobilization. This enables him to be entirely familiar with the equipment and the facilities at the station where he would serve in the event of a national emergency.

Hams are playing an important role in this new Naval Reserve Communications Divisions. As an example, the Division which trains at the U.S. Naval Reserve Training Center in Brooklyn, N.Y., has W2KGO as commanding officer, W2MY as electronics officer, and W2SKK as electronics instructor. Members of the division include WA2NWJ, WRV2NZQ, and WV2NZR, while other members of the division are being encouraged to obtain their ham tickets.

The fellow with an amateur license may be able to qualify for special recruiting consideration, since there are two programs by which he may obtain a higher pay grade than can the applicant without a ham ticket.

If you are interested in the operational or technical aspects of Naval Communications, you may obtain further information by contacting the Naval Reserve Liaison section of the Office of Naval Communications. Address your inquiry to Chief of Naval Operation (Op-942N). Rm. 5E789, the Pentagon, Washington 25, D.C. QST

Strays

One rainy day W4NJF (a Reserve commander) was operating his mobile while driving around the Norfolk Naval Air Station, when he noticed a full-dress inspection being held by one of the commands. W4NJF commented to the fellow he was working that he sure was glad *he* didn't belong to an outfit that held full-dress inspections in the rain. When he got to his office on the base, he had a phone call from W4RVW, a chief petty officer in the inspection command. The chief said that W4NJF's mobile transmissions had gotten into the p.a. system and that the inspecting captain had heard every word, realized then that it was raining hard, and had promptly secured the inspection. Now, every time that outfit is having an inspection, the c.o. calls up W4NJF and asks him not to transmit while passing his building. ('Spose W4NJF will ever make captain?)

—•••—

Phil, K2RCG, and Phyl, W2RLU, will be married on June 3. They have several things in common — similar first names, same hobbies (ham radio), both have first-class phone tickets, and both are physics majors at Columbia University.

—•••—

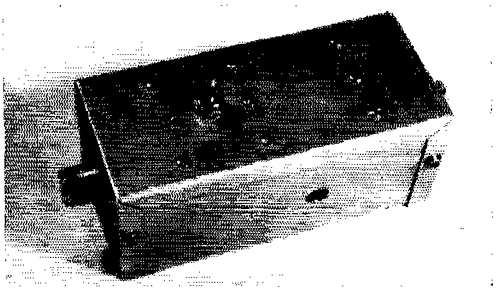
Speak Hungarian? Contact W2RIR, who has told us about the Hungarian Net. This net operates on all bands and specializes in Hungarian-language conversations.

—•••—

Ever hear the story about the two hams who went out looking for a good Field-Day site? They tramped up hill and down hill through the wilderness all day long, and became thoroughly lost. Finally they stopped and studied their topo maps long and earnestly, and then scanned the horizon. At last one of them decided he had the answer. With his map in one hand, he pointed out across the hills toward the north and said to his companion, "There, do you see that high mountain over there? Well, according to the map, we're right on top of it."

Low-Pass Filter for 6-Meter Operation

Effective Network Offering Benefit in Both Transmitting and Receiving



The low-pass filter is enclosed in an aluminum box measuring 2¼ inches square and 5 inches long. The terminal on top is for the ground connection. The hole in the side provides access to the trimmer capacitor, C_5.

BY JOHN R. LANGE,* K9ARA

The filter described in this article not only does a good job in suppressing TVI from harmonics generated in the low-frequency stages of a 50-Mc. exciter, but it will also eliminate spurious signals from a near-by Channel 2 transmitter which often clutter up the band on a 6-meter receiver. It is equally effective in suppressing harmonics from transmitters operating on any of the lower-frequency bands.

A HAM operating in the 6-meter band may be faced with several problems relating to television. The fundamental of his transmitter carrier may overload stages in neighboring TV receivers tuned to Channel 2. Various harmonics of lower frequencies in the oscillator or multiplier stages of his transmitter may fall in one or more of the v.h.f. TV channels. A third difficulty may come up if the ham station happens to be located not far from a Channel 2 transmitter. In such a situation, the ham may find the 6-meter band cluttered with sync buzzes and distorted sound.

Solving the TV receiver overload problem is, of course, a matter of inducing the TV viewer to install a 300-ohm high-pass filter in his TV receiver. A low-pass filter in the feed line of the 6-meter antenna is not only useful in suppressing harmonic output from the transmitter, but is also very effective in suppressing Channel 2 sync buzzes. Before installing the filter to be described, these buzzes were bothersome as far down as 49 Mc. on the author's 6-meter converter.

Values for the low-pass filter whose diagram appears in Fig. 1 were worked out using the *m*-derived and constant-*k* equations from the ARRL *Handbook*. The characteristics are shown in Fig. 2. The filter was designed with a cutoff frequency at 54 Mc. and a frequency of infinite attenuation at 55.25 Mc., which is the Channel 2 picture-carrier frequency.

The filter passes signals up to 51 Mc. with only about a 0.3- to 0.5-db. loss, and attenuates the Channel 2 picture carrier, and other signals on Channel 2 and above, up to over 30 db. Insertion of the filter in the transmission line at K9ARA caused negligible change in the v.s.w.r. and a v.s.w.r. of less than 1.5 was obtained up to 51 Mc. Both 51- and 75-ohm models have been built and used.

Construction

The material cost of the filter is approximately

* 1703 North Karlov Ave., Chicago 39, Illinois.

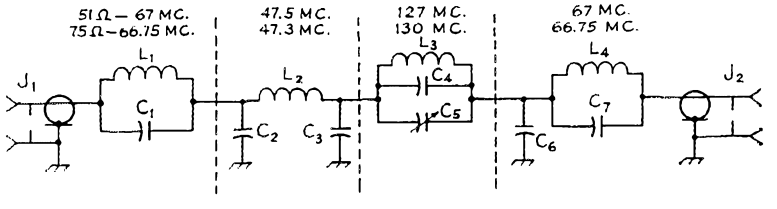


Fig. 1 — Circuit of the 6-meter low-pass filter. See text referring to resonant frequencies. See table on following page for values of inductance and capacitance. For transmitter inputs of 20 watts or less, 600-volt 2-per-cent zero-temperature-coefficient ceramic capacitors (Centralab type TCZ) are suitable for all fixed capacitors; for higher power 6000-volt disk capacitors (Centralab DD60), Sprague 60GA, Erie HD6 or similar) should be used. C_5 is a 45-$\mu\mu$f. negative-temperature-coefficient ceramic trimmer (Centralab 822BN), J_1 and J_2 are chassis-mounting coax receptacles (SO-239).

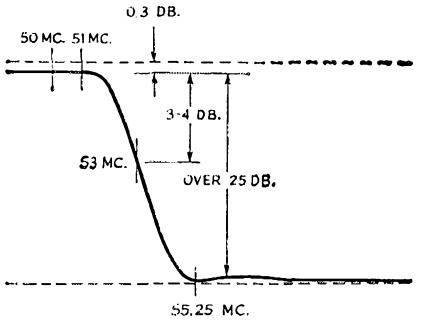


Fig. 2—Frequency characteristic of the filter circuit shown in Fig. 1.

$5.00, with the case and connectors being the most expensive items. For transmitters of over 20 watts input, 6000-volt 20-per-cent disk ceramic capacitors were used with no difficulties. One filter was used successfully with a 300-watt-input transmitter on 6 meters. The filter, of course, can be used also on the lower-frequency bands.

The photos show the construction in a 5 × 2¼ × 2¼-inch Minibox. The coils are supported by the coax connectors and by the short capacitor leads, one of which is soldered to a ground lug. The only stand-off insulators used were the two vertical, single-lug terminal strips which support the trimmer capacitor and its parallel coil and fixed capacitor. For high powers, ceramic stand-offs will prevent possible insulation breakdown. Leads should be centered in the middle of the holes through the shields and excess solder resin cleaned from capacitor bodies and stand-off insulators.

A 10-32 screw was put on the side of the filter case to attach a suitable ground wire. A ¼-inch-diameter hole was drilled in the case to admit the tuning tool for a final adjustment with the cover on.

Adjustment

Before the sections are connected together permanently, the coils are preadjusted individually with a g.d.o. to resonate at the frequencies indicated with associated capacitors as follows: L_1-C_1; L_2-C_2-C_3; L_3-C_3-C_6; L_4-C_7. Note that C_3 is common to both the L_2 and L_3 circuits. C_5 is not connected at this juncture. Coil turns are spread apart or squeezed closer together in adjusting to the resonant frequencies indicated in Fig. 1, which are not too critical. The sections are then all connected together, C_5 is added and the final filter adjustment is made with this trimmer capacitor.

Proper operation of the filter requires that the trimmer capacitor C_5 adjust the frequency of maximum attenuation to 55.25 Mc. This can be done by using a signal from a Channel 2 TV station, a converter capable of tuning to 55.25 Mc., and a general-coverage receiver equipped with an S meter. For the usual converter with 20-meter (14–18 Mc.) i.f. output, the receiver would be tuned to 19.25 Mc. The trimmer capacitor, C_5, is then adjusted for a minimum S-meter reading on the TV signal. A definite null should be tuned through with the capacitor. If the null occurs with a maximum or minimum capacitor setting, the turns of L_3 can be spread out or squeezed closer together.

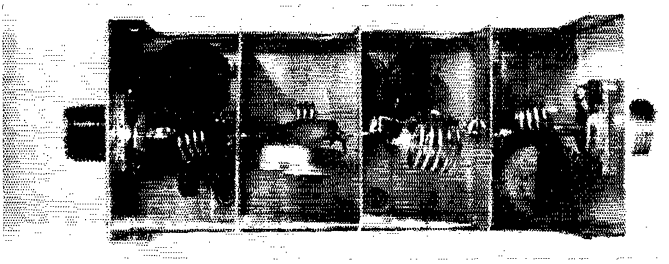
Capacitance (μμf.) and Inductance (μh.) Values for the 6-Meter Low-Pass Filter

	50 ohms	*75 ohms*
C_1, C_3, C_7	68	47
C_2	82	56
C_4	100	68
C_5	7–45	7–45
C_6	39	25
L_1, L_4	0.0825	0.121
L_2	0.3	0.441
L_3	0.0622	0.0915

Coil Dimensions (All No. 16 Wire)

L (μh.)	*Turns*	*I.D.*	*Turns Spacing*
0.441	7	½ inch	1/16 inch
0.3	5	½ inch	1/16 inch
0.121	4	⅜ inch	3/32 inch
0.0915	4	¼ inch	1 turn
0.0825	4	¼ inch	1/16 inch
0.0622	3	5/16 inch	1 turn

The author used the sweep setup shown in Fig. 3A for checking filters. An accurately-calibrated 55.25-Mc. marker is loosely coupled to the crystal-diode r.f. probe shown in B. The maximum-attenuation notch was adjusted to 55.25 Mc. by means of the trimmer capacitor in the filter. Incorrect setting of the trimmer will attenuate 6-meter signals around 51 Mc., or will reduce the attenuation characteristics of the filter on Channel 2.



Connections between the various sections of the filter are made through 5/16-inch clearance holes cut in the centers of the shielding partitions.

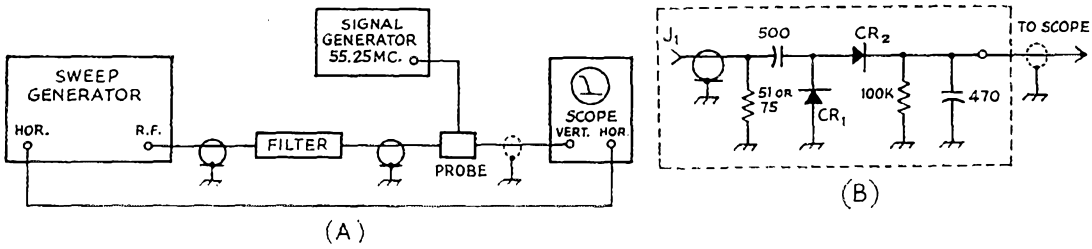


Fig. 3—(A) Setup for checking filter response. (B) Circuit of the diode r.f. probe. Capacitances are in μμf. and capacitors are disk or tubular ceramic. Resistances are in ohms and resistors ½ watt. CR_1 and CR_2 are 1N67A, 1N34A, 1N56A or similar. J_1 is a coax receptacle. Input resistance value should match coax line which should be 50 or 75 ohms, depending upon filter design impedance. The signal generator is coupled to the probe by looping the end of the generator output wire around the probe input resistor. The trimmer capacitor in the filter should be adjusted for minimum response at 55.25 Mc.

Precautions

The filter can be placed just outside the coaxial antenna relay if both converter overloading and transmitter harmonics are a problem, or it can be placed in the line close to the transmitter if only transmitter-harmonic reduction is needed.

The v.s.w.r. of the antenna, transmission line, transmit-receive switch, and connecting cables to the transmitter should be measured with and without the filter, using a v.s.w.r. bridge. Without the filter, the v.s.w.r. should be less than 2, and preferably less than 1.5, to avoid excessive filter losses or possible damage to the filter components at high powers. Readjusting the antenna match, eliminating cable splices and odd types of interconnecting cable will minimize the v.s.w.r. that the filter and transmitter will see.

If the v.s.w.r. is higher after the filter is inserted, reduce the transmission-line length one or two feet at a time, noting the length at which a minimum v.s.w.r. is obtained, and recording the inches of line removed. If the cable is cut too short by accident, the next optimum length will be half cable wavelength toward the antenna from the missed point (77 inches for a frequency of 50.5 Mc.). Another optimum point will be 77 inches back and this difference could be made up by increasing the length of the line section connecting the transmitter to coaxial relay. A change in the apparent v.s.w.r. when the filter is inserted may indicate that the transmitter has high harmonic output and the filter is just doing its job.[1] QST

[1] This may also be a result of parallel transmission-line current as discussed in the *ARRL Antenna Book*. — *Ed.*

• *New Apparatus*

Bayroy Coaxial Relay

THE Bayroy coaxial relay, manufactured by Bay-Roy Electronics, Inc., Cleveland 30, Ohio, should be of special interest to those who would like to switch antennas remotely. This usually involves mounting the relay near the antennas, out in the weather. The Bayroy relay is weatherproof and can therefore be mounted in any convenient spot — even on the antenna mast or tower. The relay is enclosed in a gold anodized drawn aluminum case with the coaxial connectors mounted on the box lid. A rubber gasket is used between the cover and box to insure a weather-tight seal. Connections to the relay coil and auxiliary relay contacts are brought out to a power connector; the mate to this connector is furnished with the relay. The auxiliary contacts can be used to operate signal-light circuitry for indication of which antenna is in use. If the relay is used as transmit-receive switch, the auxiliary contacts can be used for receiver muting purposes. The relay is rated to handle 1000 watts, any mode. Even at 220 Mc. it has a very low insertion loss and v.s.w.r. Several models are available, ranging from the one shown

in the photograph, which is the 115-volt a.c. model, to a 6-volt d.c., and 12-volt d.c. model. The mounting base plate is 2⅜ inches by 4¼ inches and has mounting holes spaced so that a standard 1¾-inch U bolt can be used to attach the relay to a cylindrical mast or to one leg of an antenna tower.

—*E. L. C.*

• Beginner and Novice —

Construction Techniques

Some Tips for the Novice on Building Gear

BY LEWIS G. McCOY,* W1ICP

THE newcomer to ham radio is faced with the problem of whether to buy ready-built radio gear or build his own. If the beginner is anxious to learn something about the technical side of radio, there is no better approach than by building equipment and learning how it works. In this article the right and wrong ways of construction will be discussed with the end view of showing the Novice how to build a piece of equipment and have it work the way it should.

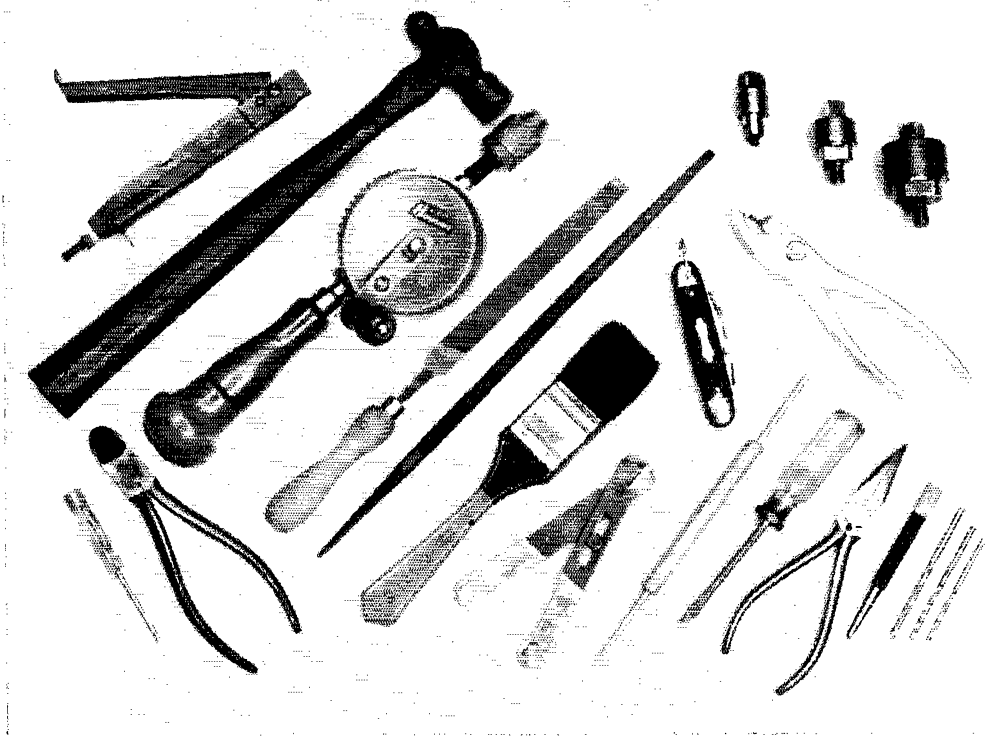
What Tools Do You Need?

Naturally, if you plan on doing your own construction work, there are certain tools you'll need. The basic tools required are listed in Table I. With these tools you should be able to do all the cutting and drilling required to prepare a chassis for wiring. You'll note that no particular type of soldering iron is specified in the table. If you are only going to do an occasional job, a soldering gun might be your best bet. A soldering gun must be turned on for each soldering operation, but it only takes seconds to reach soldering temperature. Some amateurs prefer a constant-heat-type iron. If you prefer the constant-heat type, get one with a 60-watt rating and a ¼-inch tip. Also, this type is lighter and easier to handle.

You can get by with an adjustable hole cutter for making socket holes, but socket punches do a neater and quicker job. Three are required, one each for 7- and 9-pin miniature, and another for octal sockets. For cutting large holes, such as for transformers, the nibbler tool is very handy.

Don't abuse your tools by using them for jobs they were not intended for. A little time and

* Technical Assistant, *QST*.



Here are some of the tools mentioned in the text. The tool between the knife and screwdriver is a soldering aid, which has a probe at one end and a fork at the other. This is a handy gadget for feeding wires through terminals and for use in other soldering operations. The tool at the upper left next to the hammer is a nibbler tool.

effort keeping drills sharpened and oiled will keep the tools in good shape. An oil stone can be used to touch up the cutting edges of drills. If the cutting edges of tools get too dull to be touched up with a stone, then they should be sharpened on a grinding wheel. If you use a grinding wheel to sharpen drills, keep the same cutting angles on the face of the drill. If you can afford one, an electric drill is a real work saver and there are many different types of attachments available that will make your work easier.

How to Lay Out a Chassis

If you are going to build a piece of gear from an article, it is always best to follow the layout of the unit described as closely as possible. In many cases the writer of the article will state that the layout isn't critical, but this usually means the general layout should be followed, even though an exact duplicate isn't necessary. Don't just grab a drill and start drilling holes — give a little time and thought to the arrangement of the components. Incidentally, aluminum chassis should be used wherever possible as aluminum is much easier to work with than steel. However, for heavy power supplies, steel chassis will provide greater support.

When you buy the chassis you'll find that it is covered with paper. Leave the paper on the chassis, since it will protect the top from unnecessary scratches when doing your layout. All the components that are to be mounted on the top of the chassis should be assembled and arranged on the top for the best layout. Be sure that parts below deck don't interfere with the top-mounted components. If the unit is to fit inside a cabinet, allow enough room around the parts to clear the cabinet sides when placed inside.

In laying out the components, make the electrical circuit follow a logical sequence. In other words, if you have a transmitter of three stages, oscillator-buffer-amplifier, you wouldn't put the oscillator on one side, the amplifier in the middle, and the buffer on the far side. Also, when mounting tube sockets, give some thought to the pin arrangement. Wherever possible, the plate connections of one stage should face the grid connections of the next stage. As a general rule, any coil should be mounted at least its own diameter away from surrounding metal, panels or chassis sides. This is particularly necessary if a steel chassis is used. If the coils are mounted too close to the metal, the *Q* of the coil is degraded.

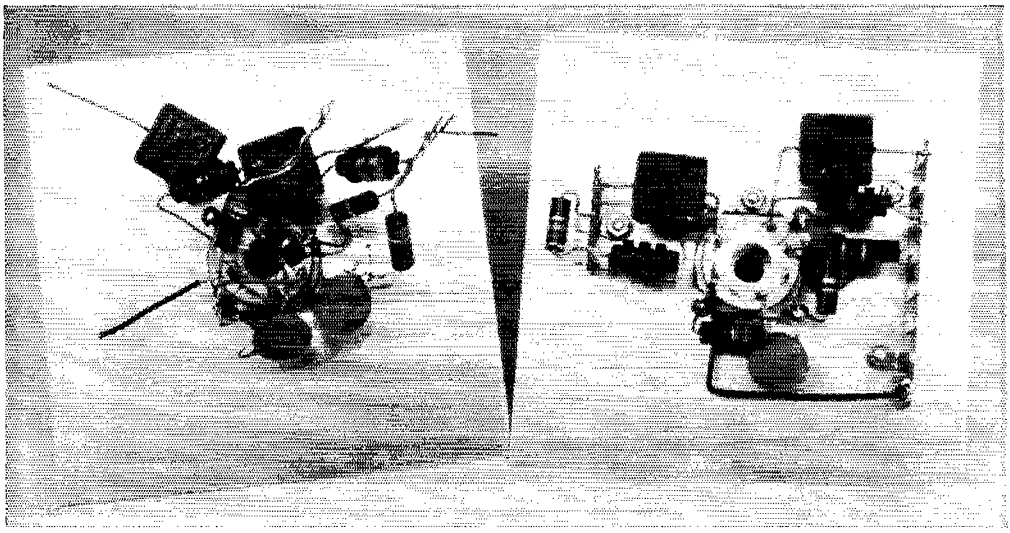
After you've decided on a component arrangement, you are ready to mark the chassis for drilling of holes. You'll find a square and straightedge handy for this purpose. Leave the paper on the chassis top and mark off the hole arrangement with a pencil. Wherever a hole is to be drilled, use the center punch and hammer to mark the spot. The center punch will make an indentation in the chassis which will keep your drill from wandering when you drill the hole. After all the holes are drilled, you can remove the paper.

Next, remove all burrs from around the holes. For small holes you can used a larger size drill to remove the burrs. With larger holes, either a knife or a cold chisel will do the job. If you are not fussy about the appearance of the completed unit, you can now mount the components. However, a much neater and cleaner piece of gear will result if the chassis is first prepared properly. There are two methods of preparing aluminum so that the finished product has a smooth sheen. The chassis can be buffed down with steel wool, washed to remove oil, and then sprayed with a clear acrylic spray. The sprayed chassis will resist finger marks and dirt when you handle the unit. The other method consists of preparing a lye bath with ordinary household lye. The lye should be mixed in an enameled container such as a dishpan or baby's bathtub (remove any dishes or babies, first.) Use about ¼ to ½ can of lye to each gallon of water and be careful not to get the solution on your hands or clothes. The aluminum chassis is then immersed in the lye bath for ½ to 2 hours, depending on how strong a solution you have. It is a good idea to use a test piece of aluminum first. When the chassis is covered, you'll notice the solution will bubble, so ventilation should be provided to permit the generated gas to escape. After the chassis has been in the solution long enough, remove and wash it clean with cold water. A paint brush wet with water can be used to remove the

Table I

Novice Tool Kit

Long-nosed pliers, 6-inch.
Diagonal cutting pliers, 5-inch.
Screwdriver, 6- to 7-inch, ¼-inch blade.
Screwdriver, 4- to 5-inch, ⅛-inch blade.
Hand drill, ¼-inch chuck.
Metal working drills, ⅜- and ¼-inch, and Nos. 18, 28, and 33.
Slip-joint pliers, 6-inch.
Large coarse files, one flat, 12-inch, one rattail, ⅜-inch diameter.
Small files, one flat, 8-inch, one rattail, ¼-inch diameter.
Hacksaw for 10- to 12-inch blades.
Pocketknife.
Square and straightedge.
Hammer, small ball-peen type.
Chisel, ½-inch face.
Center punch, 3- or 4-inch.
Socket punches, one for ⅝-, ¾-, and 1⅛-inch holes.
Soldering iron (See text).
Resin-core solder.
Optional tools:
Nibbler tool.
Electric drill, ¼-inch chuck.
Wire strippers.
Reamer, point ⅛-inch diameter, shank ⅛-inch.
Soldering aid.
Hex nut driver set, hex sizes $^{3}/_{16}$, ¼, $^{5}/_{16}$, $^{22}/_{32}$, ⅜, and $^{7}/_{16}$ inches.
Bench vise, 3- to 4-inch jaws.



The right and wrong ways of wiring components around a tube socket. Note at the right how the components are neatly arranged around the socket and are not "piled up." It may be argued that the circuit at the left will work just as well, but this is not true. There is always the danger of unnecessary coupling between the input and output side of the circuit, which is usually undesirable. In addition, one can quickly see that it would be much easier to check the wiring at the right than at the left.

black oxide which often forms. After a thorough wash, let the chassis dry and then give it several coats of clear acrylic spray. It is now ready for the components.

Wiring Do's and Don't's

There are many types of hookup wire available and the beginner is sometimes in a quandary as to which type to use. Whichever type is used, consideration should be given the amount of current the wire will be required to carry and the voltage its insulation must stand without breaking down. A wire with 1000-volt insulation commonly used is Belden type 8350 thermoplastic hookup wire (No. 22 conductor). For heater circuits where the current does not exceed 2 amperes or so, No. 20 solid tinned wire is adequate. Where greater current-carrying capabilities are required, No. 18 or larger wire can be used. If you have any doubts about the current-carrying capabilities of a particular wire size, look up its circular-mil area in the wire table in the ARRL *Handbook* and allow about 500 c.m. per ampere.

If TVI is likely to be a problem, shielded wire should be used for all heater wiring and leads not carrying r.f. currents. Belden 8885 shielded wire, which has a conductor the equivalent of No. 20, is suitable for most applications. Coax cable can be used for high-voltage leads (over 1000 volts) that must be shielded. In the event stranded hookup wire is used, the ends should first be twisted together and tinned with solder. Otherwise, when the wire is fed through a terminal there is always the danger of a single strand of wire getting loose and shorting to another terminal or ground.

Before getting into the story of making connections and wiring, a word about soldering is in order. Probably the place where most beginners make mistakes is in their soldering. In the first place, the soldering iron should be hot enough to deliver sufficient heat. The tip of the iron should be clean, bright metal. If the tip is pitted or scaly, as it will become through continued use, it should be filed clean. When the tip is clean, heat the iron and flow some solder on the tip and then wipe it clean. This tins the iron and prepares it for soldering. In radio work always use a noncorrosive solder. When you buy solder be sure to specify a resin-core type. A 40 per cent tin/60 per cent lead content is satisfactory for radio work. If you're working on etched circuit boards or with any unit that cannot stand too much heat, it would be wise to use solder with a higher tin content as the melting point of such solder is lower.

The process of soldering is quite simple. Apply the tip of the iron to the work and *let the work get hot enough to melt the solder*. Don't put the solder on the iron tip, but apply it to the connection. When the connection reaches soldering temperature, the solder will melt and flow around the connection.

If the work isn't hot enough, or if the solder is applied to the iron and not the work, a "cold" solder connection is likely to result. A cold solder joint is one that looks good but can cause you a lot of grief. The connection may prove to be intermittent, which makes it difficult to locate if you have to do any trouble-shooting. Also, be sure that all the leads being soldered are clean. In fact, it may take a little more time but it is a good idea to tin all leads with solder before putting them in a terminal. If you want, you can run the lead through the terminal and wrap it around. The only trouble with the "wrap-around" system is that you may have to remove the lead when

trouble-shooting, and the connection can get quite messy. A simpler system, and just as good from the standpoint of making a solid electrical connection, is to run the lead through the terminal, make a 45-degree bend on the end of the wire so it doesn't slip out of the terminal, and then solder it in place. When you have several leads going into a single terminal, make sure that all of them get soldered. If you tin the leads beforehand, you shouldn't have any trouble getting a good soldered connection. Don't hurry your soldering work. A little time spent making good connections can save you a lot of work later on.

When you come to the actual wiring of the unit, run all wires, wherever possible, parallel with the chassis sides. This is also true of small components such as resistors, capacitors, and coils. The completed unit will have that "commercial" look, but what is more important, will be much easier to service than if you have a hodgepodge of wiring. All leads carrying r.f. should be as direct as possible and should not wander around the chassis. On the other hand, leads not carrying r.f. can be routed around the edges of the chassis. In this case, you will probably find that you have several leads running parallel with each other and the unit can be made to look neater by cabling the leads or taping them together at intervals. Cabling techniques are described in detail in the ARRL *Handbook*. The liberal use of bakelite tie points and ground lugs will make your job easier and improve the appearance of the equipment.

Holes large enough to clear Nos. 4, 6, and 8 machine screws can be drilled with Nos. 33, 28, and 18 drills, respectively. Most volume controls require a $\frac{3}{8}$-inch diameter hole and toggle switches a $\frac{15}{32}$-inch hole. Miniature tube socket mounting frame holes are slightly smaller than a No. 4 screw, so the holes should be drilled out to take a No. 4 screw. When mounting any component with screws and nuts, always use lock washers, otherwise the component is liable to work loose.

What to Wire First

Usually the best approach is to wire the heaters and power supply first. By doing this, you can test the supply and heaters before going on to the other wiring. Wherever possible, mount resistors and capacitors close to but not directly over a tube socket. If you pile all the components directly over the socket you'll find it hard to make connections and difficult to check socket voltages. When soldering germanium diodes, small resistors or disk capacitors, especially if the leads are short, hold the lead being soldered with a pair of pliers between the body of the component and the connection. This will prevent too much heat from reaching the component and ruining it. Wherever leads pass through holes in the chassis, use a rubber grommet to prevent the lead from chafing or shorting out. If the circuit calls for grounding terminals on a tube socket, mount a ground lug under the screw and nut holding the socket and make your ground connections to the lug. In other words, keep the leads short.

When the unit is completed, there are a couple of things you can do to test it before actually applying power. If you have an ohmmeter, check the resistance between the +B line and chassis ground.

Look at the circuit diagram and find out the value of the bleeder resistor in the power supply. If there are no other resistors connected between the +B line and ground, then your ohmmeter should read approximately the same value as the bleeder. Where there are other resistors in parallel with the bleeder, such as voltage dividers, these values must be taken into consideration also. You can use Ohm's Law for parallel or series resistors for an exact figure. However, with nearly all circuits Novices will be using, the resistance between +B and ground should be something more than, say, 20,000 ohms. The ohmmeter should read whatever value the +B line should be above ground. If it is a much lower value than this, it is a good idea to check your wiring for errors. Otherwise, you will be blowing fuses or ruining the power supply when you turn the unit on. By using the ohmmeter, you can also follow the circuit, making resistance and continuity checks. If you come across a reading that doesn't look right, check over your wiring. These precautions can sometimes save you the cost of expensive components.

While it is understandable that a Novice is in a hurry to get a piece of gear completed and on the air, a little more time and effort in building your gear will pay handsome dividends.

In addition to the information given in this article, it is suggested the beginner study the construction practices chapter of the ARRL *Handbook*. You'll find information on color codes, how to wire coax fittings, and many other things of interest to the ham who wants to "roll his own." QST

Strays

W2MTD (E. C. Mann, 452 68th St., Brooklyn 20) would like to hear from any hams who worked for the Electro Importing Co. He's also looking for an extra E-I catalog.

—•••—

The Denver Radio Club has published the second edition of the *Colorado Ham Directory*, with W0SIN and K0RGU bearing the brunt of the burden. More than 2300 Colorado amateurs are listed by name, call, and geographical location. It includes several pages of operating aids, and is particularly helpful to certificate hunters who are after the Mile-Hi award. You can get a copy by sending one dollar to the Denver Radio Club, Inc., P. O. Box 356, Denver 1, Colo.

—•••—

The Old Old Timers Club is made up of old-time radio men who started in radio at least 40 years ago. It meets on the air every Thursday at 1900 EST on 3940 kc. Secretary of the OOTC is Earl Williams, W2EGE, P. O. Box 462, Asbury Park, N. J.

How To Use Them in Ham Equipment

Without previous experience in an allied line, the ham who embarks on his first construction project is likely to be bewildered not only by the almost infinite variety in size, shape and type of fastening devices, but perhaps even more by the jargon used to describe them. However, even the old hand may find a hint or two here that he hasn't thought of.

Screws—Nuts—and Things

BY WILLIAM A. DEANE,* W6RET

ONE of the basic keys to good construction is an intimate knowledge of how to fasten parts together. Few books have been written on the subject of fastening or joining, and those that have been published have either been slanted toward the production engineer or have been confined to one specialized technique. Those entering the amateur radio field are likely to have only a casual acquaintance, or none at all, with machine screws, nuts and associated items.

Machine Screws

All small screws used in threaded holes or nuts for fastening parts together and similar applications can be said to belong to the large and varied family of machine screws. The holes or nuts in which these screws fit have to be threaded exactly the same as the screw. The opening of the hole must be just large enough to pass the body diameter of the screw (diameter of screw at thread bottom) and, in some cases, must be shaped to receive and seat the head of the particular screw (flathead screws, for example).

Machine screws are made of steel, brass, aluminum, bronze, stainless steel and plastics. Steel screws are often plated with cadmium, zinc, nickel, or other material to resist corrosion. Stainless-steel screws are very strong for their size and, without any type of protective coating, are highly resistant to corrosion. Aluminum also resists corrosion well except in salty atmosphere or in the immediate presence of chemical vapors such as those discharged from chimneys.

There are several standards under which machine screws are manufactured. However, most of the machine screws that amateurs may use are manufactured under the American Standards Association (ASA) requirements. Machine screws are generally classified by head type, body diameter, number of threads per inch, length, the material from the screw is made and the finish. The screw heads that most amateurs will come in contact with are round, flat, binding, truss, fillister and oval. Fig. 1 illustrates the various head types. It will be noted that the flathead screw has a head-seating angle of 80 to 82 degrees. For this reason a standard twist drill, which has a normal cutting angle of 59 degrees, can not satisfactorily be used to seat a flathead screw. A countersink-type drill especially designed for this application should be used.

Body diameters are classified in numbered sizes from 0 to 12 and in fractions from $\frac{1}{4}$ to 6 inches. Numbers 0 to 12 are listed in decimal parts of an inch; i.e., No. 2 is 0.086 inch (86 mils) in diameter, No. 6 is 0.138 inch (138 mils) and No. 10 is 0.190 inch (190 mils).

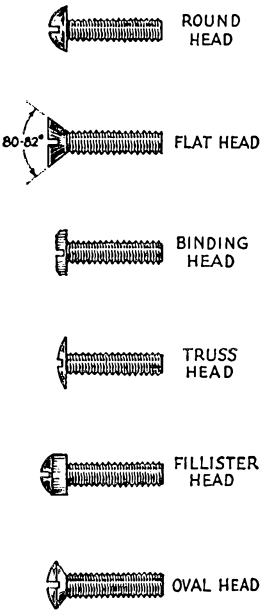


Fig. 1—Various types of machine screws frequently used in assembling amateur gear.

The number of threads under ASA standards varies from 80 to 24 threads per inch for body Nos. 0 to 12. These threads have been divided into two standard classes — National Coarse (NC) and National Fine (NF). The difference between them is the thread pitch and number of threads per inch. Coarse threads are for general work and fine threads are used in aircraft and

* 8831 Sovereign Road, San Diego 11, Calif.

automotive work where secure fastening is desired. Both coarse and fine threads have four classes or types of fit. They are designated as either loose, free, medium or close. Loose fit is used on stove bolts. Free fit is used on the majority of commercial nuts and screws used by the amateur. Medium fit is required on most machine, automotive and aircraft work. Close fit refers to machine parts where exacting tolerances are necessary.

Table I lists screw sizes No. 0 to 12, and to ½ inch by outside diameters and threads per inch. The length of a screw is measured from under the head to the end of the screw. When specifying or ordering machine screws, a full description should be given. For example, if a specification should call for a ½-inch, 8–32, flathead, steel, cadmium-plated machine screw, we would know that the length is ½ inch, body size is No. 8, and there are 32 threads per inch. The rest of the description is self-explanatory.

TABLE I

Machine-Screw Index by Diameter and Threads Per Inch

Size	*Diameter (Inches)*	*Threads Per Inch*	
		Coarse	*Fine*
0	0.060	—	80
1	0.073	64	72
2	0.086	56	64
3	0.099	48	56
4	0.112	40	48
5	0.125	40	44
6	0.138	32	40
8	0.164	32	36
10	0.190	24	32
12	0.216	24	28
¼	0.250	20	28
5/16	0.3125	18	24
⅜	0.375	16	24
7/16	0.4375	14	20
½	0.500	13	20

Self-Tapping and Sheet-Metal Screws

The self-tapping screw has attained rather wide use. It is a hardened-steel screw that cuts its own thread. The entering end of the screw is pointed or tapered and the screw cuts a thread in a drilled hole as it is forced in, thus providing a close fit, secure against loosening under average service conditions. It is supplied in sizes from No. 2–56 to ¼–20 and in lengths ranging from ⅛ to 1½ inches, depending upon the diameter, and in round, binding, flat and oval heads. The self-tapping screw is very useful in construction work where it will not be subject to vibration which, over a period of time, would cause the screw to loosen. In areas where it is difficult to place a nut on a machine screw, a self-tapping screw may be acceptable. It is very helpful in construction work of a temporary nature. It should not be used to hold grounding lugs.

The sheet-metal screw is another variety of self-tapping screw. The thread, however, is more like that of a wood screw, as shown in Fig. 2E. As the name implies, it is designed primarily for joining relatively thin metal sheet where the fine threads of a machine screw would have little holding ability. The sheet-metal screw does not hold well under strenuous vibration.

The Phillips-head screw is widely used in automotive and aircraft work. The screwdriver slot is cross-shaped and has a large center opening, tapered slots, and a blunt bottom with rounded edges, as shown in Fig. 2A. A special Phillips screwdriver is required for this type screw. In other respects the Phillips-head screw is standard and will be found in both machine and self-tapping types.

Nuts

Once a good basic understanding of machine-screw threads is acquired, it is not difficult to match a screw with the proper nut or threaded hole. Two of the most-used series of nuts included in ASA standards are the finished and heavy series. The finished is designed for average use. The heavy series is made thicker and wider for greater strength and bearing surface. The term "finished" refers to the quality of manufacture and tolerance and does not indicate that the surfaces are completely machined. Standard sizes range in width between parallel sides from ¼ through 3 inches, with coarse and fine threads. Nuts are generally classified according to screw body size and threads per inch. A 6–32 nut would indicate that it will accept a screw having a No. 6 body size and 32 threads per inch. Nuts are made of the same materials and finish as the machine screws.

In mobile applications where considerable shock and vibration are encountered, consideration should be given to the use of the elastic stop nut. The locking element is a compression collar built into the head of the nut. The collar's inside diameter is smaller than the major diameter of the screw. Therefore, when the threads of the screw enter this section, a mating thread is impressed into the locking collar. This compression force sets up a friction grip that holds the screw under rigorous conditions.

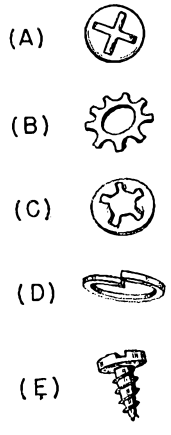


Fig. 2—(A) Phillips-type screw head. (B) External-tooth lock washer. (C) Internal-tooth lock washer. (D) Spring or split-type lock washer. (E) Sheet-metal screw.

Washers

Plain washers are used under the heads of

screws and bolts and under nuts to distribute the compressive stress over areas larger than that of the head or nut. They also serve to prevent damage to finishes from the scraping effects of heads or nuts as they are tightened. Plain washers vary in size according to screw size. The size is a measurement of their inside and outside diameters. In numerous cases there are two outside diameters for each inside diameter. Plain washers are made of the same materials as the machine screw. They are classified as light, medium, heavy and extra heavy. As most amateur construction involves machine screws of the No. 4, 6, 8, 10 and ¼-inch sizes the associate washer would be No. 4 — ⅛-inch washer, No. 6 — 5/32-inch washer, No. 8 — 3/16-inch washer, No. 10 — 7/32-inch washer, and the ¼-inch screw would take a 9/32-inch washer.

TABLE II
Common Nail Sizes

Size	*Length (Inches)*	*Wire Gauge*	*Nails Per Lb.*
2d	1	15	830
3d	1¼	14	528
4d	1½	12½	316
5d	1¾	12	271
6d	2	11½	168
7d	2¼	11	150
8d	2½	10¼	106
9d	2¾	10	96
10d	3	9	69
12d	3¼	9	63
16d	3½	8	49
20d	4	6	31
30d	4½	5	24
40d	5	4	18
50d	5½	3	14
60d	6	2	11

Lock washers are intended to exert an auxiliary friction on the under side of the head of the screw or bolt with which they are used, or on the under side of a nut. This is to keep the parts being clamped from loosening and turning when subject to vibration, as in the case of mobile application. Lock washers are generally classified as spring-lock or tooth-lock types. The spring-lock washer (Fig. 2D) is produced in light, medium, heavy and extra heavy. Such washers are advantageous when occasional dismantling and reassembling of parts are expected. Tooth-type lock washers are supplied in three styles, one having external teeth (on the outer rim of the washer — see Fig. 2B), one having internal teeth (Fig. 2C), and one having both internal and external teeth. The teeth are formed so as to rotate slightly and bite into the surfaces they contact when they are compressed. This provides good electrical contact and is recommended for general amateur application. These washers are thinner than the spring-lock type and do not occupy so much space in a pile-up of parts. The external tooth type has slightly better holding qualities than the internal tooth type. External tooth washers are also produced in a conical form to fit flathead screws.

Nails and Wood Screws

Considerable effort is expended by the average amateur in the construction of towers and related items. A little information on nails and wood screws may be of help when that next antenna-tower construction urge arises. Nails have been in use for many thousands of years and have been made of iron, copper, brass and even gold. Today we have improved these metals and added steel, monel metal and aluminum. Nails are measured by the penny system (indicated by the symbol d). This originally indicated the price per 100 nails. There are many types and sizes of nails. Table II lists a description of the common flat-head nail. In learning to recognize nail sizes readily, just remember that a common 2d (2 penny) nail is 1 inch long, and ¼ inch is added to the length for each penny size up to 16d. From there on, the sizes increase in length by ½-inch increments. Galvanized nails are coated to prevent corrosion and are recommended for outdoor use. In softwood, a nail must penetrate farther than in hardwood for equivalent holding power. About two thirds of the nail length must go into the lower piece when softwood is used. In hardwood, a nail of smaller diameter will be less likely to split the wood. Since the holding power of hardwood is about twice that of softwood, the nail does not need to penetrate as far. It is often helpful to drill a small pilot hole — about half the diameter of the nail and apply a coat of soap to the nail before driving it into hardwood. All nails hold better when driven into the wood across the grain. Use a longer nail or one with barbs when driving a nail parallel to the grain or into the end of a board.

TABLE III
Wood Screws

Size	*Diameter (Inches)*	*Approx. Drill Size Hardwood*	*Softwood*
0	0.060	—	—
1	0.073	—	—
2	0.086	58	—
3	0.099	—	—
4	0.012	48	55
5	0.125	—	—
6	0.138	42	52
8	0.164	34	48
10	0.190	31	46
12	0.216	—	—
14	0.242	19	34
16	0.268	—	—
18	0.294	9	30
20	0.320	—	—
24	0.372	¼"	19

Wood screws will hold wooden parts together much better than nails. Wood screws are made of steel, brass, bronze or stainless steel and are finished bright, cadmium-plated, nickel-plated or blued. There are three common types of heads used on wood screws — flat, round and oval — although the Phillips head is not too uncommon. Always drill a pilot hole when using wood screws. Where two pieces of wood are to be fastened, the top piece should be drilled to clear the body of the

screw. The bottom piece then should be drilled with a drill about 60 per cent of the minor diameter of the screw thread when softwood is used and about 90 per cent of the minor diameter of the thread for hardwood. A coat of moistened soap on the screw threads will help in driving the screw. In selecting the length of screw, use the rule that requires two thirds of the total length to enter the lower piece of wood. Screws driven parallel to the grain have a holding power of about 75 per cent of those driven cross grain. Therefore, slightly larger or longer sizes should be used when driving parallel to the grain. Care must be taken to select a size that will not split the wood. Woodscrew sizes run from No. 0 to No. 24. Nos. 0 through 12 have body sizes identical to machine screws of the same number (see Table 1). Threads extend over two thirds the length of the wood screw.

Table III lists the sizes, basic diameter and pilot drills for wood screws. In general cabinetwork, screw sizes Nos. 2 to 6 would commonly be used. In heavy-duty work, such as in towers, Nos. 8 to 12 would be used.

An occasional use of the lag bolt can be anticipated. A lag bolt can be visualized as a large screw with a square bolt-type head for wrench driving. Common sizes are No. 10 — ¼-inch, ⅜-inch and ½-inch, in lengths varying from 3 to 8 inches. Lag bolts must be used in predrilled holes. Use a drill that is 60 per cent of the shank diameter for softwood, such as pine and fir, and 80 per cent for hardwood, such as oak and hickory. Wood-frame structures, such as towers, tend to fail at bolted joints. Fig. 3 illustrates the type of failure occurring when the wood is stronger than the bolt. In the case where the bolt is stronger than the wood, the joint fails by deforming or splitting the wood.

To furnish a positive resistance to slip between the faces of lumber, an alligator-type connector can be used. This toothed connector is placed between the two pieces of lumber and is forced into the lumber as the members are forced together. Fig. 4 illustrates this type of connector.

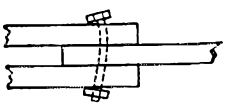


Fig. 3—Bolt failure at antenna-mast joint.

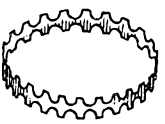


Fig. 4—Toothed timber connector.

TABLE IV

Numbered Drill Sizes

Number	*Diameter (Mils)*	*Will Clear Screw*	*Drill for Tapping Brass, Steel, Iron***
1	228		
2	221	12–24	
3	213		14–24
4	209	12–20	
5	205		
6	204		
7	201		
8	199		
9	196		
*10	193.5	10–32	
11	191	10–24	
12	189		
13	185		
14	182		
15	180		
16	177		12–24
17	173		
*18	*169.5	8–32	
19	166		12–20
20	161		
21	159		10–32
22	157		
23	154		
24	152		
25	149.5		10–24
26	147		
27	144		
*28	140	6–32	
*29	136		8–32
30	128.5		
31	120		
32	116		
*33	113	4–36, 4–40	
34	111		
*35	110		6–32
36	106.5		
37	104		
38	101.5		
39	99.5	8–48	
40	98		
41	96		
*42	93.5		4–36, 4–40
43	89	2–56	
44	86		
45	82		8–48
46	81		
47	78.5		
48	76		
*49	73		2–56
50	70		
51	67		
52	63.5		
53	59.5		
54	55.0		
55	51		

* Commonly-used sizes.

** Use one size larger for bakelite and hard rubber.

Associated Tools

It might be appropriate to discuss the use and care of some of the hand tools used with machine screws. The screwdriver is probably the most essential tool of the home workshop. It should be remembered that it is made for one purpose — turning screws. It is frequently misused for opening bottles, prying drawers open, as a cold chisel, for chipping ice, changing tires and testing tank circuits for r.f. Any of the abuses mentioned above will probably damage it to the extent that it will be ruined for its primary purpose. Most screwdriver troubles can be avoided by selecting the right size tool with the right blade for the job. Standard screwdrivers are made in lengths from 2 to 12 inches. The length is measured from the lower end of the handle to the tip of the blade. Three or four sizes, such as the 4-, 6-, 8- or 10-inch, will be satisfactory for the home shop. The size depends entirely on the size of the screw and its slot. The tip of the blade must make a good square fit in the screw slot and should reach to the full depth of the slot. Fig. 5 illustrates the correct fit.

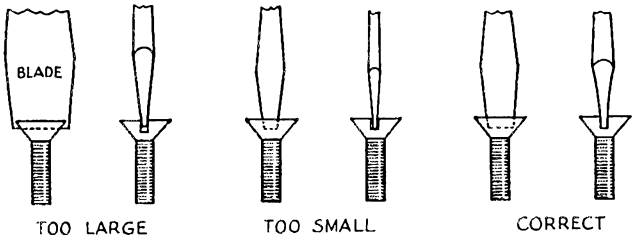


Fig. 5—The right and wrong of screwdriver tips.

The following size blade tips should normally be used with screws as indicated:

Screw	*Blade Tip*
4–40 round-head	3/16-inch
6–32 " "	1/4 "
8–32 " "	1/4 "
8–32 binding-head	5/16 "
10–32 round-head	5/16 "
10–32 binding-head	3/8 "

The Phillips-head screwdriver has a cross-shaped blade which fits the small cross slots of the Phillips screw. These screwdrivers come in sizes 1 through 5. A size 2 should take care of most amateur requirements.

Taking care of a screwdriver is simple — just keep the working edges square and the tip flat. Don't wait — get out your screwdrivers and file today. A last reminder concerning screwdrivers: "He who checks electrical circuits with screwdriver often lies on floor of workshop while spirit departs to land of ancestors."

Twist Drills

Twist drills are made of either high-speed steel or carbon steel. The carbon-steel drill will suffice for most construction work and costs less than the high-speed. Drill sizes are commonly denoted by three systems. The smaller drills come in numbered sizes from 1 to 60. The largest is No. 1, which is 0.228 inch (228 mils) in diameter, while No. 60 is 0.040 inch (40 mils) in diameter. Twist drills in the numbered sizes are listed in Table IV. An asterisk indicates the commonly-used sizes. It is recommended that several of the common sizes be purchased rather than a complete set, most of which will be used infrequently.

The letter sizes are commonly known as jobber-drill sizes and run from A (0.234 inch in diameter) to Z (0.413 inch). The third system overlaps both of the other series. The size differences are greater and are increased in 64ths from 1/16 to 1/2 inch.

When drilling avoid using too much pressure. This will generate excessive heat and burn the drill's cutting edges, possibly break the drill, or bend it so that it enlarges the hole.

To get the most satisfactory results from a drill it should be kept sharp. An electric grinder and drill-grinding fixture is highly recommended for a satisfactory job. With practice, a good job can be done by hand on the grinder. For average use the cutting angle of a drill should be 59 degrees, the lip angle clearance 12 to 15 degrees, and the angle between dead center and the cutting edge 120 to 135 degrees. It can be seen that drill grinding can be difficult for a beginner. It is recommended that one of the books on the market on the use of hand tools be consulted for full details.

Thread-Cutting Tools

Since the major portion of this article has been devoted to screws and their threads it may be well to discuss thread-cutting tools. Hand taps used to cut internal threads may be purchased in sets of three — taper, plug and bottoming taps. The taper tap is used to start the threading process because it is ground away at the tip for gradual and easy starting. Where the thread goes all the way through the metal, the taper tap is often used to complete the thread. However, if the piece is a thick one, a better thread will result if a plug tap is used after the thread has been started with the taper. The bottoming tap, as its name implies, is used to finish the thread at the bottom of a hole which does not go all the way through the material. Hand taps are held in a tap wrench.

When drilling a hole to be tapped you must remember that the hole must leave enough material for the thread to be cut. Table IV lists drill sizes for tapping. Use a back and forth rotation in doing the tapping job. Apply a light lubricant and turn the wrench a quarter turn forward, move it back a little and then forward for another quarter turn. The backward movement clears away the cut metal. Do not force a tap as taps are very brittle and have a bad habit of breaking. A broken tip may be extremely difficult to remove without ruining the material.

External threads are cut with a die. The same precautions that apply to taps also apply to dies. The material to be threaded should be the same major diameter as a corresponding size screw. For example, if it is desired to cut a 10–32 thread the material should have a diameter of 0.190-inch (about 3/16 inch). Table I can be used to select proper diameters of material.

Conclusion

There are many other applications, standards, descriptions and uses of machine screws and nuts that have not been covered. Material was selected that would be of major interest to the amateur. For additional information I recommend a visit to your local library, where you should find several books covering machine screws, fasteners in general, and the use of hand tools.

QST

Hints and Kinks For the Experimenter

COAX TO MIKE CONNECTOR

THE standard coax cable connector type 83-1SP can be made to mate with screw-on single contact microphone connectors by simply removing

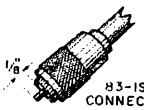


Fig. 1—Modified coax connector doubles as microphone connector.

all but ⅛ inch of the center conductor tip of the 83-1SP connector. The sketch in Fig. 1 shows the finished microphone connector.

— Jerry Malinski, K9LRU
— Carl M. Stern, K9EGH

CABLE LACING MATERIAL

THE vinyl jacket covering on popular types of coaxial cable can be used for cable lacing. Strip the covering off the coax by cutting a long, straight line down the length of the cable. Open the tube and snap it over the wire or cable you wish to cover.

— Gary Guenther, KØPQW

APX-6 ON 1296 MC.

MUCH has been published on getting the APX-6 transmitter-receiver on 1215 Mc., but there is a great deal of activity on the high-frequency end of the band, and the APX-6 transmitter will not go that high in frequency "as is." To extend the range of the transmitter to 1296 Mc., remove the six machine screws that hold the cavity assembly to the drive-gear box and remove the cavity. With a fine-tooth hacksaw, modify the cavity slugs as follows: Transmitter slug, remove ¼ inch; receiver mixer slug (t.r. cavity slug), remove ¼ inch. Do not alter the receiver oscillator slug. After cutting off the slugs, file smooth to remove all burrs. It is also necessary to construct a new feedback cable for the transmitter. It should be 6½ inches long, tip to tip of the BNC connectors. Reassemble the cavity and adjust the feedback loop for maximum output. To operate on the low-frequency end of the band, it may be necessary to use the "old" 7⅞-inch feedback cable. Power output at 1296 Mc. runs about the same as it does at 1215 Mc. — that is, about 3 or 4 watts.

— Dick Stevens, W1QWJ

TRANSISTOR AUTOMOBILE REGULATOR

THE circuit in Fig. 2 was developed to reduce regulator noise in my mobile radio station. Although my regulator is a German Bosch for my Mercedes 190D,[1] the circuit can probably be adapted for use in standard American regulators. The 2N677 transistor switches the heavy current, a job formerly done by the relay contacts in the regulator. Now the relays switch only a few milliamperes which control the base circuit of the transistor. The heavy lines in Fig. 2 shows connections already built into the original regulator. The connections to the cutout relay and the voltage and current relays are not disturbed. The transistor can be mounted on the regulator cover, which acts as the transistor's heat sink. Capacitors and resistors are mounted inside the regulator case. A new *F* terminal is necessary for this modification, as the original *F* (field) connection on the regulator is not used.

The 2N677 transistor can probably be replaced with a less expensive unit but the circuit shown does accomplish its objective of eliminating regulator noise. The regulation provided by the modified unit is as good as the original system, as indicated by the dashboard voltmeter and ammeter. The diagram in Fig. 2 is for negative ground systems only.

— Erwin Aymar, W4HS

[1] W4HS has found one way to cure ignition noise; the 190D is Diesel powered! — *Ed.*

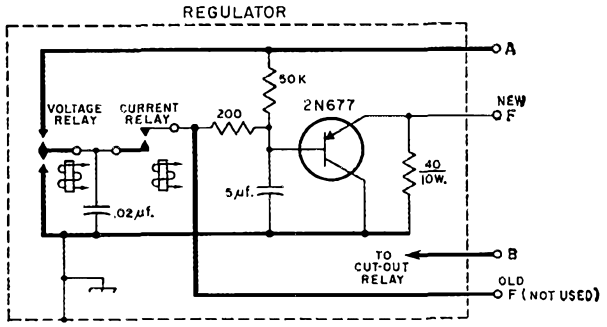


Fig. 2—Transistorized regulator reduces regulator noise.

Coaxial Transformer for Voltage-Fed Antennas

Simple Matching Device for Coax Feed

BY W. PETE CZERWINSKI,* W2JTJ

A quarter wavelength of coax cable makes a good weatherproof transformer for matching a coax line to an end-fed antenna. The author uses it to feed a half-wave beer-can vertical on 20 meters.

ACCORDING to a famous saying, many roads lead to Rome. In matching an antenna there are also many roads or approaches one can take. In a previous article [1] the author described a matching unit for an end-fed half-wave vertical radiator, constructed of a coil and capacitor. Although the electrical performance of that matching unit was almost ideal, certain mechanical features were not.

Matching System

Fig. 1 shows the basis for an improved matching device. The shorted quarter-wave coax cable at the left is electrically equivalent to the coil and capacitor of the parallel resonant circuit to the right. For a design frequency of 14.1 Mc., the length of coax cable needed is 11 feet 6 inches. If your radiator is not precisely a half wave long (and it need not be), it will be either capacitive or inductive, depending on whether it is slightly shorter or longer, respectively, at the design frequency. This is of no consequence, for the resultant susceptance of the stub and the radiator will automatically be cancelled during the tuning procedure. However, the length of the coax section should be made longer to allow for this.

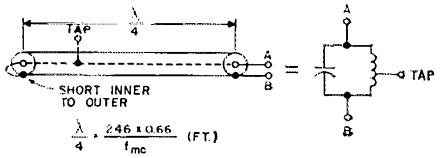


Fig. 1—A shorted quarter wavelength of transmission line is equivalent to a parallel-tuned circuit. A match is obtained in either case by connecting the feed line at a tap point. The factor 0.66 is the velocity factor of the line used for the matching section.

Adjustment

A grid-dip oscillator and a standing-wave bridge will be needed and they will be used in the same manner as described in the previous article.[1]

First, solder the inner conductor (point A) of the coaxial transformer to the radiator, and the outer conductor (point B) to the ground system. Now measure 26 inches from the shorted end and remove a half-inch-wide band of the vinyl jacket (see Fig. 2). Spread the braid carefully to expose a spot on the polyethylene inner insulation. Solder a sewing needle to the exposed end of the inner conductor of your feed coax coming from the transmitter. Insert this needle through the prepared opening in the exposed braid of the stub so that it makes contact with the inner conductor. Now spot-solder the feed-line coax and stub

* 202 Beechwood Drive, Shrewsbury, New Jersey.

[1] Czerwinski, "The 'Budget' Vertical on 20 Meters," *QST*, September, 1960.

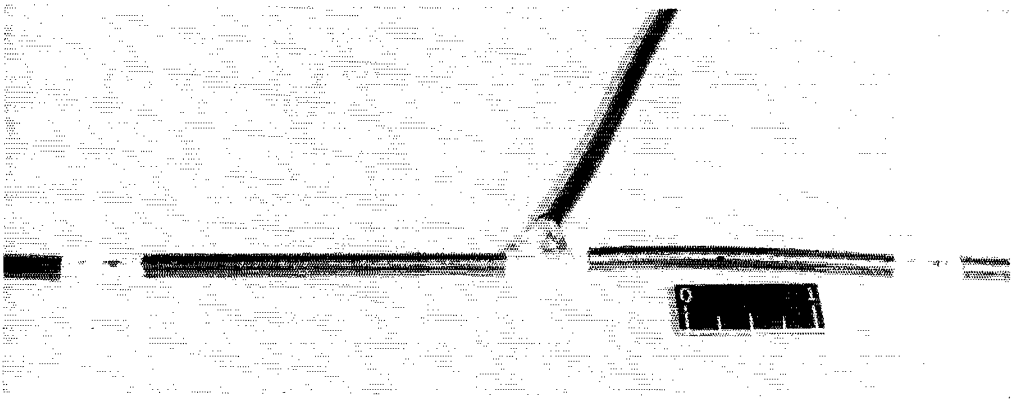


Fig. 2—The correct tapping point for the transmission line is determined experimentally by probing the center conductor of the matching section with a needle. Bared spots to right and left are additional check points.

braids together. Excite the line from the transmitter with the g.d.o., and read the s.w.r. bridge.

If you're lucky, the reading will be close to a null (no reflected voltage). If not, then make an adjustment on the length of the coaxial transformer by inserting a second needle approximately one inch from the shorted end, making sure that it is shorting the braid to the inner conductor. Repeat this adjustment, moving the short an inch at a time, as long as it improves the bridge null. Then make a similar adjustment on the location of the tap by moving the first needle approximately 3 inches either way, after baring two new spots as shown in Fig. 2. This will show in which direction the tap should be moved, and the final adjustment can be made by trying the tap at smaller intervals.

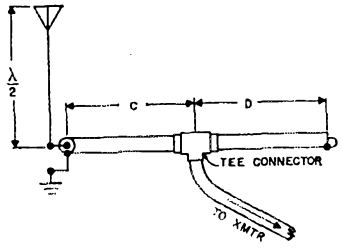


Fig. 3—After the correct tap point has been determined, lengths C and D are measured and the permanent matching section is made up using a coax T connector at the tap point.

When a bridge null is obtained and the g.d.o. dips best at the design frequency, carefully measure the dimensions C and D of Fig. 3, and make up a new cable as shown.

Materials

The author used 50-ohm coax cable throughout. The coaxial transformer section is RG-58 U. There was no sign of voltage arc-over using a DX-100 with 175 watts input. For higher power, it is recommended that RG-8 U be used. When

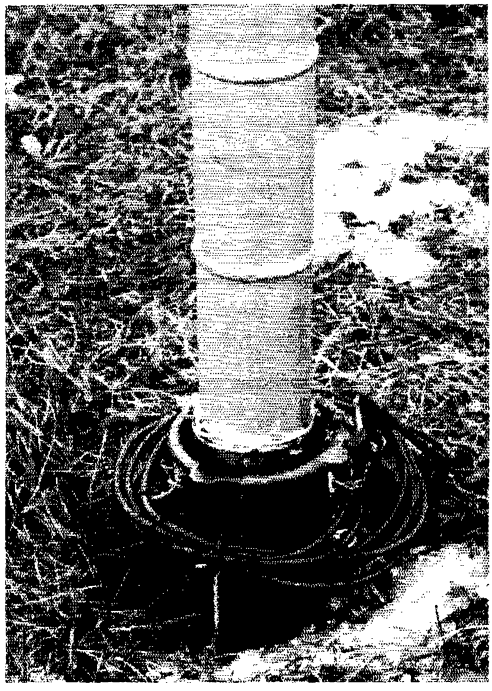


Fig. 4—The completed matching transformer may be wound up into a compact coil around the base of the antenna.

the coaxial transformer is completed, the open ends should be sealed with plastic tape; then it can be wrapped into a coil and practically hidden from view. (See Fig. 4.)

In conclusion, the coaxial matching transformer, by virtue of its physical configuration, greatly improves resistance to the effects of rain, snow, or little children, without sacrificing electrical performance. The author's unit has been in service for over a year and has proved to be a reliable and worthwhile improvement at W2JTJ.

QST

Strays

Governor Michael DiSalle of Ohio has issued a proclamation making the week of June 18–24 Amateur Radio Week in Ohio. Shown here with the governor as he signed the proclamation are William Golding, W8GJS, chairman of the Ohio Council of Amateur Radio Clubs; Robert Skidmore, K8NCY, vice chairman of the OCARC; and Ernest D'Angelo, K8DJM, secretary of the OCARC. This is the ninth consecutive year that Ohio has honored its amateurs in this manner.

• Technical Correspondence

NOTE ON TRANSFORMER WINDING

2686 Bloor St. W. — Apt. 8
Toronto 18
Ontario, Canada

Technical Editor, *QST*:

The excellent article in November *QST* by W2VLA on the subject of home-built transformers[1] prompts me to write, mentioning a couple of points that I hope will prove helpful to readers.

The information provided by Maresca (and by Coats in the earlier article)[2] is equally applicable to the rewinding of burned-out or otherwise unusable transformers. By doing this you are saved the trouble and cost of obtaining a new core. If one of the original windings is still recognizable, and if you know its original voltage rating, the new windings can be easily designed by counting the number of turns on the old winding. The number of turns required is given by equation (4) of Maresca's article, and the wire size selected according to his instructions.

If this method cannot be used, then Maresca's calculations will yield the required results. Unless the old core is known to be of grain-oriented steel it is best to assume a lower value of peak flux density, B_m — say, 12,000 gauss. A bonus benefit of using an old core is that you have all of the accessories — clamping bolts, and bells, terminal strips, etc.

A possible pitfall that Maresca does not mention is that of a shorted turn. Even *one* short-circuit between adjacent turns will prove fatal to the transformer because of the very heavy currents that will flow. The shorted turn will be burned up, and the transformer with it, so every care is necessary to avoid a single short. For this reason it is never a good idea to re-use wire from old windings. However sound it may look, its insulation is almost certainly brittle and will be damaged by the process of unwinding it. By the way, don't handle the wire any more than necessary. It doesn't help the enamel any, and it will sometimes work-harden the larger sizes and make winding harder.

The use of scramble-wound pies for the high-voltage winding is a stroke of genius — it removes the one difficult phase of hand winding. The winding should not be *too* scrambled, however. The wire should be laid on in reasonably uniform layers so that turns that lie close together are not widely separated electrically. Otherwise the voltage between them may be large enough to break down the wire insulation. Further, the more scrambled the winding is, the poorer its space factor and the greater the danger of shorted turns caused by wires crossing one another.

— *Philip H. Byrne, VE3AXX*

[1] Maresca, "More on Homemade Transformer Design," *QST*, November, 1960.

[2] Coats, "A Cool Kilowatt Plate Transformer," *QST*, September, 1959.

T.R. CIRCUIT

Norwich, Vermont

Technical Editor, *QST*:

On page 20 of the January issue of *QST* there is described a t.r. switch. Without discussing the merits of the system, which are many, I would like to point out that this circuit was devised by Prof. M. G. Morgan (W1HDA) of the Thayer School of Engineering, Dartmouth College. During the course of design of certain pulse equipment, on contract from ONR, he incorporated this feature in the final stages of a two-channel pulse transmitter, in the year 1950. This was disclosed in the status report of 15 Nov 50–30 June 51, and subsequently patented, with rights assigned to the U. S. A., in patent No. 2,886,812.

— *W. C. Johnson, W1FGO*

HIGH-ACCURACY CHANNELS AT 3-KC. INTERVALS

4125 Washington St.
Lincoln, Nebr.

Technical Editor, *QST*:

W2AOE's plan for channel-type phone operation[1] suggests a possible new method of frequency control for amateur transmitters and receivers. I have devised a system for generating a signal on any of his 50 channels in the 75-meter phone band using a minimum number of crystals. The circuit automatically compensates for v.f.o. drift and produces a signal exactly on frequency in any channel — simply by tuning the v.f.o. *near* that channel.

The principle of operation is not unlike that used in the Racal RA-17 receiver.[2] A 4-kc. oscillator is used to drive a harmonic generator (Fig. 1). The harmonics lying between 200 and 400 kc. are heterodyned to 3 Mc. where they are fed into a filter which will pass only one of the 4-kc.-spaced signals at a time. The particular harmonic being used is determined by the v.f.o. frequency. Simultaneously the v.f.o. signal is fed to a balanced mixer where it is combined with 4199 kc. from a crystal oscillator to give a sum frequency between 6799 and 6999 kc., depending on the v.f.o. setting. This is finally combined with the 3-Mc. signal in the last mixer, where the difference frequency will be on one of the desired channels between 3799 and 3999 kc.

That any reasonable amount of v.f.o. drift will have no effect on the output frequency can be seen by the following example: Assume that the v.f.o. is set to 2788 kc. and thus beats with the 4-kc. harmonic on 212 kc. to give the sum frequency of 3000 kc. in the center of the filter pass band. The same v.f.o. frequency beats with 4199 kc. from the crystal oscillator to give a sum frequency of 6987 kc., and this in turn is mixed with the 3000-kc. output of the filter to obtain the final difference frequency of 3987 kc. If the v.f.o. drifts to 2789 kc., the sum with 212 kc. will be 3001 kc., the sum with 4199 kc. will be 6988 kc., and the difference between 6988 and 3001 kc. will still be the same channel frequency, 3987 kc. The only effect on the output signal is a variation in amplitude, since 3001 kc. will be on a different part of the filter response curve.

The principal precautions to be observed with this system are (1) preventing spurious signals from appearing in the output, especially the 4199-kc. crystal-controlled signal because of its closeness to the desired output frequency, and (2) preventing more than one of the 4-kc. interval signals from passing through the filter at one time, for any v.f.o. tuning condition. The latter means that the filter attenuation should be very high when the v.f.o. is tuned midway between frequencies that give maximum output through the filter; i.e., the filter transmission should be negligible at 2 kc. either side of its band center.

Because of school work the writer does not have an opportunity to try out the method at present, but it would appear to offer a fairly simple way of getting accurately-spaced channel frequencies with a minimum of expensive equipment.

— *John A. Wick, KØHKI*

[1] Griffin, "A Plan for Improved Utilization of Amateur Phone Assignments," Technical Correspondence, *QST*, May, 1960.

[2] "A New Receiver Tuning Principle," *QST*, March, 1958.

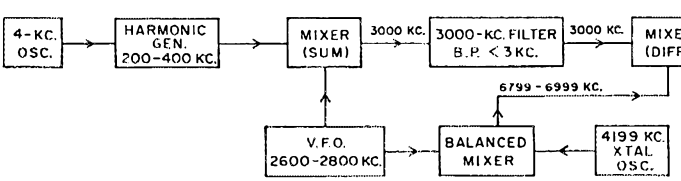


Fig. 1

W2PPL RECEIVER

183 Burbank Drive
Snyder 26, N. Y.

Technical Editor, *QST*:

Since the publication of my article on the 453 variable-i.f. receiver in February *QST* a number of points have arisen that should be explained.

Resistance R_5 in the power supply is 250 ohms at 10 watts in my set. It, or preferably the input capacitor in the filter, should be adjusted to give the desired voltage for the r.f. portion of the receiver.

In the a.g.c. circuit there should be a 1-megohm resistor between the top end of the 1-megohm resistor to Pin 2 on V_{1A} and the top of the 0.033-μf. capacitor. Without this resistance the 0.033-μf. lag capacitor on the bus will ground out the r.f. at the diode. This resistance will allow the S meter to work when the a.g.c. is switched off.

An inset in Fig. 1 shows a decoupling network that serves to reduce the gain in the r.f. amplifier to avoid blocking on 80 meters. The use of this expedient can be avoided by reducing the number of turns on L_4 to reduce the gain and this method is suggested.

Crystal Y_3 is noted in the parts list as an overtone; it is a fundamental crystal.

Some builders appear to be having trouble tuning the TV width coil in the output of the product detector to 85 kc. to get the proper attenuation or dip. The coil is tuned by the 470- and 330-$\mu\mu$f. capacitors, and they should be adjusted, if necessary. After having had experience with both types of filters in this receiver and in my earlier one (*QST*, September, 1959), I think I would recommend the low-pass type used in the latter because of its ability to cut off sharply at about 3000 cycles, thus eliminating some of the high-frequency audio signals that are only interference.

The article did not clearly explain that the potentiometer R_6 (30K) used in the T-notch circuit is not on the front panel. The "tune" knob is the slug screw and the "off" knob is a rotary-type switch. The potentiometer was set for maximum notch and left there. If it is desired to adjust the notch from the front panel, there should be another potentiometer connected in series with the one on the panel so that the panel potentiometer can be set for full depth of notch with maximum rotation. The point of full notch is very sharp on the potentiometer and too difficult to find on a panel control unless it is at one end of the travel. Incidentally, I have heard a couple of these receivers with the Hallicrafters notch coil in them and it certainly works fully as well as mine.

In the interest of having the zero beat "stay put" as sidebands are switched, and thus being able to switch sidebands in a QSO without retuning, I have added another crystal for the 6BE6 at Y_9. The new crystal is about 1600 cycles lower in frequency and is alternately switched with the original by another circuit on the mode switch. The b.f.o. is then set to center on the pair of crystals. It is pleasing to note that, once set, the stability is such that there is no apparent shift in the oscillators with time.

W2UHI has built an interesting variation of this receiver. He used WØBFL's a.g.c. circuit from *QST*, October, 1957. It certainly does a wonderful job. I may put it in mine. W2UHI had some difficulty in getting it to work due to original leaky bypass capacitors in the BC-453 i.f. He had a bus resistance of less than 50,000 ohms and had to replace all of the bypasses. I have checked mine and a couple of other 453s, and found these capacitors to be OK. W2UHI also elected to put his 6BA6 and 6BE6 stages on 80 meters and beat up from there for the higher-frequency bands. He did not experience trouble with 80-meter signal feed-through, as I thought he might. He also has the dual 6BE6 crystals. Frank used the Crosby three-triode product detector, but I'm not sure that this is of any real advantage in a receiver of this type.

Another fellow who is interested in a.m. reception is going to mechanically couple to the BC-453 i.f. coil sliders to give panel adjustment of band width. This is not too difficult to do.

Some builders have made the dial-cord drive from the BC-453 to the 6BA6-6BE6 tuning capacitor too tight, resulting in cocking the 453 dial which is spring loaded. The cord should have no tension in it. Free play at this point will not degrade performance at all.

— *Carl Ericson, W2PPL*

T.R. VILLIANY

2417 Ervin St.
Columbia, S. C.

Technical Editor, *QST*:

Quite a few stations use mixer-type v.f.o.'s with one v.f.o. oscillator on at all times. This v.f.o. signal can mix with an incoming signal to produce a spurious response in the receiver.

Some time ago while I was operating on 3795 kc. in a traffic net a fellow ham said my signals were readable on 7030 kc. Well, 3795 is not harmonically related to 7030, but I told him I would get off the air at once and check my exciter. I could not find this so-called "harmonic" on my own receiver. I made some checks with hams in my own city to be sure. They could find nothing.

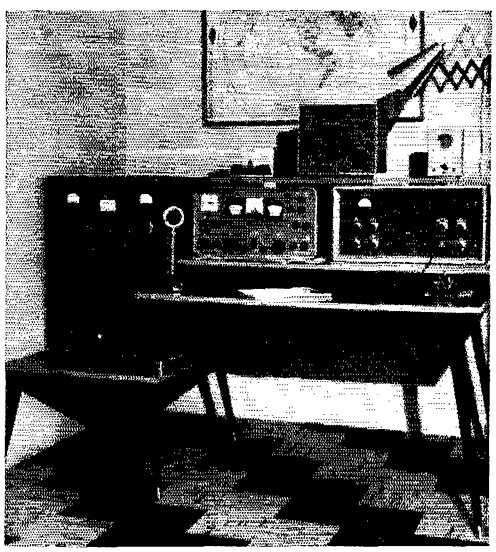
I made contact with the station that had originally given me the report and asked him whether he was using a t.r switch and whether his v.f.o. ran continuously. He confirmed this. I asked him to check again on 7030 kc., and he came right back and said, "loud and clear" on 7030 kc. I asked him to disconnect his t.r. switch from his transmitter and connect his receiver directly to the antenna. He did so, and the "harmonic" he thought he had heard on 7030 kc. was not there.

Perhaps this will save someone a great deal of time in trouble shooting his exciter or transmitter. This mixing effect can and will happen with certain types of t.r. switches.

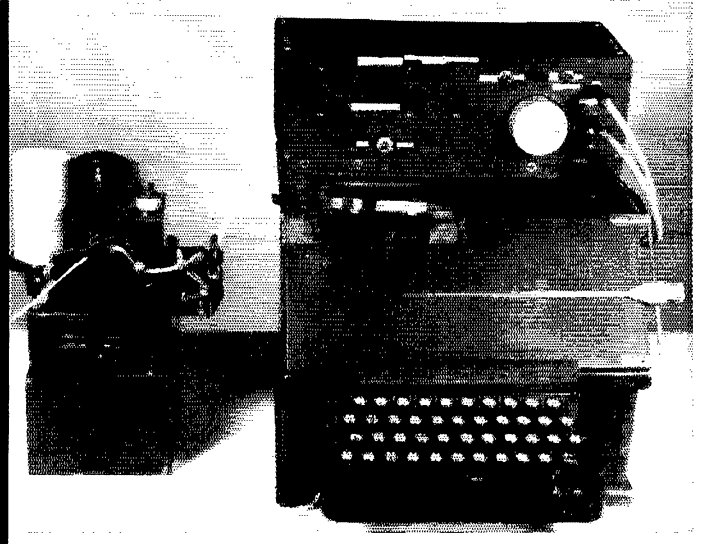
— *Paul G. Marsha, K4AVU.*

Strays

K8RHR was high scorer in the recent Hamboree sponsored by *Boys' Life*, the national publication of the Boy Scouts of America.



This is the very neat operating position at W3CVS. The final at the left is home-built, and is adapted from the all-band 813 rig described in January, 1954, *QST*. The sideband package at the right is from June, 1958, *QST*, while the receiver is from Hammarlund. The shelf above holds a Heath s.w.r. bridge, a speaker, and 1-kc. audio oscillator. W3CVS built the table using ¾" oak veneer plywood, standard tapered legs (Stanley Hardware), wood tape (Weldwood) to finish off the edges of the plywood, plus the usual treatment of stain, lacquer, and hard work. Pieces of ¾" dowel stock are used to support the shelf on which the receiver and exciter rest and also the shelf above the receiver. (Photo by K3JRU)



The author's setup includes a Wheatstone perforator, right, and a Boehme tape puller with a homemade sense-pin assembly.[1] The control circuits described in the text are contained in the box above the perforator except for one polar relay, which is in the cylindrical can standing vertically at the top left on the keyer assembly.

Automatic Tape-Operated Send-Receive Switching

BY JOHN B. NELSON,* W6EAR

Keyboard-Controlled C.W. Station

Perhaps the title of this article is unduly restrictive, since the control system described here is not limited to applications where tape transmission is available. Automatic send-receive switching with hand keying is an integral part of the system.

FROM time to time various items of c.w. (that is, International Morse code) and teleprinter-tape transmitting equipment appear on the surplus market. While this article is primarily directed toward c.w. operation, the same idea may be used for RTTY work. The tape perforators and transmitting units, generally Wheatstone perforators and Boehme or Creed keying heads, are designed to handle large quantities of continuously running paper tape to key a c.w. transmitter at high speed.

This equipment can be adapted for use in an amateur c.w. station so that it will work "start-stop." By striking one of the keys on the perforator keyboard the entire station shifts from "receive" to "transmit." After a pause of selected length, when no signal is being transmitted, the process is reversed and the entire station shifts to "receive." A method by which this can be done is explained in the following paragraphs.

Briefly, the control arrangement used at W6EAR boils down to this: After the master power switch has been turned on and all high-voltage rectifiers warmed up, the entire station is controlled from the keyboard of the tape perforator. The operator needs only to tune the station receiver and perforate tape.

To transmit, it is only necessary to strike a single key on the keyboard. Immediately after this "start" pulse has been sent, the following action takes place:

1) Keyer motor starts.

2) Station antenna is shifted from receiver to transmitter.

3) High voltage is applied to final r.f. amplifier and exciter stages.

4) Plate voltage is removed from station receiver.

5) Headphones or speaker are switched from station receiver to monitor receiver, providing a "raw-signal" monitor.

6) Tape keys the transmitter as long as the keyer sensing pins are supplied with perforated code characters.

7) Tape keyer also keys a 500-800-cycle audio oscillator. This oscillator provides additional monitoring facilities and functions as a portion of the control system.

Now — to halt transmission and receive from the distant station, the operator strikes the perforator BLANK TAPE key three times immediately after the end of the perforated message. This results in three to four inches of blank (no character) tape, these blanks normally being used between transmissions in the course of tape sending. When the blank tape reaches the keyer sensing pins, no keyed signal is sent and the following action takes place:

1) Keyer motor stops.

2) Antenna is switched from transmitter to station receiver.

3) Plate voltage is applied to station receiver.

4) Plate voltage is removed from final r.f. amplifier and exciter stages.

5) Headphones or speaker are switched from monitor receiver to station receiver.

Since the details of send-receive switching will vary with individual setups, some of the operations listed above will be replaced by others

* 4224 Avila Lane, Sacramento 25, Calif.

[1] Bartlett, "A Simplified Tape Code-Practice Oscillator," *QST*, February, 1944.

in individual cases. The description to follow is therefore confined to the basic control system. A pair of relay contacts is provided for send-receive change-over and may be used to control additional relays and circuits for any purpose that may be desired.

Keyboard Control

To maintain fast and smooth "to-and-fro" operation, the keyer should be located as close as possible to the perforator, and the keyer motor should be capable of fairly fast starts and sudden stops. When a Boehme tape keyer is used as it was originally intended, the motor has a flywheel on the shaft to smooth out the speed. For ham use in this automatic equipment the flywheel should be removed. Then the motor will start and stop very quickly at the beginning and end of each transmission.

The keying and control functions make use of two polar relays controlled by the keyer sensing pins, as shown in Fig. 3. These pins sense the tape perforations (mark and space), changing polar impulses into neutral (make and break) keying of the transmitter and audio-oscillator monitor.

Polar relay K_4 keys the transmitter and polar relay K_5 keys the audio oscillator. This type of keying will perform perfectly at speeds in excess of 100 w.p.m., which, of course, are never necessary unless the station at the other end has access to a syphon ink recorder. When S_5 is thrown to "manual," a bug or hand key can be used to activate the coil of K_6 and thus send polar signals into the keying system. In the manual position the keyer motor will not start. S_4, Fig. 2, controls the send-receive change-over relays manually. This arrangement is handy for instant change-over to manual operation and permits keying the monitor locally without keying the transmitter.

To transmit control impulses from the keyboard, two spring leaf switches are so mounted on the keyboard frame that striking the COMBINATION key will result in its connecting bar closing the start-pulse contacts. The contacts on this switch are normally open, as shown in Fig. 2. Once a transmission has started, the COMBINATION key may be used for its normal purpose without disturbing the control sequence. The second spring-leaf switch is so mounted on the frame that striking the AU key will cause its connecting bar to open the stop-pulse contacts. This switch is normally closed.

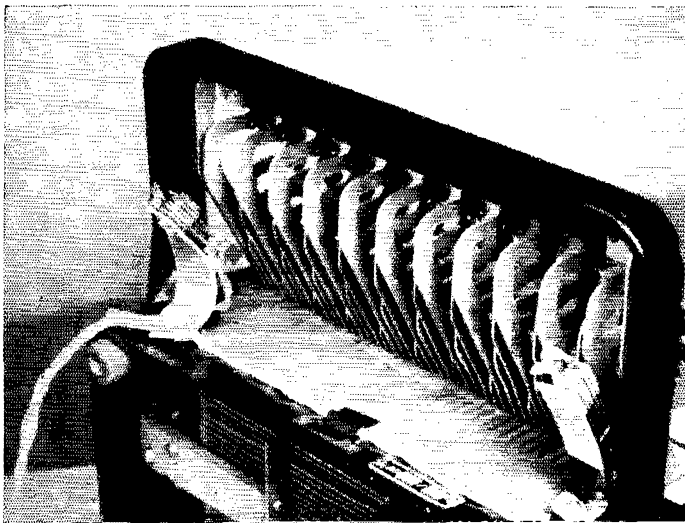
Any one of the punctuation keys on the right-hand side of the keyboard may be used for the "stop" key, but it must be remembered that this key then will no longer be useful for punctuating when a transmission is running, since striking the key will operate the "stop" control.

The stop pulse, as mentioned earlier, is entirely automatic when S_3 is in the "blank tape stop" position, being sent when the three blanks reach the keyer sensing pins. However, if so desired, the operator may control the stop function by striking the AU key. If keyboard stop control is wanted at all times, S_3 should be placed in the "keyboard stop" position.

When S_3 is in the "blank tape stop" position, the operator has complete change-over control from a bug or hand key when operating manually. The first "dit" sent on the bug changes the entire station from receive to send, and after a pause in sending of something less than one second the station changes back to receive.

Operating Details

The heart of the control system lies in the action of relays K_1, K_2, K_3 and K_8. When the start impulse is sent by striking the COMBINATION key, relay K_1 closes, starting the keyer motor and throwing all change-over relays to the transmitting position. As soon as the keyer pins sense the first code character of a transmission, the contacts of relay K_2 close the circuit to the coil of time-operated relay K_3 (relay K_2 follows the keying of polar relay K_5 via the tone oscillator). The contacts of K_3 are wired in series with the keyboard stop contacts, the coil of latching relay K_8 (the armature of which is mechanically connected to the armature of K_1 by a homemade push-rod arrangement), and a pair of contacts on relay K_1. Relay K_3 and the keyboard stop contacts, therefore, operate the latching relay which holds K_1 closed during a transmission. When the three blanks at the end of a transmission halt operation of K_2, the 40-μf. capacitor across the coil of K_3 discharges, allowing the contacts of



The leaf-spring switches are mounted under the perforator keyboard so they can be actuated when the proper key is depressed. These switches, made from jack parts, are mounted on aluminum brackets which in turn are bolted to the keyboard frame with the regular frame mounting screws.

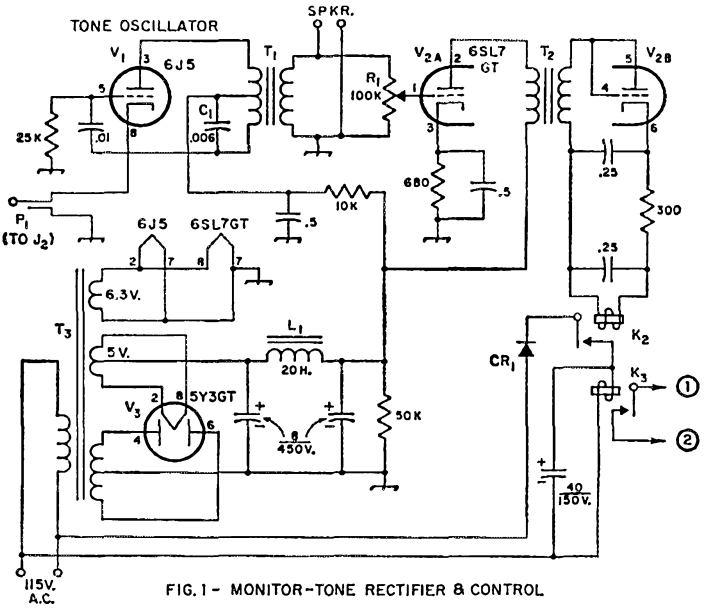


FIG. 1 - MONITOR-TONE RECTIFIER & CONTROL

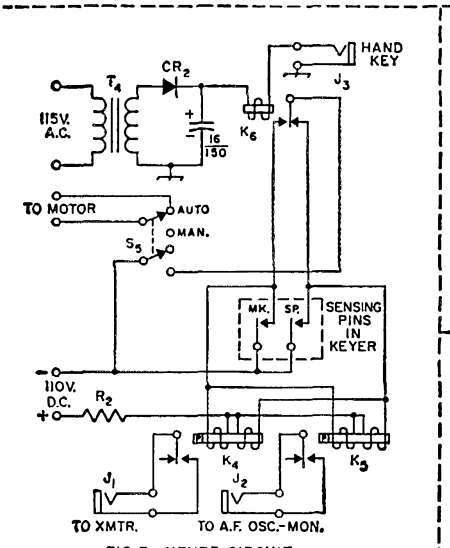


FIG. 3 - KEYER CIRCUIT

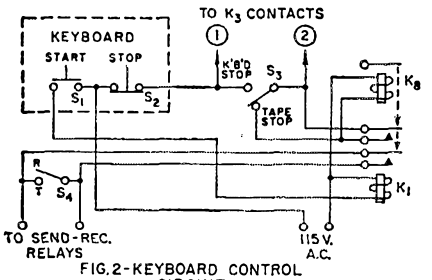


FIG. 2 - KEYBOARD CONTROL CIRCUIT

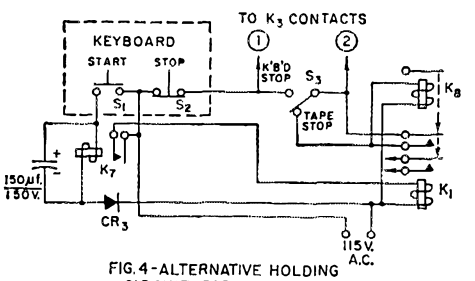


FIG. 4 - ALTERNATIVE HOLDING CIRCUIT FOR KEYBOARD CONTROL

Figs. 1-4, inc.—The control system broken down into sections. Fig. 4 is an alternative holding circuit for Fig. 2 (see text); connections to lower set of K_1 contacts should be made as shown in Fig. 2. Capacitances are in µf.; capacitors with polarity shown are electrolytic; others may be paper or ceramic as convenient. Resistances are in ohms, resistors are ½ watt, except as otherwise specified.

Accessories such as the 110-volt d.c. source indicated in Fig. 3 are not discussed in this article, since they are normally required for the perforator-keyer setup and thus are assumed to be already available.

Note on polar relays: W6EAR advises that several types—Western Electric 215-A, 255-A, 209 FG, and Western Union 17B, all of which operate on less than 60 ma.—are readily available at low cost in surplus, since automatic equipment in which these relays have been used is being replaced by newer models. The Sigma 7AOZ-16OT (see page 12, December 1960 *QST*) also will be satisfactory.

K_3 to open after a short time delay. This opens the circuit to the coil of latching relay K_8, thus K_1 opens and all sending processes halt immediately, with all send-receive relays switching to "receive." The contacts on relay K_3 open approximately one second after keying ceases, which is about the correct interval for average sending speeds. The operator, therefore, has a choice of using three blanks or hitting the stop key to end his transmissions.

Some Possible Modifications

The dual relay arrangement, K_2–K_3, was used for another purpose and was simply left that way in developing the present system. However, it should easily be possible to eliminate K_3 and use the sensitive relay K_2 for the timing function since the author's experience with the d.c. output of the rectifier section of the 6SL7 leaves no doubt that there is energy to spare for charging a larger capacitance across the coil of K_2. The capacitance can be substituted for the pair of 0.25 capacitors and 300-ohm resistor now used as a filter, and will fall in the range between 40 and 150 μf., depending on the relay resistance and individual operating preferences as to time delay. The most suitable value can be determined by experiment. If this change is made, the contacts of K_2 should connect to the points marked 1 and 2 (circled) in place of the contacts of K_3.

Study of the circuit will show that when operating with S_3 in the "keyboard stop" position, the control circuit is latched immediately (through the upper contacts of K_1) upon striking the "start" key. This is not quite the case when operating in the "blank tape stop" position, since the 115-volt circuit to the coil of K_8 cannot be completed until K_3 closes, which will not occur until actual keying starts. Thus with the circuit as shown, it is necessary to hold down the "start" key until keying commences, an interval of a second or so.

To overcome this, the writer uses the alternative circuit shown in Fig. 4, incorporating a 10,000-ohm relay, K_7, which gets its coil power from a simple selenium supply similar to that used for K_3. With 150 to 200 μf. across the coil, the start pulse holds the coil circuit of K_1 closed for about three seconds, during which period the keying has ample time to start and thus close the latching circuit. K_7 then opens and is ready for the next cycle.

Some Remarks on Keyboard C.W.

Keyboard c.w. transmission through the use of tape-operated keyers is a very pleasing experience, both to the sending and receiving operator. Also, the much-sought-after c.w. with tape precision then becomes a reality instead of a wish.

A few suggestions, or hints, based upon past experience should prove valuable to those who are planning tape operation for the first time.

The perforator and keyer should be physically arranged so that the tape loop is as short as possible at the very beginning of an operating session. Sufficient space should be allowed between tables supporting the units in order that a longer loop will reach the floor.

If a start pulse has been sent and the keyer commences using tape at a rate too fast for comfortable manipulation of the keyboard, striking the BLANK TAPE key alternately with the letter v key will cause the tape to be advanced rapidly from the perforator, resulting in v's being transmitted with more than normal spacing between characters. This allows a slow or inexperienced typist to keep ahead of the keyer if the need should arise. Once a QSO has been started, it is rarely necessary to run out tape in this manner.

Maintaining keyer speed in time with typing speed is important. A touch typist is able to perforate tape faster than average sending speeds, so the perforated tape will usually be fed to the keyer faster than the keyer is able to handle the perforator output. This allows for considerable relaxation and tension-free sending on the part of the operator. The operator is not glued to the sending position, as is the case when using paddle or keyboard manual-entry Morse code generator types of equipment.

The amount of memory realized through this medium of c.w. operation is phenomenal. During the course of a QSO a speedy typist can easily have one entire transmission completely recorded on perforated tape long before the circuit is turned over to the operator on the other end.

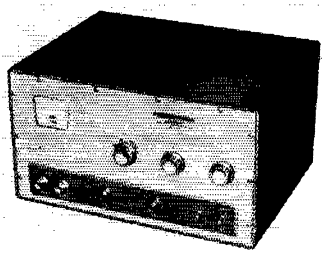
Fast, businesslike comebacks are easily accomplished by using the following procedure:

(*Continued on page 132*)

C_1—Paper or mica; value can be varied to change audio tone.
CR_1, CR_2, CR_3—Selenium rectifier, 130 volts a.c., 50 ma. or more.
J_1, J_2—Open-circuit phone jack.
K_1—D.p.s.t., 115-volt a.c. coil.
K_2, K_3, K_6, K_7—S.p.d.t., 10,000-ohm coil (Sigma 41F-10000-S/SIL or equivalent).
K_4, K_5—Polar, s.p.d.t. (Western Electric 255-A); see note on facing page.
K_8—115-volt a.c. relay with armature modified to close the contacts of K_1 mechanically.
L_1—15-20 henrys, 50 ma.; not critical (Stancor C-1003 or equivalent).
P_1—Phone plug.
R_1—0.1-megohm control.
R_2—2000 to 4000 ohms, 5 watts, for polar relays operating on 60 ma. or less (not usually critical).
S_1, S_2—S.p.s.t. leaf-spring switches made from phone jack parts; see photograph. S_1 normally open, S_2 normally closed.
S_3—S.p.d.t. toggle.
S_4—S.p.s.t. toggle.
S_5—D.p.d.t. toggle.
T_1—Interstage audio, single plate to p.p. grids (Stancor A-52-C or equivalent).
T_2—Same as T_1, but with only one side of secondary in use. Single plate to single grid type may be substituted.
T_3—Power; approx. 600 volts c.t., 50 ma.; 5 volts at 2 amp.; 6.3 volts at 0.6 amp. or more (for example, Stancor type PM 8406).
T_4—Power; 125 volts, 15 ma. (Stancor PS 8415 or equivalent).

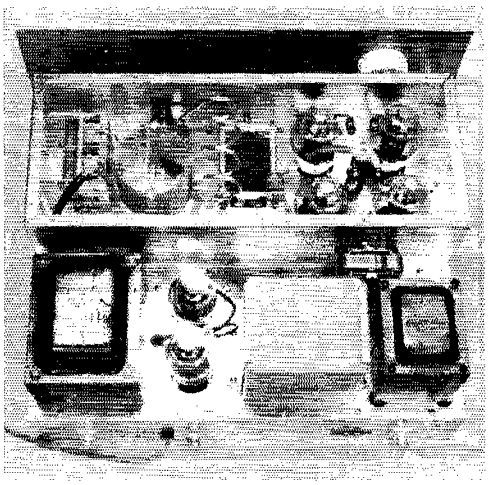
• Recent Equipment —

Model HA-10 Warrior Linear Amplifier



ONE of the new items from the Heath Company is a linear amplifier called the "Warrior" and designated Model HA-10. It is available in both kit and wired form — the first Heath departure from kit-form-only in the amateur field. The Warrior is a grounded-grid linear amplifier covering 80 through 10 meters, with four 811As connected in parallel and operated Class B. The power-handling capability is 1000 watts p.e.p. on s.s.b., 1000 watts on c.w., and 400 watts on a.m. phone (500 watts with controlled-carrier drive). The amplifier and power supplies are built on a single chassis and housed in a two-tone green cabinet.

The plate tank circuit of the amplifier is a pi network using two coils, one for the 10-meter band and the other, which is tapped, for the remaining bands. A 350-$\mu\mu$f. variable is used for the tank input capacitor. The loading capacitor is a two-gang job with a total capacitance of almost 900 $\mu\mu$f. A fixed 500-$\mu\mu$f. mica capacitor is switched in parallel with it when 40 meters is used, and a second 500-$\mu\mu$f. mica is added to the circuit on 80 meters. The network is designed to work into a 50- to 70-ohm load.



At the left in the shielded enclosure is the loading capacitor and to its right are the two tank coils. Next is the tank capacitor and then the four 811As. The cooling fan is mounted on the enclosure wall alongside the 811As. The power-supply components are mounted at the rear of the chassis. Along the back of the chassis from the left are the output terminal, scope take-off jack, scope take-off adjustment, ground lug, external bias terminals, and driver input terminal.

The 811As are neutralized with a variable capacitor connected between the plates of the tubes and a properly polarized coil wound on the filament choke. The filament choke is a bifilar winding of 16 turns of No. 14 enameled wire on a ½-inch ferrite core. The neutralizing coil is 9 turns of No. 18 wire, 8 turns per inch, one-inch diameter, and is mounted over the center of the filament winding.

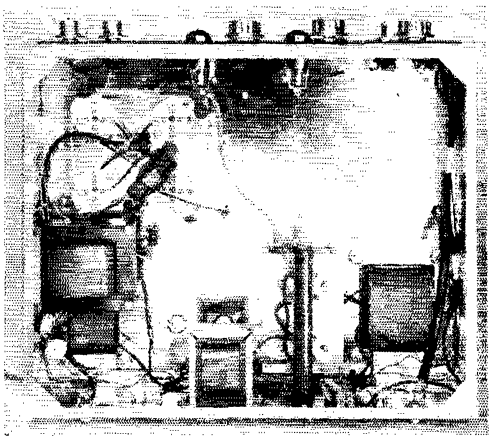
The high-voltage supply for the amplifier uses a pair of 866As in a full-wave rectifier. A 5- to-50-henry swinging choke is installed in the center-tap lead of the power transformer. An 8-μf. oil-filled capacitor and a 60,000-ohm, 100-watt bleeder resistor complete the high-voltage supply. The large capacitance, along with the swinging choke provide good power-supply regulation. D.c. voltage out of filter, key up, is approximately 1600 volts; key down, fully loaded, it is 1350 volts.

A bias supply consisting of a 10-volt transformer, silicon rectifier, 100-μf. electrolytic capacitor, and an 11-ohm bleeder provide a stiff 4.5 volts of bias for the 811As.

Complete power-supply switching is accomplished with two double-pole, single-throw switches. One switch controls the 811A and 866A filaments, a green pilot light, and a cooling fan for the 811As. The second switch is used to turn the high-voltage transformer primary on and off. The high voltage cannot be turned on unless the first switch is closed. A red dial lamp is also connected across the high-voltage switch to show when the high voltage is on.

