October 1962
50 Cents
55c in Canada

QST

devoted entirely to

amateur radio

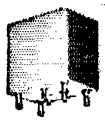
IN THIS ISSUE—DX CONTEST RESULTS

FOR EVERY APPLICATION

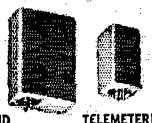
IMMEDIATELY AVAILABLE—FROM STOCK

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

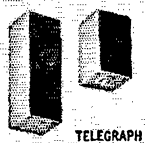
FILTERS



LOW PASS HIGH PASS BAND PASS 60 to 12000 CYCLES.



TELEMETERING 400 to 70000 CYCLES.



TELEGRAPH 425 to 2975 CYCLES.

HIGH Q INDUCTORS

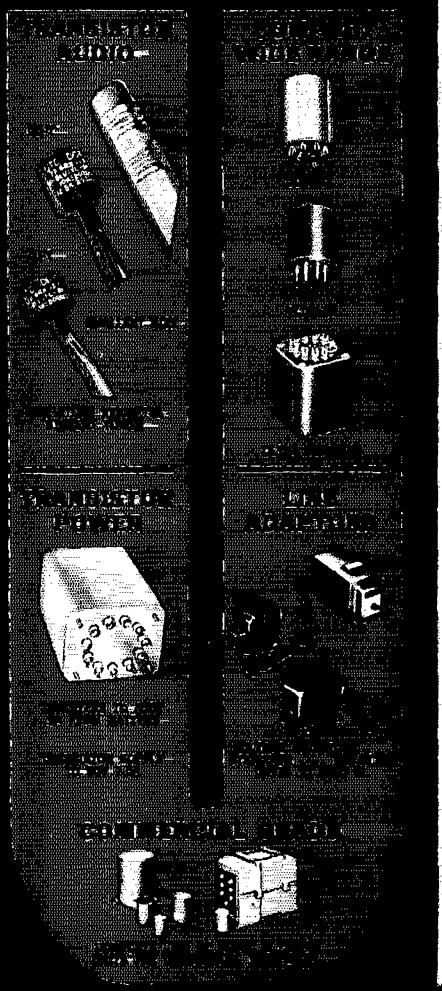
VARIABLE STANDARD

VARIABLE HERMETIC

DECADE INDUCTOR

LOW FREQU. TO 2500 HYS.

PERMALLOY DUST TOROIDS HIGHEST Q, ACCURACY, STABILITY.



HERMETIC POWER COMPONENTS

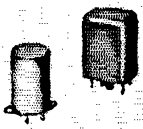
Military, Industrial

PLATE TO 6 KV CT

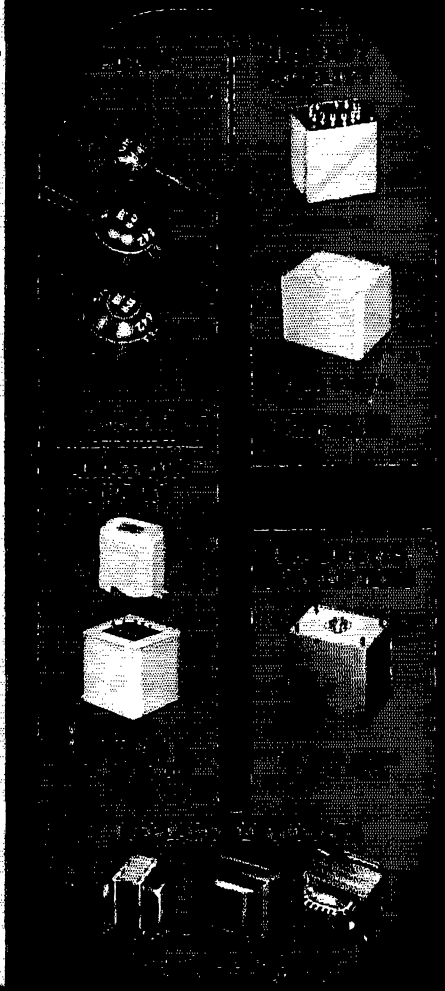
REACTORS TO 1.25A

FILAMENT 400 CYCLE

HERMETIC AUDIOS



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



And Special Units to Your Specifications

UNITED TRANSFORMER CORPORATION

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

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

HALLICRAFTERS MANAGEMENT:

"Can we build a **quality** receiver, capable of all important coverage from **85 kc through 30 mc,** with at least **3-step variable selectivity,** including a transmitter-type V.F.O. that can be **locked on frequency,** with sensitivity **under 1 mv** on the high frequency range, a high order of **mechanical** and **electrical stability,** that weighs under 20 lb., is extremely compact . . . and will sell for about **$400** ?"

HALLICRAFTERS ENGINEERING:

"Yes."

SPECIFICATIONS

Exceptionally versatile and compact triple-conversion, superheterodyne communication-type receiver. **V.F.O.** can be used as crystal locked oscillator; **Selectivity:** Variable in 3 steps, 0.5—2.5—5.0 kc. Crystal-controlled 1st and 3rd oscillators. Selectable sidebands, constant tuning rate. **Sensitivity:** less than 1 mv. on AM, less than ½ mv. on SSB/CW. **T-notch** for up to 50 db. attenuation to unwanted heterodyne in I. F. pass band. I. F. type noise limiter. Audio inverse feedback. Crystals provided for 3.5—4.0, 7.0—7.5, 14.0—14.5, 21.0—21.5, 28.5—29 mc. Four addt'l. crystal pos. for 500 kc. segments between 85 kc. and 30 mc. 100 kc. crystal calibrator included. Size: 15" x 17⅛" x 13". Net wt. 18 lb. Amateur net price: $379.95.

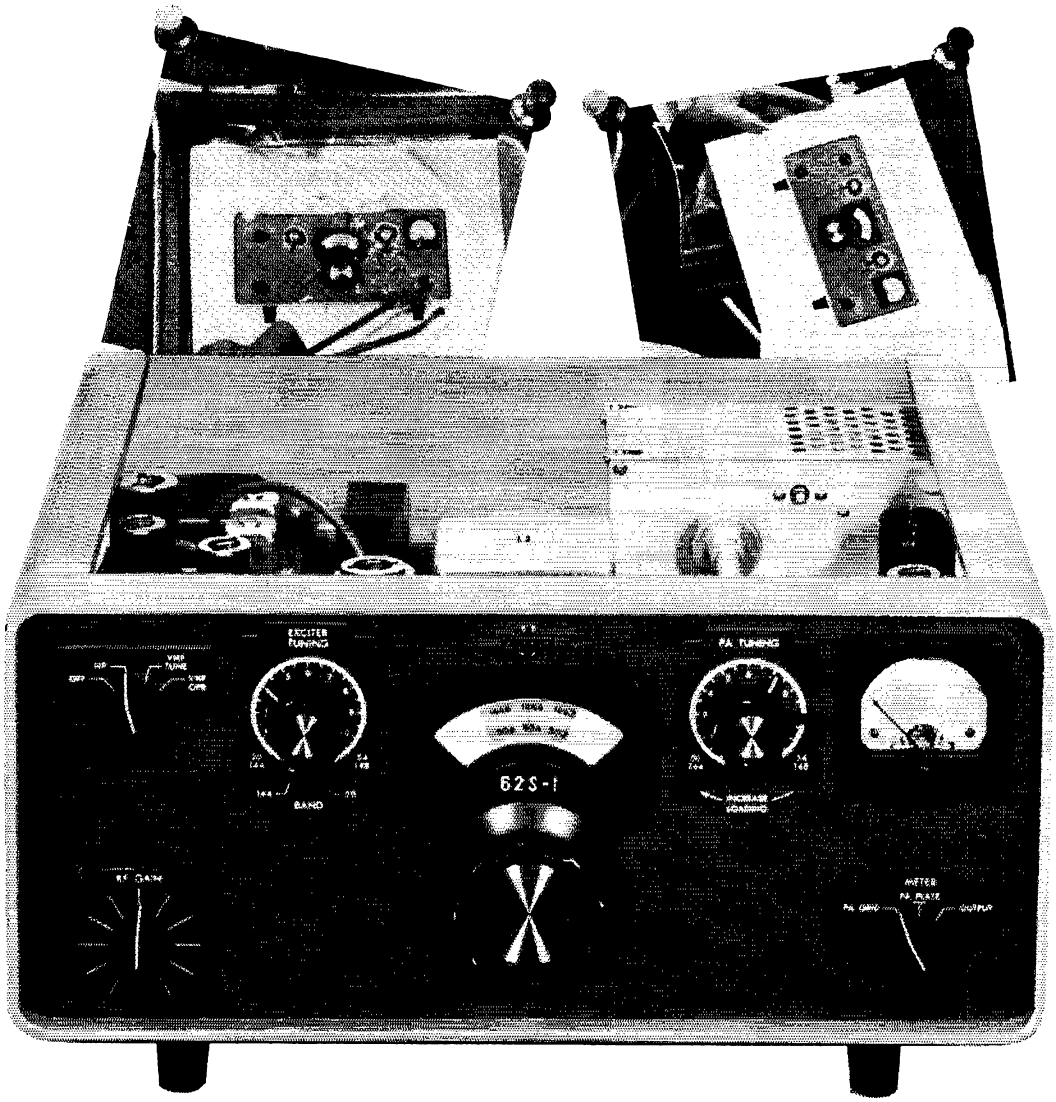
HA-10 Low freq. tuner adapts SX-117 for 85 kc.—3 mc. $24.95

Additional searching questions and exciting answers will be coming your way from Hallicrafters soon.

new SX-117 **Triple-conversion communication receiver by** *hallicrafters*

5th & Kostner Aves., Chicago 24, Ill.

Export: Hallicrafters, International Dept., Commercial Div., **Canada:** Gould Sales Co., Montreal, P.Q.



NO LONGER JUST A PICTURE

Collins' new 62S-1 VHF Converter is ready for your inspection — and here's why you'll find it best: ☐ System engineered for the S-Line/KWM-2 ☐ Excellent cross mod rejection from simple broad banding of front end for 200 kc tuning range ☐ Easy, accurate frequency readout ☐ 1 kc calibration on VHF ☐ Power input 160 watts PEP or CW ☐ Same Size as KWM-2 ☐ No additional power supply needed with S-Line or KWM-2 ☐ Provision for MARS operation out of amateur bands with the addition of crystals ☐ Simple to tune and operate ☐ For a closer look, see your distributor today!

COLLINS

QST

OCTOBER 1962

VOLUME XLVI • NUMBER 10

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

OFFICES

38 La Salle Road
West Hartford 7, Connecticut
TEL.: 236-2535
Area Code 203

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.

Printed in U. S. A.

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

—CONTENTS—

CHART YOUR COURSE TO EIMAC

for dependable, high quality power tubes

EIMAC TYPE	CLASS OF OPERATION / SERVICE	TYPICAL OPERATION — SINGLE TUBE								
		D.C. PLATE VOLTAGE	D.C. PLATE CURRENT (AMPERES)	D.C. SCREEN VOLTAGE	D.C. GRID VOLTAGE	APPROX. MAX. DRIVE POWER (WATTS)	APPROX. D.C. SCREEN CURRENT (AMPERES)	APPROX. D.C. GRID CURRENT (AMPERES)	APPROX. MAX. POWER OUTPUT (WATTS)	FILAMENT VOLTS / AMPERES
3-400Z	B / SSB	3000	.100 / .333[3]	—	0	32	—	.12	655	5.0 / 14.5
3-1000Z	B / SSB	3000	.240 / .670[3]	—	0	65	—	.30	1360	7.5 / 21.3
4CX250B[1]	AB1/SSB	2000	.1/.25[3]	350	−55[5]	0	0/.005[3]	0	300	6.0 / 2.5
	C/CW	2000	.25	250	−90	2.9	.019	.026	390	
	C/AM	1500	.20	250	−100	1.7	.02	.014	235	
4CX300A	AB1/SSB	2500[6]	.1/.25[3]	350	−55[5]	0	0/.004	0	400	6.0 / 2.5
	C/CW	2500[6]	.25	250	−90	2.8	.016	.025	500	
	C/AM	1500	.20	250	−100	1.7	.02	.014	235	
4CX1000A	AB1/SSB	3000	.25/.90[3]	325	−60[5]	0	−.002/.035	0	1680	6.0 / 10.5
4-65A	AB1/SSB	3000	.015/.065[3]	360	−85[5]	0	0/.006	0	130	6.0 / 3.5
	C/CW	3000	.112	250	−105	1.6	.022	.009	270	
	C/AM	2500	.102	250	−150	3.1	.026	.013	210	
4-125A	AB1/SSB	3000	.03/.105[3]	510	−95[5]	0	0/.006	0	200	5.0 / 6.5
	B/SSB[4]	3000	.02/.115[3]	0	0	16	0/.03	0/.055	240	
	C/CW	3000	.167	350	−150	2.5	.03	.009	375	
	C/AM	2500	.152	350	−210	3.3	.03	.009	300	
4-250A	AB1/SSB	3000	.055/.21	600	−110[5]	0	0/.012	0	400	5.0 / 14.5
	C/CW	3000	.345	500	−180	2.6	.06	.01	800	
	C/AM	3000	.225	400	−310	3.2	.03	.009	510	
4-400A	AB1/SSB	3000	.09/.30[3]	810	−140[5]	0	0/.018	0	500	5.0 / 14.5
	B/SSB[2][4]	3000	.07/.30[3]	0	0	40	0/.055	0/.10	520	
	C/CW	3000	.35	500	−220	6.1	.046	.019	800	
	C/AM	3000	.275	500	−220	3.5	.026	.012	630	
4-1000A	AB1/SSB	4000	.17/.48[3]	1000	−130[5]	0	0/.04	0	1130	7.5 / 21.0
	B/SSB[4]	4000	.12/.67[3]	0	0	105	0/.08	0/.15	1870	
	C/CW	4000	.70	500	−150	12	.137	.039	2100	
	C/AM	4000	.60	500	−200	11	.132	.033	1910	
3CX100A5 / 2C39A	C/CW[7]	800	.08	—	−20	6	—	.03	27	6.3 / 1.0
	C/AM[7]	600	.065	—	−16	5	—	.035	16	

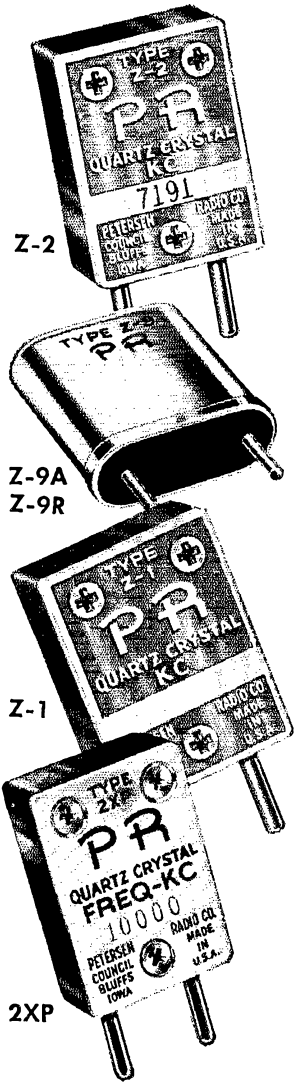
(1) Ratings also apply to 4X250B.
(2) Ratings apply to 4-250A within plate dissipation limitation.
(3) Zero signal and maximum signal dc current.
(4) Grid and screen grounded, cathode driven.
(5) Adjust to give stated zero-signal plate current.
(6) For operation below 250 Mc only.
(7) At 500 Mc.

Above you see popular Eimac tube types suitable for ham transmitters. Remember this chart when you need a tube. And remember the name Eimac. It means power. Quality. Dependability. For Eimac has more know-how, more experience with power tubes than any other manufacturer. Your local Eimac distributor can supply you with any of these tubes listed and Eimac sockets to match. Or for complete data, write Amateur Services Department, Eitel-McCullough, Inc., San Carlos, California. Subsidiaries: Eimac, S. A., Geneva, Switzerland; National Electronics, Geneva, Illinois.

It pays to insist on

PR *crystals*

STANDARD OF EXCELLENCE SINCE 1934



Z-2

Z-9A
Z-9R

Z-1

2XP

AMATEUR TYPES

Fundamental, PR Type Z-2

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

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

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

Third Overtone, PR Type Z-9A

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

6 Meters, PR Type Z-9A

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

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

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

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

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

Type Z-9R, Radio Control

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

Type 2XP

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

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

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

COMMERCIAL TYPES

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

Type Z-1, MARS and CAP

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

Type Z 1, TV Marker

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

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

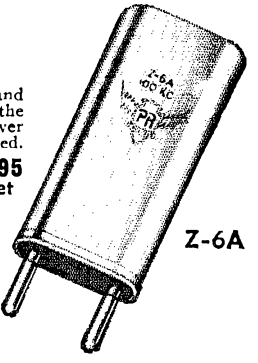
5.0 Mc. Signal Generator, .01%..... **$2.95** Net

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

Type Z-6A, Frequency Standard

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

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



Z-6A

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

MINIMUM ORDER $10

PETERSEN RADIO CO., Inc. 2800 W. Broadway
COUNCIL BLUFFS, IOWA

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.	W3JZY	Andrew H. Abraham	RFD 1	Smithburg, Md.
Southern New Jersey	K2BG	Herbert C. Brooks	800 Lincoln Ave.	Palmyra
Western New York	K2HUK	Charles T. Hansen	211 Rosemount Drive	Buffalo 26
Western Pennsylvania	W3CHN	Anthony J. Mroczka	475-5th St.	Donora
CENTRAL DIVISION				
Illinois	W9PRN	Edmond A. Metzger	1520 South 4th St.	Springfield
Indiana	W9EWH	Donald L. Holt	1312 East 28th St.	Anderson
Wisconsin	K9GSC	Kenneth A. Ebneter	822 Wauona Trail	Portage
DAKOTA DIVISION				
North Dakota	WØHVA	Harold A. Wengel	1416-6th Ave.	Williston
South Dakota	WØRRN	J. W. Sikorski	1900 S. Menlo Ave.	Sioux Falls
Minnesota	WØKJZ	Mrs. Lydia S. Johnson	1258 Van Buren St.	St. Paul 4
DELTA DIVISION				
Arkansas	K5CIR	Odia L. Musgrove	1321 W. Baraque Ave.	Pine Bluff
Louisiana	W5FMO	Thomas J. Morgavi	3409 Beaullieu St.	Metairie
Mississippi	W5MUG	Floyd C. Peetson	2469 Paden	Jackson 4
Tennessee	W4OGG	David C. Goggio	1419 Favell Dr.	Memphis 16
GREAT LAKES DIVISION				
Kentucky	W4BEW	Elmer G. Leachman	P. O. Box 406	Ashland
Michigan	W8FX	Ralph P. Theiteau	27209 W. Six Mile Road	Detroit
Ohio	W8AL	Wilson E. Weckel	2118 Tuscarawas St., W.	Canton 8
HUDSON DIVISION				
Eastern New York	W2EFU	George W. Tracy	1138 North Country Club Drive	Schenectady
N. Y. C. & Long Island	W2OBU	George V. Cooke, Jr.	3 Daisy Lane	Commack
Northern New Jersey	WA2APY	Daniel H. Farley	216 Grove Ave.	Metuchen
MIDWEST DIVISION				
Iowa	WØNTB	Dennis Burke	1418 Douglas Ave.	Ames
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	W1BCB	Albert C. Hodson	370 Capisic St.	Portland
Eastern Massachusetts	W1ALP	Frank L. Baker, jr.	85 Solor Ave.	Braintree 85
Western Massachusetts	W1BVR	Perry C. Noble	8 St. Dennis St.	Westfield
New Hampshire	W1ILQ	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	KL7BZO	Kenneth E. Koestler	2005 Sunrise Dr.	Anchorage
Idaho	W7GGV	Mrs. Helen M. Mailliet	Route 1, South	Pocatello
Montana	W7KUH	Walter R. Marten	3021-6th Ave., So.	Great Falls
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	KH6DYG	John E. Montague	1108 Kukila Place	Honolulu
Nevada	W7VIU	Charles A. Raines	Box 1025	Elko
Santa Clara Valley	W6ZRJ	Jean A. Gine Jr.	1089 Huntingdon Drive	San Jose 29
East Bay	W6OJW	B. W. Southwell	200 South Seventh St.	Dixon
San Francisco	W6BIP	Wilbur E. Bachman	880 Dartmouth St.	San Francisco 24
Sacramento Valley	W6BTY	George R. Hudson	2209 Meer Way	Sacramento
San Joaquin Valley	W6JPC	Ralph Sarovan	6204 E. Townsend Ave.	Fresno
ROANOKE DIVISION				
North Carolina	W4CH	N. J. Boruch	514 Sunset Ave.	Wilmington
South Carolina	K4HDX	Lee F. Worthington	418 Crestview Drive	Spartanburg
Virginia	W4QDY	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	3148 South 3360 East	Salt Lake City 9
New Mexico	W5ZHN	Carl W. Franz	2323 Krogh Court, N.W.	Albuquerque
Wyoming	W7AMU	L. D. Branson	342 South Elk	Casper
SOUTHEASTERN DIVISION				
Alabama*	W4OXU	Walter W. Coleman	P.O. Box 56	Springville
Eastern Florida	K4BJH	Albert L. Hamel	1300 N. E. 42nd St.	Pompano Beach
Western Florida	W4RKH	Frank M. Butler, jr.	494 Elliott Rd.	Fort Walton Beach
Georgia	W4LG	James A. Giglio	1378 Metropolitan Ave., S.E.	Atlanta 16
West Indies (P.R.-V.I.)	KP4DJ	William Werner	563 Ramon Llovet	Urb. 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	K6AAK	William C. Shelton	2036 Grandview Drive	Camarillo
WEST GULF DIVISION				
Northern Texas	W5BNG	L. L. Harbin	4515 Calmont	Fort Worth 7
Oklahoma	W5DRZ	Adrian V. Rea	Box 33	Ketchum
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	4353 West 12th Ave.	Vancouver 8, B. C.
Manitoba	VE4JY	M. S. Watson	249 Lamark St.	Winnipeg
Saskatchewan	VE5BL	Jack Robinson	4527 Elgin Rd.	Regina

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

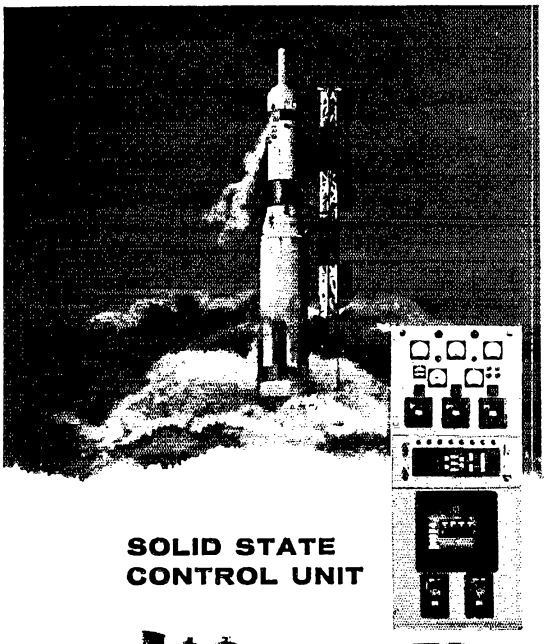
COMPLETE *Freedom* *from* POWER LINE

INTERRUPTIONS

WITH TMC's

NO-BREAK

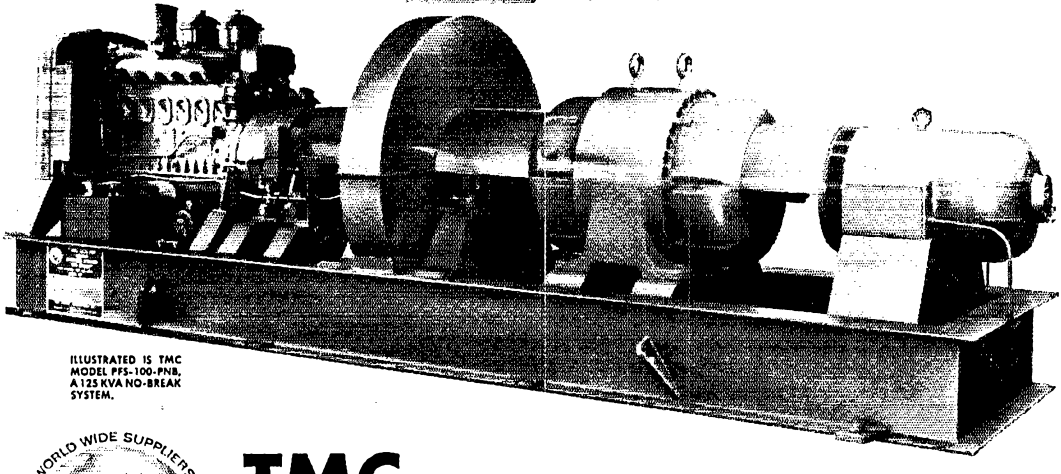
POWER SYSTEMS



SOLID STATE CONTROL UNIT

- **FROM 10 TO 600 KW**
- Frequency and voltage output within ± 0.5%
- Solid state control unit
- Complete isolation between commercial power and load
- Multi-fuel engines
- Eddy current clutches

Long term trouble free operation is foremost in the design criteria of the power systems. Conventional power systems are also available.



ILLUSTRATED IS TMC MODEL PFS-100-PNB, A 125 KVA NO-BREAK SYSTEM.

WORLD WIDE SUPPLIERS OF ELECTRONIC COMMUNICATIONS EQUIPMENT

TMC POWER DISTRIBUTION, INC.

4412 WHEELER AVE
ALEXANDRIA, VIRGINIA

Subsidiary of

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, NEW YORK

THE AMERICAN RADIO RELAY LEAGUE, INC.,

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

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

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

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

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

Past Presidents

HIRAM PERCY MAXIM, W1AW, 1914–1936
EUGENE C. WOODRUFF, W8CMP, 1936–1940
GEORGE W. BAILEY, W2KH, 1940–1952
GOODWIN L. DOSLAND, WØTSN, 1952–1962
(President Emeritus)

Officers

President . . . . . HERBERT HOOVER, JR., W6ZH
900 Wilshire Blvd., Los Angeles 17, California

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 7, 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 7, 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
RAYMOND HIGGS, W6OGI/1
38 La Salle Road, West Hartford 7, Connecticut

• • • • •

General Counsel . . . . . ROBERT M. BOOTH, JR., W3PS
1735 DeSales St., N. W., Washington 6, D. C.

Associate Counsel . . . . . Arthur K. Meen, VE3RX
Suite 405, 19 Richmond St. West, Toronto 1, Ont.

DIRECTORS

Canada

NOEL B. EATON VE3CJ
R.R. 3, Burlington, Ontario

Vice-Director: Colin C. Dumbrille VE2BK
116 Oak Ridge Drive, Baie d'Urfee, Quebec

Atlantic Division

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

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

Central Division

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

Vice-Director: Philip 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

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

Vice-Director: Graham H. Hicks W5IHP
100 Magnolia Place, Natchez, Miss.

Great Lakes Division

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

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

Hudson Division

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

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

Midwest Division

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

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

New England Division

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

Vice-Director: Bigelow Green W1EAE
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 20644, Municipal Airport Branch,
Atlanta 20, Ga.

Southwestern Division

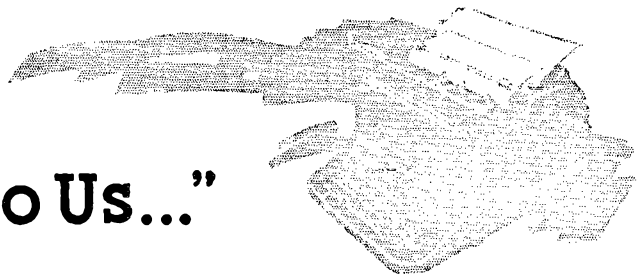
RAYMOND E. MEYERS W6MLZ
Box R, San Gabriel, Calif.

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.



"It Seems to Us..."

GOLDEN ANNIVERSARY OF LICENSING

THE early development of wireless progressed unfettered by any form of regulation; initially, there was no U. S. law. Anyone who could acquire sufficient knowledge and gear to set up a station was "on the air." There was no examination and no license. There were no assigned calls; as an amateur, you picked your own, often your initials. You picked your wavelength (or more often, the equipment you had chose it for you). If this happened to be close to a wave in use by a government or commercial station — and with the extremely broad signals of that day this occurred more often than not — he simply had to shut down until you decided to QRT! With no law, everyone had equal rights to the ether.

A series of Congressional hearings on interference and other wireless problems commenced in 1910. Many government and commercial interests wanted to abolish, or at least restrict, activities of amateur stations. Amateur radio was unorganized, but several prominent amateurs appeared before the committees to argue the right of the individual citizen to have access to wireless experimentation. During 1912, no less than thirteen bills were introduced to regulate radio; at least one had for its objective the exclusive government ownership and operation of radio facilities.

Finally, on August 13, 1912, the 62nd U. S. Congress adopted Public Law 264 — more commonly known as the Radio Act of 1912 — the first general domestic regulation of radio communication, and providing for federal licensing. Amateurs appraised the law with mixed feelings — rejoicing that their volunteer representatives had shown sufficient strength in the hearings to prevent total exclusion from wireless activity, but considerably dismayed at their banishment to the "useless" short waves.

—...—

On October 13, 1962, at the Hotel Statler in New York City, in conjunction with the Hudson Division Convention, a Golden Anniversary Banquet will be held to commemorate the 50-year mark in amateur licensing, and to honor those of today's amateurs who were first licensed in 1912. In response to announcements in *QST* and other publications, more than 50 amateurs have furnished proof of their early license status — either through submission of original documents, or citation of listing in the June, 1913, call book.[1] A special plaque will be awarded to each of these old timers by the sponsoring societies: ARRL, Armed Forces Communications & Electronics Association, Hudson Amateur Radio Council, Institute of Radio Engineers, Quarter Century Wireless Association, Radio Club of America, and Single Sideband Amateur Radio Association. Government and military communications dignitaries will attend to add tribute to the efforts of these pioneering amateurs.

Spark coils, coherers and decoherers, transformer "coffins," cage antennas, induction coils, pump-handle keys, wet-cell batteries — these were some of the marks of the early amateur station. But the most important was the amateur himself — his driving interest in the science of wireless, and his ingenuity in making the whole conglomeration work. Handicapped by lack of published information and the scarcity of wireless components, he somehow forged his way to success, and in doing so first exemplified the traditional amateur experimental spirit. The anniversary celebration is a means of tribute to all amateurs whose pioneer efforts in our early days laid the solid foundations for the later growth and development of the amateur radio service.

QST

[1] Lack of uniformity and thoroughness in the early administration of the 1912 law presented problems for the commemoration committee. Certainly many more than 50 or so of today's amateurs were actively transmitting in 1912, but a large portion simply had not gone to the trouble of obtaining a license. The committee has felt that it could not be arbiter of numerous claims of 1912 activity unless they were supported by documentary evidence.

COMING A.R.R.L. CONVENTIONS

October 13 — Hudson Division, New York, N. Y.
October 19–20 — Ontario Province, Toronto.
October 27–28 — Oklahoma State, Oklahoma City, Oklahoma.
January 19–20, 1963 — Southeastern Division, Miami, Florida.
March 15–17, 1963 — Michigan State, Saginaw, Michigan.

HUDSON DIVISION CONVENTION

New York City — October 13

The Hudson Division Convention will be held on Saturday, October 13, in the Statler-Hilton Hotel in New York City. Activities will commence at 9:30 A.M., and will include seminars and discussion sessions on virtually every phase of amateur radio. Among the activities to be subject of special sessions will be s.s.b., v.h.f.-u.h.f., traffic nets and traffic-handling, antenna theory and design, administration of FCC examinations by personnel of the New York District Engineer's Office, new equipment developments and special sessions for the YL and XYL. As part of the convention, an initiation will take place in the Royal Order of the Wouff Hong.

During the day, exhibitions of new equipment and developments will take place under the sponsorship of leading manufacturers and distributors of amateur and other electronic equipment in the newly-decorated and air-conditioned exhibit room of the hotel.

In the evening, a banquet is being held to honor holders of 1912 licenses. The major speaker will be Herbert Hoover jr., W6ZH, newly elected president of the American Radio Relay League. For more information, see page 9, this issue.

Tickets for both the day-time sessions and the banquet are available through distributors of amateur equipment in the New York area, or by mail from the Hudson Amateur Radio Council, P.O. Box 36, Huntington, Long Island, N. Y. Admission is $11.00 in advance or $12.00 at the door for the full day and evening, including banquet. Tickets will be available at the door at $2.00 for the day's activities only.

ONTARIO PROVINCE CONVENTION

Toronto, Ontario, Canada — October 19-20

The Radio Society of Ontario, Inc., is host to the Ontario Province Convention, Friday and Saturday, October 19–20, at the King Edward Sheraton Hotel in Toronto.

A full slate of technical subjects and speakers has been arranged along with transmitter hunts, tours, luncheons, and other functions.

League officials expected in attendance will be Noel Eaton, VE3CJ, division director; John Huntoon, W1LVQ, League secretary; and Art Meen, VE3RX, the new associate counsel for Canada.

Registration including the dinner, is $5.00 per person before October 12, and $6.00 thereafter.

Requests for additional information, or pre-registration should be sent to W. F. Choat, VE3CO, 38 Grenview N., Toronto, Ontario, Canada.

Talk-in frequencies will be 3.770 and 144.14 Mc.

OKLAHOMA STATE CONVENTION

Kingston — October 27-28

The third annual Oklahoma State ARRL Convention will be held at Lake Texoma Lodge, near Kingston, on Saturday and Sunday, October 27 and 28.

There will be transmitter hunts on land and water, group meetings, and various exhibits on Saturday. On Sunday, there will be group meetings, an ARRL business meeting, and "TELSTAR Communications" by S. W. Bell Tel. Co. Adjournment will be at noon.

Various types of recreation are available; there is to be a dance open to the public on Saturday night. Individuals planning to attend must make their own reservations; cottages with cooking facilities are available.

Registration begins at 8:00 A.M. Saturday; pre-registration is $3.00, unlicensed guests under 16 will be admitted free of charge. For further information write to the Oklahoma State Amateur Radio Convention, P.O. Box 7169, Oklahoma City 12, Okla. Pre-registration ends midnight, October 15.

California — The Greater Bay Area Hamfest will be held October 7, at the Hilton Inn at the San Francisco International Airport. Facilities include pools, play area, and parking for over 600 cars. Activities include hidden transmitter hunts on 75 and 6 meters, mobile judging, swap tables, equipment displays, and a tour of United Air Lines for the XYLs. Registration fee of $6.50 includes a full-course dinner. Pre-registrations must be postmarked by midnight, September 30. Send money to Greater Bay Area Hamfest, P.O. Box 113, Hayward, Calif.

Connecticut — The annual Tri-City Radio Club hamfest will be held on Saturday, October 20, at the Crocker House, State Street, New London. Registration and dinner, $5.50. Attendance by reservation only, limited to 250. Contact General Chairman Robert Chapman, W1QV, c/o Crocker House, New London, Conn.

Indiana — The Hoosier Hills Ham Club will hold a hamfest at Spring Mill State Park on Sunday, October 14. The park is on highway 60 east of Mitchc. Swap shop. Contact the Hoosier Hills Ham Club, Inc., P. O. Box 484, Bedford, Indiana, for further info.

Ohio — The Cleveland Amateuradio Convention is sponsoring the Mid-America Radio Convention on October 12 and 13, at the Sheraton-Cleveland Hotel. Registration begins at 1900 on the 12th, and the convention will wind up with the grand banquet at 1900 on the 13th. S.s.b. dinner at 1900 on the 12th, and a YL luncheon and fashion show at noon on the 13th. Technical forums, DX meeting, QCWA meeting, ARRL forum, and various entertainment. G.

(Continued on page 173)

The perfectionist's dissatisfaction with conventional v.f.o. control is often expressed by the requests that we receive for information on heterodyne exciters. The synthesizer system described here carries the heterodyne-exciter idea one step further by crystal-controlling all *frequency-generating circuits.*

The Ultimate Exciter

Continous Coverage with Crystal Control

BY CLIFFORD A. HARVEY,* W1RF

A YEAR OR two ago I built a frequency synthesizer that has occasioned interesting comment whenever I have described it on the air, so I thought a short article about it might make a few minutes of interesting reading. Basically, a frequency synthesizer can be defined as a device that makes new frequencies out of old ones, by combination. Frequency combination, or mixing, has been in use since the first days of the superheterodyne receiver, and more recently has been popular in transmitters, since s.s.b. techniques have made it necessary to obtain high frequencies from low ones by some means other than multiplying.

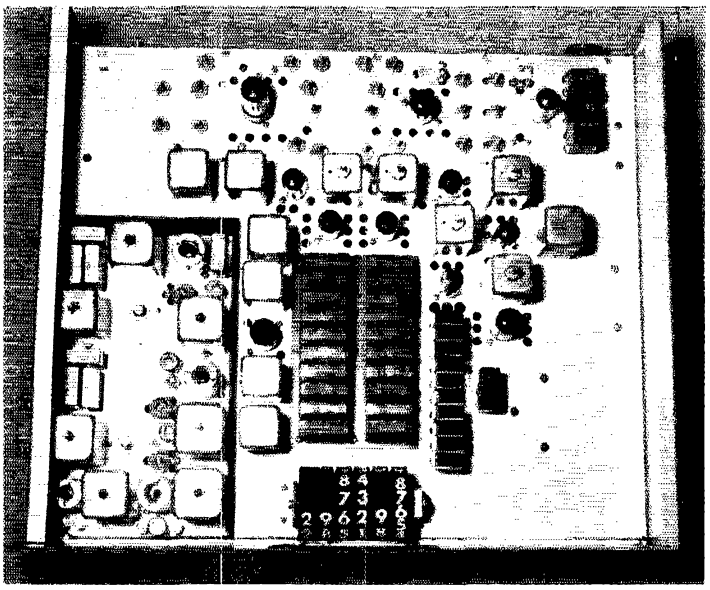
Free-running oscillators are in common use today, particularly in amateur operation, as a means of frequency determination and, in recent years, developments in tubes, insulating materials and circuitry have tremendously improved their frequency stability. However, all free-running oscillators are still subject to various forms of instability — short-term because of initial heating of the circuit components; medium-term instability as a result of atmospheric changes in humidity, temperature and pressure; and long-term instability caused by aging of components. There is nothing quite like a crystal-controlled oscillator for stability. Almost everyone who runs a self-excited v.f.o. has a crystal-controlled standard at 100 kc. or so for reference, so that adjustments can be made to the v.f.o. to correct for the various instabilities outlined above.

The obvious conclusion is: how nice it would be to have a crystal-controlled exciter capable of operation on any desired frequency in any of the amateur bands. This can be done if we start with several crystal-controlled oscillators and beat them together to come out with amateur frequencies. As a special added attraction, drums can be linked to the various crystal-switch shafts to give direct digital readout of the output frequency!

Basic Principle

Frequency synthesizers first appeared commercially about 10 years or so ago. They usually

* Box 88, Sturbridge, Mass.



Plan view of the frequency synthesizer.

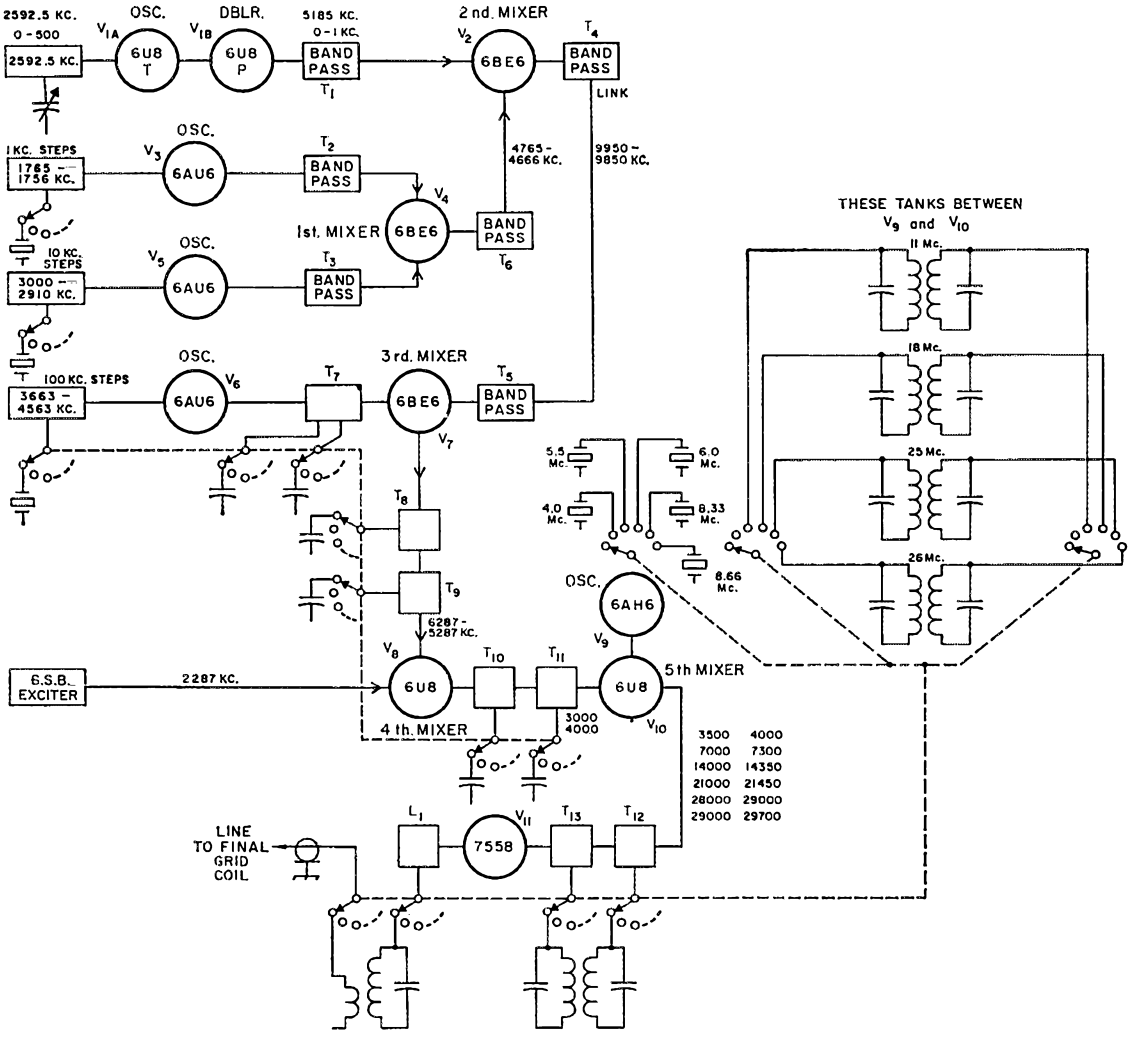


Fig. 1—Block diagram of W1RF's continuous-coverage crystal-controlled exciter.

take the form of a single very-stable low-frequency crystal oscillator, temperature-controlled and stabilized to very close limits, whose frequency is multiplied, divided, and the products combined, to result in stable output frequencies throughout any band of frequencies of interest. This type of synthesizer has one inherent deficiency that is totally intolerable to a member of the s.s.b. fraternity — the inability to divide integral kilocycles. If everyone operated on an integral kilocycle this would be all right. However, we don't operate that way and, since zero-beating the other fellow's carrier often makes the difference today between a QSO or no QSO, one of the crystal oscillators must be "rubbered" over a 1-kc. range. The exciter to be described has such a feature; it is possible to "dial up" the desired frequency by turning the crystal-selecting knobs, and finally to "zero in" on the other fellow by adjusting a knob driving a variable capacitor tuning over a 1000-cycle range.

Circuit System

I should say right here that this is not a construction article. The unit is not a device that can be built on the kitchen table in a few nights with hand tools. The fact that this exciter has 43 crystals, 15 tubes and some 54 tuned circuits, in addition to the power supply, will be sufficient to dampen a lot of enthusiasm for the idea. However, there has been evidence of general interest in reading about it, and I am sure there are still a few hams who like to design and construct who may get a few ideas from what follows.

This synthesizer can best be understood by referring to the block diagram, Fig. 1. This shows the various oscillators involved and their frequencies, and indicates how their outputs are

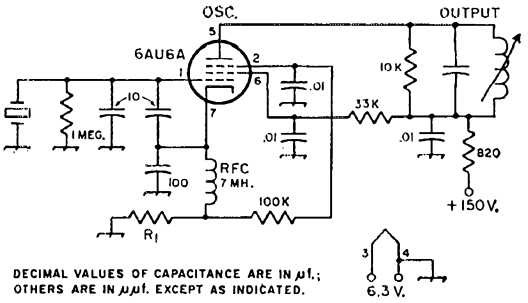


Fig. 2—Basic circuit used in all oscillators except the variable 1-kc. interpolator. Resistances are in ohms and resistors are ½ watt. Capacitors of less than 0.01 μf. are mica or stable ceramic; others are disk ceramic. R_1 is 3900 ohms for 1.7 and 2.9 Mc., and 1000 ohms for 3.6 Mc. Output circuit is tuned to desired frequency by adjustment of the inductor slug.

DECIMAL VALUES OF CAPACITANCE ARE IN μf.; OTHERS ARE IN μμf. EXCEPT AS INDICATED.

combined. Fig. 2 shows the basic crystal-oscillator circuit that is used for all oscillators except the one in the s.s.b. exciter, and the one whose frequency is varied. The circuit of the latter is shown in Fig. 3. The sideband exciter is the one designed by W6TEU and is described in *QST* for June, 1958 [1] and in the ARRL s.s.b. manual. With the particular surplus filter crystals I used, the s.s.b. output frequency turns out to be 2287 kc.