The r.f. portions of the unit are enclosed in a shielded box to reduce harmonic radiation. However, this could probably be improved upon by grounding the outer braid of the coax output lead where it leaves the enclosure.

A single meter is switched to read the different voltages and currents, with four meter positions available. The ranges in the first three positions are: grid current, 200 ma.; plate current, 1000 ma.; plate voltage, 2000 volts. The last position is a relative-power range calibrated with a 0-1000 scale; its range is adjustable by a front-panel



Bottom view of the Warrior amplifier. The filament choke is mounted directly over the 811A sockets (upper left). Other parts are chiefly power- and bias-supply components.

control and is a sampling of rectified r.f. voltage from the output side of the pi-network tank circuit. Another feature of the amplifier is an adjustable scope take-off for feeding some of the output to the vertical plates of an oscilloscope for monitoring purposes.

The kit comes in two packages, one containing the power transformers and filter capacitor, the other for the remaining components. Construction time was about twelve hours. The instruction manual is quite clear and no problems were encountered in putting the amplifier together.

The manufacturer states the amplifier can be driven by any exciter in the 50- to 100-watt output range; we tried it with a 100-watt job and found we had drive to spare. The amplifier loaded quite easily to the 660-ma. plate current specified on c.w. and worked equally well on s.s.b. — *L. G. M.*

Model HA-10 Linear Amplifier

Height: 11⅝ inches.
Width: 19½ inches.
Depth: 16 inches.
Weight: 90 pounds.
Power requirements: 1250 watts, 117 volts, 50/60 cycles.
Price Class: $230 kit, $330 wired.
Manufacturer: Heath Company, Benton Harbor, Michigan.

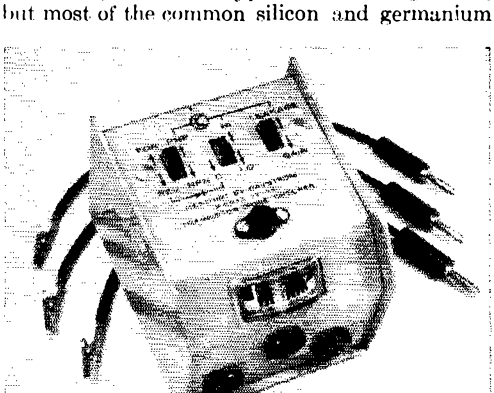
Heathkit Transistor-Diode Checker Kit

With all the new semiconductor devices on the scene today and with transistor build-it-yourself projects becoming increasingly popular, it is only natural that some method of testing these devices is in demand. Several transistor test circuits have appeared from time to time in *QST*,[1] and now the Heath Company has brought out a combination transistor-diode checker kit. Although the unit is strictly a "relative quality" tester — the meter simply has a 0-10 scale — it can help in deciding whether or not to replace the transistor or diode under test.

The model IT-10 is certainly uncomplicated when it comes to circuitry and construction, and should satisfy the busy ham who is interested in an evening's construction project. The total time involved, from opening the package to final testing, is not more than a couple of hours.

Here's what the checker can do: It tests transistors for leakage between emitter and collector terminals (not to be confused with I_{co}, which is collector current with the emitter open). The simplified circuit for this test is shown in Fig. 1A. The battery and meter polarities given are for p-n-p transistors. The tester can also be used to measure relative transistor gain. The simplified p-n-p circuit for this test is shown in Fig. 1B. A negative bias is applied through the 100,000-ohm resistor to the transistor base, causing collector current to flow which is indicated on the meter. The checker can also detect shorts — which are indicated by full-scale reading during a leakage test — and opens, which do not deflect the meter in either leakage or gain tests.

Diodes can also be checked. The diode is connected between the collector and emitter terminals on the checker (Fig. 1A) and the meter deflection noted. Then the battery and meter polarities are reversed by throwing a switch on the checker. The relative meter indications will, of course, depend on the type of diode being tested, but most of the common silicon and germanium



If the transistor or diode under test will not fit the universal socket mounted on top of the checker's case, the three leads furnished with the IT-10 can be used for making connection to the unit.

[1] Heinen, "An Experimental All-Transistor Communications Receiver," *QST*, May, 1956, p. 15.
Priebe, "Checking Transistors," *QST*, April, 1958, p. 20.

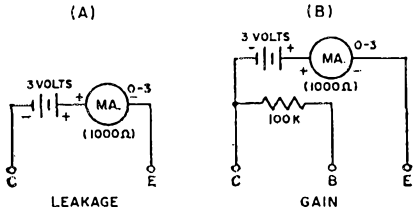


Fig. 1—Simplified circuit for the leakage test (A), and gain test (B).

diodes will show a high ratio of forward-to-reverse current — if they are good. As in the case of transistors, opens and shorts can also be detected in diodes.

In addition, the IT-10 can be used as a continuity tester. The emitter and collector test leads are connected to the circuit under test and the meter will show full-scale deflection with circuit continuity. In order to monitor the status of the internal batteries of the IT-10, the emitter-collector leads are shorted and, if the batteries are up to par, the meter will indicate full scale.

The complete circuit diagram of the transistor-diode checker is shown in Fig. 2. The switches,

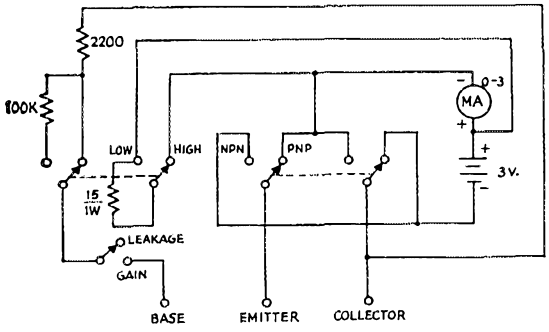


Fig. 2—Circuit diagram of the Heath IT-10 transistor-diode checker. Resistances are in ohms.

meter, and test terminals can also be identified in the photograph. The three 10-inch flexible leads connect the transistor or diode under test to the checker if the test item itself will not fit the socket provided. The leads have a banana plug at one end, for mating with the jacks on the tester, and small alligator clips on the other end.

The three slide switches on the unit include the NPN-PNP switch, which is also labeled FOR-REV, which reverses the polarity of the power supply for either n-p-n or p-n-p transistors and diode tests. The HI-LO switch is used to shunt the meter and, as the diagram in Fig. 2 indicates, reduces the series resistance in the base circuit to 2200 ohms so that a higher transistor collector current will flow in the "gain" test. In the HI position, full-scale meter deflection is increased from 3 ma. to about 175 ma., which is useful in checking high-power transistors. The LEAKAGE-GAIN switch opens the base lead for emitter-to-collector leakage tests. It is a spring-return switch normally in the LEAKAGE position.

The IT-10 is powered by three standard C cells housed in the checker's case. The case, finished in light gray, has a flange around the top and a sloping front so the unit can be placed in any position without having the meter or switches touch the supporting surface.

— *E. L. C.*

Heathkit IT-10

Height: 3 inches
Width: 3⅛ inches
Depth: 3¾ inches
Weight: 12 ounces
Power Requirements: 3 volts d.c. (furnished by two self-contained 1.5-volt type C cells).
Price Class: $7.00.
Manufacturer: Heath Company, Benton Harbor, Mich.

Hammarlund I.F. Noise Silencer

DESIGNED specifically for the Hammarlund HQ-170 and HQ-180 receivers, the Hammarlund i.f. noise silencer is an accessory that provides effective noise reduction in c.w. and s.s.b. reception. The basic circuit is similar to the Lamb silencer of twenty-five years ago, a principle which has been used recently in one form or another in several modern communication receivers.[1,2]

The silencer is inserted electrically in the 455-kc i.f. system and blanks out the receiver for short periods during individual noise pulses. These "blanks" are short enough so that with proper adjustment, the operator will not be aware of the "holes" in the signal.

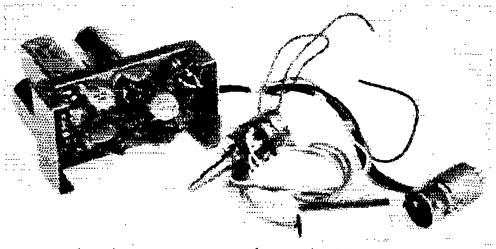
The circuit has two i.f. amplifier stages, a noise rectifier, and a clipper tube. A block diagram of the unit is shown in Fig. 1; the actual circuit closely resembles the one that has been in the receiver chapter of the *Handbook* for the past few years. Signals and noise at the input end of the silencer are amplified by the 6BH6 and then detected by V_{3A}. The resulting audio signal is a.c. coupled to the No. 3 grid of the 6BE6 i.f. amplifier, V_1, across which there is also a 6AL5 rectifier which clips off the positive-going side of the signal. The negative swings reduce the gain of V_1, and since V_1 is in series with the receiver's i.f., also reduces the total i.f. gain. A gain control ("threshold control") in the 6BH6 cathode allows adjustment of the noise amplifier's gain so that V_1 will be "blanked"

[1] "Recent Equipment," *QST*, May, 1958.
[2] "Recent Equipment," *QST*, November, 1959.

by noise pulses having amplitudes greater than that of the desired signal, but will not be affected by the signal itself.

Installing the noise silencer in the HQ-170 or HQ-180 is a short and easy job; fitting one to an HQ-170 took us only about 30 minutes. No special tools were needed; a couple of screwdrivers, nutdrivers and a soldering iron will do. No aligning is necessary, so there's no worry about special alignment tools or procedures. In the case of the HQ-170, the silencer is fastened to the receiver chassis by two self-tapping screws which normally hold the SELECTIVITY-SIDEBAND switch bracket to the chassis. The old NOISE LIMITER control is removed from the receiver's front panel and replaced by the one supplied with the silencer. The new control is actually two separate potentiometers with concentric controls; one replaces the old audio control and the other is the i.f. silencer gain control.

The tube socket adapter shown in the photograph goes between a 6BA6 i.f. amplifier tube and its socket in the HQ-170. Installation in the HQ-180 is similar, except that the silencer chassis is fastened to the inverted spade lug which is located on the top rear end plate of the bandspread tuning gang. It seems likely that the unit could be used with almost any receiver having a 455-kc. i.f., provided room can be found for it near the i.f. system.



The noise silencer is connected to the receiver by the special tube socket and plug at the right; an i.f. amplifier tube is removed from the receiver and is replaced by the plug assembly. The tube is inserted in the top of the special socket and covered by the tube shield in the foreground. The concentric volume controls replace the existing noise-limiter potentiometer on the receiver's front panel. The two loose leads in the photograph connect to the receiver for supplying the heater and +B voltages to the silencer.

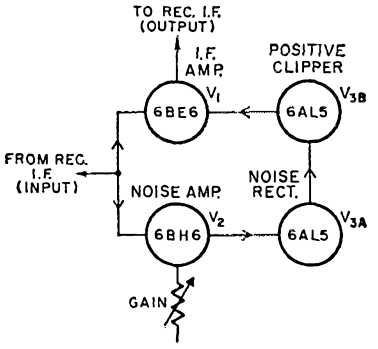


Fig. 1—Block diagram of the noise silencer.

In use, the silencer gain control simply is set to a position where the noise is effectively suppressed. The exact setting depends on the strength of the received signal, the strength of the noise, and the type of noise. The original noise-limiter circuits of the receiver are not affected and can be used separately or along with the silencer. — *E. L. C.*

I.F. Noise-Silencer Accessory

Height: 3¼ inches.
Width: 2⅝ inches.
Depth: 3¾ inches.
Power Requirements: 0.75 amp. at 6.3 volts and about 12 ma. at 225 volts.
Price Class: $35.
Manufacturer: Hammarlund Manufacturing Co., Inc., 460 West 34th St., New York 1, N. Y.

Strays

Speaking of Field Day

Some of the KL7s held an Alaskan Field Day last January, and you can see from the photo (right) that conditions were (we hope!) somewhat different than those most of us will experience on June 24–25. The temperature was 20 degrees below zero while KL7DDQ was tightening the tent stays. Other members of the Arctic ARC in Fairbanks who participated in this "Operation 49 below to the 49 below" included K9JYX/KL7, KL7CWO, KL7DMB, KL7CUH, KL7DHD, KL7AEQ, KL7AZJ, KL7DEJ, KL7DCP, KL7BET, KL7CFM, and WL7DPL.

—···—

W5KOK says not to give up if your generator starter rope breaks on Field Day. Merely tie a knot in a piece of RG-59/U and crank away.

Short QSO Anyone?

BY JOHN G. TROSTER* W6ISQ

HEY, Marge, how much time before we have to leave?

"Twenty minutes?"

"Good, I'll have time for a short QSO. Turn on the rig and here we go."

"Might as well call CQ. Only got a minute. Band's been lousy lately — probably no one on anyway.

"Hello CQ CQ CQ CQ CQ short QSO. CQ CQ CQ CQ CQ short QSO. Calling CQ for a short QSO. CQ CQ CQ CQ CQ CQ —

"Ahhhhhhhhhhhh. Grid current a little low — ahhhhhhhhhh. Ooooooooohhhhhhhhhh. Just touch it a little. That's better. CQ CQ CQ CQ CQ CQ short QSO. Hello CQ for any short QSO. Hello CQ CQ CQ CQ CQ CQCQCQCQCQCQ CQCQCQCQCQ short QSO. This is W6ISQ. Whiskey number six, I Indiana, S Sugar, Q Quebec calling CQ CQ CQ CQ CQ CQ CQ CQ CQCQ CQCQCQ short QSO.

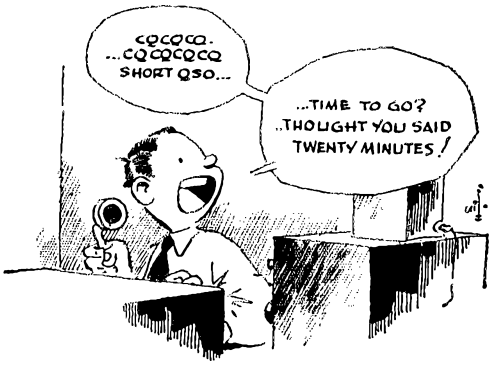
"This thing must not be tuned up right. That s.w.r. up to 1.5 Hmmmmm —

"Ahhhhhhhhhhhhh-Ohhhhhhhhhhhhh. Wonder if those meters are zeroed. Little better. Wonder why this thing detuned since last week. CQ CQ CQ CQ CQ CQCQCQCQ short QSO. Hello for a short QSO.

"Might as well rotate a little more northeast. Hello CQ CQ CQ CQ CQ CQCQCQCQCQCQCQ for any short QSO. Ahhhhhhhh. Ought to have a few more mils.

"Oh well — only have a few minutes. Hello CQ CQ CQ CQ for a short QSO. This is William Six I as in Indianapolis, S as in Saskatchewan, Q as in Queensland — calling CQ for a short QSO. CQCQCQCQCQCQCQCQCQCQ short QSO.

"Wonder if this rig is getting out. CQ CQ CQ CQ CQ short QSO. Ahhhhhhhh. CQ short QSO. This is William Number Six —



"Whatja want, Marge?"

"Time to go? Thought you said twenty minutes! Already???"

"No, I was just calling a short CQ. Probably no one on anyway. Oh well — this is W6ISQ tuning this frequency to swap signal reports. K."

"Will ya listen to this frequency — nothing but heterodynes. How come everybody always piles up on my frequency? Too many people on these days. Ought to widen the bands or something — maybe new super license or something. How can anyone get a QSO with conditions like these?"

"Oh well, I don't think this old kw. is working like it ought to — probably didn't get out of town with that CQ. Beam probably needs a good working over too. Guess I'll have to dig into the rig and see what's the matter. Ought to be able to work some one once in a while!"

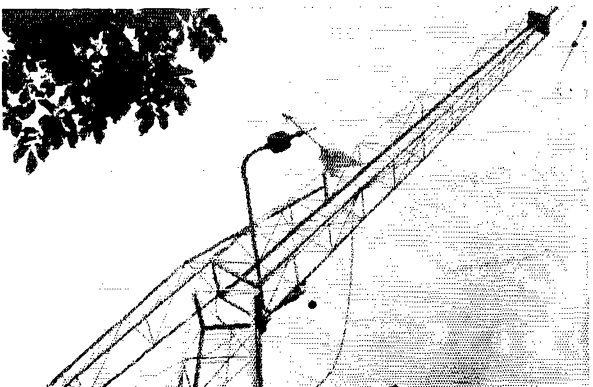
"Yeah — I'm coming. All this QRM, how can anybody work anything anymore?"

"Oh well. Can't expect too much from a short CQ anyway." QST

* 45 Laurel Avenue, Atherton, California.

Strays

WA2MLH was called out to service a microwave relay tower near Kingston, N. Y. one night in February during a howling snow storm. The drifting snow closed the road to the tower and so he and another technician were marooned at the tower site without food. But he reckoned without K2CWI, who lives at the foot of the hill where the microwave tower is located. K2CWI realized the two technicians were marooned and must be hungry, and so he plunged through the snow on foot (snowshoes, perhaps?) with a basket of food. He made two more trips later in the day before the access road was finally plowed.



Here is K5UHP's home-brew tilt-over tower. Shown here partly tilted over, the triangular section to the left serves both as a strengthening member for the joint and as a lever for tilting the tower up and down. This tower is self-supporting, and is anchored to a concrete base.

QST for

I.A.R.U. News

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." **Bold face listings indicate corrections or additions.**

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. Vienna I/9, Box 999
Azores: Via Portugal
Bahamas: **Via ARRL**
Barbados: Arthur St.C. Farmer, Storms Gift, Brandons, Deacons Road, St. Michael
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
Congo: U.C.A.R. QSL Bureau, P.O. Box 3748, Elisabethville
Cook Islands: Bill Scarborough, %, Radio Station Rarotonga
Costa Rica: Radio Club of Costa Rica, Box 2412, San Jose
Cuba: **F.A.R.A.C. QSL Bureau, P.O. Box 6996, Habana**
Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol
Czechoslovakia: C.A.V., P.O. Box 69, Prague I
Denmark: E.D.R. QSL Bureau, Ingstrup
Dominica: VP2DA, Box 64 Roseau, Dominica, Windward Islands
Dominican Republic: Jose de les 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, P.O. Box 5757, Guayaquil
Ethiopia: 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 & DL5 calls only:) DL4 & DL5 QSL Bureau, % DL4VJ Base MARS Station, APO 130, New York, N. Y.**
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 & Telecommunication 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 534, New Delhi
Ireland: I.R.T.S. QSL Bureau, **24 Wicklow St., Dublin 2**
Israel: L.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. (m), APO 925, % 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., P.O. Box 907, Mexico, 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
Nigeria: Dr. M. Dransfield, ZD2JKO, Regional Research Station, Samaru, Zaria, Northern Nigeria
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 898, Oslo

(Continued on page 136)

1961 ARRL Field Day Rules

Annual Test for Emergency-Powered Stations, June 24–25

READY for the Field Day? If not, you're just not with it. Thousands of amateurs in the ARRL Field Organization are busily readying generators, planning operating schedules, allocating assignments and otherwise impatiently awaiting this official radio-amateur way to start the summer season.

With emergency preparedness the theme, clubs and groups will take to the field and set up and operate stations independent of normal power facilities. You can participate with a club or non-club group portable; one- or two-man portable station; mobile; emergency powered home station or as a regularly powered home station. What ever your class of participation, you're sure to gain valuable operating experience under atypical conditions as well as have a grand time.

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 "calling any Field Day station" 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. 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 24 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 FC rules, which follow below, very carefully; a scan of last year's FD results (December 1960, *QST*) may give you some hints.

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 provision 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, in-

stallations 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 Contacts: 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.

10. Scoring:

Points: Each valid contact counts 1 point.

Message Credit: Credit or 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: 5. 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.

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

(*Continued on page 134*)

FIELD DAY TIMETABLE

Time	*Start*	*End*
	June 24	June 25
GMT	2100	2400

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

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 STIMULTANEOUS 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)

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.

VE/W Contest—1960 Results

LAST September 24–25, the Montreal Amateur Radio Club hosted its annual VE/W Contest for single-operator stations. When the QRM cleared, contest chairman VE2BB found himself with 383 logs, representing all Canadian and 60 U. S. sections. The 1960 trophy for top contest score goes to VE2NI with 151,528 points (higher than last year's top tally from K6SXA). Other high VE scores were summed up by VE7EH 115,473; VE7AOI 92,814; VE3AGX 91,575; VE2YA 86,826; VE5KY 84,240 and VE6AO 84,075. The highest W score was entered by W5KC with 116,314.

After eight years of administering the VE/W activity, VE2BB and XYL plan to step aside for others and at this time wish to thank all amateurs for their friendliness, cooperation and patience.

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

Maritime

VE1EK	65,121
VE1IV	63,308
VE1IM	59,724
VE1ADH	54,230
VO2NA*	36,750
VO1DC	33,578
VO1CI	29,358
VO1AW	15,402

Quebec

VE2NI	151,528
VE2YA	86,826
VE2ATU	51,792
VE2DR	49,404
VE2ARA	40,386
VE2GK	34,410
VE2HN	32,238
VE2BAE	31,866
VE2GP	31,284
VE2AEW	27,540
VE2BDU	21,112
VE2AWO	20,640
VE2AIP	19,836
VE2BV	19,780
VE2BB	12,608
VE2AWR	11,088
VE2PZ	10,200
VE2AGQ	4785
VE2AFD	3933

Ontario

VE3AGX	91,575
VE3CWA	87,672
VE3IR	81,540
VE3CZJ	76,725
VE3EMA	66,768
VE3DGW	64,008
VE3BOG	61,242
VE3EAM	59,000
VE3MI	57,592
VE3CXL	49,920
VE3AHU	44,802
VE3RIT	44,712
VE3DH	44,352
VE3BLU	41,808
VE3CWE	35,256
VE3EGG	34,188
VE3CZG	32,850
VE3CVI	28,482
VE3CSM	23,940
VE3SZ	23,715
VE3ATZ	22,542
VE3DYJ	18,840
VE3AO	16,036
VE3BWL	13,206
VE3RN	12,874
VE3BZT	12,285
VE3DU	7956
VE3BUU	4992
VE3BOI	4221
VE3AUU	4134
VE3ETM	4048
VE3BYD	4020
VE3DDU	4000

Manitoba

VE4NR	72,000
VE4MH	34,369
VE4GS	17,286
VE4ZX	15,618
VE4CF	8880
VE4AK	2580
VE4JT	2420

Saskatchewan

VE5KY	84,240
VE5DZ	23,870
VE5XP	5824

Alberta

VE6AO	84,075
VE6SF	60,180
VE6HH	32,589
VE6BK	32,480
VE6NAA	26,826
VE6IM	21,828
VE6AAV	5280
VE6GN	3120

British Columbia

VE7EH	115,473
VE7AOI	92,814
VE7XD	67,680
VE7ASY	51,642
VE7AQN	50,787
VE7AGC	48,600
VE7XN	48,051
VE7OJ	27,360
VE7AC	27,242
VE7BDP	27,048
VE7BED	25,578
VE7BFN	9660

Yukon/N. W. T.

VE8GW	53,583
VE8RW	15,456

E. Penna.

W3AIZ	86,205
W3GYP	79,275
W3AHX	63,356
W3EFY	44,836
W3ARK	28,880
W3FHR	25,125
W3ADE	19,981
K3ANU	12,635
W3MFW	12,480
K3IIA	8123
W3EWR	4512
K3HTZ	3791
K3GTQ	3032

Md.-Del.-D. C.

W3AYS	77,976
W1KGH/3	46,786
K3KHK	12,130
K3JYZ	9097
W3MSR	7220
K3KPZ	6714

S. N. J.

W2EXB	64,980
W2QDY	45,160
K2BNS	12,130

W. N. Y.

K2IMK	67,080
WA2DGG	49,818
WA2ANA	40,450
WA2CUZ	8945
K2KKI	217

W. Penna.

K3ATJ	18,294
W3LOS	15,595
W3MGP	9350
K3DFU	2924

Illinois

W9PNE	95,551
W9LNQ	84,312
W9QQG	60,215
W9CLH	58,482
K9DWG	57,507
K9JLR	47,760
K9MMS	37,526
W9QXO	17,328
W9YDQ	16,028
W9FFQ	15,595
K9RHN	13,646
W9MAK	10,398
K9ALP/9	9815
K9LGH	9476
K9IWS	1549
K9TOI	162

Indiana

K9KJD	70,665
K9RFW	68,229
K9JZZ	60,070
K9KLR	56,533
K9ICG	52,562
K9TZH	39,475
K9UKM	23,501
K9SGZ	11,696
K9OYK	7778

Wisconsin

W9DYG	80,900
W9NLJ	64,330
K9LWV	52,417
W9RKP	52,039
W9CHD	38,501
K9MKC	34,223
W2MTA/9	26,786
K9OPF	24,368
W9AEM	21,931
K9GDF	10,234
K9RZB	162

No. Dak.

KØMPH	41,587
KØRHE	7364

Minn.

KØSNC	65,305
WØRLI	52,146
KØIKL	42,885
KØSNG	37,650
KØOTH	6505
KØVTG	217

Ark.

K5TST	11,264

La.

W5KC	116,314
W5BAU	88,207

Miss.

W5AMZ	53,121

Tenn.

K4PUZ	98,770
K4RIN	90,332
K4LPW	65,305
W4PHW	38,988
K4GMR	26,318

Ky.

W4OMW	34,115

Mich.

W8APN	93,085
K8KVV	80,412
K8LJB	60,143
W8VPC	41,912
K8QEX	40,450
W8CXS	23,248
K8JGZ	20,794
K8OSQ	19,888
K8IUZ	12,635
K8PCA	9585
W8TRN	4115
K8HLR	3899

Ohio

W8OHW	102,019
K8IPS	48,248
W8DWP	47,940
K8EGY	39,860
K8BXU	29,241
K8HTM	23,259
K8QHJ	21,660
W8YGR	18,844
K8HBN	17,815
W8YPT	16,561
K8TJW	8231
K8RMK	3682
K8GKF	2653
K8KMY	2599

E. N. Y.

W2TER	54,583
K2SPP	13,643
WA2EFY	7852

N. Y. C.-L. I.

K2UVV	73,965
K2GTC	70,864
WA2EFN	50,684
WA2CZG	46,136
K2UAR	29,241
K2OWE	24,593
WA2AZE	23,880
K2RAR	17,057
W2DUN	14,512
WA2DES	12,346
W2NCG	11,372
K2IVE	10,830
K2TPZ	8447
WA2DHF	8285
WA2FMS	7105
WA2IKN	5198
WA2JZX	4268
WA2ITR	3411
W2UAL	2925
W2NHH	1083

N. N. J.

K2KFP	80,413
W2LHL	56,605
K2UUT	52,635
WA2EBR	50,684
WA2DPT	43,540
WA2ASM	35,677
W2EQS	21,227
WA2IFS	18,298
W2FXZ	12,996
K2CCF	8935
K2MFF	8093
W2NEP	3466
W2NIY	3249
W2EWZ	542
W2CVW	348
WV2IOX	54

Iowa

KØUAF	50,684
KØAZJ	47,652
WØDSP	13,898
KØHQE	1787

Kansas

KØBHM	16,450
KØGZP	15,667
KØTHN	12,996

Missouri

KØUDQ	36,389
WØFLN	34,115
WØKCG	34,115
KØVXU	33,140
KØQWS	31,190
KØVSH	21,660

Nebr.

KØQIX	29,565
KØPKW	16,570

Conn.

W1WY	81,387
W1DDJ	51,984
W1TS	36,389
W1AW[1]	28,880
K1JGK	7960
W1INB	2599

Maine

W1GKJ	56,045
W1EQ	18,194
W1SWX	18,194
K1MZB	7760

E. Mass.

K1CLT	65,630
K1DIR	33,790
W1NJL	26,154
K1DPB/1	7040

* Newfoundland/Labrador Winner. [1] W1WPR, Opr.

The following log was received too late to be ruled valid: WA2EKE 35,956.

MARC thanks the following amateurs for submitting check logs: VE3JF, VE6HM, W5ARJ, K6KUU, W7QAP, K9QBV.

(Continued on page 136)

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

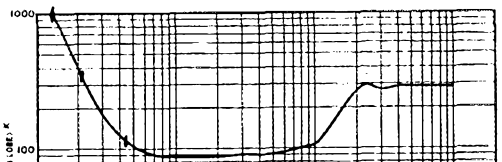
IT was just a year ago this month that the Rhododendron Swamp V.H.F. Society first started hearing echoes of their 1296-Mc. signals returning from the moon. These first echoes were obtained using a 30-watt output transmitter and an 18-foot parabolic dish. They were, in truth, weak, but they were repeatable and could be obtained at will. At the time we only knew of three other groups who were seriously interested in moon-bouncing experiments. At the present time there are at least 30 interested groups, and 12 of these groups are actively engaged in constructing equipment for use on moon-bounce experiments. Not all the interest has been centered on 1296 Mc. Several of the groups are concentrating on 2 meters; others are working on 50 Mc. and 432 Mc. A good portion of the "planning but not in construction stage" groups are concentrating on 220 Mc.

There is a natural tendency for anyone who is planning a moon-bounce effort to choose the band on which he feels his equipment is best suited to the task. In our efforts we explored the possibilities of 50 Mc. and 144 Mc. and as a result of these explorations decided that the most useful frequencies would be those above 420 Mc. The reasons we had for choosing 1296, however, did not exclude the possibility of using the lower frequency bands. The accompanying chart which shows antenna temperature *vs.* frequency is one of the prime reasons for looking above 432 Mc. to obtain optimum moon-bounce transmissions. As can be seen, the antenna temperatures at 144 Mc. are 10 times higher than those at 1296 Mc. 220-Mc. antenna temperatures are only 5 times as bad and 432 Mc. antenna temperatures are almost comparable. The prime deterrent for 432 Mc. is, of course, the existing power limit which makes the necessary antenna gain prohibitively high. This additional noise obtained at the lower frequencies does not, however, rule out their use for moon-bounce purposes, as the path loss in sending the signal to the moon and back is considerably less at the lower frequencies.

Without going into any extended calculations on how we obtain the number, the path loss of a one-meter signal leaving the earth, reflecting from the moon and coming back to the earth is 258 db. (This figure neglects other incidental changes in the path loss caused by variations of distance to the moon, absorption in the ionosphere, etc.) Now this 258 db. at one meter varies as the square of the wavelength or, to put figures on it at 1296 Mc., the path loss has increased to 271 db. whereas at 144 Mc., it has decreased to 252 db. — so that a signal traveling to the moon and back at two meters suffers 19 db. less loss than one traveling the same route on 1296 Mc.

Interestingly enough the gain of a fixed aperture antenna array varies in the exact opposite manner. For example, an 18-foot dish can give 35 db. gain at 1296 Mc. and 16 db. gain at 144 Mc. It should be observed, however, that the additional 19-db. gain obtained on 1296 Mc. for the same size dish is obtained once on transmitting and once on the receiving so that, in fact, the system antenna gain is 38 db. higher on 1296 for a constant size array.

Now in case you're confused as to what we mean by path loss, the 271-db. path loss for a 1296-Mc. signal means that a signal leaving your antenna will come back from the moon 271 db. weaker than it left. In calculating your chances of successful moon bouncing, the first step is to subtract the antenna gain from the path loss. In the case of an 18-foot dish used on 1296 Mc., this gives us approximately 35 db., which gain will be obtained once when the signal is transmitted and once more when the signal is received, for a total of 70 db. antenna gain. This 70 db. subtracted from the path loss leaves a resultant path loss for our signal of 201 db. The next calculation required to evaluate your system is to determine the weakest signal that your receiver can detect. In order to properly evaluate the minimum discernable signal capabilities of your receiver, the band width of the receiver, the noise figure or temperature of the receiver, the loss in the feed line between the antenna and the receiver, and the temperature of the antenna or the incidental noise coming in the antenna must all be taken into account. By modern standards, there is no excuse for having a receiver noise figure any worse than 1 db. and on 1296 a system temperature of 150° Kelvin should be obtainable. This would be approximately equal to having a 2-db. noise figure system. The additiona



Antenna temperature versus frequency.

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

noise over the receiver noise figure is generally incurred in feed-line loss and added antenna temperatures. This is the point in which the 50-Mc. or 144-Mc. receiving systems will suffer most, as the added antenna temperature will degrade the performance of the receiving system.

The band width of the receiver can be chosen to suit the particular fancy of the operator. In general it is safe to say that a 100-cycle band width has a 10 db. signal-to-noise advantage over a 1000-cycle bandwidth. If we assumed a 2 db. noise figure and a 100-cycle passband, the equivalent noise input of this receiver would be −151 dbm. or 151 db. below 1 milliwatt. Now this 151 dbm. is subject to considerable variation due to the integration ability of the human ear. Or to put it another way, the 10-db. advantage of the 100-cycle bandwidth over a 1-kilocycle bandwidth may be entirely offset by the ability of the ear mechanisms to produce an equivalent narrow band width of their own. Unfortunately this innate ability of the ear is somewhat difficult to calculate and varies to some degree from operator to operator, as witness the DX man who can hear more with an SW3 than another one can hear with a 75A-4. Suffice it to say that the 151-dbm. signal which will appear in the 100-cycle bandwidth is a signal equal to the noise already existing in the receiver and to the ear will be approximately 10 db. above the noise. It now remains only to calculate how much transmitter power is required to come back from the moon with a signal of at least −151 dbm. The difference between 1 milliwatt and 1 watt is 30 db. If our receiver can hear a −151 db. below a milliwatt signal, it can obviously hear a −181 db. below a one watt signal. Now the remaining path loss after subtracting the 70 db. of antenna gain was found to be 201 db. of loss. Thus if we transmitted a 1-watt signal the returning signal would be 201 db. below 1 watt or approximately 20 db. weaker than our receiver capability. So in order to obtain a signal equal to our receiver capabilities, we must add 20 db. of power to our 1-watt transmitter or 100 watts. So we find that a 100-watt transmitter using a 35-db. gain antenna at a frequency of 1296 Mc. into a receiver having a 2-db. effective noise figure and a 100-cycle passband will return a signal which is equal to a noise in our receiving system and which to our ears will be somewhere between 6 and 12 db. over the noise. So much for system requirements on 1296 Mc. The only case that can be made for lower frequencies is that the path loss is less and the antenna temperature is somewhat higher and these to some extent balance out.

Karl Lickfield, DL3FM, v.h.f. Editor of DARC, seated at the controls of the W1BU moon-bounce station.

The second problem which occurs at lower frequencies is the phenomena known as faraday rotation. Without delving into the technical aspects, what this means in plain English is that the polarization of a signal which passes through the ionosphere is shifted. The amount that the polarization is shifted depends on the angle at which it passes through the ionosphere and the frequency of the transmitted signal. This faraday rotation is practically zero at 1296 Mc. However, at 432 and lower it is a definite problem which must be contended with. Now one should not assume that the rotation is completely random and, in fact, as one tracks the moon the resultant change in polarization on the returning signal varies quite slowly. So if the receiving antenna can be rotated in polarization to optimize the received signal, it will be quite adequate for at least an hour's transmissions. The thing that is difficult is to predict exactly how much it will be at a given time for any given frequency. The obvious solution to this problem is to use circular polarization. However, while this solves the problem of faraday rotation, it does not solve the problem of hearing your own signals as the direction of rotation of the circular polarized signal is reversed when it is reflected from the moon. This means that if you transmit left-hand circular polarization, the received signal will come back with right-hand circular polarization. Once again this would not be a problem if the receiving equipment is separate from the transmitting equipment, as the transmitter can use left hand circular and the receiver can use right hand circular. However, the operator who is attempting to hear his own signals must provide a system of reversing his direction of rotation between transmitting and receiving. Furthermore, it means that if two stations are set up to exchange signals, all other stations can either hear one of the other but not both of the stations. The solution is an antenna with a switchable circular polarization and almost all commercial type installations have this capability. All this really boils down to is that a 150-foot parabolic dish with provision for right and left hand circular polarization will give approximately the same results on 144 Mc. as an 18-foot dish will give on 1296 Mc. Furthermore, the signals from the Rhododendron Swamp V.H.F. Society moon-bounce effort could be received on a 4-foot diameter parabolic antenna system with a good parametric amplifier following it.

Speaking of moon bounce, as we were, we were just privileged to receive a visit from Dr. Karl G. Lickfield, V.H.F. Editor of the Deutscher Amateur Radio Club in Germany. Karl is engaged in a scholarship effort to produce a 1296-Mc. moon-bounce installation. With any luck his installation should be completed and on the air before the end of 1961. He plans to use a 10-foot parabolic dish on a polar mount. His receiver, of course, will utilize a parametric amplifier feeding a narrow-band i.f. system. The transmitter will employ an RCA 7650. To date he has the antenna and is expecting within a month completion of his

polar mount. The transmitter hardware for the final stage is completed. And, hopefully, after his return visit to various installations in this country, his parametric amplifier will be completed.

Here and There on 6 and 2

Why is it that towers, antennas, feedlines, rotators, etc., all seem to "give up the ghost" when contest time is drawing near? We've all seen it happen many a time; or else they hold up until the contest is started and then one thing after another lets go, including the operator's voice. According to Walt, W4FWH, it has happened to him. High winds from a series of tornadoes north of his QTH in Doraville, Georgia, caused serious damage to Walt's tower and beat the elements to pieces. Because of the angle at which the tower was left leaning after the winds, the tower and antenna had to be dismantled and are in the process of being rebuilt. Walt is planning on operating the June v.h.f. contest from Brass Town Bald Mt. with gear on three bands, 50 Mc., 144 Mc. and 220 Mc. If the fellows' backs hold up and they are able to carry 420 Mc. gear, that also will be on the air. From what we heard at the Delta Division Convention from Walt about that operating mountain top, it will most certainly be a good station to listen for during the contest. So far the operators lined up for that little excursion are W4VHH, W4NWK, W4LNG and W4FWH.

Another report from a station ready for the June contest is one from Charlie, W4TLC, who sez he'll be operating on 50 Mc., 144.115 c.w., and 220.20-Mc. c.w. He'll be running 30 watts on six, and 250 on 2 and 1¼ meters.

Armond, K7MFA, says that when he moved to Casper, Wyoming, from Los Angeles he got a Heathkit HW-29 Sixer and is now enjoying low power. With the Sixer and a five-element beam, Armond has worked fourteen states and one Canadian section since his arrival in Wyoming. Among the other information he gave us was included the names and calls of six v.h.f. hams in Casper: W7VTB, W7UFB, W7PSO, K7GLL, W7VDZ and K7MFA. This is very good news for the east-coast boys and we surely will be listening for those calls when the skip stretches a bit.

A quick report from Brian, W4OAB, tells us that most of the v.h.f. activity in and around Charlotte, North Carolina, is on six meters, with most cars being equipped with "Six-ers." He has yet to hear a station above 50.5 Mc. This report brings to mind something that has popped up a number of times; according to what we *hear* there is a great deal of mobile activity on 50 Mc. But when have you read any reports of mobile operation in this column? If there is so much mobile activity, there must be a great many of the v.h.f. gang interested in hearing what the others are doing, both locally and otherwise. Don't ask us! 'Cause no one reports! Ask the friend that you know is mobile to ask his friend who is also mobile to send us a report so that we know for certain sure there is 50-Mc. mobile activity in your area. Now if the foregoing doesn't make much sense, just go back and read it over again. In this case "No news is (*not*) good news."

On the West Coast K6HCP has completed his six-meter s.s.b. rig and is running a C.E.10B to a 6360 to 2 6146's to 2-4CX300A's g.g., about 850 watts. Ken has been keeping schedules with W6FZA (178 miles) and has heard W6NLZ, but as yet no contact. The foregoing all using s.s.b., by way of scatter and meteor bursts. Ken is also working with the 6CW4 nuvistor converters for six meters and says the circuits can be improved by "tweeking."

Not many reports of "skip" for the month. A report from Mike, K3GEZ, Blairsville, Pennsylvania, gives his version of the opening of April 7. Although Mike did not work the opening, he heard many strong signals, the strongest of which were K5RGO/5 in Wimberly, Texas, and K4SFH in Mobile, Alabama; he also copied stations in Mississippi and Oklahoma. Mike is most interested in knowing whether any of the 4s or 5s heard him during the opening. Activity has picked up considerably in that area, Indiana, Cambria and Westmoreland counties, during the past year, with about fifteen new stations on the band. A second report on this same opening comes from Independence, Missouri, where KØILB and his son Bill, KNØFTO, were hearing Florida and Texas among others.

During the month of March, Dot Hall, KØGIC, had one lone skip contact on 50 Mc. That was on March 10 with WA6FTZ at San Diego, and was the last station needed for the WASD Certificate. The following day, March 11, KØGTK worked into Kansas City and heard Florida working into Oklahoma. On the 11th WA6KVS also reports an opening, for him into W5-land, along with the news that W2ILQ was heard in California during that opening. On the 13th the band was open for Jim to WØ and W7 areas. Mar. 15 the band was open once again to the 5's with reports that K9HUY was heard, and a final very erratic opening on March 31 when Øs, 7s and 5s were coming through, and very heavy QSB on the locals.

Last "opening" report received was from our old friend Jay Thornhill, K4KLD, who reports hearing LU4DOZ in Argentina on April 14. First heard Arthur at about 1:50 P.M., EST and when his signals came up to S8 (2:15) Jay gave him a call, had a ten-minute QSO, then signed. Last Jay heard Art was approximately 3:00 P.M. when he was working the boys in Florida. Art was running 10 watts to a three-element beam. No other South American stations were heard at that time and no others reported.

Now to aurora: WA2HFI reports hearing VE3AQG during the aurora of March 5. Fred also announces his plans for operating portable with W2MVA during the June v.h.f. contest. They'll be going to Mt. Greylock, Massachusetts or Mt. Washington, New Hampshire. Good luck, fellas! W3RTV heard W1s, W2s, W3s, W9s and W8s during the same auroral period on March 5. Jules says all were heard on 50 Mc. on c.w. Could copy no phone signals. K2HUK also reports 2s, 3s and 8s coming through via aurora on that date; sez only locals could be copied on phone. Stan is keeping an eye open for an APX-6 and is trying to arouse interest in his area about 'em. WA2BPE worked Ohio, Massachusetts, Michigan, New Jersey and New York on 50 Mc. during the six-hour auroral opening and ended the evening by working K9GFQ in Indiana. Tom also noted very poor auroral conditions on the nights of March 9, March 19, and March 27. W8NOH has been working diligently, both on his equipment and on the air, and has raised his states worked on 144 Mc. to 31. New ones to obtain this total are North Carolina, Kansas, and South Dakota. Lou reports the March 5 Aurora also, hearing 9s, 8s, 4s 3s and Øs coming in with good strength on 144 Mc.; he heard a few on 50 Mc. c.w., but very little on phone. On March 12 Lou was hearing Wisconsin, Indaina, Illinois, Ohio, Iowa and Kentucky on 144 Mc. at his own QTH in Michigan. On 50 Mc. he reports hearing "VYXC" on c.w. on 49.520 Mc. fading rapidly up and down, strength 4–6, with the beam south. This may have been back-scatter. Whether or no, it is put out in Canada. According to Lou the local v.h.f.ers are still "with it." W8WVP is running 200 watts on 144 Mc. K8QPI is putting up a new antenna for 220 Mc. and is working cross-band, 50 Mc., with K8IRW. K8BXX has a new 5 over 5 on 144 Mc. K8BGZ, Lansing, Michigan, heard 2s, 8s, 9s and Øs during the aurora of the 5th. Dave observes that two-meter activity is steadily increasing in his area while six-meter activity seems to be falling off. Revamping job is being done at the station of K8BGZ, including the erection of a fold over tower and a larger antenna for two meters. Factory over-haul job being done on receiver plus the 6CW4 converter. K1CXX, Auburn, Maine, adds his comments to the effect that he worked New York, New Jersey and Pennsylvania during the same aurora on 144 Mc. with good reports. Also mentions several other very poor (weak) auroral sessions during March and comments that he hears aurora quite frequently when no one else seems to be aware of it. Just may be that far northern location of yours, Dick, maybe it doesn't come down this-a-way.

We've had a great many more reports of that March 5 auroral session which seemed to be the big one for that month. A number of the boys also agreed with K1CXX and WA2BPE in stating that there were several very poor auroral sessions during the month of March.

W4ZBQ and W4HHK at the Chattanooga ARRL Delta Convention. V.h.f.-ers abounded.

From K4EUS in Virginia we received a complete report of his activity during the March 5 auroral session, on 144 Mc. "Got on at 1820 and was on until 2305. Signals faded out completely at times but there were some 'A' signals coming through about 80% of the time. I worked W1PZA, New Hampshire, at 1825; W2WZR, New York; and K1CRN, Rhode Island at 2132. I called but heard no reply from VE3NW, K9EUU, VE3AQG. Also heard K1CRQ/8, W8BAX, W2SJX, W8WNM, K2GQI, W1HUD, W2ESX, W8EKJ, W2QMK, W2RTG, W1REZ, K1AOX, W2LWI, W4HJQ, W2RCK, W2AZL, W2NCF and W9EGH. At about 2130 EST K3HDW with both regular and 'A' signal simultaneously, this was off the back of his beam — he is about 125 miles north of here. At about 2155 W3SFY was heard S7-T9 with my beam pointed at him. Swinging the beam around to the northwest caused his signal to change from T9 to 'A' with strength of 7 when 30 degrees west of north. Swinging my beam back toward W3SFY brought the signal back to T9."

Report received from K2KIR at deadline time tells of aurora on April 15 during which time Bud heard W1ET, New Hampshire; W1JSM, Massachusetts; K4VWH, Virginia; W3LNA, Pennsylvania; W1REZ, Connecticut; W9BOZ, Illinois. Bud is a recent convert to the v.h.f. bands and enthusiasm is running high. He is currently using an 8-element beam, driving an LW converter. By June he hopes to have something on c.w. but finds it a bit more difficult to do on two meters than on 80. Good luck, Bud! Another parabola in construction is one by K6AXN who has a 16-foot parabola about completed. It was constructed in eight pie-shaped sections, has an aluminum foil surface, and the construction is molded fiberglass and resin with plywood ribs to stiffen it and to provide a flange on the back to bolt the sections together. All sections were formed over the same plaster mold.

W1EHF/1 will be operating from Mt. Agamenticus, Maine, on Saturday evenings during the month of June. Operation will be on 220.085 Mc. between 8 and 9:30 P.M. and will switch to 432 Mc. upon request. At approximately 9:30 P.M. operation will commence on 432 Mc. Operation during the June contest will begin at 3:00 P.M. local time Saturday and conclude at 6:30 P.M. on Sunday. The 432 Mc. rig will be running 32 watts output to a 44-element array and a Tapetone converter with parametric amplifier in front of it. 220-Mc. equipment will consist of 75 watts output to a 32-element yagi with a Tapetone converter and a parametric amplifier. C.w. QRS (narrow bandwidth). Schedules can be arranged by addressing Frank Vernon, W1EHF, 1 George St., Cambridge, Mass.

W4VVE is back on 432.65 with 4X150 and 56 elements. Chic will have his beam to the northeast nightly at 10:00 P.M. EST. He also has 100 watts s.s.b. on two meters now and expects to increase to about 400 watts soon. QST

220- and 420-Mc. STANDINGS

220 MC

W1AJR	11	4	480
W1AZK	9	3	412
W1HDQ	11	5	450
W1OOP	12	4	400
W1RFU	15	5	480
W1UHE	11	4	385
W2AOC	13	5	450
K2AXQ	8	3	230
K2CBA	10	4	325
K2DIG	4	3	140
W2DWJ	15	8	740
W2DZA	12	5	410
K2KIB	12	4	300
W2LRJ	10	4	250
W2LWI	11	4	400
W2NTY	12	5	300
K2PPZ	11	4	190
K2QJQ	13	5	540
W2SEU	4	2	150
W3AHQ	4	3	180
W3FEY	10	5	350
W3JYL	8	4	180
W3JZI	4	3	250
W3KKN	10	4	255
W3LCC	8	5	300
W3LZD	15	5	425
W3RUE	9	5	450
W3UJG	13	5	400
W3ZRF	5	4	112
K4TFU	8	4	400
W4TLC	4	1	185
W4UYB	7	5	320
W5AJG	3	2	1050
W5RCI	8	5	700
K6GTG	2	1	240
W6MMU	2	2	225
W6NLZ	3	2	2540
K7ICW	1	1	250
K8AXU	10	5	1050
W8IJG	9	5	475
W8LPD	6	4	480
W8NRM	8	4	390
W8PT	10	5	660
W8SVI	6	4	520
W9AAG	9	4	600
W9EQC	11	5	740
W9JCS	5	2	340
W9JFP	9	4	540
W9OVL	6	3	475
W9UED	4	4	605
W9ZIH	10	5	500
KØDGU	5	3	425
KØITF	6	3	515
KH6UK	1	1	2540
VE3AIB	7	4	450

420 MC

W1AJR	8	3	230
W1HDQ	8	3	210
W1MFT	8	3	170
W1OOP	11	3	390
W1RFU	7	4	410
W1UHE	6	4	430
W2AOD	6	4	290
W2BLV	12	5	360
K2CBA	5	3	225
W2DWJ	10	4	196
W2DZA	5	3	130
K2KIB	4	2	100
W2NTY	3	2	100
W2OTA	9	3	200
K2UUR	7	3	175
K3EOF	6	3	250
W3FEY	7	3	296
W3RUE	2	2	96
W4HHK	5	4	550
W4VVE	7	4	430
W5HTZ	3	2	400
W5RCI	9	3	600
W6GTG	1	1	180
W7LHL	2	1	180
W8HCC	3	2	355
W8HRC	3	2	250
W8JLQ	4	2	275
W8NRM	3	2	390
W8PT	4	3	310
W8RQI	4	2	270
W8TYY	7	4	580
W8UST	3		255
W9GAB	9	4	608
W9AAG	5	3	375
W9OJI	6	3	330

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

2-METER STANDINGS

W1REZ	32	8	1300
W1AZK	28	8	1205
W1KCS	24	7	1150
W1RFU	24	7	1120
W1ARJ	23	7	1130
W1HDQ	22	6	1020
W1MMN	21	7	1090
W1IZY	20	7	1180
K1CRQ	19	6	800
W1AFO	17	6	920
K1AFR	17	5	450
W2NLY	37	8	1390
W2CXY	37	8	1360
W2ORI	37	8	1320
K2GQI	33	8	1200
W2BLV	30	8	1020
W2AZL	29	8	1050
K2IEJ	27	8	1060
W2AMJ	25	6	960
K2LMG	24	8	1160
K2DWJ	23	6	860
K2HOD	23	7	950
W2PAU	23	6	753
W2ALR	23	7	960
W2RXG	23	8	1200
W2SMX	23	7	1090
K2CEH	22	6	940
W2LWI	21	6	700
K2KIB	21	5	900
W2ESX	20	6	750
W2WZR	19	7	1040
W2UTH	19	7	880
W2RGV	19	8	720
K2RLG	17	6	980
W3RUE	33	8	1100
W3GKP	31	8	1180
W3SGA	31	8	1070
W3TDF	30	8	1125
W3KCA	28	8	1110
W3BYF	28	8	1070
W3EPH	22	8	1000
W3LNA	21	7	720
W3NKM	20	7	730
W3LZD	20	7	650
W4HJQ	38	8	1150
W4HHK	37	9	1280
W4ZXI	34	8	950
W4LTU	34	8	1160
W4MEJ	33	8	1149
W4AO	30	8	1120
W4VLA	26	8	1000
W4EQM	25	8	1040
W4AIB	25	8	900
W4WNH	24	8	850
K4EUS	24	8	765
W4JCJ	23	6	725
W4VVE	22	6	720
W4RMU	21	7	1080
W4TLV	20	7	1000
W4IKV	20	6	720
W4OLK	20	6	720
K4YUX	18	8	830
W4LNG	18	7	1080
W4RFR	18	9	820
W4CPZ	18	6	650
W4MDA	17	6	750
W5RCI	35	9	1215
W5AJG	30	9	1360
W5JWL	29	7	1150
W5DFU	28	9	1300
W5PZ	27	8	1300
W5LPG	25	7	1000
W5FYZ	26	9	1160
W5KTD	23	8	1200
W5JWL	22	7	1150
W5ML	16	5	700
W5FSC	12	5	1390
W5HEZ	12	5	1250
W5CVW	11	5	1180
W5NDE	11	5	625
W5VY	10	3	1200
W5SWV	10	3	600
W5YYO	7	4	1330
W5UNH	6	3	1200
W6W8Q	15	5	1390
W6NIZ	12	5	2540
W6DNG	9	5	1040
W6AJF	8	3	800
W6ZL	5	3	1400
K6GTG	4	2	800
W6MMU	3	2	950
W7JRG	13	4	1040
K7HKD	11	5	950
W7CJM	5	2	670
W7LHL	4	2	1050
W7JIP	4	2	900
W7UJ	4	2	253
W8KAY	38	8	1020
W8SDJ	37	8	1220
W8PT	37	9	1260
W8IFX	35	8	980
W8LOF	33	8	1060
W8SFG	34	8	1040
W8RMH	32	6	910
W8GGH	32	8	1180
W8BAX	32	8	960
W8NOH	31	8	1090
W8SVI	30	8	1080
W8EHW	30	8	860
W8LPD	29	8	850
W8WRN	28	8	680
K8AXU	29	8	1050
W8DX	26	8	720
W8ILC	25	8	800
W8JWV	25	8	940
W8WNM	25	8	900
W8GFN	23	8	540
W8LCY	22	7	680
W8BLN	21	7	810
W8GTK	17	7	550
W8NRM	17	7	550
W9KLR	41	9	1160
W9WOK	40	9	1170
W9GAB	34	9	1075
W9AAG	33	8	1050
W9REM	31	8	850
W9ZIH	30	8	830
K9AAJ	29	8	1070
W9PBP	28	8	820
W9LVC	27	8	950
W9FQC	27	8	820
W9OJI	27	8	910
W9ZHL	25	8	700
W9BPV	25	7	1030
K9AQF	24	7	900
W9LF	23	7	825
W9KPS	22	7	690
W9CUX	21	7	800
W9PMN	19	6	800
W9ALU	18	7	800
WØBFB	37	9	1350
WØIHD	31	8	1030
WØSMJ	29	9	1075
WØLFE	28	7	1050
WØQDH	27	9	1300
WØRUF	23	7	900
WØINI	21	6	830
WØTGC	21	7	870
WØRYG	20	8	925
WØIC	19	7	1245
WØMOX	19	6	1150
WØJAS	18	6	1130
WØAZT	17	6	1100
KØAQJ	16	6	1120
WØIFS	16	6	1100
VE3DIR	30	8	1330
VE3AIB	28	8	1340
VE3PQN	19	7	790
VE3DER	17	8	1340
VE3AQG	18	8	1300
VE3HW	15	7	1350
VE2AOK	13	5	550
VE3BPB	14	6	715
VE2ABE	9	4	580
VE7FJ	2	1	365
KH6UK	1	2	2540

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

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How?

Radio amateurs view with intense interest the communications aspects of man's first ventures into space. The restless creature must be assured a reserve of foolproof wireless contact with Mother Earth under fantastic limitations in bulk, weight, delicacy and complexity of equipment. If something goes wrong he can't call up the lab; he must get it working and keep it working. OM Doppler, weird signal paths and other factors join to complicate the project. *Here* is a Field Day proposition worthy of Marconi himself!

* * *

The old claw hammer must be nearly as ancient as carpentry, and the screwdriver as old as the screw. More sophisticated hammers and screwdrivers come along to speed the mechanical arts. That's progress. Yet the rudimentary versions apparently will be with us in quantity for some time to come. Their applications, where tactically advantageous, seem inexhaustible.

There's another venerable gadget that's been extant ever since wire and wireless communication broke upon the scene. It's called the telegraph key, and there are indications that the doggoned thing must be as durable as other basic tools. In fact it now turns up in the very forefront of sensational scientific advance. According to an Associated Press dispatch datelined Moscow, April 13, 1961, cosmonaut Y. A. Gagarin included this statement in his post-orbital commentary:

> . . . I was in communications contact on various channels using a telegraph key. Weightlessness had no effect on my ability to work. . . .

Brass-pounding at 18,000 m.p.h.! Just goes to prove something we hams — particularly DX hounds — have known right along. *We* prove it to the world day after day: Applied skilfully and advantageously, radiotelegraphy and that wonderful rugged old telegraph key are no more out of date than a man in space.

What:

We understand that Yuri worked phone, too, so you c.w.-forever chaps needn't get *too* puffed up. . . . Hams not particularly interested in journeying into space, but who like to work DX and aren't fussy about how they do it, would do well to keep their code abilities in good repair. We recall that the last sunspot minimum was especially rough on radiotelephone DX results. It's an immutable fact of communications life that fringy propagation conditions often find DX paths open for solid c.w. work while precluding use of other modes. The past few years of abnormal sunspot prosperity may have rusted a few fists and slowed some code speeds here and there. Those QRP 10- and 15-meter voice DXCCs were lots of fun, but the going is getting rough. The amateur is versatile; 'tis well that he's ready to call upon every trick and tool of the communications art, grandpa's old telegraph key included. . . . *Versatility* therefore be our theme this month, and we find this attribute no better exemplified than by DXers of the new frontier, single-sideband, on

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

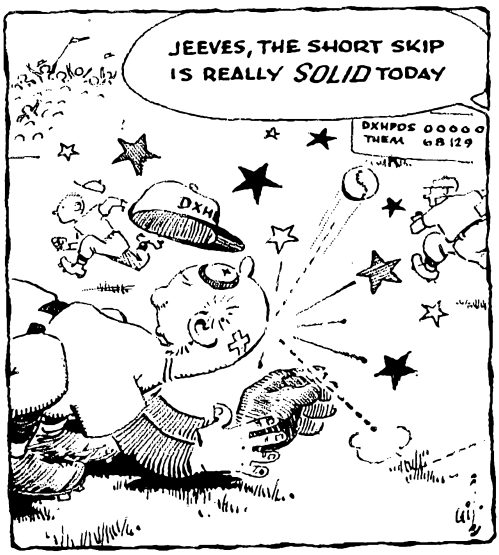
75 phone. There we find W1BU (W1FZJ & Co.), K4LNE and K6QHC slicing through to **CO7HQ**, EAs 7ID 8BA, **EI4R**, **EL2F**, **F2KC**, a flock of DJ/DLs and Gs, **GM2BUD**, **GI3CDF**, **GW3EHN**, **HC2KU**, **HB9HK**, **HH2GR**, **HR3HH**, **KG4AP**, **KP4AUY**, **LA1MB**, **LX1DE**, **OE1RZ**, **OK1FF**, **ON4BM**, **OY7ML**, **OZ4GC**, **PA0FM**, **PY3AVA**, **PZ1AX**, **SM3AZI**, **SP3DC**, **TG5HC**, **UA1DZ**, **VP5BK**, **VP7NT**, **YN1TAT**, **YV5ANS**, **ZC4AK**, **ZL1ACG**, **ZS6TE**, **4X4DK** and **9G1DF**. W1BU, as a matter of fact, has collected 165 s.s.b. and five a.m. DX stations in 43 countries in a year or so on 3.8-Mc. voice.

80 c.w. sees Japan's hams beginning to cross the water in force. K3KMO, K6QHC, W7DJU, K7CAD, W9JJN and K9LIO mention chats with **HK3AH**, **HR3HH**, **HZ1AB**, **JAs** 1BTH 1CUM 1DIC 1DMX 1DRX 1VX 1YL 2WB 5LW 7LK 8LN, **KG4AP**, **KV4s** AQ (10) 7, CI (2) 3, KH6s and KL7s in number. **PY7LJ** of Fernando de Noronha, **TI2ES**, **VK2GW**, **VP5KT** (5) 6, YN1TAT, **YV3CD**, a dozen ZLs, **ZS6s** AGH DW and TE, plus the usual smattering of routine transatlantic triumphs. Incidentally, "(10) 7" is our usual jargon for "3510 kc., 0700 GMT."

40 phone finds W1APA and W9YMZ advantageously applying the single-sideband technique for success with **EA7GF** (217) 2-3, **HZ1AB** (217) 2-3, **KC4USR** (205) 9-10, **KP4s** AUY AXT ZM, **OA5V** (290) 3, **PZ1AY** (205) 10 and **ZL3ID** (136) 11.

40 c.w. satisfies the far-away yearnings of W1OPB, K1s IVR MOD, K2PEJ, WA2s BQK KMY KSD, K3s CNN KHK, W5EHY, K5s ALU PSO VTA ZOL, W6RCV, K6CJF, WA6s IQM IVM JVD, W7s DJU LZF POU, K7CAD, K8PFY, W9JJN, K9s LIO SPO TOK SRR and I1ER with the likes of **CE1AD**, **CMs** 2HZ 2UZ (15), 8RM (1) 1, **CN8MB**, **CO2s** DM (1) 2, PY (9) 6, **CP1DA**, **DU1NL**, **EI9J**, **EL4A**, **FK8AH**, **FM7WZ**, **HKs** 1HV 1QQ 3-6, 5TD 7ZT, one HL1KQ, **HP1s** AC IE SB, **IT1AGA**, **KM6BI**, **KR6s** JM KFLY, **KV4AQ**, **KW6DG**, LA7RF/mm, **LU2s ZO** (8) 8-9, **ZR** (4) 6, LZ1KAA, **OD5LX**, **PY7LJ** (7) 8-9, **PZ1AX**, SL6DC/mm (12), **SP8HT**, **TI2WA**, **UAs** 2AC 2KWB 0KAE 0KDA (3) 9, 0KFI 0KIA 0KID, **UB5s** JX KBA KCF, **UQ2AN**, **UR2KAE**, **VK9HX**, **VPs** 2AH 2VA 4LT, **VRs** 2DK 6TC, **VS6EN**, XE2s IE (70) 5, KH (155) 1, UA, YN4AB, **YO2BU**, a dozen YVs, **ZC4CT**, **ZD8SH**, **ZK1s** AK (12), AR, a helping of ZS/ZLs, **ZP9AY**, **5N2JM**, **9M2s** FM and FS. Over 100 JAs show up on 7-Mc. lists, the "rarer" being **JA5s** MZ OZ VX ZG, JA6s BFF DC SH, JA9s FV NB YAA, JA/s NW OP QA and RR. No JA4s, by golly, except for JA4AMM/mm . . . . On the 7-Mc. Novice front WV6s NON NQN and ORS show up with **KH6DIB**, **WH6ECE** and **WP4AYZ**.

15 phone had a dandy spring season according to K1MOD, WA2CLQ, W4LJV, K1s DWU IKV LRX

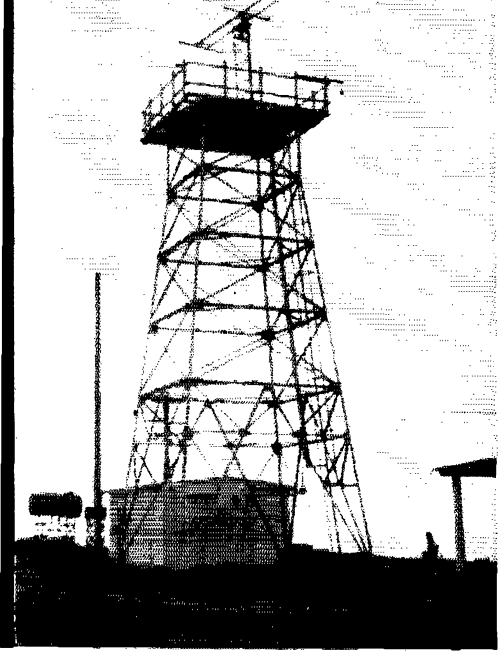


MPE, K5s ALU PSO ZOL. W7POU, W8KMI (305/298 countries worked/confirmed), K8s ITH KCO TJW, W9YMZ, K9s LIO QMJ SRR UIY VLQ, VE3PV and G3NAC. They report favorable response from **AP2**MR, **CE3**RC*, **CN**s 2BR 8CS 21, 8EU 18, 8JO (240) 20, **CO**s 2EP 20, 2UM 8RA 13, **CP**s 1BJ 5EA 23, **CR**s 4AX 6AT 6CD 6LA 7BC, **CT1**s IK PK 21, **EA**s 6AY (233) 19, 8CK 16, 9EJ, **EL**s 1D 23, 2AC 2F 17, 2V 23, 5A 16, 8D 17, **EP**s 1AD 2AT, **ET2**VB, **FA**8DD, **FB**8CO, **FF**4s AB AH AK, **FG7**XH, **FQ**8s AJ HL HN HR HT HZ, **GD3**GMH 15, **HC**s 2CB 23, 2DB 5CA (307) 13, 5HO (275) 15, a dozen HHs, **HI**s 7CJY 0, 8AJS (307) 19, 8DGH 21, **HK**s 1XT 0, 3VR, **HP1**s AC SB 18, **HR3**AK 23, **JA**s 3GM 6BC, **KA2**s JL* SC*, **KG**s 1AA* 6AIY, KL7CMI/VE8 23, **KR6**s KV LK RN* VO, **KV4**BI, **LX1**SJ, **MP4**s BBA BBL BCZ BDC TAJ, mucho OAs and OEs, **OX3**DL, **OY7**ML 20, **PJ**s 2AW 22, 3AK, **PZ1**s AR 22, AX* BE (210) 19, BF* BN BW, **SV**s 1AE 15, ØWO ØWT*, **TG**s 5HC 9BK 22, 9ED (360) 1, **TI**s 2CMF 2J 2RFT 3GDM 5RV, **UA**s 9KOK ØLO, **UN1**BC, **UR2**KAE (320) 13, VE8NS, **VK9**s PJ RO, **VP**s 2DE 2DQ (238) 16, 2RD 18, 2SI (230) 22, 2SX, 3FM (235) 19, 3MC 3RW 3YG, 4TP 23, 5AB 5BB (240) 21, 5BL 23, 5CH (245) 19, 5RD*, 6KL 6RC 23, 6WR 7BP 8DG 8DW 9DL 9L, **VQ2**s IE SB TV, **VS**s 1FE 1JX 1KP 5GS 6CL 9AAC 9APH 9MB of the Maldives, **VU2**s BK RG, **XE**s 2DO 3CB, **XW8**AL, **YN**s 2LBV 19, 4WD (280) 0-1, **YS3**TM 15, many YVs, **ZB**s 1JM (230) 18, 2AD, **ZE**s 1AA ØHE, **ZP5**CF, **ZS3**LW, 5A2TZ 19, **5N2**s ATU BRG, **5U7**AH (142) 21, **6O1**DRS 19, **6W8**s AP CE CU CY, **9G1**s CB CC CQ DN (200) 20, DQ, **9K2**s AD AP AX, **9M2**s AD EZ GV, **9Q2AA** of Kasai, **9U5**s HO VL and VS, those asterisks designating single-sideband action.

15 c.w. reports come from K1s IVR MOD, K2MMS, WA2s BQK CLQ (77/37), KMY KSD, K3s CUI (118/104), KHK, K4s LRX (90/58), MPE (145/99), ZRA (66/44), W5EHY, K5s ALU LLJ PSO VTA (85/50), W6RCV, K6s CJF ROU, WA6s IQM IVM JVD, W7s DJU POU, K8s ITH KCO TJW (84/42), K9s LIO SRR TOK UCG UIY, KØs BHM OSV OSW TNK VTG, VE3PV, G3NAC and 11ER who joyfully settle for **CE**s 1AD (63) 21, 1AG 1BD 3AG 3CB 3RY 4CO 4EC, **CO**s 2JL 7HQ (20) 15, **CR**s 5AR 7CI, **DM**s 2ACO 3RDI, **EL**4A, **FB8**XX, **FK8**AH, **FQ8**s HD HP, **GB2SM**, **HA**s 1KSA (93) 15, 3MA 5BI 16, 5FO 5KFR (28) 18, 8CE, **HC**s 1JU 2IU (23) 19, **HK**s 3TH (32) 14, 7ZT 7YB (130) 18, **HP1**SB, **HS1**R, **HZ1**HZ, **IT1**s AC TAI, **JA**s 1ACB 1CO 1LN (30) 2, 2AJT 2JW 3AF 3JM (20), 4HM 6ZU (60), 7KY 8AQ 8ZZ 9JG 9TS, **JZ0**PO, K8DVJ/**KG6**, **KA2**s GI RB I, **KG1**FD, **KM6**CB (75) 22, **KR6**s CR (56) 2, JM LY USN (30) 2, UU (30) 2, **KV4**s AA AQ CI, **KW6**s DF DG, **LU**s 1ZO (41) 11, 2ZO 3ZO, **LZ1**s BZ 13, KBD 15, KDP (40) 18, KNB, **MP4**BBL, **OA**s 3D 4AGI (37) 18, 4BR 4HK 4JK, lots of OEs, **PY7**LJ, **PZ1**BF, **SM1**AHD, **SL**s 5AB 5ZL 6BB, **SVØ**WZ, **TG9**LM, **TI2**s CMF LA, **UA**s 2AK 9DT 9DV ØEH ØGF ØKIA ØKIT, **UB5**s FG IT KAD 14, KED KFF, **UC2**s AD AG BB, **UG6AW**, **UO5**s AA 13, KAA, **UP2**AO, **UQ2**s KAA KAE, **UR2**s KAE (63) 13, KAN, VO2AW, **VP**s 7BP 7NT 8EH of Grahamland, **9EX** (82) 22, **VQ**s 2AR 2DG 2IE 2JM 2MS 3HZ (75) 18-19, 4DW 5IB (92) 19, **VR**s 3L 1, 6AC, **VS**s 5GS 9AAC 9MB, **VU2**XG, XE2BCS, **YN**s 1AA 3KM 4AB (93) 0, **YO**s 2CD (75) 14, 7DL (50) 17, eight or ten YVs, **ZB**s 1FA 1HC (50), **2J**, **ZC4**s AK 18, IP SC, **ZD6**RM, **ZK1**AR, **ZP**s 5AY 5LS 9AY 9LS, **ZS7**S, **4X4**s JU NJ, **5A**s 1TP 5TA, **5N2**ATU, **6W8**s BF (85) 14, BQ (56) 16, CP, **9M2**FS and **9U5**DM (85) 20.

15 **Novice** correspondents WV2NXP (12/5 worked/confirmed), KN4s WQM YMQ (21/9), KN5ERQ (12/11), WV6s NQN ORS, KN7NWX, KN8VUH and KN9YTJ get fine results with **CE**4s EC EI, **DM**3s PVL 18, VVL, **EA**s 6AM 8DL 17, **F**2s PO SQ, **HC2**IU, **HH2**JV, **II**s MQ ZIX, K6MINI/**KH6**, **KH6**s DJV DKI DMU DPF, **KL7**WAI, **KP4**s AV CDB TIN, **KZ5**FK, **LA**s 1SH 8YF/mm, **LZ1**KBD, **OE**s 1HJ 3WB, **OH**s 2CM 6MD, **OK2**ABU, **ON4**s EC 13, SW, **PA0**PFL, **SL5**AB, **SM5**BDX, **SP**s 2TG 3DCP 3DGR, **SVØ**WZ, **TF3**MB, **UA**s 1NA 3FM, **UR2**BU, **VP9**CX, W1TRB/**KH6**, **WH6**DUB 1, **WL7**s DMO DNK DPA DQF DUU, **WP4**s AWM AXO 16, AYP 0, AYZ, XE1FFB and YV5AWM. . . . . WA6CYT, scanning 21 Mc. while stationed in England, heard spring-time signals from KN1s ONZ ORB PZB QGC QLE QXK RHS, WV2s JBK LIS LOW NLY NPF NXS PHY PXN QMC, KN3s LOZ MHH MTC MWA MWG, KN4s CHH NUJ NXV WVX, KN5s FSM HWL, WV6s NDJ/4 NQF NTP OPM OYT PSY QHU, KN7LOY, KN8s AUH UDM URR WLX, KN9s YTX ZFK, KNØs FQY and GHF.

20 **c.w.** will doubtless be our summer mainstay if DX history remains consistent. W1OPB, K1s IMD (102/91), JFF (89/77), K2s JUA MMS UYG, WA2s BQK EFN HZF KMY (115/92), KSD (67/43), K3s CNN KHK (81/67), KMO, W4UWA, K4DWU, K5s ALU (58), CWR LLJ (48/32), PSO, W6s JQB RCV, K6s CJF ROU, WA6s CYT IQM IVM JVD, W7s DJU LZF POU (81/61), K8s KCO (36/69), PFY (73/30), W9s CLH JJN QQG, K9s IYC SRR TOK UCG UCR UIY, KØs BHM OSV OSW RNK VTG and 11ER chronicle the 14-Mc. code conniptions of **BV1**USA, **CM2**QN, **CN**s 8CC (105) 17, 8MB 9CF (60) 22, 9CG, **CO**s 2CO 2DJ 7AH 7PG, **CP**s 1DA 3CD (10) 14, **CR**s 4AF 6CD, **CT3**AV, **DM**s 2AXO 3DR 4, **DU**s 1OR 6TY 7SV (80) 5-6, **EA**s 6GE (1) 23, 8CG 0AB, **FB8**s CS 22, XX (40) 4, ZZ, **FF4**s AC (120) 16, AL (50) 22, **FG7**XC (50) 14, **FK8**AW, **FP8**AP (25) 18, **FY7**s YF YI (50) 13, **GD**s 3FBS 6UW, **HA**s 1KSA 6NC 7PZ 8CC 5-6, 8KWG, **HC**s 1JU 2CB (37) 5, 2VT 5CN, **HH**s 2CB 2JV 2OT 9DL (63) 21, **HK**s 1HV 1KS 1QQ 3AH 7YB 7ZT 3, **HL1**KQ, **HP1**s IE (5) 1, SB, **HR**s 1KS 2FG, **IT1**s AGA (70) 23, TAI, **JA**s 1BAC 4, 1CC 6, 1ES (20) 7, 1VX 3AF (25), 4HM 7ACM (32) 4, 7AD, **JZ0**s PH PO, **KA**s 2AB 2JL 2RB 2RJ 2YA 7DX 4-5, **KC4**s USB (32) 6, USV, **KG**s 1CD 1CX 1FD 4AH 4AP 6AIG 6AJT 6NAB, **KM6**s BC BI CB 2, **KR6**s JM 4, LY, **KV4**s AA (81) 22-23, AQ CI, **KW6**s DF DG, **LZ**s 1BZ 2KSK 5, **LU**s 1ZO 2ZO 2ZR 3ZO 5ZO (60) 7-11, **MP4**TAC (12) 22, **OA**s 3D 4BR (25) 3, 4FN, **OX3**s DL 22, JI NK, **OY8**RJ 3-4, **PJ**s 2AW 2ME 3AD, **PX1**YR, **PY4**ZG, **PZ1**AY, RAEM (3) 4 of Moscow, **SL2**ZA, **SM1**AHD, **SV**s 1AO ØWI ØWZ (78) 20 of Crete, **TF**s 2WFS 3AB (46) 13, 5TP, **TI2**s CMF DL LA PZ WA, **UA**s 1KED (43) 16 of F. J. L., 2AC 2AW (20) 19, 2BD 4, 9AA 9AR 9BZ 9DN 9DS 9DT 9EZ 9FI 3, 9FN 9FQ 9FW 9KAI 9KDX 18, 9KOG 9KPN 9OB ØBN (13) 14, ØCW ØEV ØKAE 19, ØKAR (55) 12, ØKCA ØKCK (22), ØKDA ØKDX ØKFG ØKIA (75), ØKID (45) 3, ØKJA ØKKD (40) 5, ØKYA (80) 13, ØKZB 4, ØTN ØTV (50) 3, **UB5**s JB JX 5, KAB KCF KED KFF NM LM XK, **UC2**s AD AR 4-5, AZ CS KSB, **UD6**AM, **UF6**PF, UG6AW, **UH8**s BI 3, KBC,



KG6IJ, newly reactivated on Iwo Jima, specializes in single-sideband work around 2100-0000 and 1000-1400 GMT. Operators Ben Burnham and KG6IVB (K2IVB) are shown stirring up a storm on 20.

UI8AD, UJ8KAA, UL7LE 4, UM8s KAB KAD, UPOL-8, UP2s AO KBA, UQ2s KAE KAR KAT (43), VEs 8AB 8ML 8NE ØMC ØNM/mm, VKs 1JE 6AW (70) 10, ØDA ØFZ (40) 7, VO2AW, VPs 5KT 7BP 7NE 7NQ 8FW (153) 23, 9EP (30), 9EX 9QQ, VQs 2HR 3HZ 5GJ (40) 22, 8BM, VRs 1B 2DK (65) 12, 6TC, VSs 1KP 1KQ 6DV 9AAC 9ARW (30) 21, VU2MD, XE2s AY (23), H, XZ2TH, YNs 1AA 1LB 1OC (28) 6-7, 3KM 4AB, a dozen YVs in six Venezuelan call areas, ZBs 2AD 5AR (sic), ZC4AK, ZD1CM, ZK1s AK (50) 8, AR, ZL5AI (153) 23, ZPs 5CF 5OG 9AY, ZS3B (75) 21, 3V8CA, 4X4NJ, 5N2s IJS (85) 18, JM LKZ (20) 21, 5U7AC (86) 21, 6W8CW (65) 20 and 9G1DE (48) 1.

20 phone will draw a crowd, too, as the Fahrenheit moves up. K1MOD, K2MMS*, WA2KMY, W4LJV, K4DWU, K5s ALU PSO, K8KCO*, W9YMZ* (98/83), K9s IYC QMJ* SRR and UIY clicked with **CO8LS, CP5EA*, CR9AH*** 14, **EA8CC, EL2Q** (210) 2, **FM7WQ, HA9OZ*** 14, **HC1KA*, HI8DGA, HHs** 2HR 2JK* 2MC 5DM, **HK3HY, HR3HH*** 2, K4THQ/VE8 (310), **KA2MM*, KC4s** USH* USV*, **KGs** 1CQ* 4AA, **KW6CGA, KR6GW*, KX6DB*** 13, **MP4BCC*** 22, **OA6AB*** 5, **OY7ML*** 20, **PZ1s** BF* BX, **TF2WFF*, TG9US, TI2s** CMF EH* J LT (211) 2, **UB5VO*** 20-21, **UI8AG* UM8s** FZ* KAA* 4, **VK9GP*** 10, **VPs** 5AR 5BL 9BN 9CIY 9WB, **VR6AC*** 10, **VS6AE*** 13-14, WA6LDL/VE8* (291), **XEs** 1LF 2DS (242) 0, **YN1s** CI* TAT*, **YV5s** AFA* (282), ATC*, **ZS7P*** 14 and **6O1**DRS* 23 as spring slipped out.

10 phone's faithful refuse to toss in the mike cover. K1MOD, W4LJV, W5EHY, K5s ALU PSO VTA, K6s CJF ROU, WA6IVM, K8ITH, W9VBV, K9s SPO (95/78), SRR TOK, Køs BHM RNK and friends get together with **CEs** 1AGI 3RC, **CN8s** CS HX, **CO8s** JK RA, **CPs** 1BH 5EA 18, **CR7CI, CT1**FF, **CX2CX** 22, **EA8CK** 16, **ELs** 2V 18, 4E (600) 18, 5A, **FS7RT, GC2AAO, HCs** 1DD 2CB 23, 4RC 17-18, 5HA (600), **HHs** 2LD 2RL (600) 21, 2RV 18, 2V, **HI8s** DGC (700) 23, DGH 17, **HKs** 1OI 16, 1TT 16, 3LX 19-20, **HPIs** CN 22, SB 16, VA 16, **HRs** 1DL 23, 2HA (800) 18, 2IB, **JAs** 1CIB 3, 3ACT/mm, 3AVD 2, 6AFO 2, 7NZ 1, **KB6**BC 23, **KG4AO, KV4BT** 17, **OAs** 1S 15, 4DO 16, **PJs** 2MC 15, 3AI 3AJ, **PZ1s** AW (800) 18, BF 17, BR, **SL6**ZK 16, **TGs** 5HC 9BM 0, 9DJ 18, 9ED, **TI2s** CMF J, **UP2**KCK, **VKs** 2ADE 3AHT 3VL 2, 4EP 23, 5GM 23, VO1s EI FS, **VPs** 2DE 22, 2GAQ 13, 3HAG 5AH 5CH (530) 19, 6AM 19, 9BM 19, **VQs** 2HR 18, 2JV 4HX, **VRs** 2BC 3L, **XEs** 1QP 23, 1WF 15, 3AF, **YNs** 4WD (330) 19, 6AH 23, **YS1s** LA 23, RM1, YVs galore, ZLs and ZSs by the hatful. **ZB1**PSE, **ZC4AB, ZEs** 1JN 2JA 2KL 18, 3JO 3JU 17, 4JX, **ZK1s** AR 22, AY, **ZSs 7L 8K, 9Q5**ID 19 and **9U5**PD, come what may.

10 c.w. clings grimly to DX life, nursed along by WA2KMY, K3CUI, K4ZRA, K5s ALU PSO, K6CJF, W6RCV, K9SPO, Køs BHM OSV OSW RNK UTX and 11ER who scuttle for **CE3AG** (50) 20, **HK7ZT** (68) 18, **JAs** 1AHS 1ANS 1BWA 1CIB 1EM 1VX 1YL 2AAT 2ANX 2CG 2HO 2UJ 0CE, **JZ0PO. OE5JE** 17, **PY7LJ** (80) 17, quite a few VK/ZLs, **VQs** 2HT 2MS, **VR2DK, YN1AA** (50) 0, **XE1PZ, ZE3JT, ZK1AR, ZP8AY** and a helping of ZS6 chappies.

160 c.w.'s post-mortem is under way concerning the riotous 1960-'61 season now past. One outstanding late-season QSO was scored by **ZL3RB** (1876 kc.) and W1PPN at 1018 GMT, April 11th, the culmination of a long series of painstaking schedules. K1KSH writes of exciting QSOs with **DL1**FF, **Gs** 3ERN 3FPQ 5JU and 6BQ, the latter worked as early as 0044 GMT. While planning bigger and better signals for next season, 160-meter steadfasts will be probing the summer static just to see what happens. And who knows for sure what will?

* * *

For help in assembling the preceding DX activity analysis we acknowledge with thanks the valuable observations of listeners T. Biros, E. Edger, S. Elfving, D. Gassman, A. Hovey, J. Howard and A. Rugg. Come again!

Where:

Africa — "I am to be QSL manager for 5U7AC and 6W8BQ," notifies W9RKP, "s.a.s.e. or IRCs a must." . . . . . "Please tell the gang that I'm taking care of ZS7R QSL chores for this year's ARRL DX Contest," pens W3SOH. "Other QSOs are confirmed by ZS7R himself." S.a.s.e. (self-addressed stamped envelopes), natch . . . . . "My QSL assistance for ZD9AM concerns QSOs made after the first of this year," clarifies W2CTN. K2UYG suggests that QSLs for pre-1961 ZD9AM contacts be rushed via SARL . . . . . "I have replied to almost every card received," writes G3GUP regarding his 5N2GUP-ZD2GUP-SU1FX activity, "but it is inevitable that some cards have gone astray in both directions. A fresh card to [the address to follow] will be answered direct if IRC (International Reply Coupon) is supplied, otherwise via bureau." . . . . . "I promise to QSL 100 per cent for the 700 U.S.A. contacts I made as 6O2RS," states G3LOE. "The boys will have to wait a few weeks while I have cards printed. I will not be returning to Somalia." . . . . . VERON of Holland lists these new prefixes for Africa: TL, Central African Republic; TN, Congo Republic; TT, Tchad Republic; and TU2, Ivory Coast Republic. Never a dull DX moment over there! . . . . . WGDXC's *DX Bulletin* understands that SU1MS will accommodate QSL inquiries addressed to M. Salam, Heidelberg Rohrbach, Lucas Cranach str. 13, W. Germany, ... K4IEX awaits logs from SU1AL in order to reply to many QSLs received for him. What say, Ahmed? . . . . . W9YMZ believes that Southeastern DX Club, Box 749, Atlanta, Ga., may be of assistance re ZD9AL pasteboards.

Asia — "AP2CR was duly licensed and authorized to operate from Dacca, East Pakistan," testifies W7VEU in lines to W1WPO of ARRL's DXCC Desk. "It was a shame more people could not work Colin on March 10th-12th but he was able to spend only three days in those tremendous pile-ups. The only authorized QSLs that will be issued will come from the copy of AP2CR's logs that I have in my possession, or from Colin himself." . . . . . "I shall be handling AC5PN's QSLs for contacts on a world-wide basis," W8PQQ notifies W1WPO. VERON'S *DX press* also mentions W6YY as a possible source of AC5PN confirmational assistance . . . . . "I will soon handle cards for VS9MB," writes W8EWB. K2QXG gave this a whirl some time ago but liaison was lacking between Mac and the Gan gang. We hope they'll keep Clyde better supplied with log transcripts . . . . . From W1YYM of the Hq. Communications Department: "XZ2TH informs me of the passing of his brother, XZ2GM. Tun will dispose of QSL matters outstanding for the latter." . . . . . HS2M, volunteer Thailand QSL chief, suggests use of the address in the listing to follow, and also emphasizes the self-addressed stamped-envelope requirement for W/K petitioners, International Reply Coupons for others . . . . . "UA9KOG QSLs direct by air in response to a card sent to [the address listed]," declares W4TDW . . . . . Sweden's PBRC has it that 4S7YL filed a complete set of logs with her QSL agent, KH6BPF. S.a.s.e. or IRC-plus-s.a.e., to be sure . . . . . "Those who send IR Coupons get my cards direct," says 4X4NJ (K7ADD). "All others go via bureaus." . . . . . VS6EC and XYL (ex-DL1OV) take charge of the HKARTS QSL Bureau with a will.

Oceania — "VS5WS will be active in July," hints G3MCN. "I will act as QSL manager." . . . . . "The Wilkes base gang is most anxious to receive QSLs and reports for their March, 1961, 40-meter activity as VK0TC," says K2QXG, QSL representative up our way. "They'll try it again in June using c.w. between 7000 and 7050 kc." Mac adds, "Now have skeds all set to get log data from VK0VK." K8PFY learns of recent unauthorized use of the call W8OLJ/PK . . . . . K4LRX iterates s.a.s.e.-or-IRC regarding his VR2BC QSL services. Greg really stirs up the s.w.l.s. with his potent 21-Mc. phone radiations . . . . . VK4EL estimates his total QSL output since 1932 at 15,000 or so.

Europe — DL5AE (K2HOM) announces the new DL4/DL5 QSL Bureau, c/o DL4VJ, Base MARS Station, APO 130, New York, N. Y. The new crop of DL5s is Yank, you know . . . . . HV1CN explains to W1BDI: "We are inaugurating a new QSL system. Henceforth I shall mail by air to W2BIB every week a duplicate of the station log of HV1CN. Max will then send to the bureaus, via airmail, cards for all contacts made by HV1CN. These will be stamped by Max with a facsimile of my signature. . . . Convey to your readers my regrets for the long delay in getting out long-overdue cards, and assure them that in the future all QSLs will be on the way to the various QSL bureaus within days after contacts are made. During the past week we have mailed out almost 2000. This should take care of matters to this date." . . . . . Polar Bear Radio Club offers callbooks individually listing Russian, East German and Bulgarian amateurs. Check with S. Elfving, Solgardsgatan 15, Ornskoldsvik, Sweden, for details. Also inquire about PBRC's DXceptional newsletter, a periodical of outstanding merit on the DX scene.

Hereabouts — W5RU, host at New Orleans's famed Antoine's, includes with each QSL a flier bearing this well-expressed observation: "All through life we carefully preserve documents showing that in the year so-and-so we were born, or vaccinated, married, promoted, acclaimed, honored and finally retired. These are valuable to all of us. The QSL which the ham finds in his mail box is his document of a worth-while contact, tangible proof of his accomplishment. Without QSL cards there would be no DXCC, WAC, WAS, WAZ or other awards; the pride of achievement could not be realized. The ham works hard for his ticket, sets up his rig and makes worth-while contacts. He looks forward to QSLs for confirmation. Not all hams are interested in QSLs, but those of us who take the trouble to send QSLs of our own, accompanied by the necessary IRCs or stamps of the country worked, with a self-addressed envelope, deserve a little consideration. QSLs make *me* happy. Won't you help by sending your card? Thanks, and may you be rewarded for your kindness and consideration." . . . . . K2BRW, a former TF2WBG staffer ('56), would like to hear from Don Ritchie, holder of the call. Skip tells W1WPO there are QSL matters to be cleared up and he has some TF2WBG QSLs left for the job . . . . . ZP5s CF and LS, popular Asuncion DXers, request IRCs from lads desiring direct QSL replies. Otherwise it's the more leisurely bureaus route

UL7FA and XYL keep Kazakh catchable on many DX bands, c.w. preferred. *(Photo via WØMLY-W1WPO)*

. . . . . Possibly representing a minority school, VE3PV expresses interest in reception reports. Peter's 21-Mc. phone attracts s.w.l. cards in quantity . . . . . Listener J. Porter has it that the VP5CH address in the listing to follow can be used for any VP5 missileer but not for British Cable & Wireless personnel. John adds that VP5BB requires s.a.s.e. to help withstand his rare Grand Turk DX status . . . . . W1OHA informs, "My recent KG4AP operation was limited by Navy duties to two evenings and 101 QSOs. QSO confirmations for all KG4AP c.w. operation on March 6th-7th should be sent to me." . . . . . WA2BQK needs the whereabouts of HRØAD, FQ8BK and YS4RA, neighbor WA2HZF will settle for the scoop on FO8VN worked last December, and K3MNJ yearns for full FG7XJ data. By the way, WA2BQK, K3MNJ and KØVTG offer their services to rare overseas DX men in bona-fide need of Stateside QSL managers . . . . . K6BX of *Directory of Certificates* and *DX QSL Newsletter* renown calls attention to the fact that many batches of QSLs are lost in the mails because of flimsy wrapping and addressing. Make sure that your shipments go out fully armored and plainly labeled. They really get shook up . . . . . Your Good Samaritans in this month's QTH catalog section are W1s APA OPB UED WPO YYM, K2s QXG UYG, WA2KSD, W3SOH, K3s CNN CUI KHK, W4TDW, K4IKV, K5ALU, W6RCV, K6CJF, W7LZF, W8EMZ, K8PFY, W9s CLH JJN QQG YMZ, K9s LIO QMJ TOK UCR UHH UIY, KØVTG, G3CMN, 4X4NJ, Messrs. Edger, Gassman, Howard and Porter, International Short Wave League, Japan DX Radio Club, Kanawha (W. Va.) Radio Club, Newark News Radio Club, Northern California DX Club, Polar Bear DX Club (Sweden), VERON of Holland and West Gulf DX Club who provide the following individual specifications:

AC5PN (via W8PQQ)
CN8MT, P.O. Box 299, Rabat, Morocco
CP1BH, Box 1295, La Paz, Bolivia
CR5AR, c/o PTT, Sao Thome Island, Portuguese Africa
EL2V, P.O. Box 37, Monrovia, Liberia
FB8CM (via W1YDO)
FQ8HN, F. Postel, P.O. Box 171, Bangui, C.A.R.
FQ8HR, Box 2013, Brazzaville, C.R.
FQ8HZ, P.O. Box 574, Brazzaville, C.R.
GB2LS (to G3AHD)
HB1DX/fl (to HB9DX)
HC2CB, C. Bartholomew, Naval Mission, c/o U.S. Consulate, Guayaquil, Ecuador
HC5HA, P.O. Box 159, Rio Bamba, Bolivia
HK2YO, Apartado Aereo 1041, Cucuta, Colombia
HK7YB, P.O. Box 704, Bucaramanga, Colombia
HP1IE (via W2CTN)
HR3HH (via KØKIE)
HS2s M MP, American Embassy, Bangkok, Thailand
HV1CN (via W2BIB; see text preceding)
IT1PAK, Dr. O. Pennisi, P. Za. Aeostino Pennisi 14, Acireale (Catania), Sicily
JA7KY, N. Wada, Shimto, Iketsu, Nichinan, Hiyazaki, Japan
KB6BP (via W6UWL)
KH6AWJ (via W6UWL)
KH6NAA, U.S. Navy Radio Station, Navy No. 66, FPO, San Francisco, Calif.
KW6DH (via W6UWL)
LA2DE/p (to LA2DE or via NRRL)
LA7RF/mm (via W6FFE)
LZ1BZ, M. Grozev, Box 699, Sofia, Bulgaria
LZ1KBD, Tolbuhin 66, Sofia, Bulgaria
OA4JY, P.O. Box 150, Lima, Peru
OA4KW, P.O. Box 375, Lima, Peru
PK1SX (to K3HVN)
PZ1AY, J. Guilonard, P.O. Box 21, Moengo, Surinam
SL2ZA (via SM2BGG)
SM2BGG, K. Wiksten, Fredrikshogsg. 17, Umea, Sweden
SP7LA, A. Zebik, Mieszkania 8, Blok 14, Mokra Ulica 25, Lodz, Poland
TG9ED, A. Berke, USOM Education, c/o U.S. Embassy, Guatemala City, Guatemala
TU2AE, G. Laine, B.P. 1863, Abidjan, I.C.R.
UA9KOG, P.O. Box 44, Novosibirsk, Siberia, U.S.S.R.
VEØNA (via VE1PX)
VK2AN/VK9, R. Howland, c/o DCA, Norfolk Island, Australia
VK8TB, Officers Club, RAAF, Darwin, N.T., Australia
VP5BL, V. Hoyes, P.O. Box 160, Kingston, Jamaica
VP5CH, Grand Turk AFB, GMRD Box 4187, Patrick AFB, Florida
VP6WR, W. Richardson, 40 Highgate Gardens, St. Michael, Barbados
VP7BQ, R. Hyneman, Grand Bahamas AAFB, c/o GMRD Box 4187, Patrick AFB, Florida
VR1D (via ZL2GX)
VS5WS (via G3MCN)
VS6AZ (via K6GMA)
ex-VS6BJ (to G3KVU)
ex-VS9ADL, Sgt. D. Leese, "A" Sqdn., Royals, Singapore
VS9ARW (via RSGB)
VS9MB (via W8EWB)
VU2XG (via G8VG)
XE2UA, Box 460, Obregon, Sonora, Mexico
XZ2GM (to XZ2TH)
YA1AC (via W7MQA)
YO3AC (via K4IEX)
YS1IM (via W2CTN)
YV1FI, Judubana, Falcon, Venezuela
YV5APX, J. Serrano, P.O. Box 3733, Caracas, Venezuela
YV6AV, J. Hernaudez, Box 92, Anaco, Venezuela
YV6CN, Puerto Ortiz, Venezuela
ZB2I (via W2CTN)
ex-ZD1AW, A. Wilson, 1a Hamel Dr., Belfast 6, N. Ireland
ZD1CM, C. Marks, P&T, New England, Freetown, Sierra Leone
ex-ZD2CKH, K. Harrison, G3OPJ, c/o ISWL QSL Bureau, 12 Gladwell Rd., London N. 8, England
ZD9AM (via W2CTN; see text preceding)
ZS3B (via WØVXO)
ZS7S (to ZS7R)
4X5DS (via IARC)
ex-5N2GUP-ZD2GUP-SU1FX, E. Howell, G3GUP, 164 Beeches Rd., Chelmsford, Essex, England
5N2LKZ (via 5N2JKO)
5U7AC (via W9RKP)
5U7AH, Niamey Airport, P.O. Box 1002, Niamey, Niger
6O1DRS, c/o Dept. of State, Washington 25, D.C., or P.O. Box 6, Mogadiscio, Somalia
6W8AD, A. Duffan, PTT, Dakar, Senegal
6W8BQ (via W9RKP)
9G1DE, Box 128, Dunkwa, Ghana
9G1DT, G. Sturgen (W3OVU), P.O. Box 16, Worawora, Ghana
9K2AY, P.O. Box 18, Kuwait, Persian Gulf
9M2GV, J. Alford, Police Hq., Muar, Malaya
9N3PM/AC4 (via RSGB)
9Q5EC, QSL to 3505 Brook Rd., Richmond 27, Va.

Note: Nothing necessarily accurate or "official" about the preceding postal patter. You may find it interesting, nevertheless. Do you have anything to add to the list? Something not already in the *Call Book*, we mean.

Whence:

Africa — "We are working on details for doing DX hounds a good turn by operating from Togo, Dahomey, the Voltaic Republic, etc., later this year," tantalizes 9G1DT (W3OVU). "We are within a day's driving distance of those countries and I've been advised that amateur operation will be approved on a temporary portable basis." . . . . . 5N2PJB (ex-MP4BCR-VQ6AE) departs Nigeria in favor of G3JHZ but says new arrivals ex-ET3LF and ex-VS6DK have applied for 5N2 tickets. Colleague 5N2GUP, now back at G3GUP, wants to "Place on record my appreciation

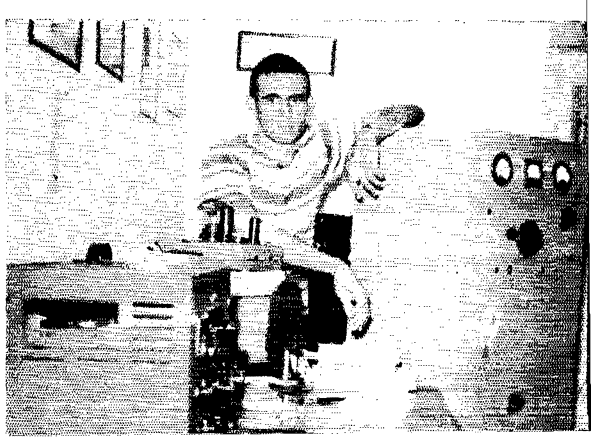
for the many fine QSOs with the W/K gang. I found their operating and manners the best on the bands even in the worst of the pile-ups. There were the odd 'bad hats', of course, but they were in very small minority. I look forward to meeting many of my old on-the-air friends again from G3GUP, this time for some real QSOs instead of mere exchanges of signal reports." . . . . . Africa addenda thanks to ISWL, JDXRC, PBRC, VERON and WGDXC: FQ8s HN and HT decry lack of Gabon activity but FQ8AL is reported on 15 phone. . . . DL9KR, flitting 'twixt Rio and Dakar, occasionally puts 6W8CW in biz and may range as far as Easter Island. . . . ST2AR prepares a potent W8JK array for DXtensive 40- and 80-meter efforts. . . . ZD2KHK is expected to tug the switch shortly. . . . Ex-ZD2CKH attempts a DX comeback as G3OPJ with a 150-watter and AR-88. . . . 7G1A mulls over Mali operational probabilities. . . . An FF7 assignment is anticipated by 5A5TA (W5LAK).

Asia — "On April 3rd-7th 4X5DS was operated at the Dead Sea on 14-Mc. c.w. by 4X4s JM MB MU and myself," records 4X4NJ (K7ADD). "We used 30 watts and a Drake receiver, working good DX despite mediocre conditions. After two months of activity at my own station, 4X4NJ, I have 80 countries and 36 states in the log." . . . . . CR9AH and VS6AE are joint recipients of Hong Kong Amateur Radio Transmitting Society's annual award for meritorious service to amateur radio. This year's presentation featured the Society's 30th anniversary dinner in December . . . . . Check with Taiwan American Radio Club, USTDC, APO 63, San Francisco, Calif., for details on its "BV" diploma, wall paper based on attainment of QSOs with more than one Taiwan amateur station. This shack decoration makes no pretense of certifying communication, a commendably honest approach . . . . . "With the coming of spring we have various plans to make amateur radio more popular in Korea," writes KARL prexy In Kwan Lee to K1JDN. "Our greatest problem is rigs for headquarters stations HM0HQ and HM9A/p. For their operation we borrow equipment from members." . . . . . KH6WW reports on the 80-meter DX success of JA8LN's 20-watt 807 which needs only Europe and Africa for an all-continent sweep. JA8WB may be the only JA with all continents worked on 3.5 Mc. — at least recently. KH6WW broke his own 80-meter ice by working JA, UA0, ZK2 and ZL on the band . . . . . The KWS-1 and 75A-4 of KG6IJ is knockin' 'em dead on 20 s.s.b., reports KG6IVB (K2IVB). Operation is mainly concerned with keeping local military personnel in touch with home . . . . . "We finally made it!" writes AP2CR to W7VEU reference his East Pakistan s.s.b. triumph in March. Colin overcame many obstacles in scoring 189 QSOs from Dacca. "It was exasperating to finally ferret a recognizable call out of the melee only to have my return report drowned out by bundles of fresh vociferous callers." AP2CR's ground-plane was no great shakes as a radiator and even less effective as a receptor, sucking in great quantities of man-made noise. "I am sorry to haul down the flag at AP2CR but I hope all my good sideband friends will continue to work me when I fire up with less exotic GW3JET. Thank all the gang, and especially the Willamette Valley DX Club, for valiant support." . . . . . HS2M specifies, "I'm usually on 14,018 or 14,058 kc. around 1100 GMT week days, also 1100-2000 on week ends, using a 720-K and RAL-8 with dipole." . . . . . Five operators divide VS9MB activity on Gan, according to W8EWB's info. The club's current layout is a great improvement over the rugged tent quarters inaugurated as VS9MA some years back but there are still plenty of problems involved in keeping the station on the air . . . . . WA6IVM and JA1CMG have logged 100 hours of chatting since they first hooked up a year ago. Two skeds weekly on 40 c.w. go like clockwork. Neighbor WA6IQM notes JA1AEA's potent 7-Mc. s.s.b. signal seeking Atlantic coast QSOs around breakfast time at our end . . . . . Despite harrassing local QRM from five DX-minded locals, JA2JW reports a fine 218/202 countries total to W8KX. An on-the-nose quad is the secret . . . . . HKARTS Hq. station VS6AJ commenced operations with a UB5KAB QSO. Ex-VS6s recently heard from include DL (now DL2AR), DO (VQ2DO), DX (G3KVI) and ED (G3MDD) . . . . . Asian notes courtesy JDXRC, PBRC and VERON: JA1EEB talks up an early Marcus effort to follow JA7QQ/1's 7-Mc. try. . . . If antenna height means anything 9N3PM/AC4 of the Hillary Himalayan party should clobber all competition.

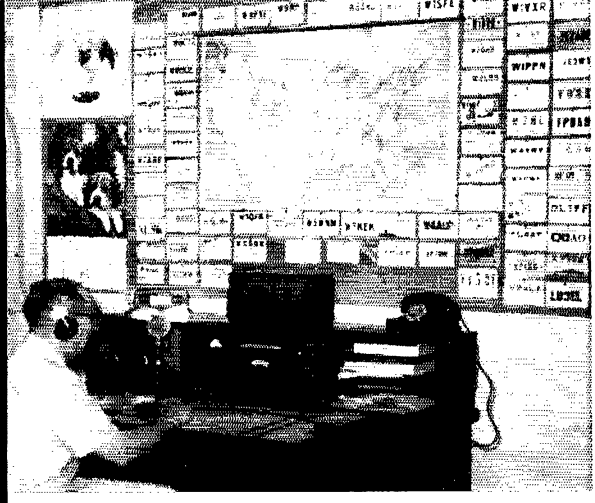
Oceania — "I've just received the calls KB6BP, KH6AWJ and KW6DH for use during my flights on the Pacific missile range," enlightens W6UWL (ex-KA5ZS). Fire when ready, OM! . . . . . Familiar DX-band fixture VK4EL tabulates 29 years of hamming at 20,657 QSOs with 212 countries and more genuine operating awards than you can shake a Zepp at . . . . . Listener D. Gassman notes W1HLP having a DX frolic at the s.s.b. switch of KX6DB. K6QHC heads for the Marshalls on Navy duty and may also get a chance to sign that log . . . . . Out Lualualei way we find W4IGA, Ks 4SPG 6LNL, KH6s DVE and CZE sharing DX developments at Navy Radio's Class 605 KH6NAA installation . . . . . K2QXG hears that a W0 may soon log a few QSOs from Russia's Mirny base, site of UA1KAE. Mac recommends a try for VK0VK on 14,015 kc. at 1230 GMT, 14,280 or 14,328 kc. at 0430-0530 . . . . . JDXRC, PBRC, VERON and WGDXC supply further Oceania items: One PK2HT is said to have schedules with 4S7YL, and there's DX action imminent by K3HVN/PK. . . . A permanent Kure Island DX entry is in the cards. . . . Lord Howe Island still features VK2FR at 0430-0630 Mondays, 14,055 kc. . . . VK8s RW TB and CR9AH all yearn for a Timor turn. . . . FK8AS has Wallis Island fever once more. . . . VR1s G and J claim Ocean Island status. . . . Renewed Kermedecs workability is predicted.

Europe — After a frustrating 12-month assignment in hamless Turkey, K9PDH is eager to become a DL5. He's also anxious to try some Continental-style DXpeditionary work in conjunction with friend DL1RE. Peter has an HT-37, 75A-4 and Viking II ready for possible action in San Marino, Monaco and what have you . . . . . Sweden military ham station SL2ZA hunts DX with 400 watts of sideband on 20 and 75 phone. SM2BGG is the pusher . . . . . W2QHH reports a neat DX performance by GI6YM/A at a Northern Ireland hobbies exhibition in early April . . . . . Sea rover K9IYC and USS *Alacrity* headed back this way after several Mediterranean stops and a deficiency of ham activity since October last. "I'll be glad to get back to good old Granite City and be on the air again," avows Joe, sending a fat list of Yanks whose solid signals pour into southern Europe . . . . . WA6CYT, reachable at 7500th ABRON, APO 125, New York, N. Y., welcomes newcomers to a Novice Amateur Radio Association and net organization. Self-addressed stamped envelopes to Keith will get you data on the deal . . . . . "I'm disgusted with this 'MC' and 'list' business," writes DL4BS, referring to VU2NRM's recent Laccadives drive. Russ feels that many QSOs logged through this procedure are of extremely doubtful validity . . . . . SM5KV/9Q5 dropped the fancy appendage and is catching his DX breath back in Scandinavia after a whirlwind Katanga career . . . . . G3MCN of Liverpool & District Amateur Radio Society urges W/Ks to watch for GB2LS on July 13th-15th, 20-meter phone and c.w., operating from the club's annual amateur radio exhibition. "The Worked Liverpool Award of our society has been claimed by many American amateurs," states G3MCN . . . . . European tidbits via NCDXC, PBRC, VERON and WGDXC: RAEM of Moscow complicates things by designating Alexander Island as UA1KED's QTH. . . . ZA2BOR, brother of ZA2BAK, makes it an Albanian DX threesome together with ZA2KC. . . . UA3FE and friends cogitate on possible Franz Josef Land DXpeditionary doings this summer. . . . DL4s FX and PI hope for Monaco with a KWM-1 this month. . . . OY7ML expects early Danish 160-meter transmitting authorization at the ten-watt level, and OH2YV anticipates the same possibility up his way.

Hereabouts — "Have call, will travel," might be the refrain from K4DWU. Ronnie has his KS4BC credentials for Swan Island and seeks the cooperation of other interested DXpeditioners for a summer sojourn. Interested? . . . . . ZL2BX visited W7SXP on the spring leg of his Stateside tour now continuing . . . . . K8KCO zoomed past the 100-country mark but must now curtail DX action in favor of



Fernando de Noronha's PY7LJ has been amazingly active on 80 through 10 meters since May, last year. Alvaro's countries total is well over 100, and there are many W/K/VEs in his log who are unaware that he's an exceptional DXCC-type catch. PY7LJ soon will resume less DXotic status as PY1BLT. *(Photo via W8KX)*



W8GDQ of Wellington, Ohio, apparently is only the second amateur in history to work all continents on 160 meters. A c.w. two-way with ZC4AK in early March clinched Willard's claim to DX fame. The first certified 160-meter WAC was achieved by W1BB in 1953. They don't come easy or often, do they?

M.I.T. schooling. It's a good thing for youngsters to bear in mind that education comes first, DX second. Opportunity for concentrated booklarnin' usually comes but once a lifetime; DX is always there . . . . . Here's an old yarn but it's always delightful: The neighbor who dropped in to complain of interference from WA6IVM caught the bug from Ray and now signs WV6OGD . . . . . W4EEE's patient dogwatch netted him QSO No. 1 on 20 phone with Malpelo's HK0TU in early April . . . . . October is PY7-LJ's Fernando farewell date, according to word via W8KX. Meanwhile, Alvaro goes at it on week ends: 80 meters at 0600 GMT, 40 at 0900, 10 at 1500. During the week PY7LJ likes 20 or 15 meters around 2000. Alvaro's unfamiliarity with English gives c.w. DXers the break on this one . . . . . W5ABY, ably abetted by the XYL and W5s FJ PM and UKK, relieves trusty W5s GNG and KBU at the masthead of WGDXC's well-circulated *DX Bulletin* . . . . . NCDXC and VERON supply these local observations: VP2VB of *Yasme* note is temporarily landbased in California. San Diego DX Club, P.O. Box 16006, San Diego 16, is ascertaining possibilities of further DX ventures by Danny & Co. . . . VO2s ran rampant during Goose Bay Amateur Radio Club's QSO spree in late April. Check with VO2NA for details regarding the club's WAG certification.

Ten Years Ago in "How's DX?" — An attempt is made to describe 1951's Mr. Average DX Man in the curtain-raising commentary . . . . . EK1AO, GD3UB, GW3s FST ZV and KV4AA still surprise our east coasters on 160. Incidentally, W4NNN challenges W1BB's claimed "first" with South America on 1.8 Mc., calling attention to his own ARRL DX Test contact with HC1PK last year . . . . . On 80 desirables include FP8AW (HB9AW), HP1BR, HZ1KE, SV0WH, ZD4AB, ZM6AK and 4X4RE . . . . . Forty-meter fans scramble madly for EK1DX, F9JD/FC, FK8AZ, KH6ACL/KP6, KS4AC, MP4BAF, VO6H, VS7NX and ZD9AA . . . . . The mob on 20 c.w. pursues C2AP, CS3AA, EK1AQ, ET3A, F8EX/AR, FR7ZA, I5ZC, KJ6AI, MB9BJ, MD2BC, MI3VG, OY3IGO, TA3FAS, VK1s RB YM, VT1AF, W2AQE/KM6, 3A2AC, 9S4s AL and AX . . . . . Phone 14-Mc. targets feature C3KK, FE8AA, KC6WC, KH6LB/KW6, KJ6FAA, ZK2AA and ZM6AA . . . . . Ten-meter voice values: FG7XA, OQ5BQ and ZD4-AH . . . . . Jeeves turns in a pathetic performance as Field Day power-source chairman . . . . . Photos of EA8AX, IS1FIC, YV5AB, HH2s DJ X and LD are added to your *QST* album of DX personalities and paraphernalia. QST

V.H.F. QSO Party—June 10-11

SUMMER operating activities commence with the June V.H F. Party, scheduled for June 10 and 11. 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. (1400) your local standard (*not* daylight) time Saturday, and continues until 10 P.M. (2200) 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.

Please follow the new log and summary form shown on page 64 of June, 1960, *QST*, or send to ARRL Hq. for a supply. These free log forms are now available on request. Reports should include your call and ARRL section, as well as times, calls, and sections of stations worked. Your entry must be postmarked by June 30, 1961, for *QST* listing.

Rules

1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, June 10, and ends at 10:00 P.M. Local Standard Time, Sunday, June 11. 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.

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. Award Committee decisions will be final.

8) Reports must be postmarked no later than June 30, 1961, to be eligible for awards. Follow the sample log for correct form ,or a message to Headquarters willbring printed blanks for your convenience. QST

14th Running Finds Activity and Scores Still Climbing

1961 V.H.F. Sweepstakes Summary

THE V.H.F. Sweepstakes looks more like its lower-frequency counterpart every year. Always the top event on the v.h.f. man's calendar, the V.H.F. SS now threatens to displace one of the Big Three (Field Day, SS, DX Contest) as an all-time favorite operating activity. The 14th running, January 7–8, 1961, brought in 1561 valid logs, up 8 per cent over the 1960 record. Some 1094 stations were on 50 Mc., and 990 on 144; both records. All this came about with conditions generally poor. We shudder to think what might have happened had there been major propagation breaks around the country!

For the first time in v.h.f. contest history, single-operator contact totals went over the 500 mark. W3HYJ and W3KKN, both of the Philadelphia area, worked 521 and 541 stations respectively. W3HYJ had 19 ARRL Sections, for 30,218 points, and W3KKN 15, for 27,025. Eight stations exceeded the magic figure of 400, once considered all but impossible of achievement in a v.h.f. contest. These included W9ROS, Roselle, Ill., with 415, showing that there was no East coast monopoly in this field.

Club spirit makes the V.h.f. Sweepstakes the grand party it is, and several years of intensive effort paid off in 1961. The Mt. Airy V.H.F. Club, never less than 5th since their entry into the fray in 1957, climbed to 3rd, then 2nd, and finally this year pushed the perennial winner, the South Jersey Radio Association, out of the top spot. With practically every member taking part, 92 Pack Rats brought home a total of 617,139 points. Note well that this is an average score per member of 6708 points, an achievement not even approached by any competitor.

SJRA virtually equalled their 1960 score, but lost to their across-the-river rivals by a wide margin. Third position in the club standings was taken by the 6-Meter Club of Chicago, repeating their 1960 effort. A new name to reckon with in club competition is the National Capital V.H.F. Society. The boys from the Washington area jumped from 9th to 4th, pushing back the hard-working Dayton Amateur Radio Association by a mere 6 points! Three other clubs retained their 1960 ranking, 6th, 7th and 9th places being held by the Mobile Sixers, Waltham Amateur Radio Association, and the Keystone V.H.F. Club. Old hands at V.H.F. contesting, the Rochester V.H.F. Group landed in the top ten for the first time, and a newcomer, the Southern California V.H.F. Radio Club, hit the 8th spot on their first try. We have the feeling that here is a group capable of making trouble for the leaders.

While all the top scores represented work on two or more bands, there were some notable one-band efforts. In 57 ARRL Sections represented, awards were won in 12 on 50 Mc. and 2 on 144. K8MMM hummed his way through 280 50-Mc. contacts for 12,320 points and the Ohio Section wallpaper. W2GOO stuck to it to lead the Eastern New York Section, and all 2-meters-only operators, with 295-10-11,800. W3IBH worked more stations on 144, an even 300, but with a lower multiplier had to be content with a thousand points less than W2GOO.

Success in digging for new sections is the mark of the hot contest operator. W1HDS came up with 20 sections on 50 Mc., enabling him to post an 8100-point total with only 135 contacts. K1AII, also in Eastern Massachusetts, operated by the licensee and W1BVP, worked 23 sections. With 280 contacts, this resulted in 18,414 points, one of the best multi-op accomplishments. How do you knock off the hard ones others miss? One way, used well by both W1HDS and K1AII, is to learn to push a key effectively. This will get you sections the voice-only fellows never even hear. Quite a few contestants bemoan the lack of c.w. in v.h.f. contests. All who can use it agree that it misses its true potential by too wide a margin, simply because not enough v.h.f. operators give it a real try. If you're looking for a secret weapon for next year, why not train a few good c.w. operators in your club? Keys are cheaper than kilowatts!

The V.H.F. SS gets around. This year we had two entrants in Alaska. KL7AUV, Anchorage, was able to work 28 stations on 6 and 2, without any DX help. K9KVV/KH6 picked up a few 6-meter contacts in the 50th State. And we even had one log from Mexico. While we cannot issue awards to, or credit section multipliers for, an area outside the ARRL Field Organization (see page 6 of any *QST*) we're happy to report that XE1OE, Mexico City, was able to work 48 stations in 7 ARRL Sections, plus Mexico. With W9OWK and W8NRM at the controls, XE1OE did business on 50, 144, 220 and 420 Mc.

A large group effort that made the contest more fun for many entrants, but which cannot be credited for awards, was that of the Connecticut Mobileers. These boys (and gals) are a potent factor in the 2-meter activity picture all through Western New England, and they went all-out in the SS, totalling some 180,000 points. Unfortunately they draw their support from much too wide a territory to be acceptable under SS Rule 7, in fairness to other clubs of the region, so they had to be ruled out of this and future club-award activities. This move is made with a bow in their direction for a superb job of v.h.f. promotion and public service. —*E. P. T.*

CLUB SCORES

Club	Aggregate	Valid Entries	Certificate Winner
Mt. Airy V.H.F. Club (Pa.)	617,139	92	W3HYJ
South Jersey Radio Assn.	493,420	113	W2BLV
6 Meter Club of Chicago	271,567	115	W9ROS
National Capital V.H.F. Society	156,743	59	W4LTU
Dayton Amateur Radio Assn.	156,737	84	K8REG
Mobile Sixers Radio Club (Pa.)	110,732	31	W3HFY
Waltham Amateur Radio Assn. (Mass.)	87,135	24	W1QXX
Southern California V.H.F. Radio Club	53,826	12	K6JQB
Rochester V.H.F. Group	45,128	38	K2YCO
Keystone V.H.F. Club (Pa.)	41,554	17	K3JFL/3
51.30 Club (Mass.)	40,533	23	W1DDV
Cowtown DX Club (Texas)	39,618	24	K5TKR
Hartford County Radio Assn. (Conn.)	36,756	8	W1PHR
Lake Success Radio Club (N. Y.)	32,469	11	W2YHP
South Bend Amateur Radio Club (Ind.)	31,212	21	W9EPT
Central New Jersey V.H.F. Society	28,900	15	W2GKR
6 Meter Club of Dallas	26,984	17	K5RBN
Greater Atlanta V.H.F. Society	26,160	14	K4JPD
Syracuse V.H.F. Club	26,070	21	K2QWD
Merrimac Valley Amateur Radio Club	24,418	7	W1HDS
1200 Radio Club (Mass.)	22,780	9	W1QIB
Maryland V.H.F. Society	22,267	6	K3HCE
York Road Radio Club (Pa.)	22,148	9	K3DXC
Earbenders Radio Club (N. J.)	21,924	10	WA2INB
Hampden County Radio Assn. (Mass.)	19,841	9	W1RFU
Geauga Amateur Radio Club (Ohio)	18,888	5	K8MMM
East Coast V.H.F. Society	15,984	9	WA2DHS
Air Capitol Amateur Radio Assn. (Kans.)	15,743	23	WØWPQ
Oh-Ky-In V.H.F. Radio Society	15,358	8	K8GYK
Milford Amateur Radio Club (Conn.)	14,846	4	W1RJA
Dutchess County V.H.F. Society (N. Y.)	13,910	9	W2LWI
King Phillip Amateur Radio Society (Mass.)	13,738	6	K1JBD
Fox River Radio League (Ill.)	12,733	12	K9WFY
North Penn Amateur Radio Club	12,724	8	K3HLN
West Jersey Radio Club	12,620	8	K2OPI
Joliet Amateur Radio Society (Ill.)	11,343	6	K9HUY
Newport County Radio Club (R. I.)	11,168	5	WA6FGU/1
IMO V.H.F. Radio Club (Ind.)	10,712	6	K9GFQ
Quinebaug Valley Radio Club (Mass.)	10,470	8	K1ICM
Greater Pittsburgh V.H.F. Society	10,128	7	K3JTH
Auburn Amateur Radio Assn. (N. Y.)	9886	9	K2MLF
Central Michigan Amateur Radio Club	9634	11	K8BGZ
807 Society of Central High School (Pa.)	8332	4	K3CHF
Whopping Fog Hollow V.H.F. Club (N. Y.)	7373	3	WA2BAH
Mid-Hudsou V.H.F. Society	7354	3	K2CVG
Michigan City Amateur Radio Club (Ind.)	7302	12	K9HYV
Mohawk Radio Club (N. Y.)	7212	4	K2OJQ
Rock Creek Amateur Radio Assn. (Md.)	6600	6	W3UCR
DeVry Technical Institute Amateur Radio Society (Ill.)	6102	4	K9JVZ
Seneca Radio Club (Ohio)	5823	5	W8MVE
SWANI Radio Club	5462	3	W9OII
Clermont City Amateur Radio Club (Ohio)	5422	5	K8BJA
West Side Radio Club	4850	9	VE3AIB
New York Contest Club	4176	3	K2RHD
Columbia River V.H.F. Society	4156	6	W7RGS
Elkhart Amateur Radio Club (Ind.)	4098	3	K9OGF
Canton Amateur Radio Club (Ohio)	3057	3	W8WNM
Barnstable County Radio Club (Mass.)	2774	3	W1YBY
Oklahoma Central V.H.F. Club	2676	3	K5ZTH
Amateur Radio Technical Society of St. Louis, Mo.	2260	4	KØHZW
Adams County Amateur Radio Society (Pa.)	2242	3	K3HQI
Nittany Amateur Radio Club (Pa.)	1857	6	W3KJM
M.I.C. Radio Club (Pa.)	1752	3	W3GCR
Eglin Amateur Radio Society (Fla.)	1606	7	W4BPJ
Fidelity Amateur Radio Club (R. I.)	699	3	K1LNB
Pocatello Amateur Radio Club (Idaho)	330	4	W7GGV
Connecticut Mobileers*			

* Ineligible for awards, contest rule #7. Approximate total counting stations outside of club territory 184,000 points.

SCORES

In the tabulation on the next pages, scores are listed by ARRL division and sections. Unless otherwise noted, the top scorer in each section receives a certificate award. The highest-scoring Novice also receives a certificate in each section where at least three such licenses submitted valid contest logs; footnotes denote these winners. Columns indicate final score, number of contacts, number of different sections worked, and the bands used. A represents 50 Mc., B 144 Mc., C 220 Mc., D 420 Mc., E 1215 Mc. Multioperator stations are shown at the end of each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3HYJ 30,218-521-19-AB
W3KKN 27,025-541-15-ABC
W3CKP 19,032-397-14-AB
W3HFY 18,584-404-13-ABC
W3CL 16,720-440- 9-ABC
K3IUV 16,140-404-10-ABC
W3TYX 14,628-318-13-AB
W3FQD 13,756-362- 9-AB
W3FSC 13,642-359- 9-AB
W3HKZ 12,342-364- 7-ABC
K3HNP 12,240-308-10-AB
W3TXO 12,060-335- 8-AB
K3ECF 11,988-333- 8-AB
W3SAO 11,968-352- 7-AB
K3AUH 11,196-311- 8-AB
W3IBH 10,800-300- 8-B
K3UUZ 10,319-304- 7-AB
K3ESL 9920-310- 6-AB
K3BPP 9808-307- 6-ABC
W3IXL 9760-305- 6-AB
W3TDF 9750-195-15-AB
W3GHM 9600-301- 6-AB
W3AJF 9158-241- 9-AB
K3IBO 8840-260- 7-AB
K3IPM/3 8772-258- 7-AB
K3EOF 8768-274- 6-AD
K3DXC 8626-227- 9-A
K3JFL/3 8280-230- 8-AB
W3FOL 8190-273- 5-AB
W3LHF 8128-254- 6-AB
W3JSD 7990-235- 7-AB
W3CXU 7980-266- 5-AB
W3CMK 7648-240- 6-AB
W3GXB 7500-250- 5-AB
K3CHF 7290-244- 5-AB
W3GEC 6750-225- 5-A
K3ATL 6704-210- 6-A
W3OR 6592-206- 6-A
W3IZU 6528-192- 7-AB
K3EMR 6524-233- 4-AB
W3HYO 6432-201- 6-AB
W3BVR 6420-214- 5-A
K3BEF 6328-226- 4-AB
W3MVF 6120-204- 5-A
K3ALK 6090-203- 5-AB
K3MTL 6090-203- 5-AB
W3ETB 6034-216- 4-A
W3AYG 5880-210- 4-AB
K3HIN 5796-207- 4-AB
W3NSI 5628-201- 4-AB
W3CFS 5600-175- 6-AB
K3JJZ 5430-181- 4-A
K3CIV 5280-165- 6-A
W3ZEY 5184-162- 6-AB
K3FEH 5134-151- 7-AD
W3BRU 5024-157- 6-AB
W3KXH 4992-192- 3-A
K3MLI 4858-176- 4-AB
W3HAB 4760-170- 4-A
W3UMI 4552-159- 4-AB
K3DAQ 4340-155- 4-A
K3GOZ 4303-166- 3-A
K3GFF 4264-164- 3-AB
K3HSS 4242-152- 4-AB
K3EOD/3 4214-151- 4-AB
K3HJA 4170-139- 5-A
K3KFD 4160-160- 3-A
W3UCA 4104-114- 8-B
W3ZOR 3910-115- 7-A
W3JGN 3744-144- 3-AB
W3QAS 3724-133- 4-AB
K3HWZ 3696-132- 4-A
K3CJV 3640-130- 4-A
K3HEX 3640-140- 3-AB
K3GXV 3536-136- 3-AB
K3EPB 3500-125- 4-A
K3GAS 3500-125- 4-A
W3ZRR 3500-125- 4-A
W3CPT 3444-123- 4-B
K3LLI 3392-106- 6-A
K3HNG 3332-119- 4-A
K3DMA 3288-137- 2-A
K3HRF/3 3168- 72-12-A
K3KVS 3146-121- 3-B
W3ZYO 3120-120- 3-A
K3AIQ 3108-111- 4-A
W3GFG 3094-111- 4-B
W3DRC 3024-108- 4-AB
K3HLN 3016-116- 3-A
K3CXV 3000-100- 5-ABC
K3MSV 2976-124- 2-AB
W3DYL 2968-106- 4-A
W3GSC 2860-110- 3-AB
K3BLR 2828-101- 4-A
W3QVI 2800-100- 4-A
W3GCR 2760-115- 2-B
K3LBT 2744- 98- 4-AB
W3UZF 2730- 91- 5-B
W3UKG 2678-103- 3-A
K3GZT 2626-101- 3-AB
W3GEW 2626-101- 3-A
K3AQH 2568-107- 2-AB
W3FEY 2460- 82- 5-ABCD
K3JGU 2376- 99- 2-A
K3EYF 2353- 91- 3-A
K3LNM 2352- 84- 4-A
K3GFC 2340- 90- 3-A
W3CLQ 2310- 77- 5-AB
W3SXD 2128- 76- 4-AB
W3HJP 2100- 75- 4-A
W3ZTL 2054- 79- 3-AB
K3IGX 2030- 73- 4-A
W3WIJ 2002- 77- 3-AB
K3HQC 1950- 75- 3-ABC
K3NBF 1950- 75- 3-B
W3ZEJ 1944- 81- 2-A
W3DIR 1920- 80- 2-A
W3AMO 1898- 73- 3-AB
W3AWA 1848- 66- 4-AB
W3GNU 1848- 66- 4-A
K3EMA 1728- 72- 2-AB
K3EIC 1690- 65- 3-A
W3SST 1664- 64- 3-ABD
W3MMV 1612- 62- 3-ABD
W3DJV 1560- 65- 2-A
W3QB 1560- 65- 2-A
K3GZU 1534- 59- 3-A
K3IFH 1512- 63- 2-A
K3DGC/3 1488- 62- 2-A
W3JSA 1482- 57- 3-B
W3NOK 1400- 50- 4-B
W3OZP 1344- 56- 2-B
K3LCR 1300- 50- 3-A
W3LRH 1300- 50- 3-A
K2GYS 1248- 52- 2-A
K3CMS 1200- 50- 2-A
W3UQJ 1128- 47- 2-A
K3JYN 1120- 40- 4-AB
K3BRJ 1118- 43- 3-B
K3HQI 1092- 42- 3-A
W3TJQ 1056- 44- 2-A
K3EYJ 1040- 40- 3-A
K3GJL 1040- 40- 3-AB
K3KEL 1040- 42- 3-A
W3IMW 1040- 40- 3-AB
W3AWG 1032- 43- 2-B
K3CFO 1008- 42- 2-A
W3EDO 962- 37- 3-B
K3JJZ/3 960- 40- 2-A
K3HQA 912- 38- 2-A
W3FLD 864- 36- 2-A
W3APS 858- 33- 3-A
W3HIX 840- 35- 2-ABC
K3BKH 816- 34- 2-A
K3JJV 768- 32- 2-AB
W3GOB 768- 32- 2-A
W3SOB 744- 31- 2-A
K3GAU 720- 30- 2-A
W3BRY 648- 27- 2-A
W3ARW 646- 19- 7-B

K3KTE 540- 21- 2-B
K3JNP 552- 23- 2-A
K3IPW 484- 22- 1-A
K3KLQ 480- 20- 2-A
W3FWC 480- 20- 2-B
W3HKZ/3 480- 20- 2-A
K3HWZ/3 462- 21- 1-A
W3CLT 432- 18- 2-AB
W3JWF 432- 18- 2-A
W3RSC 418- 19- 1-A
K3LNI 396- 18- 1-AB
KN3MDG 384- 16- 2-B
W3UQC 360- 15- 2-B
K3CNN 264- 12- 1-B
W3BUR 242- 11- 1-B
K3LBT/3 216- 9- 2-A
K3HYT 192- 8- 2-A
K3EJG 168- 7- 2-A
K3DGA 154- 7- 1-A
K3EHQ 154- 8- 1-A
W3IHT/3 154- 7- 1-A
K3HIU 130- 5- 3-B
K3EYL 110- 5- 1-A
K3EJG/3 88- 4- 1-A
K3GEN 22- 1- 1-A
W3QQB/3 (4 oprs.) 15,800-395-10-AB
K3HRD (4 oprs.) 11,445-383- 5-AB
W3IHT (W3s BES IHT) 8960-281- 6-ABC
W3WJC/3 (K3s ABS MGO, W3WJC) 8864-277- 6-AB
K3BGT (K3s BGT GMJ) 7328-229- 6-A
W3HZU (15 oprs.) 7276-214- 7-ABC
K3CHN (K3s CHN ECB) 6450-215- 5-A
W3BJG/3 (K3GDI, W3BJG) 5814-171- 7-AB
W3AEQ (12 oprs.) 5678-167- 7-AB
W3ZGD (8 oprs.) 4256-133- 6-AB
K3BVZ (K3BVZ, W3BMA) 4200-140- 5-A
K3GAY (K3GAY, W3NIV) 2016- 63- 6-ABC
K3IWK (K3s EGX HWH IWK) 1508- 58- 3-AB

Md.-Del.-D. C.

W3ASD 8970-195-13-AB
K3HCE 7056-168-11-AB
K3AZH 6878-181- 9-AB
W3CGV 5940-165- 8-ABCDE
W3JWY 5200-130-10-AB
W3NG 5056-158- 6-AB
W3OTC 4752-132- 8-A
W3JNE 4097-133- 7-AB
W3LKU 3720-124- 5-AB
K3BYD 3612-129- 4-AB
W3JZI 3108-111- 4-ABCD
K3LNH 3040- 95- 6-A
K3EHS 2828-101- 4-A
K3JEX 2828-101- 4-AB
K3CPA 2800-100- 4-AB
K3AJD 2660- 95- 4-A
W3WOD 2496- 78- 6-B
K3IJU 2492- 89- 4-A
W3AHQ 2472-103- 2-ABC
W3BYM 2464- 88- 4-A
W3MMC 2460- 82- 5-A
K3AMG 2296- 82- 4-A
K3DGK 2240- 80- 4-A
K3HDW 1870- 55- 7-AB
W3UCR 1848- 66- 4-B
W3HB 1834- 66- 4-B
K3JAN 1666- 60- 4-A
K3MAU 1482- 57- 3-A
K3BYR 1400- 50- 4-A
W3CB 1352- 52- 3-AB
K3LUQ 1300- 50- 3-A
K3LGA 1248- 52- 2-A
K3JWE 1200- 50- 2-A
W3PIH 1200- 50- 2-B
K3JIN 1176- 49- 2-A
W3ZQ 1014- 39- 3-B
W3FLU 1001- 39- 3-A
K3LXQ 960- 40- 2-AB
W3KMV 960- 40- 2-A
W3NJT 888- 37- 2-A
K3AEX 768- 32- 2-B
K3NOG 744- 31- 2-A
W3ZKI 696- 29- 2-A
K3BNV 559 22- 3-A
W3ILS 540- 18- 5-A
W3IWJ 468- 20- 2-B
K3CFD/3 432- 18- 2-B
W3CJT 264- 11- 2-B
W3ZXZ 240- 10- 2-A
W3CPM 204- 9- 2-B
W3BNE 110- 5- 1-B
K3ETW/3 (4 oprs.) 3645-229- 9-AB
W8KMX/3 (K3LNZ, K4LHB, W8KMX) 7616-224- 7-AB
K3HFV (4 oprs.) 5250-188- 4-AB
K3JUK (K3IEV, W3JQS) 5185-154- 7-AB
K3GIU (K3s GIU MXY) 3584-128- 4-AB
W3VJE (K3KPZ, W3VJE) 3104- 97- 6-AB
K3LUK (K3DGK, W3KMV) 3078- 81- 9-AB
W3JIQ (K3MAU, W3JIQ) 3030-101- 5-AB
K3MFM (K3s LMS LSO MFM) 2910- 97 5-AB
W3DHQ (W3s DHQ KDZ) 1776- 74- 2-AB
W3MSR (W3s KYF MSR) 1540- 55- 4-B

Southern New Jersey

K2ITP 23,608-455-16-AB
W2EIF 23,232-484-14-AB
K2TYW 22,591-390-19-AB
W2BLV 19,200-400-14-ABD
W2BV 16,800-350-14-AB
W2KFC 14,155-375- 9-ABC
W2PAU 13,376-352- 9-AB
W2NSF 13,140-367- 8-AB
W JAV 12,10 -275-12-AB
WA2EMB 11,704-309- 9-AB
WA2GSO 11,440-260-12-AB
W2HTL 10,926 304- 8-AB
W2AXU 10,800-300- 8-AB
W2HBE 10,624-333- 6-AB
WA2DWT 10,592-331- 6-AB
W2OSD 10,472-308- 7-AB
K2HOD 10,224-284- 8-AB
W2ZUL 9930-331- 5-AB
WA2GJE 9435-278- 7-AB
K2SMZ 8932-319- 4-ABC
K2KCI 8912-279- 6-AB
W2QBH 8160-272- 5-AB
W2LBX 7590-253- 5-AB
W2OQN 7548-222- 7-AB
WA2EIY 7296-228- 6-AB
K2KTS 6750-225- 5-AB
K2HJY 6576-206- 6-AB
K2MGZ 5852-209- 4-AB
W2GQO 5796-208- 4-AB
WA2NXV 5796-207- 4-AB
K2BZK 5684-203- 4-A
K2JVX 5550-185- 5-A
K2OHM 5550-185- 5-A
W2EXB 5344-168- 6-AB
K2UWH 5083-196- 3-AB
K2EJW 4862-187- 3 A
WA2AGK 4844-173- 4-AB
W2ADA 4836-186- 3-AB
K2YRW 4725-158 5-AB
WA2HSP 4392-183- 2-AB
WA2ICW 4160-130- 6-AB
WA2BXV 4116-147- 4-A
WA2IDT 3952-152- 3-A
K2PZF 3904-122- 6-AB
K2TUY 3892-140- 4-A
K2SXN 3816-159- 2-A
K2GCD 3780-135- 4-AB
W2TBD/2 3724-133- 4-AB
K2QOK 3640-131- 4-A
K2YIB 3600-120- 5-AB
W2ESX 3528- 98- 8-B
WA2IEK 3510-135- 3-B
W2ESG 3500-126- 4-AB
WA2JTR 3445-133- 3 B
K2MIO/2 3360-120- 4-AB
WV2IJR 3304-118- 4-B
K2RRC 3220-115- 4-B
W2GVB 3136-112- 4-B
K2BPX 3045-102- 5-AB
K2EGH 2926-105- 4-AB
K2BG 2904-121- 2-AB
K2VPA 2886-111- 3-A
WA2FDV 2842-102- 4-A
W2EWN 2760-115- 2-AB
K2MKD 2730-105- 3-AB
WA2ONB 2652-102- 3-A
WA2HGW 2624- 82- 6-B
WV2MES 2532-106- 2-B
K2OYW 2520- 90- 4-A
K2PMT 2444- 94- 3-A
K2TZH 2444- 94- 3-A
W2DMU 2436- 87- 4-A
K2YEL 2400- 100-2-B
W2WKI 2400-100- 2-AB
W8KNC/2 2340- 90- 3-A
WA2DYA 2314- 89- 3-B
K2SUN 2136- 89- 2-AB
WA2NWX 2054- 79- 3-A
WA2BLV 1968- 82- 2-A
W2BUI 1944- 81- 2-A
W2QDY 1872- 78- 2-A
WA2DIQ 1848- 77- 2-B
W2LY 1820- 65- 4-B
WA2KWS 1820- 70- 3-B
WV2MGV 1800- 75- 2-B
K2DEI 1664- 64- 3-A
WA2ABF 1608- 67- 2-AB
WV2LCB 1584- 66- 2-B
K2HDX 1464- 61- 2-AB
WA2HJI 1456- 56- 3-B
W2SDB 1440- 60- 2-A
K2DFE 1300- 50- 3-AB
WA2OWH 1296- 54- 2-A
K2OYW/2 1248- 48- 3-A
W2OWA 1176- 49- 2-B
WA2HVD 1118- 43- 3-AB
WA2BDF 1104- 46- 2-A
K2QOS 1066- 41- 3-AB
WV2MTU 1056- 44- 2-B
WA2CNS/2 936- 39- 2-A
W2TAV 910- 35- 3-B
W2OGZ 840- 35- 2-B
WA2CVR 754- 29- 3-B
W2LFN 720- 30- 2-AB
W2FXT 696- 29- 2-AB
WA2LJE 672- 28- 2-B
W2SDZ 576- 24- 2-B
WA2NWY 384- 16- 2-B
W2VX 360- 15- 2-B
W2LBX/2 312- 13- 2-B
K2EGH/2 288- 12- 2-A
K3HWZ/2 260- 10- 3-A
W2OSD/2 216- 9- 2-B
K2PWV 198- 9- 1-A
WA2KUP 168- 7- 2-B
WA2AXG/2 165- 8- 1-B
W3IHT/2 72- 3- 2-A
WA2LSB 44- 2- 1-A
W2REB (K2MPV, W2REB) 15,876-441- 8-AB
W2BAY (2 oprs.) 8260-295- 4-AB
WA2KOK (WA2s KOK MON OCU) 2522- 97- 3-AB
W2MX (K2s HES KPF) 1056- 44- 2-B

Western New York

K2ZBU 5814-153- 9-A
K2YCO 5080-128-10-AB
K2QWD 3274- 88- 9-A
W2IYR 3026- 89- 7-AB
W2ALR 2912- 91- 6-B
K2RTU 2856- 84- 7-AB
K2MLF 2784 87- 6-A
K2GUG 2744- 98- 4-ABC
W2EJZ 2610- 87- 5-AB
WA2KND 2528- 79- 6-A
K2ZFV 2380- 85- 4-AB
WA2DVB 2288- 88- 3-AB
K2ZRX 2235- 75- 5-AB
K2JJT 1995- 67- 5-A
K2KWK 1950- 65- 5-A
WA2KVN 1920- 65- 5-A
K2AVA/2 1848- 71- 3-A
K2QPC 1656- 69- 2-AB
K2TDQ 1456- 56- 3-A
K2PKK 1400- 50- 4-AB
K2RSY 1364- 63- 1-A
K2LRI 1320- 55- 2-AB
K2UXF 1320- 60- 1-AB
K2LMG 1216- 32- 9-B
WA2JMH 1200- 50- 2-A
K2QLE 1196- 46- 3-B
W2YIK 1188- 50- 2-AB
K2TXG 1183- 46- 3-AB
W2PFG 1152- 48- 2-A
K2TXX 1144- 52- 1-A
W2TKY 1122- 51- 1-AB
K2UYM 1105- 43- 3-B
K2QVC 1104- 46- 2-A
WA2CQD 1078- 49- 1-A
WA2GCF 1056- 48- 1-A
WA2QBE 1056- 44- 2-A
WV2MZU 1008- 42- 2-B
WA2OXH 902- 41- 1-A
K2OIG 888- 37- 2-A
W2QY 888- 37- 2-B
WA2DGL 888- 37- 2-AB
WA2EHS 888- 37- 2-A
K2GMZ 880- 40- 1-AB
WA2ASB 880- 40- 1-
WA2LHM 876- 37- 2-A
WA2JAU 864- 36- 2-B
WA2KDI 864- 36- 2-AB
K2MKU 840- 28- 5-A
K2HBV 836- 38- 1-AB
WA2NEF 836- 38- 1-A
W2DJL 792- 36- 1-A
WA2ELX 792- 36- 1-ABC
WA2OXL 720- 30- 2-A
K2YFY 682- 31- 1-A
K2QWC 660- 30- 1-A
W2PJO 638- 29- 1-A
W2SNI 616- 28- 1-A
WA2CJO 616- 28- 1-A
WA2ADG 594- 27- 1-A
WA2OXJ 550- 25- 1-A
K2KWI 528- 24- 1-A
WA2OXK 528- 22- 2-A
K2BRE 484- 22- 1-A
W2QNA 480- 20- 2-BC
WA2DZN 480- 20- 2-B
WA2FYH/2 462- 21- 1-A
K2EAY 440- 20- 1-A
WA2GSE/2 440- 20- 1-A
WA2MRL 396- 18- 1-A
K2JWJ 374- 17- 1-A
W2KIO 374- 17- 1-B
WA2KMI 374- 17- 1-A
K2GF 352- 16- 1-A
WA2GXC 352- 16- 1-A
W2DBS 330- 15- 1-A
WA2CUZ 312- 13- 2-B
K8PNN/2 308- 14- 1-A
K2UBA 286- 13- 1-A
W2TCU 264- 12- 1-A
W2MTG 242- 11- 1-A
WA2HEM 242- 11- 1-B
K2DG 240- 10- 2-B
K2RIT 220- 10- 1-A
W2RUJ 220- 10- 1-B
K2YGF 216- 9- 2-
K2DZV 44- 2- 1-B
K2RRM/2 (6 oprs.) 10,604-241-12-AB
W2UTH (K2s JOJ UCQ, W2UTH) 6200-155-10-AB
K2ERQ (K2ERQ, W2YLM) 5040-120-11-AB
W2RHQ (W2s RHQ UFI) 2464- 88- 4-ABC
W2PFA (W2s PFA PFD) 770- 35- 1-A
WA2FEL (2 oprs.) 352- 16- 1-AC

Western Pennsylvania

W3ZRJ/3 4368-139- 6-AB
K3JTH 3900-130- 5-AB
W3BWU 3680-115- 6-AB
K3CHC 3328-104- 6-AB
K3GGZ 2424-101- 2-AB
K3BBO/3 2320- 58-10-AC
K3EDO 1560- 60- 3-A
K3GEZ 504- 21- 2-A
W3KJM 455- 18- 3-AB
K3AKR 432- 18- 2-A
W3SYY/3 288- 12- 2-A
K3LVA 264- 11- 2-A
W3SAY 264- 11- 2-AB
K3LXR 198- 9- 1-A
W3DJM 198- 9- 1-A
W3UGV 192- 8- 2-B
K3LUX/3 154- 7- 1-A
W3EFW 130- 5- 3-A
K3CTI 88- 4- 1-A
K3ILD 88- 4- 1-B

CENTRAL DIVISION

Illinois

W9ROS 17,430-415-11-ABC
K9LTC 12,780-320-10-ABC
K9QPA 12,705-303-11-AB
K9QKB 9920-248-10-AB
K9TUL 7935-173-13-AB
W9EET 6432-201- 6-AB
K9JRQ 6048-189- 6-AB
K9ZMZ 5715-192- 5-AB
K9TEC 5475-185- 5-A
K9UTP 5296-166- 6-A
W9MCG 4575-154- 5-A
K9OOU 4536-162- 4-A
K9PAJ 4472-172- 3-AB
K9GHR 4384-137- 6-A
K9PIM 4200-150- 4-A
K9VEM 4004-143- 4-AB
K9YLN 3920-140- 4-A
KN9VIS 3808-136- 4-B
K9ZOO/9 3750-125- 5-A
K9UHC 3587-106- 7-AB
K9DWR 3584-128- 4-ABC
K9USV 3584-128- 4-AB
W9DJ 3536-136- 3-AB
K9TRG 3528-126- 4-A
K9RRE 3390-113- 5-A
K9HUY 3332- 98- 7-AB
K9QHZ 3320- 84-10-A
K9JVZ 3250-125- 3-AB
KN9ZWU 3250-125- 3-B
K9RVG 3248-116- 4-AB
K9VXY 3248-116- 4-AB
K9GLJ 3240-108- 5-A
K9EEC 3146-121- 3-B
K9SGY 3136-112- 4-A
K9WFY 3120-104- 5-ABC
K9AIA 3080-110- 4-A
K9IEB 3055-118- 3-B
K9OSR 2968-106- 4-A
K9SAM 2856- 84- 7-AB
K9TSN 2832-118- 2-AB
K9UHV 2814-101- 4-AB
K9TLR 2800-100- 4-A
K9PIZ 2744- 98- 4-A
K9BDJ 2592- 81- 6-ABC
K9JFQ 2576- 92- 4-AB
K9DTB 2550- 85- 5-AB
K9PFI 2520- 84- 5-B
K9TSQ 2424-101- 2-AB
K9ARA 2418- 93- 3-AB
K9PMG 2408- 86- 4-AB
W9WSZ 2400-100- 2-AB
K9ZTN 2244- 95- 2-A
K9GUB 2236- 86- 3-AB
W9RVG 2236- 86- 3-A
K9TDQ 2235- 75- 5-B
K9PBN 2210- 85- 3-A
K9TSW 2106- 81- 3-AB
K9SST 2028- 78- 3-A
W9NYO 2028- 78- 3-AB
K9RYI 2016- 84- 2-A
W9QXP 1938- 57- 7-AB
K9THC 1892- 86- 1-A
W9LGI 1834- 66- 4-B
K9VMK 1820- 70- 3-A
W9CRN 1820- 65- 4-B
K9UAA 1776- 74- 2-A
K9LRJ 1736- 62- 4-AB
K9CSS 1708- 61- 4-AB
W9DBJ 1680- 60- 4-A
W9WFR 1638- 63- 3-B
W9VCZ 1624- 58- 4-B
K9MYD 1586- 61- 3-AB
W9VPU 1560- 60- 3-BC
K3ARN/9 1488- 62- 2-B
K9TBA 1440- 60- 2-A
K9YHX 1428- 60- 2-A
K9RIN 1344- 56- 2-A
K9BQW 1326- 51- 3 B
K9PAI 1320 55 2-A
K9VIY 1320- 55- 2-B
K9KWF 1313- 51- 3-B
K9KGK 1300- 50- 3-A
K9URR 1300- 50- 3-AB
K9JAK 1296- 54- 2-A
K9SZT 1248- 52- 2-A
K9ETP 1224- 51- 2-A
K9KXF 1200- 50- 2-AB
K9USU 1200- 50- 2-AB
W9ZOG 1176- 42- 4-B
KN9ZAD 1166- 53- 1-B
W9AXT 1157- 45- 3-B
K9UMV 1128- 47- 2-AB
K9TAV 1080- 45- 2-B
W9AAG 1050 35- 5-BD
W9NW 1040- 40- 3-B
K9QDO 1008- 36- 4-A
K9VYB 1008- 42- 2-A
W9PDN 1008- 42- 2-AB
K9GJO 988- 26- 9-A
K9RTQ 984- 41- 2-AB
K9DOG 960- 40- 2-B
K9LYL 960- 40- 2-B
K9UMD 946- 43- 1-AB
K9WFX 946- 43- 1-A
K9GRH 936- 39- 2-A
K9HIJ 936- 39- 2-A
K9RQC 912- 38- 2-AB
K9GIS 884- 34- 3-A
K9KOH 880- 40- 1-AB
K9WQQ 814- 37- 1-A
K9QDQ/9 792- 33- 2-A
K9VYA 792- 36- 1-A
KN9ZUF 792- 36- 1-B
K9DKR 780- 30- 3-AB
K9GSR 770- 35- 1-A
K9WNX 770- 35- 1-B
K9RNW/9 768- 32- 2-A
K9EVS 754- 29- 3-A
W9KCR 704- 32- 1-A
W9OBY 702- 27- 3-B
K9DPV 682- 31- 1-A
W9BJX 660- 30- 1-A
K9ATK 624- 26- 2-A
K9AZE 624- 24- 3-A
W9ADO 624- 26- 2-B
W9QBL 624- 26- 2-B
W9KXW/9 616- 28- 1-A
K9MDY 605- 28- 1-A
KN9BBN 594- 27- 1-B
W9UVA 576- 24- 2-B
W9DCF 572- 26- 1-A
K9PUF 552- 23- 2-B
KN9BBP 550- 25- 1-B
W9RPH/9 550- 25- 1-A
KN9AWS 546- 21- 3-B
K9QDY 504- 21- 2-AB
W9YVP 480- 20- 2-A
K9JGH/9 476- 23- 2-A
K9JSG/9 456- 19- 2-A
K9UUO 456- 19- 2-A
W9MKW 420- 18- 2-A
K9GTS 418- 19- 1-AC
W9IUX 396 18- 1-AB
K9WED 396 18- 1-B
KN9AGH 352- 16- 1-B
K9POQ 286- 13- 1-A
W9NE 286- 13- 1-B
W9MJT 240- 10- 2-B
K9WXK 234- 9- 3-A
W9ACU 234- 9- 3-B
K9WNK 220- 10- 1-A
KN9BGV 176- 8- 1-B
K9YHI 176- 8- 1-A
K9PBG 168- 7- 2-A
K9IUO 144- 6- 2-A
K9GCN 120- 5- 2-A
K9JSG 44- 2- 1-A
K9ZQS 44- 2- 1-A
W9FVB (K9YHY, W9FVB) 6900-230- 5-AB
K9HDE (K9s HDE OQV) 6208-194- 6-AB
K9ZOD (K9s USX ZOD) 4144-148- 4-A
K9BCJ (3 oprs.) 3042-117- 3-A
K9UYG (K9s UYG ZUG) 3010-108- 4-AB

K9GHW (K9s GHW GHX) 1976- 76- 3-B
K9KMA (K9KMA, KN9ZGU)
1664- 64- 3-B

Indiana

W9EPT 7728-169-13-A
K9FGQ 7258-191- 9-A
K9KGI 4520-113-10-A
K9OGF 3762-105- 8-A
K9YBV 3030-101- 5-A
K9YXK 2940- 98- 5-A
W9MHP
2704-104 3-ABCD
K9MZV 2678-103- 3-ABCD
K9OYD 2632- 94- 4-AB
K9JKG 2268- 81- 4-AB
K9WJS 2220- 74- 5-A
K9HYV 2128- 76- 4-AB
K9YCA 1512- 54- 4-A
K9LSY 1260- 45- 4-B
K9GCL 1170- 45- 3-AB
K9OES 1155- 39- 5-A
K9TTX 1148- 41- 4-A
K9YQA 1118- 43- 3-A
K9PNO 1066- 41- 3-A
KN9VUQ
1036- 37- 4-B
K9VYE 884- 34- 3-A
K9JKC/9
864- 36- 2-A
K9JJL 840- 28- 5-AB
K9J81 840- 35- 2-A
K9PAY 840- 35- 2-A
K9SGS 780- 30- 3-A
W9BDG 768- 33- 2-A
K9MZU 728- 28- 3-A
KN9WZB 728- 28- 3-B
K9JCE 689- 27- 3-A
K9OET 650- 25- 3-A
K9URA 576- 24- 2-A
K9YFG 552- 23- 2-AB
K9VXW 468- 20- 2-A
W9AQW 384- 16- 2-B
K9YGZ 360- 15- 2-AB
K8BYN/9
288- 12- 2-AB
W9TWU 234- 9- 3-B
K9HCT 216- 9- 2-A
W9BRF 176- 8- 1-A
K9ELB 132- 6- 1-A
K9LZV 132- 6- 1-A
K9RKO 120- 5- 2-A
K9SEY, 110- 5- 1-A
K9PNP 96- 4- 2-A
K9GLL 72- 3- 2-A
K9AOS 66- 3- 1-B
K9YIA (K9s SGV YIA)
3570-119- 5-AB
K9GLL/9 (9 oprs.)
1820- 70- 3-A

Wisconsin

W9JFP
10,764-207-16-AB
W9QII 3584-112- 6-B
K9WUI 1853- 71- 3-AB
W9TQ 1288- 46- 4-AB
W9JQT 1232- 44- 4-AB
W9IXF 910- 35- 3-B
K9LMW/9 (K9s EUC LMW) 6450-129-15-AB

DAKOTA DIVISION

South Dakota

WØENC 612- 18- 7-AB

Minnesota

WØQIN 3172- 61-16-AB

DELTA DIVISION

Arkansas

K5IPL 1056- 24-12-A
W5BIX 931- 35- 9-A

Louisiana

W5UQR 1560- 39-10-AB
K6HNP/5
154- 7- 1-A

Mississippi

K5WLJ 384- 12- 6-A

Tennessee

W4PHW 1920- 64- 5-A
W4HHK 1365- 33-11-ABD
K4OSF 1272- 53- 2-A
K4ZJT/4 (5 oprs.)
5382-117-13-A
K4OGQ/4 (K4s FPT OGQ) 2074- 61- 7-A

GREAT LAKES DIVISION

Kentucky

K4VTS 1786- 47- 9-A
W4WYX
1050- 35- 5-A
K4SFB 432- 18- 2-A

Michigan

W8NOH 6240-130-14-ABD
K8HNB 5624-148- 9-A
K8EXB/8
3104- 98- 6-AB
W8CVQ 2562- 92- 4-ABC
K8BGZ 2380- 85- 4-AB
K8SRE 2100- 70- 5-AB
K8TOI 1820- 70- 3-A
K8HWW 1512- 54- 4-A
K8TBY 1508- 58- 3-A
K8DHN 1430- 55- 3-AB
K8RPF 1430- 55- 3-A
K8NGR 1392- 58- 2-B
K8JEE 1296- 54- 2-AB
W8CKK 1248- 52- 2-AB
W8ZGW 1200- 50- 2-B
K8UBD 1128- 47- 2-AB
K8NIE 992- 31- 6-AB
KN8TLO 960- 40- 2-B
W8VRH 902- 41- 1-B
K8PCZ 880- 40- 1-B
K8MPI 814- 37- 1-B
W8BCI 780- 30- 3-B
W8LPK 676- 26- 3-A
K8LXF 616- 28- 1-B
W8BQD 600- 25- 2-A
K8EBY/8
468- 18- 3-AB
K8JNZ 396- 18- 1-AB
K8IQW 352- 16- 1-B
K8LTJ 336- 14- 2-AB
K8CEB 308- 14- 1-B
K8IVW 308- 14- 1-A
K8SXB 286- 13- 1-A
KN8SHR 110- 5- 1-B
K8GMR (K8s GMR OQY) 1404- 39- 8-AB

Ohio

K8MMM
12,320-280-12-A
W8UMF
10,200-255-10-A
K8NYM 7002-195- 8-A
K8REG 6474-249- 3-AB
K8GYK 6032-232- 3-A
W8KKF 5928-228- 3-AB
K8TKL 5148-198- 3-AB
K8ERE 3840-160- 2-AB
W8HQK 3598-129- 4-AB
W8JRN 3588-150- 2-AB
K8HRD 3344-152- 1-AB
K8HEF 3300-150- 1-AB
K8GDV 3276-126- 3-A
K8IHQ 3250-125- 3-A
W8MVE 3240-109- 5-AB
K8ITI 3172-122- 3-A
K8IYW 3168-132- 2-AB
K8KDW 3124-142- 1-AB
K8KPD 3120-120- 3-A
K8OWB 3024-126- 2-A
W8ENH 2892-121- 2-AB
W8ODN 2880-120- 2-AB
K8SSK 2856-119- 2-A
W8PBX 2847-110- 3-A
K8EGY 2834-109- 3-AB
K8JXE 2784-116- 2-AB
K8MYJ 2728-124- 1-AB
W8GFN 2704-104- 3-ABE
W8LUZ 2704-104- 3-AB
W8ZOF 2548- 98- 3-B
K8IGF 2444-104- 2-AB
W8KPZ 2376-108- 1-A
W8GVQ 2328- 97- 2-AB
W8DWT 2314- 89- 3-B
K8BPB 2266-103- 1-A
W8SGX 2240- 70- 6-A
W8PHV 2210- 85- 3-AB
W8RLY 2210- 85- 3-B
K8VEC 2200-100- 1-AB
K8BJA 2190- 73- 5-A
W8NAF 2178- 99- 1-A
W8TEK 2040- 85- 2-AB
W8WNM
2023- 60- 7-B
W8FFA 2002- 77- 3-AB
K8PML 1980- 90- 1-A
W8PQZ 1950- 75- 3-B
K8GCS 1944- 81- 2-AB
W8RLW 1936- 88- 1-A
K8DOJ 1914- 87- 1-AB
W8RBJ 1896- 79- 2-AB
W8BMO 1892- 86- 1-ABC
W8SFG 1856- 58- 6-B
K8RBM 1848- 77- 2-A
K8JQD 1804- 82- 1-A
W8MCW
1782- 81- 1-B
KN8VZK/
1705- 78- 1-B
W8LIL 1703- 66- 3-AB
W8BPY 1680- 60- 4-AB
W8MOH 1650- 75- 1-A
W8SVW 1628- 74- 1-AB
K8IH8 1584- 66- 2-B
K8MFU 1584- 72- 1-AB
K8PNV 1540- 70- 1-A
K8VDE 1540- 70- 1-AB
W8MVL 1508- 58- 3-AB
W8STC 1496- 68- 1-A
K8DAS 1482- 57- 3-B
W8MBB 1474- 67- 1-AB
K8VJE 1456- 57- 3-AB
K8RZE 1452- 66- 1-AB
W8IPT 1440- 60- 2-B
K8LDX 1430- 55- 3-B
W8KQX 1430- 65- 1-A
W8MCS 1364- 62- 1-AB
W8ARC 1320- 60- 1-AB
K8RIZ 1300- 50- 3-A
K8KNU 1254- 57- 1-A
W8JSR 1254- 57- 1-AB
W8TEX 1232- 56- 1-AB
W8ZUN 1232- 56- 1-B
K8GKF 1210- 55- 1-AB
W8SLY/8
1188- 54- 1-B
K8KFY 1183- 46- 3-AB
K8LQX 1144- 52- 1-B
K8TUY 1144- 52- 1-A
W8BPZ 1040- 40- 3-B
K8JIA 1034- 47- 1-A
W8OJF 1012- 46- 1-A
K8GCN 1001- 46- 1-A
K8GUK/8
990- 45- 1-A
K8TID 990- 45- 1-AB
K8NBY 936- 36- 3-B
K8WGH 864- 36- 2-A
K8SGD 840- 35- 2-A
K8PBE 792- 33- 2-A
W8KKF/8
770- 35- 1-A
W8MDK 748- 34- 1-B
W8WYH 693- 32- 1-B
K8WQJ 660- 30- 1-A
W8OVG 638- 29- 1-B
W8VKB 624- 26- 2-B
W8ARC/8
616- 28- 1-B
W8CEZ 616- 28- 1-A
K8PMM 605- 28- 1-B
W8CUZ 600- 25- 2-B
W8TSN 572- 26- 1-A
W8PTF 550- 25- 1-AB
W8AL 528- 24- 1-A
K8PWH 506- 23- 1-A
K8PDO 484- 22- 1-A
K8SSM 480- 20- 2-A
K8NTZ 456- 19- 2-A
K8GCS/8 440- 20- 1-B
K8LEA 432- 18- 2-A
KN8TAU 418- 22- 1-B
W8KJM 418- 19- 1-A
K8HEF/8 374- 17- 1-AB
K8RXS 360- 15- 2-B
W8YCP 352- 16- 1-B
K8GXO 336- 14- 2-A
K8VZW 297- 16- 1-A
K8KDW/8
264- 12- 1-B
W8CUJ 264- 12- 1-B
KN8SVM 176- 8- 1-B
K8OBG 132- 7- 1-A
KN8VZK/8
88- 4- 1-B
K8MFU/8 66- 3- 1-B
K8BLS/8 (10 oprs.)
12,172-358- 7-AB
K8III (4 oprs.)
10,640-266-10-AB
K8JPY (2 oprs.)
1752- 73- 2-A
K8THO (K8s THO TOQ)
1232- 56- 1-A

HUDSON DIVISION

Eastern New York

W2GOO
11,800-295-10-B
WA2BAH
5428-120-13-AB
W2LWI 5280-110-14-B
WA2FYE
4752-132- 8-AB
K2CQG 4680-130- 8-AB
K2CVG 4200-100-11-AB
K2YAZ 3706-110- 7-B
K2GSF 3090-103- 5-B
K2BGU 2736- 72- 9-AB
WA2KCB
1980- 66- 5-AB
K2VNV 1802- 53- 7-AB
WA2IMG
1792- 56- 6-B
WV2KBK
1568- 56- 4-B
K2OZT 1500- 50- 5-AB
W2HZZ 1484- 53- 4-B
W2YPM 1400- 50- 4-B
WA2MFD
1125- 38- 5-A
WV2PQT
1008- 36- 4-B
K2TMB 840- 30- 4-AB
K2DNR 832- 26- 6-B
W2KGC 812- 29- 4-B
W2NTJ/2 780- 27- 5-B
W2DQW 672- 24- 4-B
K2UKE 576- 24- 2-B
K2GCH 572- 22- 3-B
WA2EBP 484- 22- 1-B
W2LKP 468- 20- 2-B
W2JZ 442- 17- 3-B
W2ROE 418- 19- 1-AB
W2IP 392- 14- 4-B
WV2OBA 336- 12- 4-B
WV2PCM
336- 14- 2-B
WA2HZW
312- 12- 3-A
W2SZ (K2s YQH YRZ, K3DZF)
4066-107- 9-AB
WA2KTA (2 oprs.)
2091- 62- 7-AB

N.Y.C.-L.I.

W2YHP
10,507-277- 9-AB
K2JWT 8600-215-10-AB
K2HLA 4928-112-12-AB
W2TUK 3820-165- 4-AB
W2MIDE 3366- 99- 7-B
WA2IKS 3366- 99- 7-AB
WV2OYX
3304-118- 4-B
W2KXG 3264-102- 6-B
K2RHD 3000-100- 5-B
WA2GPT
2800-100- 4-B
K2AZT 2394- 86- 4-AB
WA2EXL
2280- 76- 5-A
K2RTH 2272- 71- 6-AB
K2GVL 2250- 75- 5-A
W2QAN 1974- 71- 4-B
W2EW 1920- 60- 6-B
K2DYS 1600- 50- 6-B
WA2IKS 1596- 57- 4-B
WV2LCM
1568- 56- 4-B
W2JGY 1400- 50- 4-B
WV2NIB 1330- 48- 4-B
WA2DRK
1216- 38- 6-B
K2OJQ 1200- 40- 5-B
W2LJF 1120- 36- 6-B
W2LOS 1110- 37- 5-B
WA2FBA 1105- 43- 3-AB
W2KDC 1050- 35- 5-B
WA2KSP 1040- 40- 3-B
K2PNK 990- 33- 5-A
K2IDB 868- 31- 4-B
K2OFD 868- 31- 4-B
WA2NLK 854- 36- 4-B
WA2LJH 780- 30- 3-B
W2IN 750- 25- 5-B
K2QXG 700- 25- 4-B
WV2NLL 574- 21- 4-B
K2GHE 572- 22- 3-B
K2OWC 520- 20- 3-B
WA2IUU 442- 17- 3-B
K2KOA 440- 20- 1-AB
WV2K8M
360- 15- 2-B
W2OME 312- 13- 2-B
W2JGU 308- 11- 4-B
K2SJP 288- 12- 2-A
K2JZF 240- 10- 2-A
K2ZYB 22- 1- 1-A
K2JZW/2 (K2s JZW VNR, WA2EYX)
15,768-438- 8-AB
K2MUB (2 oprs.)
13,068-242-17-A
K2TAQ (8 oprs.)
4920-167- 5-AB
K2DUX (K2DUX, WA2PAO)
3472-133- 6-B
WA2AHB (4 oprs.)
3360-112- 5-AB
W2JDJ (W2JDJ, WA2UGB)
1972- 58- 7-A
WA2IDC (WA2IDC, WV2OHI)
476- 17- 4-B
W4JQG/2 (W2TUK, W4JQG)
360- 15- 2-AB

Northern New Jersey

K2MLB
12,719-279-13-A
K2LXI 10,626-256-11-AB
W2GKR 9180-255- 8-AB
K2LN8 6936-204- 7-B
WA2INB
5868-163- 8-B
K2OPI 5220-145- 8-AB
WA2DH8
4998-147- 7-B
WA2JMX
4500-150- 5-B
K2RMD 3960-132- 5-ABC
K2AGJ 3808-112- 7-B
WA2JAM
3800-100- 9-B
K2HH8 3520-110- 6-AB
WV2NOF
3392-106- 6-B
WA2FAW
3330-111- 5-B
WA2HFI 3270-109- 5-AB
WV2NON
2968-106- 4-B
WA2MNK
2870-104- 4-AB
K2RBD 2744- 98- 4-B
K2MHP 2618- 77- 7-B
WA2LBH
2324- 83- 4-B
WA2GWM
2240- 80- 4-B
W2SXO 2220- 74- 5-AB
WA2IFY 2160- 72- 5-B
K2MUP 2010- 67- 5-B
K2KJI 1980- 45-12-B
WA2FFB
1960- 70- 4-B
WA2BNF
1890- 63- 5-B
K2YUD 1876- 67- 4-AB
W2SMJ 1820- 65- 4-ABC
WV2JZF 1760- 55- 6-B
W2SJB 1734- 51- 7-B
W2SMF 1560- 52- 5-A
WA2CNV
1530- 51- 5-A
WA2DPZ
1456- 52- 4-B
WA2KHN
1428- 51- 4-B
W2SHU 1372- 49- 4-B
K2BJP 1260- 42- 5-AB
W2JDU 1260- 45- 4-ABC
W2QCR 1176- 42- 4-B
WA2GPF
1176- 42- 4-B
K2RVH 1120- 40- 4-B
WV2NMX
1008- 36- 4-B
K2PQR 952- 34- 4-AB
WV2NIOL 868- 31- 4-B
WV2LBG 840- 35-2-B
WA2HNC
806- 31- 3-B
K2MPD 784- 28- 4-A
W2AJB 728- 26- 4-A
K2GDR 700- 25- 4-B
K2PBP 700- 26- 4-B
W2EDY/2
676- 26- 3-B
WV2LCJ 624- 26- 3-B
WA2IFB 576- 24- 2-B
K2IQR 572- 25- 3-AB
W2OQV 560- 23- 4-B
WA2FAX
520- 20- 3-B
K2SZP 442- 17- 3-A
WA2PRM
408- 17- 2-B
WV2NOM
336- 14- 2-B
K2VNW 286- 11- 3-A
WA2IVW 234- 9- 3-A
K3HWZ/2
216- 9- 2-A
W2SWI 208- 8- 3-AB
WA2JRS 198- 9- 1-B
W2SLZ 154- 7- 1-B
K2JPO 130- 5- 3-A
WA2CGO 72- 3- 2-A
W2FJC 22- 1- 1-B
W2ADE (W2s ADE WYJ) 17,900-358-15-AB
W2PEZ (6 oprs.)
17,072-388-12-ABC
K2GLQ (K2s AWY GLQ, K3KOD)
11,484-261-12-AB
K2KDQ (5 oprs.)
4230-141- 5-AB
K2PGK (K2PGK, WA2AYA)
3996-111- 8-AB
K2SNZ (K2s SNZ YFE)
3060-102- 5-B
WA2LRX (K2CCF, WA2s JTM LRX)
2520- 90- 4-AB
WA2CCF (WA2s CCF NVG, WV2OGS)
494- 19- 3-BC

MIDWEST DIVISION

Iowa

KØKPQ 1820- 65- 4-AB
WØBTG 728- 28- 3-AB
KØHBP 560- 20- 4-AB
KØVDY 44- 2- 1-A

Kansas

WØWPQ 1792- 64- 4-AB
KØGIA 1372- 49- 4-AB
KØGIC 1326- 52- 3-AB
WØZXX 912- 38- 2-B
KØPHZ 888- 37- 2-B
WØZJY 888- 37- 2-B
KØVQY 864- 36- 2-B
WØMDK 816- 34- 2-B
WØQGN 816- 34- 2-B
KNØZLS 792- 33- 2-B
KØDHT 768- 32- 2-AB
WØBVM 720- 30- 2-B
WØAPG 616- 28- 1-B
KNØAHR
572- 26- 1-B
KØAQJ 572- 26- 1-B
KNØEBR 572- 26- 1-B
KØATS 418- 19- 1-B
KØATT 418- 19- 1-B
WØSPF 330- 15- 1-AB
WØLZJ 308- 14- 1-B

KØSML 286- 13- 1-B
WØJAW 253- 12- 1-B
KØSMP 44- 2- 1-B

Missouri

WØKMV 3520- 88-10-A
WØRVA 2304- 64- 8-AB
KØHZW 984- 41- 2-A
KØWKZ 936- 39- 2-A
WØLFE 812- 29- 4-B
KØARK 572- 22- 3-A
WØIFC 528- 22- 2-A
WØBFZ 176- 8- 1-A
KNØZTD/Ø
22- 1- 1-B
KØZCJ/Ø (7 oprs.)
2106- 81- 3-A

Nebraska

KØTVD 870- 29- 5-A
WØWRT/Ø
264- 12- 1-B
WØBBS 22- 1- 1-A

NEW ENGLAND DIVISION

Connecticut

W1HDQ[8]
12-512-273-13-
ABC
W1RJA 9120-190-14-AB
W1MEH 8260-207-10-B
K1DZI 7728-184-11-AB
W1PHR 7320-153-14-AB
K1HJV 6912-192- 8-B
K1EEW 5244-138- 9-B
W1LGE 5152-112-13-AB
K1JOY 4800-150- 6-B
W1WHL 4408-116- 9-AB
K1IED 4046-119- 7-B
W1VNO 3712-116- 6-AB
W1RVZ 3654-102- 8-B
W1FUW 3200-100- 6-B
W1JZA 3060-103- 5-B
K1OEQ 2850- 95- 5-B
K1JFN 2604- 62-11-A
W1CWF 2548- 91- 4-B
K1IWM 2520-105- 2-B
KN1NNA[1]
2490- 83- 5-B
KN1OSY
2460- 82- 5-B
K1DWL 2408- 86- 4-B
W1QBJ 2352- 84- 4-B
W1FTM 2324- 83- 4-B
K1OTQ 2156- 77- 4-B
K1GBC 2112- 88- 2-B
W1MEO 1980- 55- 8-B
K1GSD 1976- 76- 3-B
K1ILQ 1968- 82- 2-B
K1MJM 1876- 67- 4-B
K1ONJ 1860- 62- 5-AB
K1LFB 1820- 65- 4-B
K1IEY 1794- 69- 3-B
KN1PKQ/1
1740- 58- 5-B
W1FDO 1704- 71- 3-B
K1GQL 1690- 65- 3-B
K1OLT 1680- 70- 2-B
K1PNA 1680- 70- 2-B
K1GTZ 1632- 68- 2-B
KN1PUG/1
1620- 54- 5-B
K1LST 1470- 49- 5-B
K1ALY 1442- 52- 4-B
K1DDO 1440- 48- 5-B
W1RMZ 1440- 45- 6-AB
K1HLA 1428- 51- 4-B
W1NGR 1400- 50- 4-B
W1AMJ 1372- 49- 4-B
W1TZX 1372- 49- 4-B
K1JY8 1350- 45- 5-AB
K1JWK 1152- 36- 6-AB
W1HAX 1128- 47- 2-B
KN1NUM
1092- 42- 3-B
K1LMF 1080- 45- 2-B
W1FVV 1036- 37- 4-AB
W1RFJ 1032- 43- 2-AB
KN1OAV
1020- 35- 5-B
W1FDJ 1014- 39- 3-B
W1MEK 1008- 36- 4-B
K1AOY 988- 38- 3-B
K1NTK 962- 37- 3-B
W1ORG 960- 40- 2-B
W1VJG 960- 32- 5-B
W1PHT 952- 34- 4-B
K1CAK 936- 39- 2-B
K1GHK 924- 33- 4-B
KN1ONX
912- 38- 2-B
W1VLS 896- 32- 4-B
K1IEK 888- 37- 2-B
W1BNP 884- 34- 3-B
K1AZF 884- 36- 2-B
K1MNY 864- 36- 2-A
K1GHL 840- 35- 2-AB
W1NFG 812- 29- 4-B
KN1OLH 780- 30- 3-B
W1BYX 756- 27- 4-AB
K1BNO 720- 30- 2-B
K1IMS 672- 24- 4-B
K1MIP 624- 24- 3-B
K1IKT 600- 20- 5-B
KN1OSE/1
576- 24- 2-B
KN1QGC 576- 24- 2-B
KN1OYL/1
572- 22- 3-B
W1LCG 560- 20- 4-B
W1GXB 552- 23- 2-B
W1VOV 552- 23- 2-B
K1DFS 528- 22- 2-B
KN1OVM
520- 20- 3-B
K1ILH 506- 23- 1-B
K1ORF 494- 19- 3-AB
K1BCH 442- 17- 3-B
W1EKZ 442- 17- 3-B
K1GDW 432- 18- 2-B
W1FKQ 408- 17- 2-B
K1JXE/1 396- 17- 2-B
W1EYS 360- 15- 2-AB
W1WRL 330- 15- 1-A
K1IAX 312- 13- 2-B
W1UWJ/1
312- 13- 2-B
KN1OSE 308- 14- 1-B
K1IWM/1
264- 11- 2-B
K1EJT 208- 8- 3-A
W1DTG 144- 6- 2-AB
K1MAU 132- 6- 1-B
K1BFG 120- 5- 2-B
K1GLL/1
22- 1- 1-B
K1IML 22- 1- 1-B
W1ZTT (4 oprs.)
6650-133-15-
ABC
W1HCU (5 oprs.)
5016-132- 9-AB
K1QKR (4 oprs.)
2580- 86- 5-AB
W1ORI (3 oprs.)
1656- 70- 2-AB
W1AW (K1LVW, W1QIS)
644- 23- 4-AB

Maine

K1CXX 1425- 29-15-AB

Eastern Massachusetts

W1QXX
16,350-327-15-AB
W1AQE 8680-217-10-AB
W1HDS 8100-135-20-A
K1HRM 7636-166-13-A
W1QIB 7098-169-11-AB
W1ELP 6900-150-13-A
K1LKK 6552-182- 8-AB
W1EUJ 6116-139-12-AB
W1OOP 5670-135-11-AB
W1CRK/1
5500-138-10-AB
W1DDV 5229-125-11-AB
K1MKV 4410-124- 8-A
K1KKS 4046-123- 7-A
K1DVX 4000-100 10-A
W1NQQ 3648-114- 6-B
K1MHC 3630-121- 5-AB
K1CHY 3542-127- 4-AB
W1JSM 3456- 96- 8-AB
K1GNY 3402- 95- 8-A
W1BDF 3392-106- 6-B
K1HVV 3174- 89- 8-A
K1DIT 3116- 82- 9-A
K1DIR 3080- 70-12-A
K1JBD 3078- 81- 9-AB
K1AIU 2828-101- 4-AB
K1KTK 2632- 94- 4-AB
K1HDY/1
2520- 90- 4-B
K1ADB 2482- 73- 7-AC
K1IAG 2280- 60- 9-A
K1CQX 2272- 71- 6-A
W1HGT/1
2240- 70- 6-AB
W1ZOC 2074- 61- 7-AB
W1KSI 2016- 72- 4-B
W4ERX/1
1980- 66- 5-A
K1OSG 1792- 64- 4-B
K1OFQ 1680- 60- 4-B
K1PLW 1504- 47- 6-A
K1JCU 1456- 52- 4-B
W1AHE 1400- 50- 4-AB
K1BKN 1260- 42- 5-A
KN1NNN
1248- 48- 3-B
KN1NGI
1196- 46- 3-B
W1FNM 1170- 45- 3-A
W1LHV 1144- 44- 3-AB
K1LWG 1066- 41- 3-B
K1OXK 962- 37- 3-A
K1MNS 936- 39- 2-AB
K1KTH 924- 33- 4-B
K1OUY/1
864- 31- 4-A
K1AHH 744- 31- 2-AB
W1AGN 732- 31- 2-AB
K1DVJ 728- 28- 3-A
K1HGW 696- 29- 2-B
K1LKL/1
648- 27- 2-AB
W1FY 598- 23- 3-A
W1BL 550- 25- 1-AB
K1MVN[8] 546- 21- 3-B
K1OVU 468- 20- 2-A
K1OZN 462- 21- 1-B
W1JHY 442- 17- 3-A
K1KYB 432- 18- 2-AB
K1PKG 408- 17- 2-A
K1IOE/1 390- 15- 3-B
W1WMK
374- 17- 1-B
K1MNO 336- 14- 2-B
K1JBL 308- 14- 1-B
W1LUW 308- 14- 1-B
K1NLK 288- 12- 2-A
W1YBY 270- 10- 8-A
K1GMU 264- 11- 2-AC
W1TCI 242- 11- 1-B
K1AIC 192- 8- 2-B
W1BCN 180- 6- 5-B
W1BK 154- 7- 1-A
K1AVQ 88- 4- 1-A
K1NPC 66- 3- 1-A
W1SBP 48- 2- 2-A
K1AII (K1AII, W1BVP)
18,414-280-23-AB
K1OOR/1 (6 oprs.)
7240-181-10-AB
K1OOM (7 oprs.)
6120-180- 7-
ABC
W1DDN (K1JCC, W1s DDN NJL)
2632- 94- 4-B
K1PMM/1 (4 oprs.)
2562- 92- 4-AB
K1PKO (4 oprs.)
2324- 83- 4-AB
W1IPJ (6 oprs.)
2040- 68- 5-A
KN1OBA/1 (4 oprs.)
1690- 65- 3-B

Western Massachusetts

W1RFU 9922-226-12-AB
W1VNH 5652-157- 8-
ABDE
K11CM 4646-101-13-A
W1QWJ 3100- 62-15-AE
W1ALL 2975- 88- 7-B
W1FBF 1440- 45- 6-A
W1JWV 1404- 54- 3-B
W1WLE 1404- 54- 3-B
W1NJW 1312- 41- 6-A
KN1PLA
1260- 45- 4-B
K1ISW 1204- 43- 4-A
K1CYG 1170- 45- 3-B
W1NMQ 1170- 39- 5-A
K1JIR 900- 30- 5-A
W1OY 864- 36- 2-AB
K1APR 780- 30- 3-A
W1SBW 676- 26- 3-A
KN1P1L 672- 28- 2-B
W1JMM 420- 15- 4-A
W1UCB 240- 10- 2-A
K1JEA 234- 9- 3-A
W1DXS/1
216- 9- 2-A
K1CYG/1
144- 6- 2-B
K1HLE 44- 2- 1-A
W1WFL 22- 1- 1-B
W1EHF/1 (K1AIC, W1EHF)
4845-128- 9-AB

New Hampshire

K1ATL 1760- 55- 6-AB
K1KKK/1
144- 6- 2-B
W1TNO/1 (W1s TNO YQH) 7084-154-13-AB

Rhode Island

K1CRN 6804-162-11-AB
WA6FGU/1
3450- 77-13-AB
W1AJR 2000- 50-10-AB
W1TXL 1920- 60- 6-A
K1PNI 1890- 76- 4-AB
W1POP 1302- 47- 4-B
K1OUI 1206- 34- 8-AB
K1DFU 598- 23- 3-A
K1DFT 512- 16- 6-A
K1LNB 468- 20- 2-A
W1FEO 420- 15- 4-B
K1HQZ 121- 6- 1-A
W1QLD 110- 5- 1-AB
K1IKN (K1s DKF DKM IKN) 5400-135-10-AB
W1DDD (4 oprs.)
5160-129-10-A
K1KAZ (4 oprs.)
4176-120- 8-A
W1JFF (K1DPY, W1JFF)
2592- 72- 8-AB

Vermont

W1EXZ 1540- 36-12-A
K1DIR/1
1504- 47- 6-A
W1KJG 408- 17- 2-B
WA2GCH/1 (WA2sGCH GNZ) 988- 38- 3-B

NORTHWESTERN DIVISION

Alaska

KL7AUV 616- 28- 1-AB
KL7ALA 440- 20- 1-B

Idaho

K7GQE 448- 16- 4-AB
W7GGV 132- 6- 1-B
W7BDL 88- 4- 1-B
W7GCO 66- 3- 1-B
K7CXP 44- 2- 1-B

Montana

W7EGN 196- 9- 4-A
W7SFK 66- 3- 1-A

Oregon

W7INX 2074- 61- 7-AB
W7RGS 1512- 54- 4-A
K7GJQ 1128- 47- 2-AB
W7PXX 476- 17- 4-A
W7HBH 384- 16- 2-AB
K7AZC 78- 3- 3-A

Washington

W7RT 6570-183- 8-AB
W7PUA 4465-119- 9-AB
K7DBR 2788- 82- 7-A
W7ZSL 1824- 76- 2-A
K7BRQ 1680- 70- 2-A
K7IVC 1100- 50- 1-A
W7RPT 624- 24- 3-A
W7AXS 462- 21- 1-AB
K7ARZ 338- 13- 3-A
W7ANI (K7MRU, W7ANI)
1560- 60- 3-A

PACIFIC DIVISION

Hawaii

K9KVV/KH6
176- 8- 1-A

Nevada

K7HRW 520- 20- 3-A
W7MAH 450- 15- 5-AB

Santa Clara Valley

WA6BYA
6048-144-11-AB
W6BDN 5911-129-13-AB
W6YX[4] 3300- 75-12-
ABC
WV6LHS
2268- 82- 4-B
W6ASH 1050- 35- 5-B
WV6NJS 910- 35- 3-B
K6TJL/6 (5 oprs.)
13,248-276-14-AB
K6SLQ/6 (8 oprs.)
7008-219- 6-
ABC

East Bay

K6KQD 2132- 82- 3-AB
K6KLY/6 (5 oprs.)
9264-290- 6-
ABC
WA6CFA/6 (WA6S GJF OAT) 3556-127- 4-AB

San Francisco

K6VXI 1612- 62- 3-AB
W6PFK 1288- 46- 4-B
K6DLY/6
806- 31- 3-B

Sacramento Valley

W6PIV 1920- 60- 6-
ABD
WA6DDO
1120- 35- 6-B
W6MIW 1008- 36- 4-
BD

San Joaquin Valley

W6FEJ 1888- 59- 6-B
W6OVR 1260- 42- 5-AB
W6FZA 820- 22-10-AB

ROANOKE DIVISION

North Carolina

K4HGK 3344- 76-12-A
W4ACY 2130- 71- 5-AB
K4MHS 1092- 42- 3-AB
K4YJJ 598- 23- 3-B
K4QFV 572- 26- 1-B
W4VHH 510- 17- 5-B
W4CAH 224- 8- 4-A
W4BUU 66- 3- 1-AB

South Carolina

K4YUX 1320- 30-12-AB
K4YIP 966- 21-13-A
W4TLC 377- 15- 3-AB
W4DEN 336- 19- 4-A
W4VIW 198- 9- 1-B

Virginia

W4LTU 8900-178-15-AB
K4VWH 8018-211- 9-AB
K4RAY 7880-197-10-
ABC
K4UKQ 6930-165-11-AB
K6RCW/4
5400-135-10-A
W4AO 3696- 88-11-B
K4TNB 2955- 99- 5-AB
K4OYT 2400-100- 2-AB
W4KNS 2016- 72- 4-B
W4LHI 1898- 73- 3-A
W4OTX 1540- 55- 4-AB
W4THL 1404- 54- 3-A
W4KJH 1378- 53- 3-AB
K4TFU 1316- 47- 4-A
K3JQV/4
1260- 45- 4-A
K8HRR/4
1104- 35- 6-AB
W4RXC 1104- 46- 2-A
K4UEK 1032- 43- 2-AB
K4CGA 624- 26- 2-AB
W4BHD 624- 26- 2-A
W4DWY 600- 25- 2-A
W4ZBS 384- 16- 2-A
K4AJE/4 (K4s AJA AJE)
884- 34- 3-A

West Virginia

K8BLR 108- 5- 2-A

ROCKY MOUNTAIN DIVISION

Colorado

KØYJG 2254- 49-13-A
WØWYX
1768- 52- 7-AB
KØTSD 1624- 58- 4-A
WØAZT 920- 23-10-AB
K1KNQ/Ø
462- 21- 1-A
WØMOX 286- 11- 3-B

New Mexico

W5PDO[5] 360- 12- 5-A
K5KYU 104- 4- 3-A

Wyoming

W7VTB 1254- 33- 9-A
W7UFB 1224- 35- 8-A

SOUTHEASTERN DIVISION

Eastern Florida

K4RNG 2790- 93- 5-A
K4LVZ 1088- 34- 6-A
W4RMU 608- 18- 9-AB
K4RCX (K4s RCV RCX)
2822- 83- 7-
ABC

Western Florida

W4BPJ 374- 17- 1-B
W4MMW
286- 13- 1-B
W4NVW 242- 11- 1-B
W4RKH 242- 11- 1-B
K4JSJ 198- 9- 1-B
W4LXM 176- 8- 1-B
W4UXW 88- 4- 1-B

Georgia

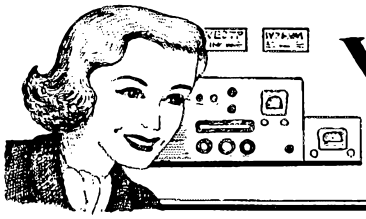
K4JPD 3444- 82-11-A
K4FNZ 3160- 79-10-AB
W4PHB 3000- 75-10-A
K4OAG 2040- 52-10-A
W4BGE 2040- 68- 5-AB
K4KLD 1656- 46- 8-AB
K4QML 1360- 40- 7-A
K4RAH 1092- 42- 3-A
K4TDU 960- 30- 6-A
W4GIS 720- 30- 2-AB
K4SHS 600- 20- 5-A
K4PKK 434- 16- 4-A
K4YZE 396- 18- 1-B
K4UWO
308- 14- 1-A
W4TOE (K4s ABT YFU YGK) 6042-159- 9-AB
K4HAV/4 (5 oprs.)
3502-103- 7-AB

SOUTHWESTERN DIVISION

Los Angeles

K6JQR 9760-244-10-AB
K6TGH 8474-223- 9-A
WA6KVS
5700-150- 9-AB
WA6AJT
5280-133-10-AB
WA6MFH
3000-100- 5-A
K6HIT 2828-101- 4-B
K6JZK 1690- 65- 3-A
WA6EAW
1378- 53- 3-A
W6NLZ 1110- 38- 5-
ABD
W6TNJ 1088- 34- 6-A
WA6LOI 948- 40- 2-AB
WA6IGU/6
352- 16- 1-A
WA6GHW
264- 11- 2-E
WA6AKS
168- 7- 2-A
K6PGJ 132- 6- 1-A
WA6DJB (K6LVA, WA6DJB)
10,856-236-13-AB

(*Continued on page 138*)



YL NEWS AND VIEWS

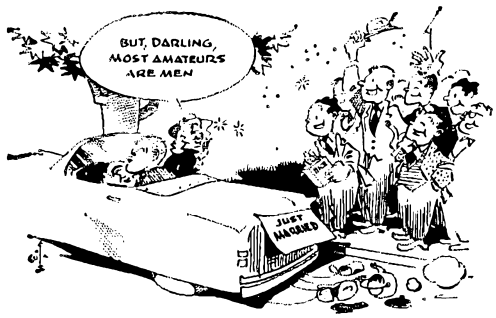
CONDUCTED BY ELEANOR WILSON,* W1QON

An unexpected dividend from amateur radio for some has been — Romance! The boy-meets-girl theme has been often parlayed more rapidly into the boy-marries-girl ending (or beginning?) by the added impact of the common denominator of ham radio. And be there an amateur radio operator, male type, so rare who isn't happy to have his spouse actively share his hobby with him? Conversely, among amateur radio operators, female type, the feeling seems to be mutual.

KN7DXE and K5CDA/mm

Hear of one OM who volunteered his "little legend of an amateur radio romance." Max Stout, K5CDA/mm, (ex-W9JTY), radio officer of the S.S. *Penn Shipper,* reveals that his initial introduction to Jean, KN7DXE, was made last summer through the kindness of Flo, W7QYA, a long-time ragchewing friend. Results of the introduction earned W7QYA the title of "Cupid" in 7-Mc. c.w. circles, for the marriage of KN7DXE and K5CDA/mm took place in Clarksville, Arkansas, Oct. 15, 1960. It was a "real Ozark wedding", and local hams naturally turned out to bestow blessings along with friends and relatives. Pipe dreams of the happy couple include a station atop Ozone Mountain equipped for emitting strong c.w. signals.

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



Never Underestimate the Power of a Woman!

We quote from the April 1961 issue of *Sparkles of Happiness*, publication of the Sparkles of Happiness Clubs, Dell Daykin, VE3AJR, president:

"One of the bugbears of the radio amateur is TVI. In the early days of TV, it is true that most hams had to modify or rebuild their transmitters to avoid causing annoying patterns on the TV sets of their neighbors. Today, however, most interference on TV is due to other causes. The idea still persists, nevertheless, and the poor ham is blamed for many things. Jeanette, K8PYN, a pal of ours from the YL Welcome Net, sent an amusing article to the *YL Harmonics* listing the dastardly deeds of which her neighbor accuses her.

"She says I have caused her sewer to become plugged so she can't flush the toilet. I've caused her iron to get too hot and she burns all her clothes. Her alarm clock won't ring any more. Her refrigerator clicks. Even her hot dogs are charged when she cooks them. I'm causing her children to get pimples. She says the fireman told her the rusty spots on her roof are definitely caused from my radio. Her city water is charged and also her telephone. She claims my radio burned down our neighbor's garage!

"So, when you receive a call from an irate neighbor who claims you are spoiling his picture and you aren't even on the air, think of Jeanette and be thankful!" — *YESAJR*

Feedback

April column, caption to photo of W1ICV: Jane's nice DXCC record should be 180 countries worked, 153 confirmed. Same column, caption to photo of KN8YGC — while a Novice Connie did confine operations to Novice frequencies. The slip was ours. We believe she has her Technician license now.

— • • • —

Congratulations to WA2LGF, Marilyn, the daughter of W2COE, Al, and WA2GSN, Lucille Schroeter, of Orange, N.J. and the niece of W2CUU, Al Neuert of Hasbrouck Heights, N.J., who wed K2GHU, Roger, the son of WA2-FFB, Reg Bogert, of Wyckoff, N.J. in May.

— • • • —

Coming Events

Field Day — June 24–25. Need we say more?

1961 AWTAR — The 15th annual All-Woman Transcontinental Air Race will start at Montgomery Field, San Diego, Calif., on July 8 and will terminate July 12 at NAFEC (National Aviation Facilities Experimental Center), Atlantic City, N.J. Carolyn Currens, W3GTC, chairman of the AWTAR radio net, invites YL participation in the net. (See last month's column.)

A Flying Sweetheart?

As mentioned in last month's column, OM K6BX of *Directory of Certificates* and Certificate Hunters Club fame, is now organizing a Flying Hams Club. Clif appeals to any YL who also hold a pilot's license to contact him. Such YLs will be eligible for nomination as the "Flying Sweetheart" for 1961, with the winner chosen not necessarily for beauty but rather for personality and popularity. Clif claims that Flying Hams Club *must* have a sweetheart, so, flying YLs, here's an opportunity exclusively yours. Contact Clif Evans, Box 385, Bonita, California.

Frances Darne, W3AKB, Elizabeth Zandonini, W3CDQ, and Ethel DeBardeleben, K4LMB (ex-W3MSU), (l. to r.) three of our most active and best-known YLs are now all members of the Washington Chapter of the Quarter Century Wireless Association. At the annual dinner of the QWCA in the capital, K4LMB was admitted as a member, joining W3AKB and W3CDQ who were already members on the basis of having been licensed amateurs for 25 years or more. Coincidentally, the three YLs are all employed in the field of engineering by the government in Washington. W3AKB is an electronics engineer with the Navy's Bureau of Ships and W3CDQ and K4LMB work for the National Bureau of Standards.
(Photo courtesy W4CVO)

We hope you all saw the photo of W6NAZ in April *QST*, page 61. For years Lenore has been one of the more outstanding YLs of amateur radio, and it is grand to see credit publicly given where it is truly deserved. Ever modest, the charming Lenore, who feels "a tremendous compulsion now to work harder than ever", felt that she was merely a symbol of other devoted traffic handlers and that it was really a "This Is Your Life — Ham Radio" show.

—•••—

The Washington D.C. chapter of the Quarter Century Wireless Association not only has three YLs as full members (see the photo of W3s AKB, CDQ, and K4LMB) but also has two husband-and-wife teams — K4LMB/W4TE and W3AKB/W3BWT. OM W4CVO wants to know if any other QCWA chapter can boast such a record.

YLCC, WAS, WAC, DX-YL Certificates

Rules for the four most popular and best-known YL awards are herewith summarized. All are issued by the Young Ladies Radio League. The DX-YL award is issued to YLs only, while the WAS and WAC-YL awards and YL Century Certificate are available to OMs as well as YLs.

Worked All States YL — This award parallels the ARRL's WAS. Contact a YL operator in each of the 50 states. Send QSLs and alphabetical by state list showing call, date, and band to Grace Ryden, W9GME, 2054 N. Lincoln Ave., Chicago 14, Ill. Include postage for return of QLSs by 1st-class mail.

Worked All Continents YL — Proof of contact with a duly licensed YL in each of the six continents should be sent to Barbara Houston, K5YIB, Rte. 2, Box 178, Garland, Texas.

YL Century Certificates — Contact 100 different YLS anywhere in the world. All contacts must be made from within 25-mile radius of original location. Submit list in alphabetical order by operators' full names, calls, and dates along with QSLs to Katherine Johnson, W4SGD, Box 666, Fuquay Springs, North Carolina. Include postage for return of QSLs by 1st-class mail. Endorsements are issued for contacts with each additional 50 YLs. (This award is for working 100 different YLs, not just 100 contacts with a lesser number of YLs.)

DX-YL — This award is issued to any YL (only) who works 25 other licensed YLs outside her own country on or after April 1, 1958. A log extract of the 25 contacts should be sent to Maxine Willis, W6UHA, 6502 Wynkoop St., Los Angeles 45, California. Note that this award is for working 25 different DX YLs, not necessarily for working YLs in 25 different countries. QST

At the ninth annual Valentine's Day banquet of the Los Angeles YLRC, eleven of the club's fifteen presidents reminisced and posed together. Standing, l. to r. are W6QOG, W6DXI, W6CEE, W6QGX, K6ANG, W6WSV; seated are W6JZA, K6BUS, W6PJU, W6CBA, and W6UHA. Founded in 1946, the club's first president was Carol Witte, W6WSV. Billie Blakesley, K6ANG, is currently president.

W6DXI, Gladys Eastman, receives from Vada Letcher, W6CEE, the new service award plaque given by the YLRL to the outgoing president of the club. The illuminated scroll-type plaque was designed by Vi Grossman, W2JZX. Presentation took place during the Valentine's Day banquet of the Los Angeles YLRC.

The rig is in the kitchen, Mom's at the rig, and the children are gathered 'round. Could be there's a contact with Dad, who's on the high seas with the Merchant Marine. Mom is Val, WA6HHF, and Dad is Andre, K6PDT. To Gene, Mike, and Kathy La Croix (and just possibly puppy Zsa Zsa) of San Pedro, California, ham radio is just as commonplace an activity as eating breakfast—well, almost. *(Photo via W6WSV)*

Happenings of the Month

LICENSE SUSPENSIONS

Ending proceedings covering more than two years, the FCC has suspended the Advanced Class license of Dale A. Hoppe, W6VSS, for a period of one year, effective April 10, 1961. On March 6, 1959 (during the ARRL DX Contest), Commission field personnel monitored W6VSS's transmissions from two vehicles about two blocks from his house in La Crescenta, California. When field-strength measurements had been made, one of the inspectors went to the house while the other stayed behind to furnish comparison readings. During test transmissions, with one engineer inside and the other at the mobile location, the signal had substantially less power, later determined to be 51,000 microvolts as against the former 90,000 microvolt signal recorded at the FCC car. The engineer in Hoppe's house then measured the input power and found it to be about 1400 watts, still in excess of the legal limit. The engineer suggested that the reduced signal might have been due to the amateur having reduced the primary voltage from 220 to 110 volts between the time the first measurement was made and the time the engineer was admitted to the station. Mr. Hoppe stated that the primary was at 220 volts but refused to allow the engineer to measure that voltage, claiming that the procedure was too dangerous.

The original suspension order was issued May 11, 1959, but Mr. Hoppe requested a hearing, which was eventually held June 23–24, 1960. Testimony during the hearing concerned, among other things, the accuracy of the measuring instruments, both those of the FCC and those installed in the amateur station. The initial decision of the hearing examiner found that the amateur had run power in excess of one kilowatt, had prevented the FCC engineer from completing his investigation, and in addition, had operated his station at a permanent location other than the one shown in his license for more than the four months provided by the regulations, without having applied for a modification of the license. The Commissioners, in reviewing the examiner's decision and subsequent exceptions filed by Mr. Hoppe, did allow minor changes to the record, but upheld the decision that the amateur had indeed violated the regulations on three counts, and placed the one-year suspension into effect. [*Section 303(n) of the Communications Act of 1934 as amended; Sections 12.131 and 12.93 (a) of the FCC regulations.*]

—•••—

FCC suspended for six months the Conditional Class license of Floyd Joseph McClure, K6QHG, Twenty-Nine Palms, California, for transmitting communications containing obscene, indecent or profane words, language or meaning on or about January 25, 1961. The suspension, which was not contested, went into effect March 28, 1961. [*Section 12.157 of the regulations.*]

—•••—

The General Class license of a San Diego amateur, Steven Charles Pugh, WA6FXI, was suspended for one year. The Commission found that Mr. Pugh, on or about January 3 of this year transmitted communications containing obscene, indecent or profane words, language or meaning, and in addition, had transmitted a call sign not assigned to the station being operated. Mr. Pugh did not contest the suspension which, accordingly, went into effect on March 16, 1961. [*Sections 12.157 and 12.158 of the regulations.*]

Strays

A featured speaker at the recent New England Division ARRL Convention in Swampscott, Mass., was Massachusetts Governor John Volpe. It turns out that the governor knows more than a little about ham radio. He has two brothers who are hams — W1LEL and K1NQV.

FEEDBACK

There's an error on page 40 of the May issue of *QST*, bottom of the left-hand column. (Meyer, "Two-Meter Transistor Converter.") The oscillator frequency is 113.5 Mc., not 133.5 Mc. Since the article was written, the transistors used have been assigned EIA type numbers. Q_1, Q_2, and Q_3 are now respectively 2N1742, 2N1743, and 2N1744.