With reference to Fig. 1, V_3 is a crystal-controlled oscillator to which any one of ten crystals, spaced at intervals of 1 kc. in the range 1756 through 1765 kc., can be connected. V_5 is a similar oscillator to which a second group of ten crystals with spacings of 10 kc. in the range 2910 through 3000 kc. can be connected. The outputs of these two oscillators are mixed in the first mixer, V_4, in the plate circuit of which is T_6. This is a double-tuned overcoupled transformer passing a band of frequencies, the lowest of which is 1756 plus 2910, or 4666 kc., and the highest of which is 1765 plus 3000, or 4765 kc.

The triode half of V_1 (V_{1A}) is connected as in Fig. 3, and is crystal-controlled on 2592.5 kc. with C_1 at minimum capacitance. With C_1 at or near maximum, the frequency is reduced to 2592.0 kc. This frequency is doubled in the pentode half of V_1 (V_{1B}) so that varying C_1 over somewhat less than its full range results in a frequency change of from 5185 to 5184 kc. A double-tuned transformer, T_1, in the plate of V_{1B} attenuates all frequencies outside this range. The second mixer, V_2, mixes this frequency with the output from T_6.

In the plate of V_2 is a single circuit, T_4, tuned to accept any frequency between 9850 (5184 plus 4666) and 9950 (5185 plus 4765). In my chassis, T_4 is link-coupled to the single coil of T_5 for convenience only; these could just as well have been one double-tuned transformer.

V_6 is another crystal oscillator, and to this is connected the third series of ten crystals, this time with 100-kc. separation, from 3663 through 4563 kc. The reason for the odd frequencies will be apparent in a moment.

T_7 is another overcoupled double-tuned transformer but, because this pass band must be 900 kc. wide, trimming capacitors are switched in on both primary and secondary by switch wafers on the same switch shaft that selects the desired crystal. The outputs of T_7 and T_5 are now mixed in V_7, and T_8 in its plate circuit passes again a band of frequencies, the lowest of which is 5287 (9850 minus 4563), and the highest 6287 (9950 minus 3663). Note that the difference frequencies are used here.

Because the band is 1000-kc. wide at this point, T_8 and T_9 are also overcoupled and trimmed every 100 kc. by two other wafers on the 100-kc.-crystal switch shaft. Again, in my chassis, T_8 and T_9 are physically-separate single coils in two shield cans for convenience and to shorten the distance to the switch wafers. They are top-coupled by a small capacitance, and they could have been one double-tuned transformer.

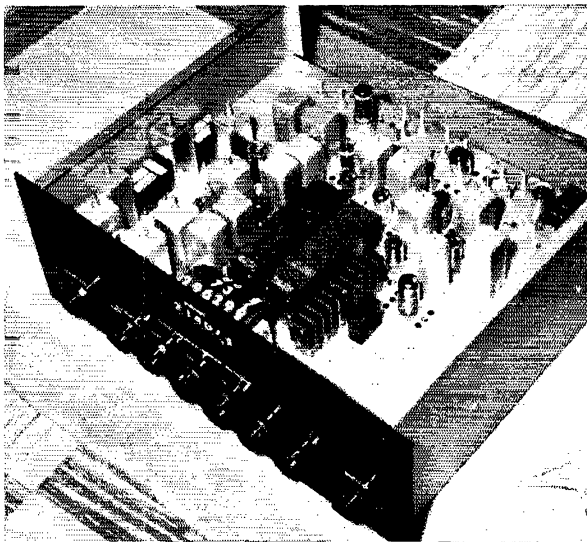
The time has now arrived to come out with the final desired frequency band. This is done by mixing, in V_8, any frequency in the band of 5287–6287 kc. with the s.s.b. output of 2287 kc. and — presto! — we have 3000 through 4000 kc.

The circuits of T_{10} and T_{11} are again individual tank circuits, overcoupled by a small top-coupling capacitance, and trimmed every 100 kc. by capacitors on two more switch wafers on the 100-kc. switch shaft. As indicated in the block diagram, this switch assembly has seven wafers including the crystal wafer.

Fig. 4 shows a sketch of the typical arrangement used for T_1, T_2, T_3, T_6 and T_7.

From here on, standard s.s.b. mixing techniques apply and, indeed, I was guided by Bigler's diagram in the above-mentioned article. The

[1] Bigler, "A Sideband Package," *QST*, June, 1958.



Drum dials operated by the crystal switches give a direct reading of frequency in the panel opening.

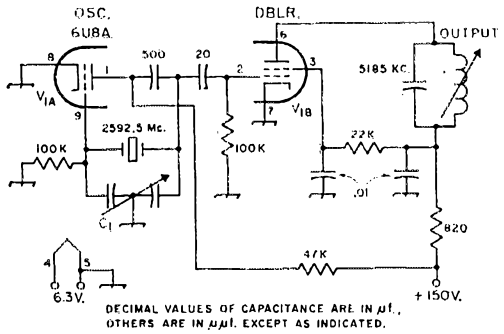


Fig. 3—Circuit of the interpolator which is variable over a 1-kc. range. The pentode section of the 6U8 is used as a doubler. Resistances are in ohms, and resistors are ½ watt. Fixed capacitors of less than 0.01 μf. are mica or stable ceramic; others are disk ceramic. C_1 is a dual variable capacitor of approximately 30 μμf. per section. The output-circuit components are selected to tune to the indicated frequency.

frequency in the 3000–4000-kc. range is always added to a new crystal frequency: the fundamental of 4.0 Mc. for the 7.0-Mc. band, the second harmonic of 5.5 Mc. for the 14.0-Mc. band, and the third harmonics of 6.0, 8.33 and 8.66 Mc. for the 21-, 28- and 29-Mc. bands, respectively. Another front panel knob, labeled "1000," selects these latter crystals, the multiplying tank, when required, and the proper plate tanks for the mixer, V_{10}, and the grid and plate of the linear amplifier, V_{11}, as well as the output lead. There are seven wafers on this shaft also. T_{12} and T_{13} are individually-tuned coils, two per band, over-coupled and loaded where necessary to achieve reasonably even output throughout the various bands. L_1 (one per band) is coupled over a 10-foot length of RG-58/U to a similar coil (also one per band) in the main transmitter, the two being again broad-banded.

Undesired Responses

One of the problems associated with any frequency-mixing scheme is the generation of unwanted frequencies. Because of the many oscillators and mixers in this exciter, I have used double-tuned circuits to couple from one section to another to avoid trouble. That is the main reason for the multiplicity of the *LC* combinations indicated on the block diagram.

Although 13 crystals sounds like an expensive proposition, they are surplus for the most part, ground and etched to the final frequencies by methods adequately described in *QST* articles. I tried to hold each individual crystal to within 50 cycles of its desired frequency in its own oscillator and, with care, this was not too difficult to do. As a standard I used a 100-kc. bar zeroed on WWV, driving a 10-kc. multivibrator, with an audio oscillator to interpolate between the 10-kc. harmonics.

Obviously, there is a wide variety of frequencies that could be used to produce the 3000- to 4000-kc. range; it is important to choose ones whose harmonics will not result in spurious beats. No trouble has been experienced in this connection, although I did have to eliminate stray coupling between the 100-kc. crystals and T_{10} and T_{11} to avoid spurious frequencies caused by the 100-kc. series directly.

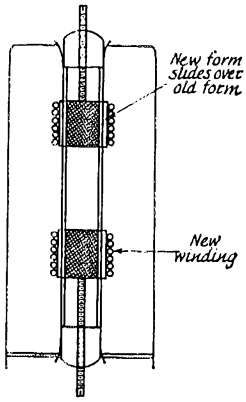
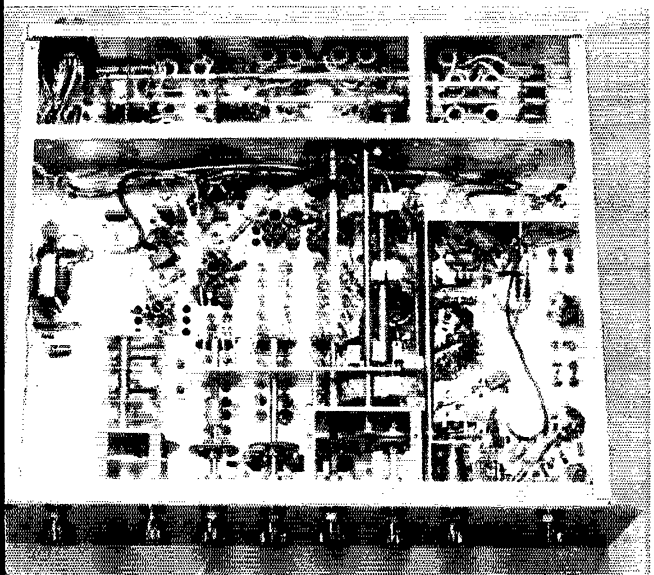


Fig. 4—Method of using old i. f. transformers for band-pass couplers.

With five knobs to select tenths, units, tens, hundreds and thousands of kilocycles, it was easy to arrange drums actuated by these knobs through dial cord for direct reading of the output frequency. This feature alone is most useful, since the reading can be relied upon over a long period of time. With each crystal accurate initially to 50 cycles, if all crystals used for a specific frequency happened to be off in the same direction, the output frequency could be as much as 300 or so cycles off the indicated frequency, so the last digit is not accurate, and is used mainly to "zero in" on another station. The other digits are accurate, however, and it is interesting to tune the receiver to some ham-band harmonic of the 10-kc. multivibrator, identify it, set the

(*Continued on page 158*)



Bottom view of the continuously variable crystal-controlled exciter.

Announcing 1962 ARRL Simulated Emergency Test

October 6-7, 1962

THERE have been some changes made. Both the American National Red Cross and the Office of Civil Defense are in the throes of vital reorganization. In fact, the throes have been so violent that we had a most difficult time locating our erstwhile contacts in Red Cross Telecommunications and OCD-RACES. Here, in brief, is what we found out.

The American National Red Cross Office of Telecommunications has vacated its offices in Richmond and moved to Washington, D. C., and is now called the Office of Communications and Reporting. Allen Richter, W4PHL, is no longer with ANRC, and our contact now is another old friend, Bob Myers, K4IAG, who is the Amateur Radio Coordinator for Disaster Communications, American National Red Cross, National Headquarters, Office of Communications and Reporting, Washington 6, D. C. There has been a cutback in Red Cross's private wire communications system, the whole thing now being taken over by A T & T and Western Union. Contrary to what we had been led to expect, this means more, not less, dependence on amateur radio. In this year's SET, the only station representing ANRC will be W4PAY, on the National Calling and Emergency Frequencies, and that's about it. Other stations previously active in the SET are now nearly inactive, and although they still exist, they may or may not obtain enough assistance from local amateurs to be active. We are going to have to depend largely on regular amateur routing all the way from Red Cross chapters to Washington.

Civil Defense is in somewhat the same situation. OCD Operational Headquarters has been moved to Washington, D. C. The Warning & Communications Division is still under A. P. Miller, with a reduced staff, and at the time of this writing there is no one coordinating RACES at federal level, although they are attempting to obtain someone to take on this responsibility. Leo, W8KA, who centralized RACES at Battle Creek, is now with another government agency and no longer connected with OCD, although he is still in contact until someone can be obtained. Meanwhile, regional OCD offices, themselves in a state of reorganizational flux, are bearing heavier responsibility for approval and implementation of RACES plans.

But, back to the SET. Despite the upheavals in Red Cross and federal c.d. circles, the SET will go on as usual. The above dates are optional, but we like to have as many AREC groups active as possible on the designated week end (it makes for a better public demonstration that way). Your individual participation, whether or not you are active or signed up in an AREC group, can take one or more of several different forms.

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

(1) Contact your local EC, if any, and offer your services in the SET. He will probably welcome your services, and maybe sign you up in the AREC. At the very least, he will be jogged to *do* something.

(2) Take part in all planning activities, whether or not they are a little inconvenient. Emergencies don't always lend time for specific planning, and this SET may be no exception; but some emergencies are predictable and can receive the benefit of at least limited planning.

(3) During the test, follow your EC's instructions. Don't foul up the procedure by being independent. Most ECs hold critiques after the SET, during which you will have ample opportunity to voice your viewpoints.

(4) Some ECs need a little push, but *all* of them need support. Talk things up at your club meetings and in local v.h.f. ragchews, and see that your EC has every reason to put on a good SET as a part of the national picture.

(5) Some of you will find yourselves in an area which is not particularly well organized AREC-wise. This need not deter you from participating. Monitor the National Calling and Emergency Frequencies (see box) from time to time, or on a regular schedule, to be ready to assist in the handling of any Red Cross, civil defense or ARRL traffic that might be flying around. Report into your local or section net, too, to offer your services.

This year there will be fewer Red Cross and c.d. stations available to take care of their own traffic, and the Red Cross collecting stations probably will not be active, except for W4PAY. Therefore, more traffic hounds will be required across the country to relay the traffic on the NCE Frequencies. More reliance will be placed on the individual amateur and amateur net than for many years. You can help us to meet this challenge by camping on the NCEFs at every opportunity and relaying traffic whenever you can. Don't forget, the NCEFs are for *calling and making contact only!* Once contact is made, move to another frequency to conduct your busines so the NCEF will be free for other calls.

Circle the dates October 6 & 7 on your calendar and make your plans to be with us. This is more important than the sweepstakes, the World Series, or your favorite ootball game. — *W1NJM.*

Strays

A famous moment in history recreated. K2ZSA held an antenna-raising party, furnishing the usual inducement plus clams and a barbecue. In the photo above left are WA2LEC, W2GKX, WB2ACN, and WA2FEK. The mast eventually reached the vertical, and was crowned with a 220-Mc. collinear . . . Above center, W1OGK (on the ladder) and K1TGR, "above and beyond the call of duty," repair the beams at K1EEG on a rainy day in June . . . At the right is WN9ALT, who tells us he is one of the great great grandsons of Samuel F. B. Morse. He says that his Novice ticket expired in August but that he will be back as a General just as soon as he licks that code problem!

Above left is W3GEG, a former ARRL Atlantic Division director, who has just returned from several years of special radio engineering work overseas. Clyde is not in the best of health, but operates as much as his strength will permit. He'd like to hear from old friends. Clyde Heck, W3GEG, 75 Edgewood Rd., Greenville, Pa. . . . Here's an all-ham family. L. to r.—VE3CEC, VE3CFN, VE3CKH, and VE3FEB. This reproduction doesn't do justice to the sparkle in their eyes! . . . K6DIB's daughter knitted these for him several years ago, and they're still going strong. Bet K6DIB keeps his feet up on the desk all day long when he's wearing these!

Recently these League and Navy officials got together in Washington to exchange ideas and viewpoints. L. to r.: LCDR Charles Winnette, USNR, recently designated Head, Naval Reserve and Amateur Radio Branch, Office of Naval Communications; John Huntoon, W1LVQ, General Manager, ARRL; Robert M. Booth, jr., W3PS, General Counsel, ARRL; Herbert Hoover, jr., W6ZH, President, ARRL; and Captain L. S. Schulz, USN, Deputy Director, Naval Communications. Since this meeting, Capt. Schulz has become a rear admiral and Deputy Director of the National Security Agency.

A Five-Element Two-Meter Beam for ~~$1.50~~ $1.49

This photograph shows the completed beam. Note the construction of the gusset plates that tie the complete assembly together.

An Easy-To-Build Antenna for the Newcomer

BY LEWIS G. McCOY* W1ICP

YES, the title of the article is correct. Here is a five-element beam that can be built for about $1.50, using readily available materials. However, to be perfectly honest, the cost is slightly greater when you add a feed line and a supporting mast. In addition to being inexpensive, the antenna is portable in the sense that it is easy to dismantle for use for mountain-top excursions for portable work.

The beam consists of a reflector, driven element, and three directors. This will provide 8 to 10 decibels gain over a dipole — a considerable increase in radiated signal strength at a very low cost. For the benefit of the Novice or Technician who is new to ham radio, let's explain antenna gain before describing the construction of the antenna.

Antenna Gain and the Decibel

Contrary to what many amateurs think, an antenna cannot act as an amplifier. In other words, if you feed a certain amount of power into an antenna you cannot expect to get more power out of the antenna than goes in. However, it is possible to construct an antenna so that a large portion of the energy is concentrated in one direction.

When we refer to antenna gain, it is customary to state the gain in decibels, abbreviated "db." The decibel is a unit for measuring power ratios and Fig. 1 is a chart showing the relation between

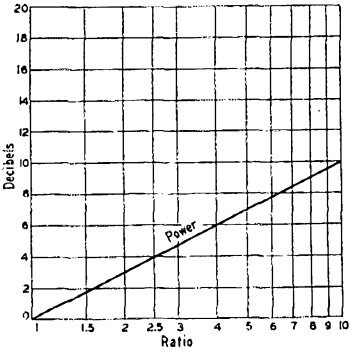


Fig. 1—Chart showing the relationship between decibels and power.

* Technical Assistant, *QST*.

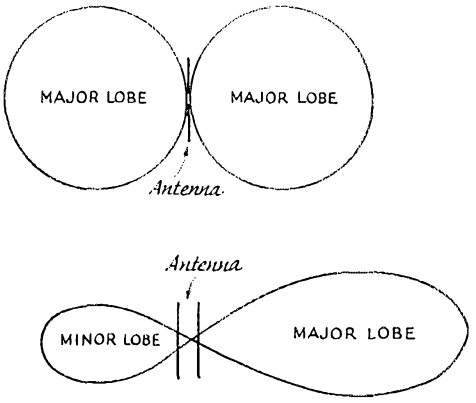


Fig. 2—At A, the pattern showing the major radiation lobes for a dipole antenna. At B, the effect of adding a parasitic element to the dipole is shown. These patterns are not true radiation patterns for such antennas but are shown to give the reader a general idea of the radiation characteristics.

power and decibels. For example, if you have a gain of 3 db., this translates to a power ratio of 2, or twice the power. A gain of 10 db. means a power ratio of 10.

It is customary to base gain figures on a comparison with a reference antenna. A half-wave dipole is used in ham radio as the reference antenna. In addition, it must always be assumed that the gain figures are based on the reference dipole being in the same location and height as the antenna being discussed.

As we said before, getting gain from an antenna simply means that we change the antenna physically so that there is more radiation in certain directions than in others. Let's assume we have a dipole on 2 meters. The general pattern for such an antenna is shown in Fig. 2A. Note that there are two major lobes broadside to the antenna axis and very little radiation from the ends of the antenna. Such an antenna could be called bidirectional because it radiates equally well in two directions. Now suppose we place another wire, slightly longer than the dipole, in the same plane as the antenna but spaced a certain distance from the dipole. This second, longer wire we'll call a "reflector." If we feed power to the dipole (we'll call this the "driven element"), the reflector will obtain power or be excited by the driven element. By using the proper spacing between the two elements we can cause the reflector to reduce the radiation in one direction but add to it in the other. Our antenna pattern would then look something like Fig. 2B. All we've done is shape the pattern by adding the reflector.

If we rotate this antenna we can beam the signal in whatever direction we choose. This gives us a stronger signal in the chosen direction and, just as important, the received signals will be stronger with the beam and we'll hear more.

The gain can be increased even more by putting additional elements in front of the driven element. These are called "directors." In the beam described here three directors are used.

Another important consideration in using a beam antenna is that it will provide a certain amount of signal rejection off the back of the antenna. The "front-to-back ratio" depends on the spacing of the elements, particularly on the reflector spacing. A beam such as the one described in this article will provide more than 20 db. front-to-back ratio. This is particularly useful in rejecting unwanted signals when receiving. It is suggested that the newcomer interested in more information on beam antennas study the chapters on the subject in the ARRL *Antenna Book*.[1]

Making the Beam

Fig. 3 shows a sketch of the beam. The boom consists of two 36-inch lengths of ¾-inch diameter wooden dowel rod, available at any lumberyard for 25 cents a length. Two wooden gusset plates are used to join the two rods together, making a total boom length of 72 inches. A third piece of dowel is used for the mast base.

The beam elements are made from aluminum "picket wire." This is ⅛-inch-diameter hardened wire, available from hardware or garden-supply stores, and it comes in 25-foot lengths for 75 cents. This particular type of aluminum wire is quite strong, and while it is easy to bend it will hold its shape under most conditions.

The first step in construction is to make the elements. The wire should be cut to the dimensions shown in Fig. 3. A little time and patience with the elements will result in perfectly straight wires. Placing the wire between two flat boards and rolling the top board back and forth several

[1] *The ARRL Antenna Book*, ninth edition.

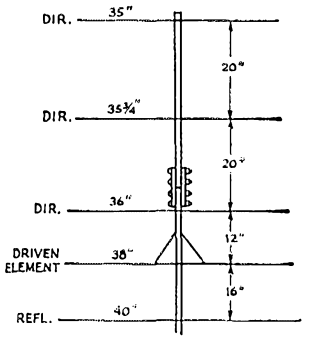


Fig. 3—Dimension details for the five-element beam.

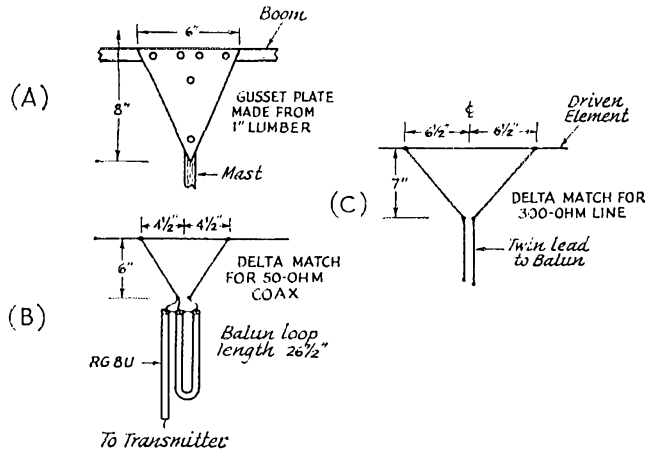


Fig. 4—Details for making the gusset plates are shown at A. B shows the delta and balun dimensions for coax feed. At C, the delta dimensions for 300-ohm feed are shown.

times will take most of the curl out, resulting in a straight element.

When the elements are completed, you are ready to mount them in the boom. All the holes for the elements are made with a ⅛-inch-diameter drill. Drill the reflector hole first and slide the element into the hole. In order to drill the other holes so that all the elements remain in line, you'll need a guide. The simplest method is to place the dowel on a table with the element extending over the end of the table. Place the dowel between two boards and line up the element so that it is straight up and down. Clamp or hold the dowel in this position and drill the remaining holes. Follow the same procedure with the other dowel rod.

The two boom rods and the mast section are secured by the gusset plates. Six ¼-inch-diameter bolts, 2½ inches long, are used to tie the assembly together. This is shown in Fig. 4 at A.

Feeding the Beam

The cheapest method of feeding the beam is with 300-ohm u.h.f. Twin-Lead. However, some hams prefer coaxial line and we'll show both methods. One important point, though: if you plan on having a long run of feed line, say over 50 feet, coax should not be used. The losses in coax are considerably higher than with Twin-Lead. In any event, if you choose coax, use the heavier RG-8/U or RG-11/U rather than the RG-58 or RG-59. The losses are considerably less with the larger types.