—•••—

In the circuit diagram of the SJ-97A transmitter, page 28, of the August, 1960, issue, the 100-$\mu\mu$f. 814 grid coupling capacitor should be connected to the stator of C_2 — not as shown.

—•••—

Re the 1296-Mc. converter in March *QST*, page 39. No information is given as to the position of the tap on L_6. About 7 turns up from the bottom will do.

Hamfest Calendar

California — The San Fernando Valley Radio Club will hold its fifth annual hamfest on Sunday, June 4, at the Victory-Vanowen Park in North Hollywood. Among the features of this event will be hidden transmitter hunts for two and six meters, free refreshments, games for the children, and other activities of general interests to hams. Admission is by donation of $1.00 and is open to the public. No pre-registration is necessary and everyone will share equally in the fun. For further information contact William J. Neilson, WA6ASA, 18639 Nordhoff St., Northridge.

Kentucky — The Interstate Annual Hamfest will be held on Sunday, June 11, 1961 at the Breaks Interstate Park, which is located between Elkhorn City, Kentucky and Haysi, Virginia, on Highway 80, 27 miles from Pikeville, Kentucky, and which is now known as the Grand Canyon of the south. The park has plenty of parking space and picnic tables. There are hardtop roads running all over the park and storm-shelter facilities for camping out. Bring the wives, kids, and some of the neighbors. It is free-for-all and the public is invited. Be sure to bring your cameras. If you have any radio or ham gear you wish to trade, sell, or give away, bring it along. Picnic will be on the grounds. Bring a basket with an extra chicken leg, or if you prefer, there is a modern cafeteria and dining room in the park lodge. For further information, contact Cordell Damron, K4BGQ, Box 129, Pikeville, Kentucky.

Maine —The fifth annual Augusta Hamfest, sponsored by the Augusta Radio Club, will be held on Sunday, June 18, beginning at 9:00 A.M. at the Calumet Club, West River Road, Highway 104 North, Augusta. Reservations are $3.00; or $3.50 at the door; children under 12, $2.25. Tickets may be reserved by writing to Wilfred Lemieux, 151 Cony Street, Augusta, Maine. All reservations and money must be in by June 14. If you want tickets mailed directly to you, enclose a self-addressed stamped envelope with your check or money order. No reservations will be made over the air. Saturday evening, June 17, there will be an informal get-together at the Calumet Club, for the "Hamfesters," XYLs and friends. Sunday there will be net meetings, a RACES conference, a swap table, an auction, hidden transmitter hunt, and a turkey dinner at noon. For further information contact Walter J. Dolson, K1BZD, 20 Pike St., Augusta, Me.

Montana — The third northcentral Montana hamfest will be held on Sunday, June 18, at Beaver Creek State Park, South of Havre, Montana, sponsored by the Hi-Line Radio Club. There will be games, contests, an auction, mobile judging contests, mobile field strength contest, hidden transmitter hunt, best QSL card display, tug o' war (phone vs. c.w.), plus a prize for ham coming longest distance and a prize for oldest ham present. There will also be games for kids, YLs, and XYLs. For further information contact Ralph L. Arthur, W7EWR, 835 16th St., Havre, Mont.

New Brunswick — An informal ham social and get-together, sponsored by the St. Croix Valley Radio Club, is to be held on July 2 at the Canadian Legion Hall, St. Stephen, New Brunswick, just over the border from Calais, Me. Amateurs everywhere are invited to participate in the July 2 activities as well as Frontier Week — an international celebration running from July 1 through the 8th. There is no registration fee. A certificate will be awarded to any amateur working a club member *and* attending.

Ohio — The Sixth Annual Picnic sponsored by the Northeast Ohio V.H.F. Group will be held on Sunday, June 18, at Sunset Park, Rte. 619, West of Alliance, Ohio, starting at 12:00. There will be mobile check-ins on six meters. Bring your lunch, although refreshments are for sale on the grounds. Registration is $2.00 per family. For further information contact Robert Morehead, K8WUP, 581 Lincoln Street, Barberton, Ohio.

Pennsylvania — The ARRL Eastern Pennsylvania Section Picnic will be held Sunday, June 18, at pavilion No. 7, Hershey park, Hershey. The program begins at 9 A.M., including speakers and other events. A swap and auction table will be set up, so bring your surplus gear. Also, bring your own basket lunch, or buy lunch at the park. The day will be rounded out with numerous award presentations. Registration is $1.00 per amateur call. Bring the family. Make all reservations in advance to Katie Gibson, K3BHU, 19 W. Pottsville Street, Pine Grove, Pa.

Pennsylvania — The Uniontown Amateur Radio Club will hold its 12th annual stag Gabfest on Saturday afternoon and evening, June 17. This gabfest will be held on the club grounds on the Old Pittsburgh Road, 2 miles north of Uniontown, Pa. just off Route 51. Refreshments will be available and there will be swap and shop. Registration is $2.00 per man at the gate, with advance registration set at $1.50. For further information and advance registration write to the Uniontown Amateur Radio Club, P.O. Box 849, Uniontown, Pa.

Pennsylvania — The Greater Pittsburgh V.H.F. Society is sponsoring the First Annual Greater Pittsburgh V.H.F. Hamorama on Sunday, June 18, from 11 A.M. to 5 P.M. at the Museum Building, South Park Fairgrounds, near Pittsburgh. This will be a convention-type hamfest, complete with indoor and outdoor activities. Although the main theme of this Hamorama is v.h.f. operation, there will be events of a diversified nature to interest all who attend regardless of their likes as to modes of operation. The Museum Building is large enough to accommodate 1500 persons and will provide shelter in case of inclement weather. Ham activities within the spacious building will consist of manufacturers' exhibition, various demonstrations, swap & shop, ham gear auction, home-brew gear exhibition, and more. There will be mobile check-in on 10, 6 and 2 meters, and a hidden transmitter hunt on 6 meters. The registration fee is $1.50 in advance and $2.00 at the door. XYLs and children are free if accompanied by a registered member of the family.

Tennessee — The Mid South Amateur Radio Association will hold its annual hamfest on June 18, at the Women's Bldg. in the Fair Grounds, Memphis, Tenn. General admission to the hamfest will be 50¢, and a noon meal is available for those who wish it, at $1.50. Transmitters will be set up on all bands to guide mobiles, and the program includes various contests. For further information, and for tickets and hotel/motel reservations, contact Clayton Elam, K4FZJ, P.O. Box 3845, Memphis, Tenn.

Vermont — Set aside June 17 and 18 to enjoy yourself in the Green Mountains of Vermont at the largest hamfest north of Swampscott. It is called International Field Day. The registration fee includes a 2-hour ferry boat ride across beautiful Lake Champlain. Early bird registrations bring free call pins. Restaurant and bar at the site, featuring a 99¢ special meal. $3.00 early bird, $3.50 at the gate. Send reservations and money to W1OJO, c/o Burlington Amateur Radio Club, Box 684, Burlington, Vt.

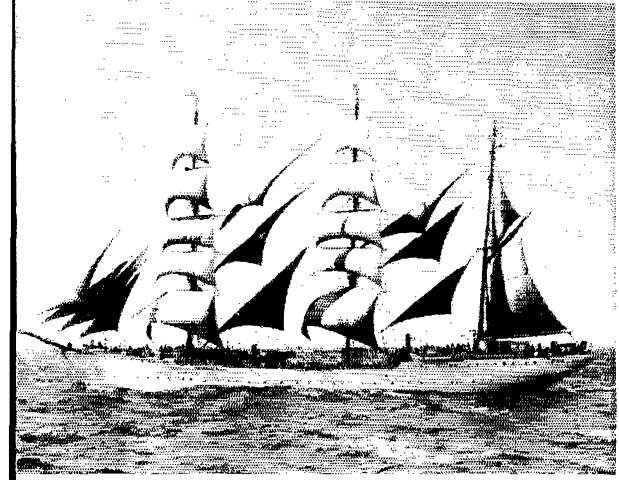
Virginia — The Virginia Phone Net will hold its annual hamfest on Sunday, June 18, at Gordonsville, Virginia.

Washington — On June 18 Seattle will be the site of the 7th annual family picnic of the Royal Order of Hootowls and this affair is known as the largest v.h.f. picnic on the west coast. For further information contact Lee M. Singleterry, sr., W7YJE, 1914 Ballinger Road, N.E., Seattle.

West Virginia — The 1961 West Virginia Hamfest will be held on Saturday and Sunday, July 8 and 9, at Jackson's Mill State 4-H Camp near Weston, West Virginia, on U. S. Route No. 19. One fee of $6.00 entitles you to registration, meals (Saturday evening, Sunday morning and noon), and lodging (Saturday night). Additional registrations only are obtainable as many as you wish in the vicinity of $2.00. All sorts of activities for the entire family. There will be a station on 3890 kc. to guide mobiles. For further information write: West Virginia Hamfest, P.O. Box 129, Spring Hill Station, South Carleston, W. Va.; or P.O. Box 909, Fair mont, W. Va.

Strays

W3JQM has worked VP6LN twice — 26 years apart.



The U. S. Coast Guard Cutter *Eagle*—the 295-foot barque which is the training vessel for the Corps of Cadets of the U. S. Coast Guard Academy. The *Eagle* embarks each summer for a training cruise to foreign ports, and again this year a ham station will be on board.

Ham Radio and the Coast Guard

By STEPHEN M. AUG,* K2EOF

When the United States Coast Guard Academy's training bark *Eagle* leaves New London, Conn., June 10, she will represent perhaps the most unique maritime mobile installation in the world.

That is the claim, at least, of the Coast Guard cadets who will operate W1CGA/mm aboard the famous windjammer for two and one half months during their yearly north-Atlantic cruise.

The *Eagle*, a 295-foot, 1900-ton, bark-rigged vessel, carried ham gear aboard last summer and worked over 1000 stations during her cruise to Great Britain, France and the Scandinavian countries. Her 1961 itinerary calls for stops in France, Portugal, Spain and the Canary Islands.

While most of the cadets' on-the-air time will be spent working all the ham stations they can, some time, will, of course, be devoted to attempting to handle traffic for the more than 250 cadets, officers and enlisted men aboard the *Eagle*.

Located in the vessel's library, on the *Eagle's* third deck, W1CGA/mm will boast a 32S-1, 51J-4 (military version of the 75A-4) and a vertical antenna. For technical reasons, however, the ham's dream of a vertical atop one of the *Eagle's* 150-foot masts will not come to pass. Instead, as was done last summer, the vertical will be attached to a railing on the forward deck house. This is about 20 feet above the waterline.

A cadet's life aboard the *Eagle*, by the way, is a mixture of hard work, pleasure and sightseeing. On his first cruises, he stands the watches and performs the duties that enlisted men carry out aboard most Coast Guard cutters: helmsman, lookout, signalman, messenger, oiler and others. He must be familiar with every part of the *Eagle* — on deck and aloft. He must be able to locate every one of the 154 lines in the dark. He must learn the hard way, with brass polish and chipping hammer, that the maintenance of a ship, even a sailing ship, is a never-ending task. He also finds that vigilance and an alert attitude are the qualities that constitute a good watch at sea.

The upperclassmen on the cruise are given the jobs with added responsibility: officer-of-the-deck, engineering watch officer, communications officer — jobs normally carried out by officers or senior petty officers.

The station aboard the *Eagle*, incidentally, represents just one small part of the ham radio picture in the Coast Guard. Though it is the smallest of the nation's armed services, the Coast Guard fosters a far-flung amateur radio communications system — both ashore and afloat. Because of the number and size of its many isolated units, the Coast Guard discovered early the great morale factor in having amateur radio stations at its units.

At present there are nearly a dozen Coast Guard vessels with maritime mobile stations aboard. They operate in areas from the lonely vigil on Ocean Station Victor in the northwestern Pacific to the icebreaker *Eastwind* (KC4USE) when she makes her Antarctic trips, to the three ships of the Cadet Practice Squadron during the summer in the north Atlantic.

In addition, the cutter *Kukui*, a Coast Guard cargo ship which roams the western and southwestern Pacific six to eight months of the year on long range logistics work, carries KH6DDD from Hawaii to the Philippines, Palaus, Marianas, Marshalls, Hong Kong and Japan.

Coast Guard hams, by the way, are the same as any others — except that their problems are often very different. On the *Kukui's* first patrol with ham gear aboard, crew members decided they weren't getting out as well as they wished using only a long wire. However, since they were off some sparsely populated islands in the Philippines, there was neither a local ham supplier nor even a hardware store. So, when a working party went ashore in the dense jungles of Talampulon, in the southern Philippines, ham ingenuity once again went to work. Several choice logs of Philippine bamboo were cut and used in the construction of a 15-meter cubical quad. Needless to say, results were excellent.

Ham radio afloat in the Coast Guard got a big boost starting in 1959, in the 14th Coast Guard District, headquartered at Honolulu. The ten cutters operating out of Honolulu were given blanket permission by Coast Guard headquarters to have ham gear aboard provided the vessels' commanding officers approved. In all previous

* Lt(jg) USCGR, c/o US Coast Guard Academy, New London, Conn.

instances headquarters permission was required — with letters going up the long chain of command.

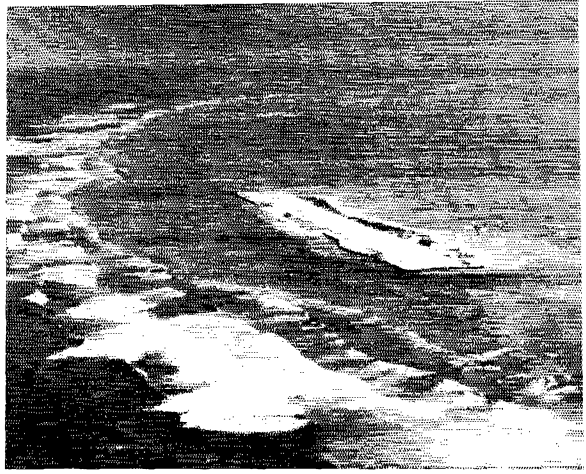
Rear Admiral Stephen H. Evans, then commander of the 14th district and though not a ham himself, saw the need for amateur radio stations largely for morale purposes. None of the regular seagoing patrols in that district was shorter than two and one half months.

As a result of the efforts of Admiral Evans, now superintendent of the Coast Guard Academy, and of several other officers in the 14th district, the first continuous amateur radio "watch" at sea was inaugurated on July 24, 1959.

On that day the Coast Guard Cutter *Winnebago* sent out the first "CQ" from Ocean Station Vistor, an ocean weather station at 34° north, 164° east, half way between the Midway Islands and Japan. She was followed within months by the cutters *Chautauqua* and *Matagorda*. All three cutters now have their own call letters. They are KH6DRY, KH6DPW and KH6DOE, respectively.

But maritime mobile contacts, no matter what their positions in the world, practically never count as new countries. As if to alleviate this problem the Coast Guard has amateur radio stations ashore accounting for 15 official ARRL countries — from VP5CD on South Caicos Island in the Bahamas, to KC6SP at Angaur in the Palaus.

Most of these are scattered around the Pacific — many on very small islands. A few of these rare DX outposts are: Johnston Island, KJ6BV; Wake, KW6CGA; Iwo Jima, KG6IC; Saipan, KG6SA; Ulithi, KC6CG; Kwajalein, KX6CA; and Eniwetok, KX6CG. This list does not, of course, include the many tiny islands scattered through the Aleutian chain, or even St. Paul Island, in the Pribilofs, KL7DNE. Nearly all of these are at Coast Guard Loran (LOng RAnge Navigation) stations. KG6AFA, however, is at the Coast Guard buoy depot on Guam. (And while it isn't DX, K3CG, at Washington, D.C., is the Coast Guard headquarters station).



KH6ABH, at Tern Island on desolate French Frigate Shoals, about 450 miles west of Honolulu. Tern Island is about 600 feet wide, 3060 feet long and about six feet above sea level.

One island that has, for a number of years, sought status as a different country is Tern Island, at French Frigate Shoals. Here, on a tiny sand spit about 450 miles northwest of Honolulu, 18 men spend a year on a lonely Loran station. Because of DXCC criteria, however, French Frigate, no matter how small, will probably never be counted as a separate country.

Kure, about 50 miles west of Midway, is soon to be the site of another Coast Guard Loran station. When this is completed, it is hoped that some Coast Guard ham station will begin operating to open another new country consistently to DXers the world over.

One of the big jobs among Coast Guard hams today is, strangely enough, not fighting for recognition and equipment, but fighting for more hams. Many ships and stations now have ham gear, much of it modern single sideband equipment, but because of a lack of operators, a good deal of it is on the air only intermittently or not at all. The lonely Loran stations, often on one-ham-station islands dotting the Pacific, represent some of the rarest and most wanted of DX. Unfortunately, many must await the coming of an operator.

To many Coast Guardsmen, especially those on isolated duty ashore and afloat, ham radio has brought something pleasant — a chance to talk to the wife at home, to hear the youngsters' voices. And for the ham, especially the K2 who has long been on the short end of the DX cycle, it is a chance to be the called instead of the often unanswered caller! QST

A multiband vertical being installed aboard the *Eagle* by members of the Academy's Cadet Radio Club. Making the installation are K2MHW, WA2FCV, and K4JHG. Of the three, WA2FCV is the only one making the cruise this summer.

Correspondence From Members-

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

MORE SOCK . . .

¶ I have *read* "More-Sock-For-Cents Antenna" (April *QST*) several times, and the message escapes me. I am a graduate electrical engineer, with several years experience in communications work, including some antenna design, so I don't think the trouble lies in my lack of comprehension.

The first part of the article deals with some obvious truths, and extols the virtues of antennas with gain (I assume relative to a dipole) and then gives the dimensions of an antenna that has been the standard for more years than my age, the dipole itself, which by definition has no gain.

The author patted himself on the back for constructing this amazing antenna for practically nothing, as could any other ham who happened to have 279 feet of 75-ohm coax, three insulators, and a pair of 150-foot towers in his junk box.

I am in full agreement that a dipole of a good material, hung over a half-wavelength in the air is a much better antenna than most hams ever get up on seventy-five or eighty meters, but Mr. Van Detta failed to solve for me the problem I have run into when I wanted to build such an antenna. What does he use for sky-hooks to hang that antenna 150 feet in the air?

Since you people printed this article, you must have seen something in it, but I don't see of what value it could have been to anyone. Did I miss the point? I have an article in the April issue of *73 Magazine* on a transistor modulator I designed, and I am open for criticism on that. — *Monroe McDonald, KL7DLC, A.P.O. 942, Seattle, Washington.*

¶ . . . . This antenna system must be mounted 150 feet up in the air, in order to realize the maximum gain. Mr. Van Detta made no mention of what he hung his wire from. Not every amateur can afford to have a pair of 150-foot masts in his back yard! — *John G. Coolen, Montreal, P.Q., Canada.*

¶ . . . This belongs in a beginner's manual, not gracing a page in "Q Street." While we can argue the pros and cons of antennas until we're blue in the face I never forget what old 1TS said to me about 23 years ago. He always liked a balanced antenna; me too. And so many of us have to use the antenna for at least two bands we don't want any coax-fed jobs. Open wire line, center feed, antenna coupler, low harmonix, my credo. — *Charles E. Gardiner, W2TB, Bayside 61, L.I., N.Y.*

¶ . . . . I couldn't see anything to it but a standard half-wave doublet until I looked up the data on RG-144U to see what made it so special. Yoicks — $4.37 *per foot!* I knew that Ws sometimes spent fantastic sums on their equipment, but didn't realize they could pick up $1000 worth of coax out of a junk box.

A triple goldplated antenna indeed! — *Merv Williams, VE7HX, Trail, B.C. Canada.*

¶ Is RG-144U coax cable tax deductible? — *Fred Krohberger, W2DUN, Brooklyn, New York.*

¶ I have been looking all over for some of that RG-144U, particularly, the kind that will stand straight up for 150 ft. Sounds great for antenna poles. Where can I get some? — *Harold J. Hebert, K1PGD, Brewer, Maine.*

¶ Last week I cleaned out my desk drawer (junkbox) and found two — yes, two — 300-ft steel towers. Thanks to the article by WA2FQZ I knew what to do with them! I sawed them in half, gave two sections to my good friend KN4NQJ, and stood the remaining two sections on end in my back yard to support my newly constructed "More-Sock-For-Cents" antenna!

I could find only a few hundred feet of RG-144U so had to buy the remaining needed footage out of the XYL's grocery allowance. I had to lay out a few more pennies for another item — a box of bandages. Somewhere around the 87-foot mark my hands became blistered from stripping cable.

God bless *QST* and its ingenious members. Keep the articles coming, hi! — *Howard L. Robert, W4TIP, Tampa, Florida.*

¶ That "More-Sock-For-Cents Antenna" sure is FB, but I ruined the first 279 feet trying to cut the center conductor free. — *Howard W. Triplett, W6BGL, Diamond Springs, Calif.*

¶ While the undersigned is, understandingly, a little diffident about submitting a proposal for an improvement in the operation of the remarkable "More-Sock" antenna, perhaps it is not too presumptuous to suggest that a small sprig of poison ivy might be entwined around the center insulator as a means of discouraging unwanted signals. Just pick it out of the junk box. — *George Applegate, W2IA, Oxford, New Jersey.*

¶ I have received an enthusiastic response to my article. In the earliest issue possible, would you please point out that it was presented to commemorate *QST*'s annual celebration of *April First!* A dipole antenna, of course, is a point of reference for determining gain, *not* a means of attaining it. Maybe you ought to print the three paragraphs you deleted from my original manuscript — the explanation about the sky hooks. Again, I guess not. Some of these guys wrote to me and talked as if they were ready to use RG-144U to put up an antenna!

You might also mention, not necessarily in connection with this article, that it should be an inviolate rule to always enclose a stamped, self-addressed envelope whenever you expect a reply from an author in *QST*. Some think that authors in *QST* should pay their own postage since they are paid for the publication of the article. You and I know better — but it's a fairly well-kept secret, judging by those who sent me return envelopes *vs.* those who did not. — *James F. Van Detta, WA2FQZ, Schoharie, New York.*

CB COOPERATION

¶ On the editorial page of April *QST* the League takes a hands-off policy regarding the 11-meter band. Since it is not a ham band, the article reasons, misuse of the band should be of no concern to hams.

Most of us work hard for our privileges, respect the FCC, and if we abuse the law we can generally expect a citation in the mail. Many of the CB boys have no respect for the law and, so far as I can see, violate just about every paragraph of the regulations. For proof, just tune down to 11 *meters yourself* and you'll hear fellows swapping QSL cards, calling CQ, ragchewing, using profanity, making transmissions with no call signs, and even conducting mobile hunts. The legal limit is 5 watts input, but they think nothing of running 50 watts or more.

Am I jealous? Why shouldn't I be! Why shouldn't the FCC be just as strict with one group as with another? If our ham license is to mean anything we should insist that this group be forced to stop calling themselves hams and exercising amateur privileges on commercial bands. As our spokesman, the League should take this stand and exert pressure on the FCC toward this end. — *Herb Merrill, K1JDA, Portland, Maine.*

¶ The deplorable condition of the CB Service deserves more than just casual attention by the League and its members. The deliberate and/or unknowing violation of Federal Regulations makes the CB operator answerable to the FCC. But the Commission has other jobs to perform. The TVI caused by him often creates ill-feeling all over

the neighborhood. And how many CBers have been mislabeled hams, undoing many hours, weeks or months of patient public relations work by the local club or individual amateur?

I would like to see the League make a substantial effort to assist the Citizen's Radio Service. I am sure there are many CBers interested in good, clean and efficient operation. Why couldn't the League help to establish, either as an independent or affiliated group, an organization similar to itself, but oriented to help the CB operators? Establishment of such a group would go a long way to bring order out of the present chaos on 27 Mc. The institution of a self-policing policy similar to the OOs would also help a lot. — *Ronald M. Litt, K2KMA, New York, N.Y.*

¶ I want to commend very highly your editorial "CB TVI" in *QST*.

CBers, generally, are quite eager to clean up their TVI problems. But, lacking a national organization, such as ARRL, the efforts are limited to local-level associations such as ours. Needless to say, wholehearted cooperation between amateur and CB organizations on a local level would benefit us both.

Unfortunately, many amateurs resent the very existence of CB and seem to want to make CB operating practices a subject of their own personal investigation. Not all CB operators are mavericks. By far the largest number of them want good operation for necessary communications. We recognize that we have problems. But these problems are basically ours and those of the FCC. No amount of criticism from amateurs will contribute to the clean-up of CB misdeeds. Nor will threats of sending tape recordings to the FCC contribute much to cooperation between CB and local amateur organizations . . .

. . . Amateurs should remember that their ranks are being swelled by many operators who have graduated from the limited CB class D band to the more rewarding amateur bands. They should remember, too, that class D CB was born amidst a maze of confusion, misunderstanding, and misinterpretation of rules. We're trying to straighten things out. In time, we will. — *R. L. Conhaim, President, Dayton Area Citizens Radio Association, Dayton, Ohio.*

HAM CALLS

¶ Enclosed with this letter please find my list of ham call advertisements as advertised by you in January *QST*. I hope I qualify for a log book. I have been subscribing regularly to *QST* since 1947, and before the last war was also on your mailing list. I find it a very helpful magazine indeed.

You may also be interested to know that I was captured by the Japanese in February 1942 and spent 3½ years as one of their slaves. I worked on the Burma railway for 12 months. As one of a small group of ex-hams, we treasured a copy of the ARRL *Handbook* which was read and re-read by us few radio men until later on it met its fate as page by page we split the paper and used it to roll our ciggrettes. A Holy Bible also suffered the same fate, but did not smoke so well. But I mention this only because the *Handbook did* save some of us from going nuts. — *A. Caswell, VK4CB, Maryborough, Queensland, Australia.*

¶ For some reason the announcers of broadcasting stations with calls starting with the letters WN distort or change the sound of the letter N, so that it is a perfect number ONE. Naturally that makes it sound as if a W1, say W1OB, or W1AE were doing the broadcasting. One station even had its call listed as a W1 in a newspaper radio program section, Hi! No kicks coming here, but naturally a licensed amateur wouldn't like it. This could be happening across part of the country. 73., — *Samuel Kruper, W3AJN, Tidioute, Pa.*

¶ There is always some confusion, when hearing a ham station, as to its state of origin (with the exception of W6/K6). If you want to get a message into, say, Wisconsin, you tune through a large number of W9 or K9 stations looking for one in Wisconsin. I therefore suggest that each of our fifty states be given a number as a prefix for that particular state, and each state would have that prefix number assigned to it on an alphabetical system that the states would each represent a call area in itself. It would eliminate to a large extent the confusing W-WA-WN-K-KN, etc., assignments of call letters and would simplify the location of all transmitters or licensed stations. It certainly would lend a helpful hand when looking for that elusive state that is so hard to work or find for message-handling. — *Harold S. Bates, W3LVK, Flourtown, Penn.*

PROCEDURE

¶ I was first licensed at the age of 13, and didn't know any more about how to operate an amateur station than I did about theory. I'm sure that there are many other fellows that have been in the same boat. If it wasn't for a local ham, KØRXJ, I would have never learned *proper* procedure. But not a great number of amateurs-to-be have a helping hand — so I feel very strongly that the Federal Communications Commission should have at least half as many questions on procedure as they have on theory and regulations. After all, what good is radio knowledge when you can't get a station on the air and keep it in proper order? Therefore I feel that by adding such questions the bands would have less QRM, and many more enjoyable QSOs. — *Steven E. Permut, KØWWJ, Denver, Colorado.*

WHY I BELONG

¶ I would like to take this opportunity to express my appreciation for all that the League has done for amateur radio in general and for me in particular. During the eight years that I have been a member I have enjoyed many sevices of the League.

The code-proficiency program helped me raise my code speed to the required 13 w.p.m. *QST* and the *Handbook* have provided many enjoyable construction projects as well as the latest in operating news and ham equipment. The League technical information service has come to the rescue more than once when I was having equipment difficulties. Last but not least, the League has provided many invaluable services to amateur radio that no individual or small group could ever provide. Running contests, representing amateur interests at international conferences as well as in Wash ngton and providing self policing services that have kept many operators from having to deal directly with the FCC are just a few that come to mind

Keep up the good work and when it comes time for my present membership to expire you can be sure that my renewal will be on its way to League Headquarters — *George B. Jones, W1QDR/W8MNK, Belmont, Massachusetts.*

BV1US ACTIVITY

¶ I wrote you a letter asking about the amateur radio situation in Taiwan (Formosa). You gave me some information, but I got the impression that you didn't know too much about it.

After hopefully writing a letter to BV1US requesting more information on the matter, I received a letter from the Taiwan American Radio Club. The secretary is presently SP5 John T. "Grant" Grantham, and the address is Box 24, USTDC, APO 63, San Francisco, California. This club is open to any American serviceman or dependent interested in radio, at a cost of $2.00 per year. Following is the information I obtained from Mr. Grantham, who holds the stateside call W4OSC:

1. American personnel may *not* hold any sort of license in Taiwan, except that they may operate the MARS club stations in the country. In other words, they cannot operate a private station.

2. A general, conditional, or higher class license is required to operate the MARS stations.

3. Hams going to Taiwan are urged to bring their gear with them, as they may operate it in the MARS station.

4. Permission must be obtained from the commanding officer of a MARS station in Taiwan prior to operating that station.

I would personally advise any U.S. ham going to Taiwan to correspond with the TARC, as they appear to be an extremely friendly bunch. — *Durant J. Imboden, WA6PLD, San Diego, Calif.*

FF4AL REPLIES

¶ I am quite ready to believe that W1VG's open letter in April *QST* was not directed at FF4AL, but your caption-writer apparently had different ideas!

I do think the open letter calls for a few remarks, however. For one thing, it is not the guys calling on *my* frequency who bother me for I skip about in listening quite a

(*Continued on page 140*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, W1DGL, Ass't. Comm. Mgr., C. W.
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

In DX Operating Give Due Courtesy; Observe Band Limits and Other Regs. U. S. amateurs undoubtedly want to put their best foot forward to rate high in the opinion of DX friends overseas. Yet, the operating news that reaches us is so often a complaint of impatient and hoggish behaviorisms that are less than tolerant or efficient . . . and are truly unbecoming in a hobby as sporting and democratic as our Amateur Radio. It could be said (again) that all DX operators can be completely in command and control pile-ups. At any rate the decent and truly experienced operator *expects* to be patient and to wait his turn. Additionally we feel in all justice, the North American amateur should sincerely try to put himself in the place of the distant operator and cooperate to the limit so that this DX friend *also* can get the values he seeks out of his amateur operating. It never seems to seep through the consciousness of some late comers in the amateur game that numerous operators are on the air to indulge in other than "formula QSOs" and quick exchanges. To a lot of the DX fraternity, W and K QSLs are a dime a dozen. From time to time our friends across the water write to decry the unintelligent, rude, interfering, and improper procedures of American amateurs in their over-zealous drive for a QSO. You might think all this was related to getting "very rare ones." Not so, we hear this from the G's and DL's, as well as others. Many hams in DX places are as anxious to do some rag chewing on occasion as we are in U. S. A., where around 6,000 amateurs a year pair up for RCC qualifying or other "getting acquainted" type of fraternal contacts.

All this may be best understood if we quote from a typical informative letter, such as recently received from K2KLW/DL4RQ.

"DL4's love to work the States . . . this presents an opportunity to talk to someone from our own country . . . but some QSOs almost make one want to QRT.

"Offers for . . . message delivery for us are out-the-window. No third-party traffic is allowed from DL land. Of course there isn't any amateur who can top the American ham for generosity (but it's important to us amateurs that we all operate *correctly*, and within the *rules*).

"Our major gripe is caused by those who can't wait for a QSO to end in order to break in on the frequency . . . sending call letters as though this was their last day on earth. When we call CQ from a foreign phone band on 15 meters it is *amazing* how many U. S. stations will zero beat . . . this even when we're 20 kc. below the American phone band! Our frequency standards are good to within 200 cycles, yet some of these operators are incensed if told that they are in the wrong. This gripe especially concerns the young amateurs who have just graduated from Novice. These make up the majority of offenders when it comes to *breaking in* and being out of the band. Of course these faults can be cured by experience. Furthermore they insist on a stereotyped QSO. They should listen to some DX rag chews so they can be more proficient in the art of conversation.

"About QSLs, patience is the word. Our replies must be by boat mail unless otherwise provided for. Air mail can occasionally cut this to 3-4 days. It's a pleasure to work the states. The Golden Rule is the order of the band here. Thanks to all the boys back home who operate in such a way as to make our lives and theirs a bit more interesting."

As the above letter emphasizes it is *important* indeed that *third party* communications be kept out of overseas contacts, excepting those with amateurs in the limited list of 14 countries where such exchanges, subject to agreements under ITU provisions do permit such work. Licensed amateurs of two nations ordinarily can communicate using code, voice or even RTTY, but *not* swap either formal traffic or informal communications for others, since these are, in fact, third parties to such a twosome. For further information on the prohibition against transmitting international 3rd party communications please see the pertinent text of Art. 42, in the License Manual chapter on International Regulations, also May *QST*, page 64, on Banned Countries.

On other points the above letter speaks well for itself. QSLs accumulate to one's satisfaction,

This handsome trophy, the John W. Singleton Award, is being offered by the Granite State Phone Net of New Hampshire to net members who demonstrate the precepts of fine operating set by W1CDX. For full information on the award see page 110, this issue. In the picture the award is being displayed to Mr. Singleton's widow by SCM W1IIQ, K1JDN, and PAM W1KVG.

QST for

perhaps slowly but admittedly this teaches one patience by the very nature of the mailing operation. The number of U. S. A. contacts is so great common recourse to QSL Bureaus is necessary for most foreign amateurs, as a proper economy measure. IRC's or other means to defray direct mailing or Air Mail ordinarily bring fullest cooperation from DX amateurs, such as the writer of the above. On the matter of going all-out for QSLs it may be appropriate to close this discussion with a reminder. Never make the QSL what some say it is becoming, "the sole reason for a QSO." Make it as it always has been in amateur radio "the final courtesy of the QSO."

The ARRL Field Day June 24–25. Here is one of the really big operating events of the year. Don't miss the fun and fraternal and operating values in the FD!

We have been reminding you in this column to do some advance planning, and to write early for log forms. With this issue of *QST* you have the rules, and reference to the report in *QST* for last December will help you picture various aspects of Field Day. But you can never get the feeling and experience of operating afield, and the thrill of making a workable emergency lash-up go through the paces, unless you get some equipment together and sally forth on the Field Day.

While *clubs* do a grand job, and enter wholeheartedly into competitive groupings, don't forget that the spirit of the try-out is just as completely exemplified if you arrange to work by yourself or with another ham or two. Should full time operating be impractical for you, give yourself just a two- or three-hour setup, and it will still be a unique, profitable and rewarding experience. One page of called-and-worked log after getting set up helps you prove to yourself that you can do this test-afield, even if you have never seen the likes before. Get with a club, if that seems the best way to take part. Should you have mobile equipment in the car, and go with the club, be sure to set a time for clearing a few personal contacts by this means to test that gear out too. What we're getting at is that this an *operator* as well as equipment test, that bona fide communication is to be proved, preferably from places where there are no wires, by amateur radio. It's a demonstration that one has the know-how to communicate by radio with reliability even if there were emergency circumstances. We like to see and know about set ups that favor the light weight, and transportability, and are more than assemblages of commercial units, but there's of course a place for all workable gear to be tested, and gas-driven and battery emergency units earmarked so they would be put to use in any and every practical need for communications, just as in a Field Day. There are several legitimate ways to be in the FD, so we leave it to you to choose your own. Here's to a successful workout . . . and we'll be looking for your log, or that of your club group.

—*F. E. H.*

Florida SECs W4IYT (Eastern) and W4MLE (Western) have gotten together, along with a number of other interested parties, on a "State of Florida AREC Communication Plan. It's a real beauty of a job, having the finest qualities of brevity, simplicity and conciseness. Thousands of copies have been distributed and more are being printed. SECs who are looking for some ideas with which to evolve statewide plans of their own would do well to have a look.

One of the best features of the plan, we think, is the designation of nets to handle certain classifications of traffic. That is, while certain nets will handle traffic only of an urgent, official nature, other nets will handle *any* traffic coming into or going out of the state. Stations reporting into the wrong net will quickly be referred to the proper net. The plan is well fortified with liaisons and alternative frequencies in case of propagation condition troubles. During an emergency, anyone with traffic for Florida will find an outlet for it on 3900 (alt. 7285), 3650 (alt. 7115) or 3940 (alt. 7275).

—•••—

Missing from the Hurricane Donna Story (Feb. *QST*, p. 61) was a report from W4VMA, EC for Hampton, Va. This report has just come to light and we detail it herewith.

At 1010 on the morning of Sept. 11 the local emergency net was called on 3850 kc. As soon as things were under way, W4VMA was relieved as NCS by Asst. EC K4GER, who was subsequently relieved at times by *K4s* CPQ CZO HDT and W4VMA. Liaison was established with K4NDL at the radar station at Fort Story, who kept the net informed of Donna's approach. W4BGP and the Norfolk group kept a barometer watch. When it became certain that the storm would hit the area and QRM got worse, the net was moved to 3835 to join the Norfolk group and the Virginia Phone Net, which were already in operation. W*4s* AGL RGN and K4SNS were operating mobile in the Buckroe Beach area; also *K4s* OBE and CML on six meters in the Grandview area operating under extremely difficult wind conditions. *K4s* GUD and GKO gave them liaison with the net on 3835.

As the eye of the hurricane passed and the wind died down, there was still much work to be done in assessing the damage. Many power lines were down, roads were impassable and some flooding had occurred. K4HDT took over as NCS and detailed K4DRQ to the power company business office, as their phone service was out. *K4s* KTR KZU DKC and W4TZN were mobile surveying downed power lines, which were reported direct to the power company through K4DRQ. Fixed stations *K4s* FMS and YZT assisted. Later, K4CZP relieved as NCS and this group continued operating until phone service was restored.

During the operation, service was also performed on behalf of the Newport News Police Dept., Buckroe Fire Dept., Grandview Fire Dept., Hampton Red Cross and the general population. The net operated for 26 hours and

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

handled great quantities of traffic. Other stations participating, not mentioned above: *K4s* GKN CPK VJB ULV IEF OEJ UOT FMJ EHN GKO, *W4s* ONV DHZ.

— • • • —

On Sept. 13, when Gulf County, Fla., was declared a potential emergency area as Hurricane Ethel approached, amateurs in Port St. Joe and surrounding area put their emergency plan into action. Communications headquarters was set up at the city hall. K4RZF disassembled his station and transferred it to the City Hall where he established himself as NCS, later relieved by K4RZF. W4WEB set up at the Weather Bureau in Apalachicola and kept all concerned informed of the progress of the storm. W4MXN operated mobile on the waterfront to monitor road conditions and high water damage in Gulf and Franklin counties. W4JOZ acted as NCS most of the night. W4ZKP operated from the paper mill. W4SGG was the only means of communication with the St. Joe Beach area. On the morning of Sept. 14, W4WEB relayed information on several small tornadoes in the area, none of which did any damage. On the morning of Sept. 15, Hurricane Ethel had turned toward the Mississippi and Alabama coast and the hurricane watch was discontinued.

— • • • —

On Jan. 24, a natural gas main was fractured by a trench digger in Parma Heights, Ohio, releasing millions of cubic feet of gas. A state of emergency was declared by the mayor and families were evacuated, in freezing temperatures, from the immediate area. The AREC/Red Cross network of Cuyahoga County was alerted at 1545 EST and mobiles *W8s* JBS and URV reported to Parma Heights City Hall. Monitoring the net frequency and relaying traffic to the Red Cross were *K8s* PYT DQB and W8IDG. Net control was K8UFN, operated by *K8s* EXL YOA and W6NMW. The gas was finally shut off at 1640 EST and the net was secured at 1735 when the danger of explosion had passed. — *K8EXL.*

— • • • —

On Feb. 18 the Chagrin River overflowed its banks in the Eastlake, Ohio, area, making necessary the evacuation of 100 families. In response to a call for assistance from W8SLZ, the AREC/Red Cross Net of Cuyahoga County was activated at 0100 EST. Mobiles *W8s* SLZ and JFD relayed communications from officials at the scene to K8LBK, who set up portable equipment in the mayor's office and to K8AOE at the school were families forced from their homes were being housed. Mobiles *K8s* UXH and EXL escorted the Red Cross convoy through the flood area in heavy fog with food, clothing and medical supplies. Relay of traffic from the flood area to Cleveland was handled by *K8s* NYZ DQB UFN GQQ and W8OKE. Successful blasting of the ice dropped the flood level and the network was secured at 0815 EST. — *K8EXL.*

— • • • —

On Feb. 26 at 1825, Clinton Co. (N. Y.) EC WA2GCH was notified by W2NIZ that the Ellenburg telephone exchange was burned down and the upper part of Clinton County was without telephone or electric service. He immediately activated the local AREC and for the next 12 hours a total of 16 stations were active on two meters. Later, 10 stations were in the 75-meter net and 7 stations on the ten meter net. Communication was maintained among the following points: Plattsburgh, Peru, Keeseville, Saranac and Dannemora. This linkage served the police, county sheriff and local TV and radio stations. Amateurs taking part: *K2s* UYM MEB TLJ OPV VXR RXP, *W2s* NIZ OZY, *WA2s* GNZ JJY GLA GCH GPY JPB DAC HSB JOI KPU NVT ETR CRC FTM JPM JOH, K1BVI/2, W1VSA. — *WA2GCH, EC Clinton Co., N. Y.*

Sez Ky. SCM W4SUD: "This is one of Kentucky's PAMs and manager of KPN, K4OZI. Young, but a good operator."

— • • • —

A disastrous sleet storm hit the southern half of Iowa on Feb. 17 at 0945, leaving parts of the state completely without communications. SEC W0EXN activated the Iowa AREC the following day. Approximately 350 stations participated in the net. Acting as NCS were *K0s* DGX EAA BSZ, *W0s* DDV JDV NWX OZO PZO RMG YDV GQ and NTB. Other outstanding stations were *K0s* KAQ QWG SLB UTC/mobile SFX FEP, *W0s* JDV CVU CRF SJU CXF BTR JRV/mobile OXY GZ JPJ, K9JJE. Story County, under the direction of W0III, worked 14 hours assisting the Ames City line office; participants were mobile *K0s* QKII YVU, W0UGR, and fixed *K0s* UAA and DUG. Union County operators participating in local duties were *K0S* REW and THG.

— • • • —

On Feb. 4 W1JOS was snowbound on Route 128 near Peabody, Mass., along with hundreds of other motorists. Several times during the seven-hour wait, he walked along the line of snowbound cars, taking names and telephone numbers of the occupants. This information was passed from his mobile rig to a net formed in Danvers, Peabody, Salem, Beverly and Gloucester to let friends and relatives know the situation. — *W1TTQ*

— • • • —

The Polk County (Des Moines) AREC was called out at the request of the chief of police on Feb. 18 to patrol streets during the evening hours. W0NTA was activated at police headquarters with operation established on 29.6 and 50.55 Mc under control of EC W0MJH, with W0PKH and K0QXT as net controls. Mobiles reporting to police headquarters where they each picked up an auxiliary policeman were *K0s* ZCA LUG TXL JRV GHD SVR LUP IEZ ALZ SAF, *W0s* QHB IVP WSJ, with *K0s* MTB PCE and RIH in supporting roles. — *K0EXN, SEC Iowa.*

— • • • —

On the morning of Feb. 25, Indiana was hit by a snow and ice storm that closed many roads and cut off communications. The Steuben County AREC moved into action with K1CMT/9 setting up a base station on 6 meters and an emergency generator to run it at county police headquarters. AREC members were alerted and stood by. K8IMS/9 discovered a car that had slid off the road and into a pole; this information was quickly passed on to police through K9TFI. — *W4CTU/9, EC Steuben County, Ind.*

— • • • —

On Feb. 25 Montreal was hit by a severe wind, sleet and snow storm that brought amateurs into action. VE2ASW contacted VE2AUU and an urgent call to members of the Montreal Mobile Amateur Club received immediate response from mobile *VE2s* QG AXU TY SC XI and AUV. Additional fixed stations *VE2s* BCT ARS RS and BDV also took part. Work conducted included reporting accidents, fires and supplying and servicing generators and p.a. systems. From 2000, when assistance was first called for, until 0800 the work proceeded. By Feb. 26 general chaos was apparent and additional amateurs became active. Laval-sur-le-Lac received assistance in all kinds of emergency communications work from *VE2s* BDP BEG BFB AHN BR BBR AWU SF and ABV. At Bale d'Urfe, *VE2s* ADQ TY RS AXU and ALU helped police and fire departments erecting and supplying portable power, repairing police radio antennae and supplying communications to c.d. and army headquarters. An emergency net was functioning on 3755 kc during the entire period, some 30 mobiles and 300 fixed stations being logged, including some VE1 and VE3 stations. Calls of stations not previously mentioned who were of material assistance include *VE2s* AI UN CDM TS VV AFZ AUE HB GD AAH, *VE3s* AKL AEW. VE2ABR cleared much hospital traffic. The South

Shore gang was also active, with *VE2s* GD AGM IK/2 ER/2 and AEW/2 spending many sleepless hours. Outlying districts such as Trois-Rivieres and Quebec were not so much affected, but even here mobiles were alerted and ready to serve if needed. To indicate the extent of communications damage, some 15,000 poles were lost by telephone, telegraph and hydro companies during the storm. — *VE2DR, SCM Quebec.*

—•••—

Add to the Chicago tornado emergency (Mar. 4) detailed last month, the following calls of participating amateurs: K9IKT, *W9s* EZN VSU.

—•••—

Members of the Madison County (Ala.) AREC and c.d. unit were alerted at 0130 Mar. 8 that a tornado had struck Eddy and Union Grove. Mobile *K4s* DAB DQI OCV RSB, *W4s* VFN NKS and W8SVC/4 proceeded to the scene, approximately 25 miles south of Huntsville, while *K4s* VJL SSP and YUD maintained contact. Considerable property damage and personal injuries were found. The mobiles and Huntsville C.D. police patrolled the area, rendering assistance as required, arriving back in Huntsville at 1000. — *K4RSB, EC Madison County, Ala.*

—•••—

The Albuquerque, N. M., AREC, including members of the Caravan Club, were called out, on Mar. 12, to assist in the search for a man and wife and three children who were missing in the Jemez Mountains north of Albuquerque. Although the AREC group was alerted prior to 2200, mobiles were not dispatched to the area until after midnight — this at the request of the sheriff. Shortly after midnight, W5UOZ proceeded to the junction of highways 44 and 422 to set up the control point and maintain communications with W5ZHN in Albuquerque. As mobile units arrived, he dispatched them to strategic points in the search area. As the search area expanded, it was necessary to provide an additional relay, so K5CXN took over at the control point and W5UOZ moved farther afield. At 0400, W5ONK took over the Albuquerque contact from W5ZHN. Shortly thereafter, K5SFU discovered the car of the missing people, bogged down in mud and abandoned. He and K5DLE followed the foot tracks from the car until they were forced to turn back because of severe conditions. Later, the state police and deputy sheriff of Sandoval County arrived and took over the search. Once the approximate location of the missing persons had been established it was a comparatively simple matter to locate and rescue them using jeeps and a helicopter from Kirtland Air Force Base. Other amateurs who participated in the search: *K5s* KWU ZGX IVR, *W5s* LQM LEF UAF WNU. — *W5ZHN, EC Albuquerque, N. M.*

—•••—

A lost 14-year-old boy found his own way out of the area around Mt. Hood, Ore., on Mar. 19, after an airplane, a helicopter, trucks and mountain climbers had spent the night looking for him. Thirteen amateurs were also involved in the search: *W7s* IGE/m ZQQ/m RXO/m IGI SGV MW UZI RCL WFP UHF PXX RVN and K7EUP.

—•••—

February reports were received from 29 SECs, six new ones since tabulation of January reports. A total of 12,175 AREC members was represented. This beats last February in AREC members, but is still three reports under. We note with interest that three sections — Ind., Mich. and E. Fla. — now boast AREC memberships of over 1000. Other sections reported: Md.-Del.-D. C., Sac. Valley, S. Dak., N. N. J., Minn., Ore., N. Texas, Colo., Kans., Ohio, S. Texas, Wash., Maine, E. Bay, Nevada, E. Mass., Ga., Santa Barbara, Wyo., NYC-LI, E. Pa., Okla., Maritime, Santa Clara Valley, Tenn., Iowa. This makes 34 SECs heard from officially this year. How about the rest of you?

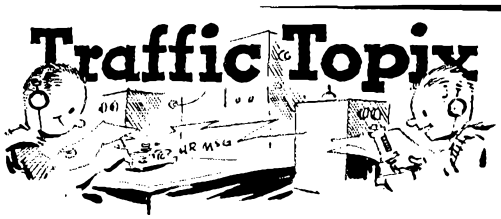
RACES News

As of the first of the year, OCDM reports that 1400 RACES plans exist throughout the U. S. and possessions, including city, county, state and OCDM regional plans.

RACES organization within states varies. In New York, organization is by counties under the state plan. In Massachusetts, the state is divided into sectors and communities within the sectors have RACES plans as well as the sectors themselves. In California, the state is divided into regions, which have their own RACES plans dovetailing into local plans. Only one state, Texas, was without a RACES plan as of Jan. 1. Massachusetts had the greatest number of approved RACES plans (275), California second with 109, Connecticut third with 107; but the total number of plans is not necessarily an index of coverage. For example, all 62 of New York's counties have RACES plans.

On Nov. 21, 28 and Dec. 5, Zone 10 RACES (Cuyahoga County), Ohio, had a Red Cross Instructor speak during its drills. The subject was First Aid, and the talk was followed by a question-and-answer session. The whole program was enthusiastically received by the group of 40-odd amateurs. — *K8DFV, RO RACES Zone 10.*

On Feb. 18, the Moline (Ill.) RACES group under the call K9RYA, held a c.d. drill to test emergency radio capabilities. The drill started at 1300 CST with K9CLW, the Target City station in Chicago, participating with mock traffic. Within a few minutes three local mobiles responded to the call and were dispatched to key spots in the county. At the completion of the exercise, while the mobiles were returning to base, K9MVJ observed a car run off the road and over an embankment. He immediately notified control, who called state police and a patrol car and wrecker were dispatched to the scene. K9MVJ meanwhile administered first aid to the car's occupants — a man, wife and small child. The Red Cross first aid course the RACES group had just finished came in handy. The drill lasted over two hours and ten messages were handled as per SOP. Nine amateurs participated.



The BPL race is getting to be the same old story, year after year. W3CUL came out on top again in 1960, by a wide margin. Mae accumulated 731 BPL points during the year, making her post-war total 5,462 points, piled up at the rate of four points for each BPL listing plus one point for each full hundred traffic points on a month-to-month basis. We asked Mae how she did it and got some good dope, which we'll present later.

Second in line was K2UTV with 442 points, also far in front of his nearest competitor. The remainder in the top ten are WØLGG (279), WØBDR (232), WØLCX (226), WØSCA (224), W7BA (223), W4PL (176), K6BPI (169) and VE2AZI/W1 (169). Two stations (K1C1F/MMQ and W3CUL) made BPL *13* times in 1960. All but two (WØLCX and VE2AZI/W1) of the above top ten made BPL each month. The following *also* made BPL every month in 1960: W1SMU, K2DEI, K4SJH, W6GYH, W8DAE, W9DGA, W9DYG, W9IDA, W9TT. And finally, here's the rest of the "top 25" BPL'ers for 1960, with annual BPL points in parentheses: K1C1F/MMQ (168), W9IDA (166), W9DYG (158), WA2CIG (147), W7DZX (140), K4AKP (136), K4SJH (136), W8UPH (135), KØONK (130), W3VR (121), W3IVS (117), W6WPF (111), W9TT (109), WØTUS (104), W9DO (103).

In the post-war column, we have quite a few calls of amateurs who stopped handling traffic so long ago that probably they are not familiar to newer traffic men. W3CUL's incredible 5,463 points is well over double her nearest competitor (W4PL with 2,122). Others in the top 25 cumulative since WWII are as follows: W7BA (2060), WØBDR (1953), WØSCA (1915), W2KEB (1873), W9NZZ (1255), W3WIQ (1184), W6GYH (1137), WØCPI (1099), W9DO (1082), W9JUJ (982), WØLGG (940), W7PGY (922), W7CZY (885), K2UTV (844), W6CE (815), WØTQD (809), WØLCX (749), WØPZO (683), W8UPH (659), W9TT (624), W2RUF (607), W4PJU (522), W2KFV (511).

Every one of the above amateurs is (or was) a giant in the traffic handling field and deserves a salute from us traffic dabblers. Ladies and gentlemen, we salute you! — *WINJM.*

March net reports.

Net	*Sessions*	*Check-ins*	*Traffic*
N.E. Area Barnyard	27	709	70
Hudson Traffic*	30	268	119
Mike Farad E & T	55	588	1259
Early Bird Transcon	31	...	347
Eastern Area Slow	31	183	72
Interstate SSB	..	999	388
7290 Traffic	46	1561	683
20 Mtr. Interstate SSB	23	553	1809
Dixie Early Bird	27	591	217
Central New England	27	369	16

* Hudson Traffic Net and Eastern States Net have merged to form a new net, the Eastern Wireless System, operating on 7090 kc. at 1715 GMT.

—•••—

National Traffic System. As you know, NTS is supposed to remain on local *standard* time throughout the year, according to CD-24. In practice, we have never been able to carry this out, as most section nets and some region nets have insisted on going along with the time their participants are forced to live by. For ten years, this has fouled up the NTS time schedule each summer.

In an E & T Bulletin put out last fall, we offered several possible solutions, chief among which was a proposal that the entire system move its schedule a half hour earlier by the sun. Thus, everybody would change net time a half hour during the summer, instead of some changing a full hour and others not changing at all.

The only trouble is that, in a system like NTS, any change has to be nationwide to be effective. Late this spring, we actually drafted a letter to all region and area net managers and TCC directors, announcing the change of schedule for a trial season, but it never went out. Section nets have to be considered, too, and because there are so many of them there was no way of notifying them except through *QST* or a bulletin. Besides, although NTS is highly organized (we keep telling ourselves), it is not regimented. We cannot say it shall be done thus-and-so and proceed with full assurance that it *will* be done that way.

Perhaps one more summer of confusion will not do any great harm. However, the trend toward standardization is definitely with us, and it behooves all NTS net managers to give the matter some thought. First, to bring all NTS nets, at all levels, into compliance with the NTS timetable; second, to keep it that way the year around — or, if we change it, change it for *everybody*, not just those in areas where clocks are tampered with. March reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN	28	1159	.813	42.9	97.0
CAN	30	1572	1.000	52.4	100.0
PAN	31	1513	.861	48.8	100.0
1RN	60	788	.412	13.1	78.6
2RN	62	688	.601	11.1	93.2
3RN	62	643	.385	10.4	100.0
4RN	62	561	.297	9.0	90.7
RN5	62	805	.388	13.0	82.5
RN7	62	641	.279	11.3	41.5
8RN	61	394	.218	6.4	86.7
9RN	62	958	.593	15.4	78.6
TEN	93	1256	.603	13.5	69.8
ECN	23	102	.190	4.4	86.9[1]
TWN	31	475	.441	15.3	89.3
Sections[2]	1278	7971	....	6.	....
TCC Eastern	102[3]	653			
TCC Central	93[3]	1446			
TCC Pacific	111[3]	1314			
Summary	2007	22949	CAN	9.7	CAN/PAN/3RN
Record	1974	26611	1.025	13.9	100.0

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

[2] Section nets reporting: GSPN (N.H.); SCN & SCEN (S.C.); VFN & VSN (Va.); WSN (Wash.); HNN & CCW (Colo.); TN (Tenn.); PEN (Sask. & Alta.); KYN & KPN Eve (Ky.);, CN & CPN (Conn.); GSN (Ga.); NTTN & NTX (Texas); RISPN (R.I.); E. Tenn. Phone & Tenn.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for March Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	308	2490	2011	373	5182
W0LGG	572	770	717	58	2117
W0LCX	55	956	867	90	1968
K4AKP	62	723	701	21	1507
K0ONK	147	642	538	12	1339
W6YDK	1071	50	38	12	1171
W6GYH	295	446	418	10	1169
W7BA	5	559	522	32	1118
W4PL	15	540	497	34	1086
W9JOZ	19	460	479	2	960
K6BPI	98	422	363	72	955
W3EML	25	455	392	25	897
K0WWD	168	358	292	66	884
W0BDR	174	392	372	3	881
VE2AZL/W1	20	418	407	1	846
W3VR	67	396	361	17	841
W0DUA	24	392	415	1	832
W9DYG	34	413	361	20	828
K9CLS/6	61	400	335	2	798
W7DZX	10	398	364	25	797
K4SJH	70	400	307	7	784
W1SMU	15	382	369	14	780
W0OHJ	5	386	370	16	777
W0TUS	22	122	550	83	777
VE3CWA	60	349	268	64	741
K4VDU	138	290	175	115	718
W9ZYK	55	305	288	61	709
K1BCS	310	186	170	7	673
W8DAE	63	328	203	64	658
W8UPH	10	324	281	42	657
W0ZWL	2	448	6	201	657
WA2GQZ	18	305	267	26	616
W4IWM	0	16	594	0	610
W8LDU/4	32	290	270	10	602
W9IDA	9	285	284	4	582
W9DO	21	269	248	42	580
W3IVS	0	138	419	5	562
W1KYQ	18	287	242	3	550
K3GSU	19	348	120	62	549
W6EOT	11	289	218	28	546
K4KDN	29	262	240	12	543
K1CIF	51	271	209	7	538
K2UBG	115	231	144	40	530
K9OZM	19	256	193	62	530
W2RUF	28	261	181	58	528
K2UCY	30	244	239	14	527
K6OZJ	3	260	247	13	523
W7ZB	22	257	211	23	513
W5ZHN	15	259	147	91	512
K0ORK	44	233	199	28	504
Late Reports:					
WØLCX (Feb.)	34	726	624	102	1486
K6PBD/4 (Feb.)	479	484	475	0	1438

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
K6MCA	71	785	759	17	1632
W4PFC	49	238	234	4	525
Late Report:					
W4DUG (Feb.)	6101	3	0	3	6107

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

W2EW	240	K8AAG	130	K7JWY	104
K7BKH	202	K3JYZ	128	W7QMU/VE8	104
W1TXL	183	K5JGP	125	K4OIJ	103
KØHGI	183	W9NZZ	125	K4ZNC	102
K3WBJ	158	WA2GLU	122	K8ONQ	102
K8KMQ	155	K4JZU	122	K0RRL	102
WA6FCO/4	153	K3HRN	120	K2DEI	101
W3KUN	147	KN1OWU	115	WA6LVX/6	101
K1DIO	146	K9LOK	115	Late Reports:	
K3HWX	138	K3KDP	114	WA6LVX/6 (Feb.)	129
WA2CCF	130	W9TT	110	K3KDP (Feb.)	119
WA2GPT	130	K5MBK	107		
		WØQDL	105		

More-Than-One-Operator Stations

W4AB/4 471

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W1KYQ, WA2GPT, K2VVL, KØWWD, VE3CWA.

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.

W1AW OPERATING NOTE

The complete summer schedule of the ARRL Headquarters station appeared on page 97 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.

Phone; NJN (N.J.); MSPN Eve, MSPN Noon, MSN & MJN (Minn.); AENB, AENO, AENP Morn, AENP Eve, AENT (Ala.); QMN (2 Mich. nets); SCN (Calif.); ILN (Ill.); CBN (Ont.); WIN (Wis.); QFN (Fla.); NJQ & SDN (S.Dak.); S.Dak 75 Eve; MDDS (Md.-Del.-D.C.); BUN (Utah).

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

Once in a while, we still manage to break a record. This month we exceeded all previous March's in total number of net sessions reported. Total traffic handled and the rate at which it is being handled are showing slight decreases because of unfavorable atmospheric conditions.

W9DYG now sends monthly CAN summary messages to all NCS and region net managers in the areas. PAN shows improvement each month; KØEDK has submitted his resignation to the Pacific Area NTS Staff. W1BVR says that 1RN is going to try to stick to the regular NTS timetable this summer (i.e., no "daylight saving" time). For the second straight month, 3RN has had 100% attendance from sections. W4PCN has received his 4RN certificate; K4AVU has decided to hang on to the managership until W4SHJ gets back. RN5 is beset with difficulties; Asst. Mgr. W5CEZ reports that the younger element are afflicted with studies, YL-itis or rules laid down by Pa and Ma, or a combination of all three. Alberta is now being represented on both the Sask. and B.C. nets, so representation on RN7 should be picking up. W9ZYK has issued a 9RN certificate to K9UGY. Of TEN's three sessions per day, most traffic is handled on the 1945 session, least at 2130; Manitoba pulls down the representation percentage with its monthly goose egg. K7NWP and W7LND have been awarded TWN certificates; Manager WØFEO puts out an excellent monthly comment and data bulletin to net members.

Transcontinental Corps. We had a pleasant personal visit with W1SMU (Eastern TCC Director) at the New England Division Convention, and discussed many NTS problems while monitoring tapes made from operations. WØBDR has been ill, we understand, but is back on the job again. W6EOT's monthly TCC report is copy of a bulletin to all stations in his area.

K5MXO is manager of the 7290 Traffic Net, which averages 40 sessions and 600 message handlings per month and has an average check-in of 35 stations per session. She is OPS, ORS, and is the proud possessor of a BPL Medallion.

March reports.

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern.....	102	88.2	1909	653
Central.....	93	95.7	2898	1446
Pacific.....	111	97.3	2587	1314
Summary...	306	93.1	7394	3413

The TCC roster: Eastern Area (W1SMU, Dir.) — *W1s* AW EMG NJM OBR SMU WEF, *WA2s* APY COO, *K2s* SSX UFT UYW, *W3s* EML WG WRE, W4DVT, *W8s* ELW UPH, VE2AZI/W1, VE3CWA. Central Area (WØBDR, Dir.) — K4AKP, *W9s* DYG CXY DO ZYK, *W0s* LCX SCA BDR. Pacific Area (W6EOT, Dir.) — W5ZHN, *K6s* LVR ZYZ GID, *W6s* EOT ELQ HC WPF, *WA6s* ATB HZM ECF, K7NWP, *W7s* GMC DZX ZB *KØs* EDH EDK CLS/6, *WØs* WME KQD FEO WHE/7

A.R.R.L. AFFILIATED CLUB HONOR ROLL

With pleasure we present our Honor Roll '61 listing of those clubs that have *100% of their club members also ARRL members.* Data for this listing, generally speaking, comes from the returns from the recent 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 special recognition is well deserved. Each listed club is now receiving as a special recognition and for club posting a 100%-ARRL Club certificate.

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 in this further Honor Roll if they qualify.

Aeronautical Center Amateur Radio Club, Inc., Oklahoma City, Okla.
Amateur Radio Club of Central Mo., Inc., Sedalia, Mo.
Amateur Radio Technical Society of St. Louis, St. Louis, Mo.
Apple Pie Hill Amateur Radio Club, Inc., Tuckerton, N. J.
Athens Amateur Radio Club, Athens, Ga.
Barnesville Affiliated Amateur Radio Club, Barnesville, Ga.
Birmingham Amateur Radio Club, Inc., Birmingham, Ala.
Blue Ridge Radio Society, Greenville, S. C.
Chicago Radio Traffic Assn., Inc., Chicago, Ill.
Chisholm Trail Amateur Radio Club, Duncan, Okla.
East Kootenay Amateur Radio Club, Kimberley, B. C., Canada
Emergency Radio Communications Assn., Milan, Ill.
Jacksonville Amateur Radio Society, Jacksonville, Fla.
Jefferson Barracks Amateur Radio Club, St. Louis, Mo.
Keystone Amateur Radio Club, Springtown, Pa.
Loudon County Amateur Radio Club, Lenoir City, Tenn.
Mason County Radio Club, Inc., Ludington, Mich.
Mummy Mountain Radio Club, Scottsdale, Ariz.
Norfolk County Radio Association, Norwood, Mass.
Northeast Nebraska Radio Club, Pilger, Nebr.
Northern New Jersey Radio Association, Englewood, N. J.
Ottawa Radio Club, Inc., Ottawa, Ill.
The Palmetto Amateur Radio Club, Inc., Columbia, S. C.
Queen City Emergency Net, Inc., Cincinnati, Ohio
Radions, Lancaster, N. Y.
Rome Radio Club, Inc., Rome, N. Y.
Royal Order of the Left Foot, Stevens Point, Wis.
The Order of Boiled Owls, West Hempstead, N. Y.
The Saginaw Valley Amateur Radio Assn., Saginaw, Mich.
Starved Rock Radio Club, Oglesby, Ill.
Tusco Radio Club, Dover, Ohio
Vanderburgh Amateur Radio Emergency Service, Princeton, Ind.
Wichita Amateur Radio Club, Wichita, Kans.
York Road Radio Club, Inc., Elkins Park, Pa.

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are *hereby* notified that an election for Section Communications Manager is about to be held in your respective Section. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions *must* be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The *complete name*, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reasons of expiring memberships, individual signers uncertain or ignorant of their membership status etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate for Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
West Indies	June 9, 1961	William Werner	Aug. 10, 1958
Kentucky	June 9, 1961	Robert A. Thomason	Aug. 16, 1960
Wisconsin	June 9, 1961	George Woida	May 12, 1961
Oklahoma	June 9, 1961	Adrian V. Rea	Aug. 9, 1961
Western Massachusetts	June 9, 1961	Percy C. Noble	Aug. 11, 1961
San Francisco	June 9, 1961	Leonard R. Geraldi	Aug. 14, 1961
Southern New Jersey	June 9, 1961	Herbert C. Brooks	Aug. 26, 1961
Maine	June 16, 1961	Jeffrey I. Weinstein	Resigned
West Virginia	July 10, 1961	Donald B. Morris	Sept. 18, 1961
San Joaquin Valley	Aug. 10, 1961	Ralph Saroyan	Oct. 10, 1961
Rhode Island	Aug. 10, 1961	John E. Johnson	Oct. 12, 1961
East Bay	Aug. 10, 1961	B. W. Southwell	Oct. 14, 1961
Indiana	Aug. 10, 1961	Clifford M. Singer	Oct. 14, 1961
San Diego	Aug. 10, 1961	Don Stansifer	Oct. 15, 1961
Utah	Aug. 10, 1961	Thomas H. Miller	Oct. 28, 1961

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections completing their election in accordance with regular League policy, each term of office starting on the date given.

Alberta	Harry Harrold, VE6TG	April 10, 1961
Idaho	Mrs. Helen M. Maillet, W7GGV	April 10, 1961
Oregon	Everett H. France, W7AJN	June 10, 1961
Eastern Pennsylvania	Allen Breiner, W3ZRQ	June 15, 1691

SS BRIEFS

The May Sweepstakes club tabulation should show the Tusco Radio Club phone winner as W8BIM with 27,376 points and the club phone award.

The phone score of W9VSO should appear as 54,020-270-62-A-25 gaining him the phone award for the Milwaukee Radio Amateurs' Club and upping the club's aggregate score to 540,306 points.

A.R.R.L. ACTIVITIES CALENDAR

June 7: CP Qualifying Run — W6OWP
June 10–11: V.H.F. QSO Party
June 15: CP Qualifying Run — W1AW
June 24–25: Field Day
July 6: CP Qualifying Run — W6OWP
July 15–16: CD Party (c.w.)
July 21: CP Qualifying Run — W1AW
July 22–23: CD Party (phone)
Aug. 2: CP Qualifying Run — W6OWP
Aug. 21: CP Qualifying Run — W1AW
Sept. 13: CP Qualifying Run — W6OWP
Sept. 15: Frequency Measuring Test
Sept. 16–17: V.H.F. QSO Party
Sept. 19: CP Qualifying Run — W1AW
Nov. 11–12, 18–19: Sweepstakes Contest

OTHER ACTIVITIES

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

June 10–11: New York State QSO Party, Binghamton Amateur Radio Assn. (p. 85, this issue).

CLUB COUNCILS AND FEDERATIONS

Affiliated Council of Amateur Radio Clubs, Inc., William A. Bentson, W7QEY, Secy., P. O. Box 1335, Portland 7, Ore.

Cleveland Area Council Amateur Radio Clubs, Gertrude E. Maxim, W8OIS, Secy., 23644 Woodhill Drive, Berea, Ohio.

Federation of Eastern Massachusetts Amateur Radio Associations, Eugene Hastings, W1VRK, Secy.-Treas., 28 Forest Ave., Swampscott, Mass.

Los Angeles Area Council of Amateur Radio Clubs, Robert F. Dailey, W6UKC, Secy., 7608 S. Sorensen Ave., Whittier, Calif.

Michigan Council of Clubs, Robert H. Pinder, K8NTE, Secy., 1277 Cricklewood Dr., S.W., Grand Rapids, Mich.

Ontario Amateur Radio Federation, Inc., A. K. Meen, VE3DAR, Secy., Suite 405, 19 Richmond St., W., Toronto 1, Canada.

Ohio Council of Amateur Radio Clubs, Ernest E. D'Angelo, K8DJM, Secy., 3134 Ontario St., Columbus 24, Ohio.

San Diego Council of Amateur Radio Organizations, Bernard Bishop, K6SSX, Secy., 5690 Yorkshire Ave., La Mesa, Calif.

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 15 at 2130 Eastern Daylight Time (0130 GMT, June 16). Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted June 7 at 2100 PDST (0400 GMT, June 8) on 3590 and 7129 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST (0130 GMT). 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 to Practice Text from April *QST*.

June 1: *It Seems to Us*, p. 9
June 5: *A Home-Built . . . for 1296 Mc.*, p. 11
June 13: *Home-Brew Custom Designing*, p. 17
June 16: *All-Transistor Walkie-Talkie for 28 Mc.*, p. 36
June 22: *Multiband Antennas Using Loading Coils*, p. 43
June 27: *The Voyage of the S. S.* Hope, p. 51
June 28: *World Time Keeping*, p. 54

DXCC NOTES

Announcement is hereby made of the addition to the ARRL Countries List of Malpelo Island. Malpelo Island is located in the Pacific Ocean some 310 miles west of Buenaventura, Colombia. The closest point of Colombian territory to Malpelo Island measures 232 miles, thus placing it under Point 2 of the criteria (see page 80, April 1960 *QST*, DXCC Note). DXCC credit claims may be made for this addition starting August 1, 1961. Confirmations for contacts with Malpelo Island must be dated November 15, 1945 or later. DXCC credit claims for this addition received before August 1, 1961 will be returned without credit.

DX CENTURY CLUB AWARDS

HONOR ROLL

W4DQH....309	W8DMD....304	W9YFV....302
W6AM.....308	W1ME.....304	W9NDA....301
PY2CK....308	W2HUQ....304	W2BXA....301
W3GHD....307	W1GKR....303	W6EBG....301
W8JIN....307	CE3AG....303	W5ASG....301
KV4AA....306	W8BKP....302	ZL2GX....300
W3JNN....305	LU6DJX....302	W1FH.....300
W2AGW....305	W8BRA....302	W6SYG....300
W3KT.....305	W7GUV....302	G3AAM....300
W9RBI....305	W5ADZ....302	G4CP.....300
W6CUQ....304	W7GBW....302	W8UAS....300

Radiotelephone

PY2CK....308	W6YY.....296	W6AM.....293
W8GZ.....301	4X4DK....296	W7PHO....293
W8BF.....299	W8KML....296	W4DQH....291
W3JNN....299	CX2CO....295	W3RIS....289
W9RB1....298	VQ4ERR...295	W1FH.....289
	ZS6BW....294	

From March 1, to April 1, 1961 DXCC Certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

CX2CO....296	G3LGL....107	W2ODZ....101
W5CKT....226	K1AWX....106	W2RIR....101
W2SKE....177	OH2FS....106	W3IJA....101
ZD1AW....133	KØIKL....105	W4QCL....101
ZS6AJH...133	LA5LG....105	K6EXO....101
OE7GF....126	UA3FT....105	JA1GW....101
K2GHM....123	W7QKU....104	UA9DR....101
W3NHA....121	EP1AD....104	YU3WP....101
VE3LZ....120	YU3VV....104	W2KYA....100
UD6AM....117	YU3YU....104	W3BCO....100
DM2ALN...116	K8UDV....103	K3EST....100
W6BFW....115	K9ORC....103	W4DSJ....100
K4DSV....113	JA1BX....103	W4MF.....100
DL1TH....113	W1IRW....102	K4UEE....100
4X4IM....113	K1MEM....102	K6TQR....100
UA3HK....111	W9ARV....102	K6UFX....100
K4RLO....108	G3HDQ....102	K8QJH....100
KR6GF....108	JA1CJN....102	WØRXG....100
W1EHT....107	KW6DG....102	VE1US....100
K5RIP.....107	OE1ZF....102	KZ5RC....100
K9MGF....107	UA3KND...102	VP9CX....100
	W1JFL.....101	

Radiotelephone

G8KS.....200	I1BKK....109	OH3NY....102
DL3DW....166	YV5AKP...105	OD5CT....101
YV5ANQ...132	LA5LG....104	V81GQ....101
WØBMQ....124	K4PUS....103	W1YPT....100
F2MO.....114	W8QHW....103	W7QKU....100
I1BLT.....114	G2HFC....103	K8LSG....100
W7GUI....113	YV5AQS...103	KØEPE....100
K4DSV....109	KJ1DW....102	KØGVO....100
K6DDO....109	KØRAL....102	OE3NH....100

ENDORSEMENTS

W3LMA....297	W3OCU....270	K9BVR....251
W8JB1....294	W3PGB....270	W1EQ.....250
W2WZ.....292	W7HKT....270	W1VG.....250
DJ1BZ....288	WØMLY....261	W2CWK....250
W2DS.....283	W1BIL....260	W5PM.....250
W6KSM....281	W2AEB....260	W6DQH....249
W2JVU....280	K2UWR....260	W1IJB.....246
K2OEA....180	W4CXA....260	W3WE.....243
W4FVR....280	W4GRP....260	W4ECI....240
W4LVV....280	W4PLL....260	W9PQA....234
W5OLG....280	G8KS.....260	W2DSU....233
W9FKC....280	W2HO.....258	W2FZY....233
DL3LL....279	W6DQH....256	W5BUK....233
W6FZ.....275	VE3BWY...255	W8UMR....232
W2SUC....273	W21RV....253	ZS1BK....232
I1AMU....272	WA2IZS...252	VE2YU....231
W2ESO....271	W9GDI....252	W8TJM....230
W2FXN....270	W8CED....251	WØBTD....230
I1UA.....227	K6DDO....185	TI2CMF....152
WØTJ.....225	K6SED....183	W6ZMW....151
W1AJG....223	HB9KU....183	K2TQC....150
W1WK.....223	KL7MF....182	WA6DTA...150
W2PZI....222	K2HIY....181	W7QNI....150
W4WDI....222	K9RAL....181	W9TMU....150
VE3PK....222	G4VC.....181	W3INH....143
W1RAN....221	W4IKL....180	W6WLO....141
W9VP.....221	W4TAJ....180	OE8SH....141
W1OOA....220	W4NO.....180	W1PPN....140
W5PSB....220	WØSLB....180	W1WTF....140
W9BQE....220	W1KXP....173	W4BHG....140
K9CJK....217	K2JFV....172	W9CMC....140
W3GRS....216	K6OYD....171	ZL1ARY....138
W4LRN....214	W9NLJ....171	W4NYF....137
K1JDN....212	SP9RF....171	OD5CT....137
W3RBW....212	W1CKA....170	K4JKY....133
K4LTA....211	W2DEO....170	K8ONV....133
W8IBX....211	W2GBX....170	W9WNV....133
W3KA.....210	W3MQC....170	K8KTZ....130
JA6AO....210	W4HQN....170	ZS6FU....130
W9QGR....207	W5ARJ....170	W9YHE....129
WØDEI....207	K5ESW....167	W8TAJ....125
I1FO.....203	WØBMQ....166	K3DKD....124
K2MGR....202	F8SK.....166	G3ISX....121
K8IKB....201	G2FFO....164	VQ2IE....121
K8LSG....201	G3CCN....164	WA2CBB...120
G3LET....201	W2WMG....162	K2YXY....120
W2K1R....200	K2DSV....162	K9OKD....120
K4YCW....200	SM6AMR...161	KØIAD....119
W7ATV....200	W7UMJ....160	EA0AB....119
W7NRB....200	W9ESQ....160	K8OHG....117
W8NJC....200	SM5BFE...157	W1OPB....115
K5KES....199	W8QHW....156	K2PXX....114
K6GLC....199	W9GVZ....156	K2UVV....112
VE2BV....199	K4TEA....155	K4MWB....112
WØOAQ....192	HB9DX....155	KØGJE....112
VE1WL....192	KH6DLF...154	K4HDR....111
SP7HX....192	W4CWW....153	K1GUD....110
W7ABO....191	W6ABA....153	W1YPH....110
W8KBT....190	W6GRX....153	K5UYF....110
VE3HB....190	DL1FZ....152	I1ZBS....110
G2IO.....190		6W8BF....110

Radiotelephone

I1AMU....268	W9HPS....172	K1EJO....140
PY4CB....264	K8CFU....170	KØMNO....140
DL3LL....253	DL6PC....170	VE5LM....140
WØJYW....251	W6YMV....169	HB9KU....140
W8JIN....250	W2SKE....164	W2DSU....137
OZ7FC....250	W2YBO....163	IT1SMO...134
W8JBI....242	VE2YU....163	9G1CW....134
W1FZ.....237	W2QWS....162	W8SMQ....132
WØQVZ....235	K2JFV....160	W4LVV....131
W1DCE....230	W2SUC....160	CR7LU....131
I1IA.....224	W2YCZ....160	K2TAP....130
W1ALF....223	W8UMR....160	K9EMG....130
ZS1DO....221	F8SK.....159	KØRDO....130
W4OM.....211	I1ZFT....157	K9LUI....126
W5KC.....211	K1IXG....154	W9YHE....125
W4GRP....205	F3KE.....153	K4LTA....123
OE3ME....205	W8TJM....151	W9CMC....123
W2FXN....201	XE1SN....150	KG4AO....123
WØMLY....196	G3CCN....145	VE2AFC...121
W6BSY....191	ZS1DC....143	W9ILW....120
W2HMJ....184	W2HXG....142	SP9RF....111
W1BIH....182		K6IPV....110

U.S.-Canada Area and Continental Leaders

KH6CD....261	VO1DX....251	VE6NX....256
KL7PI....249	VE2WW....280	VE7ZM....297
WØQVZ....296	VE3DIF...260	VE8AW....195
WØELA....296	VE4XO....200	ZS6BW....294
VE1PQ....252	VE5RU....209	4X4DK....299

Radiotelephone

W1FH.....289	W9AIW....283	VE5RU....192
W2BXA....283	VE1PQ....154	VE6TF....181
W5BGP....265	VO1DX....141	VE7ZM....277
KH6OR....261	VE2WW....226	G2PL.....268
KL7AFR...190	VE3QA....241	ZL1HY....288
	VE4RP....102	

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: DUI, PAM: IVS, RM: AXA. New appointments are K3HEX and GOF as OESs: HWK as OBS; and K3KNL as OPS. K3JHE has joined MARS. New Gear Dept.: NOH was QRL getting an Apache transmitter ready for the CD Party. K3HIN has a new 6-meter rig and a Halo antenna. YPF erected a 40-meter antenna. A new folded dipole aided K3CNN in getting a 559 report from UA3-Land. The new club call of the Short Skip RC is K3OUI. ID is working on a new 10-meter rig for the new shack location. KMD is accumulating so much gear that he has to move the shack to the basement. K3MNJ has successfully constructed an electronic keyer. NNL added a *Q*-Multiplier to his new home-brew receiver and now hears more than he can work. K3KBO has a new 10-20-meter vertical but is experiencing trouble with the v.f.o. K3HWX plans to be active in KV4-Land by the time this gets in print. HNK plans to go back up to the mountains with the Clark Summit boys for Field Day. Your SCM will be present at K3KNO/3 to receive any Field Day traffic. UIU was in the YL-OM Test and scored 200 points. The Susquehana Valley ARC presented a public demonstration on emergency communications operating right alongside of 20 TV sets without any TVI. K3LKR operated portable in Chicago and Boston on 6 meters and had plenty of contacts. EAN is getting his share of 40-meter DX and worked his first VU heard on 20 meters in 28 years. BNU now claims ownership of 31 certificate awards. K3KZG worked his first DX, an HB. New officers of the Lancaster Transmitting Society are RLT, pres.; JPS, vice-pres.; OY, secy.; K3DHV, treas. HZZ now has his beam back up after the winter storms. K3ACD passed his 17th birthday. K3EHP sends his OES report from Turkey stating there is no amateur radio activity permitted. YRT sprayed his BC-348 a cherry-red color. VR and CUL are Florida visitors, while DUI, DGX, ZRQ, K3BHU and K3NZD visited Morton. We wanted to load up on some of Mae's gear but IVS refused to help load the stuff on DGX's station wagon. Traffic: W3CUL 5182, EML 897, VR 841, IVS 562, K3GSU 549, HWX 353, MVK 194, W3HNK 151, NNL 143, AXA 122, K3HEX 119, W3IUI 86, DVT 85, K3CAH 84, IMP 77, CRU 65, HTZ 63, W3KMD 58, K3JLW 50, JSX 50, BHU 49, MVO 35, W3ZRQ 33, WHK 32, JSX 28, K3KBO 24, DCB 15, KNL 15, W3BFF 10, ITI 9, K3LKR 7, BNR 6, W3EAN 6, BNU 5, GYP 4, K3KZG 4, W3DUI 2, OY 2, ELI 1, ID 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—SEC: CVE. MDD Traffic Net meets at 1915 EST Mon.-Sat. on 3650 kc.; MDDS (slow speed) Net at 2030 EST daily on 3650 kc.; MEPN (phone) Mon.-Wed.-Fri. at 1800 and Sat.-Sun. at 1300 EST on 3820 kc. March appointments: K3APM, EAX and K3MZY as ORSs. We would like volunteers for EC appointments in Caroline, Charles, Dorchester, Frederick, Kent, Queen Anne, Somerset, Talbot, Wicomico and Worcester Counties in Maryland. Net certificates went to K3APM and K3MZY. The combined 6-meter group, consisting of the Md. V.H.F. Society, the FM Amateur Club, the Anne Arundel RC and the Aero ARC, held a successful banquet at Gwynn Oak Park Mar. 11. K3ADS reports conditions improving on 2 meters. AYD is trying c.w. for a change. BUD is scheduling an emergency-powered AREC test in St. Mary's County. New officers of the Rock Creek ARA are UCR, pres.; K3CWK and TKE, vice-pres.; K3LFN, secy.; and GSH, treas. CDQ is now out of the hospital. CQS is active in Silver Spring. K3CWG submitted his usual good OES report. ECP is busy as always with club affairs, meetings and traffic. K3EJF maintains his 2- and 6-meter activity. K3EIZ reports he now has a 100 per cent ham family, and that the Aero ARC had a successful winter code class. EAX reports that the new Univ. of Md. ARA officers are YRS, pres.; K2USG, vice-pres.; ZGN, secy.; and K3ACM, treas. EOV handled traffic for a patient in a Philadelphia hospital. EQK says the MEPN Picnic will be held July 23 at Braddock Heights Park. KEXM/3 still is on Okinawa now signing KR6AM. K3GJA is doing fine with Montgomery County AREC. K3GKF did well in the Delaware QSO Party. K3GMD is now out of the hospital and is using his artificial larynx. Johns Hopkins ARC, GQF, now has a new 40-meter vertical. HKS is having antenna troubles. HQE has a new V-5 vertical and is overhauling his station. The Washington RC had a talk on "Ultrasonic Cleaning" at its Mar. 3 meeting. K3HRN turns in a good traffic report. K3IZM reports a lot of 50-Mc. activity. JFR is lining up two Asst. ECs. K3JIQ reports DX on 10 meters. K3EHZ reports that the B&O ARC's 1961 officers are K8KRU, pres.; CKA, vice-pres.; K3HPE, secy.-treas.; and K3JDF, Act. Mgr. JSL has a pair of TBY transceivers. Glad to hear from JTE, who is continuing his satellite bounce activity at the Univ. of Pa. K3JVB has a new "Sixer" on the air. K3JYZ made BPL with a good traffic report. KHA checks in from Baltimore. K3KHK is building a 96-milliwatt rig. K3KHN is now active on 6 meters. K3KPZ still is having modulator trouble. LDD reports the Harford County AREC Net is on 28.590 Mc. each Wed. K3LEM has a new vertical. K3LFD is active in traffic work. K3LLR still is on 6 and 2 meters. K3LUQ is alternate 6-meter net control. K3MDL is the poet laureate of MDD! K3MZY has completed a 2-meter rig. KN3OMJ had a station on exhibit at the H.S. Science Fair. TMZ has a vertical beam. UE reports 3RN has 100 per cent attendance. UMO is a member of the Md. House of Delegates. K3WBJ made BPL. YTW has moved back to Baltimore. ZAQ is now the section's leading OO. ZGN is busy at EAX. ZNW is sparking MDDS. Traffic: (Mar.) K3KDP 278, WBJ 235, W3UE 207, K3HRN 200, JYZ 165, LFD 104, VE3DYK/W3 77, W3ZNW 67, TN 45, EOV 43, HQE 43, K3GJA 37, W3ECP 31, BKE 28, K3JIQ 22, APM 21, W3EQK 20, K3KPZ 20, W3EAX 15, K3EJF 15, MZY 15, GZK 14, W3JFR 13, K3KHK 10, LUQ 10, W3CQS 9, K3MDL 8, W3BUD 5, K3LEM 5, W3UCR 3, AYD 2, JZY 2. (Feb.) K3KDP 204, W3HQE 41, K3APM 27, W3UCR 27.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. RMs: W2BZJ, W2HDW and W2ZI. New appointments: K2VKS, Medford Lakes, as OBS and WA2KWB, Yardville, as OPS. W2RG, who has served faithfully for a number of years as Radio Officer of Camden County, has retired in favor of K2MBD. K2KPF, Maple Shade, has been appointed Asst. EC in Burlington Co. N.J. Phone and Traffic Net totals for March: 31 sessions, QNI 620 and traffic 191. W2ZI worked 68 stations in the recent 160-Meter QSO Party. K2EWR, Haddonfield, again is active on NJN. K2SNK, Trenton, has received the A-1 Operator certificate. WV2RFR and WA2RFY are new calls in the Vineland Area, also WA2OHM in Millville. K2CPR has a new transmitter. K2QXG, W1JTD and W6IBD were recent visitors at his QTH. K2MBW, Millville, is quite active in the N.J. Phone Net. K2JGU, Glassboro, is vacationing in Florida. WA2OVR and WA2OGV have acquired their General Class tickets. Congrats. W2GQK is on 6-meter s.s.b. The Gloucester Co. ARC is sponsoring a code and theory class at Pitnam High School Tue. nights. K2OJX and K2AQL edit the Gloucester Co. ARC paper, *Cross Talk*. SIRA's achievement certificate, issued for contacting a given number of the club members, continues to attract widespread interest. The Philadelphia EC and adjoining counties are planning a closer liaison with N.J. counties in the Camden Area. WV2QZQ and WV2RCW, Levittown, have received their Novice Class tickets. The Levittown (N.J.) ARC is making plans for Field Day and its picnic. K2VNL, NJN's manager, issues a very fine monthly bulletin. Eighteen activity reports were received this month, but no reports came from Atlantic, Cumberland, Salem or Cape May Counties. Please report activities the 1st of each month. Traffic: (Mar.) K2DEI 168, K2RXB 160, W2RG 148, W2BZJ 98, W2ZI 61, K2MOV 28, K2MBW 27, K2EWR 24, K2SOX 23, WA2KWB 18, K2SNK 11, WA2ARJ 8, K2CPR 5, WA2EMQ 5, WA2HJD 5. (Feb.) K2MBW 108.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF and W2EZB.

PAM: W2PVI. NYS C.W. meets on 3615 kc. at 1900, ESS on 3590 kc. at 1800. NYSPTEN on 3925 kc. at 1800. NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, 1PN on 3980 kc. at 1600. W2ZRC bought a new home and finds his time is limited so he has resigned as RM. He has done an FB job through the years. W2EZB has been appointed to take his place; he also is the new 2RN mgr. Appointments: K2AGC as EC for Schuyler Co., K2DVC as EC for Genesee Co., K2QLE as OES. W2RUF was the only one to make the BPL in March. Don't forget the Penn-York Hamfest to be held June 3 in Athens, Pa. The SWNYHFA will hold its Annual V.H.F. Picnic at Great Valley Fire Tower July 22 and 23. WA2ADK invites all interested hams to attend. The Corning ARA's new officers are K2UOQ, pres.; W2SLE, vice-pres.; WA2BPE, secy.; WA2AEA, treas.; and W2OSY, Pub. chmn. The ARRL State Convention will be held in Niagara Falls Sept. 15, 16 and 17. Plan now to attend. The Niagara RC is doing an FB job and this is one you won't want to miss. K2KYJ and WA2MQX got their General Class licenses. WA2CRH reports that the Adirondack RC will hold a TX hunt on 2 meters June 4. He also has a new homebrew electronic keyer. K2KKH was winner of the Walton ARA "Miles Per Watt" Contest. W2TFL and WV2MIP finished 2nd and 3rd. WA2HMW got his WAC. New York State presented the Monroe County RACES organization with a citation for organizing and maintaining a communications network for c.d. W2CTA is RO in charge. Join in the Field Day fun and prove to your community that hams are prepared to perform service under emergency conditions. The RAWNY's Board of Directors elected W2PVI, pres.; W2QWS, vice-pres.; K2ZAB, treas.; and K2LGJ, secy. WA2EOZ is conducting code and theory classes for the radio control boys in the Buffalo Area so they can get off the citizen band. About ten new Techs. are ready. This is a worthwhile project because these fellows build their own transmitters and receivers. They will start a 6-meter net in the area. Traffic: (Mar.) W2RUF 528, W2EZB 357, WA2CIG 251, K2RTQ 222, WA2IYB 192, WA2GLA 128, K2QKK 102, WA2CRH 91, K2TDG 84, K2OFV 51, W2PVI 41, K2GAO 40, W2PGA 39, K2QDT 38, W2FEB 37, WA2OTC 36, K2EE 27, W2RQF 25, W2VUY 23, WA2DAC 21, WA2BFI 20, K2DPA 20, W2QQK 20, K2RYH 14, W2TPV 12, W2ZRC 12, W2BLO 10, K2HOH 8, K2BWK 6, WA2EGX 6, K2KIR 2. (Feb.) W2EZB 430, K2MQA 27, K2RYH 27, WA2CEF 14, W2ZRC 8. (Jan.) W2ZRC 14.

NEW YORK STATE QSO PARTY

June 10-11

The Binghamton Amateur Radio Association invites all amateurs to participate in the 1961 New York State QSO Party. The contest will begin 1800 EST Saturday and run to 2400 EST Sunday, June 10-11. Entries may be made phone to phone or c.w. to c.w. with the general call of *CQ NY* or *Calling any New York State station.* Out of state stations send their section, NY stations use their county and all send QSO number and report. The suggested frequencies are 3580 3840 7050 7120 7250 14,050 14,250 21,100 21,300 28,050 and 28,800 kc. Count two points for each contact and multiply by the number of sections (for NY amateurs) or counties (for non-New York amateurs) for total score. All log entries must adhere to FCC regulations and received no later than July 7, 1961; send to NY STATE QSO PARTY, 16 Field Street, Binghamton, New York.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: KUN, NUG and GEG. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The Keystone Slow Speed Net (KSSN) meets at 1830 EST on 3585 kc. Mon. through Fri. JT and UGV have been appointed alternate Radio Officers for Allegheny County. The ATA of W.Pa. showed ARRL's, "The First Thirty Years of Amateur Radio." at its Thirty-Fifth Anniversary Meeting. It is suggested that affiliated clubs who haven't as yet seen this make it a *must* in the near future. The Washington County ARC took a tour through the Washington Steel Plant as a regularly-scheduled meeting. K3KMO is working DX on 80-meter c.w. K2GQA now is running 1 kw. K3CJH has an all-band rig on the air. KNQ is spending most of his time playing golf. QYG's DX total now is 134. The Etna RC reports via *Oscillator*: TZW is looking for help instructing the children at the school for the blind (K3AGE); BVV now is on 6 meters; GJY built an electronic keyer; NCP's new call is WA6OIV. ZZO's XYL received the call K3ONN. MIZ vacationed in Florida. The Nittany ARC reports through *QST de K3HKK*: K3LUX is building a quad on 6 meters; WFZ is now on 2 meters; SYY and K3KMO spoke on and demonstrated ham radio at the Philipsburg Rotary Club. The Greater Pittsburgh V.H.F. Society will stage its HAM-O-RAMA on June 18 at the Museum Building at South Park. The object of the Ham-O-Rama is: (1) To acquaint hams of lower frequencies with v.h.f., its advantages. (2) to promote interest in v.h.f. through a program on interest and activities. (3) to acquaint v.h.f.ers with new ideas and improvements. (4) to acquaint SWLs and potential hams with our activities. The GPVHF Society also will conduct a Six-Meter Contest coincident with the ARRL June V.H.F. QSO Party. For rules, contact any member. The Cumberland Valley ARC reports via *Valley QRM*: ZUX now is on 2 meters; ZQU is going s.s.b.; DQA gave a talk on working DX at a regular club meeting. The McKean Radio Club reports: K3DPL is in the Air Force; K3INH has a mobile rig. The RAE is conducting code and theory classes the 1st and 3rd Thurs. at the Red Cross Bldg. The Steel City ARC reports via *Kilowatt Harmonics:* MPO recently was appointed as State Radio C.D. Officer; JVM is on 10 meters; ZDW lost his tower in a recent storm. The Pittsburgh Semi-Annual S.S.B. Dinner was well attended in April. RSB and WFR were co-chairmen for the event at Garneaus' Smorgasbord in Monroeville. Traffic: (Mar.) W3KUN 338, MFB 244, K3KMO 76, W3LSS 52, SMV 36, WDZ 35, K3HWL 30, GHH 16, HSE 15, GQA 14, KNQ 5, COT 4, W3LOD 4, UHN 4, QYG 2. (Feb.) K3HSE 25.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC, PSP, RM: USR. PAM: RYU. EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. Only a few weeks are left in which to be eligible for preregistration at the Central Division Convention, which will be held in Springfield, Illinois, Aug. 26 and 27 at the St. Nicholas Hotel. Send your registrations to SHM, c/o WMAY, at Springfield, Ill. WOO celebrated his 25th year of hamming with a dinner given to him by the Starved Rock Radio Club. SXL reports that the Bloomington gang graduated 18 Novices from its recent class. K9RAS is using his new Ranger to build up his DX. SKR's new antenna is on a 50-ft. tower. K9UOV and K9OZM are starting a new slow-speed Novice net on 3670 kc. K9MFK has gone kw. on s.s.b. K9SRW is now mobile on 6 meters. TV, SEV and EU have new Tri-Banders. PBY is now operating RTTY on 40 and 80 meters. JID has a new HT-37. After the big wind during the month of March, many of the gang have had to replace their antennas and masts. MAK is operating 160 meters with a new home-brew 807 rig. The Experimental Amateur Radio Society of Rockford was approved for League affiliation by the Executive Committee of the American Radio Relay League, Inc. UYP and YJF are on the v.h.f. bands with Heath "Twoers" and claim that they do better than higher price rigs for rag-chewing and DX. K9MPC is sporting a Heath "Sixer." Another father and son team has joined the gang. BPG and his dad, K9MWA. K9QPA, K9TSU, K9ZTP and K9ZMZ are organizing the Perfect Copy Rag Chewers Net in Chicago. IFA, EC of Greene County, with AREC members TYJ, K9APA, K9TYP, QLR and KN9YOJ, have formed the Green County Severe Weather Corps Net. The Chicago Area hams were very active during the recent tornado on the city's south side. Praises from c.d. officials and newspapers were high in their regards for the services of the amateurs. The S.S.B. Dinner of the Starved Rock Radio Club was attended to capacity and 6SAI was the featured speaker. The CARCC's new meeting place is Austin Town Hall, 5610 W. Lake Street, Chicago, and its new officers are QKE, MSG, FVU and STR. The Annual Hamfesters Picnic will be held Aug. 13 at the same place as previous years. K9RHU has a new SB-10. KN9YXC had an appendectomy with K9JJD as the attending surgeon and K9TKX as the anesthetologist (and K9YTY, physician, helping) while OM K9WZA paced the hall. That is a new type of ham party! A new call heard is KN9EQF. A total of 311 messages was handled on the North Central Phone Net and the ILN reported a total of 272 in 21 sessions. IDA, DO, OZM and K9LOK are BPL operators this month. Traffic: W9IDA 582, DO 580, K9OZM 530, BTE 397, W9USR 324, K9UGY 282, LOK 249, IVG 207, W9JXV 200, FAW 126, IMN 105, K9QYW 91, ZTH 85, W9DZB 67, K9TVA 55, WEG 52, JJD 45, QAE 39, KEJ 32, W9SXL 31, K9CRT

(Continued on page 86)

30, W9MAK 20, RYU 20, K9LXG 19, W9EET 18, K9OAD 18, SCP 15, W9PRN 14, K9QJR 14, W9MAK 10, K9MLI 10. RAS 9, OEV 7, KCX 5, W9WPC 5, K9QMJ 4, QPA 4, BIV 3, ISP 2, RHU 2, W9SKR 2, BVN 1. (Feb.) W9DZB 63, K9RAS 18.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ. PAMs: K9AOM, BKJ, K9PFQ and RVM. RMs: DGA, TT and VAY. Net skeds: IFN, 0900 daily and 1830 M-F on 3910 kc.; ISN (s.s.b.), 1930 daily on 3920 kc.; QIN (training), 1800 M-W-F on 3745 kc.; CAEN, daily at 1900 on 1850 kc.; QIN, daily at 1900 and RFN, 0700 Sun. on 3656 kc. New appointments: PIN as EC of Whitely County and K9TQE as EC of Bartholomew County. FWH is OBS. Congratulations to the IMO VHF ARC which is now affiliated with ARRL. K9CFG, LER, K9PEF, QUI and DKR were among the amateur exhibitors at the Delco Remy Hobby Show. A new high school club is the Highland Radio Club (Anderson). Members are active on 40-meter c.w. and phone using the club's sponsor's call, CEA, until a club call is issued. Purdue ARC has purchased a triband beam and is now on 6 meters. K9YBU is now General Class. The Columbia City RC has a new HQ-140X. New officers of the Kokomo ARC are K9HRS, K9PEF, K9CFG, YIT and PXZ. Eighty were present at the Brentlinger Award Banquet, sponsored by the Wabash Valley ARA. Speakers were NZH and WONTI. Honored guests were IHO, ANH, ZHL, UUU and KT. A new call on 40 meters is KN9DZE. Indiana now has ECs in 66 of its 92 counties. *Amateur Radio exists as a hobby because of the service it renders.* March net reports: RVM reports IFN traffic at 412, ISN totalled 271, reports K9AOM. CAEN traffic was 30, reports K9PFQ. RFN handled 79, reports TT. VAY reports 69 for the QIN (training) and 199 for QIN. Those making BPL: JOZ, ZYK, TT and NZZ. Traffic: W9JOZ 960, ZYK 709, TT 340, MM 232, NZZ 223, EHZ 134, VAY 128, K9GLL 95, W9SWD 93, RVM 85, GJS 74, K9AOM 69, KN9CMG 68, W9DZC 53, K9SSI 52, W9QVQ 48, K9LZN 47, WET 44, W9DOK 41, DGA 37, CC 35, K9PFQ 34, PUI 30, W9AOJ/9 29, IHG/9 28, RTH 22, K9ILK 21, MAN 21, W9BUQ 18, SNQ 18, IMU 17, YYX 17, K9RMQ 16, W9HUF 15, K9HMC 12, W9BDP 11, EJW 10, ENU 10, DKR 9, K9GEL 8, YVS 8, AEK 7, W9BRW 7, K9TQJ 7, CRS 6, PNP 6, IXD 4, TFJ 4, W9AB 3, AQW 1. (Feb.) K9RFW 82, W9AOJ/9 32, K9UEF 28, PFQ 27, AHD 6, GSV 4.

WISCONSIN—SCM, George Woida, W9KQB—SEC: BCC. PAMs: NRP and NGT. RMs: VIK and VHP. New appointees: K9YDY as OBS, K4PQT as OPS, FZC as OO Class IV, K9HDL as OBS and OO Class III and IV. A WSSN certificate went to K9VSO; BEN certificates to K9s SFA, HXJ, ZYU, VCN and ZMI. VSZ has become a member of the Old Timers Club. K9VER received his Conditional Class license and 15-w.p.m. CP award. GIL is enjoying s.s.b. and 160 meters. The Sun Prairie Club has become affiliated with ARRL. EC QIX reports increased emergency operating planning in Lincoln County. Plans for the Wisconsin Net Association Picnic to be held July 9 at Fond du Lac are completed. LEE is operating 2-meter RTTY. OES K9MWQ has a new NC-300 and converter. JQE received a WAS certificate for 10-meter mobile contacts. He also completed his YLCC on phone. KXK reports KN9CKA is new in Waupaca and K9YBC eliminated the "N" from his call. ADM, now at Antarctica operating LU1ZR, was worked by KXK. KN9YTJ received his RCC and 15-w.p.m. CP certificates. K9GDF now has his Keystone Award (No. 111) and is the second Wisconsin operator to receive this award. Ex-SCM RQM has a new mobile setup. KQD is editor for the Milwaukee club bulletin. The auxiliary of this club presented the play, "Evolution of a Ham," which was enjoyed by the members. SZR reports that YT now has a permanent station consisting of a Ranger, a Johnson KW and a 75S-1. Members of the BEN-WIN-WSSN are asked to kindly send all news for the Wisconsin Net Association bulletin to NGT, 376 W. Washington Ave., Hartford, Wis. Traffic: W9DYG 828, CXY 408, W2MTA/9 269, W9SAA 260, K9GDF 208, W9KQB 120, K9JXW 56, SQV 49, W9VIK 44, VHP 38, CBE 37, YT 37, K9YDY 36, W4VRD/9 34, W9NRP 29, K9UJJ 29, W9MWQ 25, APR 21, OTL 16, WJH 15, FXA 14, K9GSC 14, W9HHX 6, ONI 6, KN9YTJ 5, W9GIL 4, K9HDL 4, ELT 3, JQA 3, VER 1.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—RM: KTZ. PAM: KØKJR. OO certificates were endorsed for KØOSV and KØOSW. CBN is now on 75 meters. CAQ is working mobile with an AF-67 on all frequencies. KØAZX has a complete new rig. The North Dakota 75-Meter Phone Net reports: 24 sessions, total check-ins 548, minimum check-ins 10, maximum 30; 67 pieces of formal traffic handled, 62 pieces informal traffic handled with 8 relays. Traffic: KØIVQ 345, ITP 58, WØMQA 26, YCL 20, CAQ 15, KØKJR 15, WØAQR 14, PHC 14, KØGGI 13, PVH 6, RRZ 5, WØAYZ/Ø 4, OMA 4, KØAJW 2, WØBHF 1.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: SCT. Newly elected officers of the Huron ARC are SDK, pres.; KØTKO, vice-pres.; KØTKN, secy.-treas.; KØKOY, act. mgr. The HARC conducts code and theory classes twice weekly. KØBSW has been appointed EC for Lake County and PMA replaced NNX as EC for Kingsbury and Miner Counties. The Radio Research Club of Brookings is painting and revamping its club room. ZWL's Weather Net has discontinued operations after another successful year. The net will resume about Oct. 1. ZWL made BPL for the fifth consecutive month. WUU's cubical quad lost out to the wind two weeks after it was erected. PMA spoke to the Kiwanis Club on amateur operations. KØALT, Sioux Falls, received her General Class ticket. ZRA has returned to Sioux Falls from Arizona. New Novice ticket: KNØFPY. He's the son of BQH. Traffic: WØZWL 657, SCT 402, DVB 272, KØBMQ 168, AIE 85, WØVQC 49, KØYNR 39, WØOFP 29, CTZ 27, KØVYY 26, WØVTX 23, KØWJT 16, DHA 10, PDW 6, TNM 5, VIZ 5, WØCMJ 4, PMA 4, TLU 4, WCN 4, KØYFJ 4, WØYVF 3, KØDUR 2, SEJ 2, UXC 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles Marsh, ØALW. SEC: TUS. PAMs: OPX and KØEPT. RMs: PET and KØIZD. NNG reports that the KMG Net meets daily at 0100 GMT on 3835 kc. OO KLG and parents vacationed in Arizona. RM KØIZD received his amateur Extra Class and 1st-class radiotelephone licenses. KØGIW resigned as EC because his college classes take up most of his time. Dir. BUO, OO LST and ORS RQJ are new members of the A-1 Operator Club. 8IBB is attending IBM school in Rochester. EC KØOQF was appointed communications commander for the local CAP unit. OES NYM will attend Washington U. in Seattle for the National Science Foundation Science Teachers Institute this summer. He will operate his 6- and 2-meter portable equipment. OES KØVLP finished building his 80-10-meter transmitter and is assembling a Heath v.t.v.m. OO WMA wired a Heath stereo. ZOB, UMX and KØZTZ spent time in the hospital. KNØEZI, of Adrian, has a home-brew transmitter, 30 watts on 80 meters and 6 watts on 40 meters. He receives on a home-brew receiver and an S-40B. KNØFYV is a new ham in Reading. BCY, ex-W6YJS, resides in Rochester and uses a Globe Chief and an S-85 receiver. PAM OPX's daughter Barbara is a student teacher in North St. Paul. OPS KØSBB purchased a model No. 15 RTTY machine. ORS MGT was married Mar. 25th. KØOTH vacationed in Colorado. OOs KLG, LST, WAS and WMA listed a total of eleven violations. Naval Officer KØOEE was home on leave from the Antarctica and visited KJZ. NGF attended the School Board Convention in Philadelphia. ORS DQL has a new HT-37 transmitter. Worthington Amateur Radio Club officers are UMD, pres.; IZU, vice-pres.; KXW, secy.-treas.; MZR, trustee. The Annual St. Cloud Hamfest will be held Sun., Aug. 13, starting at 1600 GMT (10 A.M. local time). Registration is one dollar. See you all there. Traffic: (Mar.) WØTUS 777, KØORK 504, WØISJ 323. PET 304, QDL 199, KJZ 140, KØQBI 125, WØHEN 86, OPX 79, BIV 66, KØAKM 65, TXT 63, WØUMX 59, DQL 55, KØUKU 46, ZKK 34, WØALW 29, KØEPT 28, JYJ 26, PML 24, LWK 23, WØBUO 21, KØMPG 21, WØFGP 20, KLG 20, KØOQT 20, WØWVT 19, LST 16, KØIZD 15, KYK 15, QLM 15, IKU 14, VPJ 14, WØKFN 13, NYM 13, PUO 13, ATO 11, IRD 11, KØSNG 11, BAD 10, JCF 9, WØMXC 9, KØRHN 7, WØTHY 7, KØVRD 6, WØWMA 6, KØWYV 6, WØOOU 5, KØTXT 4, VPP 2, WØSZJ 1, KØVXW 1. (Feb.) WØALW 14, KØIDV 2, VPP 2. (Jan.) WØHEN 56.

DELTA DIVISION

ARKANSAS—SCM, Daniel B. Patterson, W5SMN—SEC: K5CIR. PAM: DYL. RM: K5TYW. The OZK C.W. Net meets on 3790 kc. each evening at 0100Z. All amateurs are asked to check in and help with the traffic. Between the wind storms and having trouble with his HT-37, K5TYW has been off the air but hopes to be back on soon. VQD has a brand-new grandson and soon will have a new and bigger ham shack. TJH has a tom cat that he is willing to sell at about 0600 in the morning. This cat gets Jack up in time for him to meet

(Continued on page 94)

ANOTHER CASE FOR V.H.F.

LET us consider for a moment antennas for V.H.F. As they are physically smaller than a low frequency antenna, it should be obvious that for the same power gains they will be less costly. The converse is also true: that more dollars invested in a V.H.F. antenna will provide greater gain than on lower frequencies.

IF the V.H.F. antenna provides 10 db of power gain, which incidentally is possible to accomplish with yagis of practicable size, the effective power is ten times greater than that radiated by a dipole. A good rule of thumb for comparing the effectivness of an S.S.B. vs. AM signal, each under optimum conditions of receiver bandwidth, is a 2 to 1 gain in favor of S.S.B. In other words, 50 watts P.E.P. is equal to a 100-watt 100-percent modulated A.M. carrier. Hence, if we put 50 watts P.E.P. into the 10 db gain antenna, the radiated talk power would be the equivalent of 1000 watts AM in a dipole.

I'M sure you will all agree that 1000 watts radiated is a substantial signal on any frequency, but let's stick to V.H.F. With this amount of signal on 2 or 6 meters, amateurs should be able to get some scatter transmission effects and thus consistently increase their contact area from purely local ground wave of some 30 to 50 miles out to 150 to 300 mile range.

WITH these thoughts in mind, we at Hallicrafters have come up with two new transverters. The HA-2 is for two meters and the HA-6 for six meters. These units both function in the same fashion but provide different output frequencies. Here's the way you use them: Connect either one to *any* 10-meter receiver and transmitter and the transmitter signal will be converted to V.H.F. The incoming V.H.F. signal is converted to 10 meters to feed the receiver. On the transmitter side the transverter will take any input from 10 to 100 watts.

THE transverter is a linear frequency converter so that no matter what mode you feed into it, it will convert the input signal to a new frequency. Therefore, if you feed it AM, out comes AM; feed it S.S.B., out comes S.S.B. Obviously it will also convert FM, CW and R.T.T.Y on 10 meters to signals on V.H.F. frequencies.

— R. W. "BUD" DROBISH, W9QVA

Bill Hallgren Jr. W. J. Hallgren W9AC for hallicrafters

ADVERTISEMENT

"INVADER"

EXTENSIVELY FIELD

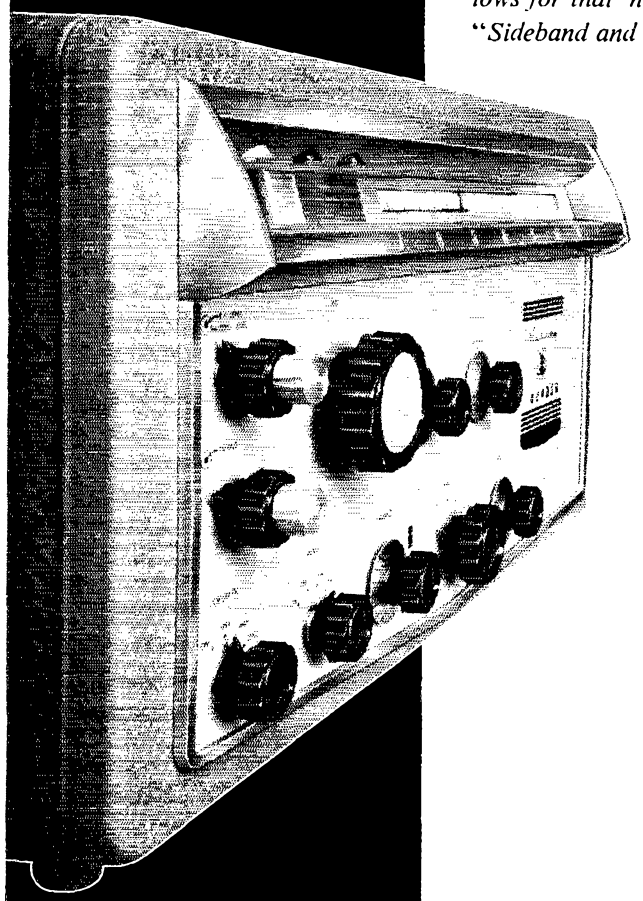
here are typical reports:

"Sideband never sounded so good!"

"Excellent penetration and an outstanding signal!"

"Full-fidelity voice reproduction—picks up the lows for that 'natural' sound for the first time!"

"Sideband and carrier suppression is tops!"



Here's the transmitter with the sharp, penetrating signal you've been waiting for—plus *more* exclusive operating and convenience features than any other SSB Transmitter on the market today! A classic of modern communication equipment design, the "Invader" offers instant bandswitching coverage 80 through 10 meters—no extra crystals to buy—no realigning necessary—delivers a solid 200 watts CW input; 200 watts P. E. P. SSB input; 90 watts input on AM! Unwanted sideband suppression is 60 db or better! Built-in VFO is differentially compensated. Exclusive RF controlled audio AGC and ALC (limiter type) provide greater average speech power—high gain push-to-talk audio system has plenty of reserve gain for either crystal or dynamic microphones. VOX and anti-trip circuits are extremely smooth in operation—built-in anti-trip matching transformer—adjustable VOX time delay circuit. Mixer-type shaped keying is crisp, sharp—click and chirp free. Single knob wide range pi-network output circuit—fully TVI suppressed. Blocking and operating bias for noise-free T-R switch operation.

Cat. No. 240-302-2—Wired and tested with tubes, crystals and crystal filter. **Amateur Net** **$619.50**

superior to phasing-type units . . . sets a new standard in filter design!

EXCLUSIVE—Now, for the first time, not only **better** audio fidelity—but balanced audio response in a filter-type transmitter. The only equipment on the market using a specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db sideband suppression—more than 55 db carrier suppression! Select either upper or lower sideband instantly with a front panel "mode" switch.

the finest SSB signal on the air!

TESTED BY DOZENS OF UNBIASED AMATEURS!

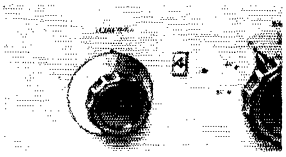
A BOLD STATEMENT FROM E. F. JOHNSON CO.

The sophisticated engineering and styling of the "Invader" is *unmatched* by other equipment within the amateur field—*bar none!*

Long recognized as the "first choice among the nation's amateurs" . . . Viking transmitters achieved popularity in a solid and healthy way. Known the country over as the line that gives you excellent engineering and performance, outstanding dollar value and more features at a popular price . . . the Viking line now achieves a new pinnacle with the introduction of the "Invader" and the "Invader-2000". We feel that the creative and imaginative engineering in the "Invader" sets aside "old fashioned" ideas that a unit is good simply on merit of the manufacturer's name alone! It has to perform—and nothing outperforms the "Invader!"

EXCLUSIVE—Converts to the Invader-2000, an integrated desk top transmitter, with the addition of high power conversion unit. (Remote power supply can be placed in any convenient location.)

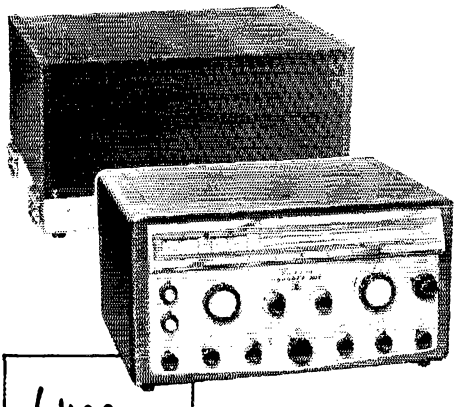
EXCLUSIVE—The only transmitter with both limiter ALC and audio AGC for an **extra** sharp signal! Reduces overdriving and flat-topping—increases average audio level for greater penetration and the **best** signal anywhere!



EXCLUSIVE—Single-knob wide range output circuit makes it possible to load into just about any conceivable type of antenna!

EXCLUSIVE—Full-time VFO heater element keeps VFO at operating temperature, even with the equipment turned off! No warm-up drift—rock-solid stability!

add hi-power conversion overnight for an integrated 2000 watt desk-top transmitter!



HI-POWER CONVERSION—Take the features and performance of your "Invader" . . . add the power and flexibility of this unique Viking "Hi-Power Conversion" system . . . and you're "on the air" with the "Invader-2000". Completely wired and tested—includes everything you need—no soldering necessary—complete the entire conversion in one evening!

Cat. No. 240-303-2 . . . Amateur Net $619.50

INVADER-2000—All the fine features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply completely wired and tested. Rated a solid 2000 watts P. E. P. (twice average DC) input on SSB; 1000 watts CW; and 800 watts input AM! Wide range output circuit (40 to 600 ohms, adjustable.) Final amplifier provides exceptionally uniform "Q". With multi-section power supply, tubes and crystals.

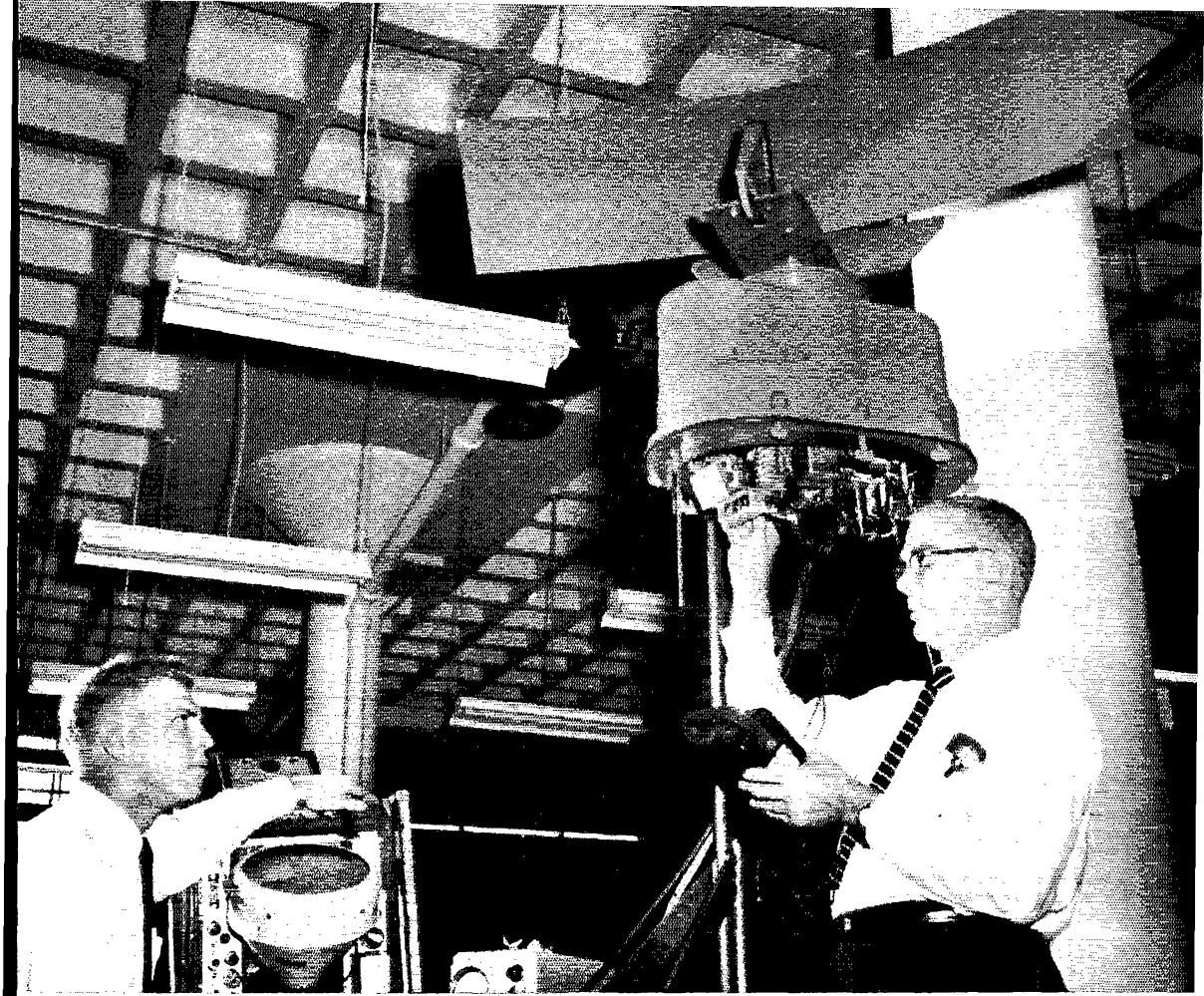
Cat. No. 240-304-2 . . . Amateur Net $1229.00

free 8-PAGE BROCHURE . . . Yours on request . . . complete specifications and photographs on the "Invader" and the "Invader-2000"!

FIRST CHOICE AMONG THE NATION'S AMATEURS

Viking®

E. F. JOHNSON COMPANY • WASECA, MINNESOTA.



STEPHEN HERZOG (left), K5RMA, and George Mayo, K1LYE, check out marine radar equipment at a Raytheon Electronic Services Division service center in Boston, Mass.

FIELD ENGINEERING WITH A FUTURE

From Boston to Seattle

Raytheon field engineers Steve Herzog, K5RMA, and George Mayo, K1LYE, are shown here on a special technical evaluation assignment at one of the Raytheon Electronic Services Division's 17 service centers, situated in major marine and industrial communities from Boston to Seattle, Duluth to New Orleans.

This time they're testing commercial marine radar. Tomorrow it might be an installation project or overhaul and repair. For Raytheon field engineers tackle a broad range of tasks all over the country and overseas. And, with continuing expansion of services, there is plenty of room for advancement to executive positions.

Perhaps you can qualify for a Raytheon field engineering future. Requirements: previous experience plus an E.E. degree or the equivalent in practical experience with guided missiles, fire control, ground and bombing radar or sonar.

Benefits: attractive salary, insurance, educational programs and relocation assistance. *For details, please write Ronald Guittarr, Electronic Services Division, 2nd & South Ave., Northwest Industrial Park, Burlington, Mass.*

RAYTHEON

RAYTHEON COMPANY

ELECTRONIC SERVICES DIVISION

from Heathkit®

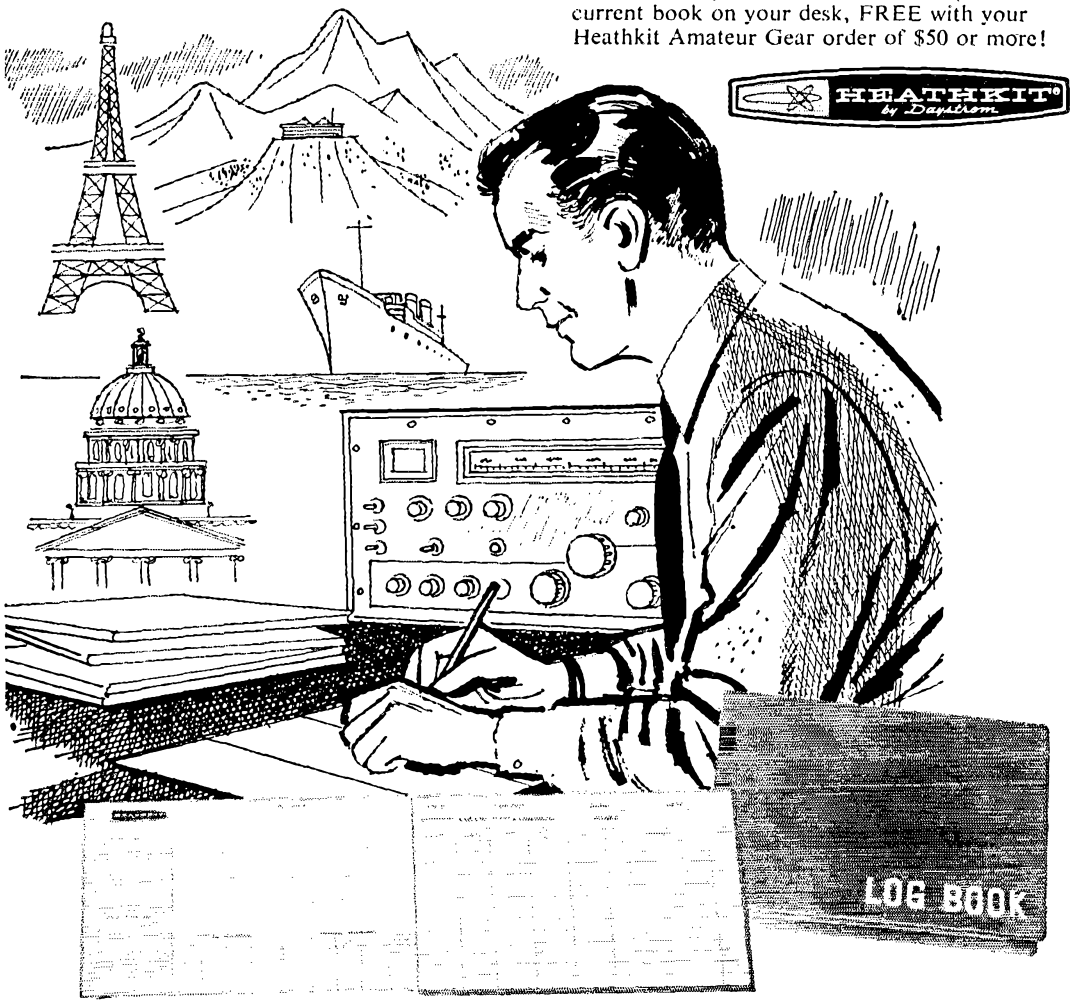
Special "Bonus" Offer

for Summer Buyers

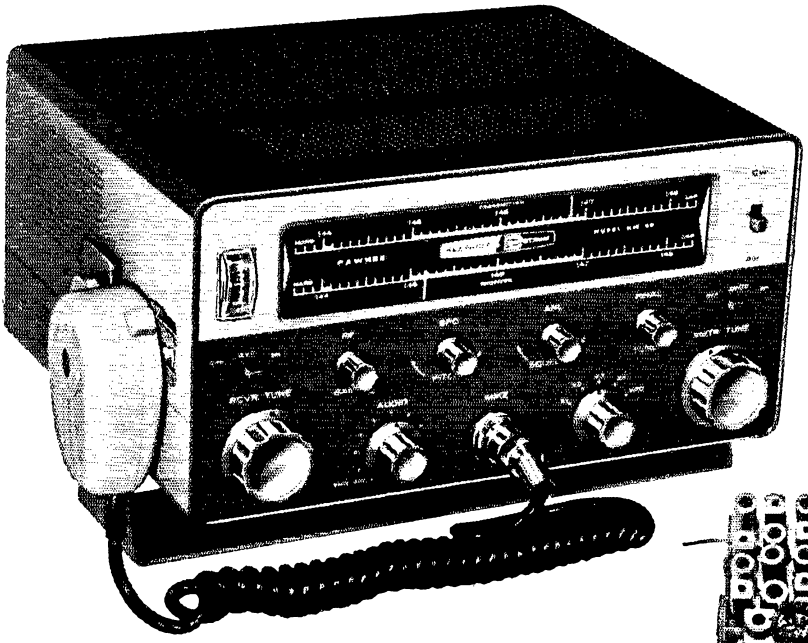
5 new-design Log Books and Handsome Cover FREE!

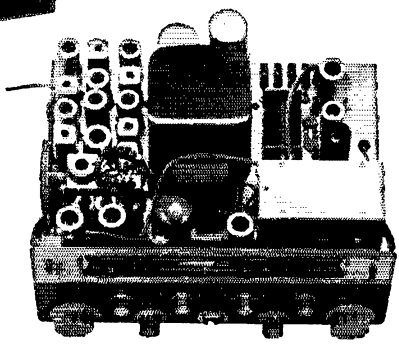
- **Designed for round-table QSO's**
- **Eliminates unnecessary details**
- **Eliminates note transferring**
- **Each page is a QSO with basic data logged just once**
- **Each book is a permanent file**
- **Fits your desk; measures 8½ x 5½ closed**

This new log book puts the fun back in operating by taking the work out of log keeping. Designed for round-table QSO's, you log basic data only once on a page and fill in spaces for each station's call, handle, etc. Each page has a calendar and spaces for traffic summaries, schedules, and notes. You get a neat log as you operate; no more laborious transferring of notes to another book for permanent filing. Get 5 log books and a handsome vinyl cover in which to keep the current book on your desk, FREE with your Heathkit Amateur Gear order of $50 or more!



HEATHKIT®... number one with Amateurs for quality with economy...





KIT HW-10 $199.95

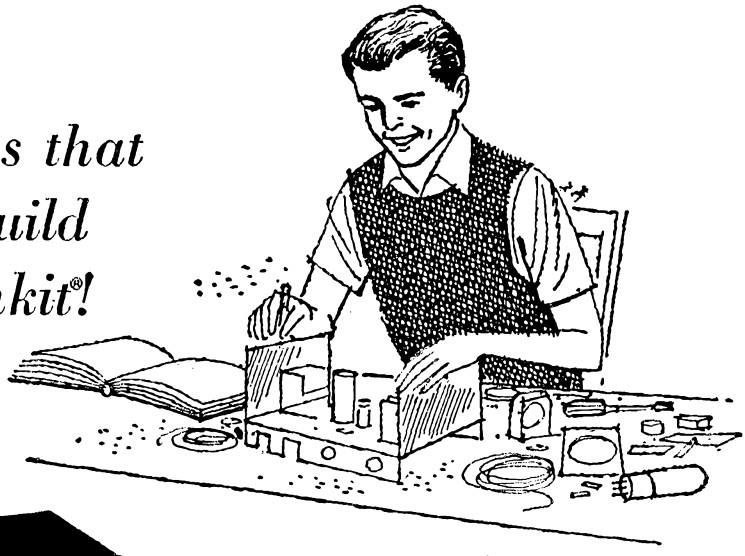
Compare features, performance, and price...and you'll choose Heath's new VHF transceivers, "Pawnee" and "Shawnee"

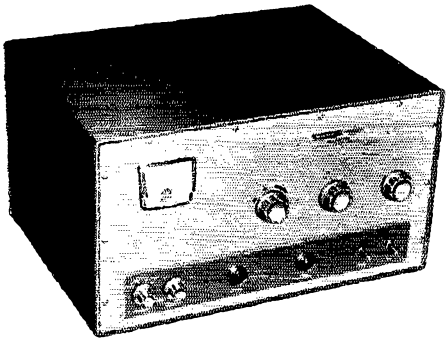
• Output: 10 watts nominal CW, 8 watts nominal AM • Built-in VFO • Tracked exciter stages for single-knob tuning • 4 switch-selected crystal positions • "Spotting" switch • Built-in low pass filter • Built-in 3-way power supply, 117 vac, 6 or 12 vdc • Push-pull 6360 final rf amplifier • Dual-purpose modulator provides 10 watts for plate modulation or 15 watts for public address operation with external speaker • Push-to-talk microphone • Double conversion with first oscillator crystal controlled, first IF and second oscillator gang tuned • Voltage regulated oscillators • Illuminated slide-rule dial • Tuning meter automatically reads signal strength or relative power output • Squelch and noise limiter controls • Built-in speaker • Heavy-duty AC & DC power cables • Primary fused relay • Complete shielding • Compact, 6" h x 12" w x 10" d • Recommended for the experienced ham kit builder; time approximately 70 hours.

KIT HW-10 (6 meter), **KIT HW-20** (2 meter)...$20 dn., $17 mo.....**$199.95** ea.

SPECIFICATIONS—Frequency coverage: (HW-20) 143.8 to 148.2 mc; (HW-10) 49.8 to 54.0 mc. **Noise figure:** (HW-20) 8.5 db or less; (HW-10) 6 db or less. **Sensitivity:** for 10 db S/N ratio, 0.5 uv or less. **Squelch sensitivity:** less than 1 uv. **Selectivity:** 15 kc at 6 db down. **Image rejection:** better than 70 db. **IF rejection:** 50 db. **Output impedance:** 50 to 72 ohms, unbalanced. **Transmit & receive power requirements:** At 6.3 vdc: 14.5 & 8.5 amps; at 12.6 vdc: 7.5 & 4.5 amps; at 117 vac: 120 & 60 watts.

Guarantees that you can build any Heathkit®!





- **Operates SSB, AM & CW on 80 through 10 meters**
- **Exclusive internal RF shielding for maximum TVI suppression**
- **Interlocked switching of HV for maximum protection**
- **Clean, functional styling—easy to build**

HERE'S THE RIG THAT'S WINNING PRAISES AROUND THE WORLD . . . THE NEW HEATHKIT "WARRIOR" G-G KW LINEAR

The HA-10 is a completely self-contained desk-top kilowatt linear, loaded with special features! • Amplifier and HV, filament and bias supplies are built in. • Drives with 50-75 watts, no matching or swamping network required. • Grounded grid circuit puts part of drive in output for up to 70% efficiency. • 4 paralleled 811A's, fan-cooled, and 2-866A's. • Oil-filled, 8 ufd 2 KV capacitor and 5-50 henry swinging choke for high peak power output with low distortion. • Neutralized, for high stability. • Best value in amateur gear. 100 lbs.

Kit HA-10...$23 dn., $20 mo.....**$229.95**
Assembled HAW-10...$33 dn., $28 mo.....**$329.95**

SPECIFICATIONS—Maximum power input: SSB-1000 watts P.E.P., CW-1000 watts, AM-400 watts (500 watts using controlled carrier modulation), RTTY-650 watts. **Output circuit:** Variable pi-network (50 to 75 ohms). **Driving power required:** 50 to 75 watts—depending on frequency. **Input circuit:** Broad banded—requires no tuning. **Input impedance:** 50 to 75 ohms. **Band coverage:** 80, 40, 20, 15, 10 meters. **Panel metering:** Switch-selected, grid current, plate current, high voltage and relative power output for ease of loading. **Tube complement:** 4-811A, 2-866A. **Size:** 19½" W. x 11¾" H. x 16" D.

MONEY BACK GUARANTEE

The Heath Company unconditionally guarantees that you can build any Heathkit product and that it will perform in accordance with our published specifications, by simply following and completing our check-by-step instructions, or your purchase price will be cheerfully refunded.

you can't lose with this money-back guarantee

FREE 1961 Heathkit Catalog. Biggest electronic kit catalog in the world . . . 92 pages packed with over 200 Heathkits . . . see the complete Heathkit Amateur Radio line plus stereo/hi-fi, marine, educational, and test instruments available on easy time payments . . . as low as $2.50 dn., as long as 18 months to pay. Send for your free copy today!

HEATHKIT® by Daystrom

HEATH COMPANY
Benton Harbor 9, Michigan

Please send my FREE copy of the 1961 Heathkit Catalog

Name_____

Address_____

City_____ Zone_____ State_____

Station Activities

(*Continued from page 86*)

the Arkansas Emergency Net. K5CIR has a 350-watt home-brew rig using a pair of 811s modulated by a pair of 811s and driven with an ARC-5. NLL has an ART-13 on the air. SZJ has his HRO working again and it is doing a better job for him. K5VOL has completely worked over the control and power wiring in his shack and put it all to central control boxes. K5ZQT is now on the air with an Apache; he is receiving with an R-100 and using a 40-meter doublet. K5TST moved to McIntyre, Ga., and has the call W4CCZ. YHT has obtained a Model 15 teletype and hopes to be on soon. He is on 75 meters with a home-brew phasing exciter and a pair of 811As in grounded grid. K5EJQ has a Heathkit "Two-er" and WZP has an SCR-522 that he is using. The frequency is 145.35 Mc. Thanks for K5BUQ's nice article in April *QST* on s.s.b. transceivers. Traffic: K5USE 437, W5DTR 117, SZJ 91, K5PMC 36, IPS 31, W5RIT 21, K5MEA 16, PAM 14, UEK 12, BTH 8, CIR 8, W5SMN 6, TJH 4, K5VOL 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—That Delta Division Convention at Chattanooga was a big success as far as the Louisiana contingent was concerned. K5SGK, of Metairie, walked off with the big prize. The convention was very well attended, with extremely good management on the part of 4MF and his convention committee. K5USO finally got his vertical up and working. Our SEC, MXQ, is waiting for his new Johnson Invader to come in. K5LZA, back from Texas A&M, dropped the portable and is working from home. EA should be on the air from the new QTH with his DX-100B real soon. UQR reports openings on 6 meters and is looking for contacts on 145.3 Mc. each Sun. at 1900 CST to expand 2-meter activity. ML is on 50 Mc. with 50 watts and a ground-plane antenna 50 ft. high and is trying to make his states total 50. Right now he has 44. CEZ, a brasspounder who has strayed to RTT, was not able to make the Chattanooga Convention because of a strike at his plant. K5UYL has been fighting transmitter bugs. HHA has been helping our PAM with the handling of the new Delta 75 S.S.B. Net. He holds both ORS and OPS appointments. K5DGI has been endorsed as OO. He made a score of 287,000 in one of the CD Parties and is out to make it 3,000,000. GAD has been back home after a spell at the hospital and should be returning to work shortly. Take a look at your ARRL station appointment certificate. Send it to your SCM for endorsement if it is due. Traffic: W5CEZ 467, HHA 135, K5USO 78, LZA 31, QXV 23, W5MXQ 6, W4LDM/5 4.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—Two new clubs have been formed in the section. The Columbia Amateur Radio Club has its charter. The Jones County Amateur Radio Club expects to have its charter very soon. K5YGR is pres.; K5SNN, vice-pres.; and FDQ, secy. of the Jones Club. K5WUX is pres. of the Columbia Club. The Keesler Club at Keesler AFB is becoming active again. The Biloxi Amateur Radio Club announces that it will hold its Annual Hamfest July 1 and 2 at the Beach Community House. The club's 6-meter activity is going great. I plan to see you at the hamfests. New appointments are K5AFP as OBS; K5MDX, K5AFP, K5QNF, CJR and RIM as OPSs; RIM and K5QNF as ORSs. EWE has been in the hospital but is home now and doing OK. The Jackson Amateur Radio Club announces its hamfest will be held the last Sunday in July. Traffic: K5RUO 168.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4OUK. RM: W4FX. PAMs: W4VQE, W4UVP and W4UOT. Thanks to PAH, now retiring as PAM, for his faithful service. Welcome to the following new PAMs: W4UVP for eastern time zone a.m. and W4VQE for s.s.b. activity. Congratulations to the Chattanooga gang on an FB Delta Division Convention. W4ZBQ and W4KYL got talked about for their 6-meter Echo bounce tests. W4SGI and K4VSN gave a demonstration of APX-6 1200-Mc. equipment and operation. W4UVP reports a net on 50.7 Mc. in the Tri-City Area on Tue., Wed., Thurs., and Sat. nights. New officers of the RA Club of Knoxville are W4TZJ, K4FSJ, K4VZL, K4RKW and K4IUF. New appointments: W4VJ and W4WXH as ORSs; W4VJ and W4TDW as OBSs; W4TDW as OO; W4GVZ as OES. Renewed appointments: W4ZBQ and W4TZG as ECs; W4FX as ORS; K4KYL as OES; W4TZG and K4RIN as OOs. Traffic: (Mar.) K4AKP 1507, W4PL 1086, W4OGG 223, W4WXH 184, K4OUK 130, W4VQE 122, W4HSR 120, W4VJ 113, W4FX 108, K4BWS 101, W4PQP 73, K4MKX 59, W4ZJY 50, K4AMC 35, W4TZG 32, K4FNR 28, W4UIO 25, W4PFP 18, W4TYY 13, W4UVL 12, W4UVP 12, K4LPW 6, W4PAH 6, K4VOP 6, W4JVM 4, W4YRM 3, K4KYL 2, W4SGI 2. (Feb.) K4LPW 4.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: W. C. Alcock, W4CDA. SEC: W4BAZ. PAMs: W4SZB and K4OZI. V.H.F. PAM: K4LOA. RM: K4KWQ. W4BAZ reports that 403 messages were originated at the Louisville 1961 Home Show. The public also was given information on amateur radio, c.d. and Red Cross activities. Generally it was most successful and much was learned on how to make it even better next year. MKPN handled 86 messages in March with good state coverage, averaging 19 stations per session. W4KJP, K4OLT and W4SZB has a perfect attendance. W4RHZ is sending code practice Mon.-Wed.-Fri. on 51 Mc. W4KKG is experimenting with beams on 10-15-20 meters. WN4AGH is starting out right with a traffic total of 5 his first month on the air. W4CDA is painting the shack. W4JUI is working with MARS on frequency calibrations. W4ADH is working on the mobile rig. A group of very interested students and hams on Murry State campus are doing research and publication through the newly-formed Nathan B. Stubblefield ARC, named in honor of the earliest inventor of radio and a resident of Murry. K4RBI worked EA8CG on 7 Mc. K4NJX worked his first DX, ON4IE. K4HSB is rebuilding antennas. K4ZQR conducts a weekly theory class. Our most active OO is K4ZRA. OO reports also were received from W4RHZ and K4ZQR. The Kentucky Colonel certificate will be sent to Kentucky amateurs. Send 10c and your address to K4CGW. Out-of-state amateurs must work 15 Colonels. Membership is now 1554. Traffic: W4BAZ 402, K4CSH 353, K4VDL 307, W4HTD 268, K4QCQ 122, K4VDN 86, K4OZG 67, K4LOA 50, W4RNF 48, W4KJP 46, W4YYI 32, K4RBI 26, K4HSB 25, W4SZB 25, W4SUD 24, W4CDA 22, W4KKG 20, K4VDO 11, W4VJV 11, K4ZQR 10, K4HCK 9, K4OLT 9, W4ADH 5, WN4AGH 5, W4SZL 5, KN4YZV 5, W4RHZ 4, K4NJX 3, W4JUI 2, W4WVU 2.

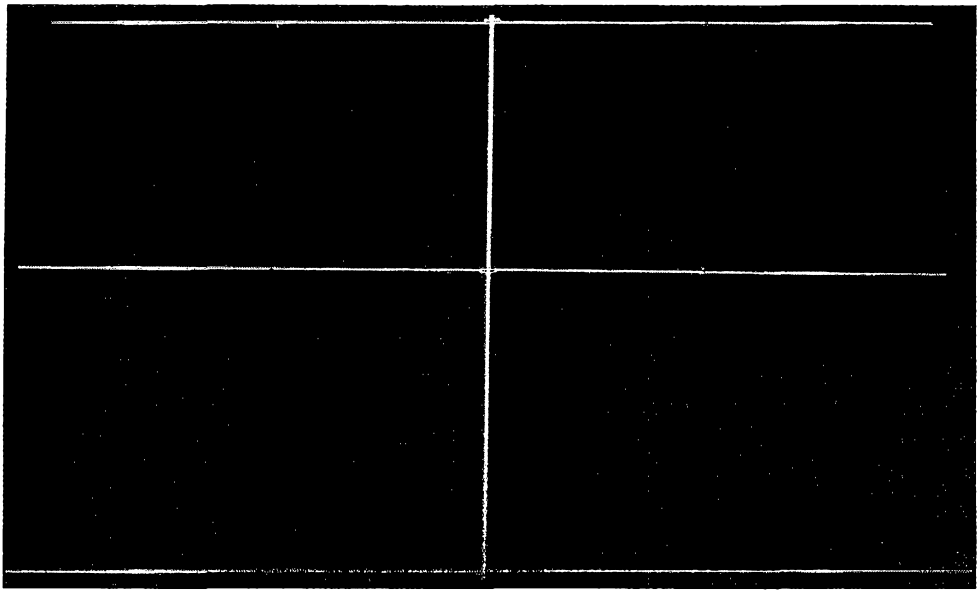
MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: ELR, RMs: SCW, OCC, QQO and FWQ. PAMs: K8CKD and JTQ. V.H.F. PAMs: NOH and PT. Appointments: PDF as EC; K8OTJ as ORS; JTQ, SWF and TIC as OPSs; SWF as OBS. New officers: Huron Valley ARA—K8JDM, pres.; K8OKC, vice-pres.; K8PBA, secy.; OFI, treas. Oak Park ARC—K8RJC, pres.; K8KCJ, vice-pres.; K8SBD, secy.; K8JZS, treas.; TZV, act. The Ford ARL—PEF, pres.; K8JXW, vice-pres.; K8LTU, secy.; K8PCD, corr.secy.; PCR, treas.; K8UBV and K8SGH, act. Wyoming ARC—K8SMK, pres.; K8EVW, vice-pres.; K8LZL, secy.; K8ROV, treas.; FOL and K8LZL, dir. The Wolverine/BR/MEN Net Picnic will be held July 16 at Jackson. The Bay City Convention was very good, even the parking was planned! The St. Clair Valley ARC members were shown through the Huron Lightship by Capt. K8IVF. The MCRC hosted OT Nite at Greenfield Village. The Central Michigan ARC and Grand Rapids ARA had a good combined meeting with K1IGI, from National, speaking on "RX Design." From GRARA *QRM*: "Who is the one OM not s.s.b.-equipped who works 'em c.w.?" Probably your SCM! From Flint *County Static*: DTZ says "All hams should leave a will for equipment disposal, just in case." The DARA is making a complete emergency trailer for FD. CKK, Ingham County EC, puts splendid EC and v.h.f. reports in the Central Michigan ARC *Bulletin*. EMD gets KN8YTE on 40 meters. PT likes 6CW4 Nuvistors. K8EWI and K8KCO are college bound. The Saginaw TX hunt was entered by CAM, CTY, HZF, QPO, SGR, LNE, K8s CSE, DML, DDV, GOU, JLD, KQU, JXS, MPI and SWQ. K8AEB is back on the air. He was "CM" in '14 and 8AGK in '16 and was off the ham bands forty years. BEZ now is on 2 meters. CQU has a new linear. MPD runs CP on 29 Mc. NWW likes audio modulator for GDO from *QST*, May '60. IXJ makes his own keyer. The MAI Club station is in a new QTH. NOH is using a "corkscrew" antenna for 144 Mc. K8KMQ makes BPL on originations plus deliveries again. K8IUZ is on 50-Mc. mobile. Traffic: (Mar.) K8IUZ 296, KMQ 229, W8OCC 211, K8OTJ 210, PKU 119, NHC 103, JJC 102, W8RTN 95, NOH 74, ELW 66, K8LZF 66, W8WQH 63, K8EXE 60, HLR 59, W8FWQ 57, EU 55, FX 54, EOI 45, HKT 44, K8DJQ 38, W8ILP 36, QQO 36, K8GJD 33, W8IXJ 31, K8AEM 30, W8DSW 27, K8NAW 25, MEG 24, W8NWW 24, AUD 22, CQU 21, ZHB 18, IUJ 17, OQN 17, K8KQV 16, W8AHV 14, EGI 12, JKX 12, JTQ 12, TBP 12, ZJE 12, QIX 11, MPD 10, DSE 9, SCW 9, REZ 8, K8QEX 8, BZL 6, W8YAN 6, K8JED 5, W8QBA 4, K8LPV 3, W8THZ 3, K8TJH 2. (Feb.) K8EXE 81, W8CQU 18, K8AEM 12, W8IUC 12, OCU 11, K8KVM 8, PVC 4, W8TIN 4.

OHIO—SCM, Wilson E. Weckel, W8AI—Asst. SCM:

(*Continued on page 98*)

Beautiful Beams By Gotham

AND THEY HAVE STOOD THE TEST OF TIME !



The Gotham beam shown above is our D103N, for ten meters and Citizens Band operation. Its performance is unexcelled. It sells for only **$22.95,** shipment by express, charges collect. As on all Gotham beams, the elements are a full half-wave, in a simple Yagi design; all tubing is aluminum alloy; and assembly is quick and easy.

FREE

Send a card for our valuable catalog of 50 different antennas with specifications and characteristics. Gives bands and frequencies covered, element information, size of tubing used, boom length, shipping weight, feed line used, polarization, and other data.

GOTHAM

1805 PURDY AVENUE
MIAMI BEACH, FLORIDA

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been tal king about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-T12TG)

OR IS K4ZRA THE NEW CHAMP?

Read his letter, and see his diagram of a typical installation and what it achieved:

2539 Christie Place
Owensboro, Kentucky

GOTHAM
Miami Beach, Florida

Gentlemen:

While I was at home last summer, I had occasion to use your GOTHAM vertical antenna on the air for about two months. I was quite amazed with the excellent performance of that inexpensive and simply installed antenna. It did everything you, K6INI, and others said it would, in spite of the generally poor band conditions during the summer months.

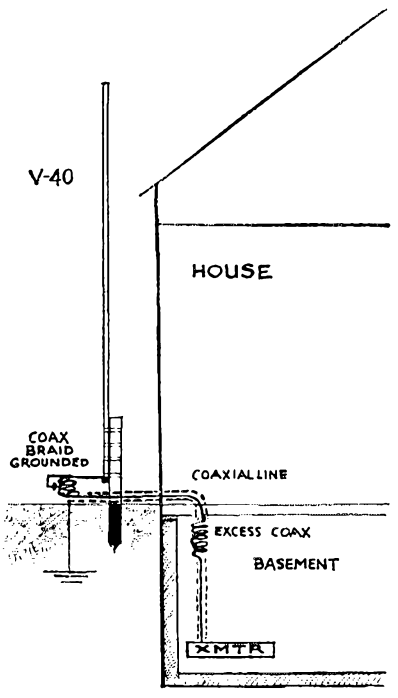
During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallicrafters reboxed SX-28.)

The above mentioned contacts were made with the vertical mounted several inches off the ground, without radials, with only a simple ground connection to the coaxial shield. Later I raised the antenna up about 20 feet and installed the radials and this improved the already good signal pattern and enabled me to pick off another 12 DX countries and other DX contacts in a couple of weeks of good band conditions. In the latter part of August I used several single-band vertical and ground plane antennas and found that the single GOTHAM vertical equalled all these individual antennas.

Another attractive feature is the versatility of installation. It works high or low on ground, with or without radials,

K4ZRA's INSTALLATION

THAT WORKED WONDERS WITH A GOTHAM V-40 VERTICAL



mounted in any space. Of course I did find that the best installations were the two mentioned above, but they were fairly simple to arrange, especially the first one!

The GOTHAM vertical is also a superior receiving antenna and I would strongly urge you to recommend that it be used for receiving as well as transmitting.

I just wanted to tell you how pleased I was with the overall performance of your antenna. For an inexpensive, easy-to-install, dependable antenna that really works for both DX and "local" W/K contacts, I don't see how one could ask for more and I would certainly recommend a GOTHAM V-40 to anyone desiring these features. Good luck in 1961 with those FB antennas!

Sincerely,
Daniel F. Onley, K4ZRA

Some Stations worked by K4ZRA using a Gotham V-40. Call, RST, freq. mc. given

CE1AD -569-14	W1AW -599-14	PX1PF -569-14
CO7NR -579-14	KG1FR -579-14	PY7AIO-579- 7
CN8MB -579-14	KG4AB -579-14	SP2KDT-579-14
CT2BO -579-14	KH6JG -589-14	TI2DN -599-14
DL1EE -589-14	KL7AWR-579- 7	UA3GM -579-14
EA2FQ -589-14	KM6BT -579-14	UR5FK -579-14
EA8CP -589-14	KP4TIN -589- 7	VP2LD -569- 7
EL4A -589-14	KV4AA -589-14	VP3YG -559-21
F9ER -579-21	K2SBC -589-14	VP4TK - ? -21
FA2VC -589-14	LA2IG -559-21	VP5VB -589-21
FP8BM -599-14	LU2NZ -589-14	VP7VB -589-14
G3JLB -589-14	OA4HK -589-14	VP9G -599-14
GW3IEM-579-14	OE5HE -559-21	VQ2IE -559-14
HB1ZA -589-14	OH3ND -569-14	VO3HE -569-14
HC1JU -589-14	OK2PO -579-14	VE3BL -589-14
HH2OT - ? -14	OX3MT -599-14	VN4AB -579-14
HK3RQ -579-14	PA0MDG-569-14	YU1KA -569-14
I1BVP -599-14	PJ2AE -579-14	YV5APR-589-14

CANADA:

VO1DC -599-14	VE3BU -589- 7	VE7AIT -589-14
VO2AW -679-14	VE4MW -589-14	VE8RW -599-14
VE1DO -589-14	VE5KY -589-14	VE0NM -589-14
VE2EA -599-14	VE6VV -589-14	

All states were worked with very fine reports.

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

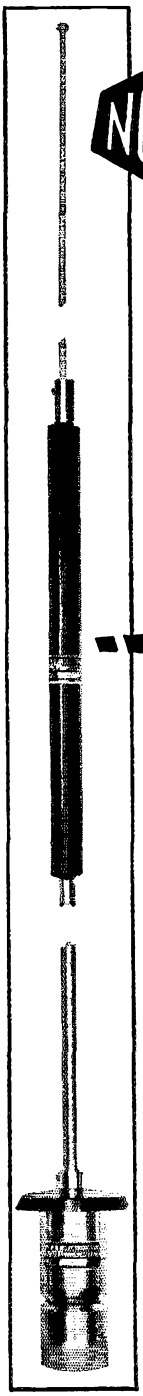
☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

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.....



NOW!

GAIN ANTENNAS

BUSINESS MEN'S FREQUENCY or TWO METERS

(144-170 Mc)

FIXED STATION and MOBILE

Engineers in the Communication Field have tried and proven GAM VHF antennas to give users the ultimate in performance. GAM antennas will give you the "marginal" signal, in most cases eliminate the "dead" spots and cut down on "picket fence" effect. These antennas are end fed through an efficient hermetically sealed matching transformer that is part of the antenna. All models are light in weight and of heavy duty construction.

MODEL TG-3-S

FIXED STATION; 2 STACKED

9 db gain for $45.00 Net

- Gain of 9 db over coaxial antenna*
- Heavy duty construction
- Two half wave elements
- Can be cut to frequency
- Mounts on standard 1¼" pipe
- 52 Ohm Impedance
- SWR less than 1.5-1

MODEL TG-2

MOBILE ANTENNA

6 db gain for $14.10 Net

- Half wave resonant antenna
- 6 db gain over coaxial antenna*
- 52 Ohm Impedance
- SWR less than 1.5-1
- Functions without additional elements
- Reduces flutter effect and extends coverage

*As usually installed in mobile and fixed stations

CONTACT YOUR DISTRIBUTOR OR GAM DIRECT

G·A·M Electronics Inc.

138 LINCOLN ST. MANCHESTER, N. H.

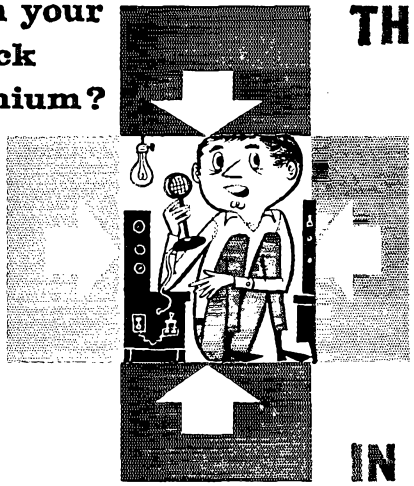
J. C. Erickson, 8DAE. SEC: NHP. RMs: BZX, DAE, VTP and K8ONQ. PAMs: HJZ and K8MFY. The Queen City Emergency Net's 1961 officers are K8DGE, pres.; SVU, vice-pres.; K8BAQ, secy.; K4MGK, treas.; and HQK, comm. mgr. K8BXT drove QDQ and your SCM to the Ohio Council of Amateur Radio Clubs meeting in Lancaster, where your Great Lakes Director UPB and 26 club delegates attended. The OCARC elected GJS, chairman; K8NCY, vice-chairman; K8DJM, secy.; and AL, treas. as 1961 officers. The OCARC is sponsoring another certificate for working 25 Ohio YLs since 1945 to be known as Worked Ohio Ladies Award (WOLA). A notarized list or a list certified by the RC officer should be sent to EQN, 353 S. Arlington Ave., Springfield, Ohio, with K8MZT assisting. K8s RMW and WLP received their General Class licenses and the latter has a new NC-98. K8USJ has a new Heath "Sixer." New appointments are NBK as OO, K8s RKY and RXD as OESs and HCR and K8PBZ as ORSs. K8MFY has a new Heath "Sixer." K8ONQ was promoted to captain in the Signal Corps Reserves. WRH has a new Lafeyette 6-meter transmitter. WRJ and K8WUO are new members of Chix on Six and its new secy is K8RGY. K8MZT was in the hospital for a knee operation. TNB and K8STP both sent me a copy of *Smoke Signals from the Indian Hills Radio Club*, which tells us the club's 1961 officers are K8RSF, pres.; ETI, vice-pres.; K8PIB, secy.; and K8STP, editor. At a special meeting a color film was shown of a 10,000-mile African Safari. K8HEF again sends me two copies of Dayton ARA's *R-F Carrier*, which states that OJFG spoke to them on "Vehicular Noise Suppression" at its first meeting and at the second meeting a sound color film entitled "The Teacher Wore White," a tour picture of the receiving tube plant of General Electric showing their manufacturing process, was shown; new Technicians are K8s RUW, SDD, TVK, VBV, VER, VEZ, VFS, VZK, YFG, YFI, YJX, and YQH and the new Novices are KN8s VFY, YGM, YLX, YLZ, YMA, YMB, YNA, YNB, YOB and YPO in the Dayton Area. The Warren ARA sent the first issue of its bulletin called *The Q-Match*, which states an Old-Timers Nite was held with CEQ demonstrating Spark gear. K8BXT passes along this news: SCL has a new SR-34; K8NCV has a new tribander beam; W8CMQ moved to California; QMS and UYX moved to Florida; VWI moved to Illinois; CMZ, FBE and K8BXT have a new HT-37; CMZ has a new Valiant; OGB and K8KQW have new Gonset G-76s; K8ANG was discharged from the Navy; K8AZY has a new Apache; K8AMR has a new 6N2; K8KAE has a new Johnson 500; KN8YOI has a new Ranger; K8BXT received WFRC, Keystone and W807 Awards; the following are away at college: K8OQB at Villanova, FBE, K8KHS and K8KOP at Youngstown, K8LVN at Case, K8CTQ at Kent State, K8KFS at Purdue and K8OZK at Miami. The Lancaster Hamfest will be held June 17 and 18 and the FCC will give examinations for the General Class license. Toledo's *Ham Shack Gossip* names KN8WDL as its Ham of the Month and informs us 1UED spoke to the club on the Geneva Conference frequencies; GMA was in the hospital, TWD and HWX have a new Hornet Tribander beam and ESN vacationed in Florida. The Greater Cincinnati ARA's *The Mike and Key* states the club saw a demonstration of exhibition shooting at its meeting and the code class is in full swing under the direction of IVE. Inter-City RC's 1961 officers are K8MFZ, pres.; SOU, vice-pres.; and K8QVD, secy.-treas. KN8ZBL, a doctor at Crile VA Hospital, is a new Novice. Findlay RC's *The W8FT News* tells the 1961 officers are KIL, pres.; USS, 1st vice-pres.; UN, 2nd vice-pres.; KII, secy.-treas.; two films were shown, one Signal 30 and the other Nike-Hercules at club meetings; HW is mobile; UN won an Elmac PMR8 receiver. From Canton ARC's *Feedline* we learn that K8SWE dropped the "N"; the club is conducting a code class on the air on 28.9 Mc. at 2000 Mon., Wed. and Fri. and new Novices are KN8s YLK, YOM and YVZ. All Ohio ECs: Send your reports to the SEC's new QTH, which is 5034 Oak Ridge Dr., Toledo 13. DAE, UPH and K8ONQ made BPL in March. CL is now a Silent Key. Traffic: (Mar.) W8DAE 658, UPH 657, K8ONQ 269, W8BZX 254, ZYU 220, K8AAG 176, QHH 161, KSN 64, W8CXM 51, K8RUC 49, W8QCU 46, K8MFY 45, MYG 45, PBZ 37, SQK 31, HTM 28, W8YGR 28, AL 27, LZE 24, OUU 24, K8OEX 19, W8OKN 18, LT 17, K8IBX 16, BNL 11, W8STR 9, PBX 8, K8QOJ 8, W8WYS 4, K8AXK 3, HSU 3, W8EEQ 2, LMB 2, K8LUP 2, W8GKB 1, K8TER 1. (Feb.) W8ZYU 342, K8MTI 54, W8CXM 51, LZE 32, K8MFY 12, W8OUU 10, QCU 10, TXT 3, K8NXN 2, W8PMJ 2.

HUDSON DIVISION

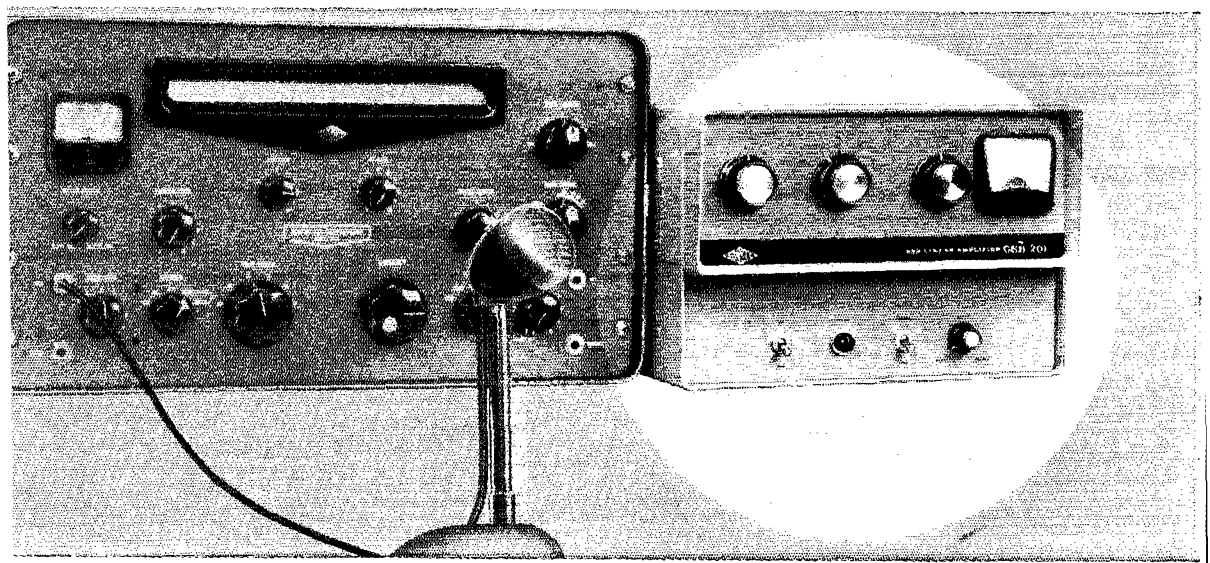
EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; ESS on

(*Continued on page 100*)

room in your shack at a premium?



THE GONSET GSB-201 RF LINEAR AMPLIFIER GIVES YOU BIG POWER IN SMALL SPACE



- 1500 watts P.E.P.* input gives full peak kilowatt for sideband.
- 12½ inches wide, 8 inches high, 17 inches deep. No external power supply needed.
- Industrial-designer styled, soft gray enamel, all controls up front, full-vision metering plate MA. and relative power output.
- Full bandswitching, 80-40-20-15-10 meters.
- Four 811A tubes, grounded grid.
- Can be driven by exciters of 65-150 watt class.

$399.50

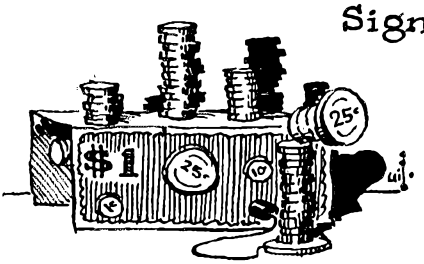
*PEP input is approximately twice average d.c. input.

GONSET

Division of Young Spring & Wire Corporation

801 South Main St., Burbank, California

A 5 Dollar Signal?



HOW FAR do you think your voice would be heard with a five dollar rig? Not very far! For the same amount of money invested in the American Radio Relay League your voice, no matter where you are located, can be heard in Washington, D. C., in Atlantic City, in Geneva, or wherever Amateur Radio is cussed and discussed. As a bonus you get the best balanced magazine in amateur radio; each edition with something for almost everyone from beginner through the most advanced ham. Your investment gets stretched even further when you consider the many services which the League makes available to its members: technical aid, license information, legal advice, literally dozens of awards and contests, and the opportunity to participate in the organization through a myriad of field appointments, such as EC OO, etc.

THE LEAGUE is "Of, by and for" the amateur. Its board of directors is elected by the membership and is responsible to them for its actions.

EACH AMATEUR is as important as the next and when he speaks his voice is heard. If you are not already a member join now and LET YOUR VOICE BE HEARD. Non-hams are invited to join also. They don't have the right to vote but they do get *QST* and can become full members as soon as they get their licenses.

QST and ARRL membership $5—additional licensed family members at the same address $1. $5.25 in Canada, $6 elsewhere.

THE AMERICAN RADIO RELAY LEAGUE, INC.

West Hartford 7, Connecticut

3590 kc. at 1800; MHT (Novice) on 3716 kc. Sat. at 1300. Appointments, W2DQW, W2HZZ, WA2DJJ and K2UTC as OBSs; WA2NBU as OES. Endorsements: K2EIU as ORS and OPS. A 5-kw. gas-driven generator is reported by WA2KUS. Active in traffic is WA2LYP with a T-50 and a home-made receiver. The Putnam Club solved its housing problem and now is meeting in a school. With code and theory classes, the Ulster County Club had movies at its March meeting. Hudson Division Director W2KR was a guest of the Schenectady Club. K2DEM will be operating K1PGQ with traffic from New Milford, Conn., at a boys' camp during the summer. K2EIU/2 is completing his senior year at R.P.I. Congratulations to K2QJL, our new RM, who is manager of the ESS Net. W2SZ now is operating from a new shack on the campus with construction assistance from club members at R.P.I. The A. B. Davis HS Club, K2VSU, has a monthly operating contest for members. WA2IMB is a new General Class licensee in Pelham Manor. New officers of the Ulster Co. Club are WØRGY/2, pres.; K2JON, vice-pres.; WA2DSS, treas.; and K2VYN, board member. The family team of WA2JZH and WA2JZI has a new DX-60. Not a new rig but a new harmonic is the addition at WA2DBF and WA2DBH. RACES citations for service were given to WA2DST, W2RAE, K2SJN and K2ZDJ by the New Rochelle C.D. Director. New officers of the New Rochelle Club are K2SJN, pres.; WA2JZA, vice-pres.; WA2FCR, secy.; and WA2DST, treas. K2BVC was first to qualify for the CQ Century Club on 220 Mc. Traffic: K2MBU 193, W2THE 162, WA2HGB 153, W2EFU 105, WA2KUS 54, K2OZT 44, K2QJL 27, W2PHX 19, K2RKY 17, K2TXP 17, K2HNW 13, W2PKY 13, K2EIU/2 5, W2BXP 4, WA2LYP 4.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2GXC. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0030 GMT nightly and 0015 GMT on Sat. NLI (early) 3630 kc. at 2330 GMT nightly; NYC-LIPN, 3908 kc. at 2230 GMT nightly; V.H.F. Traffic Net, 145.8 Mc. at 0130 GMT Tue.-Wed.-Thurs. BPL cards were earned by K2UBG, W2EW, WA2GPT and WA2GLU, the latter three on originations plus deliveries. WA2GPT has now earned her BPL medallion and becomes the second YL medallion holder in the section. Congratulations, Bea. WA2BPK passed the General Class exam and hopes to sked his brother, WA2AED/9, in Indiana. Now that W2GKZ has completed his kw. station on c.w., a.m. and s.s.b., Dave is planning an antenna system to do justice to the rig. K2TEU, the Massapequa HSRC, is looking for skeds with other schools on 20, 15, 10 and 6 meters. Please contact WA2CZG if your school is interested. K2QBW is engaged in amateur space communications planning. New officers of the Amateur Radio Society of CCNY are W2PVQ, pres.; WA2DGW, vice-pres.; and WA2HSK, secy.-treas. K2HTX reports the formation of a 6-meter RACES net

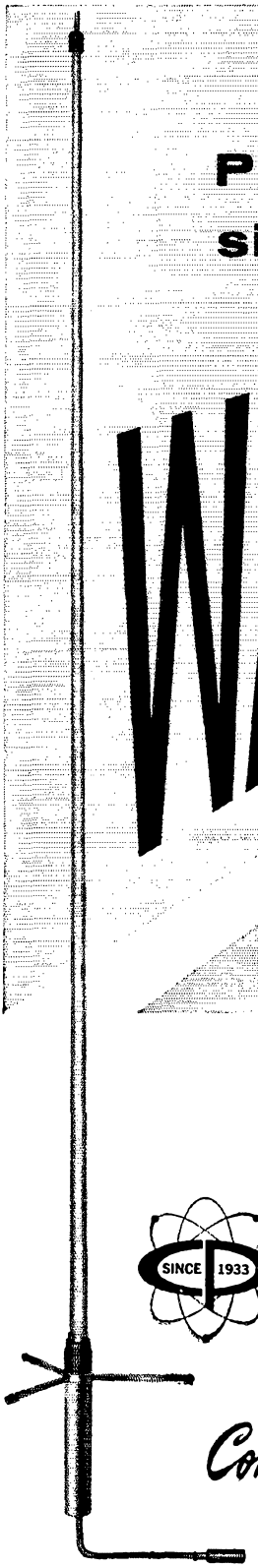
NEW YORK STATE QSO PARTY

June 10-11

See page 85

in Huntington Township, which meets at 0100 GMT Mon. on 50.460 Mc. K2MEM now is using a four-element beam on 10 meters. WA2RZZ is a new call in Dix Hills. Officers of the Calhoun HSARC, WA2KCW, are WA2ICX, pres.; WA2KPK, vice-pres.; and Sharen Sharp, secy. WA2BWO reports a very fine first traffic total. K2JXD is working with a nuvistor front end for 6 meters. It is interesting to note that our V.H.F. PAM, W2EW, has now earned his 12th BPL on the V.H.F. Traffic Net. Our section is ideally suited for traffic-handling on 2 and 6 meters and all license classes can participate. Why not sign in on 145.8 Mc. and see what enjoyment you can find in handling traffic? WA2FMF is the new 6-meter EC for Kings County replacing K2AAL, whose services were greatly appreciated. Many questions are being received relative to 220-Mc. activity in our section. If you operate on this band, please inform this office so that I can publicize the activity for others to see. A 5894 final for 432 Mc. is under construction at W2SEU. K2PWG is putting the finishing touches on his 100-watt rig for 2 and 6 meters. W2CWD keeps regular skeds with his dad, W9VNN. Put a big red circle around the date Oct. 14! The Hudson Amateur Radio Council will present the 1961 Hudson Division Convention on that date. I will be operating at W2YKQ/2 on Field Day if your club wishes to send its FD message direct. If you can't participate in the field, please fire up the home rig and give the fellows and gals at their portable sites

(*Continued on page 102*)



Put your signal –

WAY OUT YONDER!

–with

STATIONMASTER®
Base Station Antenna
Cat. No. 200-509

- FREQUENCY RANGE ..... 144-174 Mc
- OMNIDIRECTIONAL GAIN ..... 5.8 db
- MAXIMUM POWER INPUT ..... 500 watts
- NOMINAL INPUT IMPEDANCE ..... 50 ohms
- BANDWIDTH ..... ± 0.3%
- VSWR 1.5:1
- RATED WIND VELOCITY ..... 100 MPH
- WEIGHT ..... 30 lbs.
- ELEMENT HOUSING LENGTH ..... 19'

SINCE 1933

Communication Antenna Systems for American Business

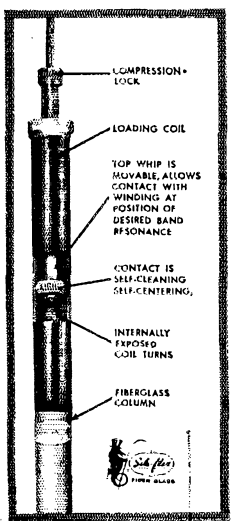
Communication Products Company, Inc.

MARLBORO • NEW JERSEY

webster
MANUFACTURING

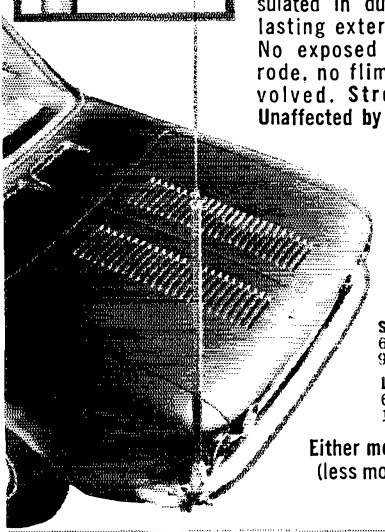
BAND-SPANNER

streamlined mobile antenna for effective 5-band operation



BAND-SPANNER, an exclusive Webster design—distinctive—fine looking on any car—a top performer on 80-40-20-15-10 meter bands (and MARS frequencies)—one of the finest antennas for use with multi-band equipment. Easily handles transceivers with power inputs of 100 watts or more; Collins KWM-2, Gonset G-76 among others.

Loading inductor is wound directly on upper portion of strong, lightweight fiberglass support column. Exact resonance anywhere within any band is obtained by simple, plunger-type adjustment of stainless steel top whip. **Winding is contacted internally**, is encapsulated in durable epoxy for lasting exterior protection. No exposed joints to corrode, no flimsy plastics involved. **Strong! Durable! Unaffected by moisture.**



TWO MODELS:

Short Band-spanner, 60" telescoped, 93" extended.

Long Band-spanner, 63" telescoped, 117" extended.

Either model: (less mount) 24.75

WEBSTER Mfg, 317 Roebling Rd, South San Francisco, Calif.

Gentlemen: Please send free booklet, "Mobile Antennas—Simple Steps to Peak Performance."

Name _____ Call _____

Address _____

CITY ZONE STATE

a contact. Good luck! Traffic: K2UBG 530, W2EW 428, WA2GPT 424, WA2GLU 206, K2UFT 183, W2GKZ 144, K2RBW 127, K2THY 95, WA2BWO 86, K2BH 83, W2GP 59, WA2CZG 46, WA2GAF 35, W2OKU 34, K2DNY 33, W2UGF 27, W2OBU 20, K2MYW 16, W2DID 10, K2CMJ 7, WA2FBC 7, W2PF 7, W2AEE 5, W2MDM 4, K2QBW 4, K2YQK 2, W2DUS 1.

NORTHERN NEW JERSEY—SCM, J. Sparks Remeczky, K2MFF—SEC: WA2APY. RM: K2VNL. PAM: K2SLG. V.H.F. PAM: K2KVR. Section nets: NJN daily at 2300 GMT on 3695 kc., NJPN Mon. through Sat. at 2200 GMT and Sun. at 1300 GMT on 3900 kc., N.J. 6 & 2 at 0300 GMT. Thurs. and Sun. on 51.15 Mc. and at 0200 GMT Wed. and Sun. on 147.75 Mc. The above times are based on EDT. New appointees are WA2BNF and K2HHS as OESs and W2GRF as OO. The NJN reports 31 sessions held, attendance 659 and traffic 450. The NJPN reports 31 sessions, attendance 620 and traffic 191. The N.J. 6 & 2 nets report 19 sessions, attendance 175 and traffic 58. W2REH has become a member of the A-1 Operators Club. WA2CCF, WA2GQZ and K2UCY earned BPL cards for March traffic. K2PCG installed a tower to hold up his v.h.f. beams. K2KXW brought his countries total to 103 and is very confident that he can get QSLs to match. W2NIY received the Mayaguez Award and the United Nations Award. K2YXY received the DXCC Award. WA2IDM received his WAS and United Nations Awards. The following clubs have become ARRL affiliates: The Kessler Amateur Radio Club, the Zephyr V.H.F. Society and the West Jersey Radio Club. Congratulations! The new officers of the Rockaway Valley RC are WA2AKJ, pres.; WA2AJW, vice-pres.; WA2AKL, treas.; WA2AKM, secy.; WA2AJS act. mgr.; WA2AKD, prop. mgr.; K2SZA, historian. WØHRV, of Denver, visited K2UFM. K2UKQ has become a member of the A-1 Operators Club. The members of the Columbia High School RC are busy relocating their station and installing new antennas. W2FZV has a new Heath "Twoer." K2DQT has a new 50-ft. tower under his 6-meter antenna. WA2ILB has a new 450-watt amplifier. K2VVL is building a Heath VHF-1. The new officers of the Jersey City RC are K2QGD, pres.; W2ECO, vice-pres.; W2ZAL, treas.; W2IUJ, secy.; K2KOS, public relations; K2ONE and K2SST, act. mgrs. K2HHS received the WCONN Award with all contacts on 2 meters. K2DKY moved from the Bronx to South Orange. W2CCK is the new Radio Officer for Belleville, with K2EFC and K2DRA first and second deputies. WA2ELK is the new C.D. Radio Officer for Harrison. WA2COO was elected manager of the new Eastern Wireless System Net. This net replaces both ESN and HTN. It meets at 5:15 P.M. on 7090 kc. WA2IEF and K2VEY have a new harmonic. Traffic. (Mar.) WA2GQZ 616, K2UCY 527, K2VNL 274, WA2CCF 250, W2OPB 157, WA2COO 154, WA2EQO 127, K2VVL 110, W2RXL 63, WA2JHQ 57, WA2KKH 55, W2EBG 51, WA2EBR 51, K2MFF 46, K2EQP 41, K2VNK 41, W2ANG 31, W2DRV 29, W2CVW 22, WA2AKM 18, W2EWZ 18, K2MFX 17, K2SLG 17, WA2CNV 11, K2JTU 10, K2AGJ 9, WA2EJZ 8, W2CFB 7, WA2ILB 6, K2ZFI 6, W2BVE 5, W2NIY 2, K2PQR 2, W2VMX 2, K2QGD 1. (Feb.) WA2APY 212, WA2EBR 161, WA2EDG 33. (Jan.) WA2EBR 82, WA2EDG 15.

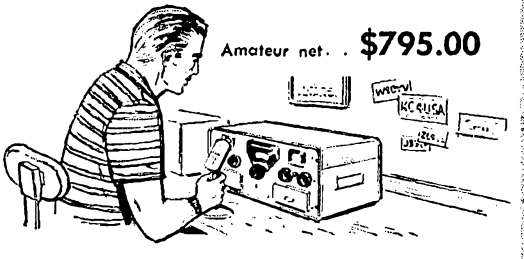
MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—Asst. SCM: Walter G. Porter, OUJC. SEC: KØEXN. PAM: KØMFX. RM: PZO. March report for the TLCN is 25 sessions, 202 QNS, 339 QTC. The 160-Meter Phone Net will hold its Annual Picnic at Webster City June 11. Emergency flood communications at Waterloo were participated in by KØAVM, DFR, CVV, JFF, OTV, WØPTL and ZLL on Mar. 30 and 31. Near Decorah on Mar. 27 the following helped in the flood emergency: KØRTF, KTP, CIN, KØOHE/Ø and KØJVW/Ø. From Feb. 17 through 21 the Iowa AREC Net was activated to furnish communications during a bad sleet storm in the southern half of the State. KØMYU received an EC appointment. MUH and ZQC renewed theirs. CCT received an OBS appointment. KØGEY is stationed with the Army at a Nike-Ajax guided-missile site near Berkeley, Calif. The Coon Valley Radio Club, at Yale, Iowa, is now affiliated with the ARRL. KØZMU participated in some MeComb, Ill., c.d. work. Traffic: (Mar.) WØLGG 2117, LCX 1968, BDR 881, DUA 832, PZO 383, NTB 184, SCA 133, KØEXN 56, WØLJW 48, KØHBD 38, KTP 36, WØBLH 27, PTL 26, KØYLN 25, WVK 24, WØIO 21, KØVKT 21, KAQ 16, POI 16, AUU 13, WUR 13, LXL 12, VUM 12, WØGQ 11, YDV 11, YOZ 11, KØQFK 10, ZCQ 10, EVC 9, VHR 9, ZMU 8, BRE 7, GOT 7, IHC 7, WØPUR 6, QVA 5, EEG 4, KØMYU 4, WØUHO 4, NYX 3, KØVSV 3, WØFMZ 2, HNE 2, KØRTF 1. (Feb.) WØLCX 1486, KØEXN 17, WØLJW 16, GQ 7.

(Continued on page 104)

BROAD BAND
EXCITER / TRANSMITTER

ONLY ONE TUNING CONTROL • THE VFO



Amateur net. . **$795.00**

REGARDLESS OF PRICE....

THE 200V IS THE STANDARD OF COMPARISON IN CONSTRUCTION, WORKMANSHIP, EASE OF OPERATION, STABILITY and AUDIO QUALITY.

AVAILABLE NOW

WRITE FOR LITERATURE

FREQUENCY COVERAGE

3.5 - 4.5 MC
6.5 - 7.5 MC
13.5 - 14.5 MC
20.5 - 21.5 MC
27.7 - 29.7 MC

You don't settle for "partial" frequency coverage when you buy a 200V

POWER INPUT: 200 watts PEP on SSB
175 watts on CW, FSK, PM
100 watts on AM

CHOICE OF: LSB, USB, AM, PM, CW, FSK

INVERSE AUDIO LIMITER
PERFECTED AUDIO FILTER
POWER OUTPUT CONTROL
SILICON RECTIFIER POWER SUPPLY
2" MONITORING SCOPE
LOAD MISMATCH PROTECTION
DOUBLE HETERODYNE CIRCUIT
NEW MIXER CIRCUITS

CARRIER SUPPRESSION: At least 50 DB.
SIDEBAND SUPPRESSION: 50 DB.
CALIBRATION ACCURACY: 1 KC.
UNWANTED MIXER PRODUCTS: Down in excess of 50 DB.
AUDIO RESPONSE: Approx. 200- 3800 Cycles.
OUTPUT inherently matches load impedances of 52 - 72 ohms.

Central Electronics, Incorporated

1247 W. BELMONT AVENUE • CHICAGO 13, ILLINOIS

subsidiary of ZENITH

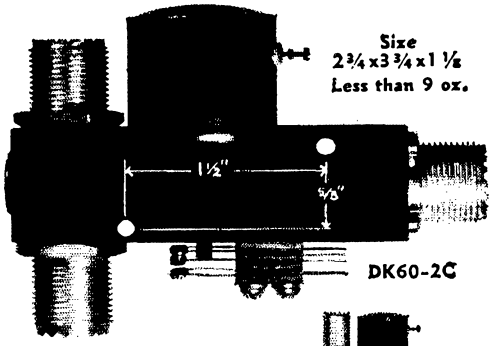
DOW-KEY

DK60 SERIES

COAXIAL RELAYS

4 different models, A.C. or D.C.

(and Types C, TNC, BNC, N, UHF Connectors)



STANDARD RELAYS INCLUDE:

DK60 — SPDT r.f. switch.

DK60-G — SPDT r.f. switch with special "isolated" connector in de-energized position.

DK60-2C — SPDT r.f. switch with DPDT auxiliary contacts.

DK60-G2C — SPDT r.f. switch with DPDT auxiliary contacts and special "isolated" connector in de-energized position.

★ Relays available in weatherproof boxes for exterior installation.

★ Ganged, multiple position switch arrangement available for remote control selection of antennas.

★ Unconditional guarantee for period of one year. (We will repair if faulty within one year.)

r.f. SPECIFICATIONS:

Low VSWR: less than **1.15:1 from 0 to 500 mc. Low Losses:** Pure silver contacts. Parts in crucial positions plated with fine silver. **Low Cross-Talk:** (greater than 80 db) (in energized position) in DK60-G and DK60-G2C through use of patented "isolated connector". **High Power Rating:** (a) 1 kw through straight connectors (b) to 10w through "isolated connector" — excellent for video switching. **SPDT r.f. Contacts:** r.f. leakage extremely low, below typical r.f. connectors.

MECHANICAL SPECIFICATIONS:

High Contact Pressures: Long life expectancy greater than 1 million operations. **Continuous Duty:** Teflon feed-through terminals used on coil to provide connection ease.

ELECTRICAL SPECIFICATIONS:

Wide Variety of Coil Voltages: 6,12,24,32,48,110,220 D.C. coils at 2.0 watts; 6,12,24,110,220 A.C. volts at 6 volt-amps, 50-60 cps. (Special voltage or resistance available on request.) **Less Than 50°C Temperature Rise Above Ambient:** Maximum operating temperature is 100°C except on special order. Auxiliary contacts available for power control — DPDT at 5a. 110 v A.C. on DK60-2C and DK60-G2C.

See any one of our 700 Dealers and Distributors in U.S. and Canada for catalog sheets or write:

DK60 SERIES RELAYS PRICED FROM $12.45

DOW-KEY COMPANY

Thief River Falls, Minnesota

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: KØIZM. Asst. SEC: LOW. RM: QGG. PAM: ONF. V.H.F. PAM: HAJ. Section nets: KPN, 3920 kc. Mon., Wed., Fri. 1245Z, Sun. 1400Z. NCSs KØQKS, EFL, WØFHU. ORB. QKS, 3610 kc. daily 0030Z. NCSs SAF, TOL, BYV, KØBXF. Kansas Storm Net, 3920 kc. Mon. through Sat. 0001Z. NCSs are the SEC and ECs. The State has been asking that the Storm Net again be started. It now has been and we hope the SEC and ECs can keep it going like it is at present. We wish to thank KØOUS and the Liberal Club for the pleasure of being with them and helping to get the Storm Net started. The net was activated three times in March because of tornado activity. The Kansas University Radio Club elected KØHIM, pres.; WER, vice-pres.; KØGWG, secy.; UAW, treas. Dot. KØGIC, was awarded Centennial Certificate No. 7. There are lots left for stations qualifying. BYV is over the hump on DXCC. KØRNZ finished first in the Pan-American Contest which was worked in Spanish. My thanks to him for an FB OO report. Endorsements: KØBXF, EQD, KØQKS. FHU, KØEWW, KØZXN as ECs; SAF, ABJ, KSY, KØHVD, TOL, BLI, KØIQA, RJF, VBQ, KØRYQ as ORSs; WJB, KØJID, KØRNZ, BLS, KØYBV, KØYWG as OPSs; IFR as OBS. Traffic: (Mar.) WØOHJ 777, KØHGI 423, WØSAF 189, FNS 146, ABJ 129, QGG 71, BYV 64, KØHVG 55, WØBLI 33, KØQKS 31, WØIFR 22, TOL 21, KØUHF 17, WØKKS 15, VBQ 11, KØEFL 8, WØFHU 6, KØJID 6, PSD 6, GIG 5, VLD 4, YWG 4, WØFDJ 3, KØGIC 3, GEL 2. (Feb.) WØRJF 86, KØUHF 3, JID 2.

MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØLTP. RMs: OUD and KØONK. PAMs: BVL and OVV. Asst. SEC: KØLTJ. MSN (3715 kc., 2215 GMT Mon.-Fri.), 20 sessions QNI 184; QTC 225; NCSs KØONK 6, VPH 11, RPH 2, BKI, HBN (7280 kc., 1805 GMT, Mon.-Fri.), 23 sessions; QNI 613; QTC 346; NCSs: OJT 9, KØWNZ 6, K5JXD 3, KØYWT 2, KØHGI, KØWBD. MON (3580 kc. 0100 GMT, Mon.-Fri.), 27 sessions; QNI 127; QTC 173; NCSs: OUD 9, KØQCQ 5, KIK 4, UXQ, DRI, KØQXQ, WAP, SMN (3580 kc., 4 sessions; QNI 19; QTC 22; NCSs: OUD 2; DRI, WAP, MEN (3885 kc., 2400 GMT M-W-F), 12 sessions; QNI 426; QTC 107; NCSs: OHC 4, KØONK 4, MMR 2, EEE, OVV, ZLN 2. Appointments: KØLTJ as Asst. SEC; KØVPH and EEE as OPSs; EØRPH, WYJ and KØVPH as ORSs; KØIHY as EC; KØOYV and KØONK as OOs. Endorsements: KØLTP as SEC; BVL as OPS; BVL as PAM; KØSGJ and KY as OBSs; KØSGJ as OES; KØSGJ as OPS; KØHIM, KØQCQ and KØBLJ as ORSs. KØHIM has been elected president of the Kansas University RC. The club station is AHW, active on 7 through 28 Mc. KØPFF reports a new HT-32A in action. KØVPH has received a 25-w.p.m. CP certificate. GCL reports completion of his s.s.b. rig. KØZFS and BER are doing experimentation and research on antennas for the ultra-high frequencies. The Jefferson Barracks RC has as a club project constructed several 50-Mc. rigs. These all operate on 50.280 Mc. and among those stations active with the equipment are KØKWL, ZVY, KWJ, BVM, WØODI and KØDCQ/M. The gang would appreciate out-of-town contacts. A state-wide meeting of RACES Radio Officers was held at Jefferson City; the SCM regrets his inability to attend because of illness. Traffic: (Mar.) KØONK 1339, VPH 143, WØKIK 122, MKJ 110, ANT 108, KØQCQ 97, WØBVL 96, OUD 92, KØVBU 91, RPH 62, WØWAP 60, BUL 58, ARO 46, KØMMR 45, WØUXO 42, KØPCK 41, BLJ 32, WØEEE 32, OVV 32, KØMAU 31, WBD 28, WØPXE 21, RTW 20, KØVNB 20, WØAYB 17, KNØFPC 17, WØGBJ 13, KØQHF 11, WNZ 11, IHY 1. (Feb.) WØWYJ 242, KØPFF 8, MAU 4.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTSU. The Nebraska Emergency Phone Net, EGQ NC, had QNI 1062, QTC 73, informal traffic 131, 100 per cent reporting VGH. The West Nebraska Emergency Net, KØRRL NC, reports QNI 633, QTC 397. The Nebraska 75-Meter Morning Phone Net, KØDGW NC, reports QNI 727, QTC 110. The Western Nebraska Phone Net, NIK, reports QNI 705, QTC 584, 100 per cent reporting KØAIE, KØBMQ, DVB, NIK, OCU and RIH. The Nebraska Section C.W. Net, NYU NC, reports QNI 214, QTC 99, 29 sessions. The Central Nebraska Amateur Radio Club has organized at Broken Bow with KØCGM, pres.; KØPZS, vice-pres.; KØPZR, secy.-treas. The Semi-Annual Nebraska-Kansas S.S.B. Dinner was held Mar. 25 at Phillipsburg. The Nebraska Section C.W. Net report for February is QNI 173, QTC 73. Traffic: (Mar.) WØNIK 496, KØRRL 168, KJP 88, WØOKO 76, KØDGW 72, KTZ 72, QFK 63, WØAHB 61, OCU 61, PZH 57, RIH 55, NYU 53, DDT 51, ZJF 37, GGP 35, RHN 35, EGQ 32, KØYDF 32, DFO 29, BOQ 22, SLB 21, MSS 20, WØHOP 14, KØRRQ 11, WØVZJ 11, KØWEP 9, UWK 8, WØYFR 8, RJA 5, URC 3, HTA 2, VEA 2, WKP 2. (Feb.) WØNYU 71, KØQFK 46.

(Continued on page 106)

Announcing the NEW

hy-gain

150 Megacycle Communication Band Antenna Systems

FOR THE 144-174 MC BAND

Base Station

6.1 DB GAIN STACKED JAYPOLE ANTENNA

The first mass produced stacked dipole array — the Hy-Gain Model SD-150 — available at amazingly low price. Produces highest gain (6.1 db) of any commercially manufactured stacked dipole 150 mc antenna. With 9.5 db gain in one favored direction with a slight reorientation of staggered dipole positions. All aluminum (wt: 19 lbs.); complete factory preassembly. Constructed to withstand 100 mph winds with ½" radial ice load. Iridite treated for resistance to corrosion.

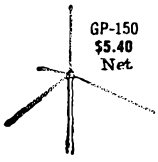
SD-150
$125.70
Net

⅝-WAVE 3.4 DB GAIN COMMERCIAL DUTY GROUND PLANE

GPG-150
$21.90
Net

Hy-Gain Model GPG-150 is an extended ⅝-wave ground plane developing 3.4 DB omnidirectional gain. All aluminum (wt. 4 lbs.). Ruggedly built to withstand 100 mph winds at ½" radial ice load. Completely iridite treated.

¼-WAVE STANDARD UNITY GAIN GROUND PLANE



GP-150
$5.40
Net

Lowest cost base station antenna available — yet built to commercial duty standards. All aluminum — iridite treated. Ideal for small two-way systems when price is important. Model GP-150.

Mobile

UNITY GAIN ¼-WAVE ROOFTOP MOUNTED WHIP

MW-150
$2.85
Net

New design stainless steel Model MW-150 ¼-wave rooftop mounted vehicular whip. High impact cycolac molded base mounts easily from top of roof with unique positive grip locking mechanism. Solderless connector for RG58U cable. Whip only is easily replaceable.

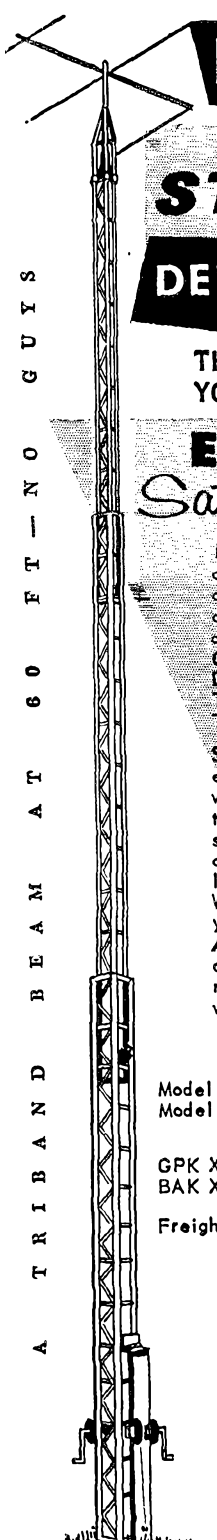
3.4 DB GAIN ⅝-WAVE ROOFTOP MOUNTED WHIP

MWG-150
$8.97
Net

Double effective power both receiving and transmitting with the Hy-Gain MWG-150 mobile whip. Extremely flexible stainless steel whip only 52" high. Hermetically sealed matching inductor. Single hole top mounting base and solderless RG58U connector.

WRITE FOR COMPLETE LITERATURE, SPECIFICATIONS ON YOUR LETTERHEAD DIRECT TO

hy-gain antenna products
1137 N. 22nd ST.
LINCOLN NEBRASKA



DESIGN

STRENGTH

DEPENDABILITY

THREE REASONS WHY YOUR BEST BUY IS...

E-Z WAY Satellite "60"

E-Z WAY AERO-DYNAMIC design decreases wind load and provides telescoping action that permits raising and lowering of tower sections. CRANK UP TO 60 FEET, DOWN TO 25 FEET and TILTS OVER FOR ACCESS TO ROTOR OR BEAM.

STRENGTH is built-in to every E-Z Way Tower...Heavy wall steel tubing legs, continuous diagonal bracing of solid steel rod and electrically welded throughout....no loose bolts or nuts here. E-Z Way design and strength are your assurance of DEPENDABILITY that you can count on year after year. See your nearest distributor today or write for free literature.

The SATELLITE

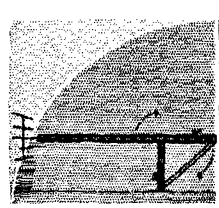
Model RBX-60-3P (Painted)	$335.00
Model RBX-60-3G (Galvanized)	$410.00

MOUNTING KITS:

GPK X60-3 (Ground Post)	$125.00
BAK X (Wall Bracket)	$17.00

Freight Prepaid anywhere in (48) U.S.A.

A TRIBAND BEAM AT 60 FT — NO GUYS



TOWERS

E-Z WAY

INC.

P.O. BOX 5767 TAMPA5, FLORIDA

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr., W1CHR—SEC: EOR, RM: KYQ, H.F. PAM: YBH, V.H.F. PAM; FHP. This section's net schedules and frequencies are the same as reported previously. KYQ made BPL again and advises the CN held 31 double sessions handling 556 messages. The averages were 12.5 for the first session and 5.1 for the second. Average attendance was 13.5 on the first and 5.2 on the second. High QNI were K1s MZM, LQD and W1RFJ. K5SPD/1 is Asst. Radio Officer for Daytime Communications in Groton C.D. VW is back after a two-month Florida vacation. BDI attended conventions and visited clubs. K1VR is getting interested in traffic work. FVV is building a burglar alarm for his car to protect his mobile equipment. RAN had a rung go out from under him while 43 feet up his tower. Fortunately, he did not fall. RFJ reports the following new hams in the Stratford Area: KN1s REP, QVX, QHU, QCR, QCP and K1DEO. K1HTV worked four new countries, thus putting him over the 100 mark. He has a new 20-meter ground-plane too. KQY operates RTTY Sun. mornings on 3640 kc. KSH is building a new exciter and modulator. ECH and MFX are erecting a 65-ft. fruit-juice-can vertical. Wow! YBH has a new HQ-180 and reports the CPN handled 216 messages in 31 sessions for an average of 7 per session. Averages: Daily attendance 22; net time 51 minutes. Attendance Honor Roll: K1DGK, YBH, K1AQE, FHP, DAV, K1MBA, K1BSB, MLT and VQH. FHP says CVN handled 28 messages in 14 sessions with a total of 58 stations checking in. High QNI were FHP, KN1PKQ and JZA. New stations were KN1RJK and K1LQV from Torrington. K1CFW says that the CQRC had 4 sessions with 47 stations checking in. K1MNX is building a 2-meter receiver. BSS is active on 160 meters. K1s ANV and KML have new tribanders. The Spiritan ARC now has the call K1JAD. Its members are active in c.w. traffic work. Connecticut had 96.7 per cent attendance at IRN sessions during March. Let's make that 100 per cent in the future. Reports received: OO from K1s HTV, 1LJ, GUD, KSH, WIVW, EQV and RAN; OES from FVV and K1MNX. New appointments: K1IVR as ORS. Appointments renewed: HJG and ECH as OPS; ROX as ORS; FOM and HJG as OES. Traffic: (Mar.) W1KYQ 550, AW 239, YBH 228, OBR 225, K5OEA/1 204, W1RZG 181, K1KSH 153, W1NJM 106, K1JAD 102, GGG 71, HOP 61, W1CHR 57, EFW 57, FHP 55, K1MZM 51, AQE 44, W1BDI 35, K1DGT 31, MBA 24, W1RFJ 21, CTI 20, NTH 19, BNB 16, QV 12, VIY 9, CUH 8, K1BSB 5, W1HJG 5. (Feb.) W1NJM 188.