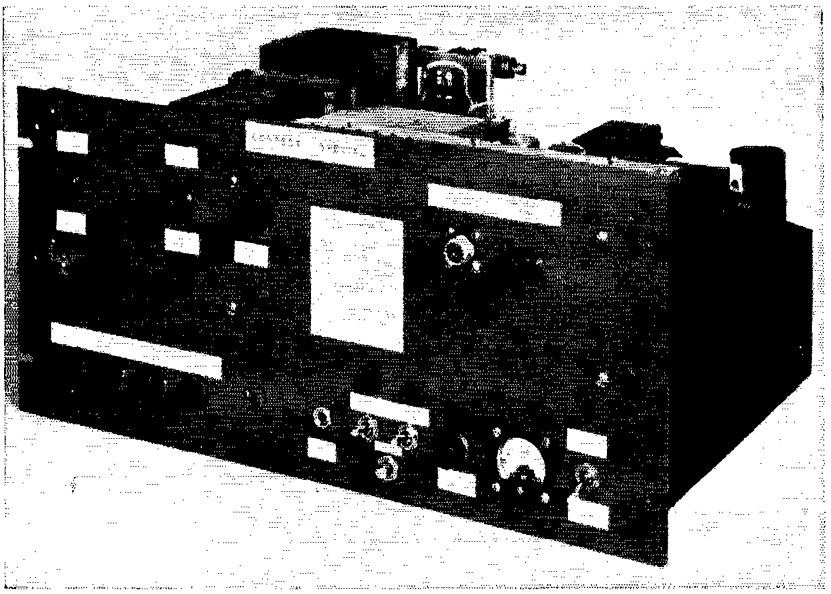
In both types of feed we use a delta match on the driven element. The delta matching system consists of fanning out the feeders where they are attached to the driven element. Fig. 4C shows the delta dimensions for 300-ohm feed. The wires for the delta can actually be the wires in the 300-ohm line. All you need do is skin back the wires of the Twin-Lead from the polyethylene insulation for a distance of 12 inches. Tape the Twin-Lead to the boom 7 inches from the driven element and then fan out the wires so that each wire can be attached to the element 6½ inches each side of center. Metal clips can be made up using a nut and screw to hold the delta wires to the element. Trim off any excess wire so that the delta wires are straight.

One more item, a balun, is required to complete the feed system. Nearly all transmitters these days use coax output, and the simplest method of getting from unbalanced to balanced is with a balun. A balun of the type described here permits you to go from balanced to unbalanced feed systems and also provides a 4-to-1 impedance ratio. If made from a length of RG-59/U (73 ohms), it will provide a step-up which is close enough to 300 ohms (Twin-Lead impedance) for our purpose.

In the event only a short run of feed line is needed to feed the beam, you may want to use coax. In this case the balun would be mounted at the boom immediately at the end of the delta. Fig. 4B shows the delta and balun dimensions for RG-8/U (52-ohm line). The balun dimensions for either the 52-ohm or 73-ohm line are the same. If the balun is to be used at the boom, or for that matter anywhere outside the shack, the ends of the coax should be taped to prevent moisture from getting into the coax.

The wooden mast section can be mounted inside one-inch diameter water pipe or in ¾-inch diameter electrician's thin-wall conduit. If you are in the bucks, you can install a TV rotator; if not, it can be turned by the "armstrong" method. A study of the radio catalogs will show there is a large variety of TV mounting hardware that can be used to install the beam.

For portable use it is just a matter of sliding the elements out of the boom, removing the two outside bolts in the gusset plate, and folding the boom together. This makes a compact package for transporting the beam. QST



Front view of the Contest Special 144-Mc. transmitter. All control functions are clearly marked, to assist operators not thoroughly familiar with the equipment.

The V.H.F. Contest Special

We like to think that many readers scan QST articles for ideas that can be applied to the solution to their particular problems, and that a constructional article need not necessarily describe equipment that will be widely duplicated in precise fashion. This is such an idea presentation. Even if you never expect to haul a complete 120-watt 2-meter station out to a mountain top for a week end of v.h.f. contest operating, we think you'll find this design worth studying. The transmitter described has been a principal factor in the success of one of the West's outstanding v.h.f. contest stations.

A 120-Watt 144-Mc. Transmitter, Complete in One Package

BY H. M. MEYER, JR.,* W6GGV

THE grand art of v.h.f. mountain-topping has come a long way from the days of the superregenerative receiver and the modulated oscillator. It is not unusual now for a group of 10 to 20 v.h.f. enthusiasts to assemble a ton or so of gear, plus a 5- to 10-kw. generator, and head for the hills at V.H.F. Party time. Equipment and operating techniques have become quite sophisticated, and a good deal of advance planning is required by any group contemplating a successful expedition.

The Contest Special is a 2-meter transmitter designed and built especially for this work. It has been used on several v.h.f. contest expeditions, and has performed well. It is a complete unit on one chassis, requiring only a power source and antenna to be ready for use. The intent of this article is not to give complete construction details, but rather to point out those elements that were considered in the design decisions that yielded the finished product.

A great deal of thought went into the basic design, to fit the following requirements, arrived at after participating in several contest expeditions, both alone and with large groups. The transmitter should be in the medium-power class, not greater than 200 watts, operating with good efficiency. If you go to all the trouble of packing yourself and gear to some remote hill, take along something that can be heard over the expected din. Its signal should be well modulated. If you have lots of carrier and the other fellow can't hear what you say, you might better operate c.w. The transmitter should be rugged and reliable; well capable of taking the beating of transport over rough mountain roads, without requiring extensive repairs and adjustment before it can be

*2435 Parker Court, Mt. View, Calif.

put into operation. The package should be one unit, to minimize work at setup time. One man should be able to haul it around. This implies a weight maximum of about 60 to 80 pounds.

The following operating conveniences were deemed desirable: (1) A.m. or c.w. at the flick of a switch. (2) Monitoring of the a.c. line voltage. (3) Spotting switch. (4) Crystal switch. (5) Coaxial antenna relay. (6) Monitoring and control of output power. (7) Single central metering circuit. (8) Reasonable r.f. shielding. (9) Front-panel access to all major controls.

The transmitter is shown in block-diagram form in Fig. 1. Exact duplication is not considered likely, as each builder will think of changes to suit his particular needs. This is not a simple project that can be completed in a few hours; however, the satisfaction derived from the results has been more than worth the considerable time required to complete the unit.

The entire transmitter, with power supplies, modulator and all operating accessories other than microphone, key and antenna, is built on a 13 × 17 × 3-inch chassis, with an 8¾-inch rack panel. Some surplus items were used in the construction, but in each case adequate room was left for replacement by standard commercially available items, in the event of component failure. Minor modifications were made as a result of two expeditions, and I'm sure that others will be made in the future.

R.F. Section

The r.f. portion of the transmitter occupies only the front 3½ inches of the chassis. The low-level portion is mostly below the chassis. The tubes, crystals and 6146 plate circuit are visible at the left side of the top view, as seen from the front. The amplifier occupies the right two-thirds of the r.f. section, and is enclosed in a shield. The shield in the bottom view encloses the low-level circuitry and the final-amplifier grid circuit. The complete r.f. schematic is given in Fig. 2.

The frequency control section is a bit unusual, in that two crystal oscillators are employed. Originally it was intended to use only FT-243 surplus-type crystals, in the 8-Mc. range. After the transmitter was completed in this form, a separate crystal oscillator and buffer for use with precision crystals in an oven was added for band-edge c.w. work The 6BH6 oscillator and 6J6 buffer so used can be seen mounted on the back wall of the r f. shield, in the bottom view. This circuit minimizes crystal current, and reflects the necessary capacitance for accurate determination of the crystal frequency. The crystal oven circuit provides an operating convenience as a by-product: an accurate reference point for calibration of the receiver.

The normal crystal oscillator, a 6CL6, also functions as a tripler to 24 Mc., driving a 5763 tripler to 72 Mc. This drives a 6146 doubler, which drives the final 5894 amplifier. Drive levels to the final amplifier and doubler are controlled by varying the screen voltage on the 6146 and 5763, respectively. Power input to the final amplifier is also controlled by a screen potentiometer.

A keying relay breaks the screen voltage to both the 6146 and 5894 for c.w. operation. When the contacts open the screen is allowed to go negative, as the screen potentiometers are returned to minus 12 volts d.c. Several schemes were tried using an a.c. keying relay, but it was finally decided to use a d.c. relay and incorporate a small bridge-rectifier circuit to provide the relay voltage. The oscillator and 5763 run continuously in the c.w. transmitting position, but with the driver

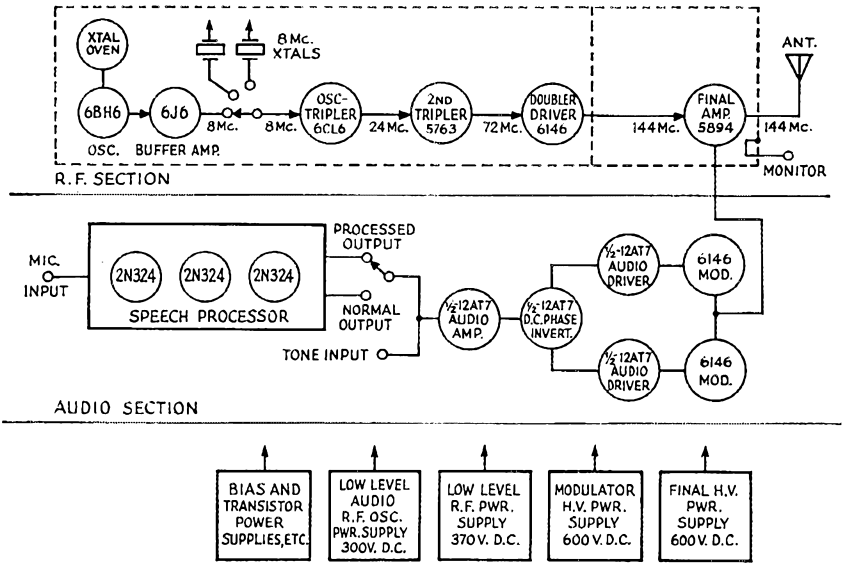


Fig. 1—Block diagram of the 144-Mc. Contest Special. Dashed lines indicate shielding of the r.f. portion of the transmitter.

L_1—8 turns No. 20, ¾-inch diam., ½ inch long.
L_2—3 turns No. 18, ½-inch diam., ⅝-inch long.
L_3—2½ turns No. 12, ⅝-inch diam., spaced ¼ inch.
L_4—1 turn, inner conductor of RG-58/U around end of L_3 away from plate.
L_5—1 turn, inner conductor of RG-58/U around L_6 at center.
L_6—3 turns No. 12, ½-inch diam., ½ inch long.
L_7—Silver-plated copper or brass tubing, ½-inch diam., 7 inches long, spaced 2 inches center to center. Connecting strips of flexible silver-plated stock ½ inch wide and 2½ inches long, are used from line to capacitor stators.
L_8—Loop of No. 12 wire coupled to L_7. See top view.
L_9—4 turns No. 18, ⅜-inch diam.
Series trap—6 turns No. 18, ½-inch diam., spaced wire diam., tuned with 7–45-$\mu\mu$f. ceramic trimmer.

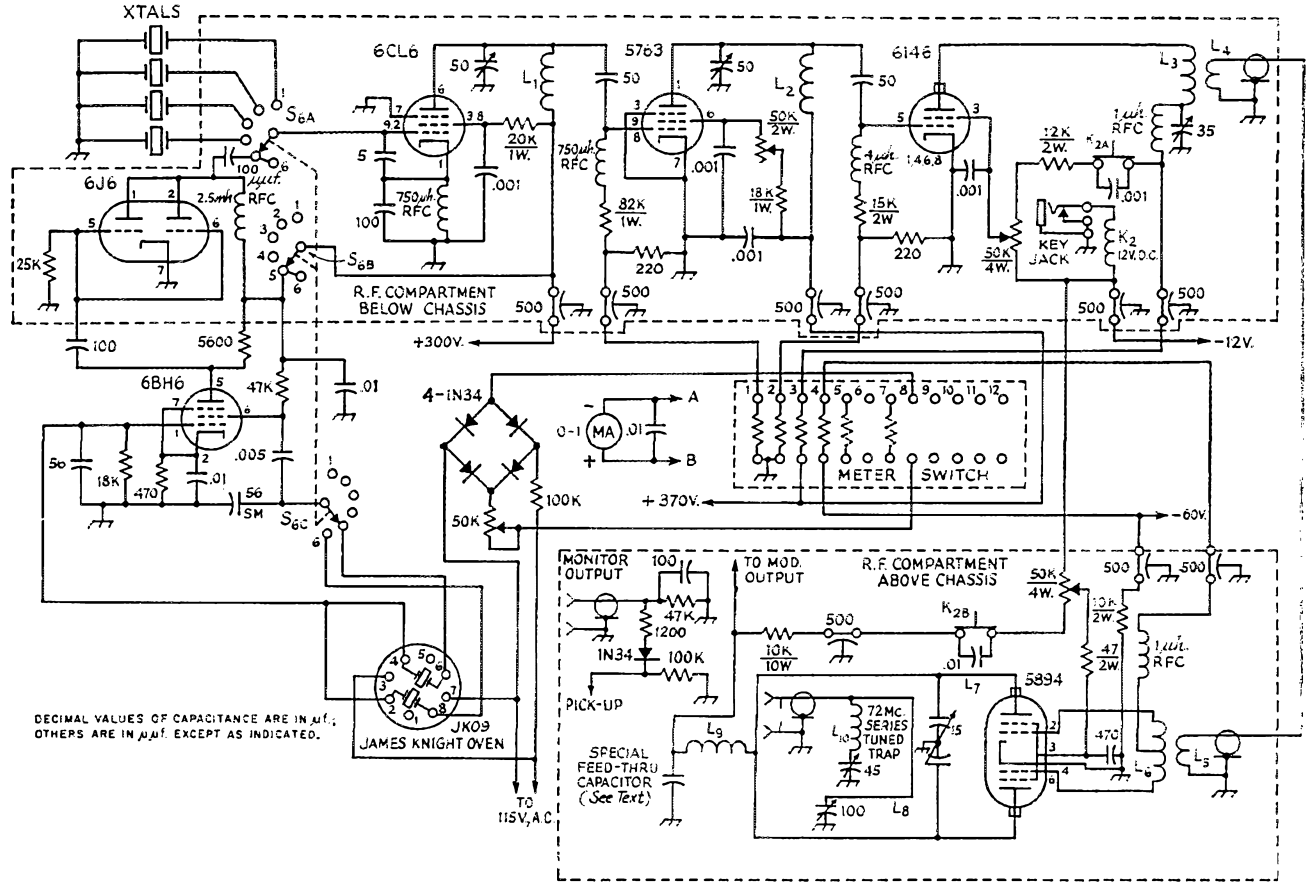
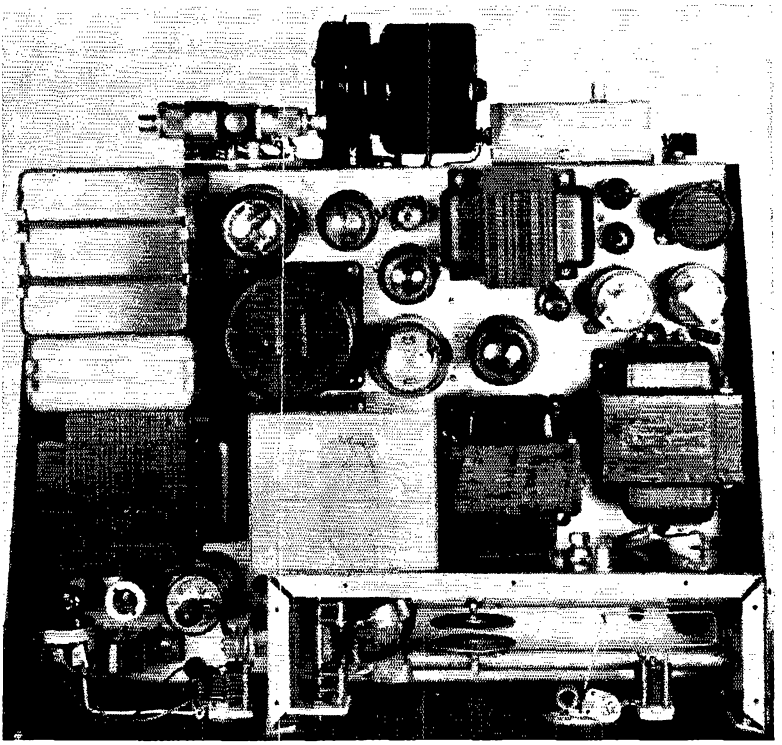


Fig. 2—Schematic diagram of the r.f. portion of the Contest Special. Insofar as possible, parts information has been included in the drawing. Resistors are ½ watt unless specified. SM indicates silver mica.



Top view of the 2-meter transmitter. The r.f. portion occupies only the forward 3½ inches of the chassis. The modulator is at the right, power supplies at the left. The small shield on the rear wall houses the transistor speech-processing unit.

and final both keyed, no difficulty with excessive backwave has been encountered. Leaving the first stages running virtually eliminates keying chirp.

The 6146 plate circuit uses an old v.h.f. dodge often employed when the designer is faced with high tube output capacitance. The plate coil, L_3, outwardly appears to be series-tuned, but it is essentially a single-ended circuit tuned by two capacitors in series, one of them (the tube output capacitance) being fixed. This is an effective way to increase the inductance of the tank and provide more efficient transfer of energy to the succeeding stage or load. The 5894 grid circuit is resonated by the tube input capacitance at the desired frequency by adjusting the turn spacing of L_6. No difficulty with drive has been experienced up to 147 Mc., though it does fall off at the high end.

The final tank was salvaged from a surplus radar tuning unit. The tuning capacitor is an old Cardwell split-stator type intended for v.h.f. service, with rather large spacing and low tuning range. Its capacitance was not quite enough to resonate the plate circuit at 144 Mc., so disk capacitors from the radar unit were added. These could be omitted if a split-stator capacitor of 15 to 20 $\mu\mu$f. per section is used. Plate spacing should be 0.07 inch or more.

The output coupling loop, L_8, is visible in the top view. Its dimensions are not critical, but it should be of such length that it resonates with approximately 25-$\mu\mu$f. tuning capacitance, if the transmitter is to work into a 50-ohm load. The end rotor plate of the series capacitor may be

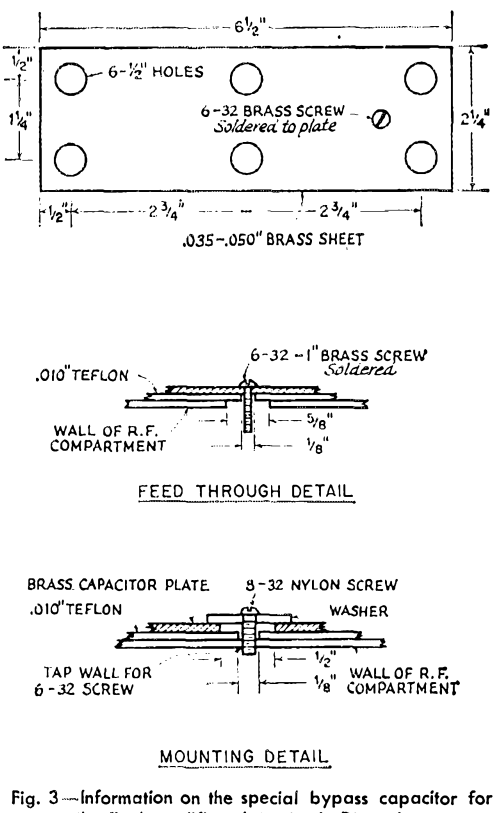


Fig. 3—Information on the special bypass capacitor for the final amplifier plate circuit. Dimensions given provide about 625 $\mu\mu$f.

bent so that it shorts out the capacitor at maximum setting, for use where the reactance presented by the load is very low. A 72-Mc. series trap is connected from the coaxial output fitting to ground. This was installed to clear up a very slight pattern noticed on the home TV receiver on Channel 4.

Modulated high voltage is fed into the tank compartment via a homemade feed-through capacitor mounted on the rear wall of the r.f. compartment shield. Details of this capacitor are shown in Fig. 3. It is extremely important that the high-voltage line be at r.f. ground potential at this point, particularly when the stage is modulated. Great difficulty with r.f. feedback was experienced when using conventional bypasses, and commercially available feed-through designs are marginal for the voltage requirements.

Instability problems in the final circuit were eliminated by paying particular attention to mechanical symmetry, and by using a final tube socket that did not have built-in screen bypassing. For some reason, the 5894 did not like to operate as a straight-through amplifier in a socket with the built-in capacitors, a trait that caused the author three weeks of grief before it was discovered!

A monitor circuit was constructed as an integral part of the final and proved very useful in adjustment of the modulation level, as well as providing a convenient means of monitoring performance.