MAINE—Acting SCM, Herbert S. Merrill, K1JDA—New appointment: YYW as OBS. Certificate endorsed: K1GVQ as ORS. The PTN meets daily at 1900 on 3596 kc. The SGN meets daily at 1700 on 3940 kc. The MSSN meets daily at 1730 on 3726 kc. The Maine AREC Net (closed net for ECs) meets Sun. at 0900 on 3940 kc. Don't forget the Augusta Hamfest June 18 at the Calumet Club, West River Road, Highway 104 North. Advance reservations ($3.00) should be mailed to VXU at 151 Cony St. by June 14. With QIH as chairman and SIN as MC, it promises to be quite an event. An innovation this year will be an auction by GRG. TFV has been operating portable from Mount Desert Rock, a tiny island 20 miles off the coast. KVI (the PAWA station) operated portable from the Portland Sportsman Show and created a great deal of public interest. SMQ has a new DX-100 and has the spring mobile fever. Also stricken are K1BXU, K1NWX, K1GXC, K1LCD and VXV. TOZ, QIQ and GPY have each been on a spring cruise to Jamaica. K1BWB has moved to Vermont. FCS is on with an 813 rig. BOK is making plans for a hamfest in Dexter Aug. 13. The Cumberland County Net has elaborate plans to load up the world's tallest vertical with a kw. for Field Day. K1KSG has a new 15-meter beam. KNJ and UDD are both home and doing fine after a stay in the hospital. K1MBM has worked the last continent for his WAC. Recent operators from K1MDM at Togus VA Hospital are KFY, WRZ, ZLT, K1HAU, K1HAV and K1DCF. The Sea Gull Net reports 192 pieces of traffic with 27 sessions. Traffic: K1MBM 167, MZB 85, MPM 77, KSG 69, W1QJA 69, GRG 60, K1IMI 49, W1GPY 36, K1MDM 31, BZD 17, EFZ 17, GSF 16, W1OTR 16, OTQ 11, K1LHE 10, OJH 10, W1LXA/1 9, K1OAZ 9, DVG 3, W1KVA 3, FKH 2.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—SEC: AQG. We still have many towns that do not have an EC. Any Radio Officer who is a member of ARRL and whose town does not have an EC is welcome to write us. Heard on 75 meters: GLU, RJC, DXQ mobile, K1s KED, LAD and OBA. Heard on 2 meters: YQI, UIQ, K1s JPX, MPF, MPJ, LOE, KN1s QEQ and QQI. K1OTA is on 10 meters. K1OLJ and K1NDF are on 6 meters. BVP is going to Coast Guard OCS at Yorktown, Va. K1GYH has a Valiant

(Continued on page 108)

ASK THE MAN WHO OWNS ONE...

AND LISTEN TO THE DIFFERENCE!

HAMMARLUND HX-500 SSB TRANSMITTER

- ★ SSB, DSB, CW, FM, FSK for RTTY plus 40 cps identification keyed shift.
- ★ Carrier suppression 50 db or better.
- ★ Unwanted sideband suppression 50 db or better.
- ★ 3rd and 5th order distortion down 30 db or better.
- ★ Spurious frequencies down 50 db or better.
- ★ 80, 40, 20, 15 and 10 meter bands.
- ★ Tuning accuracy better than 200 cps.
- ★ AND POWER THAT COUNTS—OUTPUT POWER OF 100 Watts P.E.P.; 100 watts CW; 25 watts AM; 100 watts FM; 100 watts FSK.

It doesn't take long to *hear* the superiority of the HX-500 SSB Transmitter as any owner will tell you. He'll tell you about the true TALK-POWER first—resulting from the restricted speech range... then he'll get into the details about operational features such as separate dial scales for each band, the fact that all crystals are included at no extra cost, and all about the built-in antenna changeover relay. Most of all, he'll brag about the solid contacts he's made with his HX-500. In fact, if you don't change the subject, you'll never get away from him.

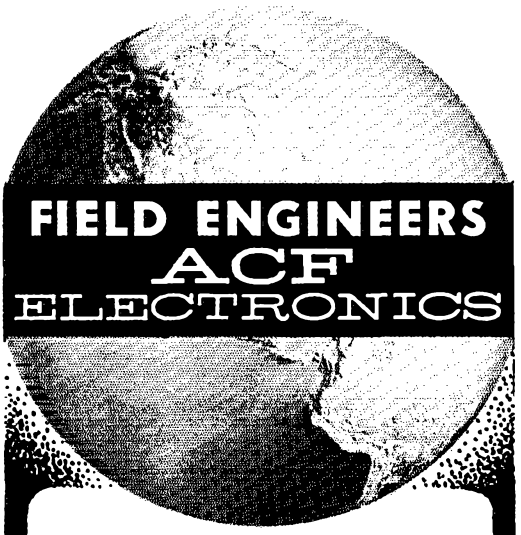
amateur net $695.00

See it at your dealer, or—write for complete technical details...

Established 1910

HAMMARLUND

MANUFACTURING COMPANY, INC.,
an affiliate of Telechrome
460 West 34th Street, New York 1, N.Y.



FIELD ENGINEERS
ACF
ELECTRONICS

FLIGHT
SIMULATORS

COMPUTERS

FIELD SERVICE ENGINEERS

Experienced engineers can enhance their careers in this expanding program by providing professional engineering services on complex electronic and electro-mechanical equipment at military installations throughout the United States. A few overseas assignments available after initial assignment in Continental U.S.A. Dependents are permitted at all times.

Challenging positions are available for those who possess a degree in electronics or an equivalent education, including experience in the design and/or maintenance of analog computers and radar. A knowledge of the theory of flight, navigation, aircraft pilotage techniques and instrument flight is desirable.

All qualified applicants will receive consideration for employment without regard to race, creed, color or national origin.

Please send resume to:
Mr. Robert J. Reid
Professional Employment, Dept. 444

ACF ELECTRONICS DIVISION
ACF INDUSTRIES
RIVERDALE, MARYLAND

with a cubical quad on the air. K1ADH is organizing the Brookline C.D. Emergency Net on 28,680 at 7:30 P.M. on Tue. K1MNQ worked GC8MF on 3.6 Mc. BGW attended the Boston and N.Y.C. RTTY Dinners and the IRE Show. PTR has a DX-100; TVI ruined the DX Contest for him. EHT, Wayland EC, has 6 full members in the AREC, and worked 47 countries with 137 contacts in the DX Contest. K1GGS joined the Coast Guard. KN1PUR has an EICO-720 transmitter, HE-10 and SW-54 receivers and is building a 2-meter transmitter. HIL says he is selling out. The Harvard Wireless Club, AF, elected 9ARB, pres.; ETH, vice-pres. and station mgr.; IZR, secy.-treas. K1KKS is working on gear for 5650 Mc. and has a halo for 6 meters. TUP is back in Massachusetts again. IHC is working on rigs for 1296 and 5300 Mc. JSM, AHE, EPZ, K1s JBL, KTK and LMZ have an APX-6 that they are converting for the 1215-Mc. band and also are working on antennas. The Milton Radio Club is being formed. The Framingham Club had a talk on "YLs in Ham Radio" by ZEN and K1IZT. BB and DEL are busy on 160 meters. TZ is better and gets up to the shack once a day. RGX is home from the hospital and doing well. New on 2 meters: K1JAO, K1KKB, KN1s QNQ and QOG. The EM2M held 31 sessions with 454 stations and a traffic total of 257. OFK had many visitors at his QTH. I wish more of you ECs would send monthly reports to AOG. HJP was auctioneer at the Framingham Club. K1LFA will have 75 watts on 6 meters. 4QEG is the new secy. of MX. NKA built a 6-meter pre-amplifier. K1JAW says there is a new Eastern States Net at 1715 P.M. on 7090 kc. K1JIU has a new bug. K1IUS has a 5" scope for a monitor. K1MHM is overhauling his equipment. K1PYI is on 6-meter s.s.b. K1LJK has an SB-10 and a Valiant working well together. He and K1OIC took 2nd place in the New Bedford mobile hidden transmitter hunt. K1KJF is on 75 meters with a 28-watter. BCN says activity on 2 meters is picking up on the Cape. OFK is our new PAM for 2 meters. K1GUU is a new OO. New officers of the QRA: ZNG, pres.; K1OCD, vice-pres.; 1GK, secy.; OG, treas.; ZQM, LEL, SPL, OKB, HBB and QPO, directors. QRA means Quinnapowitt Radio Assn. K1OYD is on 2 and 6 meters. PEX is manager of the 6-Meter A.F. MARS Net. FJJ has a mobile rig in the new car. ACB has 240 worked for DXCC. FQA now is an A-1 Operator. OHA had an FB time as KG4AP. NJL is busy in contests. Appointments endorsed: K1s DIO and MHC as OESs; AUQ, K1JIU, SMO and FJJ as ORSs; BCN, K1ADH and SPL as OBSs; NF as OO; HIL and K1ADH as OPSs; BCN Sector 2-C, QQL Sector 1-F, MOJ Millis, SPL Sector 1-C, IPZ Shirley, MMQ Milton, BHD Everett, HRY Wellesley as ECs. KSZ is building a 1296 converter. K1s KYP and NAZ had new harmonics. We now have a 6-meter WRONE Net on Wed. afternoons. The 6-Meter Cross Band Net held 23 sessions with 443 check-ins and traffic of 219. The Mass. V.H.F. Society meets on the air every Tue., Thurs. and Sun., and held a meeting of the gang in Waltham. K1RBX is ex-3JJC, now in Peabody. K1NST has her General Class license. Her OM K1NJE passed his. GL is a Silent Key. Traffic: (Mar.) W1AWA 493, K1GNR 317, DIO 262, W1ZSS 148, PEX 141, K1MEM 140, W1EAE 112, OFK 103, K1AFF 52, OCD 52, W1FJJ 50, K1JAW 50, W1DOM 47, K1JIU 44, W1DFS 39, AOG 37, WAW 36, K1IUS 32, W1SIV 32, K1OJQ 30, DGI 28, GKA 24, CMS 17, W1AUQ 15, K1GYM 15, DTJ 13, MHM 9, LCQ 8, MHC 8, W1RQL 8, HIX 6, K1GTX 3, W1NJL 3, K1JML 2, LJK 1. (Feb.) W1EAE 236, K1OCD 52, AFF 26, W1MX 5, AF 4.

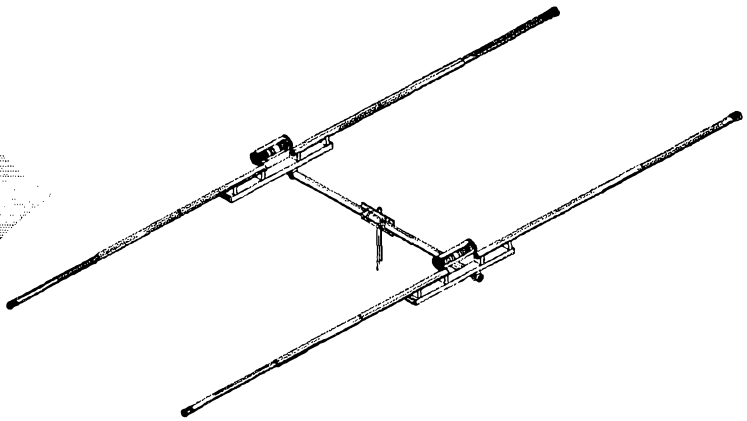
WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: BYH/K1APR. RM: K1IJV. PAM: DXS. FAB, K1IQZ and K1LRB received Official Phone Station appointments during March. MNG's Official Relay Station appointment was endorsed. DPY is back on the air on 75-meter s.s.b. The Hampden County Radio Association hired a bus for transportation to the New England Division Convention. ZPB worked 5N2ATU in Nigeria on 15 meters and will be studying at Wesleyan University this summer. K1PIL put on a ham radio demonstration from WWLP-TV. The West. Mass. C.W. Net (WMN) handled 152 messages during the month with an average of 5.8 messages per session. Most active on the net were BVR, K1IJV, YK, ZPB and BKG, in that order. The Novice Net is going fairly well with a total of 14 different stations. WMSN is doing well also. Starting Apr. 8 a new 6-meter net went into operation, the Greenfield Area Radio Net Tue. at 7 P.M. and Sat. at 8 P.M. on 50.8 Mc. with K1MFS, K1IQZ and K1PZR as Net Control stations. Speakers at the Berkshire County Amateur Radio Association were JAH and his XYL, Margie, both of whom presented a program of colored slides. (Incidentally, both Bill and Margie have gained world-wide renown in the field of photography.) At a previous meeting, UDT gave a very interesting talk on capacitors. DEJ and K1JGW are on s.s.b. K1GFT is chairman of the Pittsfield Radio Club Field Day committee. DGT

(*Continued on page 110*)

It's The

GREATEST!

the
All
New



40 Meter SIGNAL MASTER

by Mosley

Model S-402 Features . . .

- Excellent Forward Gain and F/B Ratio!
- Efficient Link Coupled Feed!
- 100% Rust Proof!
- Heavy-wall 6061-T6 Aluminum Boom and Elements!
- 2 Elements for True Beam Performance!

"Forty" is the *hot* band now and the all new Mosley Signal Master Beam is the antenna to give your signal real authority! This rugged beauty is designed and engineered to provide the performance you need whether you are DX hunting or relaxing in a pleasant rag-chewing session.
You'll want a Mosley Signal Master Beam . . . see it at your favorite Ham Equipment Dealer's store!

Amateur Net, $124.50

Mosley Electronics, Inc.
4610 North Lindbergh Blvd. – Bridgeton, Missouri

EQUIPPED FOR SERVICE

Art Brown, W9IHZ

Your choice of new equipment is not limited at Brown Electronics. We carry all the major lines, among them the names appearing below.

Barker & Williamson—Central Electronics
Collins—Cushcraft—R. L. Drake
Elmac—Gonset—Hallicrafters
Hammarlund—E. F. Johnson—Mosley
National—P & H—RME

TRADES—Liberal allowances for commercially built ham equipment, especially late models in particularly good condition.

USED GEAR—A diverse inventory of late model used equipment, realistically priced. Our list is frequently revised and we guarantee satisfaction.

TERMS—We carry our own contracts. We're flexible, our charges low, $6.00 per hundred per year on the unpaid balance over as long as 24 months or more.

RESPONSE to your inquiry will be rapid, will be by mail. We'll give you our best offer first and no high pressure. We would like very much to have the opportunity to quote on your requirements.

REQUEST FOR QUOTATION (Please Print)

I have the following used gear to trade: (Please use this code to describe it.) 3. Like new, little use; 4. Minor signs of use, no major blemishes; 5. Good condition, with minor modifications; 6. Has major modifications, or requires major repairs.

_____

_____

_____

I am interested in purchasing the following equipment:

New ☐ _____

_____

Used ☐ _____

No obligation to buy is implied.

---------- * ----------

Name: _____

Street No. ot R.F.D.: _____

City: _____

State: _____

BROWN ELECTRONICS Inc.
1032 Broadway • Fort Wayne, Indiana
PHONE Anthony 3381

and AZW worked HKØTU on the rock of Malpelo. Traffic: W1BVR 214, K1IJV 135, CAU 75, W1WEF 73, K1LBB 69, W1ZPB 69, YK 66, FAB 52, K1LRB 30, W1LDE 27, K1GCV 21, PZR 18, W1DVW 14, K1PIL 4. (Feb.) K1CAU 25. (Jan.) K1CAU 31.

NEW HAMPSHIRE—SCM, Ellis F. Miller, W1HQ—SEC: K1GQK. RM: K1CIF. PAM: KVG. The GSPN meets Mon. through Fri. at 2400 and Sun. at 1430 on 3842 kc. The NHN (c.w.) meets Mon. through Sat. at 2330 on 3685 kc. CNEN meets Mon. through Sat. at 1145 on 3842 kc. The new officers on the Concord Brasspounders are FTZ, pres.; EAW, vice-pres.; and CUE, secy.-treas. Every amateur in the section is earnestly requested to participate in and support the AREC and (or) RACES in your area. Our ability to provide communication circuits under emergency conditions is one of the prime reasons we are allowed to enjoy our great hobby. Certainly we can all spare an hour, or perhaps two, once in a while to participate in a training session. You are not only providing a public service to your neighbors, but also providing yourself with "on the job training" in emergency communications. I wonder how many of us, if called upon this very minute to operate under emergency conditions could truthfully say, "I know exactly what to do," or "I am completely familiar with the operating procedure which should be used under these conditions." If you don't know who your county EC is, your SCM will be glad to supply the information. For information on RACES in your area, write to the State Radio Officer in care of the State Civil Defense Agency in Concord. Traffic: K1BCS 673, CIF 538, KN1OWU 134, W1CUE 117, K1JDN 66, W1TA 63, KVG 33, 1IQ 20, K1GQH 18, IIK 10, W1EVN 7, K1EEN 6, CFX 2, MID 2.

JOHN W. SINGLETON MEMORIAL TROPHY

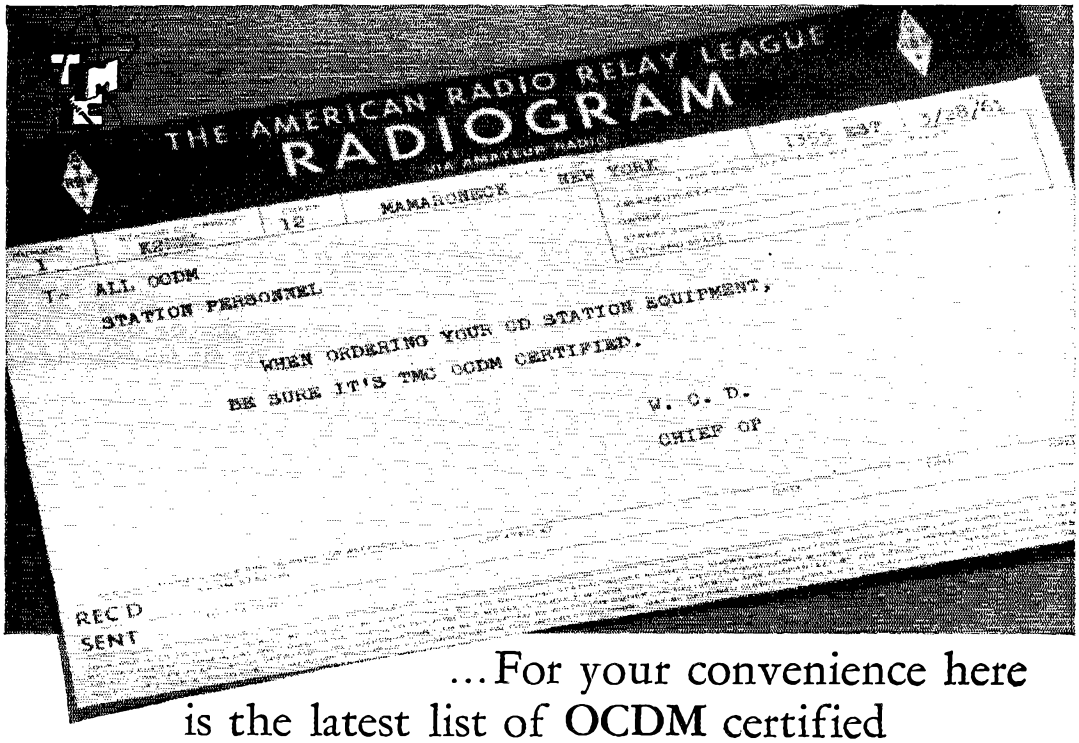
This trophy will be awarded to a worthy member of the Granite State Phone Net every 3 months, in order to perpetuate the memory of the deceased founder of the GSPN (W1CDX) and to stimulate net growth, attendance and adherence to the principles of the League. To be eligible, contestants must have checked into the net at least 10 times since Jan. 1, 1961, and be a certificate holder in good standing (PAM and SCM not eligible).

Scoring Schedule: (a) *Participation points* (40) are based on an overall 3-month period with 4 points per check-in with a minimum of 30 minutes per check-in. (b) *Traffic* (15); five points for the first 10 ARRL traffic points handled, ten points for the first twenty, fifteen points for the first thirty or more. (c) *Operating Technique* (10) based on compliance with ARRL procedures, with emphasis on zero beating. (d) *ARRL activity* (15) as determined by the SCM and PAM based on station activity reports. (e) *NCS* (10) with reliability, punctuality, tact and enthusiasm. (f) *New memberships* (10) valid upon issuance of Section Net certificate.

The trophy winner will be announced after compilation of points for the preceding 3-month period (commencing April 1, 1961), Cooperative efforts among the SCM and PAM and NCSs will establish the winner of each quarterly award.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ, RM: SMU, PAM: TXL Endorsement: WED as OBS. RISPN report: 31 sessions, 298 QNI and 67 traffic. OBS reports: TXL and SMU. OES reports: K1DZX and PNI. The NCRC of Newport had as its program for the month K4LPR and ØTRH, ex-F7BM, who spoke of their activities in amateur radio. Newport Area hams taking part in the C.D. Training Program are TXL, instructor, JFF, JHF, ETM and K1DPY. The WIAQ Club of Rumford issued WRI Cert. No. 8 to K1JLE. HXV was elected to membership and K1NSY received his General Class ticket. The W1AQ Net, which meets at 29.2 Mc. every Wed. at 2100 hours, has been very successful because of the efforts of K1HMO, LQX, NSY, CZB, LII, CZD, BDN, W1JZI and REK. The K1QDI Club of Tolman H.S. has completed its DX-40. At its last meeting three of the new members took the Novice Class exam. TXL has a new dual dipole for 80 and 40 meters. K1DZX has a new home-brew transmitter on 6 meters and JYO has a new HQ-110 receiver. CFT is kept busy baking her favorite cakes for the boys on the RISPN. Traffic: W1SMU 780, TXL 396, K1GRC 42, DZX 27, PNI 13, BBK 8.

(*Continued on page 112*)



...For your convenience here is the latest list of OCDM certified TMC Equipment by classification...

OCDM ITEM	TMC MODEL	TMC BULLETIN NO.
OCDM R-02	GPR-90RX	SSB 205
	GPR-90RXD	SSB 205
OCDM R-04	GPR-90	SSB 179
OCDM R-16	GPR-90	SSB 179
	GPR-90RX	SSB 205
	GPR-90RXD	SSB 205
OCDM T-32	GPT-750	SSB 227
	SBT-1K	SSB 237
OCDM T-32 CW	SBT-1K	SSB 237
OCDM T-32 SSB	GPT-750	SSB 227
	SBT-1K	SSB 237
OCDM T-34	GPT-750	SSB 227
OCDM SE-100	MSR-4	SSB 196
	MSR-5	SSB 196
	MSR-6	SSB 196
	GSB	SSB 194
	GSB-2	SSB 194
	PAL-350	SSB 215
	SBE-2	SSB 195

THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, NEW YORK
and Subsidiaries
OTTAWA, ONTARIO • GARLAND, TEXAS • ALEXANDRIA, VIRGINIA

Order Now from WRL's Supermart of Values

$40 Value! - SAVE

1 Once In a Lifetime

Just $10.95

Hermetically Sealed Filter Choke

8.8 HY
500 MA-DC
50 Ohm DC
10 KV Insulation
7¼" high
7¼x5¾" Sides
Shp. Wt.
39 lbs.
Order QE6

Economy WRL Verticals 80-10M

$14.95

Self supporting; easy mounting; no traps or radials. Heavy Illumitronics Coil. 5-minute installation. Up to 1000 watts. Coax fed; takes only 4" of space. Overall height - 23 ft. Complete instructions. Rustproof hardware, irridite treated.

Drive 3" pipe in ground; clamp on heavy Cycoac base. All band matching coil then tapped for band in use with special tap supplied. Wt.: 8 lbs.
Order VQ-G-6

EXCLUSIVE 2

Never Before Such Savings!

New 15' RG8/U coax with 83-1SP plugs each end.

99c

Order QB6

Same as above but with wall brackets for side mounting on house.

$12.95

Order VB-Q-6

3 SAVINGS

SAVE 70%

Streamlined Cabinet/Chassis

SAVE 4

Complete with unpunched matching panel. Perfect for experimenter, builder. Use for transmitters, amplifiers, receivers, etc. 8"x14"x9". Wt.: 8 lbs.
Order QX6
Only $3.95

$20.00 VALUE

Delay and Control Relay

Just $1.95

Perfect for any Xmttr., linear, etc. Supply 115 VAC to the time delay relay and in 20 seconds it actuates the control relay which has 10 amp SPDT contacts to control eqpt. Both may be unplugged from bracket.
Order QT6

LOW DOWN PAYMENT 5

WRL WORLD RADIO LABORATORIES
3415 W. BROADWAY • PHONE 32 8-1851
COUNCIL BLUFFS, IOWA

Send the following bargains: _____

☐ Enclosed is my check Q6

NAME: _____ CALL: _____

ADDRESS: _____

CITY _____ STATE _____

VERMONT—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB. PAM: HRG. RM: KRV. Vermont frequencies: C.w., 3520; phone, 3855. RTTY 3620 kc. Nets: C.w., M-S 1900 and Sun. 0900; GMN, M-S at 1730; VPN, Sun. at 0900; VEPN, Sun. at 1730. Congratulations and welcome to KN1RMF, KN1RMG and KN1RMH, all of St. Albans. IT has been in Burlington Hospital and K1MPN has been in Montpelier Hospital. We wish both a speedy recovery. KINKS visited in Burlington and returned to Newburgh, N. Y., with a "Twoer," portable 2 meters. KJG had 164 good QSOs in March, 41 on 2-meter phone. ZJL, of Saxtons River, is active in RACES and MARS. K1BDA, of Middlebury, is attending Middlebury College and has just started activity on 75 meters. K1POA, of Chester Depot, has a DX-100B and operates on 20 meters. Traffic: VE2AZI/W1 846, W1KRV 87, EIB 34, K1IRH 26, W1ZYZ 24, KJG 22, HRG 12, K1MVV 6, W1RNA 5.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7CGV—The FARM Net elected GGV, mgr. and K7HDW, net control, assisted by KXJ, DWE and JET, with SLY, ISY and K7NDX as alternates. GMC is assistant e.d. director of Nez Perce County. Plans are being made for the Idaho RACES Hamfest in Boise June 3 and 4. Shelley hams are reorganizing the club. HAU, K7ENE, K7GHF, K7MNZ and K7NHA formed a bowling team. RKI told the Rotary Club about ham radio in the e.d. K7CXP explained GMT conversion to the Pocatello Club. The Magic Valley Club has classes in code and theory. K7LLA has a new son. Scholarships were awarded DHL to the U. of Cal. and WBK to the U. of Texas. OSH moved to Rupert. A new ham in Payette is KN7ORQ. Operating RTTY on 148.1 Mc. are EDP, JMH, IGK and HPH. Club prexies, please list your address with the SCM for mailings. The FARM Net handled 112 pieces of traffic with 807 check-ins in March. Traffic: (Mar.) K7KBY 78, W7GMC 42, GGV 40, VQC 27, JFA 16, EEQ 11, K7LGP 3. (Feb.) W7GMC 63.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ. PAM: YHS. RM: K7AEZ. The MPN meets M-W-F on 3910 kc. at 1800 hours. TSN meets Mon. through Fri. at 1200 on 7230 kc. MSN meets T-T-S at 1830 on 3550 kc. A new award is available from the Livingston Old Faithful Club for working 35 Montana counties. We also understand another certificate is coming out of Great Falls. K7NHV and K7LGV have dropped the "N." IBG is heard at his home QTH for awhile. CJB and JIZ are heard on 6 meters. Old Faithful Radio Club officers are BPF, pres.; TZY, secy.-treas. With regrets we report the passing of GIY, of Great Falls, a very fine man and one who kept 160 meters going here in Montana. K7CZQ reports a new club has been formed at Livingston. DCI and CDH have a new transmitter. K7LDZ is the new president of the Cathode Ray Radio Club. A speedy recovery is wished to UWY, who is in the hospital with a heart condition. We hear that VPY will be leaving for an overseas shift soon. The Havre gang says the Northcentral Hamfest will be held June 18, 1961. Traffic: K7BKH 299, DCI 220, DCH 64, W7TYX 52, K7EWZ 28, GHK 23, KJH 16, LDZ 15, GXB 8, IHA 8, W7IDK 6, YUB 6, TGG 4.

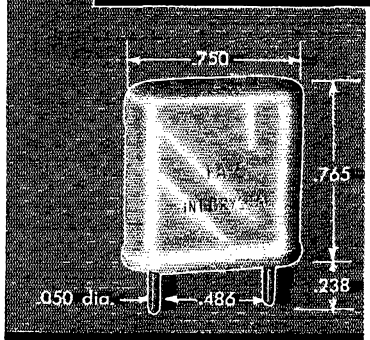
OREGON—SCM, Hubert R. McNally, W7JDX—AJN, our present RM, has been elected to replace yours truly as SCM. Everett has been on OSN for a long time and is very active and should make you a good SCM. As for the retiring SCM, it has been swell working with all of you and my only regret is that old man bursitis has made it impossible for me to keep on. I hope to get back on the air regularly after I retire from the Santa Fe Ry. on July 1 and to restore the many contacts all over the state and elsewhere. In the meantime, our traffic total has taken a big jump and all of our nets are working nicely. ZB and K7JWY made the BPL and AJN, BVH, MTW, ZFH and IWD made BRAT during March. K7KBK, DIC and others spent hours recently aiding an air search and rescue activity. K7IMH is active on 6 meters. K7CNZ is the new EC for Benton County, and K7DFU is the new EC for Deschutes County. ZB and K7IWD are new OPSs. A fine report was received from WKP on AREC activity. We believe this section had a very high AREC standing among all U.S. sections in 1960. This really should be my last and I am hoping the new SCM will be able to dictate and type the next one. 73 and best luck to all of you. Traffic: W7ZB 513, BDU 250, K7AXF 214, JWY 111, W7ZFH 72, K7KBK 46, W7MTW 43, K7IWO 41, W7DIC 26, DEM 21, DTT 15, K7HMJ 15, CLL 2.

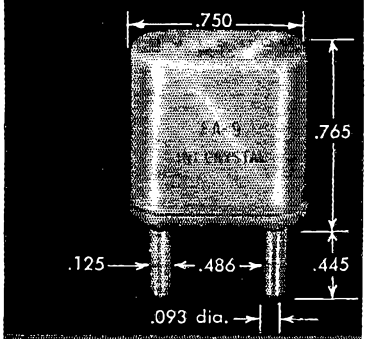
WASHINGTON—SCM, Robert B. Thurston, W7PGY—The Mt. Baker Radio Club has been reactivated and

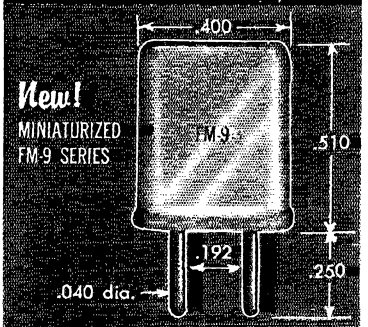
(Continued on page 114)

Amateur Crystals

1000 KC to 137 MC - .01% TOLERANCE







New! MINIATURIZED FM-9 SERIES

Wire mounted, plated crystals for use by amateurs and experimenters where tolerances of .01% are permissible and wide-range temperatures are not encountered.

Just any crystal in any oscillator will NOT combine to produce spot frequencies. These crystals are designed to operate into a 32 mmf load on their fundamental between 1000 kc and 15000 kc. Overtone crystals operate at anti-resonance on 3rd mode and series resonance on 5th and 7th mode crystals.

- **HOLDERS:** Metal, hermetically sealed. FA-5 and FA-9 are HC/6U pin type while the FM-9 is an HC/18U pin type.
- **FREQUENCIES** (Specify crystal type and frequency when ordering.)

	FA-5 and FA-9	Price	FM-9	Price
Fundamental	1000 - 1499 kc	$ 5.75	Not available	
	1500 - 1799 kc	$ 4.95	Not available	
	1800 - 1999 kc	$ 4.40	Not available	
	2000 - 9999 kc	$ 3.30	8000 - 9999.999 kc	$ 5.00
	10000 - 14999 kc	$ 4.40	10000 - 15000 kc	$ 5.50
	15000 - 20000 kc	$ 5.50	15001 - 19999.999 kc	$ 6.50
Overtone (3rd)	10 - 14.99 mc	$ 4.40	Not available	
	15 - 29.99 mc	$ 3.30	20 - 39.99 mc	$ 5.00
	30 - 59.99 mc	$ 4.40	40 - 59.99 mc	$ 5.50
Overtone (5th)	60 - 75.99 mc	$ 4.95	60 - 89.99 mc	$ 6.50
	76 - 99.99 mc	$ 7.15	90 - 100 mc	$ 8.50
	Not available		101 - 110 mc	$10.00
Overtone (7th)	100 - 137 mc	$ 9.35	Not available	

Overtone crystals are calibrated on their overtone frequency. They are valuable for receiver-converter applications and are NORMALLY NOT UTILIZED IN TRANSMITTERS, since only a small amount of power is available under stable operating conditions.

- **CALIBRATION TOLERANCE:** ± .01% of nominal at 30° C.
- **TEMPERATURE RANGE:** —40° to + 70° C. ± .01% of frequency at 30° C.
- **DRIVE LEVEL:** Recommended, maximum 3 milliwatts for overtones; up to 80 milliwatts for fundamentals, depending on frequency.

ONE DAY PROCESSING . . .

Orders for less than five crystals will be processed and shipped in one day. Orders received on Monday through Thursdays will be shipped on the day following. Orders received on Friday will be shipped the following Monday.

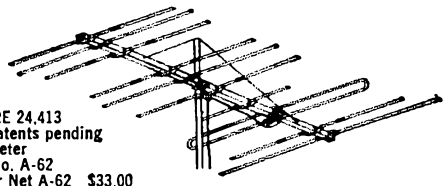
WRITE FOR 1961 CATALOG **FREE!**

INTERNATIONAL CRYSTAL MFG. CO., INC.

18 NORTH LEE • OKLAHOMA CITY, OKLA.

NOW!
TWO ANTENNAS IN ONE*

*another *FIRST* from *FINCO*



Patent RE 24,413
Other patents pending
6 & 2 Meter
Model No. A-62
Amateur Net A-62 $33.00
Stacking Kit AS-62 $2.19

The Only Single Feed Line

6 & 2 METER
COMBINATION YAGI ANTENNA

from **FINCO**®

- Heavy Duty Square Aluminum Boom, 10 Ft. Long
- All Elements are Sleeve Reinforced And Completely Pre-assembled With "Snap-Out" Lock-Tite Brackets
- Boom Suspension Rods Are Supplied Completely Pre-assembled, Ready To Be Snapped Into Upper End Of Mast

ON 2 METERS:
18 Elements
1—Folded Dipole Plus Special Phasing Stub
1—3 Element Collinear Reflector
4—3 Element Collinear Directors

ON 6 METERS:
Full 4 Elements
1—Folded Dipole
1—Reflector
2—Directors

A6-4 6 Meter 4 Element
Amateur Net $17.16
Stacking Kit AS-6 $2.19

A2-10 2 Meter 10 Element
Amateur Net $11.88
Stacking Kit AS-2 $1.83

A1¼-10 1¼ Meter 10 Element
Amateur Net $11.88
Stacking Kit AS-1¼ $1.26

See Your *FINCO* Distributor
or write for Catalog 20-226 to:

THE FINNEY COMPANY
Dept. 21, 34 W. Interstate St., Bedford, Ohio

meetings are held the 2nd Tue. of each month. Officers are EIL, pres.; K7HSF, vice-pres.; QGP, secy.-treas. and EIL, JWJ, QGP, K7HSF and K7HNI, trustees. The WARTS Picnic is scheduled for July 8 and 9, possibly at Lake Wenatchee, where it has been held in previous years. JTR has a new HX-500 transmitter and Commanche receiver. K7INP dropped the "N" from his call. K7IKP has returned to his old stomping grounds in Spokane. K7NLD has an Apache with an SB-10 s.s.b. generator. Nine clubs out of fifteen have ratified the constitution of the Puget Sound Council Amateur Radio Clubs (PSCARC). The Ray Johnson Co. donated two full-size beams for 10-15-20 meters to the Boeing Club of Seattle. KN7LUV really is knocking off the DX contacts and has received a Code Proficiency certificate for 35 w.p.m. KL7CCR/7, ex-W7RPZ, is renewing old acquaintances in Seattle. K7JRP has received confirmation of his 50th state. NNF has a new tower and rebuilt his quad. KN7s OFX and OFW are having a race to get WAS. K7IYR is working on a new quad. K7DFS and K7DFT, a husband-and-wife team from Missoula, Mont., recently moved to the Richland Area. K7COD/mobile, assisted by W7s JBH and ORK, obtained special Medical-Hospital attention for a Mount Vernon Boy Scout who received a broken leg while on a skiing outing near Mount Shuksan. The VARC had eleven successful Novices and two General Class licensees from its code and theory classes. RMJ was named FD chairman of the VARC to defend its National Championship. YFO is on a yearly roundup of all his AREC members in Benton County. DZX still is having rig trouble. MCU is home from the Coast Guard and tinkering with s.s.b. and f.s.k. K7KNZ is starting a new AREC net for Clark County and is looking for NCSs. OZY is covering the Whitman County Area for new AREC members. AFC joined the ranks of Silent Keys Mar. 29. At a recent meeting of the Tacoma Club the members made a trip to Pacific Lutheran University to view the closed circuit on TV. The club also will assist with the communications in the Daffodil Parade. K7AYD is chairman of the FD program for DK, the Tacoma Radio Club. BTB has a new tribander up and working FB. JC' purchased a Valiant and says he might go on phone after these many years. CWN says he is very QRL MARS. AMC is all hopped up over the Annual Hamfest to be held in Bremerton. The Lewis County ARC would like to compete in a contest with some other radio club in the state. Traffic: (Mar.) W7BA 1118, DZX 797, QLH 233, GYF 215, K7IEY 149, W7APS 125, K7MFF 121, W7KZ 112, AMC 68, K7NLD 64, W7YPW 53, JEY 39, USO 29, AIB 20, K7BBO 16, W7BTB 10, IST 5, OMO 4, JC 2. (Feb.) W7QLH 136.

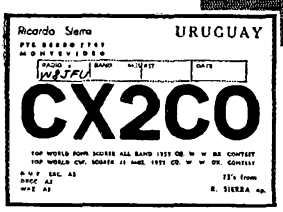
PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—The NARA had a fine talk by John Kleppe on "New Developments in Infra-red" at its March meeting. K7NFU and KN7OHY are new hams in Reno. K7KLY is making use of a Slide Mt. repeater. DEG is back in Reno. AHA and family visited in Elko. CJZ is building a DX-60. OIR was in an auto accident—no injuries, except the deer. KHU is active again and has been reappointed as an OO. BJY joins the Boulder City gang on 144 Mc. Your SEC, JU, had a perfect year for reports during 1960, but because of your SCM's oversight it failed to get reported in April *QST*. Traffic: W7KHU 31, K7CJZ 2, ETN 2.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—K6KEV married Dorothy Florence on Mar. 24 and sailed for a Hawaiian honeymoon aboard the *Matsonia*. On board was WA6ATC/mm. Dorothy has volunteered as chef for the Palo Alto Club's Field Day. The club plans to enter the five-transmitter class with a well-organized schedule for all operators. WA6HVN will be in charge of SCCARA's Field Day. W6UW, the SCCARA station, is activated each Thurs. night. New gear, new antennas and operator scheduling add up to fun for all. K6BBD is station trustee. W6DFL, K6DMW, K6GID, WA6GQE, WA6GGX and W6IGE keep their f.m. rigs hot and receivers open on 145.45 Mc. It's a sort of continuous round table. K6HCP works 6-meter s.s.b. on a regular schedule at 1600 GMT Sat. and Sun. W6AUC keeps regular skeds with his brother in W4-Land on 20-meter c.w. WA6KRG has a new Hy-Gain vertical. W6YHM has his RTTY set up in full operation. K6GZ has returned to RN6 as regular APO liaison. K6BBD has his BS degree in industrial management and finds a little more time for the hobby. Traffic: K6KCB 456, WA6OLQ 211, W6YBV 132, W6DEF 121, W6AIT 104, WA6OAQ 91, K6GZ 84, W6FON 82, W6YHM 57, K6VQK 54, W6HC 52, W6AUC 45, K6YKG 34, W6ZLO 24, WA6KRG 17, W6OII 11, W6PLG 6, K6EQE 3, K6SMH 2.

EAST BAY—SCM, B. W. Southwell, W6OJW—SEC: K6DQM. ECs: K6TYX, K6VXK, K6ESZ, W6FAR,

(Continued on page 116)



"better, more consistent QSO's"

. . . writes Ricardo Sierra, CX2CO, of his Electro-Voice Model 664 Dynamic Microphone

CX2CO, one of the world's top rated phone DXer's, writes us that his new E-V Model 664 microphone has resulted in *"better and more consistent QSO's."* Considering his DX record—over 270 countries—this is indeed quite a statement. He adds that, even under *"severe conditions of propagation and interference"*, most contacts report *"normal reception and 100% understanding"* of his transmission. This, CX2CO claims, is due in large measure to the improved modulation provided by his new 664 mike.

Letters such as CX2CO's justify the advanced engineering of the Electro-Voice Model 664. Utilizing the *exclusive* Variable-D® design, this fine microphone provides highly directional sound selectivity and reduces pickup due to ambient noise and reverberation by 50%! VOX operation with the 664 is smooth and reliable. Its greater pickup range actually doubles the conventional working distance. And, best of all, uniform response of the 664 guarantees maximum peak effective radiated power.

See this fine microphone at your Electro-Voice distributor—today.

TECHNICALLY SPEAKING: Variable-D Dynamic design of the Model 664 incorporates multiple sound openings to the back of the diaphragm—one each for high, low and mid-frequencies. Response is completely free of dips and peaks with uniform cancellation of sounds, echoes, or reverberations from rear of microphone.

Pop-proof wire mesh grille minimizes wind and breath blasts. Output level -55 db. Rugged, exclusive E-V Acoustalloy® diaphragm unaffected by moisture, humidity, temperature, and mechanical shock. Convenient ON-OFF switch easily converts for relay control, if desired.

Model 664 (without stand)
Amateur Net Price: $51.00

Model 664 (with Model 419 Desk Stand)
Amateur Net Price: $57.00

Electro-Voice®

Commercial Products Division
ELECTRO-VOICE, INC.
Dept. 612Q Buchanan, Michigan

THE VHF AMATEUR

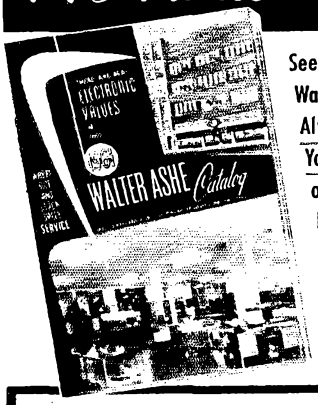
A full-sized magazine printed only for the VHF enthusiast! All phases of the hobby: 6 meters, 2 meters, 220, 432, and 1296 mc, including a regular VHF SSB column, Moonbounce column, and report on South American VHF Activity edited by LU3DCA.

Our May issue, for example, contained **40 pages** including—"10 watt 6 Meter Transmitter" by the Radio Society of Harrison, New Jersey (K2IAP); an article on Satellite Scatter by K2QBW; Propagation Forecast; "2 meters with an 829B" by K1CXX; "Customizing your SIXER" by WA2GBW; "VHF Combine" by WA2CWA; "Rabbit Ears for 6"—a revolutionary approach to an old idea; plus a regular running W.A.S. column, free "Trading Post", pages after pages of pictures, an Author's Contest, APX-6's and where to get them and countless other articles of worthy note.

Subscriptions—**$2.00** for a full year (12 issues), **$5.00** for three years (36 issues). If you like, just drop a quarter in an envelope for a sample copy. Editor-Publisher—Bob Brown, K2ZSQ.

THE VHF AMATEUR, ***Dept. 2A, 67 Russell Avenue, Rahway, New Jersey***

We Trade Higher!



See How Walter Ashe Always Saves You More on Amateur Equipment, Hi-Fi Systems, Parts and Supplies . . . everything you need!

FREE NEW 144 page Walter Ashe Catalog

Get our "Surprise"* Trade In allowance on any new 1961 equipment . . . yours on Walter Ashe's famous E-Z Terms! Ask for our reconditioned list, too!

*On Xmitters and Receivers made since 1945

RUSH COUPON—You'll hear from us double quick...

Phone: CHestnut 1-1125

WALTER ASHE RADIO CO.

Dept. Q-6-61, 1123 Pine St. • St. Louis 1, Mo.

WALTER ASHE RADIO COMPANY
Dept. Q-6-61, 1123 Pine Street, St. Louis, Missouri

I am interested in_____

What is the Ashe "Surprise" allowance on_____

_____

Name_____

Address_____

City_____ Zone____ State_____

☐ Send 1961 Catalog ☐ Send Reconditioned Bulletin

W6WAH and K6HTJ. KØGEY/6 is located at the missile site in the Bay Area and is going on 144 Mc. WA6LVX/6 is a new ORS in Angwin and made BPL for Jan. and March. Congrats. OO W6IDY reports that some s.s.b. operators are not identifying properly. W6NBX is getting some 50-Mc. gear together. Traffic outlets are needed for NCN in the Vallejo and Travis AFB Areas. If interested, drop a line to W6NBX, RM, at 2110 McKinley Ave., Berkeley, Calif. WA6NFI has a new Globe Scout 680-A and is going on 144 Mc. with high power. W6FZC is wiring control circuits for his RTTY gear and antenna-equip patch panel. The EBARC met Mar. 10 at John Hinkel Park. W6CUS, club station, has a five-element beam. WA6LVX/6 is attending Pacific Union College in Angwin. WA6KLL and WA6KIT are new members of the LARK. The MDARC held its annual auction Mar. 17. The HARC's TVI Committee received a nice letter from the FCC office regarding its efficient TVI cooperation. WA6HGO has a five-element 50-Mc. beam with 50 watts. WA6DJD is recovering from a back injury. Get well quick, OM. W6UUE is in the hospital with a bad knee. WA6IMC lost his antenna because the retotiller cut the guy wires. WA6ONO still is heard on c.w. while awaiting his new DX-60. K7IDH/6 has opened a new office in Hayward. W3WAU/6 has an all-new station setup. K6JZN is working with the Heart Fund campaign. Good work, OM. W6VKR was a visitor at the HARC. EC K6VXK is the new chairman of the HARC's club paper. K6QLF has a Viking Valiant, a Matchbox and an SX-71 receiver. W6ALY has an ART-13 and an SX-42 receiver. W6NBL's XYL is in Herrick Memorial Hospital. Traffic: (Mar.) WA6LVX/6 488, W6NBX 167, K6GK 125, K6ZYZ 64, WA6NFI 33, WA6MIE 2. (Feb.) WA6LVX/6 231. (Jan.) WA6LVX/6 219.

SACRAMENTO VALLEY—SCM, George R. Hudson, W6BTY—SEC: K6IKV. ECs: K6BNB and K6GOT. ORS: W6AF. PAM: W6GQS. OOs: W6WLI, W6GDO and K6ER. ORS: W6CEI. OES: W6PIV. OPSs: K6EIL, W6PIV and W6GQS. The SCM will welcome reports from the many clubs throughout the section with reference to their elections, meeting times and places and activities. This month we spotlight the Northills Radio Club which, its president says, is the smallest but one of the most lively of the ARRL groups in the Valley. Officers are K6TWE, pres.; W6ISX, vice-pres.; W6QYJ, secy.; W6VEZ, activities. The club is knee-deep in Field Day planning and expects to make a big splash from Grouse Ridge this year. The club meets the 3rd Tue. of each month at the Fair Oaks Community Clubhouse. Your SCM attended the Pacific Division Director's meeting Apr. 8 and learned of the visit of ARRL Secy./Gen. Mgr. Huntoon to Sacramento in June. Check with your local radio club president for the exact date, time and meeting place. We are fortunate to have such a man address us, so let's all turn out and give W1LVQ a big welcome. W6EAG spoke to the South Sacramento Exchange Club recently. W6BNK is on the air with a KWM-2 and the trimmings and expects to put up his new G4ZU beam soon. Congrats to WV6PWV on her new ticket and 13th birthday. WA6CJU now is working 80-meter c.w. but is getting a new Ranger and a TO keyer soon. W6WLI now has RTTY perking. W6AF transmits Bulletins on 14,090 kc. at 0130Z. K6ER is having plate-power transformer troubles. W6QYX is active in the Golden Empire Emergency Net on 1980 kc. Traffic: WA6CJU 19, K6EIL 6, K6YZU 3.

SAN JOAQUIN VALLEY— SCM, Ralph Saroyan, W6JPU—The Tuolomne Amateur Radio Club holds code and theory classes every Wed. night from 7:30 to 9:30 at the c.d. office. The Tuolomne Radio Club also is accumulating radio parts for OH8OP, who is an exchange student, in order to build up a transmitter. Anyone who has something good, send it to Box 186, Jamestown, Calif. K6ROU worked 7 new countries in March. W6EFB has a 54-ft. crank-up tower with a 20-meter beam. The NCN is looking for outlets in the Modesto, Merced and Yosemite Areas, 3635 kc. K6OZL is running 300 watts on 75 meters. The Tulare County Radio Club has changed its meeting nights to the 4th Fri. The SJVN had 27 sessions, 446 check-ins and a traffic count of 100. W6UBK is putting up a new 80-meter antenna. W6SMS has a 6N2. W6NKZ is running a 3-phase power in his mobile with 100 watts. W6FXV has a new car and a new 6146 rig for mobile work. WA6PKI has now worked 13 states. W6MXR is heard on 75-meter mobile. W6JXY has a new HT-37. K6ZCD is having meter problems. W6EPB changed all filters in his final power supply and is back on the air. K6BKZ is rebuilding his NC-200 for s.s.b. K6GTI got his mobile receiver working. W6SEV is on 40-meter s.s.b. with a 10A. W6KOC is back in Fresno, attending Fresno State College, and is on the air with a KWM-2. W6JPS is back on 75-meter mobile. Traffic: K6ROU 207, K6OZL 127, K6EJT 60, W6EFB 34, W6ARE 24.

(*Continued on page 118*)

To the hundreds of Hams who have taken the time to write, we at EICO can only say...

FROM THE BOTTOM OF OUR HEARTS, THANK YOU

We promise to continue to do all in our power to merit your approval.

Milton Stanley
3909 High View Rd.
E. Peoria, Illinois

Electronic Instrument Co., Inc.
3300 Northern Blvd.
Long Island City 1, N. Y.

Dear Sir:

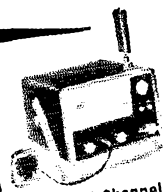
When I saw your Model 720 Transmitter on display, it looked so good that I decided to purchase a 720 kit. I put it together in five evenings. The instruction book is so well written that any beginner can build this kit with no trouble at all. When I put the 720 on the air for the first time, I called CQ and a station in Munising, Mich. answered me and gave me a 599 report. In two months I had worked 37 states with a single wire antenna about fifteen feet off the ground.

All stations worked gave me a good report. I was so pleased that I purchased an EICO Model 730 Modulator. Results were equally good. I have worked 44 states and Canada on phone with the 720 and 730. All reports I get are very good. The clipping level control and the over modulation indicator helps make the EICO 730 Modulator the best buy for the money and I personally believe the EICO 720 Transmitter is the best 90-watt rig on the market. The EICO 720 and 730 together make an all around rig that is hard to beat. I am so well pleased with the quality of EICO kits that I am looking forward to building more of your products. I highly recommend EICO kits to beginners as well as the old timers.

Sincerely,
Milton Stanley
MILTON STANLEY, K9VJH

90-WATT CW TRANSMITTER* #720
Kit $79.95
Wired $119.95
*U. S. Pat. No. D-184,776
"Top quality" — ELECTRONIC KITS GUIDE. Ideal for veteran or novice. 90W CW, 65W external plate modulation. 80 through 10 meters.

NEW! 60-WATT CW TRANSMITTER #723
Kit $49.95
Wired $79.95
Ideal for novice or advanced ham needing low-power, stand-by rig. 60W CW, 50W external plate modulation. 80 through 10 meters.



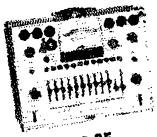
CITIZENS BAND TRANSCEIVERS
Single and Multi Channel Models Available.
From Kit $59.95 Wired $89.95

HIGH-LEVEL UNIVERSAL MODULATOR-DRIVER #730
Kit $49.95 Wired $79.95
Delivers 50W undistorted audio. Modulates transmitters having RF inputs up to 100W. Unique over-modulation indicator. Cover E-5 $4.50.

GRID DIP METER #710
Kit $29.95 Wired $49.95
Includes complete set of coils for full band coverage. Continuous coverage 400 kc to 250 mc. 500 ua meter.

PEAK-TO-PEAK VTVM #232 & *UNI-PROBE®
Kit $29.95 Wired $49.95
VACUUM TUBE VOLTMETER #221
Kit $25.95 Wired $39.95
*U. S. Pat. No. 2,790,051

COLOR & MONO DC-5MC LAB & TV 5" OSCILLOSCOPE #460
Wired $129.50 Kit $79.95
5" PUSH-PULL OSCILLOSCOPE #425 Kit $44.95 Wired $79.95



DYNAMIC CONDUCTANCE TUBE & TRANSISTOR TESTER #666
Kit $69.95 Wired $109.95
TUBE TESTER #625
Kit $34.95 Wired $49.95

RF SIGNAL GENERATOR #324
(150kc-435mc)
Kit $26.95
Wired $39.95
TV-FM SWEEP GENERATOR & MARKER #368
Kit $69.95 Wired $119.95

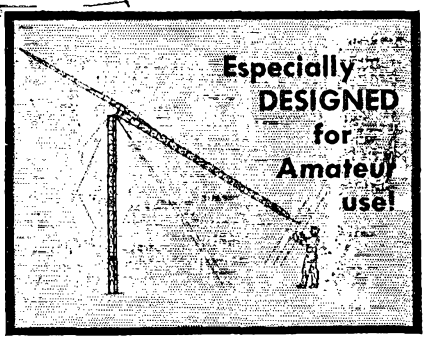
EICO®
3300 Northern Blvd.
Long Island City 1, N. Y.

EICO, 3300 N. Blvd., L.I.C. 1, N. Y.
☐ Send free Catalog & name of neighborhood distributor.
☐ Send free "Short Course for Novice License." ☐ Send 36-page STEREO HI-FI GUIDE: 25c enclosed for postage & handling.

QST-6
Name.....
Address.....
City.....Zone.....State.....
Add 5% in the West.

ENGINEERS: Excellent career opportunities in creative electronics design. Write to the Chief Engineer.

ROHN "fold-over" TOWERS*



first IN DESIGN *foremost* IN SALES

ROHN "fold-over" towers are ESPECIALLY made for amateur use. They are the most practical tower in design because they allow you to work ON THE GROUND for antenna maintenance and servicing. You'll quickly agree that this is a most wonderful feature for an amateur tower. In addition, these towers are made and designed for true, heavy duty use. They are structurally sturdy for use up to 70 feet and in enough sizes for *all* types and sizes of amateur antennae. This means that they can easily handle your requirements. They have unexcelled workmanship. They are hot-dipped galvanized after fabrication which means you have no problem of maintenance. They come as a complete package with all materials and accessories included. Add all these wonderful features together and you see why they're the most demanded tower today! Priced from $186.

FREE literature and near source of supply gladly sent. Be Sure you investigate ROHN towers before buying!

*Patent—2,875,865

ROHN *Manufacturing Company*

Box 2000 • **Peoria, Illinois**

"World's largest exclusive manufacturer of TV-Communication towers"

Are You

TRADING?

Let me make you a trade-in offer on your used amateur equipment. All name-brand merchandise—late serial numbers assured. Quick delivery.

WRITE TODAY! Bill W9ZSO-KØIUH

COMMUNICATIONS EQUIPMENT CO.

518 State St., LaCrosse, Wis.

Phone 4-7373

ROANOKE DIVISION

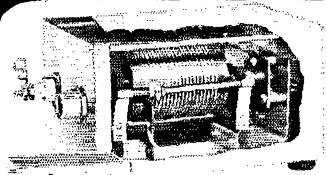
NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: W4DRC. V.H.F. PAM: W4ACY. RM: K4CPX. The Tar Heel Emergency Net has been reorganized, with W4EYZ replacing W4QC as net manager. W4DLH replaced W4TJA as net secretary. K4CPX has been appointed Route Manager and I am sure he will do an excellent job. He informs me that there is a need for outlets in many towns. C.w. operators are advised that the NCN operates on 3547 kc. beginning at 6:30 P.M. The Tar Heel Net can use outlets in many places. If your town or county is not represented, please try to check in on one of these nets. The phone net meets on 3865 kc. at 7:30 P.M. W4CPI, of District 8-A (Winston-Salem, Forsythe County), sends a very interesting report on local AREC-RACES activity. These boys are doing a swell job with their service to the community. Other ECs should contact them to get some excellent ideas. W4BAW, EC for AREA 2-A, reports they have 81 AREC members with 75 full members, 6 mobile units and 3 emergency units. I would be happy to hear from other ECs as regularly as I do from W4BAW. Some of the traffic men want to see traffic listed. Others raise ned when I do. So I catch it either way. I can't win. BPL medallions are issued automatically by ARRL. Traffic: (Mar.) K4CPX 285, W4BAW 110, W4UGI 43, K4YCL 36, K4FUN 15. (Feb.) K4FUN 54.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. PAM: K4IIE. RM: PED. W4CXO has a new linear on HT-32A using three-811s. C.d. 3-meter activity is booming around Columbia. W4CPX and W4VIW are on 6-meter s.s.b. K4JXZ is EC for Florence. W4TWW has been re-endorsed as OBS. The Charleston ARC, with K4YBG as president, entertained W1BDI on his recent visit. The Mike & Key Club of Greenville had a class of seven to take the Novice exam.; the club has 26 members—all busy with F.D. plans. K4PIK is looking for contact on 20 meters back into S.C. K4KIT has earned his section net certificate on SCN; W4PED was endorsed as ORS. At the SCN meeting in Columbia Mar. 9, W4KNI gave a report of traffic for the past year; K4ZHV was elected new net manager; K4AII and W4HMG discussed RACES; W4GQV discussed League affairs along with PAM, RM, K4CPX-RM from North Carolina, and AVU, net manager of 4th region net. W4HNW has shown great interest in emergency traffic. KN4NVX is interested in becoming OES and K4VVT in OO. Traffic: W4AKC 129, K4AVU 111, K4HDX 73, W4FFH 71, W4ANK 65, W4VIW 52, K4BRP 47, W4CHD 22, K4HJK 20, W4SME 19, W4TWW 18, W4CXO 12, W9QNT/4 2.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—SEC: W4VMA. PAM: W4BGP. RMs: W4LK, K4MXF, K4KNP and W4QDY. March brought forth a couple of changes in our section leadership appointments. W4VMA, who was the EC of Hampton Roads Peninsula, is now our new SEC. W4LK is the new VN Manager, taking over from K4QER, who has resigned. Ann did a nice job as VSN mgr. and later as VN leader. The Roanoke Club sent in AREC applications from 37 of its people!! This is great and now we need an EC to take care of this group! The club has 60 full members and 14 associates. The following clubs publish their own club papers: Roanoke, Lynchburg, Tidewater and Alexandria. The TMRC ran a contest for a name for its paper, which K4IAJ won with the name *The Tidewatter*. Incidentally, our section rose to 4th place in the national standing with AREC! We lost the services and presence of K4LPR, who was transferred to Philadelphia, Pa., on a new job assignment. New appointees: K4UVT and W4TE as ORSs; K4PQV as OPS; W4CBM as EC (Pulaski Area). K4UVT is our new NCS on the Sat. VSN session. We now have a new net—The Va. S.S.B. on 3925 kc. daily at 2100 EST. K4JQO is the acting mgr. K4MXF reports 6 new countries for DXCC 113. W4CXQ is leaving for the USN. One of our ORSs suggests that the new s.s.b. net follow VFN on same frequency as he misses the late session of VN and the Va. Ham. Anyone with ideas? K4LTK reports a new General Class licensee in Hopewell, K4VBW. W4JUJ now has YLCC 300 and received the award as the top Virginia scorer in the Kansas Centennial QSO party. Traffic: (Mar.) K4VDU 718, W4PFC 525, K4MXF 186, W4CXQ 155, K4FSS 150, W4LK 127, W4QDY 119, K4PQV 84, W4OOL 70, W4IA 59, K4KNP 43, K4PQL 36, W4RHA 34, K4AL 33, K4UVT 30, W4WO 30, K4JQO 21, K4FMJ 19, K4YZT 18, W4BGP 15, K4ARO 14, W4TE 13, W4KX 11, W4BZE 10, W4FOR 10, W4DLA 8, K4LTK 8, W4AAD 6, W4OWV 6, K4LPR 4, W4WBC 2. (Feb.) W4FOR 307.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—The West Virginia Hamfest will be held at Jackson Mill on July 8 and 9 with VMP, of South Charleston, as general chairman. Better make plans to attend. The

(*Continued on page 120*)



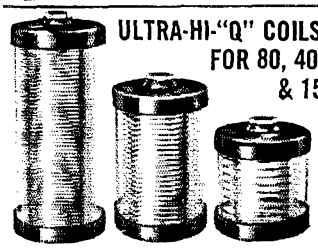
6 or 12 volt models

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"

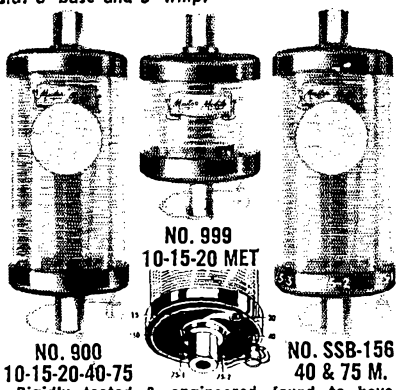
Positive action, just slide whip in or out to loading point and lock nut into position.

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

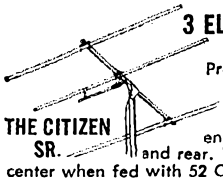
Folded radiating element for installation requiring a ground plane configuration and a wider useful range.

11 Met. . $24.50
10 Met. . 24.50
6 Met. . 16.95
2 Met. . 14.95

SR-600

3 ELEMENT 11M. BEAM

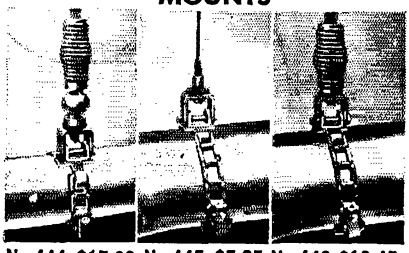
NO. SR-500



THE CITIZEN SR.

Provides a power gain of approx. 5 (7DB) in forward direction. 10 to 1 interference reduction from sides and rear. VSWR-1. 1 to 1 at band center when fed with 52 OHM coax. . . **$36.00**

MOUNTS



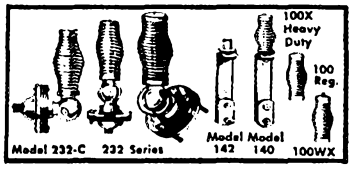
No.444 $17.80 No.445 $7.95 No.446 $13.45

Adjustable to any bumper. No holes to drill.

UNIVERSAL MOUNTS

Heavy-duty communications antenna mounts. Either mount can be attached through openings as small as 3/16". Receptacle for spring or whip with phenolic insulators. 3/8"-24-thread.

MM530 Deluxe Dbl. SS.. $21.95
MM531 Deluxe Sgl. SS... 11.95
MM520 Dbl. St-Cad. Pl... 7.95
MM519 Sgl. St-Cad. Pl... 4.95



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

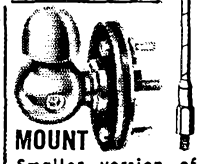
Gets your signal through where others fail. Concentrates signals at the lowest angle, provides omni-directional pattern for best coverage. Matches RG 59/U Cable. SM-700

11 Met. . . .	$17.95
10 Met. . . .	17.95
6 Met. . . .	15.95
2 Met. . . .	10.95

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**



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**

WRITE FOR FREE CATALOG

All products are for Universal Use-Mobile, Home, Marine, C.A.P., Civil Defense, Emergency, etc.

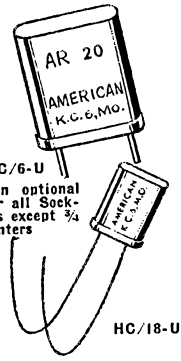
EIA ELECTRONIC INDUSTRIES ASSOCIATION

Master Mobile Mounts, Inc.

4125 W. JEFFERSON BLVD. • LOS ANGELES 16, CALIF.

AT LEADING RADIO JOBBERS EVERYWHERE

* TWO-WAY * COMMUNICATION CRYSTALS



HC/6-U
Pin optional for all Sockets except ¾ centers

HC/18-U Subminiature

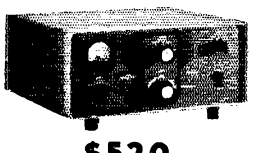
UNCONDITIONALLY GUARANTEED
FAST SERVICE

American specializes in two-way communications. Frequency correlation data for G.E., Motorola, R.C.A., Collins, Globe, Johnson, Lear, Narco, Hallicrafters, Link, Gonset, Heath, Bendix, Aerotron, U.S. Gov't. and many other companies. *Include postage with order.*

FREQUENCY RANGE	CALIBRATION TOLERANCE	PRICE
3000 KC to 9999 KC	.002%	$3.50
15 MC to 30 MC TM	.0025%	$3.50
30 MC to 50 MC	.0025%	$4.00
10 MC to 17 MC Fund	.002%	$4.00
2001 KC to 2999 KC	.002%	$4.00
50 MC to 60 MC	.0025%	$6.00
1000 KC to 2000 KC	.002%	$7.50

Write for quantity discounts —

AMERICAN CRYSTAL CO.
P.O.BOX 2366 • KANSAS CITY 42, MO.



ORDER YOUR
NEW COLLINS
30L-1 Linear
$520 NOW

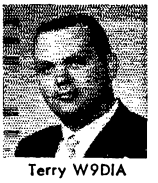
FROM ME AND INSURE EARLY DELIVERY — TOP TRADES AND FINANCING OFFERED, says Steve, W9EAN

Send for your FREE complete list of all used amateur equipment now on hand


Steve W9EAN

Be Sure to Get Our Top Trade-In Allowance Before Trading ... Free Used Equipment Lists.

Also see Collins KWM-2 at Harris Radio Corporation Fond du Lac, Wisconsin on Fri. 7–9 Sat. 9–3


Terry W9DIA

AMATEUR ELECTRONIC SUPPLY
3832 W. Lisbon, Milwaukee 8, Wisconsin
Phone: WEst 3-3262

WVN C.W. Net publishes a swell *Newsletter* to net members. The Blennerhassett Radio Club has received its club call, K8YOI. Three members have received General Class licenses: K8UZX, K8VAH and K8JJG. New Techs. are K8PSN, K8UEH and K8VAI. New Novices are KN8YFK, KN8YGZ, KN8YBQ, KN8TZZ and KN8UNK. GWR is mobile and operates frequently from Ritchie Co. K8CSG, VMP, K8BIT and TVO visited the East River ARC. K8UJO, editor of the East River ARC Bulletin *Static* is located in California. SSA, SEC for West Va., needs more AREC members. GIU, editor of the Elkins Radio Club and the members publish a very constructive Bulletin each month. The Kanawha Radio Club states "they plan to win the '61 Field Day. Anyone interested in taking them on? With plenty of know-how, WHQ and PQQ are finding DX on 3.5 and 7 Mc. V.h.f. activity is increasing by leaps and bounds throughout the state, with Clarksburg, Parkersburg, Charleston, Weirton, Wheeling reporting active nets. Traffic: W8NYH 79, WUB 68, K8CNB 39, W8QXS 21, UYR 12, K8JLF 8, JSX 4, W8ESH 2.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: SIN. PAMs: CXW and IJR. RMs: MYB and WME. OBSs: KØDCC and KØEPD. Send news and reports to 920 W. Adams. The new Denver Metropolitan Area EC is KØOVQ. HNN established a QNI record on Mar. 25 of 53. WYX and DCW were 1st and 2nd winners of the Rocky Mountain Canary Award. The Denver Hamfest is to be held July 16 and the Pueblo Amateur Radio Hamfest June 3 and 4. CGQ reports that the BARC membership now exceeds 70. WOP and WOQ, new Greeley hams, are reorganizing the Greeley Club. EC CEZ is writing an AREC Disaster Manual for Boulder County. VLS (the XYL of your SCM) got her commercial 1st-class phone ticket in March. NIT was speechless when the PARA presented him with a clock and timer for 28 years of amateur service. IA handled 1826 WX messages in March. WWJ is preparing a 500-watt final. YLA, *CTVN* editor, says they could use some more subscribers. MNQ reports a 2-meter contact between Thornton and Colorado Springs. SIN and others participated in the Denver Easter Parade for Crippled Children. Traffic: KØWWD 884, QGO 334, IIT 328, WØBES 314, FEO 138. KØDCW 112, WØMYB 54, KØQAN 47, WWJ 35, WØCBI 33, KØRTI 16, EVG 14, WØIA 3, KØMNQ 2, WØSIN 2.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: Col. John H. Sampson, 7OCX. SEC: K7BLR. ØFVD/7 found a lucrative position in WØ-Land and has left a hole in the state's traffic-handling chores. March was a good month for the Beehive Utah Net. BRAT awards went to OCX, QWH, JQU, K7s IMB, COM and IVQ. OCX also earned the BRAT Award on TWN. It has been suggested that BUN be run on GMT. Plans for the Rocky Mountain Division Convention have been completed and it promises to be a big affair. A program of top-notch speakers has been arranged. Entertainment for XYLs and children has been arranged. Remember the date: June 16-18. See announcements elsewhere in this magazine for further details. Traffic: K7NWP 468, W7OCX 133, QWH 21.

NEW MEXICO—SCM, Newell F. Greene, K5IQL—Asst. SCM: Carl W. Franz, 5ZHN. SEC: BQC. PAM: ZU. V.H.F. PAM: FPB. RM: ZHN. The Breakfast Club meets Mon. through Sat. at 0630 MST on 3838 kc. NMEPN meets Tue. and Thur. at 1800 and Sun. at 0700 on the same frequency. The NMBP meets Mon., Wed., Fri. at 1900 MST on 3570 kc. Our Vice-Director, OCX, was a visitor in Albuquerque and met with the Caravan Club and the RATTS. LEF and party trekked to the Four Corners where one can operate /5/7/Ø all at one time. K5ZCA hopes the DX on 40 meters will come back to his new Invader. VC has a new Zeus on 6 and 2 meters with a potent signal. Don't forget the Rocky Mountain Convention in Ogden June 17-18. How about more reports? Traffic: W5ZHN 512, UBW 106.

WYOMING—SCM, Lial D. Branson, W7AMU—The pony Express Net meets Sun. at 0830 MST on 3920 kc.; the Wyoming Jackalope Net 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. Wyoming Hamfest dates will be July 22 and 23 at Deer Haven in the Big Horn Mountains between Buffalo and Worland, Wyo. AXG of Basin, Wyo. who was 83 years old, passed away on Mar. 30. The funeral was held at Basin on Apr. 3. He had been a ham for about 35 years. The XYL of NNX is on the sick list. ØOII and K7MEX/Ø were visitors at the Casper Radio Club meeting on Apr. 4. K7MAT skeds CX2CX, Montevideo, Uruguay, on 10 meters. The Cheyenne Radio Club publishes

(*Continued on page 122*)

A 30-SECOND QSO

QRA?

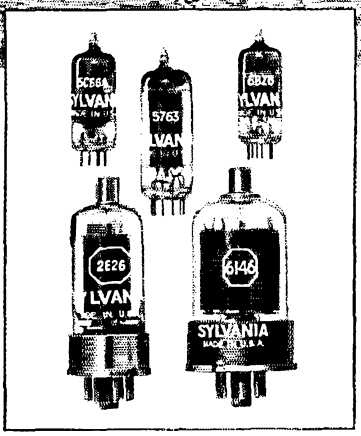
SYLVANIA

QRU?

POWER TUBES

QTH?

YOUR LOCAL DISTRIBUTOR



. . . right, your local franchised SYLVANIA INDUSTRIAL TUBE DISTRIBUTOR is geared to fast service, prompt delivery of SYLVANIA POWER TUBES. Popular types are immediately available. Insist on SYLVANIA.

Industrial, military, broadcast, and aviation communications men have been relying on SYLVANIA TUBES for years for solid copy. Get them into your sockets today!

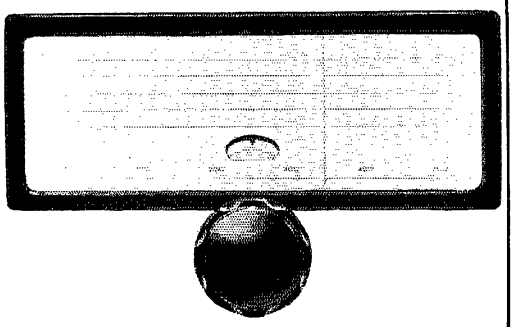
SYLVANIA

SUBSIDIARY OF

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

EDDYSTONE



GEARED SLOW MOTION DRIVE

For Amateur Radio & Communications

RECEIVERS & TRANSMITTERS

A high grade assembly, flywheel loaded, manufactured to fine tolerances, provides a smooth positive drive with a reduction ratio of 110:1. The vernier with its 100 divisions rotates 5 times for one pointer traverse, giving 500 divisions with positive reset readings. A cam adjustment on the vernier assures correct zero setting. A spring loaded jockey arm maintains tension of the pointer drive. Overall dimensions 9⅜/₁₆" x 5¾".

Manufactured by
Stratton & Co., Ltd. (Eddystone)
Birmingham, England

PRICE $16.50 NET
Postpaid

Distributed by
BRITISH RADIO ELECTRONICS, LTD.
1833 Jefferson Place, N.W.
WASHINGTON 6, D. C.

Looking for A-1 Reconditioned EQUIPMENT?

LARGE STOCKS?
LOWER PRICES?
FREE TRIAL?
GUARANTEE?

HENRY HAS IT!

Equipment at both Henry stores may be traded back in 90 days at full price on new equipment. Our time payments save you money because we finance ourselves. Write, phone or visit either Henry store to get better equipment at less cost on better terms.

Henry **Radio Stores**

Butler 1, Missouri
ORchard 9-3127

11240 West Olympic Blvd.
Los Angeles 64 Ph GRanite 7-6701

a *Ham-Gram* each month which is very interesting. Traffic: W7DXV 112, BHH 96, HH 34, YWW 32, K7IAY 23, KLE 20, W7LKQ 19, JHO 11, AMU 10, K7CQX 10, W7GSQ 9, BXS 8, K7GDX 8, W7ABO 7, AEC 6, ION 6, K7AHO 4, W7BKT 4, K7HAW 4.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ—SEC: K4JDA. RM: W4RLG. PAMs: K4PHH, K4BTO and W4JJX. New appointments: K4YUD as ORS; K4DSO as OPS; W4WGI and W4CAR as OESs; W4DS as OBS. We regret that W4BEP has joined Silent Keys. K4YUD, AENS mgr., welcomes new members K4NNR and K4UEV and thanks NCSs K4DAB, K4OCV and W4YFN. The AENS is the Madison County Emergency Net and meets each Sun. at 1330 CST on 3825 kc. W4BMM has been appointed RACES Officer for Cullman County. W4DS has a new 75-meter antenna. K4KHC reports the Muscle Shoals ARC is preparing for a big hamfest in the Tri-Cities Aug. 20. K4RCA has a new SB-10 on the air. K4WHV and his dad, K4WHW, are having loads of fun on 15-meter c.w. and phone. K4MIR has been appointed Asst. EC for Chambers County. K4SAV has received A-1 Operator and 30-w.p.m. CP certificates. W4USM reports new officers of the Gadsden ARC are K4KRA, pres.; Fred Bauer, vice-pres.; W4EBO, secy.; K4KQH, treas.; K4YFU act. mgr. K4KDE and KN4NJA are attending the Birmingham ARC traffic class conducted by W4ATK. K4GXS says, "Grounding switches are no good unless you use them." K4YTT has a DX-40 and an HQ-160 and is a new member of AENP. AENT broke all previous attendance records in February. K4ZXX won first prize in the recent AENT Contest. Other winners were K4DJJ, K4SAV, W4OQG, K4CMZ, W4MKX and K4KDF. Congrats to K4UDK and W4OQG on receiving AENB Net certificates. Alabama was 100 per cent on RN5 during January and February. W4SEZ now is QNI RN5 Wed. K4GOW is building a kw. amplifier, an exciter and 250-watt mobile. K4TRJ reports a new General Class licensee in Jasper, K4PRE. K4TRJ has built a 20-watt mobile rig for 80-10 meters. Birmingham ARC was honored Apr. 14 by a visit from W1BDI, ARRL Communications Manager. K4DSM made RCC. K4UPI works 15- and 20-meter s.s.b. with a 20A and 4/125 final at 500 watts using an HQ-129X receiver. W4TOI is building a power amplifier with four 814s for all bands. W4CIN is now on 432 Mc. W4WGI is building a 432-Mc. tripler and final amplifier, also a 144-Mc. "Long John." K4BFF was home on leave from the Navy. W4UAR reports a new station in Anniston, WA4AEP; also that those interested in 2 meters meet each Tue. at 1930 CST on the air. Congrats to the new Springville ARC, and the Springville Novice Net, which meets daily except Sun. on 3725 kc. at 1600 CST. Net members are KN4WSK, KN4NUW, KN4NSD, KN4BRZ, WN4ADQ, WN4ABX, W4OXU, K4WVD and K4YUD. W4OXU reports 3 more awaiting Novice Class licenses. *Six-Meter News:* AENO welcomes new members K4ZKG, K4EEA and W4PNC. K4UMD is attending code classes at the YMCA. K4ZNI reports a new c.d. 6-meter net in Dothan. K4FJZ has a new 6-meter Halo and reports the Auburn 6-Meter Emergency Net furnished communications between departments at the Auburn Annual Village Fair Apr. 15. Station active were K4FJZ, K4MOC/4, K4UQD/4, K4KIA/4, K4IJS/4, K4HIY/4 and K4PKI/4. K4OVE operated on 2 and 6 meters during the recent RACES emergency. K4WHW reports most Decatur stations now are on 6 meters for local emergency work. WHW built a new rig, mobile and fixed. K4KHC reports increased 6-meter activity in the Tri-Cities. K4MEQ is NCS on 6-meter RACES Network E Wed. nights. W4WGI is on 6 meters running 150 watts to p.p. 6146s; receiver is a 6BS8-6U8 into an HRO-50T, with a three-element wide-spaced beam. K4TIY, AENX mgr., reports 38 per cent attendance in March and welcomes new members K4TJG and W4ATK. The Bessemer ARC meets the 2nd and 4th Thurs. at 7:30 P.M. at the Bessemer City Hall. Jefferson County AREC held a Treasure Hunt Apr. 9. W4EFF, K4OIY, K4JSP and his XYL attended the Columbus, Ga. Hamfest. W4UAR worked Roswell, New Mex. on 6 meters Mar. 8. Traffic: (Mar.) K4ZXX 215, K4PFM 213, K4AOZ 95, W4RLG 69, K4PHH 47, W4KIX 45, W4PVG 44, K4UPL 25, K4GXS 24, K4YUD/YTQ 24, K4SAV 21, K4WSH 21, K4JDA 17, W4OKQ 15, K4KDE 14, K4KHC 14, W4MI 14, W4OXU 14, K4BTO 13, K4WHW 12, W4WHW 12, W4YER 12, K4TJG 10, K4RSB 9, K4ZNI 8, K4HJM 7, K4RIL 7, K4MEQ 6, K4TDJ 6, W4USM 6, K4TRJ 5, K4YTT 5, W4CIN 4, W4DS 4, K4KJD 4, KN4NSD 4, K4QMH 4, K4DSO 3, K4UMD 3, K4CTB 2, W4CIU 1, W4TOI 1, KN4WSK 1, (Feb.) K4ZXX 306, W4KIX 46, W4YER 13, K4HVN 2, K4OVE 2.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: W4IYT. RM: K4KDN. PAMs: W4SDR

(*Continued on page 124*)

NEW Clegg 99'er 6 METER TRANSCEIVER

A Compact, Top Quality Station for just $119.99!

CHECK THESE EXCLUSIVE 99'er FEATURES:

- Dual Conversion SUPERHET with Squelch, Noise Limiter, S Meter, AVC.
- Low Noise RF Preamplifier.
- Stable — Selective — Vernier Tuning — Built-In Speaker.
- 8 Watt Crystal-Controlled Transmitter.
- 9 Tubes and Rectifier — 14 Tube Performance.
- Completely Wired and Tested with AC Power Supply.
- 6/12 Volt Mobile Adapters Available.

Clegg LABORATORIES

602 RT. 53, MT. TABOR, N. J. • OAkwood 7-6800

Ask your Clegg Distributor (listed below) for full information. He'll be glad to serve you.

California
Henry Radio, Los Angeles, Severns, Hemet
Western Radio & TV Supply, San Diego
Mission Ham Supply Co., Riverside

Connecticut
Kaufman Electronics, Bridgeport

Delaware
Delaware Electronics Sup., Wilmington

Florida
Amateur Radio Center, Inc., Miami

Illinois
Allied Radio, Chicago

Indiana
Brown Distributors, Fort Wayne
Van Sickle Radio Supply, Indianapolis

Iowa
World Radio, Council Bluffs

Kansas
Acme Radio & T. V., Hutchinson

Maryland
Key Electronics, Wheaton

Massachusetts
De Mambro Radio Supply, Boston
Radio Shack, Boston
Graham Radio Co., Reading

Michigan
Purchase Radio Supply, Ann Arbor
Radio Parts, Inc., Grand Rapids

Missouri
Henry Radio, Butler
Walter Ashe, St. Louis

New Mexico
Car Parts Depot, Roswell
Valley Engineering, Los Alamos

New Jersey
Federated Purchaser, Mountainside
Terminal-Hudson, Newark

New York
Terminal Electronics, New York
Harrison Radio Corp., New York

North Carolina
Dalton-Hege, Winston-Salem

Ohio
Universal Service, Columbus
Sternbergs, Inc., Cincinnati

Oklahoma
Radio, Inc., Tulsa

Pennsylvania
Tydings Company, Pittsburgh
Eugene G. Wile, Philadelphia

South Carolina
Dixie Radio Supply Company, Sumter

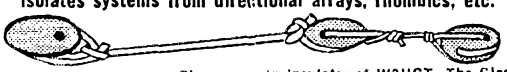
South Dakota
Dakota Supply, Yankton

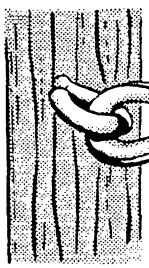
Virginia
Key Electronics, Arlington

Washington
Radio Supply Company, Seattle

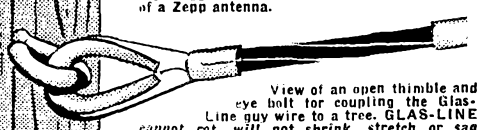
NON-METALLIC GUY LINE — PERFECT FLEXIBLE INSULATOR — REVOLUTIONIZES HAM RADIO & TV ANTENNA SYSTEMS

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

Announcing* NEW "G-3 50X GLAS-LINE CABLE" with 2,500 lb. TENSILE STRENGTH *with proper use.

100' SPOOL $13.90 Plus $1.50 for postage & handling

600' REELS $69.50 Plus $3.00 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

FREE

AMATEUR TRANSFORMER CATALOG

60 & 25 CYCLE POWER XFORMERS. CONVERT EICO, HEATH KITS, ETC. TO 25 CYCLES.

Also Other Types for Every Ham Requirement

FOREIGN INQUIRIES INVITED

KAR-TENA MFG., P.O. BOX 185
Newmarket, Ont., Canada

Please mail Standard Transformer Catalog to following:

NAME.....

STREET.....

CITY.....**STATE**.....

COUNTRY.....

and K4LCF. V.H.F. PAM: W4RMU. Section nets: FPTN, 3945 kc. M/S 0700; FMTN, 7230 kc. M/S 1200; TPTN, 3945 kc. daily 1730; GN, 7115 kc. daily 0830; QFN, 3650 kc. daily 1830; FEPN, 3910 kc. Tues. 1830; East Net, 3910 kc. daily 1930; Fla. Sidebanders, 3940 kc. Sun. 1700. The v.h.f. emergency/traffic nets are being formed and growing. FEPN is showing new signs of life under the constant prodding of K4OII, net manager. Anyone who would normally want to participate in emergency operations such as occurred during "Donna" are urged to report into this net and to register with his EC as an AREC member *and learn what to do before trying to help during an actual emergency.* Write your EC, SEC or SCM for information. Read *QST*. The hurricane season is a regular thing—remember? A solid State C.D. Operations Communications Plan is now being formed. Ham radio is represented by the SCMs and SECs of both East and West Fla. W4RGF, who has been giving antenna demonstrations to clubs throughout the state, has been forced to quit. Three mobiles helped direct the DeSota Celebration Parade in Bradenton. W4LVV's DXCC score now is 288/283. He made WAC on 7 Mc. in 34 minutes. Watch the Ft. Pierce Radio Club. It's *going place and is* 100 percent AREC. W4FPC, St. Pete, holds so many active net certificates that a single Form 1 won't do. Traffic: (Mar.) K4SJH 784, W4IWM 610, W8LDU/4 602, K4KDN 543, K4EHY 477, WA6FCO/4 384, W4SDR 340, K4BY 290, W4FPC 241, K4LCF 224, K4FMA 203, W4TRS 172, W4AKB 166, K4BZ 151, K4ENW 148, W4FE 136, K4JZU 135, K6PBD/4 127, W4EHW 115, K4OII 110, K4ZNC 104, K4COO 101, K4AKQ 95, K4RNS 94, K4AX 81, K4VSA 81, W4BKC 76, W4EAT 75, K4ILB 72, W4IYT 62, K4GSO/4 57, K4BNE 56, KN4YSN 52, K4DBT 51, W4DVR 50, K4ANR 35, K4OZS 33, W4NLX 32, K4BZS 30, K4YOQ 27, K4RHL 23, W4CNZ 22, K4ZIF 21, W4HTH 20, W4LMT 19, K4MTP 18, K4BOO 15, W4LSA 12, W4LVV 12, K4DAX 11, K4PPX 11, K4RBR 11, K4LVE 10, K4RCV 9, K4YPN 9, K4IWT 7, K4VGD 5. (Feb.) W4DUG 6107, K6PBD/4 1438, W4AB/4 471, K4YOQ 134, W4IYT 114, K4PPX 45, W4PWB 40, W4HTH 16, K4LML 12, K4OSQ 9, W4GOG 3.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: K4UBR. Tallahassee: A large group of W. Fla. hams met to hear W1NJM, National EC, speak. W4HXH handled traffic for Industrial Arts teachers during a meeting at F.S.U. Those aiding were W4WEB, K4BDF, K4FTJ, K4ARK and K4QVL. W4MLE and W4RKH attended the Fla. C.D. Comm. meeting in Jacksonville and met with the SCM and SEC of E. Fla. The TARC is looking for a good FD site. W4DDY and W4MLE are working on plans to tie together the Ga. and Fla. Emergency Nets. Quincy: K4EYC is the new EC for Gadsden County. K4QDN built a new 65-watt c.w. rig. Chattahoochee: W4FIW will be active on 75-meter phone soon. K4DFY is in the service, but operates 40-meter c.w. on his visits home. Port St. Joe: A phone net newsletter simular to that of *QFN*, is being considered. Send your ideas to W4WEB. Monticello: K4BDA is QRL school work at Madison Jr. College, plus announcing at the local BC station. Ft. Walton: The EARS is buying a 2-meter transceiver to better equip it for c.d. work. W4SRX also will be equipped with s.s.b. soon if plans work out. W4UBR is experimenting with v.h.f. while W4ATA takes over QFN. Pensacola: The NAS Club classes are going strong. K4FOG writes an interesting column in *Gosport*, the NAS paper. W4LMH has a new KWM-2. V.h.f. club mobiles provided communications for the sports car races near Pace. W3HJU/4 is a new contributor to *Highbander*. Traffic: (Mar.) K4UBR 233, W4MLE 155, W4BVE 134, K4VND 110, K4BDF 30, K4QAC 14, K4ZMV 11, W4LMH 2. (Feb.) W4MLE 28. (Jan.) W4MLE 75.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: W4PMJ. PAMs: W4LXE and W4ACH. RM: W4DDY. The GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs. and at 0800 Sun. The GSN meets Mon. through Sun. on 3595 kc. at 1900 EST and 2200 EST with W4DDY as NC. The 75-Meter Mobile Net meets each Sun. on 3995 kc. at 1330 EST with K4YID as NC. The GPYL Net meets each Thurs. on 7260 kc. at 0900 EST with K4ZZS as NC. The Atl. Ten-Meter Phone Net meets each Sun. on 29.6 Mc. at 2200 EST with W4BGE as net mgr. The Ga. S.S.B. Net meets Mon. through Fri. on 3972.5 kc. at 2000 EST with K4RHB as net mgr. The Atl. Radio Club Phone Net meets at 2100 EST on 21.36 Mc. each Sun. night with W4DOC as NC. On Mar. 31 tornados hit many places in Georgia. Those requiring emergency communication were Unadilla, Gorella (an area 8 miles south of Hawkinsville, Ga.) an area around Reidsville, Ga., Columbus, Ga., and Phenox City, Ala. W4FYC operated as net control station for the GCEN from 1426 GMT Fri. until 1600 GMT Sat. April 1. Stations participating were W4FYC, W4LXE, W4TT, W4BKM, W4BKK, W4DLC, W4ZUF, W4UNG, W4UCC, W4YWP, W4ATF, W4DOZ, K4QMI, W4DLZ, K4SEP, W4CLQ, K4IZO, W4UUH, K4UYC, K4PGJ, K4LHF,

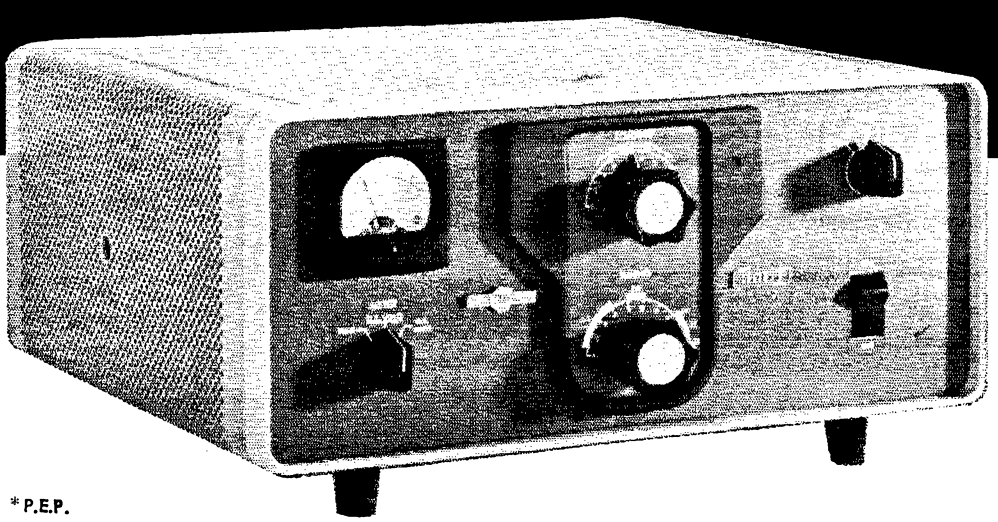
(*Continued on page 126*)

1000 Watts* of Packaged Power Input

30L-1 by Collins

Now available For Scheduled Delivery

...from HARVEY RADIO



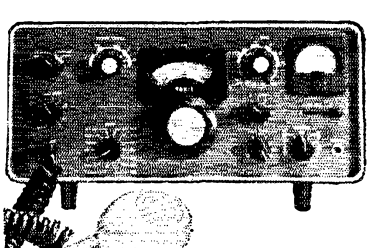
*P.E.P.

For the Ham on the move — now for the first time a KW is available to you for mobile use — AC input power required is only 550 watts . . . use aboard boats, on planes, in emergency communication vans or in fixed station. It's compatible with any 100 watt exciter and has just what you need for top performance.

RF INVERSE FEEDBACK ■ AUTOMATIC LOAD CONTROL ■ SELF-CONTAINED POWER SUPPLY ■ SILICON RECTIFIERS ■ HIGH/LOW POWER SWITCH

The amazing part of the product is the price. Harvey is happy to offer the quality of Collins at the low, low price of **$520.00**

Amateur Net



For those who have the Collins 32S-1, here's the perfect match-mate for full SSB and CW at top efficiency.

Use with the Collins KWM-2 and you have all the power you need for mobile, portable and fixed station single side-band communication on all amateur bands between 3.4 mc and 29.7 mc.

KWM-2 Price: **$1,150.00**

Take a tip from Harvey — trade up to Collins — today. There's no better value around — and Harvey check-up service assures you that what you receive is just what you expected.

OUR 34TH YEAR

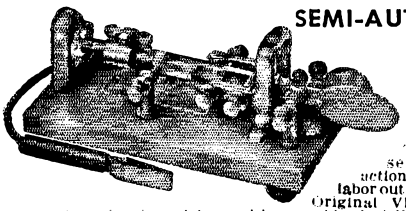
hrc HARVEY RADIO CO., INC.

103 West 43rd Street, New York 36, N. Y./JUdson 2-1500

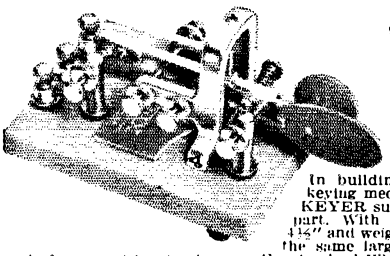
SEND FREE OF TIRING EFFORT

With VIBROPLEX

SEMI-AUTOMATIC



The Vibroplex's semi-automatic action takes all the labor out of sending. The Original Vibroplex gives sharp, clear signals and is precision machined. Adjustable to any speed. Good for 30 or more years, even under rough usage. Comes in five models, standard or deluxe. Priced at only $17.95 to $33.95.



VIBRO-KEYER

In building an electronic keying mechanism, VIBRO-KEYER supplies the perfect part. With a base 3¼" by 4½" and weighing 2¾ lbs. Has the same large sized contacts, main frame and trunion lever as the standard Vibroplex. Speed adjustable to suit your own taste. Standard model, priced at $17.95. Deluxe, with Chrome Plated Base $22.45.

Order today at your dealers or direct

THE VIBROPLEX CO., INC.

833 Broadway New York 3, N. Y.

FREE Folder

NEW! from P&H

MODEL AR-1

TRANSCEIVER ANTENNA TRANSFER UNIT

Here is the answer to the problem of using your transceiver as an exciter for any linear amplifier. The AR-1 transfers the antenna to the transceiver while receiving and provides the necessary switching to connect the exciter to the amplifier, and the amplifier to the antenna when transmitting. A front panel switch also permits the exciter to operate straight through to the antenna. The relay is shock-mounted and the case is insulated to reduce noise. Standard SO239 connectors are provided for low impedance coax lines.

LOW INSERTION LOSS: Transceiver output to amplifier input, less than 1.02:1 SWR, 3 to 30 Mc. Amplifier output to antenna, less than 1.12:1 SWR, 3 to 30 Mc.

The AR-1 requires 6.3VAC (6.3V jack on KWM-2) and normally open auxiliary contacts on the exciter relay. (ANT. RELAY jack on KWM-2). The AR-1 may also be used as a conventional antenna change-over relay. Size 3" X 4" X 4".

PRICE.....$32.50

P&H ELECTRONICS INC.

424 Columbia Lafayette, Ind.

K4AT/4, K9BEU/4, K4CFN, K4KGC, K4GWX, W4ACH, W4NSH, K4FPP, W4FWP, K4YHE, K4FDM, W4MIW, K4ZXA, W4RVH/4, K4CCJ, K4CZU, W4FOE, K4AYQ, W4KR, W4GBH/4, K4POL, K4DNH, K4ASF, WØLOR/M, W4TAG/M, K4SER, W4VSW, K4UUT, W4CLF, W4TJS, K4MDK, K4AWN, K4SZF/4, K4FPP/M, and W4VZY. W4DDY will move to Augusta in June. Georgia hams scored a victory at the Youth Assembly this year. K4ZMT was elected speaker of the House; K4BYK, pres. pro-tem.; K4BVD, lt. governor. This gives three of the top five offices to hams. Traffic: W4DDY 136, K4BVD 88, K4FJD 67, W4FYC 36, W4RLZ 13, K4FPZ 11, K4BAI 6, K4MIH 6, K4UJS 6.

SOUTHWESTERN DIVISION

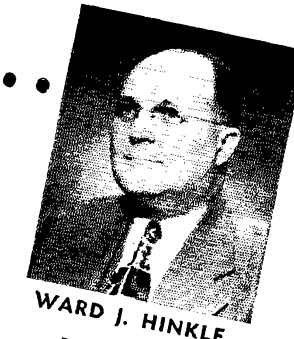
LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6LVR. PAMs: W6BUK, W6ORS and K6PZM. The following stations earned BPL for the month of March: K6MCA, W6GYH, KØCLS/6 and K6OZJ. Congrats, fellows! WA6IUO has a new 10-meter three-element beam. K6EVR made a good score in the DX Test. K6MSL is working over the station. WV6OWM has a new AT-1 and an AC-1 on the air. W6WPF is giving the station a well-deserved overhaul. K6MGO has a new AF-68 rig and raised the antenna to 65 feet. W6NAA has a new 10-kw. generator for emergency work. New officers of the Desert Radio Amateur Transmitting Society are W6FB, pres.; K6EJS, vice-pres.; K6EBZ, secy.; and W6GKM, treas. K7AGG/6, has a 44-element beam on 2 meters. KØCLS/6 cleared traffic from K6BSA at the Sports Show. New officers of the Citrus Belt Amateur Radio Club are K6BUK, pres.; WA6INH, vice-pres.; K6EF, secy.; Mary West, treas. W6USY now is working in Pasadena. WA6DWP had a nice vacation in Las Vegas and Death Valley. K6EA is back at sea humping lumber. W6BES is putting up new 7- and 3.5-Mc. antennas. W6BUK is chairman of the Nominating Committee for the Mission Trail Net. W6AM grabbed a new one on phone and c.w. with HKØTU. K6YVN is handling traffic for missionaries in Peru. K6BAY now is doing NCS duty on MCAN-7. W6VOZ spent some time in Arizona. W6SRE is doing a wonderful job as instructor in radio for the junior high boys. WA6GSP wants to sked stamp collectors. We notice a new "A" in WA6MAP. Congrats, Pat! Support your section nets: On phone, the SoCal Six Net meeting at 0300 GMT on 50.4 Mc.; on c.w., the SCN meeting on 3600 kc. at 0300 GMT. Traffic: (Mar.) K6MCA 1632, W6GYH 1169, KØCLS/6 798, K6OZJ 523, WA6BCZ 377, K6QPH 352, WA6DJB 215, W6HHG 207, W6SYQ 189, K6BAY 142, WA6MAP 131, WA6KVS 98, WA6DWP 93, K6YVN 82, W6LIP 79, K6SIX 70, K6JSD 64, WA6JOC 63, K6ATB 50, WA6CKR 42, W6USY 34, K6HOV 33, WA6JDB 30, WA6JJJ 28, K7AGG/6 19, W6CK 18, K6EA 18, WA6LPS 18, K6MGO 18, WA6MFH 10, WA6QFC 9, W6NKR 2. (Feb.) WV6MAP 98, K6PZM 42, W6UGA 10.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—PAM: OIF. RM: LND. The Copper State Net meets at 1930 MST Mon. through Fri., the Grand Canyon Net Sun. at 0800 on 7210 kc.; the Tucson AREC Net Wed. at 1900 on 3880 kc. On May 27 the doors of the Westward Ho in Phoenix will be opened to the most fabulous convention Arizona has seen in many years. There will be swimming parties, a visit to LJA, who has the world's most modern ham shack, trips to the West's most western town, and learned discussions for the more serious-minded amateurs. Two convention tickets donated by the Arizona Amateur Radio Club were won by K7GPZ, and EFQ. An interesting incident occurred on the Copper State Net recently. OIF, PAM, and Net Control, received a call from JTC, superintendent of the Black Mountain Mission near Chin Lee on the Navajo Indian Reservation. The parents of Nahe John were trying to locate their son. He was supposed to have been in an accident and in the hospital. Efforts to locate Nahe in Phoenix failed. It was learned that he worked for the Sante Fe. KYM, a Sante Fe employee, suggested the Santa Fe Hospitals in Phoenix, Parker or Los Angeles. A check with Parker through a fellow ham netted nothing. Another amateur in Los Angeles checked and found Nahe in the Sante Fe hospital there. All this was relayed back to JTC, who in turn relayed the information to the parents in their own Navajo language. Why did we have to search for John? Because in the Navajo language "California" and "Phoenix" are the same word. Interesting!

SAN DIEGO—SCM, Don Stansifer, W6LRU—The new chief operator for W6YDK, the Marine Corps Recruit Depot station in San Diego, is K8GTB. We understand the Newport, Fullerton and Orange County Radio Clubs want to host the 1962 ARRL Southwestern Division Convention at Disneyland. Many local area amateurs recently were saddened by the passing of K6ITJ, of La Jolla. A special meeting of the San Diego DX

(Continued on page 128)

A Word from Ward...



WARD J. HINKLE

MEET THE TH-4 THUNDERBIRD TRIBANDER

If a ham wanted to do a professional job of putting up a communication antenna, there was a time when he practically needed a degree from M.I.T. and a Ph.D. in electronic engineering.

I'm happy to report that has all been changed. And do you want to know who changed it? The Hy-Gain Antenna people out in Lincoln, Nebraska — that's who. Who else but Hy-Gain could cram so many features into one antenna? Just take a look, for example, at their brand new, all new, 4-Element, Thunderbird Antenna, Model TH-4:

- A bandwidth that'll knock you for a loop maintains low SWR over the whole band (resonance 1.05 on 10 Meters, 1.15 on 15 Meters, and 1.1 on 20 Meters!)
- The Model TH-4 guarantees *maximum* forward gain — and that's exactly what you get!
- No fuss, no muss, no sweat! The Hy-Gain Beta Matching System is pre-tuned right at the factory. And no further adjustments are necessary. You couldn't improve on it if you tried!
- Are there any other matching devices to fiddle with? Absolutely not.

This Thunderbird goes up quicker 'n smoother than the tail of a happy dog. Just follow instructions — and you're in business. But I could go on talking about it till I busted into the next two feature stories.

Here's a better idea. Sit down right now, send me a post card asking for all the dope on the TH-4! You'll be glad you did!

Ward J. Hinkle W2FEU

the TH-4

is a 4-element tribander for 10, 15 and 20 meter operation;- bright finish aluminum construction of 2" OD boom and 1¼" telescoping to ¾" elements. Massive formed steel boom clamp. Solid state Slim-Traps for minimum wind-loading and maximum performance. Unique Beta Match pretuned. Interlaced 4th element for optimum spacing. Guaranteed to withstand 1000w AM or 2 KW (PEP). Weighs only 38 lbs.

$117.50

Please send immediately: ☐ complete engineering bulletin on the Hy-Gain TH-4, ☐ free catalog of all Hy-Gain Amateur Antennas.

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____

Adirondack Radio Supply continually stocks the entire Hy-Gain line of Communications Antennas — tribanders, monobanders, verticals, doublets, mobile antennas — for your convenience. You'll find it more profitable, more expedient, and easier . . . to order from Ward.

Before you buy or trade, wire, write, call or drop in to see WARD, W2FEU

ADIRONDACK RADIO SUPPLY

185-191 W. Main St., Amsterdam, N. Y.
Phone: Victor 2-8350
Ward J. Hinkle, Owner

RIDER BOOKS
FOR BEST RESULTS FROM YOUR RIG THRU GREATER ELECTRONIC KNOW-HOW

NEW TITLES

INTERNATIONAL TRANSISTOR SUBSTITUTION GUIDEBOOK (4500 Direct Substitutions), *Keats A. Pullen, Jr., Eng. D.* Reliable, Proved, Direct Substitutions only. Includes case styles and dimensions, **$1.50.**
CITIZENS BAND RADIO, *Allen Lytel*, **$3.90.**
HOW TO LOCATE AND ELIMINATE RADIO AND TV INTERFERENCE (2nd Ed.), *Fred D. Rowe*, **$2.90.**
BASIC MATHEMATICS (4-Volume 'Pictured-Text' Courses), *Norman H. Crowhurst.* New 'learn-by-pictures' course makes it easier than you ever dreamed to learn math — *NOW AVAILABLE*, VOL. I, Arithmetic As An Outgrowth Of Learning to Count, **$3.90.** *NOW AVAILABLE*, VOL. II, Introducing Algebra, Geometry, Trigonometry, Calculus as Ways of Thinking in Mathematics, **$3.90.** Vols. III and IV available towards end of 1961.

AMATEUR RADIO

GETTING STARTED IN AMATEUR RADIO, *Julius Berens*, W2PIK, **$2.40**
BUILDING THE AMATEUR RADIO STATION, *Julius Berens*, W2PIK, **$2.95**
RADIO OPERATOR'S LICENSE Q & A MANUAL (6th ed.) *Milton Kaufman*, cloth **$7.10**
SHORTWAVE PROPAGATION *S. Leinwoll*, **$3.90**
RIDER GLOBAL TIME CONVERSION SIMPLIFIER *J. G. Daiger*, **$1.00**
HOW TO USE GRID-DIP OSCILLATORS *Rufus P. Turner P.E.* K6AI, **$2.50**
SOUND-N-SIGHT CODE COURSE *Lewis Robins and Reed Harris*, Complete Course (0 to 20 words/minute), **$15.95;** Novice Course (0 to 8 words/minute) **$9.50;** Advanced Course (9 to 20 words/minute), **$8.95**

FAMOUS 'PICTURED-TEXT' COURSES — EACH A LOW-COST EDUCATION IN ELECTRONICS

BASIC TRANSISTORS ('Pictured-Text' Course), *Alex. Schure, Ph.D.*, soft, **$3.95;** cloth, **$5.50.**
BASICS OF GYROSCOPES ('Pictured-Text' Course), *Carl Machover, E.E.*, 2 vols., soft cover, **$6.60;** cloth, **$7.75.**
BASICS OF MISSILE GUIDANCE & SPACE TECHNIQUES ('Pictured-Text' Course), *M. Hobbs, P.E.*, 2 vols, soft covers, **$7.80;** cloth, **$9.00.**
BASICS OF DIGITAL COMPUTERS ('Pictured-Text' Course), *John S. Murphy*, 3 vols., soft cover, **$8.40;** cloth, **$9.50.**
BASICS OF ANALOG COMPUTERS, *Thos. D. Truitt (Dir. of Advanced Study Group, Electronic Assoc., Inc.) & A. E. Rogers (Sr. Consultant, Electronic Assoc., Inc.)*, 3 vols., in one cloth binding, **$12.50.**
BASIC ELECTRONICS (5-Volume Standard Course), *Van Valkenburgh, Nooger, Neville, Inc.*, set of Vols. I to V in soft covers, **$11.25;** all 5 vols. in one cloth binding, **$12.75.**
BASIC ELECTRONICS (Expanded Course), set of Vols. I to VI in soft covers, **$13.85;** 6 vols. in one cloth binding, **$14.85.**
BASIC ELECTRONICS (Vol. 6 Only), soft cover, **$2.90;** 170-6H, cloth, **$3.95.**
BASIC ELECTRICITY, *Van Valkenburgh, Nooger, Neville, Inc.*, soft cover, 5 vols., **$11.25;** all 5 vols., one binding, **$12.75.**
BASIC SYNCHROS AND SERVOMECHANISMS, *Van Valkenburgh, Nooger, Neville, Inc.*, soft cover, 2 vols., **$5.50;** 2 vols. in one cloth binding, **$6.95.**
BASIC PULSES, *Irving Gottlieb, P. E.*, soft cover, **$3.50;** cloth, **$4.75.**
BASIC TELEVISION, *Alex. Schure, Ph.D.*, soft cover, 5 vols., **$11.25;** all 5 vols. in one cloth binding, **$12.75.**
BASIC ELECTRICAL POWER DISTRIBUTION, *Anthony J. Pansini*, 2 vols., soft cover, **$4.80.**
BASICS OF FRACTIONAL HORSEPOWER MOTORS AND REPAIR, *G. Schweitzer*, **$3.90;** cloth, **$4.90.**
BASIC CARRIER TELEPHONY, *David Talley, E.E.*, soft cover, **$4.25;** cloth, **$5.75.**
BASIC ULTRASONICS, *Cyrus Glickstein*, soft cover, **$3.50;** cloth, **$4.60.**

Available at your electronics parts distributor, or order direct

JOHN F. RIDER PUBLISHER INC.
116 West 14th Street, New York 11, N. Y.
Canada: Chas. W. Pointon, Ltd.,
66 Racine Rd., Rexdale, Ont.

Club was held at the home of W6RCD in April to host one-day visitor MP4BBW of Middle-East sideband fame. The regular meeting of the DX Club in April was held at the home of W6KSM. WA6FJD worked PY7LJ on 7 Mc. for a new country. K6ENX, DXer in Escondido, recently enjoyed a two-month vacation. The Annual Newport Spring Banquet, held in Santa Ana in mid-April, was a success as usual. The Convair Club held a swap-night, and much gear changed hands. K6BPI has helped two Navy patients with back injuries by furnishing them code oscillators and booklets on how to work for their licenses. K6LKD reports problems from the North County Area. He can't find a good hill for Field Day. W6FWF now is s.s.b. with an HT-37. ZB2AD was No. 277 for W6LRU. K6BHM has a Heath linear being driven by his HT-37. W6JH is converting his rig to s.s.b. with an SB-10. Traffic: W6YDK 1171. K6BPI 955. W6EOT 546. WA6CDD 359. K6LKD 177. WA6ATB 113. W6ELQ 58. K6RCK 6.

SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—SEC: W6JLY is making plans to build up a 75-meter s.s.b. rig something like W6JPP is using. The York Mountain ARC's officers for 1961 are W6IWD, pres.; WA6KKU, vice-pres.; WA6KKT, secy.-treas. EC for the Atascadero Area is WA6GXA. K6UOT has his 2-meter antenna up and is now on 2 meters for good. WA6BVO will be on 2 meters when the bugs are out of the transmitter. WA6JBA finished building the 2-meter Heathkit transmitter and is putting out an FB signal on the air. W6ENR is conducting a code and theory class at his shop in San Luis Obispo. K6RWP is planning a trip to the South Pacific to FOB-Land. He plans to be on 20-meter s.s.b. This is quite a switch for an a.m. operator. Field Day is coming up so let's have a big turnout from the Santa Barbara section. Traffic: W6YCF 34. W6UWL 6. W6JLY 2.

WEST GULF DIVISION

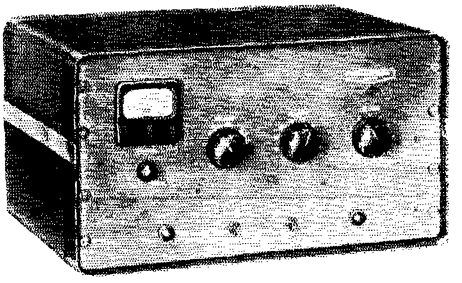
NORTHERN TEXAS—SCM, L. L. Harbin W5BNG—By the time you read this the tornado season will have come and gone in the West Texas Area, we hope, and it is good to know that the hams in that part of the country are doing all they can to be prepared for any emergency that might come up. Much interest is being shown in AREC and RACES and attention is being given portable equipment and power supplies. In Tulia, Swisher County, the Mid-Plains ARC has several mobile units with easily-erected dipole antennas and a 3.5-kw. portable power supply. When I requested K5ILL to try to get more news from the East Texas Area I did not expect him to stir up a hornet's nest but he almost did. Thanks, Dell, and I will get the news in as soon as I have room for it. I am working on the assumption that news is news if you have not heard it. K5WZT is on s.s.b. with what he calls "a poor-boy station." Morris won a Collins 75S-1 at the West Gulf Convention in Dallas and his XYL gave him a new HT-37 for Christmas. All he had to do was tie on the antennas. Did you know that there are more than 175 licensed and active hams in the Tyler and Smith County Area? Many of them are old-timers with two-letter calls. Harrison County has a new c.d. communications director, R. Z. Bozeman. Mr. Bozeman has been active in communications work since 1949 and is the holder of commercial phone and telegraph as well as amateur Extra Class licenses. Traffic: W5BKH 358. K5BKH 186. W5GY 130. K5ILL 77. W5ANK 75. K5QWR 59. PXV 32. W5LR 27. K5YPO 19. SWP 18. W5IL 8. K5KZA 8. BDX 4. W5CF 4.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—SEC: K5KTW. K5ZNP is a new General Class licensee in Holdenville. KN5INX is a new Novice at Cordell. A new Novice in Temple is KN5IHI. K5ZCK is now on 6 meters. JCY was featured on television in an actual contact with Peru. PAA has a new 300-A and an HQ-180. The Northeast Oklahoma V.H.F. Society is now an affiliated club. We received a copy of its new club magazine. Congratulations. New officers of the Wheatstraw Amateur Radio Club are K5RER, pres.; AIC, vice-pres.; K5GDE, secy.-treas. K5ZTH, editor, and K5DRM, assistant editor, are doing a fine job on the *Oklahoma Central Club V.H.F. News*. The Tulsa Electron Benders is a unique club and really doing a fine job. The Tulsa Amateur Radio Club is putting out a new Tulsa amateur information book. The Oklahoma City Amateur Radio Club held its Annual Auction Mar. 10. IWL came out of the YL-OM Contest with a YLCC certificate. K5ZBS was high-score operator in the Sweepstakes. DRZ was made an honorary member of the Oklahoma City V.H.F. Club. K5ZEP, PRW, RCW, WPP and W5VEJ are now on 2 meters. Traffic: K5IBZ 293, W5OOF 180. DRZ 146. K5MBK 137. JGP 127. CAY 112. JGZ 74. W5ADB 68. K5AUX 65. W5KY 46. K5LZF 37. DUJ 32. W5MFX 30. CCK 28. K5ELG 27. W5WAF

(*Continued on page 130*)

Tired of having your barefoot toes "tromped" by the high power boys?

HARRISON brings you "DX BOOTS" at a 1/3 $aving!



GONSET GSB-101 LINEAR AMPLIFIER

- Single knob bandswitching 80, 40, 20, 15, and 10.
- Simplified tuning, with flexible pi-network output for 30 to 200 ohm loads.
- Requires 60-70 watts driving power, but adds this into the output!
- Internal DC operated antenna relay. Quiet!
- Uses four 811-A tubes. Low replacement cost!
- Built in heavy duty plate and bias supplies, uses 866-A's.
- Compact—Only 11" x 19" x 14½" deep!

Everyone brand new, in sealed cartons, guaranteed by full factory warranty.

Add this powerful KW Amplifier to your SSB or CW exciter, and make the DX hear you.

With PEP input of a full 1000 watts plus the driving power adding to the output, this high efficiency linear will put real sock into your signals.

Sold regularly for ~~$459.50~~

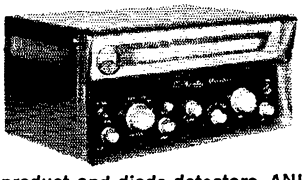
"HAM HEADQUARTERS, USA" SPECIAL SALE PRICE **299.00**

SAVES YOU $160.50

QUANTITY LIMITED! ORDER NOW!

WE'RE TRADING HIGH ON GONSET

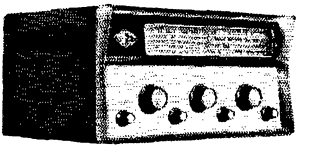
Easy Terms, Too!



"HOT" RECEIVER SSB-AM-CW

Sensitivity, plus! Selectivity — down to 100 cycles for CW! Dual conversion, with product and diode detectors. ANL, S meter. Long scale one-band-at-a-time dial for 80, 40, 20, 15, 10 and 6 meters. (Real live "hop" on 6!) An outstanding performer

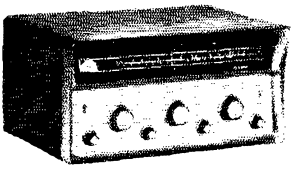
G-63, $239.50



HIGH PERFORMANCE—LOW COST

The Gonset G-33 gives you more, for less money! Full coverage—BC band and 1.8 to 34 mc, with separate bandspread calibration of ham bands. Six tubes, internal speaker, smart styling, amazing performance.

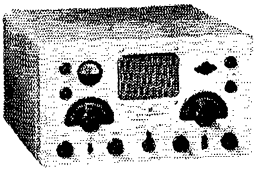
G-33, $89.95



BIGGER DOLLAR VALUE RECEIVER

Sensitive — Selective — Stable! Point by point comparison proves the Gonset G-43 is better value in its price range. High Q printed circuits, 1650 kc IF, give better than 3 microvolt sensitivity on all frequencies .54 to 30 mc. Drum dial has l-o-n-g scale for each band, 80 thru 2 meters. Automatic Noise limiter, S Meter, speaker, eight busy tubes!

G-43, $159.50



AC 48 WATT COMMUNICATORS

Complete station. Powerful VFO transmitter, sensitive receiver, speaker and husky AC pack—all in rugged case only 7½" x 13" x 12½". Ideal for shack and travelling—only 29 lbs.

G-50 (Technicians delight) 50-54 MC $319.50
G-28 Ten Meter. 28 to 29.7 MC $299.50

"HAM HEADQUARTERS, USA"!

• 225 Greenwich Street, New York 7, N. Y. • BArclay 7-7777
(Long Island • 144-24 Hillside Avenue, Jamaica)

HARRISON

learn code faster, easier than ever before

RIDER SOUND-N-SIGHT CODE COURSE

by Lewis Robins & Reed Harris

- applies Reinforced Learning—psychological principle proved successful by Armed Forces.
- uses LP records to teach you to hear signal pattern correctly and identify it—how to transmit.
- uses identification cards to teach you the correct letter associated with each signal pattern.
- uses instruction book to speed your progress.

...plus an imaginary instructor (in complete and novice courses) provides correct answers to speed code learning. Many people have learned to receive 5 words per minute within 9½ hours. Eliminates code plateau barrier!

3 INDIVIDUAL COURSES—THERE'S ONE FOR YOU

COMPLETE COURSE (0-20 words per minute)—Six 10" LP records (192 minutes of recording, 28 recordings). 47 ident. cards, book #REC-020, **$15.95.**

NOVICE COURSE (0-8 words per minute)—Three 10" LP records (96 minutes of recording, 28 recordings), 47 identification cards, book. #REC-08, **$9.50.**

ADVANCED COURSE (9-20 words per minute)—Three 10" LP records (96 minutes of recording, 28 recordings), book. #REC-920, **$8.95.**

Records prepared in collaboration with the N. Y. Institute of Technology and mfd. by Decca Records.

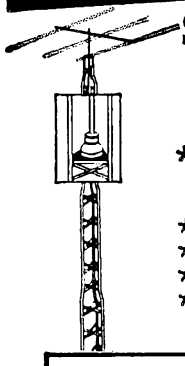
FROM THE RIDER 'HAM' LIBRARY

GETTING STARTED IN AMATEUR RADIO; BUILDING THE AMATEUR RADIO STATION; HOW TO READ SCHEMATIC DIAGRAMS and the famous RADIO OPERATOR'S Q & A MANUAL (6th edition)

at parts distributors or order direct Dept. Q8

JOHN F. RIDER PUBLISHER, INC.
116 West 14th Street, New York 11, N. Y.

PREPAID ANYWHERE
IN THE 48 (CONTINENTAL U.S.A.)

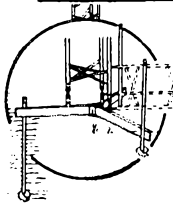


SELF-SUPPORTING SPAULDING WRL SPIRE

★ Self-supporting 32-48 ft. above ground with any full-size 3-element Tribander. May be extended to 120 ft. with proper guying.
★ Commercial Grade Construction.
★ Streamlined in appearance.
★ E-Z "Instant" Installation.
★ Extra large, 19½" base width.

AND LOW COST . . .
32' CONCRETE MOUNT MODEL
32 ft. spire with anchor base as shown: $75.00

Only $49.95 **$2.00** Down Amateur Net



WORLD RADIO LABORATORIES
3415 W. Broadway • PHONE 32 8-1851
Council Bluffs, Iowa

24, K5DLP 21, W5JXM 19, PNG 18, K5VNJ 17, OOV 15, W5WDD 14, GIQ 13, KL7CWX/5 13, K5OVR 12, W5WAX 12, K5BNK 10, W5UYQ 10, K5YTH 10, INC 9, W5VLW 8, K5CBA 5, W5EHC 4, K5JOA 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: AIR, PAM; ZPD, RM: K5BSZ, URW is the EC at Port Lavaca. K5LLJ is the president of the Edna High School Radio Club. K5JFP is the proud owner of a new Warrior Kilowatt. The 7290 Traffic Net had 46 sessions, 1561 station check-ins and 683 messages. We are sorry to lose K4BSS/5 from our traffic nets. Nick is going on another assignment for the Navy. We also are losing DHR, who is moving to Fort Stockton. Hurry back, fellows. ZPD and ITA soon will be heard with a new kw. final. The new officers of the Houston Amateur Radio Club are DSF, pres.; PMI, vice-pres.; K5PFF, secy.; K5RDP, program; K5OLJ, membership. Glad to report HQR back among the walking, after being in the hospital with a broken leg. GMT and his XYL visited in Houston. JHW, a confirmed bachelor, we thought, finally fell to Dan Cupid. Congratulations, Don. Don't forget the STEN Convention at Victoria on June 9, 10 and 11. If you miss it you will miss one of the best. Traffic: K5MXO 61, JFP 45, W5ZPD 14, K5WQM 6.

CANADIAN DIVISION

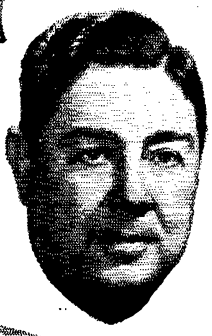
MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: H. C. Hillyard, VO1CZ, and A. E. W. Street, VE1EK, SEC: BL. We wish to thank VE1EK for accepting the post of Asst. SCM. The St. Croix Valley Club plans to hold an informal get-together and picnic at the Legion Hall, St. Stephen, N.B., on July 2 in conjunction with Frontier Week. A special certificate will be awarded to any amateur working an SCVR Club member and attending. The invitation is open to all. Further details are available from any member of the club. The NBARA plans to hold its Annual Meeting and Picnic at Grand Lake during the latter part of July. OZ and ADH have returned from an interesting vacation in Florida. YQ is on 6 meters. ABS is active on 14-Mc. phone. Congratulations to MZ, now operating A-3. ADM is on s.s.b. with an HT-37. The Fredericton Radio Club has been reactivated and interest is keen. Field Day preparations are nearly completed in most Maritime clubs. Traffic: VE1ADH 40, OM 28, YQ 16, DB 12, ES 4.

ONTARIO—SCM, Richard W. Roberts, VE3NG—Activity was at its highest in March. The Sky-Wide ARC operated the booth at the Sportsman in Toronto and your SCM was very pleased with the results. CWA hit his fourth BPL and also has an A-1 Operator Club certificate. EPI is mobile on 144 Mc., DPR, BGB and DSR also are on the same frequency. Carleton University has a new club at Ottawa with 2WK, pres.; COP, secy.; BZQ, treas. DCI has his DXCC on phone. EOV is active. Windsor is getting ready for the Ontario ARRL Convention to be held Sept. 29 and 30 in the Prince Edward Hotel. The club held open house recently. BUR is back with a tan from Florida. BMB works FB DX on s.s.b. The Ottawa Valley Mobileers has a new club crest. BHA and BOH are now mobile. UY is back from Florida. 5GO visited the Ottawa gang. The Skywide ARC, came up with an FB bulletin, BCR is editor. ASA is now a resident of Bermuda. DMK is active. DVK is Class A. Northshore held a Dinner May 6 in Pickering. BHW is off to Belleville. CZJ is s.s.b., also ATI. AZV is on 2-meter mobile. BEY is now Class A in N. Bay. AML is Ontario SEC and is available to clubs as a speaker. Contact him well in advance. TO and JU were guests of the Niagara Club. CHF is a Silent Key. He will be missed by many and remembered by all. DTO, DUG and DXZ, were in Philadelphia, Pa., at a convention. NG, DZA and AJA were mobile at Meaford during Easter. TX is getting in the groove again. AKL is manager of the Laurentian Net, on 3755-kc. phone. Our QSL Mgr. requires *your* self-addressed stamped envelopes to send *you* your QSL cards. VE3s take note, please. Traffic: VE3CWA 741, BZB 177, DPO 168, NG 122, CYR 73, AIL 68, BAG 66, CFR 57, EHL 54, NO 50, COO 37, DTO 33, DWN 33, BUR 26, AML 22, EAM 20, BZU 15, VP 10, AMT 7, DLC 7, DU 4.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Our thoughts now turn to the great event of the year, Field Day. The South Shore gang, last year's winner, hopes to repeat. St. Johns Radio Club, APX, has entered the award circle. Three QSLs from stations displaying the club stamp, plus 50 cents, will entitle you to a diploma. Members are AIL, ANI, AIP, ASL, ARA, AOZ, BCB, BDQ, RM and SG. W7QMU/VE8, who has done fine traffic work up North, expects to return to the

(Continued on page 132)

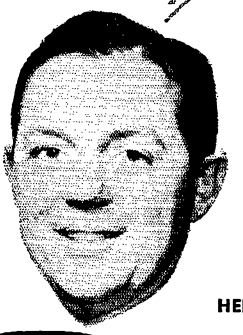
"CALL ME for Personal Service"



Bob Henry
WØARA
Butler, Mo.
ORchard 9-3127

ON

"CALL ME for Personal Service"



Ted Henry
W6UOU
Los Angeles
GRanite 7-6701

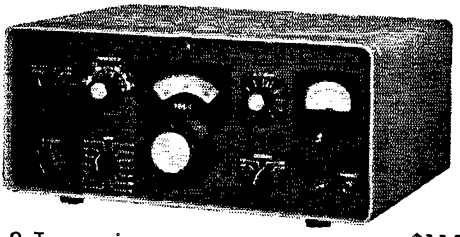
OPEN NOW
THE 3rd
HENRY RADIO STORE
931 N. Euclid Ave.,
Anaheim, Calif.

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	$1150.00
32S-1 Transmitter	666.00
516F-2 AC Power Supply	115.00
516E-1 12V DC Power Supply	270.00
75S-1 Receiver	520.00
312B-3 Speaker	32.00
312B-4 Speaker Console	195.00
30S-1 Linear Amplifier	1556.00
30L-1 Linear Amplifier	520.00

Write, phone or visit either store today!

Inquiries and orders from military men and others outside USA wanted

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

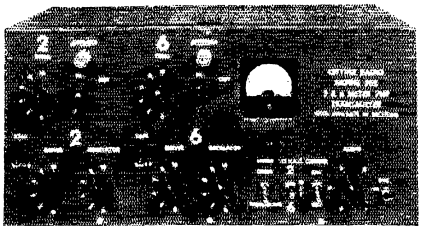
Henry Radio Stores

11240 West Olympic Blvd.
Los Angeles 64 Ph. GRanite 7-6701

BIG TRADE-INS

"World's Largest Distributors of Short Wave Receivers"

2 AND 6 METERS ON ONE CHASSIS
WITH SEPARATE RF SECTIONS
LETTINE MODEL 262

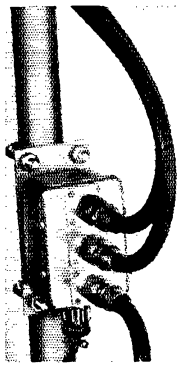


Powerful 45 to 50 Watt VHF Transmitter With Mobile Connections and A. C. Supply

The 262 contains the identical RF sections of the 2 meter 242 and the 6 meter 242 transmitters on one chassis, with a single 242 audio and power supply section. The only switching necessary to change bands is in the filament circuit. The separate RF sections make RF switching unnecessary, providing the same high efficiency of single band transmitters. Each RF section has its own tubes and circuits, comprising 4-5763's as oscillators and drivers, 2-6146's as final amplifiers, 12AT7 crystal mike amplifier, 6V6 audio driver, 2-6V6's class B 100% push-pull plate modulator, 5U4G rectifier. Two separate antenna outputs are provided with coaxial connectors on the front of the transmitter. These are connected to swinging links, controllable from the front panel, matching antennas from 52 to 300 ohms. The 262 uses standard 8 inc. crystals and will operate with the Lettine VFO. A socket is provided at the rear for relay connections. Cabinet 8 x 17 x 8 inches. Weight 32 lbs. Will operate mobile from a PE-103 dynamotor. Completely wired and ready to operate.

Price with eleven tubes and two crystals—$137.50.
Send Full Amount or $25 With Order—Balance C.O.D.

LETTINE RADIO MFG. CO.
62 BERKELEY STREET VALLEY STREAM, L. I., N. Y.



NEW "All-Weather" COAXIAL RELAY

• Eliminate expensive coaxial cable • Mounts anywhere, outdoors or indoors • Mating power connector supplied • 1P2T construction — operates 0 to 225 mc. • Full 1000 watt capability • Extremely low insertion loss—less than 0.1 db. • Attractive gold anodized aluminum construction • Weatherproof—gasket sealing • High quality TR switch • Money back guarantee.

CHOOSE FROM 7 POPULAR MODELS

Type UHF No.	NET	Type N No.	NET	POWER
CU 420	18.95	.....	.....	115v A.C.
CU 421*	19.95	CN 421*	22.65	115v A.C.
CU 121*	19.95	CN 121*	23.90	6v A.C.
CU 621*	19.95	CN 621*	23.90	12v D.C.

*X1P2T aux. contacts

Write to Hal, W8YPT for catalog sheet. Dealer and distributor inquiries invited.
ORDER NOW . . . Send Check or Money Order to:

BAY-ROY ELECTRONICS, INC.
P. O. Box 7503 Cleveland 30, Ohio

States in June. CT and DR helped JE get his "unintelligable speech" working. DR's sleet storm beam casualty will be replaced by a new TH-3, while WY is investing in a TH-4. LE, who signed /W7 for some time, is now back and will concentrate on 80 and 40 meters, c.w. and phone. EC reports TK and HO are reliable members of the Quebec Phone Net. BW, ASK and ANB are planning a ham club at La Tuque. Mrs. IC was successful in securing her ticket and now signs EB. The Annual BERU Test saw much local activity despite mutilated sky-hooks from a recent storm. WW appears to be a top scorer, while YU, NV, AYY and many others turned in fine efforts. IE's signal on 75-meter phone has increased tremendously since he acquired a new Apache transmitter. WT reports increased activity in the OQN C.W. Net, with 25 sessions and 203 messages handled. HI spent some time in the hospital but is back on the air. AGM, a new ORS, is a very active traffic man. AQN is looking forward to summer yachting. EP's mobile installation is almost ready. Traffic: W7QMU/VE8 157, VE2AGM 123, WT 121, DR 107, EC 18, BG 14, AUU 12, AFJ 9, JZ 9, AGQ 8, QG 7, APR 6, AUE 4, BDV 3, ED 1.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—ASC, Chilliwack ARC, operates a DX-35 and an HQ-129X receiver with many active members on the air. RS, BFW and AOS are active on 75 meters. KN won the Federal Competition for Regional Superintendent of Radio Regulations DOT for B.C. AEY took as his bride a Scotch lass. AHN has left for G-Land to stay. AV and his two sons suffered polio attacks, leaving Warren in poor shape. The Royal City ARA's call is FY, in honor of Shirley Craig. AQN now is a VE5 in Melden, Sask. DZ has completed his Cheyenne and RETMA course. For information on the OK Hamfest to be held in OK Falls this year, contact FS. DH, OO and OBS, laments no DX on 10 meters. AQG has retired from the BCAREC Net to the garden for the summer. It's nice to hear UW calling the Island Section. AC and his XYL had a serious mishap with their car. Both are doing well. Net reports: RM AIG has awarded the SNC to LL, YS, AP, BFW and AOY. Before you leave us, AOT, we all want to thank you for the hard work you did on the BCEN. BCAREC Net report for March: Sessions 27, check-in 1556, traffic 94, verbal messages 334. BCEN manager BAZ reports: Sessions 60, traffic 172. RM AAF reports the slow-speed C.W. Net meets on 3700 kc. for those who wish to see how traffic is handled before going to BCEN on 3650 kc., which works at 18 words but will go slower on request. FB confirms. Traffic: VE7AMW 19, FB 18, DH 11.

MANITOBA—SCM, M. S. Watson, VE4JY—The WARA is sponsoring demonstrations of ham radio to some of the Winnipeg high schools. A successful 6-meter transmitter hunt was held in March with GU, KF and FY taking the honors. The March meeting of the ARLM featured a lecture and demonstration of RTTY by BJ. Both the beginner and advanced classes arranged by the ARLM in cooperation with the Winnipeg School Board are in progress under Duncan McRea and RT, as instructors. RR, of The Pas, has been appointed PAM for Manitoba to replace JW, whose term has expired. FX, JQ and EF have been buying up bamboo poles for quads. It is with deep regret that we record the passing of AY, of Morden, Man., on Mar. 12 after a brief illness. Traffic: VE4JY 32, KN 15, PE 13, QD 8, TE 6, RR 4.

Keyboard-Controlled C.W.

(Continued from page 48)

After the operator has struck the AR key and K or KN keys to conclude a transmission, he should (1) strike the BLANK TAPE key three or more times, and (2) commence the sequence for the next transmission by perforating the distant

(Continued on page 134)

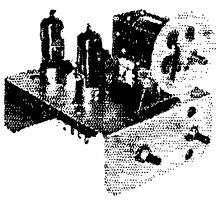
TRI-BAND-QUAD
$1.00
COMPLETE PLANS

- No Stubs
- High F to B
- Very Broad
- High Gain
- Low S. W. R.
- 30 Lbs. Max.

BARRINGTON SPECIALTIES, Box 154, Barrington, R.I.

BULLSEYE BUYS at ARROW!

AMERICAN GELOSO V.F.O.'s



Wired, tested, calibrated, ready for use. Mod. 4/104 for driving one 807 or 6146 final in AM or CW under Class "C" conditions.

Mod. 4/102 for driving two 807's or 6146's final. Has 5 bands. Supplied with Mod. 1640 dial ass'y.

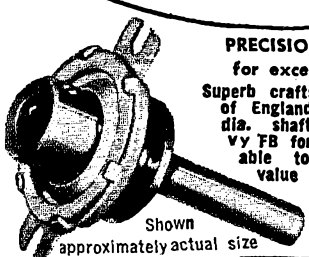
Mod. 4/103 for 144-148 mc bands. Combines VFO primary freq. of 18 mc with xtal fundamental freq. of 12 mc. Supplied with Mod. 1647 dial ass'y.

Mod. 4/104, 4/102 or 4/103 less tubes and xtal, each $29.95

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.

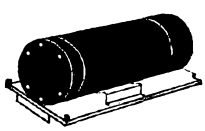


Shown approximately actual size

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.

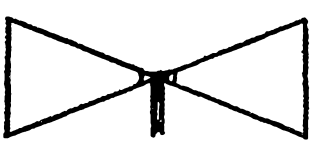
Amateur Net $1.50 ea.
10 for $13.50



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

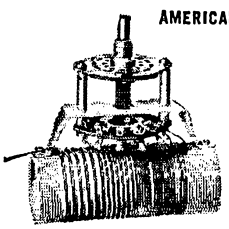


"Wonder Bar" 10 Meter Antenna

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

AMERICAN GELOSO PI TUNING COILS



Units have 6 posit. tap switch mounted on ceramic coil form. Mod. 4/111 designed for use with two 807's or 6146's (in parallel). Freq. Range 3.5 to 29.7 mc.

Mod. 4/112 is designed for use with single 807 or 6146. Handles up to 60 w. Range: 3.5 to 29.7 mc.

Mod. 4/111 or 4/112, each $4.95

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.

3 for $3.49 Amateur Net $1.39 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

TRADE-INS WELCOMED

"Mage" Magers
W0OJI, President
A Ham Since 1910

ONLY $22.46
a month
will buy you a
61 Ft Vesto
SELF-SUPPORTING
TOWER
which will last
a lifetime!

VESTO GALVANIZED STEEL TOWERS LAST A LIFETIME!

VESTO TOWERS HAVE: No guy wires! No cables! No moving parts! Easy to Erect! Prices start at $149.

VESTO TOWERS OFFER YOU:

- 4-leg construction for better balance—greater strength
- Safe, steel ladder from ground to platform near top
- Safety platform with metal railing and trap door (optional)

IDEAL FOR SMALL CITY LOTS

Even a 61-Ft Tower requires a space only 12 feet square!

NO VESTO TOWER HAS EVER BEEN DAMAGED BY HURRICANE

Invest 3 cents! Write today for complete FREE information

VESTO CO., INC.
20th & Clay St.
North Kansas City, Mo.

$ $ $ $ $ $ $ $ $ $ $ $ $ $

WE BUY

HAM

EQUIPMENT

FOR

CASH

TRIGGER

7361 W. NORTH AVE.

RIVER FOREST, ILL.

PR 1-8616 TU 9-6429

$ $ $ $ $ $ $ $ $ $ $ $ $ $

station's call letters three or more times, DE his own station call letters three or more times. Then as a given transmission nears its conclusion, the following action takes place in this order:

1) Transmission comes to an end by signing to the distant station.

2) Blank tape reaches the keyer sensing pins, stopping the keyer motor and positioning all equipment units to "receive."

3) The next transmission to follow from the keyer is already headed up, and will instantly engage the keyer sense pins the moment the operator strikes the "start" key.

Of course, there will be variations from these suggestions, depending upon rates of speed being used and other factors.

The operational methods outlined above have definitely proven that tape keyer operation is expeditious and convenient in most phases of c.w. activity. QST

HBR-16 Product Detector Circuit

(Continued from page 21)

longer overdriven at the signal levels developed by the HBR-16 when the i.f. gain is advanced to the point where the a.v.c. and S meter become operative. The resultant audio reproduction on s.s.b. signals is distortion free, for all practical purposes, even though the over-all receiver gain is such that the S-meter readings are off scale."

Ted also has been asked frequently about the advisability of broadening out the i.f. à la W7PIK's letter in December *QST* (page 45). His reply is that most fellows want the selectivity that goes with the ordinary method of alignment. But it doesn't cost anything to try it both ways if you're interested. QST

Field Day Rules

(Continued from page 51)

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 24. 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

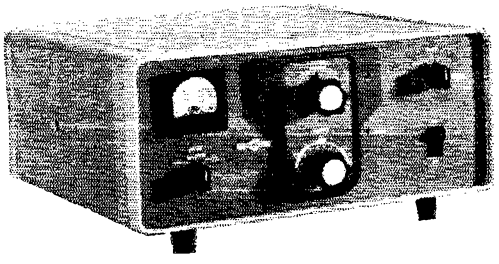
Your Ham Headquarters – WASHINGTON to FLORIDA

SPECIALIZING IN THE BEST AT EASY TERMS
HIGH TRADES AND LOW DOWN PAYMENTS
WRITE FOR DETAILS OF OUR TIME PAYMENT PLAN

COLLINS KILOWATT LINEAR

NEW 30L-1

order it now for early delivery. Collins new 30L-1 Linear Amplifier is a compact unit with 1 KW PEP input. It's the same size as the famous Collins KWM-2. The 30L-1 is compatible with any 100 watt exciter. Other Collins features include: RF inverse feedback; automatic load control; self-contained power supply; silicon rectifiers; and high/low power switch. **Amateur net price: $520.** The demand for this unit makes it necessary for you to place your order with Electronic Wholesalers now for early delivery.



Stop in soon and see the complete Collins line of amateur equipment. Invest in equipment that protects your investment—Collins.

ELECTRONIC WHOLESALERS, INC.
61 N.E. 9th STREET • MIAMI 32, FLA. • Phone FRanklin 7-2511
FORMERLY ELECTRONIC SUPPLY

ELECTRONIC WHOLESALERS, INC.
1301 HIBISCUS BLVD. • MELBOURNE, FLA. • PArkway 3-1441
FORMERLY ELECTRONIC SUPPLY

ELECTRONIC WHOLESALERS, INC.
2345 SHERMAN AVE., N.W. • WASHINGTON 1, D.C. • Phone HUdson 3-5200

THE radio amateur's HANDBOOK

3,300,000 + Copies!

A best seller indeed! Total recorded distribution of THE radio amateur's HANDBOOK passed the 3.3 Meg mark as initial shipments of the 38th Edition were made earlier this year. A technical book has to be outstanding to merit such astronomical success. And the 1961 Edition is better than ever. The "standard manual of amateur radio communication," it's packed with information useful to the amateur and professional alike.

Transmitting, receiving, phone, c.w., v.h.f., u.h.f., mobile, antennas, construction, transistors, semiconductors, vacuum tubes, FM, AM, SSB . . . THE HANDBOOK covers all these and more. Keep abreast of developments. Pick up your copy of ARRL's handy HANDBOOK now!

$3.50 U.S.A. proper

$4.00 U. S. Possessions and Canada,

$4.50 elsewhere

Buckram bound Edition **$6.00** everywhere

THE AMERICAN RADIO RELAY LEAGUE

WEST HARTFORD 7, CONNECTICUT

I.A.R.U. NEWS

(*Continued from page 49*)

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: **Central Radioclub,** P.O. Box 95, Bucharest
Salvador: YS1O, Apartado 329, San Salvador
Singapore: **QSL Manager, P.O. Box 777**
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: Sveriges Sandare Amatorer, Enskede 7
Switzerland: U.S.K.A., Sursee
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

VE/W Contest

(*Continued from page 52*)

W. Mass.
W1AZW....26,642
K1IJU....15,162

N. H.
W1FZ....34,115
K1IIK....25,830
W1ZQR....23,393
K1NBN....12,509
W1QGU....5415
K1KPS....4765

R. I.
K1JYN....34,602
K1JTL....6067
K1BBK....1733

Alaska
KL7ALZ....11,696
KL7WAH....9096

Idaho
K7DAS....34,114
K7GTK....23,501
K7BWV....20,995

Montana
K7CTI....31,678

Ore.
W7JLU....22,743
W7QNI....11,841
W7IAQ....6498

Wash.
K7CHH....49,221
W7ZVY....13,862
K7APK....4874

Hawaii
KH6CJG....20,794
KH6DVG....11,372
KH5DGL....5198

S. C. V.
WA6HRS....15,512
K6LRN/6....3885
W6OKK....3032

E. Bay
WA6ECP....53,121
W6IPH....9242

S. F.
K6EIE....37,526
W6YC....35,089
K6JFY....6105

Sac. V.
K6SXX....22,743
K6EIL....21,660

S. J. V.
K6ROU....29,566

N. C.
W4PLL....50,360
K4YCL....23,122

S. C.
W4BWZ....59,944
K4YYL....58,482
W0YFT/4....57,507

Va.
W4CHK....90,160
W4HTV....81,387
K4TFL....29,241
W4JUJ....23,068

W. Va.
K8MIH....19,494
K8JLF....11,913
K8NIN....4874

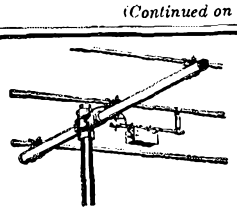
Colo.
KØTMM....51,334
KØVFN....13,897

Utah
K7DVT....26,002

N. Mex.
K5UYF....74,564
K5VDI....20,824
W5NTM....11,370
K8QMK/5....6498

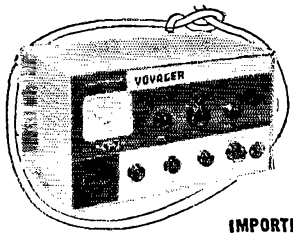
Wyoming
K7CRL....19,638

(*Continued on page 138*)



BEAM EXPENSE
can be lowered with a beam designed to last.
• THREE BAND • TWO BAND
• SINGLE BAND
TENNALAB 417 S. Tenth St. Quincy, Ill.

THE LAFAYETTE ROUNDUP OF HAMSHACK VALUES

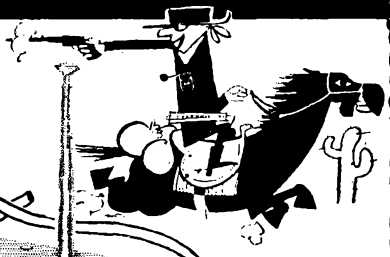


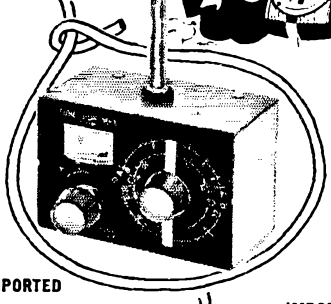
IMPORTED

MODEL HE-25
"VOYAGER" TRANSMITTER

Single knob bandswitching 80 through 6 meters with a full 120 watts CW or 70 watts phone operation. High'Q,pi-network mat-ches antennas from 40-600 ohms.

109.50





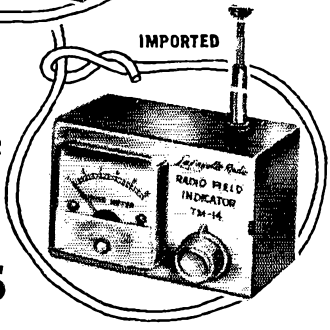
IMPORTED

8.95

MODEL TM-15
WAVE METER

Checks transmitter output for harmonics, parisitics, and out-of-band operation. Provided with magnetic feet. Perfect for the novice.

IMPORTED



IMPORTED

MODEL TM-14
FIELD STRENGTH METER

Complete, no wires to connect. Monitor transmitter output, check antennas, etc. Perfect for mobile, provided with magnetic feet.

6.95

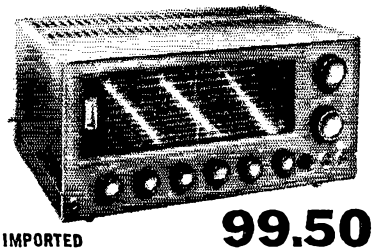
37.50

HE-28 RF WATTMETER AND SWR BRIDGE

150 watts full scale—Built-in dummy load—Wattmeter ±5% to 54 mcs. SWR ±5% for in line use.

AN UNHEARD OF BREAKTHROUGH IN THE COMMUNICATIONS RECEIVER FIELD

THE LAFAYETTE HE-30



- TUNES 550 KCS TO 30 MCS IN FOUR BANDS
- BUILT-IN Q-MULTIPLIER FOR CROWDED PHONE OPERATION
- CALIBRATED ELECTRICAL BANDSPREAD ON AMATEUR BANDS 80 THRU 10 METERS • STABLE OSCILLATOR AND BFO FOR CLEAR CW AND SSB RECEPTION • BUILT-IN EDGEWISE S-METER

IMPORTED

99.50

THE DREAM RECEIVER FOR TODAY'S CROWDED BANDS AND AT AN IDEAL PRICE

LAFAYETTE RADIO

165-08 LIBERTY AVENUE, JAMAICA 33, N. Y.

OTHER LOCATIONS

NEW YORK, N. Y.	NEWARK, N. J.	BRONX, N. Y.	PARAMUS, N. J.	BOSTON, MASS.	PLAINFIELD, N. J.
100 6th Avenue	24 Central Avenue	542 E. Fordham Rd.	182 Route 17	110 Federal Street	139 W. 2nd Street

FREE 324-Page 1961 Catalog No. 610

Cut Out & Paste on Post Card

Lafayette Radio Dept. VF-1 P.O. Box 190 Jamaica 31, N. Y.

☐ $.....Enclosed. Send Stock #..... ☐ Rush FREE 324 Page Catalog 610

☐ $.....Down Payment Enclosed for Stock #.....

Lafayette Easy Pay Application Will Be Forwarded Upon Receipt of Down Payment

Name _____

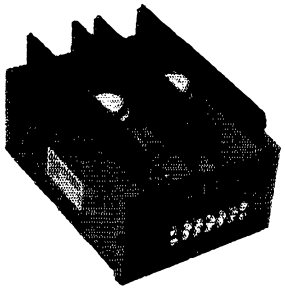
Address _____

City _____ Zone _____ State _____

MOBILE POWER SUPPLY

MODEL
A12/600/200

NOW
$59.50



This 12V input dc to dc transistorized converter is conservatively rated for continuous output of 120 watts at 600V or 300V, or any combination of 600 and 300 volt loads totaling 120 watts.

High efficiency, small size, and light weight, plus freedom from maintenance, conserve your battery and increase the enjoyment of mobile operation.

GLOBE

ELECTRONICS DIVISION
GLOBE INDUSTRIES, INC.
525 MAIN STREET
BELLEVILLE, NEW JERSEY

Ala.

K4BQU	36,551
K4DSM	22,093
W4DS	7509

E. Fla.

K4RAD	77,976
K4JLD	55,883
W4ORT	53,121
W4QVJ	17,185

W. Fla.

W4MLE	33,212

Ga.

K4BVD	73,103
W4BEY	62,705
K4TEA	55,071
K4UJS	51,169
K4CDF	45,811
W4HYW	29,566
W4WTA	26,858
W4BHG	14,620
W4TKD	7364
K4PBK	6931

W. I.

KP4KD	3682

Los Ang.

W6NZW	59,457
WA6CGS	43,320
W6GQX	34,655
K6OPI/6	32,100
K6MSG	31,190
K6VRJ	29,169
W6JST	22,743
WA6IGU	10,234
WA6FVL	7581
W6OEO	6209
K6QPH	5632
WA6AYF	1300
W6JQR	758

Ariz.

W7ENA	31,190

S. Dgo.

W6ZVQ	107,704
WA6CEZ	26,317
W6VAK	19,927
WA6DNX	5957
K6STZ	2310

No. Tex.

K5IID	59,944
W5JD	18,628

Okla.

K5OCX	43,213
K5WZJ	432

So. Tex.

W5WZQ	100,881
W5LGG	24,468
K5JFP	22,526
K5LLJ	6227
W5MPE	4874
K5SEK	551

V.H.F. Sweepstakes

(Continued from page 67)

WA6IBM/6 (W6HBE, WA6IBM)	6440	161-10-A	
W6UFJ/6 (W6UFJ, WA6KYR, WV6NSU)	1872	78-2-AB	

San Diego

WA6JMQ	1274	46-4-AB	
WA6FJJ/6	696	29-2-B	

WEST GULF DIVISION

Northern Texas

K5TKR	7068	186-9-AB	
K5LIW	6612	175-9-AB	
K5ZPE	4230	141-5-AB	
K5RBN	4020	134-5-AB	
K5FUL	3330	111-5-A	
W5WAK	3120	104-5-A	
W5FRK	2800	100-4-A	
K5ZMR	2420	110-1-A	
K5GHR	2328	97-2-A	
K5YKX	2288	88-3-A	
K5RWR	2160	90-2-A	
K5EMY	2054	79-3-A	
K5UIA	2054	79-3-A	
K5UMD	2016	72-4-A	
K5IBS	1804	41-12-A	
K5UGQ	1612	62-3-A	
K5QES	1562	71-1-A	
K5SCA	1540	70-1-A	
K5WWZ	1408	64-1-AB	
K5ZPC	1320	60-1-A	
K5MTK	1254	57-1-A	
W5CQT	1248	52-2-A	
K5YOS	1210	55-1-A	
K5KVE	1200	50-2-A	
K5VUF	1188	54-1-A	
K5ZIF	1100	50-1-A	
K5TXX	1012	46-1-A	
K5VRY	1034	47-1-A	
K5KWB	996	42-2-A	
W5AWL	984	41-2-A	
K5RJL	946	43-1-A	
K5VUM	836	38-1-A	
K5ZBM	754	29-3-AB	
W5FEG	704	32-1-A	
K5VFA	660	30-1-A	
W5AQS	648	28-2-A	
K5VRW	638	29-1-A	
W5CQM	638	29-1-A	
W5BJB	616	28-1-A	
K5KKS	550	25-1-A	
K5PII	528	24-1-A	
K5RHY	374	17-1-A	
K5FOD	154	7-1-A	

Oklahoma

K5ZGV	2160	54-10-AB	
K5ZTH	1326	39-7-A	
W5VCJ	756	27-4-A	
K5LRE	594	27-1-A	
K5CBA	330	15-1-A	

Southern Texas

K5FRG	912	38-2-AB	

CANADIAN DIVISION

Quebec

VE2AIO	1512	32-14-A	
VE2BBP	220	10-1-B	
VE2TT (VE2s AXY TT)	900	30-5-B	

Ontario

VE3DIR	2772	78-8-AB	
VE3APF	2080	80-3-B	
VE3AQG	2016	72-4-B	
VE3CIL	1560	60-3-B	
VE3AIB	1300	50-3-B	
VE3ATB	1080	45-2-AB	
VE3BYU	744	31-2-B	
VE3CWN	624	26-2-B	
VE3CUY	616	28-1-B	
VE3CLL	612	26-2-B	
VE3BZV	576	24-2-AB	
VE3CUA	403	16-3-AB	
VE3CRD	308	14-1-B	
VE3BYY	286	13-1-B	
VE3CYS/3	242	11-1-B	
VE3DHG	240	10-2-B	
VE3UT	220	10-1-B	
VE3DBY	176	8-1-B	
VE3RIT/3 (VE3s BFA CYS EPD)	384	16-2-B	

Alberta

VE6DB	72	3-2-A	

[1] Novice Award Winner. [2] Hq. Staff, not eligible for award. [3] KN1PUR, opr. [4] W7QDJ, opr. [5] K5QIN, opr.
Non-competing: W2QFQ, W3UHN, WA6CBQ, WA6GER, W8TYL, XE1OE.

DXCC WAZ WAS

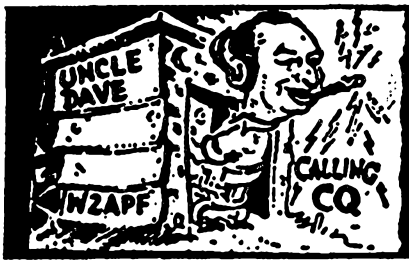
Display and protect your choice QSL cards in the new DX-QSL transparent card packet. Made of strong, long-lasting clear polyethylene to hold ten cards. Only 49¢ postpaid per ten-card packet. Ten packets for $3.95. Satisfaction guaranteed or your money back.

ORDER TODAY
FROM **DX-QSL**
P. O. BOX 19033
HOUSTON 24, TEXAS

CUBICAL QUAD BEAMS

Pre-cut **$59.95** — Just put together and use. — Pre-tuned. **$79.95**

Order from our Eastern Distributor:
Adirondack Radio Supply, Amsterdam, New York
or order direct from
SKYLANE PRODUCTS, 406 Bon Air, Tampa 10, Florida

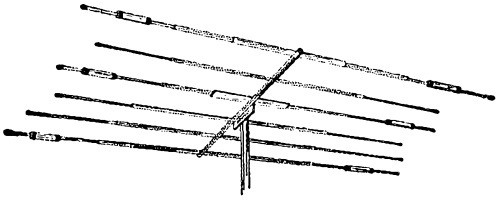


FORT ORANGE
Radio Distributing Co. INC.

904 BROADWAY ALBANY 4 N. Y. U. S. A.
AMATEUR HEADQUARTERS

Cable Address "Uncledave" **CALL ALBANY HE 6-8411** **NITES GR 7-5891**

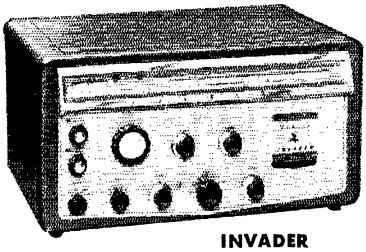
THIS MONTH WE ARE FEATURING SOME NEW UNITS WHICH SHOULD BE AVAILABLE BY THE TIME YOU READ THIS—ALSO WE HAVE A FAIR AMOUNT OF THE SPECIAL NEW AND USED UNITS WHICH HAVE BEEN FEATURED FOR THE PAST THREE MONTHS LEFT IN STOCK! SO, WRITE US FOR COMPLETE LIST IF YOU DON'T HAVE THE PAST THREE ISSUES OF QST!—73 AND CUL—UNCLEDAVE, W2APF.



MOSLEY TA-36

4 Elements on 10
3 Elements on 15
3 Elements on 20

Price.....**$129.50**



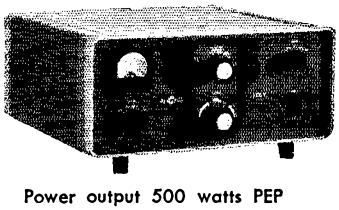
JOHNSON

INVADER

Power input: 200 watts PEP, 200 watts CW, 90 watts AM
Price.....**$619.50**

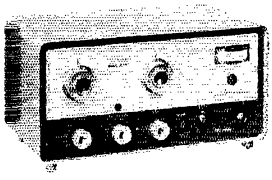
INVADER 2000

Power input: 2000 watts PEP (twice average d.c.), 1000 watts CW, 800 watts AM
Price.....**$1229.00**



COLLINS
30L-1
Linear

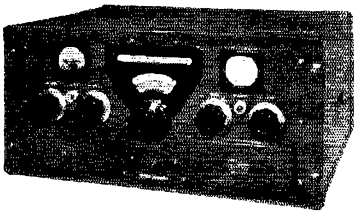
Power output 500 watts PEP
Price.....**$520.00**



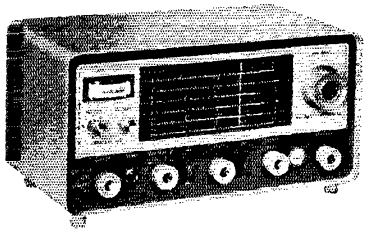
HALLI-KIT
HT-40
Transmitter

Complete coverage of all amateur bands 80 through 6 meters
Maximum d.c. power input, 75 watts
Price (wired and tested).....**$99.95**
Price (kit)..... **79.95**

CENTRAL ELECTRONICS 200V



Power input: 200 watts PEP on SSB; 175 watts on CW, FSK and PM; 100 watts on AM
Price.....**$795.00**



HALLI-KIT
SX-140
Receiver

Complete coverage of all amateur bands 80 through 6 meters
Price (wired and tested).....**$109.95**
Price (kit)..... **94.95**

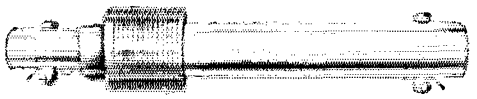
Write Uncledave W2APF with your needs and problems.

TRADE-INS ACCEPTED *AND* FOREIGN TRADE SOLICITED
BANK FINANCING

TIME PAYMENTS 18 Months to pay. Life Insurance at no extra cost

UNCLE DAVE'S RADIO SHACK
A SUBSIDIARY OF FORT ORANGE RADIO DISTRIBUTING CO.

Order Today for a New Pleasure in Ham Radio!



4 and 5 BAND

ANTENNAS

- Designed for a lifetime of use
- Coils moisture-proofed with Scotchcast Resin
- Designed to withstand 10KV RF
- No leads to switch, no coils to change; change bands with your transmitter in 20 seconds
- Can be fed with coax, tuned feeders, etc.
- Only best quality parts used!
- All antennas include coils, twin lead, heavy duty insulators and copperweld wire

FIVE BAND DOUBLET ANTENNA works 80 thru 10 Meters. Covers 80, 40, 20, 15 and 10 meters. Overall length 111'. Twin lead 88' 8".

HI-POWER

1 KW 5HC-F 5-Band KW coils (pair).....**$19.95**
SSB 5HA-F 5-Band KW antenna.....**$33.95**

LO-POWER

¼ KW 5BC-F phone coils (pair) or
5BC-C CW coils (pair).....**$12.50**
5BA-F phone antenna or
5B-C antenna.....**$27.50**

FOUR BAND ANTENNA works 40 thru 10 Meters

HI-POWER

Covers 40, 20, 15 and 10 meters. Overall length 56' 8"
Twin lead 80'
1 KW 40M-C 4-Band KW coils (pair).....**$14.95**
SSB 40M-A 4-Band KW antenna.....**$24.50**

Distributor Inquiries Invited
Available From Your Favorite Dealer or Write

GENERAL CRYSTAL CO. Inc.
372 Wilmot Avenue **Burlington, Wisconsin**

DOW-KEY CONNECTORS

PANEL MOUNT Durable, silver plated, precision made. Only ⅜" hole is needed, no screws. ea. 70

DOUBLE MALE Favorite everywhere. Precision made, rugged locking type. Silver plated. ea. . . . 1.25

DOW-KEY COMPANY, Thief River Falls, Minn.

THE LEAGUE EMBLEM

With both gold border and lettering, and with black enamel background, is available in either pin (with safety clasp) or screw-back button type. In addition, there are special colors for Communications Dept. appointees.

- **Red enameled background for the SCM.**
- **Green enameled background for the RM, PAM or EC.**
- **Blue enameled background for the ORS or OPS.**

THE EMBLEM CUT: A mounted printing electrotype, ⅝" high, for use by members on amateur printed matter, letterheads, cards, etc.

Pin, Button or Cut: $1.00 Each, Postpaid

AMERICAN RADIO RELAY LEAGUE
West Hartford 7, Connecticut

Correspondence from Members

(*Continued from page 75*)

bit. What annoys me is the operator who hunts down and zeroes-in on whatever station I am working on whatever frequency, and then proceeds to call me — zero beat with my contact — the whole time the latter is transmitting. This has slowed things down considerably for, being a stubborn cuss, I insist on going right back to the station being worked and having him repeat his transmission as many times as necessary until I get it solid.

And then there is W1VG's recommendation that the DX station give out no more information than his name, rank and serial number — or the amateur equivalent — before moving on to the next contact. Now, for my part (and there must be many another DX station in the same situation), I do not consider my operations here as the DXpedition variety. I have spread the word around pretty generally that I shall be here for the next two years or more. I thus hope to be able, eventually if not immediately, to QSO practically all stations desiring an FF4 contact. I am fully aware that the boys are anxious to "get a new one" as soon as possible and I try to oblige, but under the circumstances I do not think it unreasonable of me to pause from time to time to have a short chat with an old friend. After all, *I* would like to get a little fun out of this business, too. DX contests are fine, and I've enjoyed many from both sides of the fence. But when you have the impression of having been in a DX contest every day for two months running, and with no end in sight, it begins to pall on you a bit . . .

. . . I won't even go into the matter of directional CQ's except to note that two nights ago I called "CQ New York City" and got immediate replies from every U.S. district (except the 6th and 7th, which were not coming through at the time) plus, in the middle of it all, a very loud YU with a T6 note.

I do not mean to imply that all the boys resort to the operating tactics described above. In fact, the vast majority of amateurs cooperate magnificently in the smooth operation of the DX station. But there are always enough who don't to make life pretty difficult at times.

So you see, the DX station is not always master of the situation as you imply. There are certain situations he just can't handle from his end, and he is much too far away to make effective use of a Rettysnitch. — *Rupert A. Lloyd, jr., FF4AL, Abidjan, Ivory Coast.*

¶ . . . I approve [of W1VG's sentiments] 100%. Have gone through the same agonizing baloney about name, QTH and address repeated several times to each caller. Also, I view with contempt the m.c. system — how are we to contact a W2 who is m.c.'ing an FF8 — ground wave or telephone?

Maybe I'm selfish — all DXers are. But there should be better op techniques than now employed. — *Ted Melinosky, K1GUD, New Britain, Conn.*

¶ True, we have our own backyard to clean up, but many of our own yards would become clean if some of these DX stations "ran the show" and let us know who's the boss. I think it's important to note that not all U.S. stations heed the DX operator's "call 5 down", etc., but that's mainly because, as you said, the DX operator will answer those who call even on his own frequency.

I'm glad you made the point of not wasting time with the transmission of name, QTH, QSL info, etc. You're absolutely right — we do know all that!

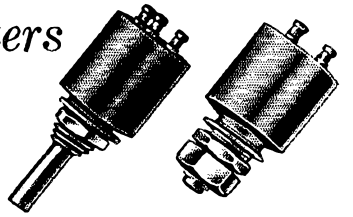
Most important, I'm extremely happy that you suggested a DX station give both calls at the end of the first transmission! Many is the time when after calling a DX station, I can't even hear him, because some guys are still right on the frequency calling him! When I do hear him, he's in the

(*Continued on page 142*)

YES, WE AND THEY SURE
HAVE COLLINS—WILL TRAVEL
Get in touch with WILSON — "That's All"
QCWA | Willard S. Wilson, Inc. 405 Delaware Ave., Wilmington, Del. W3DQ Est. 1920 K2IUS | VWOA

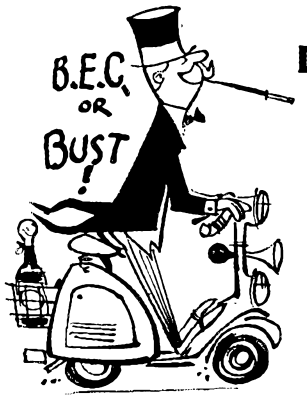
CLAROSTAT

1/2" Precision Potentiometers



Series 57 means "More Performance in Less Space." Only ½" in dia., weighing ¼ oz. "Hi-Load" winding element, improved rotor and brush, for maximum reliability and stability. • Ask for catalog.

CLAROSTAT MFG. CO., INC., Dover, New Hampshire



WE CATER TO THOSE WHO DEMAND GOOD VALUE . . . with Economy in Mind

Mosley TA36 — 4 Element Beam: 4 elements on 10
3 elements on 15
3 elements on 20
Price: **$129.50**

CDR Ham-M Rotator: Controls large Antennas. Load rating over 1,000 lbs. Provides 365 inch lbs. rotating torque. **$110.00.**

50 foot/8-conductor Color-Coded Rubber Cable. 50 ft. roll — **$2.95** (outside of cable completely covered with rubber).

Glas-Line (Non Conductive Guy Wire): 500 lbs. tensile strength. (Eliminates need for glass "break up" insulators). Ideally suited for heavy amateur antennas. 100 foot spool **$3.75.** . . . 600 Foot spool **$17.50.**

New National Receivers — sealed factory cartons:
NC270 with NTS-3 Matching Speaker — @ **$225.00** for both.
NC303 @ **$395.00**
NC400 @ **$795.00**

BC221 Frequency Meter. With Internal Modulation and orig. calibration book. Lab tested — excellent condition. **$99.00.**

TS175U Frequency Meter: Excellent, like-new condition. W/orig. book. Individually calibrated from 85 thru 1,000 Mcs. (looks like BC221). **$250.00.**

Eimac JAN Tube type 4-65A's @ $10.00.

Plate Transformer: Pri: 115 VAC @ 60 CPS, with taps. Sec: 3200 VCT @ approx. **300 Ma. Overall Dimensions:** 8 ½" H x 4¾" W x 8" D. Wt: 27 lbs. Mfd. by RCA. **$10.50.**

Hughes Swinging Choke: 20 Hy. @ 50 Ma. D.C./3.5 Hy. @ 250 Ma. D.C. 75 Ohms D.C. Resistance. Herm. sld. Ceramic insulators. Wt: 5 ½ lbs. Overall Height: 4⅝". 3 ½" W x 3" D. **$1.95.**

RCA Mica Capacitor: 4,000 Mmfd. 3000 V. Peak. **$1.95.**

RCA Plate Xfmrs: 1290 V.C.T. @ 360 Ma. Pri: 115 V. w/taps. 60 CPS. Herm. sld. **$4.95.**

RCA Plate Xfmrs: Pri: 115 VAC @ 60 CPS. Sec: 905 V.C.T. @ 360 Ma. **$3.95.**

Variable Capacitor: Dual 215/215 Mmfd. .125 spacing (4500 V.) **$7.75.**

RCA Plate Xfmr: 905 VCT @ 360 Ma. Pri: 115 V. w/taps @ 60 CPS. Herm. sld. **$3.95.**

Merit Choke: 10 Hy @ 250 Ma. #C-3182. **$2.95.**

Xmtg Variable Capacitor: 72 to 1,008 Mmfd. @ 3500 V. Ceramic ins. **$8.50**

Variable Capacitor: 18 to 400 Mmf. V. Ceramic ins. **$2.50.**

#213 Sockets for 304TL & 304TH, $1.15 each.

Cathode Ray Tube Shield (for tube type 2BP1) $2.95.

Cornell-Dubilier 4 Mfd @ 4000 VDC Oil Capacitor. $9.95 (3 for $27.00.)

Hughes Swinging Choke: 20 Hy/3.5 Hy @ 50/250 Ma. 75 Ohms. **$1.95.**

UTC Type S-32 Swinging Choke: 5/25 Hy/ 225 Ma/120 Ohms. **$4.90.**

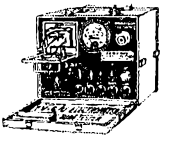
Plate Xfmr: Pri: 115 VAC @ 60 CPS w/taps. Sec: 3200 VCT @ Approx. 300 Ma. **$10.50.**

Filter Choke: 8 Hy. @ 200 Ma. (90 Ohms D.C. Resistance) Herm. sld. **$1.75.**

World Globe, 12" Diam. Beaut. colors. Topography is raised above surface of actual globe. **$19.95.**

Compact 125 Watt Modulation Xfmr: Pri: 10,000 Ohms Plate-to-Plate. Sec: 4550 Ohms (Has screen winding. 3300 Ohms). Open frame, epoxy impregnated. Winding insulation to ground: 5000 Volts Peak. Orig. designed for PP 4-65A's. Dimensions: 3¼" H x 3½" W x 3¼" D. Wt: 3 lbs. **$6.95.**

TV6/U Bendix Electrometer Tube Tester: Checks 5889, 5886, 5803, 5800, 5799, etc. Brand New. With Book **$55.00.**



UTC Choke: 6 Hy. @ 500 Ma. (27 Ohms) **$8.95.**

UTC Choke: 6 Hy. @ 1 Amp. (33 Ohms) **$13.95.**

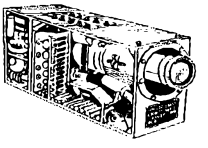
Jennings UCS Vacuum Variable Capacitor: Capacity: 10 to 300 Mmf. @ 10 KV. Complete, less shaft. **$49.00**

7 Foot, Heavy-Duty, 3-Conductor AC Line Cord. With polarized plug. U.L. approved. **$.40.**

3-Prong Adaptor for above: to fit standard 2-wire AC outlet w/separate grounding wire and lug. **$.25** (U.L. approved).

RCA CRV-59AAC TV Xmtr/Camera with 1846 Iconoscope. $95.00.

RCA Precision 500 KC Crystal Oscillator: Accuracy 0.0012%. Contains Precision 500 KC xtal oven. 5840 tube. Herm. sld. Mounts on standard 7 pin miniature socket. Requires 6.3 VAC or DC. 75 50 100 V.D.C. W/schematic. **$3.75.**



Xmtg Variable Capacitor: Approx. 20 to 750 Mmfd @ 4,000 V.D.C. Capacitor enclosed in ingenious oil-bath, allowing high-voltage and small size. Overall dimensions: 6 ½" L x 3¼" H x 3½" W. **$11.95.**

BARRY ELECTRONICS CORP. **Dept. Q-6**
512 Broadway, New York 12, N. Y.

(Minimum order $2.00)

( ) Enclosed is money order or check and my order.

( ) Send copy of new 1961 "Greensheet" catalog.

Name.....Title

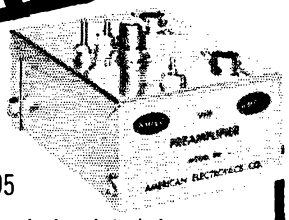
Company.....

Address.....

City..... State

NEW AMECO NUVISTOR PREAMPLIFIER

for 50, 144 and 220 Mc. bands
Lowest Noise
22 DB Gain



$13.95 wired and tested

Add an Ameco Nuvistor Preamplifier to your converter or receiver to improve the noise figure and gain. Image and spurious rejection will also be improved as the Model PV has two tuned circuits. Compact, easily connected, low power requirements.
Model PV with tube, wired and tested.
State which band $13.95

For any band, 80, 40, 20, 15 or 10 meters, the Ameco Model PH Preamplifier has a better noise figure than most multiband receivers, 23 db. minimum gain, will improve image and spurious rejection with its two tuned circuits. Especially effective on 10 or 15 meters.
Model PH with tube, wired and tested.
State which band $13.95

Write Dept. Q-6

AMERICAN ELECTRONICS CO.
178 HERRICKS ROAD, MINEOLA, L.I., N.Y.

KEY.municator TRANSISTORIZED
"PRO STYLE" TELEGRAPH KEY
Cast metal, transistorized oscillator, batteries last for months. Mounted on 9"x19" rugged base. At Electronics Dealers.
9.95

DOW-KEY COMPANY
Thief River Falls, Minn.

Groth TURN COUNT DIAL
Registers Fractions to 99.9 Turns
FOR roller inductances, INDUCTUNERS, fine tuning gear reducers, vacuum and other multiturn variable condensers. One hole mounting. Handy logging space. Case: 2" x 4". Shaft: ¼" x 3". TC 2 has 2½" dial — 1¼" knob. TC 3 has 3" dial — 2¾" knob. Black bakelite.
TC 2 $5.50—TC 3 $5.75—Spinner Handle 75c extra
Add 12¢ for Parcel Post
R. W. GROTH MFG. CO.
10009 Franklin Ave. Franklin Pk., Illinois

NOW A 3-BAND . . . .
SINGLE FEEDLINE
QUAD
. . . . by CUBEX

No relays, switches or matching devices required. Operate 10–15–20 meters with only one 52 or 72 ohm line, plus all the CUBEX MK III features at no increase in price.
Only $67.50 ready to install
HI GAIN • HI FRONT-TO-BACK RATIO • PRETUNED • NO STUBS • HUSKY CAST ALUM. SPIDERS • RUGGED 2" TUBULAR ALUM. BOOM • TV ROTOR TURNS • LARGE CAPTURE AREA • UNDER 30 LBS.
Write For Free Brochure "SF"
CUBEX COMPANY
3322 Tonia Avenue Altadena, Calif.

middle of his transmission and at the end he says *BK*. Now, how should I know whether he means me, Joe or my next door neighbor?

I sure hope some of those DX operators catch on. They have to know they really are king! — *Steve Berens, K2GTF, Laurelton, New York*

I sincerely hope that the "open letter" by one of your staff in April *QST* is not a true indication of ARRL thinking. The charges and insinuations must be taken as an insult by the persons to whom the letter was so obviously addressed. The expressions used were certainly a shock when compared to the usual high caliber of writing found in the pages of *QST*.

What right has W1VG or any or all of us to tell amateurs in other countries how to operate so as to increase *our* enjoyment of the hobby? For years *QST* has tried to point up the many facets of radio as enjoyed by amateurs, and to encourage a broader outlook in our operations. DX is certainly not all things to all of us. I have had QSOs with all of the people to whom that letter was addressed and know that working us is not their compelling reason for being on the air. I also know that a courteous approach to them will result in a QSO and a QSL. Surely that is not "time wasted."

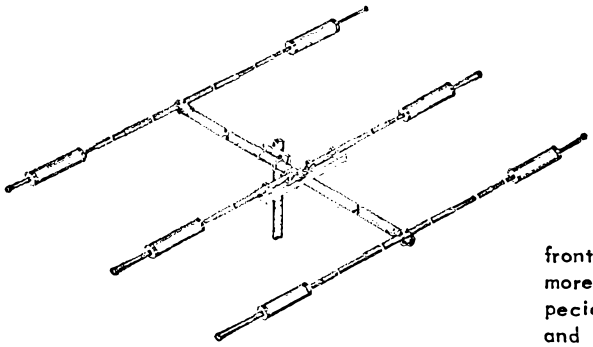
To me, the opportunity to get on the air and communicate with others with similar interests is one of the greatest privileges of the modern world, especially since practically world wide contacts are permitted. To keep this privilege let us, in this country, try to understand the man on the other side; he is trying, hard, to understand us.

To clarify my position, I belong to both RCC and DXCC and have been an avid supporter of ARRL for some 25 or 30 years. — *George W. Holland, W1QMM, Essex Junction, Vermont.*

Silent Keys

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

K1EAD, Cdr. Herbert Davies, Hingham, Mass.
W1GL, John H. Robishaw, Ipswich, Mass.
W1MRP, William F. Vornkahl, Westport, Conn.
W1QNC, Walter Hall, Lawrence, Mass.
W2BCY, William A. Dixon, New York, N. Y.
W2DIF, Paul D. West, Albany, N. Y.
W2EZ, Robb L. Millham, Liverpool, N. Y.
K2GIF, Henry G. Bawden, Lincroft, N. J.
K2RGH, Floyd C. Dence, Lisle, N. Y.
K3DBI, Ashley H. Brockett, Elderton, Penn.
W3ITV, Robert E. Clark, Washington, D. C.
W3JZI, Earl R. Gahle, College Park, Md.
W3STL, John F. Telford, Minersville, Penn.
K4AHW, Lawrence P. Algeo, Hialeah, Fla.
W4BJP, John B. Joyner, Richmond, Va.
W4GA, Arthur L. Racke, Alexandria, Ky.
W4HZZ, William E. Cunningham, Arlington, Va.
W5CFS, Hilary E. Lindsey, Tyler, Tex.
W5DRF, John N. Ellis, Cleveland, Miss.
K5JAW, Bill W. Martin, Ringwood, Okla.
K5YEQ, Paul T. Kohler, Fayetteville, Ark.
K5YJU, Dale W. Doering, Atascosa, Tex.
W6AQ, Leonard G. Hayden, Los Angeles, Calif.
K6FK, Ernest L. Petit, Los Angeles, Calif.
W6QDT, Antone J. Silva, Modesto, Calif.
W6RXC, William C. Evans, Glendale, Calif.
W6ZHN, Robert O. Hedden, Buena Park, Calif.
W7AFC, Wylie M. Sheets, Seattle, Wash.
W7AXG, Hubert C. Avery, Basin, Wyo.
W7GIY, Jesse T. Caffyn, Great Falls, Mont.
K8AOK, William F. Bertz, Ann Arbor, Mich.
K8GTT, George F. O'Connor, Durand, Mich.
ex-W9AXO, Herman C. Hughes, Terre Haute, Ind.
W9OCC, Ralph H. Knopf, Richmond, Ind.
WØEDY, James T. Roberts, Kearney, Neb.
KL7CP, Clark H. Moore, Anchorage, Alaska
VE1XZ, A. F. Tanner, Sydney, N. S., Canada
VE5JA, Jack W. Allen, Melville, Sask., Canada
VE7BEB, Donald J. Anderson, Chemainus, B. C., Canada



ANTENNAE for WWV/WWVH RECEPTION

Model WWV-33 – 3 element beam is resonant at 10, 15 and 20 mcs. Excellent forward gain and high order front-to-back rejection. Offers improved and more reliable long-path reception and is especially useful at locations between WWV and WWVH. Fully rust-proof and hurricane rated. Easily assembled by non-technical personnel.

Model 5-WWV-D – 5 frequency dipole antenna covers 2.5, 5, 10, 15 and 20 mcs. Reception pattern is typically figure 8 with two maximum lobes appearing broadside to antenna. The 5-WWV-D comes completely assembled including end insulators and 100 feet of 75 ohm lead-in line.

USED BY:

- MILITARY
- INDUSTRY
- SCIENCE
- UNIVERSITIES

Specifications and Data Upon Request

Mosley Electronics, Inc. 4610 N. Lindbergh Bridgeton, Missouri

NOVICES!

Lose Your "N" and Get a Tan

ON TOP OF THE BLUE RIDGE MOUNTAINS

Two weeks of fun at camp—and a chance to earn your General Class ticket, besides!

Are you 12, 65 or in between? Last year's camp-for-hams, Camp Albert Butler, proved successful for Novices of all ages.

This Co-Ed Amateur Radio Camp, YMCA owned and operated, is designed for just 60 campers. There is no age limit but a Novice or Technician license is required. Time will be divided between radio classes and the usual camp activities such as swimming, hiking, softball, etc.

Entire Staff consists of licensed hams who are instructors in Electrical Engineering in some of our finest colleges and universities.

Camp opens on August 6th and closes August 19th.

Tuition of $150 includes usual camp expenses —notebooks, textbooks, Health and Accident Insurance, as well as horseback riding.

Since applications will be considered in the order they are received, send now for booklet and application blank to C. L. Peters, K4DNJ, using attached coupon:

C. L. Peters, K4DNJ — Q6
General Secretary
Gilvin Roth Y.M.C.A.
Elkin, North Carolina

Please send me the Booklet and Application Blank for the Camp Albert Butler Radio Session.

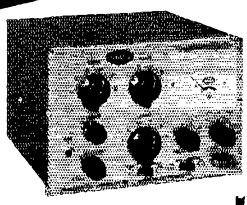
NAME.....

Novice or Technician Call.....

ADDRESS.....

CITY.....Zone.....STATE.....

NEW AMECO COMPACT 6 thru 80 TRANSMITTER



CW and Phone
Mobile or Fixed
6146 Final, Straight
thru on all bands.

The AMECO TX-86 can handle 90 watts input on CW and 90 watts peak input on phone on all bands. It is extremely compact (5" x 7" x 7") and attractively packaged in a satin finished copper panel and a black perforated cabinet. Tube lineup is—a 12BY7 oscillator, a 6BQ5 buffer and a 6146 final, modulated by a 12AX7 and a 6AQ5 in an improved low distortion type of screen modulator which cannot be distinguished from plate modulation by ear, S meter, oscilloscope or panadaptor. It is NOT controlled carrier modulation; it is NOT clamp tube modulation. Other features include push-to-talk mike jack, audio gain control, potentiometer drive control (no detuning of circuits), TVI suppression, crystal control or external VFO.
Power required for maximum output—6 or 12 volts for filaments, 300 V. at 75 ma. and 600 V. at 150 ma. Will also work with reduced output and with no changes from a 300 V. supply.

NET PRICES: Model TX-86K, complete in kit form..$84.95
Model TX-86W,
completely wired and tested.....$109.95
AC Power Supply for TX-86,
to provide full output power,
Write Dept. Q-6 Model PS-3, wired and tested $44.95

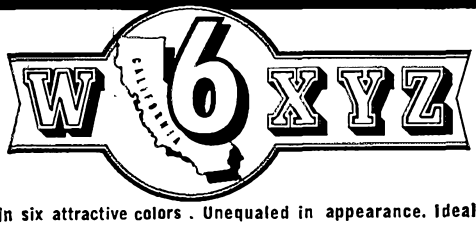
AMERICAN ELECTRONICS CO.
178 HERRICKS ROAD, MINEOLA, L.I., N.Y.

Franky the Frog says: BRIDES should blush in June, but FIELD DAY ENTHUSIASTS should not. So visit the SIX-HAPPY-HANDY-HAMS at THE AMATEUR HEADQUARTERS of Southern New England to be sure all the necessary preparations have been made for a successful outing.

A complete stock of name brand equipment which includes COLLINS, ELMAC, GONSET, HALLICRAFTERS, HAMMARLUND, HY-GAIN, E. F. JOHNSON and NATIONAL RADIO is always maintained.

W. H. EDWARDS CO., INC.
116 Hartford Ave., Providence 9, R. I. • Tel. GA 1-6158—6159—6614

NEW Your Call and home state in a single custom decal!



In six attractive colors. Unequaled in appearance. Ideal gift. $1.95 each. Add 4% tax in Calif. Approx. size 3¾" x 9". Mailed P.P. within 7 days. No COD's please.

CALL-D-CAL P.O. BOX 3915, TERMINAL ANNEX, LOS ANGELES 54, CALIFORNIA

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.

W2, K2 — North Jersey DX Ass'n, P.O. Box 666, Hillside, N. J.

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.

W4, K4 — Thomas M Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.

W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.

W6, K6 — San Diego DX Club, Box 16006, San Diego 16, Calif.

W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.

W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.

W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive Flossmoor, Ill.

WØ, KØ — Alva A. Smith, WØDMA, 38 East Maine St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.,

VE2 — George C. Goode, VE2YA, 188 Lakeview Avenue, Pointe Claire 33, Quebec.

VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.

VE4 — Len Cuff, VE4LC, 86 Rutland St., St. James, Man.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 833 10th St., N., Lethbridge, Alta.

VE7 — H. R. Hough, VE7IIR, 1290 Simon Road, Victoria, B. C.

VE8 — Earl W. Smith, VE8AT, P.O. Box 534, Whitehorse Y. T.

VO1 — Ernest Ash, VO9AA, P.O. Box 8, St. John's, Newf.

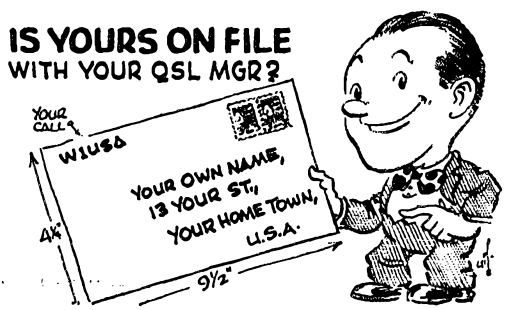
VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.

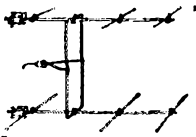
KP4 — Joseph Gonzalez, PK4YT, Box 1061, San Juan, P. R.

KH6 — John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, Hawaii.

KL7 — KL7BLL, Anchorage Amateur Radio Club, Box 211, Anchorage, Alaska.

KZ5 — Ralph E. Harvey, KZ5RV, Box 407, Balboa, C. Z.





A Range of VHF and UHF Antennas on the Unit System To Enable Construction of Multi-Element Arrays to Suit Space and Pocket

UHF-VHF

50 Mc. to 450 Mc.

NEW From the House of Antennas— THE J BEAM SKELETON SLOT FED YAGI

For the first time this side of the Atlantic — Features high gain with short booms — ruggedness — constant impedance over band — low SWR — light weight sturdy aluminum alloy — half power beam widths 40°–60°. Baluns available for all VHF bands — See December 1958 *QST* — Many models to choose from — All arrays may be fed with low-loss 300 ohm line or 50 ohm with balun — mast clamps for 1 to 2-inch mast. A call, a card or letter will bring all information — Don't be left out when the bands open up — with the skeleton slot you will be there. See it now and compare with any VHF beam on the market.

ROHN TOWERS
E-Z WAY TOWERS

•

CDR ROTORS
TRANSMISSION LINE

•

G4ZU BEAMS
TELREX BEAMS

Order now for VHF DX Season. Immediate Delivery. All Antennas in Stock in Limited Quantities. Don't Wait!

Order a complete antenna system from ground up. See the selection now at our store or at Starved Rock Hamfest. Look for K9EEC 2-meter signal with a 6 over 6 slot.

HOUSE of ANTENNAS
MASTER SERVICE COMPANY

1153 East 82nd
Chicago 19, Ill.
Tel. SO 8-9282

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-fifth year.

DOUGLAS INSTRUMENT LABORATORY
176 Norfolk Avenue — Boston 19, Mass.

FREE COIL BULLETIN

Technical data on coils specified in *QST* and Handbook. Standard coil series ideal for experimenters and designers.

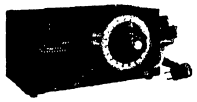
NORTH HILLS ELECTRONICS INC.
Glen Cove, Long Island, New York

DISTRIBUTORS
Harrison Radio Corp., New York, N. Y.
Radio Shack Corp., Boston, Mass.
Zack Radio Supply Co., Palo Alto, Calif.

LAMPKIN METERS + 2nd Commercial License = YOUR OWN PROFITABLE BUSINESS!

You already have earned one FCC license—your ham ticket. With a little extra study, you can get a 2nd class radiotelephone license. This one can lead to lots of money . . . in a business that's a natural for a ham.

THERE IS AN URGENT NEED FOR TECHNICIANS WITH 2ND-CLASS COMMERCIAL LICENSE—TO MAINTAIN TWO-WAY COMMERCIAL RADIO. FREQUENCY ADJUSTMENTS ON THESE OUTFITS CAN BE MADE ONLY BY PROPERLY LICENSED AND EQUIPPED TECHNICIANS. TO LEARN MORE . . .



LAMPKIN 105-B
FREQUENCY METER
RANGE 0.1 TO 175 MC AND UP.
PRICE $260.00 NET.

LAMPKIN 205-A FM
MODULATION METER
RANGE 25 TO 500 MC.
PRICE $270 00 NET.

Send for FREE BOOKLET—

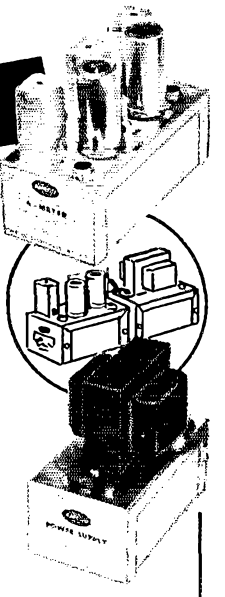
"How to Make Money in Mobile-Radio Maintenance!"

LAMPKIN LABORATORIES, INC.
MFG Division, Bradenton, Fla.
At no obligation to me, please send me free booklet "HOW TO MAKE MONEY IN MOBILE-RADIO MAINTENANCE"—and data on Lampkin meters.

NAME_____
ADDRESS_____
CITY_____ STATE_____

LAMPKIN LABORATORIES, INC. BRADENTON FLORIDA

NEW AMECO 2 & 6 METER CONVERTERS



COMPLETE KIT AS LOW AS $19.95

2-METER FEATURES INCLUDE:

- Crystal controlled.
- New 6ES8 high gain, low noise, cascode first RF amplifier. 6U8A second RF amplifier-mixer. 6J6 oscillator.
- Spurious and image rejection—over 70 db.
- Noise figure better than 4 db.
- Gain—over 30 db.

6-METER FEATURES INCLUDE:

- Crystal controlled.
- New 6ES8 high gain, low noise, cascode RF amplifier and 6U8A mixer-oscillator.
- Spurious and image rejection—over 70 db.
- Noise figure—better than 4 db.
- Gain—over 30 db.

The Ameco Converters are housed in a compact (2" x 2½" x 5") 2-piece brushed copper chassis. Brings in any signal that can be heard on any commercially available converter. The IF output on both converters are easily changed to allow converter to have any output frequency for hook-up to any receiver. The power requirements of 16 ma. at 100 to 150 volts DC and .85A at 6.3 volts AC for the 6-meter converter or 30 ma. at 100 to 150 volts DC and 1.15A at 6.3 volts AC for the 2-meter converter can be obtained from the receiver or from the Ameco Power Supply. Model PS-1, also housed in a 2-piece copper chassis. Power supply can deliver 50 ma. at 125 volts DC & 2A at 6.3 volts AC & may be used to supply power to many accessories around the ham shack.

10 meter, 15 meter, Citizens band, Police & Fire converters also available

	6-meter	2-meter
Converter complete with tubes and crystal for 7–11 Mc. or 14–18 Mc. in kit form with instructions	$19.95	$23.95
WIRED AND TESTED (with tubes and crystal)	27.50	33.95
Kit or wired models for any other output frequency (30.5–34.5 Mc., 28–30 Mc., .6–1.6 Mc., etc.)—$1 extra		
Power Supply complete in kit form. Model PS-1	10.50	
WIRED AND TESTED, PS-1W	11.50	

Sold at all Ham Distributors or contact:

AMERICAN ELECTRONICS CO. 178 Herricks Rd. (Dept. Q-6) Mineola, L. I., N. Y.

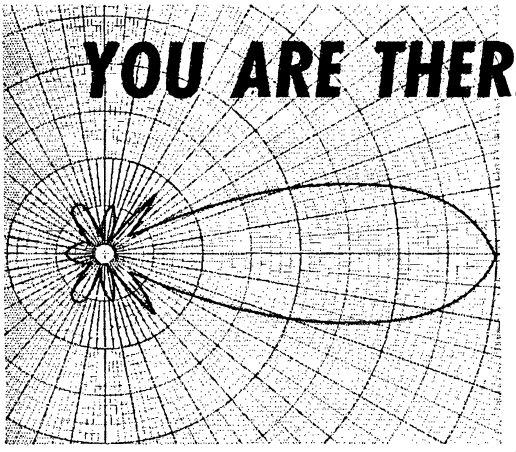
I can give you personal service on helping you select better gear per dollar for your operating pleasure. Over 30 years' experience. Big trades, easy terms. Used bargains.

VAN SICKLE RADIO SUPPLY CO.
Gene Van Sickle, W9KJF, *Owner*
4131 N. Keystone Ave.
On the northeast side of
Indianapolis 5, Indiana

INSTANTLY they know who you are! Wear one of these engraved black Formica lapel pins. Features your name and call, and shows you belong to ARRL. Wear it at all hamfests and break the ice.

CHUCK K9TVA

#Q65 ..... $1.25 ppd.
As Tie Clasp. #Q30 ..... $1.25 ppd.
Silver finished TIE CLASP with mike design #Q37 $2.00 ppd.*
Name and Call engraved $1.00 extra. *Plus 10% F.E.T.
Send Orders and Remittances to
CHUCK BAER, K9TVA ENTERPRISES
6429Q N. Glenwood Avenue Chicago 26, Illinois



with **telrex**

—"the-performance-line"—

with a "MATERIAL" difference!

NOW! "Monarch" 4 Band 10-15-20 and 40 meter "balun" fed Single-trans-line 4 Band antenna

$985.00 —AND WORTH EVERY PENNY OF IT!

Send For PL77—Tech info on 107 Antennas

For TOP-MAN-ON-THE-FREQUENCY results...
Install a Telrex antenna...dollar for dollar better in every way! Antenna systems from $6.95 to $12,000.00

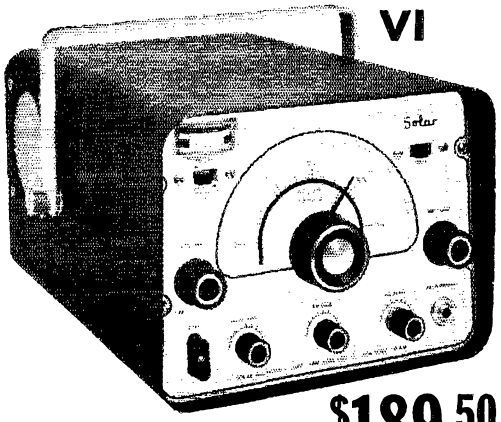
ANTENNAS SINCE 1921 **telrex LABORATORIES**

Communication and TV Antennas

ASBURY PARK 40, NEW JERSEY, U.S.A.

6 METER TRANSCEIVER

SOLAR SYSTEM VI



TRANSMITTER 12 watts input to 5763 final • All transmitter controls are on the front panel • Both plate and grid of final are metered • Push-to-talk operation • Uses a crystal, ceramic or carbon microphone • Uses popular low cost 8 mc crystals • Provision for a VFO • 35-75 ohm output, can be used with car whip • Spotting switch to check your frequency.

RECEIVER Better than ½ microvolt sensitivity • Built-in noise limiter • Double-conversion superhet for selectivity and no band images • I.F.'s of 3 mc and 455 kc • Vernier dial for fine tuning (6:1).

FEATURES Power input: 6 vdc, 12 vdc, and 115 vac • Three input power supply built right in . . . no separate mounting, no separate costs • Weighs only 15 pounds . . . great for trips, vacations • 8" x 6" x 12", fits anywhere • Chassis easily removed for service, nothing hidden • Military type construction for ruggedness • High quality components used throughout • Carrying handle/mounting bracket (for car, boat, or plane) • Removable mounting feet for installation anywhere.

$189.50

SOLAR ELECTRONICS CORP.

Send for literature giving full details. Representative Inquiries Invited.

SUBSIDIARY OF SEG ELECTRONICS, 12 HINSDALE ST., BROOKLYN 7, N. Y

going

Mobile or Portable THIS SUMMER?

Then, your log-keeping needs can be met by the ARRL MINILOG. Convenient, pocket-size, it contains proper headings for all necessary entries. MINILOG will help you comply with FCC regs, provide a lasting record of the many pleasant QSOs you'll enjoy this summer.

Spiral bound, 4" x 6" . . . . . 30¢

USA Proper, 35¢ elsewhere

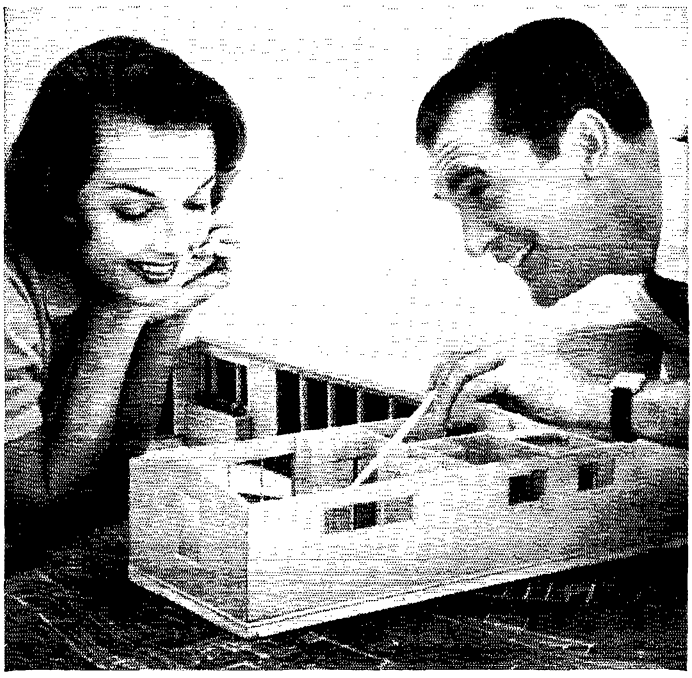
If you prefer more detailed station records, the ARRL Log Book with ruled 8½ x 11 sheets (also spiral bound to lie flat when open), will make record-keeping a pleasure. Useful also for portable or mobile as well as fixed station operation! . . . . . 50¢

USA Proper, 60¢ elsewhere

These are available in loose-leaf form (punched for 3-ring binders), *100 sheets* $1.00

The AMERICAN RADIO RELAY LEAGUE, INC.

WEST HARTFORD 7 • CONNECTICUT



Will he ever save the down payment? He'll be in his new home sooner than he thinks, if he saves something every payday. The effortless, automatic way is the Payroll Savings Plan for U.S. Savings Bonds.

How to buy a down payment on a new home for $1.25 a day

Saving for a new home, or anything else in fact, is simply a matter of spending less than you earn. Thousands of Americans have found an automatic way: the Payroll Savings Plan where they work. Through this plan your payroll clerk sets aside a certain amount each payday for U.S. Savings Bonds. As little as $1.25 a day buys a $50 Bond a month (cost $37.50). In 5 years you'll own Bonds worth $2,428.00—enough for a down payment and closing costs.