Modulator

The modulator section occupies the right rear portion of the chassis, as viewed from the front, top. A small box on the rear wall of the chassis houses the transistor speech processor unit. Orig-

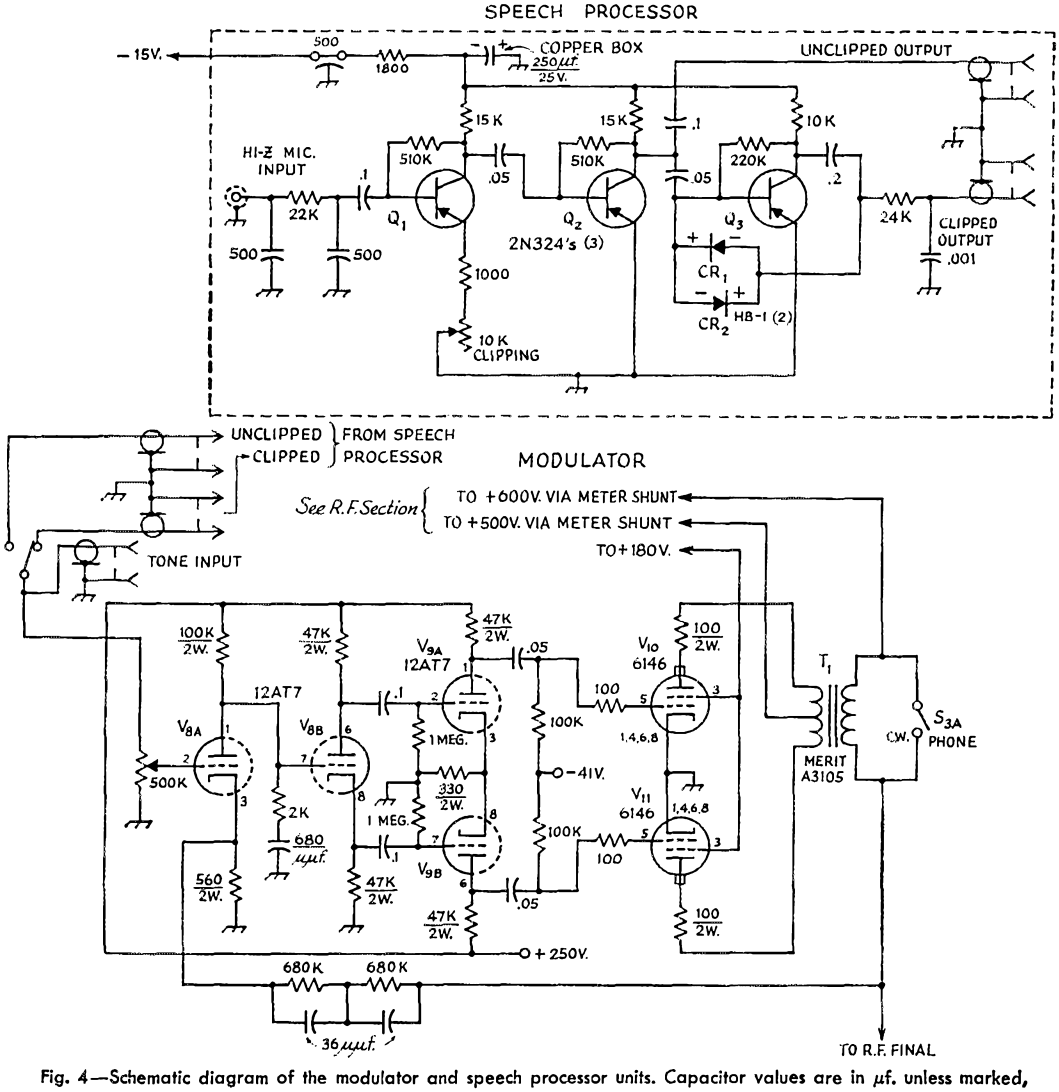
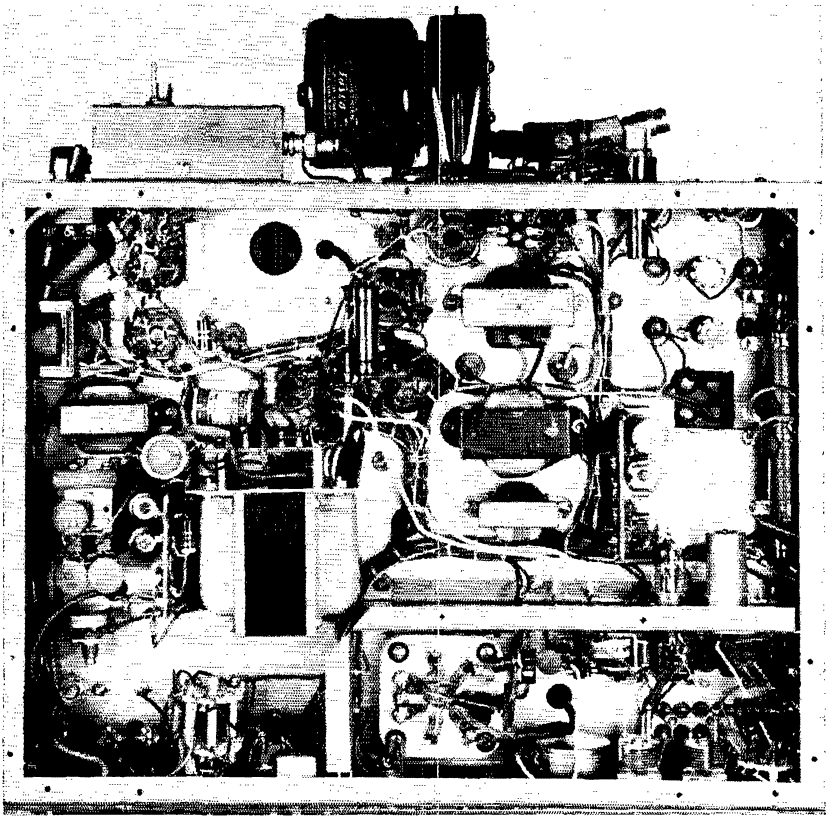


Fig. 4—Schematic diagram of the modulator and speech processor units. Capacitor values are in μf. unless marked, resistors ½ watt unless specified.



Looking into the bottom of the transmitter, the low-level stages and amplifier grid circuit are seen at the front right. The modulator circuits are at the left, and power-supply components at the right.

inally, this was mounted under the chassis, but the temperature rise with the bottom plate attached degraded the transistors' performance to such an extent that the unit had to be moved outside. No damage was done to the transistors, and the original ones are still in use, even though the temperature was high enough to cause complete malfunction. No difficulty has been experienced with the unit mounted as shown, even with he equipment operating in full sun, with the temperature over 90 degrees.

The processor limits the speech range to approximately 500 to 3500 cycles. It also clips the sine waves, making them more nearly rounded-top square waves. The heart of the clipping and shaping circuit is the HB-1 silicon diodes. These are inexpensive, and it is strongly recommended that no substitutions be made if good performance is desired. Clipping level is controlled by changing the gain of the first preamplifier, and clipping up to 20 db. may be inserted in the system. For maximum benefit from the speech-processing feature, a noise-cancelling microphone should be used, though a conventional microphone will work satisfactorily. An essential point to be made here: Do not expect the audio to sound like a broadcast station, or you will be greatly disappointed. The basic purpose is to be heard and understood, not to sound like a hi-fi set! For normal local operation, the unclipped output can be used to drive the amplifier for more pleasant-sounding audio. The processor increases the average power of the audio in the sidebands, and gives the transmitted signal the desired punch.

The speech amplifier and modulator are fairly straightforward, except that great care was taken to provide good low- and high-frequency characteristics. Since the processor produces essentially a square wave with rounded tops, the amplifier requires more bandwidth. It is important that the feedback line be shielded to prevent stray pickup, and that the feedback network itself be soldered directly to the cathode of the 12AT7 first amplifier, V_{8A}.

If you want lots of audio, don't skimp on the separate power supply for the 6146 modulators, or the VR tubes that keep the screen voltage constant. If the high voltage on the modulators is increased to 600, increase the bias to minus 45 volts. It was originally planned to run the modulator this way, but a suitable transformer was not readily available. The output filter capacitors on the final high-voltage supply should be as large as possible, for good audio. Two Pyranol units were paralleled, to bring the output capacitance to 15 μf. Either the Merit A-3105 modulation transformer or the equivalent Stancor unit can be used

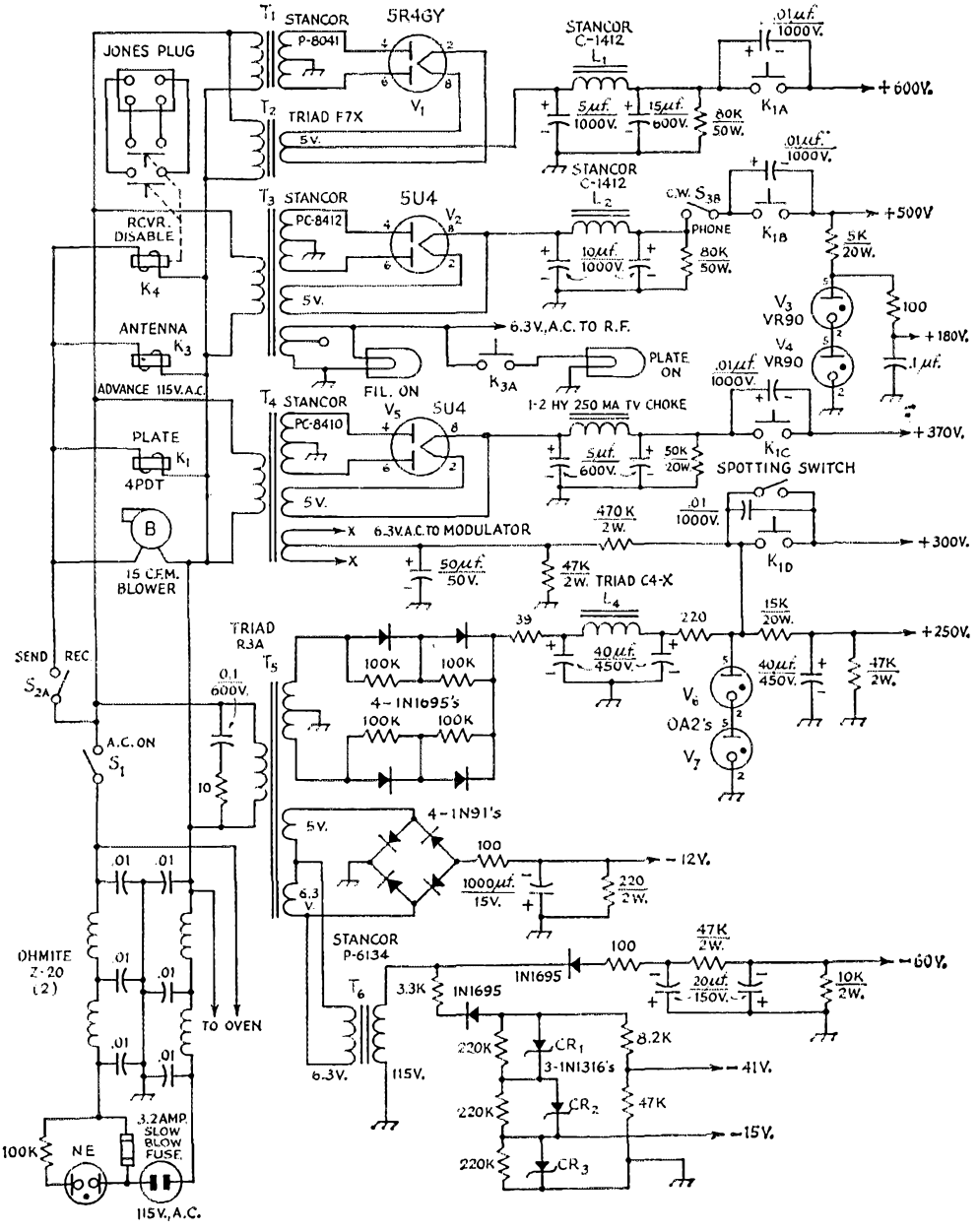


Fig. 5—Complete power-supply diagram for the 144-Mc. transmitter. Capacitors with polarity marked are electrolytic; values in μf. throughout. Resistors ½ watt unless specified.

with the specified feedback network. Different networks may be required with other transformers.

This modulator system delivers more effective audio than many other arrangements tried, and it is well worth the extra cost and effort. Credit for most of the audio design work belongs to Bud Rorden of Stanford Research Institute, and Don Cone, K6SKU.

Power Supplies

The power supplies make extensive use of diodes, for space and weight economy. Zener diodes used to regulate the bias for the modulator and the voltage for the speech processor could be eliminated by regulating the bias-supply voltage with a VR tube. One rectifier tube was eliminated by using four 1N1695 diodes in the 250-volt supply. The diode-protection circuit in the primary of this

supply limits transient peaks to a safe value. Do not try to do without it. The 100,000-ohm resistors in parallel with the diodes are another safety measure, to equalize the voltage across each diode.

The high voltage for all circuits is switched by relay contacts that are inserted following the filter sections, rather than in the center taps of the transformers. This was done to reduce hot switching transients and increase reliability. Since this is a contest unit, the transmit-receive switching service will be heavy and any reasonable technique should be used that will lessen the possibility of break-downs. Generous use of small relays was made primarily as a convenience in switching auxiliary equipment and control circuits. Specific details are left to the particular needs of the constructor.

Testing and Use

Detailed adjustment procedures are not described, since an exact duplication of the entire setup is not anticipated. Testing and adjustment are straightforward, and should not cause the experienced v.h.f. man any great trouble. Ease of putting the equipment into use can be enhanced greatly by systematic pretesting small blocks of circuitry during the construction process. Nothing can be more frustrating than turning on the main switch controlling several circuits, and finding that nothing works. If the component parts have not been checked out in advance, you will not have the faintest idea of where to look for trouble.

But when you have built equipment of this kind, gotten it working properly, and then used it in the heat of a v.h.f. contest, we think you will feel that it was all worth the effort. It will help you to carve yourself a niche in the band at a spot of your own choosing, and other contestants will find it expedient to give you elbow room.

QST

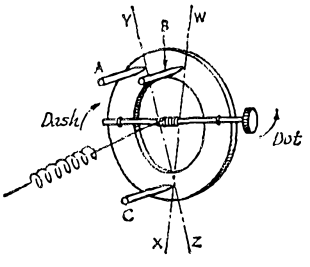
• *New Apparatus*

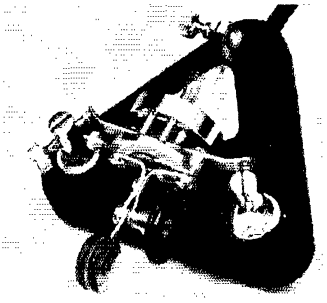
New Key Mechanism for Electronic Keyers

THE key shown in the accompanying photograph is of unusual design, based on using pivots rather than conventional bearings for precise and frictionless movement. The heart of the mechanism is a metal ring, as shown in the sketch, held against three pivot points by the tension of a coil spring. Although not shown in the sketch, the contact arm and operating arm are also mounted on the ring. Pressure in one direction on the paddle causes the assembly to rock on one pair of pivots, such as A and C, along their axis, YZ, while the ring moves away from the third pivot, B. Pressure in the opposite direction causes the ring to pivot on B and C along axis WX, with the ring moving away from A. In the actual construction, the ring is supported entirely by the pivots, which fit into the usual cup bearings.

The movable contacts are at the ends of a cross arm mounted on the ring. The fixed contacts are on screws which thread into split mounting posts. An Allen-head screw is used for tightening each post against its contact screw — a much more positive way of locking the contact than the knurled stop nut that has been traditional for generations in key construction.

The "weight" of the action can be adjusted by changing the tension of the coil spring shown in the sketch. The end of the spring is fastened to a fine steel wire which can be wound up on an adjusting screw to vary the tension. There is also a "ratio" adjustment, by means of which the spring loading can be made lighter on the dash side than on the dot side, and vice versa. The principle is simple — turning the thumbscrew shown in the sketch moves the hook on the spring back and forth along the cross rod to vary the point





at which the spring force is applied, thus throwing it to one side or the other of center.

Another useful feature is the height adjustment on the paddle arm. The paddle can be swung up or down by loosening the screw holding the side knob, which can be used for operating the device as a simple hand key.

The FYO key is constructed on a heavy cast-iron base with rubber feet. The operating mechanism is finished in contrasting bright and satin chrome, and gives an impression of precise attention to detail in construction and finish. The contacts are of "fine" silver. The key is made by J. A. Hills, W8FYO, 8165 Inwood Ave., Dayton 15, Ohio.

— *E. L. C.*

Strays

FM Nets, a directory of fixed-frequency, wideband, f.m. nets may be obtained by sending an s.a.s.e. to T. A. McKee, K4ZAD, 1306 Grove Rd. Most of these nets are using modified surplus taxi and police gear and the frequencies 52.525 and 146.94 Mc.

—•••—

K1AZD parked his car briefly in Skowhegan while vacationing in Maine and returned to it to find the local fire department at the scene. The crisis was over, however, as WV2VHH, also vacationing in Maine, had happened by and, spotting smoke pouring from the car, had disconnected the storage battery (the difficulty lay in a short in K1AZD's mobile rig).

Some Thoughts on Power Supplies

Beneficial Uses of Reactance

BY G. FRANKLIN MONTGOMERY,* W3FQB

Some interesting and unusual variations in conventional half-wave, voltage-doubling and bridge rectifier-filter circuits result in more efficient operation and better voltage regulation.

To most amateurs, an a.c. power supply is a technical trifle. Having decided on a particular output voltage and current, we build the supply almost without additional thought. Not much is needed; most of our supplies are based on a few conventional designs that nearly always give satisfactory results. But it sometimes pays to think about suiting the power supply to its job. Grammer,[1] for example, managed to cut costs (but not performance) by taking advantage of the fact that power-transformer losses are distributed one way in amateur practice and another way in the continuous service for which the transformer is usually rated. Feeding both high-voltage and low-voltage rectifiers from a single transformer winding [1,2] is another scheme that deserves more use. The idea of this article is to bring several additional circuit innovations to the attention of amateurs who build their own equipment.

Shunt-Regulated Supplies

Shunt voltage regulation is often used in small power supplies for receivers or low-power transmitter stages. One of the oldest methods is shown in Fig. 1. The output of a conventional rectifier is fed through a dropping resistor R_D to a regulator tube VR in parallel with the load. (A semiconductor breakdown diode, or Zener diode, can replace the VR tube. A vacuum-tube shunt regulator is also possible.) Part of the rectified current is passed by the gas-filled regulator and, as long as the gas is continuously ionized, the load voltage is nearly constant and independent of changes in line voltage or load current. The average output voltage of the rectifier must be greater, of course, than the regulator voltage. Calculating a suitable resistance for R_D follows a procedure given in the ARRL *Handbook*.

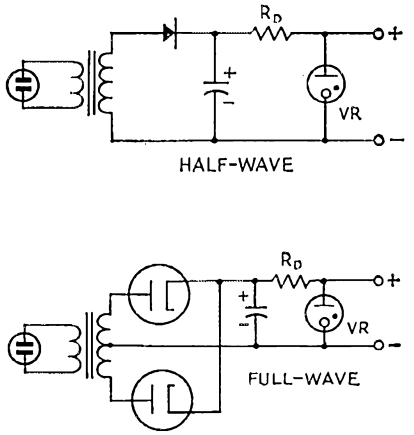


Fig. 1—Conventional power-supply circuits using VR-tube regulation.

A small but worthwhile improvement can be made immediately in these circuits. Resistor R_D is split into two equal parts, as shown in Fig. 2. For a given output current, both the peak rectifier current and the output ripple voltage are less than before. If the capacitor should short-circuit, the first of the two resistors may go up in smoke, but there is now a good chance that the rectifier will survive — a chance that is minimal in the circuits of Fig. 1.

In all of these circuits, resistor R_D is an irksome necessity. Essentially, we start with a power supply whose load-voltage regulation is reasonably good, ruin the regulation with a series resistor, and then restore it by adding the shunt regulator. The resistor is a source of inefficiency and unwanted heat. There ought to be another way.

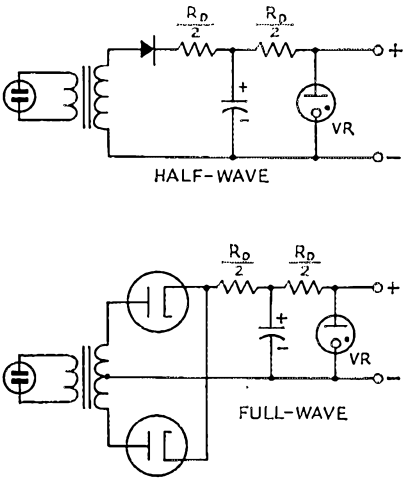


Fig. 2—Dividing the VR-tube dropping resistor into two sections as shown improves filtering, reduces peak rectifier current, and provides a certain amount of overload protection for the rectifiers.

*517 23rd St. N.W., Washington 7, D. C.

[1] Grammer, "More Effective Utilization of the Small Power Transformer," *QST*, November, 1952.

[2] McCoy, "Plate Modulation for the TV-Set/Surplus Transmitter," *QST*, July, 1961.

Promoting Efficiency

One other way is shown in Fig. 3. This circuit is a conventional half-wave shunt rectifier, with an important difference. Suppose the input capacitance C is made intentionally small. The alternating current passed by C is determined by its capacitance, by the transformer voltage (and frequency), and by the resistance of the load. Consequently, we can specify C so that the rectified current available for the shunt regulator and load is limited to any value we choose. No power is dissipated in C. Neglecting the small losses in the resistances of the transformer, rectifier, and choke, the only power absorbed from the line is the power delivered to the load, the regulator, and R_D. Resistance R_D now needs to be only large enough to suppress relaxation oscillations of the VR tube.[3] If C is chosen to limit the current to a value safe for the rectifier, we can short-circuit the output terminals indefinitely without damage to either the power-supply components or the line fuses. Try that on your present equipment!

The inductance L of the filter choke is assumed to be very large. An inductance of 10 henrys or greater is satisfactory for most applications; in any case, an inductance small enough to resonate with capacitance C at the line frequency should be avoided.

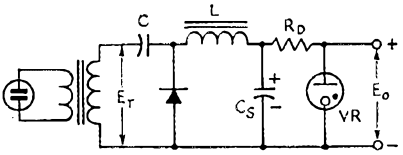


Fig. 3—Shunt rectifier circuit. By proper selection of a value for C, the output terminals may be shorted without damage to components.

The circuit of Fig. 4 is a useful variation; it is a conventional voltage doubler except that once again the input capacitance C is intentionally limited. In this case, the filter capacitance C_S must be as large as possible, because it assumes the full burden of smoothing the ripple in the rectifier output. A second choke-capacitor filter section can be added to relax the requirement on C_S. With C chosen to safely limit the rectifier currents, the output of this supply can also be short-circuited without damage.

The circuits of Figs. 3 and 4 use half-wave rectifiers exclusively. (A voltage doubler, however its circuit may be drawn, is fundamentally two half-wave rectifiers with their d.c. loads connected in series.) An especially attractive full-wave circuit is shown in Fig. 5, in which capacitor C limits the current to the bridge rectifier. Full-wave rectification allows the output ripple to be smoothed more easily. In addition, this circuit can be designed so that its short-circuit output

[3] Tube types 0A3, 0C3, etc., display a negative incremental resistance at currents below approximately 10 milliamperes. An R_D of 500 to 1000 ohms is usually sufficient to maintain a net positive resistance in shunt with the filter capacitor C_S. The same resistor also limits the surge current through VR when the tube first ignites.

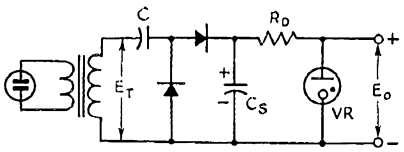


Fig. 4—Capacitor limiting applied to a voltage-doubler circuit.

current is only moderately greater than the maximum current at full load voltage. Inductance L in Fig. 5 is assumed to be greater than the *critical inductance* discussed in the power-supply chapter of the ARRL *Handbook*.

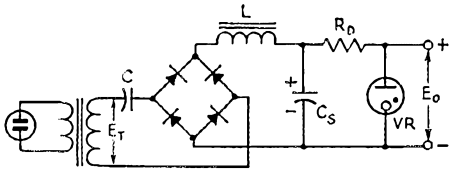


Fig. 5—Capacitor limiting applied to a bridge rectifier circuit.

Designing for Shunt Regulation

It is easy to determine the input capacitance C for these circuits. With the regulator removed, the output voltage varies with output current in the manner shown by the dashed curves [4] in Fig. 6. When the regulator is added, the *load* voltage and *load* current behave as shown by the solid lines in the figure. We could establish the regulated load voltage at any point on the dashed curves, but it is particularly convenient to choose, as a guide, the point specified by the formulas that follow. This point represents the maximum output power of the supply for a given value of C. Choosing it ensures that for any load current greater than the specified load current, the power absorbed by the load will be *less* than the power delivered just before the voltage regulation fails.