Six nice things about U.S. Savings Bonds

• You can save automatically on the Payroll Savings Plan or buy Bonds at any bank • You now earn 3¾% to maturity, ½% more than ever before • You invest without risk • Your Bonds are replaced free if lost or stolen • You can get your money with interest anytime you want it • You save more than money—you buy shares in a stronger America.

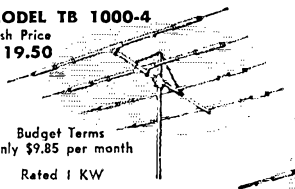
You save more than money with U.S. Savings Bonds

This advertising is donated by The Advertising Council and this magazine.

20th ANNIVERSARY 1941 1961

COMPLETELY NEW . . . FROM HORNET

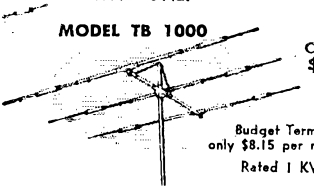
MODEL TB 1000-4
Cash Price
$119.50



Budget Terms
only $9.85 per month
Rated 1 KW
Four working elements
on all three bands.

Superb construction and unequalled performance has gained world wide acceptance for Hornet antennas. ASK THE AMATEUR WHO OWNS ONE!

MODEL TB 1000



Cash Price
$89.75
Budget Terms
only $8.15 per month
Rated 1 KW

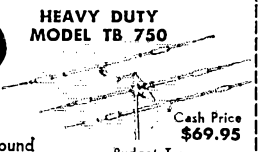
AND
IT'S SO EASY TO BUY

- Use the order form below
- Check the model of your choice
- Mail coupon

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.

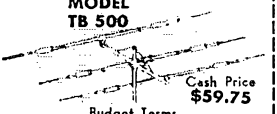
HORNET ANTENNAS

HEAVY DUTY
MODEL TB 750



Cash Price
$69.95
Budget Terms
only $6.35 per month
Rated 750 watts

MODEL
TB 500



Cash Price
$59.75
Budget Terms
only $5.40 per month
Heavy Duty

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

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 1000-4. ☐ I will pay cash within 10 days, if fully satisfied. ☐ I will pay $12.00 within 10 days and $9.85 per month for 12 months.
☐ I prefer the Model TB 1000. ☐ I will pay cash within 10 days, if fully satisfied. ☐ I will pay $9.00 within 10 days and $8.15 per month for 11 months.
☐ I prefer the Model TB 750. ☐ I will pay cash within 10 days, if fully satisfied. ☐ I will pay $7.00 within 10 days and $6.35 per month for 11 months.
☐ I prefer the Model TB 500. ☐ I will pay cash within 10 days, if fully satisfied. ☐ I will pay $6.00 within 10 days and $5.40 per month for 11 months.

MY CALL LETTERS ARE _____
NAME _____
ADDRESS _____
CITY _____ STATE _____

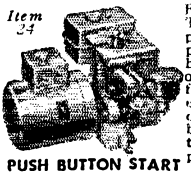
ABSOLUTELY NO RISK ON YOUR PART

MAIL YOUR ORDER TODAY — NO MONEY REQUIRED WITH ORDER

"The World's THRIFTIEST Light Plants"

Have a steady, dependable 115 v. of AC electricity for receivers, transmitters, antenna motors, emergency lights, etc. . . . for radio amateurs, camps and Civil Defense . . . at DIRECT-TO-YOU FACTORY PRICES
No wiring needed . . . just plug in.

Item 34



PUSH BUTTON START

Exclusive new ELECTRONIC BRAIN provides instant full power upon demand, holds thrifty idle otherwise. Slashes fuel cost . . . doubles engine life! Available on all our plants. Built by experts dedicated to bring you a better product!

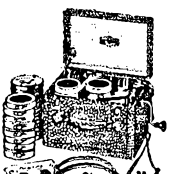
Model illustrated, our portable 700 watt plant. 2.3 H.P. easy-starting Briggs-Stratton engine. Radio shielded, shock mounted . . . hams report less hash than on commercial power line. Complete with voltmeter and built-in winding to charge auto batteries. Easily fits in car trunk. Wt. 72 lbs. **$149.50**
1500 Watt Plant (Item 45) same as item 24 but with larger generator and engine . . . more than double the output. If ELECTRONIC BRAIN desired, specify and add $30.00. **$199.50**

We make all sizes to 100,000 Watts. Write for information.
Send 10¢ for Big, New Catalog. Free with order.
Prices f.o.b. factory. Money back guarantee. Send check or m.o.

Master Mechanic Mfg. Co. Dept. 1-661, Burlington, Wis.
Southern Customers Write Dept. 1-661, Box 65, Sarasota, Fla.

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!

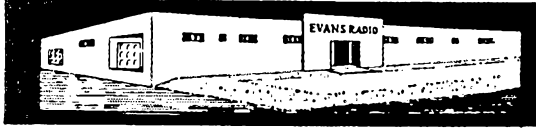
The Instructograph Code Teacher literally takes the place of an operator-instructor and enables anyone to learn and master code without further assistance. Thousands of successful operators have "acquired the code" with the **Instructograph System.** Write today for full particulars and convenient rental plans.

INSTRUCTOGRAPH COMPANY
4709 SHERIDAN ROAD, CHICAGO 40, ILLINOIS
4700 S. Crenshaw Blvd., Los Angeles 43, Calif.

EVANS HAM SHACK ➧ OFFERS FREE COUNSEL TO THE BEGINNER!

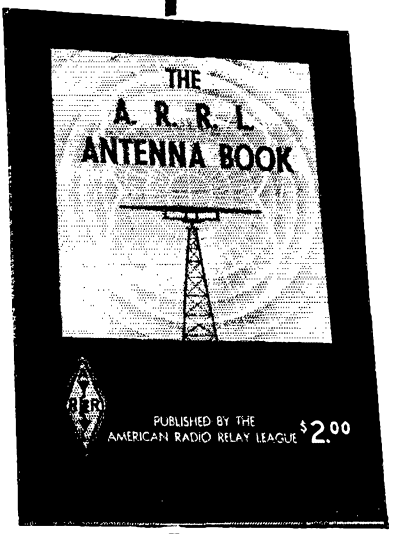
Never hesitate! Our job is to counsel as well as sell. As Northern New England's largest distributor we'll help you select new or reconditioned equipment. Our sales are backed by our engineering department — no need to return equipment to factory for repairs. Come to us, we will meet your purpose as well as your purse.

- **Service to hams by hams**
- **Engineering Department**
- **Good trade-ins and liberal time payments.**



Evans RADIO
P.O. BOX 312 • CONCORD, N. H.

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 Ninth Edition of the ARRL Antenna Book!

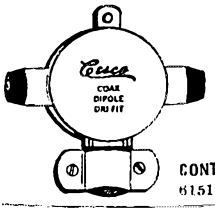
Planning an elaborate beam to snag those rare DX stations? Looking for information on mobile whips? From basic theory to how to build 'em, horizontals, verticals, rotaries, fixed beams, transmission lines, v.h.f., u.h.f., together with dimensions, photos, drawings, radiation patterns, you'll find details 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

TELETYPEWRITER EQUIPMENT • **COLLINS 51J-3 RECEIVERS .50-30.5 Mc.** Teletype: #14, 15, 19, 26, 28; Kleinschmidt: TT4A, TT76, TT98, etc. Telewriter Receiving Converter, etc. For general information & equipment list, write to TOM, W1AFN, *ALLTRONICS-HOWARD CO.*, Box 19, Boston 1, Mass. RIchmond 2-0048.



DRI-FIT CONNECTOR

Completely moisture proof. For use with coax cables RG-8, RG-58, RG-11, RG-59 and 300 ohm twin tubular. Has eye pull up for inverted V's.

Amateur Net $2.95

See your Distributor or write

CONTINENTAL ELECTRONICS & SOUND CO.
6151 Dayton Liberty Rd., Dayton 18, O.

DKC-RFB *SIGNALS 'POP OUT'* WITH DOW'S **PREAMPLIFIER**

Get signals you didn't hear!

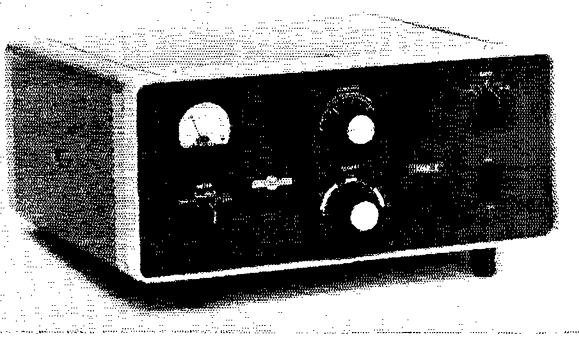
Not a gimmick, but a tested and proven accessory. Precision made, fully backed by Dow-Key's traditional Factory Warranty.

HELP YOUR RECEIVER! The DKC-RFB Booster is a 50 to 70 ohm impedance matching "broadband preamplifier" guaranteed to increase the over-all gain by 1 to 6 "S" units on all bands (1.5 to 30 mc). To improve sensitivity, work with DX, and bring up weak unintelligible signals, you'll want a DKC-RFB. Designed for receivers up to the $300 class.

price . . . **$10.75**

DOW-KEY COMPANY • THIEF RIVER FALLS MINNESOTA

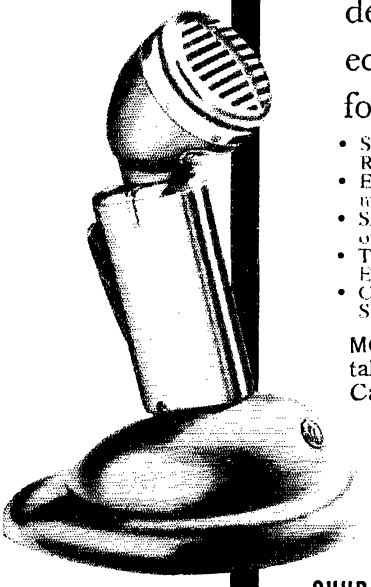
ORDER YOUR COLLINS 30L-1 500 WATT LINEAR FROM C&G NOW The new compact 30L-1 500 watt linear is the same size as the famous Collins KWM-2, and has a self-contained power supply. Its price is quite reasonable, too—$520. Order the Collins 30L-1 now for early delivery!



ELECTRONICS CO.

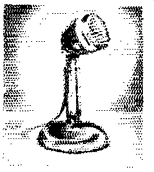
Northwestern headquarters for Collins
2502 Jefferson Avenue, Tacoma 2, Washington
2221 3rd Avenue, Seattle 1, Washington

get **SHURE** quality & dependability in a completely equipped SSB MICROPHONE for less than $30



- Sharp Cutoff Below 300 and Above 3000 cps—Minimizes Splatter, Reduces Unwanted Sideband.
- Elimination of resonant peaks permits higher average power—more audio punch.
- Shaped frequency response—Superb Intelligibility—Naturalness of voice.
- Trouble-Free Controlled-Magnetic Design—Hi-Output—52.5 db—Extraordinarily Rugged—No humidity problems.
- Complete with Grip-to-Talk Switch, Desk Stand, 2-Conductor Shielded Cable. Will operate VOX and Grip-to-Talk.

MODEL 440SL—ONLY $28.50* Complete with stand, grip-to-talk switch, 7 ft. highest quality 2 conductor shielded cable. Cable connector equivalent to Amphenol MC3M plug.



MODEL 440—ONLY $15.00* Low cost, same performance characteristics as 440SL. 7 ft. single conductor (shielded), less stand, switch, connector.

**Amateur Net Prices*

SHURE BROTHERS, INC., 222 Hartrey Ave., Evanston, Illinois

MICROPHONES, HIGH FIDELITY AND ELECTRONIC COMPONENTS

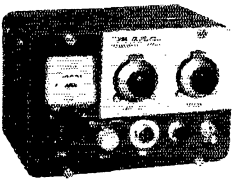
mars

MOBILE TRANSMITTER

"MARS"

Bandswitching 75-40 Meters
12 Watts AM phone
Fully Assembled
7½" x 5" x 4¼"
Less power supply

Husky Signal . . . plenty of clean audio . . . ask the ham who owns one . . . fully guaranteed.



$59.95

(Imported)

PAUSAN COMPANY · SAN RAFAEL, CALIF.

SSB Improve your Mileage and Readability under bad Conditions

200-V TRANSMITTER

INPUT: 200W SSB, P.E.P.; 175W CW, FSK; 100W AM
OUTPUT: 110W SSB, P.E.P.; 100W CW, FSK; 33W AM

Also the Complete CENTRAL ELECTRONICS SSB line

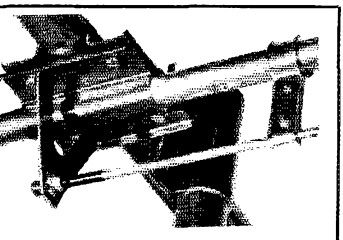
- **MM2 'SCOPE.** Monitors your own and the other fellow's signals. Kits or W&T.
- 10B, 20A Exciters, VFO's, Slicers, Kits or W&T.
- **RECEIVERS, CDR Ham-M ROTATORS, Tri-Ex, Spaulding, Aermotor Towers.**
- **TELREX BEAMS** — the best in Beams!

Write for Bulletin "Getting Started" and "Stepping Up" in SSB. Give call letters. . . . SAVE MONEY BY MAIL.

Domestic and Overseas — *Order from* W9UDN at

ORGANS & ELECTRONICS Box 117 Lockport, Illinois

THE NEW SPACE-RAIDER BEAM—
A BEAUTIFUL JOB!



Nothing has been spared to provide maximum quality, performance and long life in the new SPACE RAIDER BEAMS. These sturdy antennas have a built-in ruggedness unsurpassed in anything being offered to Hams anywhere at any price.

SPACE RAIDER BEAMS are pre-tuned and matching section comes pre-resonated so that when assembled according to simple instructions the antenna is all ready to go and will provide unity SWR in the middle of the band tapering to less than 1.5 to 1 at band edges. Optimum forward gain and front-to-back ratio are standard on SPACE RAIDER BEAMS.

20 METER BAND B-20-3 — 3 Element, 1¼" O.D. center sections, 1" O.D. and ¾" O.D. adjustable end sections. Booms: 2" O.D. 18' long, .12-.12 wavelength spacing. Excellent forward gain and front-to-back ratio. 23 lbs. **$54.50**

15 METER BAND B-15-3 — 3 Element, 1¼" O.D. center sections; 1" O.D. adjustable end sections. Boom: 2" O.D. 12' long, .12-.12 wave length spacing. Excellent forward gain and front-to-back ratio. 19 lbs. **$44.50**

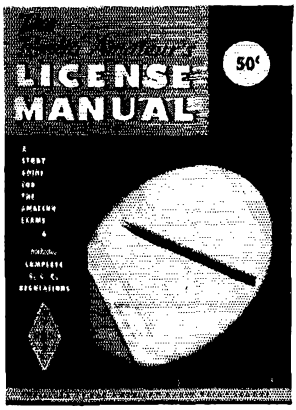
10 METER BAND B-10-3 — 3 Element, 1¼" O.D. center sections; 1" O.D. adjustable end sections. Boom: 2" O.D. 12' long, .17-.17 wavelength spacing. Excellent forward gain and front-to-back ratio. 16 lbs. **$34.50**

Space-Raider
ANTENNAS & CRANK-UP ANTENNAS

Prepaid Shipment U.S.A. Direct Inquiries to 1076 E. Walnut Street, Pasadena, Calif.

COMPLETE . . .

THE 46th edition of the Radio Amateur's LICENSE MANUAL is complete, up to date and revised to include latest information on amateur licensing. Contains information on questions included in FCC amateur exams, all the dope on frequency privileges for the various classes of amateur licenses, the full text of RACES regs, details of the U.S.-Canada Reciprocal Operating Agreement, code-practice shedules, and the current FCC examination schedule. A useful manual for all, newcomer and oldtimer alike. Always up to date.



Order YOUR copy today

PRICE **50¢** POSTPAID

ALL the dope between two covers . . . complete and easy to understand.

- NOVICE • CONDITIONAL
- TECHNICIAN • GENERAL
- EXTRA-CLASS

The AMERICAN RADIO RELAY LEAGUE, Inc.

WEST HARTFORD 7, CONN.

TRADE 4 WAYS

at the NEW amateur radio exchange

COME IN AND SEE STAN BUCKWALTER, K2APL

- **TRADE** HI-FI for Amateur Radio*
- **TRADE** Amateur Radio* for HI-FI
- **TRADE** HI-FI for HI-FI
- **TRADE** Amateur Radio* for Amateur Radio*

★ Amateur Radio includes: Ham, SWL, Citizens Band Equipment, Test Equipment

DO ALL YOUR TRADING UNDER ONE ROOF!

Amateur Radio Exchange offers the best trades—full 90 day warranty on all equipment—new or used—exclusive trade-back-plan which protects your investment! Time payments arranged.

FOR THE BEST . . . SERVICE . . . QUALITY . . . VALUE

VISIT THE NEW

amateur radio exchange

A division of the AUDIO EXCHANGE—since 1950 —the original and complete trading organization.

For trading information address Dept. H6 for booklet Y

153-21 Hillside Avenue Jamaica 32, New York

AXtel 7-7577

STORE HOURS: TUES. to FRI. 10 a.m. to 8 p.m.
SAT. 10 a.m. to 6 p.m. CLOSED SUNDAY AND MONDAY

HOLIDAY FOR HAMS

Mobile your way to Kedge with the family.
Modern cabins equipped for house-keeping.
With long wire or dipole.
Write for maps, rates and reservations.

KEDGE LODGE, KEDGEMAKOOGE, N. S., CAN.

"Norm" Bowers. VE2BBY/1.

CANADIANS! We have large stocks of nationally advertised Ham parts. *Write for Free Bulletin.*

THE CRAWFORD RADIO

P. O. BOX 617

VE3YR "Geo" — 119-121 JOHN ST., N. HAMILTON, ONT. — VE3JU "Bill"

Cush Craft

- 2 Meter with mast Model # AM-2M $8.70
- 2 Meter stacked COMPLETE Model # AM-22
- 6 Meter with mast Model # AM-6M $12.50
- DUAL HALO with mast. Mod. # AM-26 $17.45

HALOS

NEW

PORTABLE 3 El. 6 meter beam. (50" x 4" folded) Model No. A50-3P $10.95

CUSHCRAFT 621 HAYWARD ST. MANCHESTER, N. H.

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

HAMFEST, June 4, Starved Rock Radio Club, George Keith, W9MKS, Secretary, RFD #1, Oglesby, Illinois.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

WANTED: All types of aircraft or ground revrs, xmttrs or test equipment. Also large xmttr or special tubes needed. Ham gear bought and sold. For immediate action for cash write or phone Ted Dames, W2KUW, 308 Hickory St., Arlington, N. J.

MOTOROLA used FM communications equipment bought and sold W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N. Y.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

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.

KWM1 and a few high plate dissipation tubes wanted. 304T1/TH 4-1000A, 4PR60A, etc. Ted Dames, W2KUW, 64 Grand Place, Arlington, N. J.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Globe, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halsted St., Chicago Heights, Ill. Tel. SKyline 5-4056.

WANTED: Old time commercially built and unaltered amateur spark transmitting and audiotron receiving equipment. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

SSBERS! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operating; promoting advancement of SSB equipment; and disseminating SSB technical information. Read "The Sidebander", official publication of the SSBARA. Dues $3.00 yearly. Write for membership application, sample "Sideband-er", to SSBARA, 12 Elm St., Lynbrook, N. Y.

COAXIAL Cable, new 58Ω—30 ft. length, $1.00; 180 ft. six lengths, $5.00. Send postage one pound per length. Radio magazines, buy, sell, trade. R. Farmer, Plainview, Texas.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N. C.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

COMPLETE Service: Transmitters and receivers. QSLS. Reasonable. KØDGX, Keith, 601 East 4th St. South, Newton, Iowa.

WANTED: Collins KW-1. A. Jensen, 208 N. Foothill Rd., Beverly Hills, Calif.

MAGAZINES: QST, 233 volumes, 1940 to current date; CQ, 86 vols., 1945 to 1953; 3 Handbooks; 1945-1946-1948. Best cash offer for lot. W8SWF, Dearborn, Michigan.

SELL 2 Mf. G-E capacitors, 4000v DC, $5.00 or 2 for $9.00. Guaranteed. Dawson, 5740 Woodrow Ave., Detroit 10, Mich.

WANTED: Commercially-built transceivers and QST for any months of 1922, 1923, 1939 and 1940. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

WANTED: Oldtime wireless receivers, exmtters, etc. Magazines, books, give prices and description, W5WB, 702B N. Fillmore, Amarillo, Texas.

OUTSTANDING QSLS? Largest variety samples 20¢ (refunded) "Religious" QSL samples (with bible verses) 10¢. Sakkers, W8DED, Holland, Mich.

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS. Quality and economy complete samples dime. QSL Printing, 4319 Wuthering Heights, Houston 45, Texas

QSLS. Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSL-SWL-CB-WPA. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Samples, 10¢ with catalogue, 25¢.

C. FRITZ for better QSLS! Samples 10¢. P. O. Box 1684, Scottsdale, Ariz.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glensdale Ave., Toledo 14, Ohio.

QSLS. Faster, lower prices. Catalog 25¢ (refundable) samples stamped envelope. Dick Crawford, K6GJM, Box 607, Whittier, Calif.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KN6ZMT, Creative Printing, P. O. Box 1064-C, Atascadero, Calif.

SUPERIOR QSLS, samples 10¢. Ham Specialties, Box 3023, Bellaire, Texas.

QSLS, 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., New Brunswick, N. J.

PICTURE QSL. Cards of your shack, home, etc., Made from your photograph. 1000, $13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLS, SWLS, reasonable prices. Samples 10¢. Robert Bull, W1BXT, Arlington, Vt.

QSLS that are different, colored, embossed card stock, and "Kromekote". Samples 10¢. HomePrint, 2416 Elmo, Hamilton, Ohio.

QSLS, SWLs, XYL-OMs (sample assortment approximately 93¼¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

QSLS-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

1½" Call QSLs (2 sides printed), 100, $2.75 samples free. Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

GLOSSY QSLS, 100, 4 colors, $3.50. Others less, Samples 10¢. Dick, W8VXK, 7373 No. M-18, Gladwin, Mich.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLS-SWLS. 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS-SWLS. Free Samples. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLS, 300 for $3.95. Free Samples. W9SKR, "George" Vesely, R.R. #1, Box 208-A, Ingleside, Ill.

QSLS Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS, SWLS, Rubber stamps. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix, Ariz.

DON'T Buy QSLs until you see my free samples. Bolles, 7701 Tisdale, Austin 5, Texas.

QSL: Samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS, $2.50 and up. Samples 10¢. RLB Print M.R. 12 Phillipsburg, N.J.

FAST Service, send stamp for QSL samples. K2 Press, Box 372, Mineola, L.I., N.Y.

RUBBER Stamps, $1.50. Call and Address Hoar, W2UDO, 32 Cumberland Ave., Verona, N.J.

QSLS, Samples, dime. Printer, Corwith, Iowa.

JUNE, July only! 10% Discount QSLS. Samples 10¢. Savory, 172 Roosevelt Rd., Weymouth, Mass.

SNAPPY, different QSLs. Dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS: $1.75 per 100, postpaid USA only. Glossy, red and green. All orders mailed within 10 days. Free Sample. Hobby Print Shop, Umatilla, Fla.

QSLS. Samples 10¢. W7IIZ, Wines, Box 183, Springfield, Oregon.

QSLS. 100 for $3.00. Glossy. Samples free. Distinctive designs. R. A. Larson Press, 32 Midland Ave., Stamford, Conn.

QSLS, samples 25¢ refundable with order. Lawrence, W4ZMC, P.O. Box 6073, Nashville 12, Tenn.

3-D QSLS, with fabulous new "Mirrow-Sheen," "Neon-Glo," and Outer Space designs. Over 100 color combinations and styles. Complete sample brochure free. 3-D QSLS, 5 Wood End Road, Springfield, Mass.

RUBBER Stamps for hams, sample impressions, W9UNY, 542 North 93, Milwaukee, Wis.

CANADIANS! QSLs in fluorescent colors, by silk screen process. Free samples. Martin, 8 Kensington St., Woodstock, Ont., Can.

BETTER Than anything you have seen: craftsman-built British communication receivers. Eddystone model 888A for ham band only; other models for general coverage from $115 to $1270. Spec sheets from Maurice, VE3CZG, Top Television Service, Ltd. Elliot Lake, Ont., Canada.

CANADIANS: Selling complete station. 75A2, Collins 310OC2 VFO, Eldico TR1 300 watt AM, Heath Scope, heavy duty 40' crank-up, TA33Jr, TR4 rotator, Selsyns, $995. ppd. Terms. R. H. Baynton, VE5VZ, Lloydminster.

KWS-1, SC-101 integrated control unit and 75A-4, A complete and superb station in top condition. Package $2000. W2ADD.

LOWEST Prices: Latest amateur equipment. Factory fresh sealed cartons. Self-addressed stamped envelope for lowest quotation on your needs. HDH Sales Co., 919 High Ridge Rd., Stamford, Conn.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, $1.50; General $1.75; Extra, $2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

COMPLETE File of QST for sale: 1915-1951. Landa, R2, Clayton, Ga.

SOUTHERN California: Transmitters and receivers repaired, aligned, bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllog 3-0500.

WANTED: Cash for surplus tech manuals, one or one hundred. State condition and equipment type. W4FXQ, Box 2513, Norfolk, Va.

TRANSFORMERS (3) W2EWL Special, $3.00 PP. Coils L1 thru L7, 3 xtrmrs, template for "W2EWL Special", $10.95 PP. Vitale, W2EWL, Denville, N. J.

6 COILS for Transistor 6 meter converter December QST $5.95. Postpaid U.S.A. Specify I.F. W5ZKT, 1441 Pleasant Dr., Dallas, Texas.

TOROIDS: Uncased 88 Mhy, like new. Dollar each. Five/$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

COLLINS 75S-1, in exc. condx. with spkr, $350.00. No trades, please! W7NOI, 1126 S. W. Curry, Portland 1, Oregon.

LAMINATE Your ticket, cards, photos at home. No heat! Guaranteed! 14 sheets of plastic, $1.00. Namecraft, Box 56P, Ft. Lee, N.J.

TRADE Electronic parts for firearms. Want war Mausers, souvenir rifles or pistols. W5UZI, 1351 Sage Loop, Los Alamos, New Mexico.

NEW TV tubes, 6198 or 5527, $50.00. W1BYX, Box 122, Rockville, Conn.

FOR Collins in Detroit Area it's Michigan Ham Headquarters, also large selection of trade-ins on display. M. N. Duffy Ham & Electronics, 2040 Grand River, Detroit 26, Mich. Tel. WO 3-2270.

WANTED: Early Hallicrafters receivers for private collection. Please state price and condition. Thank you. H. E. Hoagland, 3036 South Robertson Blvd., Los Angeles 34, Calif.

COLLINS: KWM-1, AC supply, $595; 51J2, $495; 51J3, $675; 75A2, $275; 75S2, $525; R-390A, HT32A, $475; Valiant, $299; Ranger $210; R-274 .54-54 Mc., $295; BC-1031C Panadaptor, $125; BC-610-1, $295; HRO-60, $325; HRO-50T1, $225; Northern Radio VFO, $125. Want teletype equipment for cash, or trade for new amateur equipment. Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

ANTENNA Farm: 20 acres bordering two state highways. Tall pine trees, brook. Fine radio location. 7 miles to Capitol. $2000. Terms. W1THM.

We Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, L.I., N.Y.

SURPLUS Owners, power supp. 110VAC inp. 24VDC at 14 amps. 475VDC at 125 Ma, 450VDC at 30 Ma 6.3V at 16 amps 24V at 30 Ma. $25.00. PP. Robert Armstrong, 702 Union St., Schenectady, N.Y. Tel. DI 6-1266.

SELL: Heathkit mobile, Cheyenne, Comanche, power supply, mount, SX-101 MK III. Must sell. Offer? W2YCS, 145 Ackerman Ave., Ridgewood, N.J.

B&W 5100, $225; HQ-145 w/clock and calibrator, 3 mos old, $245; Harvey-Wells TBS-50C, w/home brew supply, $40; Johnson Matchbox, $40; DuMont 213A modulation scope, $30; homebrew transistor supply 6VDC in, p. 400 v., 100 Ma. outp., $20. Sry, no shipping! K1MUN, Joe Phillips, 4 Naples Ave., Norwalk, Conn. Tel. TEmple 8-1303.

KITS Assembled, quality workmanship. Twenty percent plus shipping. Fine, K4QCP, 2405 Spring Valley, Louisville 5, Ky.

FOR Sale: Panadapter, Mod. PCA-2T-200, in exc. condx, w/ instrux handbook. $70. Robert B. Hupper, K2PLD, 47 Willits Road, Glen Cove, L.I., N.Y.

KWM-2, Collins 516F-2 AC pwr. supply, both in mint condx and in original cellophane containers and cartons, operated 3 hours, Collins conversion bulletins: $1000; Lt. Frtd L. Caposcela, W2IWC, NRTD, TAGSUSA, Ft. Harrison, Ind.

WANT: Drake SSB receiver. State serial number, condition, and price. Col Ed. Sears, 4725 Bridle Trail, Santa Rosa, Calif.

WANTED: Collins KWM-2, state cash price and condx. C. J. Hire, W8ZES, 81 Parkwood Blvd., Mansfield, Ohio.

JUST Out! Our 1961 Catalog, over 5000 items, receivers, transmitters, test equipment, tubes, tech manuals, schematics, walkie-talkies, transformers, parts, plugs, write Bill Slep Company, Drawer 178Q, Ellenton, Fla.

WANTED: BC221 for cash. P.O. Box 667, Borger, Ttxas.

SELL: NC-300, series 460, $219; DX-35, $39. With manuals. Jim West, 315 Sunset Circle, Lookout Mtn, Tenn.

SELL: K2POO keyer, $30 or best offer. Will ship. K8RHR.

SELL: Globe Chief 90-A, Heath DX-35, National NC-98, best offer. Dave Kistler, K3KIE, 52 Maffet St., Wilkes-Barre, Penna.

SELL Commercial Triband quad and trap vertical. Reasonable. No shipping, sry. Call AL 5-3232, Manhattan, W2TXV.

SELL: Three xn 3 to 4 Mc Command transmitters, completely converted for ham use. $12.00 each or your best offer. Globe Chief Deluxe, $50.00. Globe screen modulator, $7.00. All in gud physical and opertg. condx. K8SZC, Frank Folt, 1309 Elm St., Mt. Pleasant Michigan.

SELL HRO accessories: E & F coils, $48.00; NBFM adapter, $25.00; Universal product detector SSB adapter, $25.00. K6CI, Box 536, San Juan Capistrano, Calif.

CE 10B with VFO. Gud condx. $99.00. Want: HT-32, K6TWL.

SELL: CW xmtr 100 watts, 160-40 mtrs, Pr 807 final, in cabinet. Ant. tuner, Monimatch, 4 xtals, $50.00. K2HVR, 28 Pasadena, Buffalo 21, N.Y.

WANTED: 40-75 mtr. beam ants. and Hy-Gain, RBX-1 roto brake. T. Lesher, K3NCU, 25 North Market, Elizabethville, Penna.

TWO Eimac 4-125As, new and unused, $15.00 each. Also homebrew PA, 100THs PP in 28 in. rack with power supply, $70.00 but no shipping, sry. Want old time QSTS. W2DYU, 36 New Lawn Ave., Kearny, N.J. Wyman 1-6498.

FOR Sale: 6 meter rig, Command Receiver, S-53A, misc. ham equipment. K4JCX, 121 Maple Lane, Oak Ridge, Tenn.

WANTED: 810s, filament transformer and sockets for the same Variable vacuum capacitors with at least 7500 volt ratings, 4-400s, relay rack at least 60" high, heavy duty a.c. relays. Joe Artioli, 1070 Parker St., Springfield, Mass.

COLLINS 32S-2, 516F-2, perfect. $550.00. W4RQR, 5804 Accomac, Springfield, Virginia.

PROFESSIONALLY wired Apache, $220.00; prefer local sale but will ship. Ernest McCall, 10004 E. 34th St., Independence, Mo.

NEW TH4 Thunderbird beam—Triband $85 and Globe-King 500C. W2LFB, 13 Shepherd, Nutley, N.J. Tel. 7-7552.

FOR Sale: Excellent SB-10, $80; HQ-140XA, $170; "A" Slicer, $35.00. John D. Mininger, K9DMC, 1624 S. 8th St., Goshen, Ind.

SWAP: Accordian, full size youth model, cost $350.00, 3 yrs. old. Played twice. Need gud rcvr or what have you? F. Wolf, 1733 Dannley Dr., Brunswick, Ohio.

FOR Sale: 20A exciter with QT1 and 10 through 160 458 VFO, $200 or best offer. Fred B. White, W9HOQ, 344 North Milwaukee Ave., Libertyville, Ill.

ELMAC AF-67, $105; Shure 505-C mobile mike and coil cord, $10; PE-101 12V. dynamotor, $8.00; mobile coax relay, $5.00; all are in exc. condx. All for $120.00. One BC-611-C handie-talkie with extra tubes. Like new, $35.00. W4FDK/5, 1704 W. Main St., New Iberia, La.

TECH Manuals, New Original Maintenance Books, APA-10 $5.00, APA-38 $8.00, APN-1 $6.50, APN-4 $8.00, APN-9 $10.00, APR-1 $7.50, APR-4 $7.50, APX-6 $8.50, ARC-1 $10.00, ARC-2 $8.50, ARC-5 VHF $8.50, ARC-27 $8.50, ARR-2 $7.50, ARR-5 $8.50, ARR-7 $8.50, ARR-15 $10.00, ART-13 $12.50, BC-224—BC-348 (Specify Model) $8.50, BC-375 $7.50, SCR-274N Command Sets $8.50, SCR-522 $10.00, ARN-5 $7.50, ARN-6 $8.50, ARN-7 $8.50, URC-4 $8.00, TS, TM, RTTY manuals in stock, send requirements, free catalog with 5000 items, Bill Slep Company, Drawer 178Q, Ellenton Florida.

GONSET GSB-100, Hallicrafters SX-101A, Moving, must sell. Little used, exc. condx. $650.00. W4KCF, P.O. Box 241, Burnside, Ky.

SUPERPOWER: Unused, heavy duty Thordarson plate transformer 6000v C.T./3500 V. C.T. at .750 amps. Matching chokes and fil. xfrms. Also DX-40, VF-1, H.V. ceramic mica capacitors and other items. Cleaning house. Send stamped envelope for info and list. S. J. Cohn, 2910 Reisterstown Rd., Baltimore 15, Md.

32S-1 serial 1123, perfect. Never removed from cabinet. Less power supply. $490 cash. Alvah Culpepper, RFD 7, Macon, Ga.

SELL: Communicator III (2 meter) perfect $180. Will ship F.o.b. KWM-2, A-C $1000. C. W. Ham, W2KDC, 38 Radcliff, Huntington, N.Y.

NC-98 receiver, in gud condx. $95. F.o.b. H. L. Tate, W4NTS, Box 388, Southern Pines, N.C.

HT-33-A Hallicrafters KW linear; about 1½ yrs. old; clean, new PL-172 Penta tube, just installed. $550.00. W2PMR, 433 Abington Ave., Bloomfield, N.J.

FOR Sale: Hallicrafters HT-18, in exc. condx, with manual, $40.00; New Collins 455-J 3.1 mech. filter, 3.1 Kc bandwidth, for 75A4, etc., $25.00; Collins potted filter chokes, 4 yr. at 500 Ma., new, $3.50 ea. Wanted: Hammarlund Super-Pro receiver (BC-779, BC-1004, etc.). State condition, price. All F.o.b. A. C. Cogle, K4ARO, 1667 Varina Ave., Petersburg, Va.

COMMUNICATOR III 6 meters, new condx, all cables, instruction book and diagrams. Saturn Halo, $180.00. W9IRE, 10728 S. Washtenaw Ave., Chicago 55, Ill. BE 3-4080.

"HORSE-Trader" Ed Moory is authorized to sell for Cash Brand New Collins Equipment of the Late' "Chuck" Schwartz (W4LVG) Memphis, Tenn. As follows—KWM-2 $975.00, Portable PM-2 Pwr Supply $129.00, CC-1 Carrying case $69.75 Six month warranty Un-opened cartons, also Factory Reconditioned Collins KWS-1 & Pwr Supply $1075.00 & 75A-4 $539.00, Drake 2-A demonstrator $229.00, 30S-1 Demonstrator $1-50.00 B & W 1.PA-1 Kilowatt Linear and supply $289.00. HT-33 Linear Factory reconditioned $299.00. Used 200-V $625.00. Terms Cash: No trades. Ed Moory Wholesale Radio, Box 506, DeWitt, Ark. Phone Whitney 6-2820.

SELL: 75A4, spkr, 3.1 and 500 cycle filters, $570.00; Gonset GSB-100 plus external transistor audio limiter, $350.00; CE MM-2, $100; prop pitch motor, 500 watt SSB amplifier using 4-400A with spare 4-400A and power supplies, $175.00. Unable to ship final. Judd, W4VWV, 7105 Village Drive, Annandale, Va. CL 6-8465.

CENTRAL Electronics gated compression amplifier, Mod. GC-1, practically new, $25.00. CML 10 meter converter, $10.00. K2POA, 29 Boone, Bethpage, N.Y.

HRO-60 with calb calibrator. All bands, original carton and booklet, in mint condition, $350.00. Phone HI 3-0803. H. Webb, 125 Ocean Ave., Jersey City, N.J.

MOBILE Cheyenne transmitter, transistor supply, Gonset Super 12, Webster all-band spanner antenna, all mounts, everything expertly wired and calibrated. XYL problems. All equipment new in March. Steal it for $190.00, everything. Jack Ewan, 336 Maywinn Rd., Defiance, Ohio.

SELL: HT-32 transmitter, $395. And SX-101 Mark III receiver, $250.00. Both in like-new condx. W3HPL, L. Oldt, Mickleys Gardens, Allentown, Penna.

WANTED 800 Cyc. filter for 75A-3 F455B. Have new RDZ 200 to 400 Mc. receiver for sale, $25.00. W6TMC, 905 S. Lemon St., Anaheim, Calif. KE 3-1181.

WANTED: Everyday Mechanics and Everyday Engineering magazines, QST prior 1919. Proc. I.R.E. February 1922 and prior 1919. Department of Commerce Call Books, Amateur and Commercial. W1NP/2, 926 Woodgate Ave., Elberon, N.J.

ATTENTION California! Complete station, perfect condx and operating. HQ-170, Apache, TR switch, SWR bridge, coupler, 14AV vertical, all cabling, desk, $500 or make offer separately. Terms and delivery possible. WA6MYA, 2642 Escondido Ave., San Diego 11, BR 7-2093.

GOING Overseas: HQ110C, like new, $160; Navigator transmitter, ideal Novice/General rig, $85; leak point-one preamp, $10; leak 12 inch arm with dynamic cartridge and transformer, $10; Tannoy 15 in. spkr in Carlson enclosure, $65; musician's amplifier, $12; Garrard changer, $15. Ernest Hardin, Quarters 267, West Point, N.Y.

SELL: SB-10, $70; Heath OM-3 'scope, $30; T47/ART-13, complete, $35; 833'A, $15; 806s, $6.00; 828s, $3.00; 3B28s, $2.00. Johnson 226-1 inductor, $15; Johnson 200-CD-70 variable $10. J. Meyett, K9JII, 404-26 Ave. East, Superior, Wis.

SCRATCH! S-108, $110; QF-1, $5.00; both for $105. You ship. Wanted: Viking Ranger. U send cost. Sacrifice: DX-40 & Key, $60.00. Professionally wired. KN4NDX, 1347 Avalon, Montgomery, Ala.

T91/VRC4. 1.7 to 8.7 mc. new with mike, $30.00, used $22.50 F.o.b. BC329 $35; 4 Kw plant, 120 volts, 60 cycle, $275. K2MQX, Lowville, N.Y.

SELL: Hallicrafters SX-99 receiver, matching speaker, Heath Q-multiplier, Ameco code oscillator. Excellent condx, $135.00. Complete. Bob Miller, RD #5, Lisbon, Ohio.

CLEAN Up Bargains! SX99 Rcvr., $75.00; Tabletop cabinet 200 watt transmitter, plate modulated, 90% finished, $45.00; Vibroplex key, $6.00; $80 Regency transistor all-band converter, $35; TVI suppressed Meissner VFO transmitter, $22.00; 1929-1936 QSTS, $15.00; 300-watt roller inductance, $5.00; KW coils, new KW variable condenser, $10; 20 others, $1.00 up, etc. Vergne, K2KGU, 420 Riverside Dr., New York 25, N.Y. MO 6-8513.

SELLING Last lot of parts and equipment. Enclose stamped addressed envelope for list. DeClaive, 6646 MacArthur Blvd., Oakland, Calif.

FOR Sale or trade: 1924 model Atwater-Kent with spkr, ART-13, new Master Matcher, used Master Matcher. W5DHK.

A-1 Reconditioned equipment. On approval. Trades. Terms. Hallicrafters SX-99 $99.00. SX-100 $199.00, HT-37, S-85 SX-110, SX-111, SX-101A, HT-32; Collins 75A-1, 75A-2, 75A-3, 75A-4, KWM-1, 32S-1, 75S-1, KWS-1; Central 20A $159.00; Elmac PMR-6 $69.00, AF-67 $109.00; Gonset G-66B, G-77A, G-50, GSB-100, GSB-101; Hammarlund HQ-100 $129.00, HQ-110 $179.00, HQ-129X, HQ-140X, HQ-140XA, HQ-150, HQ-160, HQ-170 HQ-180; Johnson Adventurer $29.00, 6N2 $99.00, Navigator $99.00, Viking II $179.00, Valiant; National NC-98 $89.00 HRO-50T $199.00, NC-300, HRO-60, NC-183D, NC-303; Heath, Globe, RME, other items. List free. Henry Radio Company, Butler, Missouri

AF67. James C-1050 6/12 p.s., ps-2V, 115 p.s. $150; Super Six, noise limiter, $35; 600-D, $15. K5OKY/O, 4040 E. 46th Pl., Tulsa, Okla.

HQ-170C, Hammarlund's really hot amateur band receiver, guaranteed in new condx. Used less than 35 hours. Latest series. About one year old. With speaker. Original carton and instruction book. Priced to move quickly: $275.50. Prefer local sale but would consider other offers. W1IOB, F. W. Rockwood, 186 N. Rolling Acres, Cheshire, Conn. Tel. BR 2-8559.

Q-MULTIPLIER, Trade for bug. WV6NFA, Fourteenth St., Kingsburg, Calif.

SALE: Excess components: ART-13 transmitter, modified, in exc. condx, $35.00; ART-13 pwr. supp., less HV transformer, $90: Astatic HZ-20 microphones, $10: meters 2¾" diameter, 200 Ma., 500 Ma. Ima. (0-50 scale), 150V DC, $3.00 ea. Transformers, Merit 1800V CT, 220 Ma., $5.00; 5V CT, 3 amps, $1.50; ½ lb. spool, #22 SCC 40¢; 300 ohm SPDT relays, 50¢; 45X-674 Tungar bulb, $2.00; variable crystal 7120+ KC, $3.00; Michael Steckman, 117-52 222 St. Cambria Heights 11, N.Y.C., N.Y.

SELL: Transcon Six Meter Transceiver, moderately good condx, $25; matching power supply, $12. K9TYH, 1627 Madison St., Evanston, Ill.

SELL Knight VFO, first $20.00. K8BIT.

COLLINS 75S1 Ser. 2267, in exc. condx: $395 shipped. Guy Hartley, Jr., RFD 1, Mount Juliet, Tenn.

MOBILE Gonset G77A with 3-way power supply and Pierson K93 rcvr, near new, with S meter and 3-way power supply. Shure 50C mike, connecting cables, Heath RF tuning meter, antenna, Master Mobile, extra spares, etc. Ready to go on air. Will ship prepaid anywhere USA. $350.00. W6EVO. Irv Grossman, 619 S. Hill St., Los Angeles, Calif.

WANTED Collins 51J3 or 51J4. W5DA. 11525 Saint Michaels, Dallas 30, Texas.

FOR Sale: Johnson Valiant F.W., $350.00; HQ-170C, $325.00. Both 6 months old. Johnson 3-element 20M beam. $50.00. WØBCN, Bellevue, Iowa.

WANTED: Wireless Specialty Co. IP500 with loading coils; also matching two-step amplifier. Nelson Dunham, W2LO, 42 Cliff Court, Highland Park, N.J.

BEGINNERS-Code memorized in one hour. New Method. Used in Armed Services, ham radio, scouting. "Ketchum's Hour Code Course". $1.00 postpaid. Money back guaranteed. O. H. Ketchum, 10125 Flora Vista, Bellflower, Calif.

COLLINS S-Line Station 75S-1, 32S-1, 516F-2, 312B-3, 30S-1 for sale. 75S-1 has BFO filter and crystal. Have buyer for late serial KWS-1 with late serial 75A-4. Will accept trade plus cash at my QTH. No shipping, sry. Frank, WA2FMC, Hauppauge Road, Smithtown, N.Y. Tel. ANdrew 5-6137.

SALE: BC221AK, unmodified, excellent, original calibration book; modulation, $65.00. First money-order gets it. F.o.b. Cedar Rapids. KØDHF, Box 67, Hiawatha, Iowa.

NEW ART-13 schematics 21" x 13" complete transmitter, $1.00. Paul Saylor, K4PDG, 236 Oak Grove Rd., Memphis 17, Tennessee.

RANGER, Factory-wired, $175.00; NC-300 and 1¼, 2 and 6 converter, in matching cabinet, $260.00; S40A, $55.00, all like new. Lettine 240 CW and AM, plate modulated, 50 watts, $40.00. Gonset 6-meter converter, $30.00. K2EEE, Tel. EV 5-0013, Brooklyn, N.Y.

DX40 Professionally wired, one year old, excellent, $60; Heath power meter, $10; Heath crystal calibrator, $10. Sapiro, K1-JMH, 9 Dell Drive, East Haven, Conn.

APACHE TX-1, $195; also Heath SB-10, $75; both perfect. Combination $260.00. A real opportunity! Phil Finnegan, K5-JDH, 3301 Merrick Drive, Houston 25, Texas.

75A4, like new, to best offer. F. Hartley, W2MI, Vineland, N.J.

SELL: $30.00 complete. Hy-Gain 5BD multiband doublet assembled to 100 ft. RG8/U. Included 6-5 ft. 1½ in. dia. Al. mast sections and chimney mtg. hardware. Used one week. Landlord withdrew permission to install. E. Bosinski. 201 Eighth St., Jersey City, N.J.

WANTED: 75A1 or 75A2 Collins receiver. Will pay cash. Mechanical filters preferred. Walter Taylor, RD #2, Hammondsport, N.Y.

PUT Your KWM2 mobile. Mobile mount, $96. 12V DC power, $216; Mosley TM-5, $50. All complete. All excellent. Am leaving for Guam in August. L. H. Rincy, 5934 S. Alameda, Corpus Christi, Texas.

SELL D-104 Mic and G-Stand, $25.00, Electro-Voice 600D-Hi Z mic. w/coiled cord, $19; Jones Micro-Match indicator and coupler, $28.00; Collins 312B3, spkr, (new), $22; Advance co-ax relay, $9.00; Hy-Gain 5-band traps, $8.00; Johnson lo-pass filter, $10. All in perf. condx. WA2EBO, Jack, 244 Hansen Ave., Albany, N.Y. Phone HE 8-4795.

HQ-110 for sale, in excellent condx, $200 takes it. KØOBV, 717 9th Ave., Coralville, Iowa.

HALLICRAFTERS SE-34AC, vy gud condx, also Finco 6 and 2 M beam; both for $300. Kent & Williams, 927 E. Washington St., Medina, Ohio.

FOR Sale: Collins 30S-1 linear amplifier, used less than 10 hours, $1195. Jennings OCS 10-300 mmfd vacuum variable, new, $60. Patterson, W5CT, Rt. 7, Box 347, Dallas, Texas.

WANTED: F500B14 1.4 kc. mech. filter for 51J4. Sell: F455J31 3.1 kc mech. filter for 75A4. Merrill Roscoe, 1880 18th St., East Moline, Ill.

HAM Philatelist with accumulations of UN, Ghana, Israel wish to trade for ham gear: If interested advise gear and wants: W4JMA, Box 455, Hampton, Virginia.

SELL: Recently factory reconditioned Heath DX-35, VF-1. Both $55.00. Other misc. equipment. KØSBF, 1103 Lynwood Drive, Rolla, Mo.

SELL KWM-1 and AC supply. Sacrifice. In exc. condx. $460.00. Leo Bartley, 24 Pleasant Drive, Mtd. Rt., Rome, N.Y.

SELL: KWS-1 perfect, $975; HC-10 converter, $90, like new. W3VDE, 1219 Yardley Road, Morrisville, Penna.

"I Wish I had a kilowatt"—you've probably said it many times. My Johnson Ranger-Thunderbolt combination will give you the full gallon on c.w. and 800 watts input with the T-Bolt as an a.m. linear. Both units are factory-wired and are yours for $575, FOB West Hartford. W1VG, L. A. Morrow, 99 Bentwood Road, West Hartford 7, Conn. Phone ADams 2-2073.

FOR Sale: Multi Elmac AF68 xmtr, 6-80 mtrs. PMR8 rcvr, M1070 AC/DC pwr. supply, Webster bandsoanner, Multiband antenna: base mount, all cables and books. Used 1 mo. Closest bid to $400 takes it. C. Goldman, 3220 89 St., Jackson Heights, N.Y. K2LZQ.

F/S Or T 100 watts (829B final) 2-meter, RFDeck $15; 60 watts PR8073 mod., $15; supply for RFDeck 500V at 250 Ma, 500V at 150 Ma $15; supply for mod., 750V at 350 Ma (PR 866), $20; 3500 at 200 Ma; Rack, $5; 500 watts at either 2300V or 1000V, PR866s, $25; 100 ft. triangular steel tower, 5-19 ft. sections, 1 tapered 5 ft. section, wt. approx 1500 lbs: guys, turnbuckles, etc. complete. $60; 16 element horiz. 2M beam, $5.00; Prop pitch motor, $10. Want: Citizens band units, marine transceiver, geiger counter, metal detector. Don Fielding, W1-VLE, Gail Drive, Ellington, Conn.

NC-183D for sale. In exc. condx, purchased May 1957. $320.00. CE model B SB slicer, Q multiplier, $50. W3DVX, 65 N. Church St., Carbondale, Penna.

BARGAIN: Apache, $219. Cheyenne w/EV-727 mike. Heath AC pwr. supply, $125. Both perfect, with latest manuals, modifications. Excellent appearance. Richard Smolenski, K8GJD, 1109 Tamarack Ave., Grand Rapids, Michigan.

TAPETONE 417A two-meter converter, $70, Hy-Gain three-element 15 meter beam, $25; 10 meter 3-element, $20; Heathkit EA-2 Hi-Fi amplifier, $28; Heathkit FM-3 tuner, $20; Webcor automatic record-changer, $18. All equipment in exent condx. Money order or certified check. K4IHO, 2106 Pine Drive, Raleigh, N.C.

FOR Sale: Globe Scout Deluxe, $150.00; VFO, $50.00; Mosley Trapmaster, $10.00; Hy-Gain TBW ant., $10.00; QSTs, run: 1930-1959. Tom Lesher, K3NCU, Elizabethville, Penna.

SACRIFICE! All like new: Hallicrafters SX-101A, $335; new HT-37, $395; T.O. keyer with Vibro-keyer, $65; TA-33 Tribander, $75; AR-22 rotator, $20; plus D-104 mike, relays, etc. Sell all for $875 or piecemeal. Will deliver within 150 miles. Paul Griffin, K1KNS, Cognewaug Rd., Greenwich, Conn.

SENECA. Will sell at Heathkit price, $159.95. In perfect condx. K4ZYA, 278 South East 4th Ave., Pompano Beach, Fla.

TO Settle estate: New, never used and carrying full guarantee: 2 ea. Drake 1-A w/xtal calibr., $299.95, less 40%; 2 ea. Central Electronics 20-A, $279.50, less 40%; will ship all or part on receipt of check prepaid anywhere in U.S. Send for list of hi-power plate xfrmrs, tubes, etc. First come, first served. H. D. Von Jenef, 1711 Atkinson Rd., Palatine, Ill.

WANTED: Hallicrafters Mod. SR-75. In working order. Don Guptill, 17 Park St. Ct., Medford, Mass.

DRAKE 2A calibrator, two extra xtals, in mint condx: $230.00. Bill King, 204 Lagoon, Northfield, Ill.

VIKING II, in exc. condx, w/VFO, book. First $170. You ship. WA6AJD, Carl, 15436 Faysmith, Gardena, Calif.

GONSET G66B, $150.00 cash. A. Thompson, W2JGV, 116-21 227 St., Cambria Heights 11, N.Y.

CLEANING Out! Send self-addressed stamped envelope for list of equipment and parts. BC224H (same BC348), AC power, rack, plug, $65. C. Moe, 6790 Bollinger Rd., San Jose 29, Calif.

CENTRAL Electronics 20A with QT-1, VFO. Clean. $150 F.o.b. Tecraft 2-mtr. xmtr, $25.00. Want: Heath Chippewa amp. with or without tubes. K4SCT, 1340 NW 190 St., Miami 69, Fla.

SALE: Complete CW station. 90 watts Eico 720K with Heath VF-1 and AC-1 antenna coupler (remote controlled). $95.00. K1PVM, 5 Stark Ave., Wakefield, Mass.

TRADE For top receiver and other ham gear: Have Sanborn Ekg, McKesson B&R for M.D. also one Rolleiflex, Zeiss, Contaflex, G.E. Disposal, RME-69, office equipment. R. Grayson, M.D., KNØFAX/9, phone TErrace 3-9808. 172 Schiller, Elmhurst, Ill.

SELL: Latest version Viking Challenger xmtr with six meter VFO, $95; WRL 755A VFO, $35.00. K8WYU, 377 Franklin Court, Worthington, Ohio.

FOR Sale: Ranger 75W phone/c.w. xmtr with push-to-talk, grid block keying. Dow T/R relay and c.w. monitor. In exc. condx. WØAEP, 2723 B Ave., N.E., Cedar Rapids, Iowa.

FOR Sale: SX-88 with speaker, $350; Valiant, $325.00. Both in exc. condx. James Spencer, 1102 Grand, Laramie, Wyoming.

SELL HQ-170C, Globe Scout 580 plus many extras. All for $300. Ideal station for Novice. B. E. Crumrine, K3JFV, Media, Penna. Phone LO 6-0934.

LAMPKIN Freq. meter 105B, $180 and mod. meter 205, $180, both in exc. condx and both for $345. You pay shipping. WØTOY, 3738 Cranbrook Drive, White Bear Lake 10, Minn.

TRADE AT, HQ110C for Tapetone Skysweep with 2-meter converter. Trade Gonset 1.6 to 6 Mc mobile converter and ATR 6 volt 125 watt inverter for 100 watt 6 meter H/B trans., pwr. supply and mod. Will ship collect. Fred Harmon, WØBNJ/5, Hwy. 7 North, Oxford, Miss.

FOR Sale: Collins 75A-2, in gud condx, $295; Eldico TR1-TV, 250 watt cw/am transmitter, $195, fair condx. This transmitter has worked over 250 countries. Will sell separately or both for $475. Stu Gregg, K1IJG, RR #1, Ridgefield, Conn. Phone ID 8-3639.

WANTED: FFR Tuning Drawers, such as FFRD-5, 6, 7 and 8 or complete FFR receiver. W2ANB.

WILL Sell 2 length 52 ohm coax 100 and one 200 feet, one 450 Th tube, one P 10FP4A, all new. Highest offer takes. Frank R. Prina, Jr. 1424 John Adams Pkwy., Idaho Falls, Idaho

SELLING Out! Free list. Steve Pinion, Route 2, Bedford, Va.

SWAP Colt 45 Frontier and Edison phonographs for DeForest audions. Will sell duplicate QSTS from 1916. Atwater-Kent breadboard and other antiques. List sent. Want stationary steam engine. Paul Giganti, 2429 San Carlos, San Carlos, Calif.

GLOBE Scout 680A transmitter factory wired with book, $75.00; Hallicrafters receiver S85 with book, excellent, $75. WA2LAV, 278 East Greenwich Ave., Roosevelt, L.I., N.Y. Tel. FReeport 8-8610.

SELL: SSB homebrew 2-6146s, VOX, heavy duty pwr. supply, $50.00. K8IDH, 5211 Hillgrove, Lorain, Ohio.

DX-40, in gud condx; 8 months old, $50.00. K3MTG, Oxford, Penna.

OPERATING Station for sale. Ranger, RME-4300, linear amplifier, power supplies, 3 beams, rotor and other gear. All good condition. For details and prices write Phil Rubin, K8GRD, 1718 Northgate Rd., Springfield, Ohio.

CHELSEA 24-hr. dial ship clock, 6-inch plastic case, no bell, $35. SLR-F communications receiver mfd. by Scott, $75; housecleaning surplus radio gear and components, stamp for list. W6NHT, 1700 Pine, Martinez, Calif.

DX-100, blocked grid keying, VFO pushbutton spotting, continuous output loading. This rig worked DXCC 200. Come and get it for $125.00. A. Ekblad, W2KIR, 161 Evans St., New Hyde Park, L.I., N.Y. Phone FL 4-3122.

SALE: HQ-160 receiver, in exc. condx, $275.00. WA2GPF, 14 Grove St., Waldwick, N.J.

DX-35, VF-1, $55; Gonset Super 12 conv., never used, $67.50; Subraco, MT-15X mobile xmtr, $25.00. Heath MP-10 pwr. converter, new, unused, $30. Warren Lincoln, 6616 Trotwood, Kalamazoo, Mich.

PE-103, new with base and cables, $15. Also one used less B&C, $5.00; BC453-B, good, used, $10; Two ARC-5 xmtrs on rack 3-4 Mc., and 7-9.1 Mc, good, used, $15.00 pair. Buyer to pay shipping. W7OSV, 4826 Memory Lane, Salt Lake City 17, Utah.

SELL: Central Electronics Q-multiplier, $20; B&W FC-30 filament choke, $6.00. K2PHP, 136 Rose Ave., Woodcliff Lake, N.J.

FOR Sale: HT-37, $325; SX101A, $290. Dr. K. Sayther, 1304 Christoper Ct., Metairie, La.

SELL: Collins KWM-2 with AC pwr supply; HQ-129X; 800 watt 120 VAC 60 cycle gasoline generator (self-starting); Morrow 5BR-2 converter; 500 watt modulator (pr. of 810s); 2000V DC 500 Ma. pwr. supply. W. B. Desnoes, W2HB C, 117 Lorraine Ave., Mt. Vernon, N.Y.

C.E. 10B, QT1, Deluxe VFO. 80-20M. coils, $125.00. Leonard Hatteberg, W7HPM, 528½ Liberty, Silverton, Oregon.

FOR Sale: Going SSB DX100, $160; HQ110, $160; AF67, $95; Gonset Super 12 converter, $40; Mosley mobile 3-band antenna, $14; mount, cables, mike, relays, write for details. S. Kattan, 65 East 52nd St., Brooklyn, N.Y. Tel. HY 3-5773.

VIKING II and VFO, $200; NC-300, Calib. & 6 M. meter conv. $275; Gonset Super "12", $50.00; RME "99" rcvr, $125.00. W1GKC, "Doc" Freedman, 589 Haverhill St., Lawrence, Mass.

WANT: Dial only for TS 47/APR. Sell, Electronics mags, 5/53 to present, $2.50 per year. Al Livingstone, 12-01 Ellis Ave., Fair Lawn, N.J.

SELL: Globe Scout 680, $85; Heath VFO, $10; Heath Q-multiplier, $9; 10, 15, 20 meter converter with Preselector, $35.00; speech amplifier and clipper, $10. K1HQA, 127 Field Crest Rd., New Canaan, Conn.

SELL: HQ-170, clock and spkr, $283; D-104 mike w/stand, $15; Gonset Tri-Band beam 3220, $75; excellent, ship prepaid. P. J. Davis, 3511 Redding Road, Chattanooga, Tennessee.

SKY-SWEEP VHF received by Tapetone, complete with converters. Covers 6, 2, 220 and 420 bands. In exc. condx. $279.95. L. S. Lewis, 2 Hoover Pkwy, Lockport, N.Y.

FOR Sale: Seneca VHF-1, $170; SX-99 w/R-46B spkr, $120. In A-1 condx. Jim, W4MES, Richmond, Va.

75S-1 available at 331/3 discount from net. Your certified or cashier's check for $345 brings it to you in original packing F.o.b. Chicago. F. Price, 4620 Magnolia, Chicago 40, Ill.

SELL: HRO60, in exc. condx. Coils A, B, C, D; $300, F.o.b. Butler, N.J. Will deliver within 50 miles of NYC. W2EX, 39 Elm St., Butler, N.J.

RTTY Operators: 2050 to 3050 CPS input filters: $12.00. Mark and space filters, $20. Laursen Electronic Sales, Box 205, Lee's Summit, Mo.

WANT: Hammarlund HC-10 SSB converter. Will swap a Precise model 308 8½ in. oscilloscope. Williams, 499 Weaver, Mississippi City, Miss.

WANTED: Johnson Matchbox, lowest price. WØSCN, P. Bauer, 1362 Hillcrest, Colorado Springs, Colo.

AMATEUR Paradise vacation. Livingstone Lodge & cabins, Mascoma Lake, Enfield, N.H. Couples, families, 100 acres, swim, fish, boats, sports. Dartmouth golf, tennis 32nd year, light housekeeping, $20. PPPW, children half, literature, Al Livingstone, W2QPN, 12-01 Ellis, Fair Lawn, N.J.

LOCAL Sale only! Valiant, $350.00. Matchbox, $35.00. Both in exc. condx. WA2GYC, 671 Bryant St., Westbury, L.I., N.Y.

SELL: Heath DX-100 with manual, in exc. condx, $125.00; HQ129X with manual, works fine, $115; BC-312 with pwr. supply, $40. Will crate and ship F.o.b. RD #1, Seneca Falls, N.Y. W2GXF.

KNIGHT 50-watt transmitter assembled by EE. $30. F.o.b. K3KSM, 527 Cochran, Sewickley, Penna.

COLLINS 75A4 in exc. condx, $495 cash. C. R. Armour, WØWMV, 1205 Olive, Carthage, Mo.

WANTED: QSTS for 1922 to 1927. P.O. Box 196, Hammond, N.Y.

WANTED: Back QSTS July, Oct. 1927; Feb. September 1928; May 1929; Jan., Feb. and July 1930. Feb. 1932 and QSTS 1925 and prior. D. C. Langdon, Box 2538, Juneau, Alaska. State price and condition.

WANT: KWS-1 power supply cabinet, BC1016 inker. Sell: Thunderbolt $399; Johnson SWR Bridge, $5.00; Wheatstone tape perforator, W8RMH, 1910 Long Point, Pontiac, Mich.

NEED 1415 Kc I.F. coils for BC454 3-6 Mc. receiver. Will answer all replies. Earl Blair, W4ZEQ, 281 Alexander Ave., Spartanburg, S.C.

ALUMINUM for every ham need. Write to Dick's, 62 Cherry Ave., Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

FOR Sale: HQ129X with matching spkr, $130; Elmac PMR6 with S-meter, $55; Paco G-30 signal generator (new) Johnson Thunderbolt, $415 (like new); equipment new or excellent shape, guaranteed. Shipped F.o.b. You specify method. Money orders or certified check. W4LCR.

ONE HQ170 receiver with clock. Bought it in 1960. In excellent condx. $295. R. S. Burnett, 1656 Foster, Memphis, Tenn.

SURPLUS Bargains. Command receiver BC-453, $13.95; BC-454, $10; BC-455, new, $13.00; T-19/ARC-5, 3-4 Mc, $10; SCR-522 transceiver, $19.50; BC-348 receiver, $79; ART-13 transmitter, $39.00. Send for new catalog. Hi-Mu Electronics Sales Co., 133 Hamilton St., New Haven, Conn.

QSTS Wanted: December 1915 to June 1916, inclusive; April 17, August '19, July '22. About fifty old issues to exchange. SASE for list. C. W. Janes, 15 George St., Littleton, Mass.

TRIGGER. Cash paid for ham equipment. 7341 W. North Ave., River Forest, Ill. PR 1-8616. Chicago #TU 9-6429.

SEMI-Automatic keys, $20.00. D. Hunter, 1906 West Hanna Ave., Tampa 4, Fla.

SELL: DX100B. Best offer over $190; VF-1, VFO best offer over $17; Eico 730 modulator factory-wired with case. Best offer over $65 V3JR antenna/accessories. Best offer over $20. Preceding guaranteed excellent. Xmtr used 8 months, others 2, also Pentron, Emperor Tape recorder, in gud condx. Cost over $200. Best offer over $90. K4HSB, 304 Lexington, Maysville, Ky.

FOR Sale: Johnson Viking I with VFO, $125.00; Hallicrafters SX-100 with spkr, $185. Les Widick, K30KT, 27 Washington Dr., Cherry Point, N.C.

WANT Heath capacity meter kit CM-1. State price, condition. K5KTX.

WANTED: Two vacuum var. cond., one 1500 mmf. max., one 200 mmf. max, Stan Talago, W8PRM, 426 Grand Ave., Bridgeport, W. Va.

BRAND New Demonstrator Hammarlund HQ-160, $275. Knox Electronic Supply, Inc. 67 N. Cherry St., Galesburg, Ill.

GONSET 66-77A, receiver and transmitter, factory built pwr. supply and modulator 6/12 VDC and 115V A.C., all built in custom-made metal portable case. Accessories: manuals, ant., R.F. meter, reluctance push-button hand-mike, Webster all-band spanner whip antenna. Only connections are Antenna and input voltage. Best offer over $380.00 for this A-1 set-up. Send for misc. parts list of xfrmrs, chokes, filter conds., meters, etc. W3BBV, P.O. Box 722, York, Penna. or Phone 2-6037.

MM2 Analyzer, used 10 hours, $120.00. Warranty. K6RPZ, 3211 Quandt Road, Lafayette, Calif.

FOR Sale: Heath speaker system SS1 and SS1B four speakers, black lacquer cabinets, $65.00; Heath TS4A TV alignment generator, perf., $35.00. Edward B. Schotield, 54 Penn Beach Dr., Pennsville, N.J.

FOR Sale: DX-40, $45.00; VF-1, $12; S40B, $45.00. Jim Wilson, 505 Nash St. Rockwall, Texas.

FOR Sale: S-38E receiver, $35.00. Perf. condx. Contact Tolda, GR 7-1719, N.Y.

SELL Gonset G-76, Turo, 146—26 No. Hempstead Tpke, Flushing 55, L.I., N.Y.

FOR Sale: SX-101, $275; 500 watt homebrew 813 trans. wid pwr. supply and modulator, $200; Hallicratters S-53 rcvr. $45.00; Hallicrafters HT-40 trans. (factory wired), $75; Globe self-powered VFO, $25.00. Charles Eichelberger, 1815 Nott St., Schenectady, N.Y. Phone EX 3-9067.

WARRIOR Linear, 20 hours use, perfect, $189 f.o.b. Scranton, Penna. getting 30L-1 to match my S/Line. K3IZH.

GOING Sideband, So, one unmodified Collins 32V3 exciter goes for $330.00. Sorry, can't ship. W9CR. Phone NE 1-6000, Ext. 412. 9 AM to 4 PM. Chicago, C. Reese.

WANTED: Multi-Elmac PSR-6 receiver. Pwr. supply. James McKee, 52-30 39 Ave., Woodside 77, L.I., N.Y. Tel. OL 1-1610.

LOCAL Sale: Johnson Ranger, $160; NC-200 with spkr, $40.00; Vibroplex Orig. Deluxe, $15; all for $200. Will deliver 50 miles. W2IIG, Ernest Northrup, 129 E. 17th St., N.Y. 3, N.Y. Tel. ORegon 4-4163.

HQ-129X, $120; Adventurer, $28; Knight VFO, $18; 25W plate mod., $18. K2GBH.

HARVEY-WELLS TBS-50C, BFO and pwr. supply; in perf. condx. $75. KN9ZSG, 714 Highland Ave., Glen Ellyn, Ill.

HALLICRAFTERS type electronic keyer, including key, $35; Collins F500B60 mechanical filter, $30. W1ZHY, 10 Blanchard St., Nashua, N.H.

SALE: Trade. Excellent S-53A and S-meter. Gray Shockley, Vicksburg, Miss.

WANTED: Coils and conversion ideas for Collins 32RA-8 transmitter. W8GZF.

FOR Sale: Collins 30K1, in mint condx, 500 watts phone, 600 c.w. Cost $1475. Sacrifice $575. W3GBO.

VIKING 500 for sale, $640; CE10A and Deluxe 458 VFO, $125; Lettine 240 Dynamotor, ATC1 converter, 75 meter Master Mobile antenna, $125.00. W4GMN, Box 371, Lebanon, Va.

VALIANT, factory-wired and tested, in exc. condition, only 10 months old, $300.00. WA2IVS, Dave Lippman, 192 Lyons Ave., Newark, N.J.

CRYSTALS Airmailed: SSB, MARS, Novice, Commercial. Net. Custom finished FT-243 .01% any kilocycle 3500 to 8600 $1.49 (10 or more FT-243 99¢), novice 99¢, 1700 to 20.000 $1.95, 20.001 to 30.000 $2.25. Add 50¢ each for .005%. Add 60¢ for HC-6/u hermetics. QST packaged crystals: "SSB Package", June 1958 and SSB handbook; "Phasing" November 1959; "IMP" May 1960; DCS-500 Feb. 1960; Listed sets (5-FT-243) $9.95, hermetics $13.95. Filter: "SSB Package", 2 matched $7.45. Multiband Receiver February 1961—$16.95. Crystals for all projects, write. Airmailing 9¢ per crystal, regular 5¢. Crystals since 1933. C-W Crystals Box 2065Q El Monte, Calif.

COLLINS 30S-1 Linear bargain: can't be told from new; 4CX1000A just checked OK by Eimac. Sacrifice for $1095 if sold before I leave for Mexico. Can ship in original packing f.o.b. Chicago. R. Yeager, 1455 Wilson, Chicago 40, Ill.

SELL: One new, one used, RK4D32, one Drake 587 audio band pass filter, Carter Dynamotor 12v input 400v 200 Ma output; Sola transformer 3200V CT, 1150VA. Make offer. Want: Scott 330D tuner, McIntosh C20 preamp. Haynes, W8FOV, 2413 Mallory, Flint 4, Mich.

FOR Sale: 100V approx. 40 hours TT, $495; new, in factory sealed crate, $595. Need cash. Have to sell one. RTTY 455 polar relay, like new, $2.95 PP. Relay socket, 75¢; teletype chadless tape splicer, new, $3.00 PP. K9CNG, Vandalia, Illinois. Al Hourigan, Jr.

SELL: Heath Tener with pwr. supply, 29 Mc. xtal. and mic. exc., $45.00. Paul Jagnow, 212 5th St., Coralville, Iowa.

QUICK Sale! New Heathkit antenna impedance meter, wired, Model AM-1, cost $14.95, Sacrifice $6.95; Heathkit Balun coil, wired, mod. B-1, cost $8.95, sacrifice $4.95; never used, Heathkit DX40 meter, dual range (0-6) (0-150) Ma. Cost $9.95, sacrifice $5.95; used Vibroplex bug, cost $27.95; sacrifice $9.95; K3AOL, 1201 Stanwood St., Philadelphia 11, Penna. Phone RA 5-1519.

FOR Sale: Collins 75S-1, 32S-1 and 516F-2, $900. Fred McCarron, KØSOX, 5303 N. 44th Ave., Omaha 11, Nebr.

SELL: Drake 1-A, 20-A, VFO, QT-1, 80-10 vertical, best offer. Paul Hellenberg, 5005 Wind Point Rd., Racine, Wis.

HIGHLY Effective home-study review for FCC commercial phone exams. Free literature. Wallace Cook, Box 10634, Jackson 9, Miss.

SELL: Viking Valiant. Appearance excellent. I just can't make it work. Will take $200. Bill Dunsmore, K4KIR, 4605 7th Ct., So. Birmingham, Ala. Tel. WO 1-8165.

TEKTRONIX Oscilloscope, brand new model 310, light, portable, operates on 115/230v 50-800 cycle line. Vertical freq. response dc-4 mc. Complete with 10 meg. probe, adapter, green filter and instruction manual. $525.00 or best offer. Rullman, K7MSH, 3065 S.W. 123rd Ave., Beaverton, Oregon. Tel. MI 4-9731.

STANCOR A-3899 600 watt Multimatch modulation transformer, $65.00; MM-2 scope, $95; new RCA 575A rectifiers, $20 pr.; new RCA 810's, $20 pair; new RCA 813's, $20 pair; Millen 90651 Grid Dipper, $40; Millen 90672 Antenna Bridge, $30; B&W HDVL coils 10 thru 80 meters plus base coaxial links, $25 complete; GE Pyranol 2 mfd 4000 volt condensers, $6 ea.; oil-filled plate xfrmr 115/230 volt primary 3000V DC 500 Ma secondary, $65; filament xtrmr 5 volts 60 amps, $7; modulation monitor with Weston 3" square VU meter, $20; Johnson 100D90 variable split stator, $6; PE-101 Dynamotor, $5; complete 600 watt output Class B modulator with tubes, transformers, bias supply, $100. W9YFV, 190 E. North Ave., Elmhurst, Ill.

FOR Sale: NC303 receiver, cream puff. Speaker, Deluxe calibrator and two-meter converter, $375.00. WV2LKB, Phil J. Raneri, 43 Croton Lake Road, Katonah, N.Y. CE 2-3326.

WANTED: KWM-2 with or without both supplies; Johnson KW Matchbox with built-in SWR meter, 500 cycle filter for 75A4, 300 mmf. vacuum variable, 110V 20 to 30 amp. Variac, 4-1000A and air socket Collins 310C, give serial number, description, condx, price first letter. K3BHB, 903 Western Ave., Jeannette, Penna.

SELL: Viking KW with desk, $950.00. F.o.b. Hickory, N.C. Dr. Charles A. Brady, Jr., W4ENH, 817 8th Ave. N. E. Hickory, No. Carolina

DRAKE 1-A receiver, $190 or your best offer. DX-20, $25.00. K8GTI, 740 N. Highland, Dearborn, Mich.

SELL: Hammarlund HQ129X and spkr. $115.00; C.E. sideband slicer, Mod. A WAP1, $30; Heathkit Q multiplier, $8.00; mobile 10-meter transmitter, $15.00; PE103 Dynamotor, $6.00; c.w. transmitter 80 and 40, $25.00. W2FFH, 316 Jerusalem Rd., Scotch Plains, N.J.

SELLOUT: 100V (#935) orig. crate, $495; 600L, like new condx, $270; 75A4 (#4707) in mint condx, $530; 800 cycle and 6 Kc filters available if desired. Gonset Communicator II (2 meters) (C.D. model), mike, xtals, S meter, Telrex beam, $145.00; Johnson Matchbox, Jr, $30; Champion Vibroplex key, unused, $10; Lakeside Timer, $5.00. Want KWM-2, state serial number, condition and price. Leon Schwartz 3832 Washington, Chicago 24, Ill.

SALE: Globe Chief DLX with modulator and $25.00 five way antenna coupler. Best offer. WA2OVR.

COMPLETE Rig! R-100 accessories: DX-40, VF-1, D-104, "Blue Racer", K2POO keyer-monitor, 3-ele. beam, rotator, other accessories. Exc. condx, in use. $250.00 plus shipping. K4JYP, Henry Adams, 315 S. Chapman, Greensboro, N.C.

MOBILE: Sell Gonset Twins G77, G66B, 3-way supplies, $150 each or $285 for both. In exc. condx. Risley, W1LIL, Higganum, Conn.

TAPE Recorder, $115; Wollensak T-1515, Monaural, 10 watts. Plays stereo with external amplifier. Response 40-15,000 cps± 3 db. Used only 25 hours. W1RML, 46 West Ridge Drive, Avon, Conn.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Factory service at reasonable prices on Collins, Hallicrafters, Hammarlund, Gonset, National, Harvey-Wells. Our 25th year, 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

WANTED: Few BC-348 receivers perferably unmodified then consider modified. Please state conditions, prices. OM. P.O. Box 578, Taipei, Formosa.

100-V, never been fired up, latest serial number, $550; Viking II, $159.25; Ranger, $189.50; 20-A, $189.50; 10B, $129.50. All in splendid condition. First check, first served. Cleaning house. W4JSH, Box 1212, Lexington, Kentucky.

SELL: New Valiant $395.00; SX-25 with spkr, $75.00. Hy-Gain 10-meter 3-el. beam, like new, $15.00. David Tranberg, WØRRJ, Hallock, Minn.

SSB Station. CE100V, Johnson Pedestal Kilowatt, and HQ-170. All late models, in perf. condx, $2,000 F.o.b. Will ship. Would consider selling individually. Will demonstrate. Don Morgan, KØTAJ, 305 East 1st. McCook, Nebraska.

SELL DX-40, VF-1 for best offer. Bob Eckweiler, WA2GUQ, 29 Homer Place, Manhasset, N.Y. MA 7-5038.

COLLINS S-Line 75S-1, 32S-1, 516F-2, 312B-4 and 30S-1 linear, better than new, 32S-1 and 312B-4, used less than 4 hours! All used less than 50 hours. Guaranteed perfect! Will sell only as a complete station! Cash or finance through your bank. Own the best for less. $2600! F.o.b. K3MVP, 8258 Brittany Place, Pittsburgh 37, Penna.

FOR Sale: 60-9 surplus transmitter (3 complete units), 4-811, 4-1616 and 3-1625 tubes. 1-Kw plate transformer and matching choke and filament transformer. Cost me over $100. Yours, complete as above, $50.00. F.o.b. Paul Friedel, 3117 Jeffrey Rd., Baltimore 7, Md. K3AHN.

FOR Sale: HT-32, mint condition, with extended 10 meter coverage per QST article Feb. 1960, all tubes test good, $495, F.o.b. W6GMC, 614 Bradbury Road, Monrovia, Calif.

FOR Sale: Receiver, Technical Materials Corp. GPR-90, 1 yr. old. Transmitter: BC-610-E complete, 10-160 mtrs. tunable M.O. Antenna: Mosely rotary, Trapmaster Model TA-33, three element, Triband 10, 20, 40 mtr. Rotator: CDR. Tower: 25 ft. Vesto. Will sell complete or separately. For prices and details write to Donn McGlehan, 56 Chipmunk Lane, Wilton, Conn.

MUST Sell Hammarlund HQ-140X receiver, perfect condition, with spkr, $149. W2GCJ, Frank Blode, 3 Lake Ave., Lake George, N.Y.

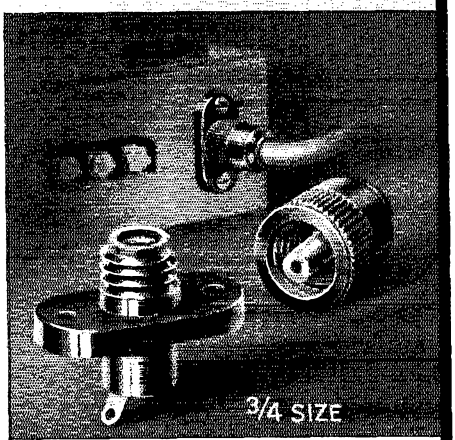
6N2 SR-34 Hallicrafters Transceiver. 6-12-110 volt. Excellent condition. $325.00. K4RTG, Penhook, Va.

HEATH Apache and SB-10. $299. K3DOX.

FOR Sale: National NC-173, $93; Heath DX-35, $34.00 plus assorted other gear. Send for list. All in great shape, but must sell for college. Woody Demitz, KØODR, 727 Radcliffe, St. Louis 30, Mo.

SX-28 in exc. condx, with matching spkr, $115.00; Modern 4-400A all band amplifier with power supplies, $125.00; Meissner Shifter A-1, $25.00; parts, tubes, power supplies for KW amplifiers. Write for further info. Four new Eimac 304 TLs, $15.00 each. Neill A. Jennings, P.O. Box 7152, Greensboro, N.C.

Designed for Application



THE NO. 37001 SAFETY TERMINAL

An old favorite in the line of exclusive Millen "Designed for Application" products. Combination high voltage terminal and thru-bushing. Tapered contact pin fits firmly into conical socket providing large area, low resistance connection. Pin is swivel mounted in cap to prevent twisting of lead wire. Easy to use. ¼" o.d. insulation high voltage cable fits into opening in cap. Bared conductor passes thru pin for easy soldering to pre-tinned tip of contact plug.

●

Standard 37001 available in either black or red bakelite. No. 37501 is low loss mica filled yellow bakelite for R.F. applications.

JAMES MILLEN MFG. CO., INC.

MAIN OFFICE AND FACTORY

MALDEN

MASSACHUSETTS

Index of Advertisers

ACE Electronics Div. 108
Adirondack Radio Supply 127
Allied Radio Corp. 160
Alltronics-Howard Co. 150
Amateur Electronic Supply 120
Amateur Radio Exchange Div. 152
American Crystal Co. 120
American Electronics Co. 142, 144, 146
American Radio Relay League
QST 100
Antenna Book 150
Emblems 140
Handbook 136
License Manual 152
Logbooks 147
Arrow Electronics, Inc. 133
Ashe Radio Co., Walter 116

Barrington Specialties 132
Barry Electronics Corp. 141
Bay-Key Electronics, Inc. 132
British Radio Electronics, Ltd. 122
Brown Electronics, Inc. 110

C & G Electronics Co. 150
Call-D-Cal 144
Camp Albert Butler 143
Central Electronics, Inc. 103
Clarostat Mfg. Co., Inc. 141
Clegg Labs. 123
Collins Radio Co. 2
Communication Products Co., Inc. 101
Communications Equipment Co. 118
Continental Electronics & Sound Co. 150
Crawford Radio, The 152
Cubex Co. 142
Cush Craft 152

Douglas Instrument Labs. 145
Dow-Key Co., Inc., The 104, 140, 142, 150
DX-QSL 138

Edwards Co., W. H. 144
Elco 117
Eitel-McCullough, Inc. 4
Electro-Voice, Inc. 115
Electronic Wholesalers, Inc. 135
Evans Radio 149
E-Z Way Towers 106

Finney Co., The 114
Fort Orange Radio Distributing Co., Inc. 139

GAM Electronics 98
General Crystal Co., Inc. 140
General Electric Co. 159
Glas-Line Co., The 124
Globe Industries, Inc. Electronics Div. (Belleville, N. J.) 138
Gonset Div. 99
Gotham 95, 96, 97
Groth Mfg. Co., R. W. 142

Hallicrafters Co., The 1, 87
Hammarlund Mfg. Co., Inc. 107
Harrison Radio 129
Harvey Radio Co., Inc. 125
Heath Co., The 91, 92, 93
Henry Radio Stores 122, 131
Hornet Antenna Products Co. 149
House of Antennas 145
Hy-Gain Antenna Products Co. 105

Instructograph Co., Inc. 149
International Crystal Mfg. Co., Inc. 113

Johnson Co., E. F. 38, 89

K9TVA Enterprises 146
Kar-Tena Mfg. 124
Ked-Ge Lodge, Ltd. 152

Lafayette Radio 137
Lampkin Labs., Inc. 145
Lettine Radio Mfg. Co. 132

Master Mechanic Mfg. Co. 149
Master Mobile Mounts, Inc. 119
Millen Mfg. Co., Inc. James 158
Mosley Electronics, Inc. 109, 143

National Radio Co., Inc. ..... Cov. III
North Hills Electronics, Inc. 145

Organs & Electronics 151

P & H Electronics, Inc. 126
Pausan Co. 151
Petersen Radio Co., Inc. 5

Raytheon Mfg. Co. 90
RCA Electron Tube Div. ..... Cov. IV
Rider Publisher, Inc., John F. 128, 130
Rohn Mfg. Co. 118

Shure Bros., Inc. 151
Skylane Products 138
Solar Electronics Corp. 147
Space Raider Antennas 151
Sylvania Electric Products, Inc. 121

Technical Materiel Corp. 7, 111
Telrex, Inc. 146
Tennalab 136
Trigger 134

U. S. Savings Bonds 148
United Transformer Corp. ..... Cov. II

Van Sickle Radio Supply Co. 146
Vesto Co., Inc. 134
VHF Amateur, The 116
Vibroplex Co., Inc., The 126

Webster Mfg. Co. 102
Wilson, Inc. Willard S. 140
World Radio Labs. 112, 130

FROM THE GENERAL ELECTRIC COMPANY

6 answers—with some long-range meaning for Engineering Writers

Q Is this message published in an effort to hire Engineering Writers? If so, does it also include Technical Writers?

A **Yes, General Electric has openings for professional Engineering Writers in its Heavy Military Electronics Department. Most of these are new openings, based on Department growth. But while inquiries from Technical Writers would be welcome, these particular openings are for Engineering Writers only.**

Q So there is no misunderstanding, will you pinpoint the difference between the Engineering Writer and the Technical Writer in your organization?

A **It is in the degree of technical competence required. In our organization, the Engineering Writer is a professional in the full sense of the word—with a technical competence approaching that of the Design Engineer with whom he so closely works. HMED's Engineering Writers either have their BSEE's or the equivalent in experience and training.**

Q What is the nature of the work?

A **If qualified, you'll be assigned to one of the major electronic systems programs for which the Department is responsible. For example, you might be assigned to the Navy SQS-26 program—involving the most powerful shipborne sonar in the free world. Or it could be to a project designed to monitor all activity in millions of cubic miles of ocean. And these are but two . . . .**

Q What functions are involved?

A **You'll be providing the first "translation" of the raw material (i.e. graphs, schematics, charts, etc.) produced by the Design Engineer into manuscript form. From your manuscript and under your direction, support personnel provide publications covering systems philosophy, installation, operation, and maintenance for use by military customers.**

Technical competence is the vital qualification here. Certainly your writing talent is valuable, but in terms of major electronic systems—we need your technical competence. That's why even though you have responsibility from start to printed material, your support personnel take care of finished writing, illustrating, and printing.

Q What are the qualifications?

A **You could be qualified in either of two ways:**

1. If you have your BSEE and experience in our product line, you are probably qualified.

2. But we would also strongly consider an E.C.P.D.—accredited Technical School graduate or a man with two or more years' credit toward his BSEE. But in this case, you must have also had the following military experience:

2 or more years' maintenance or repair of major electronic systems, specifically radar (land-based or shipborne), computers (fire control or GCI), or sonar.

Q Assuming I qualify, would it really be worth a job change?

A **Yes—if you are looking for greater professional opportunity. In the first place, you'll be treated (and expected to contribute) at a high level. Also, you'll be joining an organization within G.E. that continues to grow. The technical writing staff has grown by 700% in the last eight years and there is no let-up in sight. Obviously, this means you are joining a Department that needs your talent—and the need will continue into the foreseeable future.**

More information about General Electric's extensive benefits program is available upon request. Relocation assistance will be provided. Qualified personnel will be invited to Syracuse for interviews at Company expense.

EQUAL JOB OPPORTUNITY For All Qualified Applicants

178-01A

FOR MORE INFORMATION, send a summary of your background and experience in confidence to:

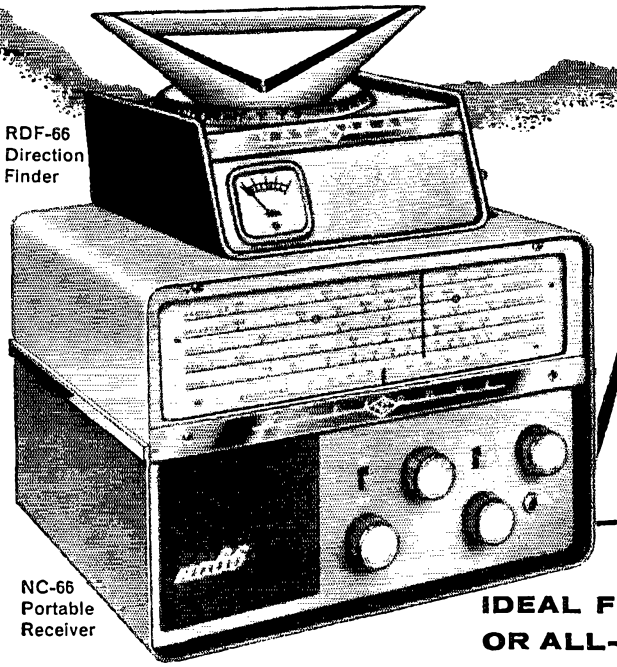
Mr. George B. Callender
Engineering Administration, Section T-9
Heavy Military Electronics Department
General Electric Company
Court Street, Syracuse, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

ALLIED saves you $60.00 on this famous NATIONAL

NC-66 PORTABLE RECEIVER and RDF-66 DIRECTION FINDER.....!



available only at ALLIED!

• • •

SPECIAL FACTORY CLOSEOUT PURCHASE

Regular Price $139.90

ALLIED SALE PRICE, BOTH FOR $79.90

Easy Terms: NO MONEY DOWN

SAVE ALMOST HALF!

Allied passes tremendous savings on to you! Receiver is the versatile, popular 3-way portable NC-66. Use it anywhere—on AC, DC or self-contained batteries. Tunes 150 to 400 kc and 500 kc to 23 mc in 5 ranges. Covers longwave, shortwave and standard broadcast bands. Built-in 5" PM speaker; ferrite loop for BC, whip antenna for SW. Size, 9¾ x 12¼ x 10". RDF-66 Direction Finder is an accurate navigation aid for pleasure craft, etc. Has built-in meter; one-null indication; 7 x 8½ x 10"; powered by the NC-66. Both units can be yours for far less than the original price of the receiver alone! Less battery. Shpg. wt., 25 lbs.

77 SX 984. NC-66 and RDF-66.
SALE PRICE.....**$79.90**
80 J 616. Battery for NC-66. Wt. 6½ lbs. **$ 5.57**

EASY TERMS • **NO MONEY DOWN**

QUANTITIES LIMITED! ORDER TODAY

IDEAL FOR BOATING, CAMPING OR ALL-AROUND PORTABLE USE!

- ✓ *Keep tuned in on the latest weather*
- ✓ *Hear world-wide shortwave broadcasts*
- ✓ *Listen to the broadcast band*

ORDER FROM

ALLIED RADIO

SAVE $60

ALLIED RADIO, Dept. 46-F1
100 N. Western Ave., Chicago 80, Ill.

☐ 77 SX 984 National NC-66 and RDF-66
☐ 80 J 616 Battery for NC-66

$.....enclosed

Name_____
Print

Address_____

City_____ Zone____ State_____

2 BANDSPREADS

Calibrated foreign broadcast bands, calibrated amateur bands, either at the mere flick of National's exclusive Dial Selector. Double-conversion in a general coverage receiver at only $199.50. True variable selectivity with National's patented "Ferrite Filter" to provide clear, readable AM, CW, and SSB reception. Sensitivity—better than 1 microvolt. Five bands—540 kc to 30 mc.

Latest addition to National's "Cosmic Blue" series. "Flip-Foot" equipped for effortless operation.

See it, and tune it for yourself.

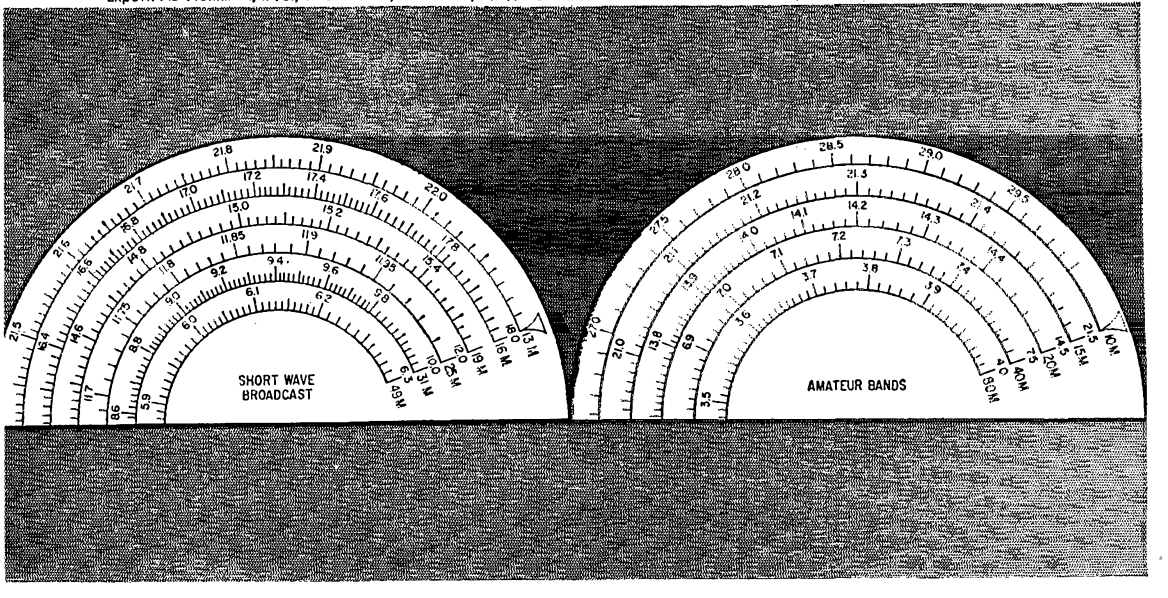
The All New NC-190

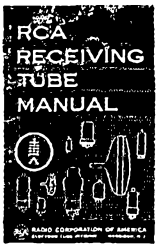
NATIONAL RADIO COMPANY, INC.

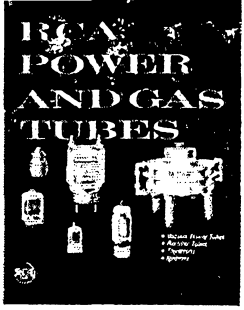
MELROSE 76, MASS.

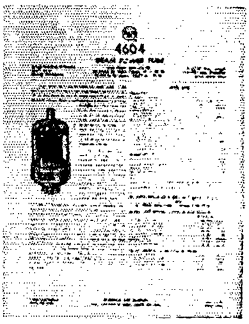
A WHOLLY OWNED SUBSIDIARY OF NATIONAL COMPANY, INC.

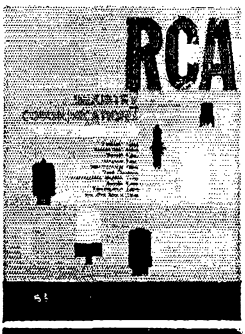
Export: AD AURIEMA, INC., 85 Broad St., New York, N. Y. Canada: CANADIAN MARCONI CO., 1830 Bayview Ave., Toronto 17, Ont.

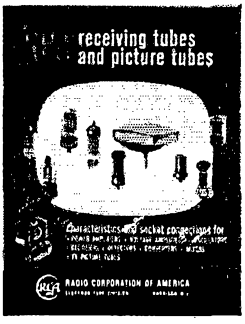


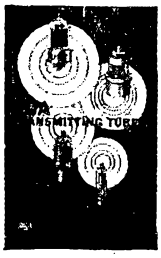












RCA Transmitting Tube Manual, TT-4. Covers power types having up to 4 Kw plate input and associated rectifier types. 2565 pages of data, theory, application, circuits... Price $1.00..

RCA Power and Gas Tubes, PG101D. Illustrated 32 page booklet giving technical data in quick-reference form on 175 different types including RCA vacuum power tubes, rectifier tubes, thyratrons, and ignitrons. Price 30 cents..

RCA Receiving-Type Tubes for Industry and Communication, RIT-104B. 32 pages of technical information on premium tubes, low-microphonic amplifier tubes, glow-discharge tubes, pencil tubes, small thyratrons, and many others. Price 30 cents.

RCA Receiving Tube Manual, RCA-20. Revised, expanded, and brought up to date, contains 432 pages of technical data on more than 760 receiving types and 170 picture-tube types. Features tube theory, new circuits, resistance-coupled amplifier charts, curves, and socket diagrams. Price $1.00.

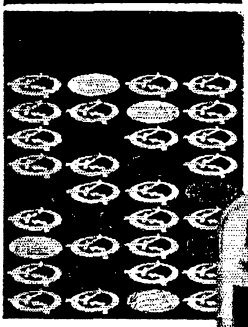
RCA Semiconductor Products, SCD-108D. 40 pages packed full of technical data on RCA transistors and silicon rectifiers, plus 37 circuits. Price 30 cents.

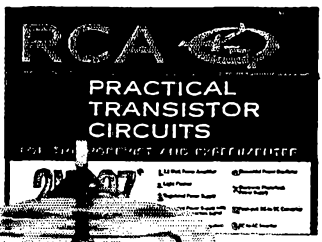
RCA Receiving Tubes and Picture Tubes, 1275-J. 48 pages of technical data on more than 900 receiving tubes and picture tubes. Price 35 cents.

Transistor Fundamentals and Applications, 4T37. Discusses transistor theory, applications, and servicing techniques. Price 50 cents.

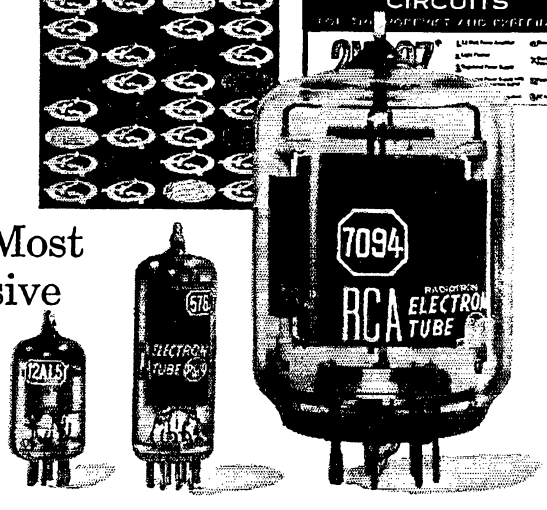
Practical Transistor Circuits, 4T64A. 12 practical circuits utilizing RCA-2N307 Power Transistor of special interest to the hobbyist and experimenter. Price 15 cents.

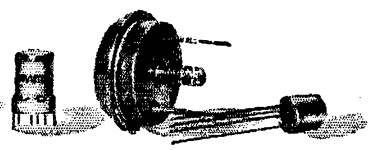
RCA Technical Bulletins. Individual technical bulletins are available for most power-tube, industrial receiving-tube, transistor, and silicon rectifier types. Single copy for a specific type is available—free on request.





Amateur Radio's Most Comprehensive Technical References on...





POWER TUBES • RECEIVING TUBES • SEMICONDUCTOR DEVICES... What's the best power tube for my final? Which tube combination will do the most for my receiver design? Which is the right transistor for my portable rig? You can get the answers to questions like these from the RCA publications pictured on this page.

Here, in easy-to-understand form, is a storehouse of technical facts you will want to know about hundreds of RCA tubes and transistors. In these publications you will find operating conditions, quick-reference charts, pages of circuits—application hints, installation tips, characteristics curves, all sorts of technical aids.

For copies of these authoritative ham-shack references, check the list above and contact your RCA Tube Distributor. Or remit payment with your order—direct to Commercial Engineering, Section A-37-M, RCA Electron Tube Division, Harrison, N. J.

RCA

The Most Trusted Name in Electronics

RADIO CORPORATION OF AMERICA