The transformer voltage E_T and the input capacitance C that determine this maximum-power condition are given in Table I for each of the three rectifier circuits, assuming a line frequency of 60 c.p.s. The first step is to choose the regulated load voltage E_0 and the maximum load current I_0 that will be drawn at E_0. Knowing E_0, we can then calculate from the table what E_T should be. And knowing E_0 and I_0 allows us to calculate C.

Example: I want a v.h.f.-converter power supply to deliver a maximum of 30 ma. at 105 volts. I plan to use the voltage-doubler circuit of Fig. 4 with a 105-volt VR tube (0C3). Then $E_0 = 105$, $I_0 = 30$. From the second line of the table, the required r.m.s. transformer voltage is

$$E_T = (0.7)\,(105) = 74 \text{ volts},$$

and the input capacitance is

$$C = (16)\,(30)/(105) = 4.6\ \mu\text{f}.$$

These values would be nearly optimum, but the

[4] Montgomery, "Current-Limited Rectifiers," *Proceedings of the IRE*, February, 1962. Quantitative curves are given that permit any desired variation in design.

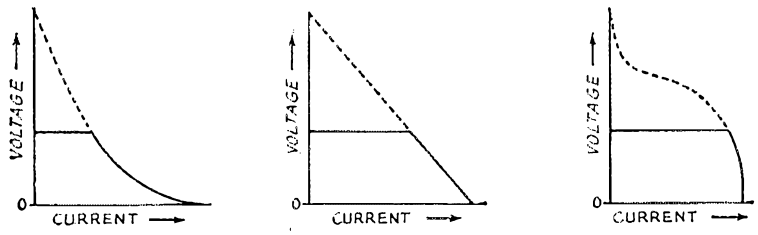


Fig. 6—Typical output-voltage curves for three types of rectifier circuit with capacitor limiting. Dashed lines indicate how the voltage soars at small load currents in the absence of a regulator. The solid lines indicate the performance with VR-tube regulation. The abrupt drop at the high-current ends of the curves indicates that the regulating capability of the VR tube has been exceeded.

closest transformer I have is one with a 125-volt secondary. Now, it is not necessary to adhere slavishly to the formulas. If the product of transformer voltage and input capacitance is maintained constant, the short-circuit load current does not change. A 3-μf. capacitor will therefore be more suitable with the 125-volt transformer than would the 4.6 μf. calculated for the lower voltage.

The complete diagram of the supply is shown in Fig. 7; its load characteristic is shown in Fig. 8. The jump in output voltage above the 30-ma. point is caused by deionization of the VR tube. With the 1000-ohm series resistor, however, this jump is smooth and retraceable, and no VR-tube oscillation occurs.

TABLE I

(For 60 c.p.s. source frequency)

Circuit	E_T (volts r.m.s.)	C (μf.)
Half-wave (Fig. 3)	1.6 E_0 (volts)	$\frac{3.9\ I_0\ \text{(ma.)}}{E_0\ \text{(volts)}}$
Voltage-doubler (Fig. 4)	0.7 E_0 (volts)	$\frac{16\ I_0\ \text{(ma.)}}{E_0\ \text{(volts)}}$
Bridge (Fig. 5)	1.6 E_0 (volts)	$\frac{2.7\ I_0\ \text{(ma.)}}{E_0\ \text{(volts)}}$

The Capacitors

The input capacitor for all of these circuits must be nonpolarized. The bridge rectifier, and the half-wave rectifiers when delivering large currents, operate in such a way that the input capacitor is charged positively during one part of the a.c. cycle and negatively during the rest. Consequently, a polarized electrolytic will not do. The capacitance required is usually a few microfarads or less, and paper capacitors are convenient. The voltage rating should comfortably exceed the peak transformer voltage, 1.4 E_T.

The filter capacitors, Cs, can be any type, and their working-voltage rating need be only slightly greater than the regulated load voltage E_0, *provided* the supply is never operated with the regulator removed. Without the regulator or load, it is characteristic of these circuits for the output voltage to rise to the peak voltage of the transformer secondary (twice the peak secondary voltage for the voltage doubler), as it does in a conventional supply. Note that in Fig. 7, the VR-tube jumper is used to disconnect the rectifier input when the tube is removed, preventing the output voltage from rising above its regulated value.

Unregulated Supplies

We turn now to unregulated supplies, in which we rely on the basic design of the rectifier and filter to maintain the load voltage reasonably constant. These are frequently — but not always — high-power supplies, such as the plate supply for a transmitter final amplifier, and we tend to avoid d.c. regulators because of the high power that the regulator itself would have to dissipate.

Half-Wave Supplies

A small supply is sometimes needed for fixed bias in a transmitter or for auxiliary equipment. When neither regulation nor smoothing has to be especially good, the half-wave circuit of Fig. 9 can be tried. If the regulation of this circuit proves insufficient, as it might when the supply is used to supply bias for a modulated amplifier, then one of the shunt-regulated circuits can be substituted for it.

For low-voltage, relatively high-current supplies, an easier way to better regulation is the circuit of Fig. 10, which allows us to use an input choke in the filter.[5] In combination with the bleeder resistance R_B, the choke provides smoothing and regulation that are much better than those obtainable with the ordinary half-wave rectifier. It is important to note that simply adding an input choke to the conventional half-wave rectifier of Fig. 9 is of almost no use; the choke degrades the regulation in this case, and while the peak rectifier current is limited, the output ripple is not basically reduced.

From one point of view, Fig. 10 is not a half-wave circuit but a full-wave rectifier in which the load is returned to one end of the transformer winding rather than to its center tap. As far as the transformer is concerned, however, the circuit operation is half-wave, because the transformer

[5] The shunt diode provides a path for inductor current when the series diode is not conducting, thereby maintaining an uninterrupted flow of current to the filter if L is sufficiently large. See Montgomery, "Improving Rectifier Circuits," *Electronics*, April 7, 1961.

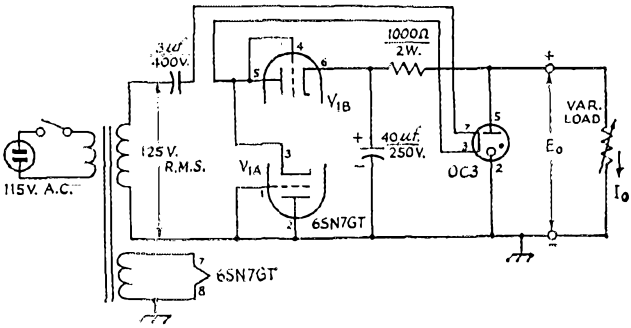


Fig. 7—A complete circuit using limiting capacitor. Design procedure is discussed in the text. Performance curve is shown in Fig. 8.

delivers current only when its secondary voltage has the polarity shown. With a sufficiently large L (and neglecting the direct voltage drops in the choke and rectifiers), the output voltage is 0.45 times the r.m.s. secondary voltage.

A disadvantage of Fig. 10 is the large inductance required for L. For optimum regulation with any choke-input filter, L must be greater than the *critical inductance*, which is discussed in the *Handbook* for the conventional full-wave rectifier. In the circuit of Fig. 10, with a power-line frequency of 60 c.p.s., the critical inductance is

$$L_{\text{CRIT.}} = \frac{R_B}{218} \text{ henrys},$$

where R_B is in ohms. Power supplies using this circuit require either a lower value of bleeder resistance or a larger inductance than is normal for conventional full-wave supplies.

Voltage-Multiplying Supplies

Now we come to a scheme that ought to start some soldering irons heating. Is it possible to build a satisfactory high-voltage transmitter supply with an inexpensive transformer? Given a junk-box TV transformer, for instance, can we obtain a d.c. output at 1200 volts with good regulation?

The conventional way of generating a high voltage from a low-voltage transformer is to use a voltage-doubling circuit, and one is shown in Fig. 11. The usual voltage doubler has several disadvantages; the peak rectifier current is very large compared with the output current, rectifier heating is severe, the voltage regulation is poor, and reducing the peak rectifier current degrades the regulation. If the circuit could be arranged to use a choke-input filter, the peak current could be reduced and the voltage regulation improved; but simply adding chokes in series with the rectifiers is of no help for the same reasons that apply in the case of the conventional half-wave rectifier.

There is a way out if we are willing to use a special filter choke.[5] In Fig. 12, the circuit of Fig. 11 has been modified by adding a choke with two equal windings. The windings in this particular arrangement are connected in series, so that a single winding with a center tap can be used instead. The input current to the filter, as in the usual full-wave rectifier supply, is passed first by one rectifier, then by the other, but only one of the inductor windings conducts at a time. Since the two windings have a common core, the magnetic field of the choke behaves as it would if the current were carried continuously by a single winding. The result is a "voltage doubler" that retains the usual advantages of choke-input operation: improved filtering and regulation, and nearly constant rectifier current during each half-cycle.

Assuming negligible direct voltage drops in the choke and rectifiers, the output voltage is 1.8 times the r.m.s. voltage of the transformer. The advantage of this result is shown by the following:

Example: I have a surplus TV power transformer whose secondary is rated at 800 volts, center-tapped, at 200 ma. What can I expect from it, using the circuit of Fig. 12?

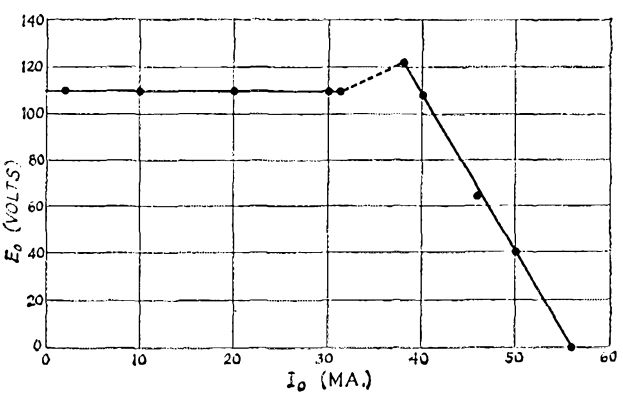


Fig. 8—Voltage-regulation curve of the supply diagrammed in Fig. 7. The regulator tube loses control at a load current slightly above 30 ma.

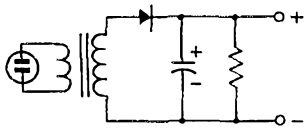


Fig. 9—Conventional unregulated half-wave circuit.

First, the output voltage is

$E_0 = 1.8\,E_T = (1.8)(800) = 1440$ volts

or perhaps 1400 volts, allowing for the drop in the choke and rectifiers. Second, the maximum permissible current must be based on transformer heating. The usual TV power transformer is rated for continuous duty with a capacitor-input filter following a full-wave center-tap rectifier. Grammer [1] found that the transformer winding losses are reduced considerably when the transformer is loaded intermittently, as in amateur use, and when the filter includes an input choke. These savings apply to the voltage-multiplier supply, with some modification. The secondary current in Fig. 12 is twice the output direct current, and it is delivered by the whole secondary rather than one-half the secondary as in the case of the center-tap rectifier. This fact increases both the primary and secondary winding losses, although not in the same proportion. On the other hand, Grammer's measurements show a reduction in secondary loss by a factor of 0.5, and in primary loss by a factor of 0.7, by changing from capacitor input to choke input. If an average duty factor of 0.5 is also assumed, the net result for the voltage multiplier is a direct output current equal to one-half the rated current for the same total winding loss. Therefore we can safely draw

$I_0 = 0.5\,I_{RATED} = (0.5)(200) = 100$ ma.

at 1400 volts.

This result is conservative. Grammer pointed out that the total transformer loss is reduced still further if we refrain from using all of the filament or heater windings included in the typical small power transformer. For reasons that seem economical to the power company if to no one else, the line voltage has been creeping up on us over the years. Many will find older transformers still on hand that are designed for 110-volt operation. When one of these is plugged into the modern 117-volt (or better) line, it should come as no surprise to find it running appreciably hotter than it used to, even with no load, because of the greater core loss at the higher voltage. The increase in secondary voltage may not be needed. If not, then it is worthwhile to use one or more of the idle filament windings

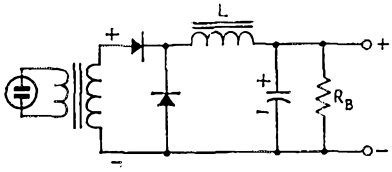


Fig. 10—The addition of the shunt diode to a conventional half-wave circuit permits advantage to be taken of the voltage-regulating properties of a choke-input filter.

to reduce the line voltage applied to the original primary. (A single 6.3-volt winding connected in series with the old primary, with the proper

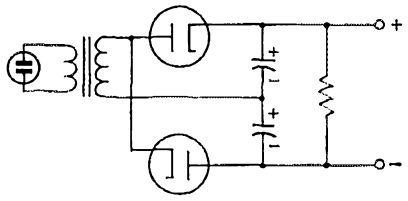


Fig. 11—A conventional voltage-doubler circuit.

polarity, makes a good combination for 117 volts.)

Rectifiers and Chokes

For a given output current, each rectifier of a voltage-multiplier supply must pass twice the current required of the rectifiers in a full-wave center-tap or bridge-rectifier supply. For the same output voltage, however, the rectifier peak-inverse voltage is only one half that of a full-wave center-tap supply; it is equal to the peak-inverse voltage of the rectifiers in a full-wave bridge, which requires, of course, four rectifiers rather than two. Rectifiers tend to become expensive as the peak-inverse rating increases, and consequently the voltage-multiplier circuit may often be the least costly choice for a supply developing more than one kilovolt.

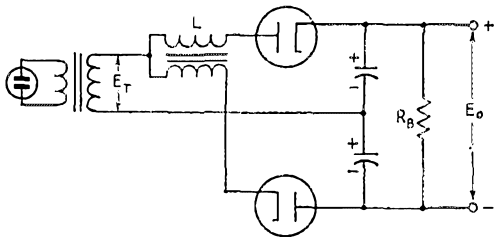


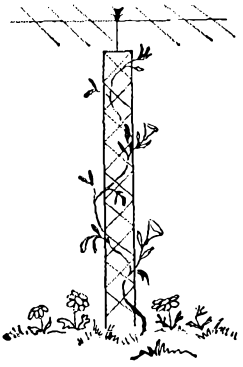
Fig. 12—The advantages of choke input in reference to improved regulation and reduced rectifier current may be obtained in a voltage-doubler circuit by the use of a center-tapped choke as described in the text.

A practical drawback is the present scarcity of suitable chokes. This is a new idea, and manufacturers have not yet come forward with a line of tapped or two-winding filter inductors. For the time being, about the only recourse is to modify an existing choke for the purpose or to order a special choke from the manufacturer. Modification is not too difficult a job for unsealed chokes, but it means disassembling the core, removing half of the coil to make the tap, winding it back on, and reassembling the core.

For optimum regulation, the inductance of the choke must exceed the critical inductance for a given bleeder current, as in any choke-input filter. A bleeder resistor must be used if the load is to be intermittent or variable, as it is for c.w. or modulated linear amplifiers.

(*Continued on page 158*)

The Towering Problem



BY JAY KAY KLEIN,* WA2LII

PROBLEMS of all degrees of complexity beset the amateur, but none is so towering as a backyard monster to which everyone but the next-door cat objects. The amateur that would slink home after dark if his car were out of style by more than three years blithely proceeds to guy up a 1922-style metal lattice behind a 1962-style fancy ranch with cantilevered plywood deck.

Of course, there's no one to stop him — except the XYL, three or four short-circuited neighbors, and maybe the police department under direct orders from the zoning commissioner. Heck, if even the little woman signs the "no-no-no!" petition, you're a blown-fuse, buddy.

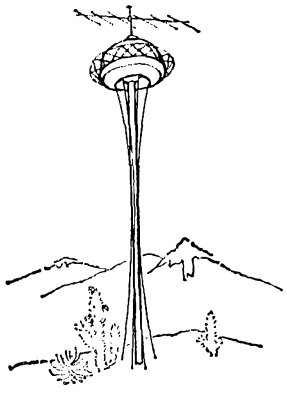
In an era that has seen four-square tin lizzies transformed into smooth-flowing metal sculptures, communications equipment has generally kept its no-nonsense, designed-for-utility look. Sure, some receivers these days are products of industrial designers' drawing boards and may, with only minor XYL misgivings, be placed on loving display in the living room. Most gear, of course, still is relegated by the dust-mop set to the Siberia of cellar or attic.

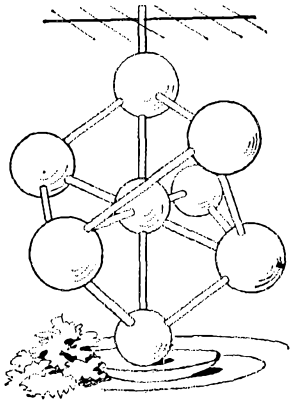
Unfortunately, antenna towers have to be kept on public display at all times. They just don't work worth a darn down in the basement. To hams, these structures are a sight for sore eyes. To the uninitiated, these are merely public eyesores. It's hard to realize your little darling is a personal affront to your wife, your neighbors, and sometimes even to the men in blue with brass buttons. That this is so far too often is shown by the many dismaying reports in *QST* of zoning-attempts and neighborhood grievance committees. It's almost enough to drive one to the citizens band, where you can wreck everyone's TV reception without fear of losing your ticket.

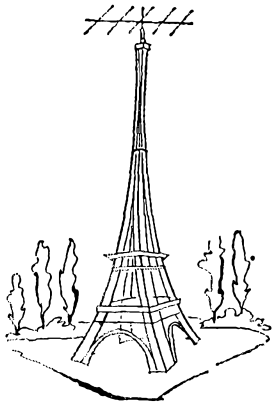
Attempts at suppression of your right to construct as large and ugly a tower as you can afford generally fail, but they do cause individual amateurs much agony and expense (even more agonizing). But let's face it, on a statistical basis, amateurs don't exist: with just about 1/10th of one per cent of the population in ham radio, a random sample of 1000 people could easily fail to include a single ham! All of which suggests — maybe you don't have to join 'em, but at least you don't have to step on their toes.

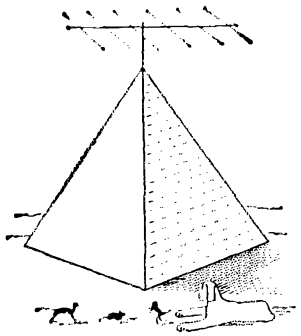
When the XYL says "no tower!" or threatens to plant morning glories at its base, you know something has to be done, especially if she outweighs you. What to do? Well, if you look at the situation just illogically enough, there really seems to be little need for towers to remain

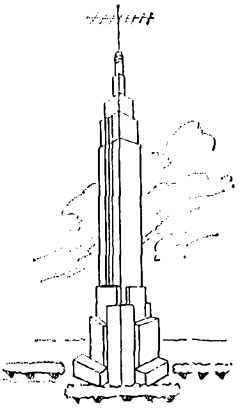
* 219 Sabine St., Syracuse 4, New York.
All drawings by WA2LII's XYL, D. E. Klein.

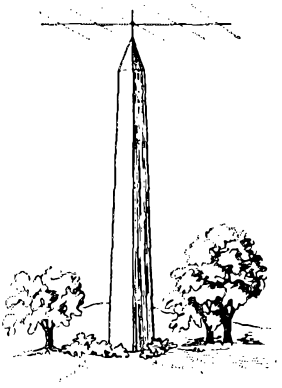












barren utilitarian structures. Modern industrial design techniques should enable manufacturers and kit-builders to come up with towers that differ as markedly from box girders as cars do from Conestoga wagons. Aesthetically pleasing structures can combine strength with grace, and utility with beauty. Even a simple chrome-plating job would help a tower brighten up the average neighborhood.

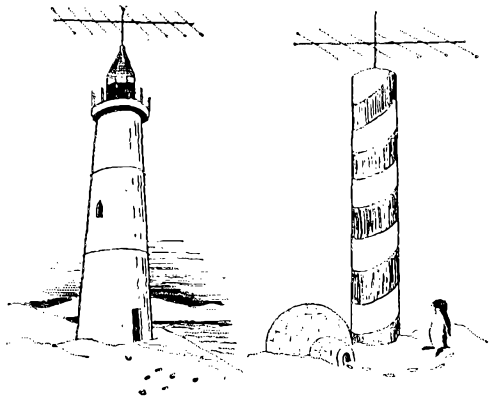
Tower design articles have frequently appeared in *QST*, dealing with such technical information as wind-loading and sheer stresses. But articles on design for beauty have long been missing. Nor have manufacturers dropped headfirst into the breech — these big shots of the communications world have not created a big boom in tower design, but have merely popped into the field with pivoted poles and guyed girders. And so we find a complete lack of towers acceptable to modern suburbs and style-conscious XYL's.

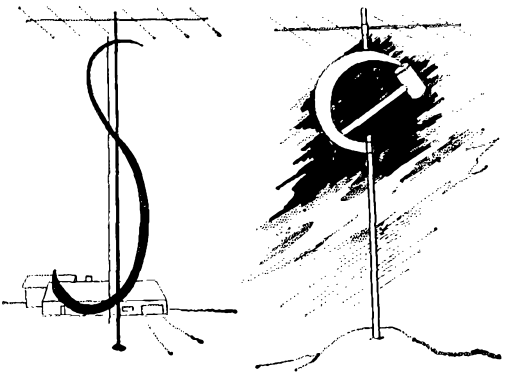
That is why I will present here a few modest proposals intended to arouse interest in securing towers with the curves you love to look at. Sketches are by my wife, done with the pious hope that all XYL's everywhere will ultimately benefit, especially her. These designs are merely offered as examples of what could be done, with a little imagination. Attempts to transform these sketches into working blueprints could only result in having *your* locality declared a disaster area.

Perhaps the most serious type of design presented here is based on the tower structure of the Seattle World's Fair. Few stylish suburbs could resist the erection of a tower design so well publicized in the mass media and so elegantly narrow-waisted. Revolving restaurant is optional, of course, depending on the exact degree of s.w.r. desired. Last year's model, the Brussels World's Fair Atomion, may still prove popular in some areas. The Pylon of the 1939 New York World's Fair is hopelessly outdated, except for very old-fashioned communities, and hence is not illustrated here.

Everlastingly appealing is the Eiffel Tower style, and the design is perennially popular both in Europe and in North America. Around Montreal, the style is, *naturellement*, very much *de rigueur*. Not so popular in North Africa, this style would yield ground to that old standby, the nonmetallic pyramid. Obviously, this design is mentioned in order to leave no stone unturned; major drawback is land requirement — seventeen acres for the Gizeh model. Guying is not required.

New Yorkers will be intrigued by a tower modelled after the Empire State Building. It is particularly adapted to a large-city environment. If built full scale, the tower may be used to moor dirigibles. Members of the Senate set, on the other hand, along with thousands of Con-





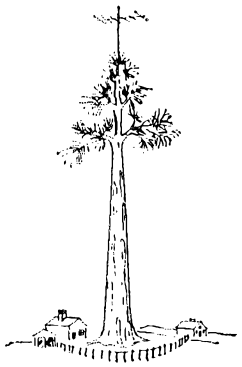
gressmen, may prefer a tower based on the Washington Monument. This design looks best surrounded by acres of grass and tourists.

The Light House design is particularly appropriate for rare-call DXers. A collapsible model could also be made available for transport on DXpeditions. At this point, sheer utility has given way entirely to the aesthetics of the situation. Completely practical, though, is the South Pole design for permanent erection in Little America. Frozen-stiff hams could make real use of this red-and-white symbol of amateur radio contact with the outside world.

For the most exclusive suburbs of capitalistic America, the Dollar Sign tower is designed to harmonize with neighborhood aspirations. With a silver-plated tower of this design, election to the country club will come as a matter of course. The particularly wealthy ham could construct the tower of sterling silver and use it as a giant money clip as well as a beam holder-upper. At the other side of the world, possession of a Red Star tower will ensure invitation to the finest parties and forestall awkward questions about political reliability.

Hams of rural inclination will welcome the last suggested style of tower, which will harmonize with the most countrified atmosphere. Nonmetallic, unguyed, and inexpensive, a Giant Redwood tower may be grown directly from seed. Simply plant and water well for fifteen hundred years.

Although some of these designs may not be as practical as one would wish, it is hoped that they



have given rise to serious thoughts about the towering problem in the backyard. To ensure domestic tranquillity, strictly utilitarian towers should give way to designs in harmony with other neighborhood structures. Just as good design in transmitters is an aid in avoiding interference with neighborhood television viewing, good design in towers is an aid in avoiding interference with neighborhood sight seeing.

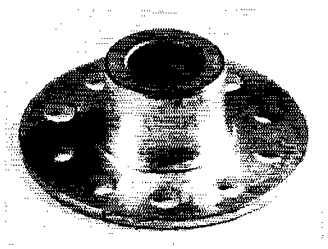
In an attempt to work out solutions to the problem, I have kept my nose to the grindstone, eye on the ball, and ear to the ground. Mostly I have got a sore nose, bloodshot eyes, and dirt in my ear. It was also difficult to work in that position. The towering problem still awaits final solution, but it is now out in the open where radio amateurs everywhere can dodge the issue.

QST

• New Apparatus

Multiconnection Ground Studs

Ground loops, feedback and hum are always a problem to the constructor and can usually be lessened by the use of a good common chassis ground. The JAN Ground Studs, shown in the photograph, are designed to provide a convenient means for making a positive equipotential chassis



ground. Because of their construction, they can be stacked vertically and, if necessary, the individual wires can be removed without disturbing adjacent terminations — something that is certainly difficult to do when using a single common ground lug!

The studs are available in several sizes, shown in the following table:

Type	P/N 1001	P/M 5008	P/N 7004
Diameter of disk (in.)	.75	.75	.50
Height (in.)	.312	.250	.280
No. of terminal holes	12	10	8

All types are made of half-hard brass, electro-tin plated. Prices range from 29 cents each for P/N 1001, 33 cents each for P/N 5008 and 21 cents each for P/N 7004. The studs are available direct from Jan Engineering, 2018 Pico Blvd., Santa Monica, California. There is no minimum order.

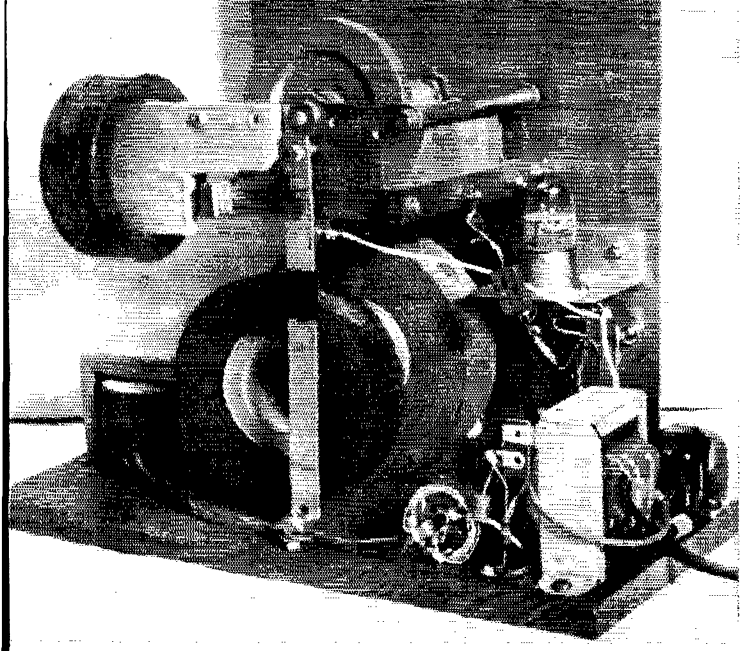
— *E. L. C.*

Strays

K1OZJ and K1JOZ had worked each other but had never met until, by pure chance, they happened to be photographing the Texas marker on the Texas-Oklahoma state line at the same time.

—•••—

WA6BYO, a printer by trade and so he should know, says that proof of the high quality of *QST* lies in the fragrance of copies 15 years old, in comparison with the odor from other magazines. The high quality of *QST* paper makes the difference.



You don't see these much any more—honeycomb coils. These were made by Coto-Coil a good many years ago, and are still going strong. See footnote 2 for the present address of the Coto-Coil Company, if you're interested in duplicating this receiver. (Or were you going to wind your own?)

An NAA Receiver

Being a Very Low Frequency Receiver Indeed

BY E. E. PEARSON,* W3QY

SEVERAL months ago the article on the new NAA[1] began to stir some feelings which had been dormant for almost 40 years. I recalled how I used to tune in NAA's old spark transmitter on 2500 meters back in 1920. It was those weather reports and press which finally got me over the hump in learning the code, to the point where I could copy it longhand instead of by printing the letters. The passing of NAA was a sad event.

But now, a new NAA was born . . . and what a station! I began to yearn to hear those magic letters again. For some time I didn't do anything about it, but about a month ago I saw a v.l.f. receiver announced in one of the electronic trade journals. It listed the frequencies of several stations, including NAA on 14.7 kc. This did it. Since "frequency" had no significance when thinking of such stations, I determined that 14.7 kc. was about 20,400 meters. I recalled that my old Honeycomb coil tuner with the 43-plate Murdock capacitor would tune in LY, the American-built station at Bordeaux, France. LY transmitted on 23,500 meters. I looked back through an old log (the original one, in fact) and found the circuit for the receiver which I used at that time. It included a 1500-turn coil which, with the variable, was connected to the grid and plate of the old Audiotron tube (the famous ultra-audion circuit).

For some reason I had kept several honeycomb coils all these years since I left 8AXZ at Toledo and, sure enough, the DL-1500 was available. In no time I had slapped together some gear and was ready to look for NAA. However, the ultra-audion circuit didn't pan out too well with the "half 12AY7" triode I was using, so I resorted to the time-honored "tickler" circuit. Here again fortune was with me, for I had a 600-turn coil which worked beautifully. The two coils were mounted on a mailing tube which just happened to be the correct diameter. For the tuning capacitor I used a .001-μf. Cardwell. This combination covers a frequency range of about 10 to 20 kc.

Upon connecting an antenna to it, I discovered that local broadcast signals (non-existent in 1920) can really put stuff into a direct-coupled receiver. In this situation still another honeycomb coil, one of 200 turns, trapped out most of the broadcast racket. Having gotten rid of the distractions, I could hear several stations as I turned the big Cardwell capacitor. I camped on one which seemed louder than the rest and after listening to a great deal of code groups and other items the station suddenly broke off and started ...— ...— ...— —.. . —. .— .— ! There were those old letters again . . . I could almost bawl as the memories came back.

Having built the set initially for battery power, with a 6-volt lantern battery and a single 45-volt B battery (that was the 1920 arrangement), I bowed to progress and mounted a silicon-diode rectifier and power transformer on the "chassis."

* 448 W. Clapier St., Philadelphia 44, Pa.

[1] Baldwin, "NAA — 1961", *QST*, October, 1961, p. 80.

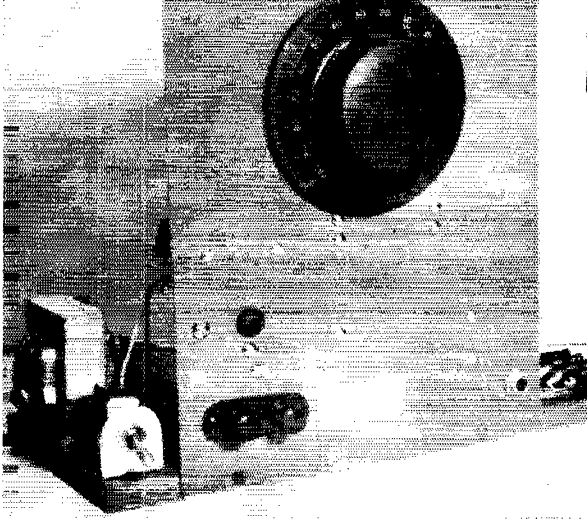
In order to feed the output into an audio amplifier I added a transformer I happened to have.

Running the signal into the audio amplifier turned out to be a surprising experience. Somehow I couldn't get any "gain" out of the amplifier. In due course I figured that the 15 kc. from the oscillating detector must be the culprit, and so it was. There was a 1.5-volt v.l.f. signal present across the output of the transformer! This signal would not bother a pair of earphones but did it ever plug up an amplifier! Some sort of low-pass audio filter is a must if one intends to use the signals to feed a speaker. Such a filter is shown on the diagram. It is the one suggested for modulators in the ARRL *Handbook* (see Fig. 9-12, p. 268, 1962 edition).

Another thing. Tie the antenna terminal to the longest, highest piece of wire you can locate and by all means connect the ground side to a water pipe or equivalent. At 15 kc. the leakage back to the line through the power supply isn't a good "ground." Finally, reverse the leads to L_2 if the receiver doesn't oscillate.

I brought the receiver into my lab at the company and showed it to several hams of the present generation, most of whom are s.s.b. enthusiasts. They gazed upon my museum piece with awesome wonder! Here was a receiver operating at 15 kc. Why, that's *audio* frequency! Gad, look at the size of those coils! And the "bandspread" with that .001-μf. capacitor!

Photographs of the antedeluvian device and a circuit for it accompany this article. In building it, there's one big hitch. Where in this day and age does one get the honeycomb coils? All I can say is that the original ones were made by Coto-Coil Co. and I believe the company is still in existence.[2] The receiver is terrific for code practice and it will run along for hours with a beat note as steady as a rock. And aside from that, it will give you the unforgettable experience of hearing NAA! QST



W3QY's NAA receiver seen from the front. You've heard of "breadboard." This is it. At these frequencies you can put the parts just about anywhere you want to, without worrying about the losses.

[2] The Coto-Coil Company is still very much in existence, at 65 Pavilion Ave., Providence 5, R. I. W1BES of Coto-Coil tells us that if there is enough demand for the coils mentioned in this article, they will be made available. If you're interested, write directly to W1BES at the above address. — *Editor.*

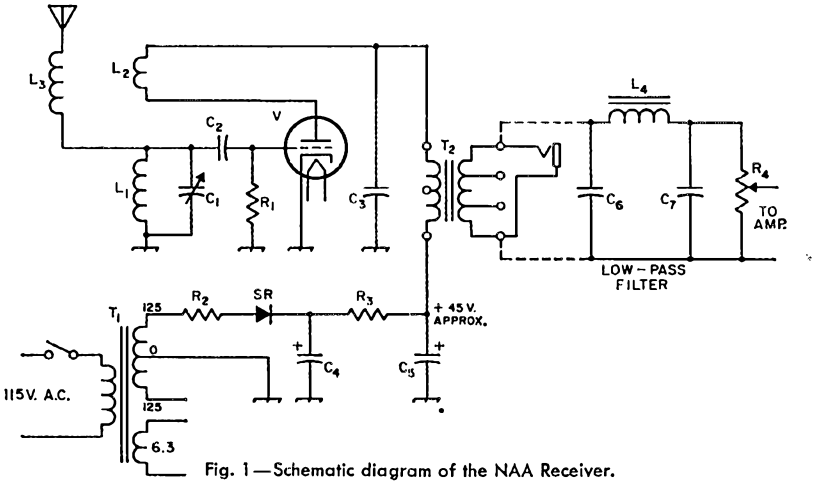


Fig. 1—Schematic diagram of the NAA Receiver.

C_1—.001-μf. variable.
C_2—100-$\mu\mu$f. mica.
C_3—.1-μf. paper.
$C_{4,5}$—30-μf., 150-w.v.d.c., electrolytic.
C_6—470-$\mu\mu$f. mica.
C_7—330-$\mu\mu$f. mica.
L_1—1500-turn honeycomb coil (see text).
L_2—600-turn honeycomb coil (see text).
L_3—200-turn honeycomb coil (see text).
L_4—20 hy. choke (Stancor C-1515).
R_1—2 megohm, ½ watt.
R_2—10 ohms, 1 watt. (Included with silicon-diode rectifier listed below.
R_3—250K, 2 watts.
R_4—500K.
SR—Silicon-diode rectifier (Sarkes-Tarzian M150).
T_1—Power transformer, 250 c.t., 25 ma., 6.3 v., 1.0 a. (Stancor PS-8416).
T_2—Output transformer, (the author used a Stancor A-4752.)
V—Any receiving triode with 6.3-v. heater.

By combining the features of the phasing and filter types of carrier and sideband suppression, VK2AC finds that more complete suppression is obtainable in practice with less critical adjustment of either section.

Phasing/Filter S.S.B. Generator

Dual System for Better Sideband Suppression

BY DR. LEO H. McMAHON,* VK2AC

SINCE the introduction of amateur s.s.b. in its present-day form, late in 1947, the two systems of sideband generation — filter and phasing — have been subjected to much experimentation and practical testing. As to a preference between the two methods, the trend toward the filter system, in one form or another, by manufacturers of amateur equipment may be taken as a guide. This also follows a long-established practice in commercial communications systems. For the home constructor, however, both systems present problems. In the case of the filter system, the main ones are cost, positioning of the basic frequency in respect to the filter response, and sideband switching. With the phasing system, they are in the adjustment of the phasing controls (particularly in r.f. phasing), limitation of the suppression obtainable in practice, and wide frequency response unless special steps are taken to minimize it.

It was considered that if the two systems were combined, each in a simple form, the end result would be an improvement, even if each system was not adjusted to a highly accurate degree. The chance to put this into practice came with the availability of a "Sideband Package" [1] built in its originally described form, but in which the sideband generator was not considered satisfactory. This generator was simply replaced by a new one consisting of a low-frequency phasing-type generator, followed by a single half-lattice filter. The end results from this generator have been excellent as to both carrier and sideband suppression.

* 22 Pitt St., Randwick, Sydney, N.S.W., Australia.

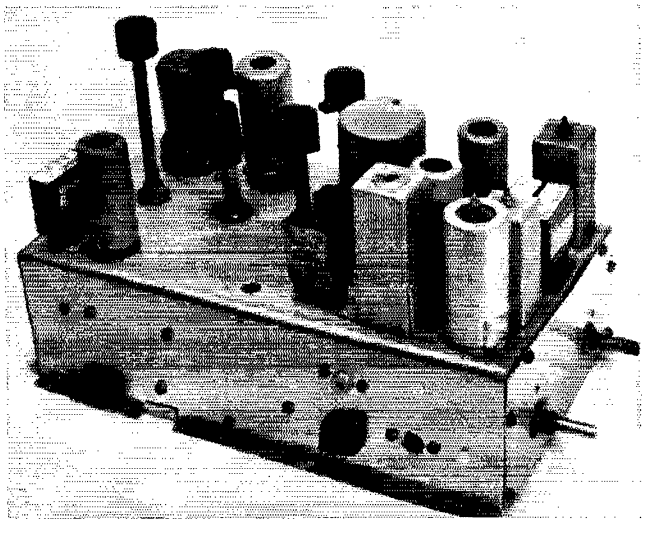
[1] Bigler, "A Sideband Package," *QST*, June, 1958.

Audio Phasing Circuit

The phasing system used (see Fig. 1) is essentially the one described by W2EWL,[2] but scaled down to approximately 440 kc. This frequency was chosen chiefly because suitable crystals were on hand. The exact frequency can be a matter of choice. The audio output at T_{301} in the original "Package" circuit was found to be sufficient with a little to spare.

There is one minor modification in the input resistor of the B & W audio phase-shift network used in the W2EWL circuit. The division of audio voltage input to the network must be in the ratio of 7:2. This ratio is determined by the position of the moving arm of the 500-ohm input potentiometer. However, it is possible to get this ratio in respect to either end of the potentiometer. This may cause confusion which can be avoided by using a fixed 500-ohm resistor as part of the network, so that the higher voltage is always applied

[2] Vitale, "Cheap and Easy S.S.B.," *QST*, March, 1956.



VK2AC's sideband generator is constructed to fit in the space occupied by the original generator in the W6TEU exciter. To the left are Y_1 and V_1, the audio ratio and balance controls, the plug-in p.s.n., and the 12AT7. Near the center are R_1 and R_2, the s.b. selector crystals (disregard the frequency marking on the foremost holder), and a round shield can containing L_1L_2. In the adjacent line are L_3L_4, the 12AU7, and the 6AG5. C_2 (hidden) is mounted between the two tubes. At the right-hand end of the chassis are the 6BU8, T_2, the filter crystals, and T_1.

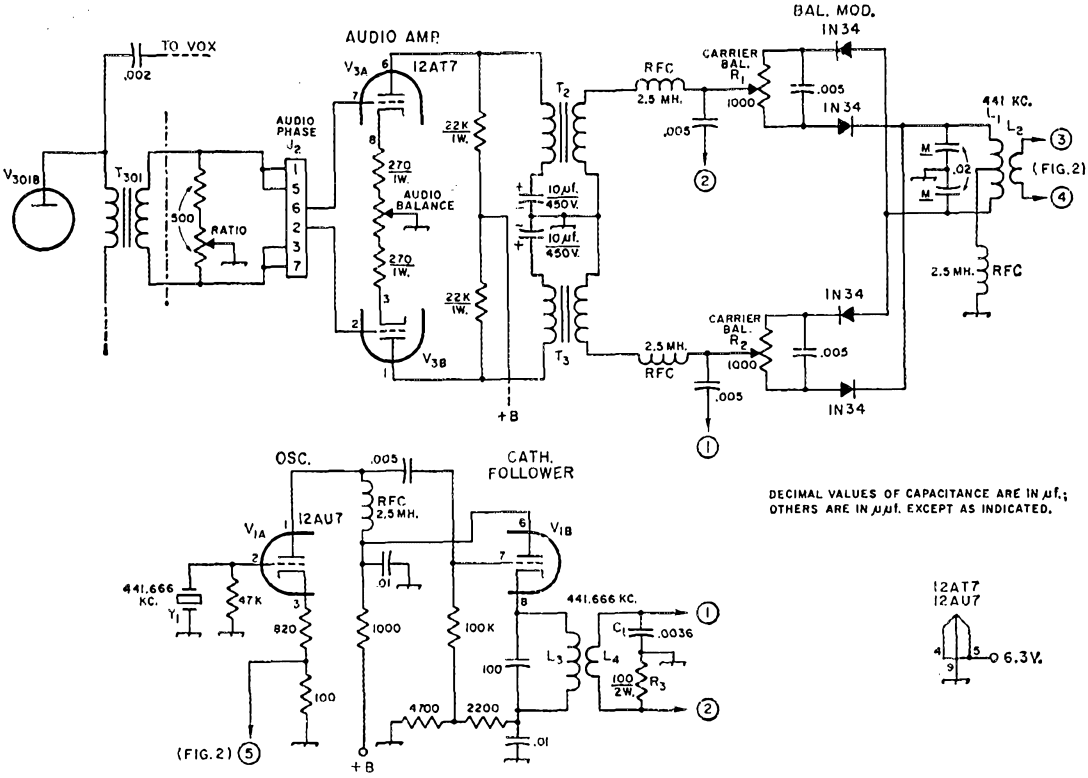


Fig. 1—Audio and r.f. phasing circuits. Audio output from T_{301} in the "S.S.B. Package" now goes to the W2EWL phase-shift circuit (portion between broken lines in which original component designations are used) instead of to the balanced modulator. R.f. input to the W2EWL balanced modulator is now at 440 kc. instead of 9 Mc. Semiconductors replace vacuum diodes in W2EWL's balanced modulator. The oscillator circuit is a modification of one used in the "Package."

Resistances are in ohms, and fixed resistors are ½ watt unless indicated otherwise. M indicates mica. Other fixed capacitors not listed below are disk ceramic. Values in the W2EWL portion of the circuit are the same as in the original.

C_1—Mica capacitors in parallel (see text).
L_1—40 turns No. 24 enameled, ⅝-inch diam., close-wound.
L_2—13 turns wound over center of L_1.
L_3—Approx. 1.3 mh. (see text).
L_4—25 turns wound at ground end of L_3.
R_1, R_2—Wire-wound control.
R_3—Nominal value (see text).
Y_1—Channel 318 (surplus).

to Pins 1 and 5 of the p.s.n. as required. Increasing the total input resistance to 1000 ohms has little effect in practice. If a potentiometer of less resistance is available, this can be used with a smaller fixed resistance to maintain the total of 500 ohms, if desired.

The coupling transformers used between the audio phase-shift stage and the balanced modulators are simply a pair of high- to low-impedance audio transformers. In the original W2EWL unit, it was suggested that 20,000 to 200 ohms be used. Anything of this general nature is satisfactory provided that the two transformers are similar.

R.F. Phasing

The r.f. oscillator that generates the basic 440-kc. signal (also shown in Fig. 1) is patterned after the low-frequency circuit used in the "Package." The phasing arrangement is a very simple *RC* network suggested by ZL1AAX.[3] It is coupled to the output tank of the cathode follower. A value of 100 ohms was used for the resistance arm, and the capacitance required for a reactance of this same value is approximately 3600 $\mu\mu$f. Several capacitors of smaller values in parallel are used to make up a total of approximately the required value. Likewise, R_3 is made up of several higher-resistance values in parallel. The resultant capacitance and resistance are juggled until the r.f. voltages measured across the two arms are equal. Once this condition has been attained, no further adjustment of r.f. phasing should be required — a point that should appeal to all who have tried to adjust the two-coil system.

L_3 should be a coil of i.f. type that will resonate at 440 kc. with a capacitance of 100 $\mu\mu$f. So far as the coupling coil L_4 is concerned, it is necessary that it be only large enough to produce about 2 volts of r.f., peak to peak, across the output terminals. There is no point in making the coil larger than this.

[3] Earnshaw, "An Improved Phase Shift System," *CQ*, November, 1959.

Balanced Modulator

The balanced modulator is a 440-kc. version of W2EWL's, using semi-conductors instead of the vacuum diodes. To maintain the same *LC* ratio in the output circuit requires an increase in capacitance of about 20 times that used at 9 Mc., or a value of 0.02 μf. for each of the two capacitors, the resultant of the two in series making a capacitance of 0.01 μf. across the coil. (As a convenient way of arriving at the size of coil needed to resonate at 440 kc., a coil was wound that would resonate at 4400 kc. with 1/100 of the capacitance, or 100 μμf.) A crude attempt was made to match the 0.02-μf. capacitors by connecting them across an audio oscillator and measuring the voltage drop across individual capacitors until a pair with essentially the same drop was found.

Wire-wound controls were used at R_1 and R_2 because they were found to be more reliable and positive in their action than carbon units.

Crystal Filter

The output of the balanced modulator feeds a conventional Class A amplifier stage (see Fig. 2) which is followed by a single half-lattice filter. It is possible to overdrive the 6AG5, so the input coupling should be adjusted to avoid this.

The use of a single half-lattice filter in this combination gives all the results required. Surplus crystals were used and, since it is a difficult job for most amateurs to alter the frequency, a different approach was used in selecting the basic frequency in respect to the filter curve. A study of the surplus-crystal frequencies available, shown in the following table,[4] will reveal recurring frequency differences of 1389, 463, 926, 463 and 1389 cycles when two-digit and three-digit channel numbers are interposed.

Channel No.	Fundamental Freq. (kc.)	Difference Cycles
317	440.277	
38	440.740	463
318	441.666	926
39	442.592	926
319	443.055	463
40	444.444	1389
320	444.444	0
321	446.296	1389
41	445.833	463
322	447.224	926
42	448.148	926
323	448.611	463

By experimenting it was found that a frequency separation of 1389 cycles between the two filter-network crystals was sufficient. This represents the difference between Channels 320 and 319. Then, depending on the type of microphone in use and the general pitch of the operator's voice, the carrier frequency chosen was 463 or 1389 cycles below the lower-frequency filter crystal. The carrier crystal frequency in Fig. 1 is shown as 441.666 kc.

[4] Mason, "Surplus Crystals," *CQ*, January, 1957.

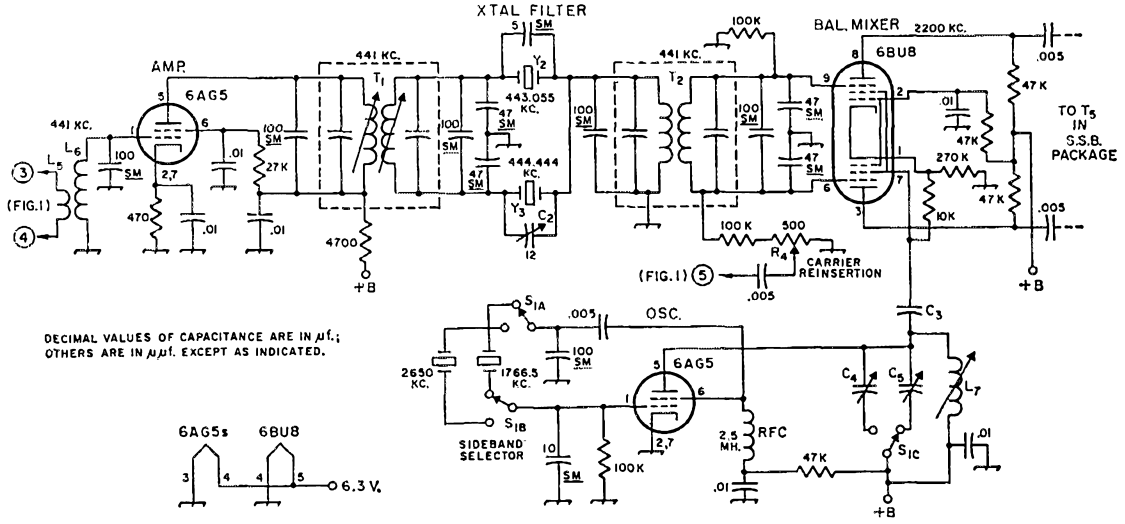


Fig. 2—Crystal sideband filter, balanced-mixer and sideband-selector circuits. This section fits between the balanced modulator of Fig. 1 and the 2250-kc. mixer of the "Sideband Package" circuit. The sideband selector replaces the original system in the "Package."

Resistances are in ohms, and fixed resistors are ½ watt unless indicated otherwise. SM indicates silver-mica capacitor. Other fixed capacitors not listed below are disk ceramic.

C_2—3.5–12-μμf. trimmer (Centralab 827-B).
C_3—"Gimmick" (see text).
C_4—65–340-μμf. trimmer (Elmenco 303).
C_5—100–500-μμf. trimmer (Elmenco 304).
L_5—5 turns over ground end of L_6.
L_6—Same as L_3 (Fig. 1).
L_7—20-μh. iron-slug coil (Miller 4407).
R_4—Wire-wound control.
S_1—3-pole 2-position rotary switch.
T_1, T_2—455-kc. i.f. transformer.
Y_2—Channel 319 (surplus).
Y_3—Channel 320 (surplus).

This procedure is so simple, and gives such good results, that it is advisable to purchase a few odd crystals with which to experiment. The aid of other amateurs should be enlisted and their opinions sought and studied to decide which carrier frequency is the most satisfactory from an audio point of view in each particular case. This may not seem to be a very scientific approach to the problem, but it represents by far the most satisfactory method from the practical angle.

A variable phasing capacitor (C_2) is necessary for adjusting the filter to optimum. To provide a range of adjustment, a small fixed capacitance in the vicinity of 2 to 5 $\mu\mu$f. is placed across the lower-frequency crystal, and a small variable capacitor of about 3 to 12 $\mu\mu$f. or so across the other.

The transformers used in the filter are of the ordinary type, padded to approximately 440 kc. and provided with a capacitive center tap.

Balanced Mixer

The balanced mixer stage (Fig. 2) uses a 6BU8, which has worked very well and gives a conversion gain of about five. Balancing controls were tried in the experimental model but were not found necessary. C_3 was made by twisting together two pieces of insulated wire.

Sideband Selection

Sideband selection is accomplished by shifting the frequency of the oscillator feeding the balanced mixer. The system of selection used in the original "Package" was ingenious, but it may give rise to a possible source of trouble. In the frequency-multiplying stages any generation of a fifth harmonic might be applied to later stages and appear as carrier. It is not possible to balance out this fifth harmonic and so the practical carrier suppression may not be satisfactory. Some fifth-harmonic energy is always generated in the multiplying stages and can feed into the output stage by devious routes.[5] With the cheapness and availability of crystals ground to a desired frequency, the method shown in Fig. 2 is an easy way to avoid this possible difficulty. The two crystal frequencies should be spaced twice the carrier frequency. Crystals ground to specified frequencies may be obtained reasonably from several firms advertising in *QST*.

Construction

Physically, the unit was constructed to replace the original generator in the "Package." However, a 5 × 9½ × 3-inch chassis was used to allow mounting of some of the components underneath. The first things mounted were the carrier-insertion potentiometer and the sideband switch to fit in exactly the places occupied by these controls in the original unit. From then on, parts were mounted with an attempt to keep r.f. sections as well spaced and isolated as possible to avoid unintentional coupling. The audio transformers were mounted underneath on opposite sides of the chassis. The diodes were mounted between the balancing potentiometers and the 0.02-μf. capacitors, as well spaced as possible and at right angles.

The balanced-modulator coil, L_1, was mounted above the chassis and covered with a shield, while the Class A input coil, L_6, was mounted underneath.

Adjustment

In the adjustment of any s.s.b. transmitter, the use of a v.t.v.m. with an r.f. probe is almost mandatory. The first step in the adjustment is to see that the two crystal oscillators are operating properly. In the low-frequency oscillator, the input to the arm of each balance potentiometer is about 2 volts peak to peak. This is not a very large value, but it is quite sufficient for the purpose.

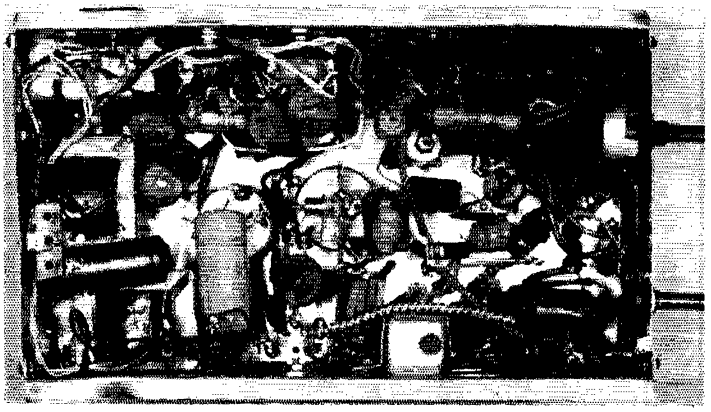
The next step is to peak all of the tuned circuits. To do this, the crystals are removed from the filter, and one of them put in the oscillator. A spare FT-243 crystal, or a capacitor of about 10 $\mu\mu$f., is inserted in one of the filter sockets to provide a small amount of capacitive coupling across the filter.

Set the phasing capacitor, C_2, to minimum, and unbalance the modulator by running one of the balancing potentiometers to one end. With the output stage of the exciter feeding a dummy load, and with some sort of output indicator, such as a v.t.v.m., connected across the load, (or a receiver tuned to some output frequency of the transmitter, as described in the s.s.b. chapter of the *ARRL Handbook*), all tuned circuits are peaked.

Next, adjust the injection from the crystal oscillator to give maximum gain in the conversion stage. With S_1 set to the low-frequency crystal, set C_5 near maximum capacitance and adjust L_7 for maximum injection. Then adjust C_3 for optimum injection. Now turn S_1 to the high-frequency crystal and adjust C_4 for the same injection. If the same injection cannot be obtained, it may be necessary to repeat the process with C_5 set to a lower or higher value. Optimum injection is a matter of only a few volts. Since this oscillator feeds into a high-impedance load, it is easy to overdrive the mixer. As a matter of fact, care must be used constantly to avoid overdriving at any point in the system. Overdriving is a most common fault in many s.s.b. transmitters. It is always better to underdrive than overdrive, so always set the levels a little on the conservative side.

The next step is to see that the circuitry associated with the filter is functioning properly. To do this, remove the FT-243 crystal (or capacitor), and leave the two filter sockets empty. Now vary the phasing capacitor to see if the signal fed through to the output passes through a minimum. It is necessary to find this minimum so that in the final adjustment the capacitor can be set correctly for the most symmetrical response. The

[5] This was not definitely confirmed by the author, nor has this difficulty been reported by anyone who has built the "Package." Adequate shielding of the multiplier stages is important, of course, — *Editor*.



Bottom view of the filter/phasing s.b. generator. The audio output transformers are mounted at right angles to the left. L_5L_6 is mounted against the lower side of the chassis The balanced-modulator diodes are at the center. Shafts extending to the right are R_5 (above) and R_1 (below).

null point represents the point at which the circuit is neutralized. This point will be very close to the final correct position. Whatever signal that passes through after the null has been obtained is fed around the filter through stray paths. With the combination of phasing and filtering, a small amount of stray signal is of no importance.

The balanced modulator should now be checked for carrier feed-around. This subject is seldom given sufficient consideration. To make this check, replace the 10-$\mu\mu$f. capacitor in one of the filter sockets and then disconnect the two r.f. leads from the balancing potentiometers of the modulator. Put the 441.666-kc. crystal in the oscillator and then listen on a receiver to one of the transmitter output frequencies. Any signal heard is a result of leak-around and must be minimized.

Shielded wiring should be used in all power circuits. Remember that a capacitance that makes a good bypass at 9 Mc. may not be sufficient at 440 kc. The voltage picked up at the cathode of the 441.666-kc. oscillator should be the minimum required to give full carrier reinsertion, since it was found that there was quite a large amount of leak-around directly from the oscillator to the 6BU8 stage. The voltage required at injection grids of the 6BU8 is only on the order of 300 millivolts, peak to peak.

It was found necessary to shield the balanced modulator output coil. After all other steps had been taken to minimize the leak-around, it was found that there was still slight leakage between the oscillator and mixer tubes, although they were many inches apart. Shielding of both tubes is necessary. Time spent in getting rid of this leak-around will give you a much better signal.

Now the r.f. leads to the balancing controls can be replaced and the carrier-balance controls adjusted for maximum suppression. The greater part of the carrier suppression takes place in the balanced modulator with a little additional help from the filter. (The main contribution of the filter is in eliminating the unwanted sideband.) Even without the filter, the residual carrier should be well down in the hum or noise. The stability of carrier suppression of this high degree is quite good, but not absolute.

The next step is to set the sideband-suppression controls. This is done first for the phasing system, with crystals removed from the filter and the 10-$\mu\mu$f. capacitor substituted as described earlier. By far the easiest and fastest way to set the ratio and audio balance controls is to feed in a single tone of about 1000 cycles and adjust for minimum response on the unwanted sideband, using a receiver of sufficient selectivity; otherwise, you will have to make use of an oscilloscope pattern. When the audio phasing controls have been set, replace the filter crystals and set the filter phasing capacitor, C_2, for maximum sideband suppression. It is in this step that you will need some sensitive detecting device; since the degree of sideband suppression will test the capabilities of any receiver. It gets to a point where it is hard to decide which to believe — the receiver or the generator.

An important point to watch in these adjustments for sideband suppression is to be sure that the same sideband is suppressed in both the phasing system and in the filter. If it becomes evident that opposite sidebands are being suppressed in the two sections, this can be corrected by reversing one set of audio output leads, or the r.f. input leads to the balanced modulator. The setting of the filter phasing capacitor for maximum suppression should come very close to the previous setting made for balance in the crystal filter. Once the suppression controls have been set, the tuned circuits can be repeaked. In all of these adjustments, it is very essential to be sure that no stage is overloaded, since this may lead to false indications.

In many phasing-type transmitters, even when the carrier-suppression controls are set to the optimum points, there is still a lot of residual signal. This is caused by the generation of low-frequency sidebands by the ripple frequencies of the high-voltage supply. Even when the last audio tube is removed, where parallel feed is used there still remains a circuit through which these low frequencies can circulate and so introduce sidebands at the ripple frequency in the output. Since the phasing system cannot suppress these low-frequency sidebands, it is essential

(Continued on page 160)

Ham Bird-Watchers Award

BY PAUL C. AMIS,* W7RGL

THE current rash of awards and certificates has indicated one definite lack in hamdom's sleuthing. To fill this need, it is recommended that the following new award be thoughtfully considered.

The Ham Bands Bird-Watchers Award

This award will be issued to those radio amateurs who can show proof of observing the following bird types found in or near the radio amateur frequency bands:

1. Gravel-Throated Splatterer
2. Forty-Meter Grouch
3. Gimlet-Eyed Click-Watcher
4. Great American Regret
5. Wooley-Headed DX-Snatcher (found perched precariously *on band edges*)
6. Yellow-Bellied V.F.O. Swisher
7. Early-Morning Cuckoo
8. Loud-Mouthed Warbler
9. Tail-Ending Grinch
10. Sideband Garbler (whose call is "Ah-h-h Umm-m Err-r")
11. Midnight Band Thrasher
12. Ruffled Spouse
13. Whooping Chirper
14. Long-Winded Coot
15. Flea-Powered Pushover (found at fringes of DX pile-ups plaintively piping "CQ DX")
16. Double-Breasted Peewee
17. Drifting Clicker
18. Locked-Key Clobberer
19. Fuzzy-Minded Bandscratcher (locale: found calling "CQ DX" during SS Contests)

To those astute followers of the *Ionosphere* who can claim sighting of all of the species on at least three different bands, the award should be a suitably-framed ARRL Official Observer application.

There may be a number of bird types which have, by oversight, myopia, or QRM, been left off the above list. The author apologizes for such neglect, but, as a practicing radio amateur, it must be recognized that with the passage of years, he tends to become a Diehard [1]. QST

* Route 1, Box 438 Poulsboro, Washington.

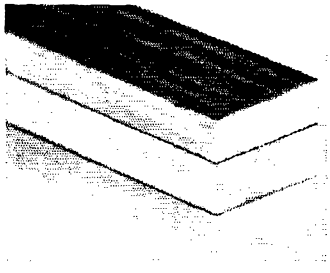
[1] A DIEHARD is a ham who worships the very ground his head is stuck in.

• *New Apparatus*

Wooden Radials for Cubical Quad Antennas

THE use of wooden radials in the construction of quad antennas is a feature presented by the Steel & Engine Products, Ltd., Liverpool, Nova Scotia, Canada.

The radials are made of three laminates of straight grain selected white ash (see cross section of a radial in the photograph). The grain in all three laminates runs lengthwise and the laminates are all treated with wood preservative on top of which is sprayed a coat of epoxy enamel. A fourth laminate is added to the radials between the spider and the 10-meter portion of the antenna, for greater strength.



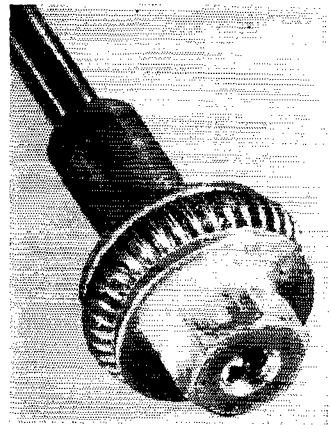
Each finished radial weighs about 5½ pounds, and measures 1¼ inches square at the spider end and 1 inch square at the other end.

Aluminum spiders, "T" mast couplings, a boom, etc., are also available for building a complete cubical quad antenna.

— *E. L. C.*

Mobile Antenna Band-Changing Contactor

SLIDING contacts have been used inside loading coils for years, but some made poor r.f. connections to the coil and sometimes "hung up" on the coil turns.



The Band-Spanner mobile antenna uses a new circular contactor that cannot get caught or twisted out of shape and is completely free to rotate. The special contact, shown in the photograph, is affixed to the lower end of a whip and is made from a spirally-shaped copper conductor. This assembly can be pushed up or down, plunger style, inside a fiberglass column which contains the antenna loading coil. The movable contact makes connection to the bare turns at any desired part of the loading coil. The top whip is calibrated at the factory so that it can be raised or lowered quickly to the proper setting for any band from 75 through 10 meters. For fitting into the garage or carport, the whip can be telescoped down so that the over-all length of the antenna is only 63 inches (Model A-61) or 60 inches (Model A-62). The antenna is manufactured by Webster Mfg. Co., 317 Roebling Road, South San Francisco, California.

— *E. L. C.*

Bouquets to the strong South American effort by YV5AGD on *both* c.w. and phone. With 435,150 c.w. and 252,180 phone points, Antonio was 2nd highest DX scorer in both contests, a total of 2868 contest QSOs! With such an improvement over his 1961 score, this station should be tough to beat in the 1963 ARRL DX Contest.

Scores Climb Despite Conditions

Official Results – 1962 ARRL International DX Competition

TWENTY meters was open to Central Asia via the short skip path over the North Pole at 1430 GMT, 17 March. The boys were working such juicy ones as AC5CP, VQ8BM, and VU2AJ. Those who had worked them were frantically searching for additional rare multipliers during the short opening. And there one was . . . a weak watery signal with a slow halting fist calling a long long CQ . . . *dah dit dah dit dah dah dit dah*. You could feel the receivers stopping on the frequency, beams zeroing in, and hear a few of the boys swishing in and peaking their finals. Oh boy, was it a JT1 or AC3? There, he's finally signing . . . *de de KN1 — KN1 —* . Don't ask me, I don't know."

Sounds like an Alfred Hitchcock thriller, but W9IHN depicts this episode from the 1962 ARRL DX Contest of last February and March. What is a DX Contest anyway? Ask any entrant and he probably isn't sure himself. Said K1PIA, mystified at his own participation: "Hadn't planned to enter, but once started, I couldn't stop." Is it the competition? Is it a chance to get new countries for DXCC? Is it a chance to demonstrate your ability to entice DX with operating skill during a given span of time?

The ARRL DX Contest is fair game for *everyone*, both the casual and serious DXer. The long hours might be tough on the OTs out for score, but it provides the peanut whistles a better chance to sneak the rare ones while the kilowatts are napping. Gives everyone a better chance, too, should there be a band washout. The DX Contest is popular too for the DXer who can't "live" by his rig sleeping with a mike in his mouth and a key clutched in his paw, in order to make the DXCC Honor Roll. The c.w. contest is traditionally a jewel, with the phone contest a pot of fun, too. Why not make it a sideband contest is a question sometimes asked. Well, what is the phone contest now? Why put blinders on the contestant? If he can come up with a winning score on sideband, a.m., n.b.f.m., or tin cans hitched together by a wet string, or a combination of all, what difference does it make? It's a voice contest. *You* pick the way you want to talk, not ARRL.

The ARRL International DX Competition, with this its 28th running, is deeply rooted in the history of amateur wireless. F8ZF reminds us: "People don't seem to realize the ARRL DX Contest is the continuation of the First Transatlantic Tests. I was too young for these, but the DX Test is the occasion for meeting old friends and making new ones." Yep, the 1962 DX Contest was the latest in a long line of challenges to the DX Contester. Let's examine just what transpired in the February-March 1962 fracas.

C.W. Highlights

It's no secret the m.u.f. has been dropping like a balloon leaking hydrogen, but it's also obvious from this year's scores that the DX hounds have been compensating for it with more use of 40 and 80 meters. Actually, conditions were really pretty fair both c.w. week ends,

with 15-meter openings giving the boys a needed boost. Unfortunately, most of the DX crowd had long given up on 10-meters as a "Silent Key," and thereby missed some good opportunities. W6GQK bemoaned the fact with: "Band conditions were good considering the fairly low sunspot numbers. Ten meters was open during the day, but not much use was made of the opening." Newcomer K1NOL commented: "The only c.w. contact made in two years in amateur radio on 28 Mc. was during the ARRL DX Contest." WA2IZS detected a faint pulse: "Ten meters still has some life in it yet." The 10-meter ship may have a considerable starboard list, fellas, but let's not give up the ship until it's sunk!

Scores took a considerable upturn this year. Last year only 27 W/VEs topped 200,000 points compared to 59 this year, while 30 non-W/VEs broke 100,000 to 41 this year. W3MVB ponders an explanation: "Band conditions are going down with the sunspots, but my score has doubled each year for the past three years. What's the reason? Experience and improved operating practices? According to my graph, watch out next year." Conditions to the Indian Ocean and Asia were in the doldrums with our good friend Milt, VQ8BM, noting: "Band conditions were very poor compared to last year, openings being of much shorter duration. Next year I expect to be back in the U.K. under my former call, G3GVQ. Have really enjoyed the DX Contests." VU2MD reported poor conditions with only short band openings to W/VE. When they were coming through though, a host of callers were on frequency, with WA6KMF noting ZK1AR's command to the tailending flock of brethren: "I'm going to work K9VRU or bust." Meanwhile, luck was with K7CTI who "was pleased to snag VS4RS in Sarawak one-half hour before the contest was over."

Rigs ranged all the way from complete kilowatt S-Lines for each band to mobile rigs like K3JOY/1: "Yes, I know it is probably the lowest submitted score, but I'm proud of it. It may interest you to note that K3JOY/Mobile in Mass. worked UA3HR, my first real DX from the car. Maybe I get the booby prize for the lowest submitted score, but by golly, I was in there trying!" W6ERS philosophizes on power: "I have worked these contests with everything from a 5-watt 6AQ5 crystal oscillator to the present 800 watts. Having now discovered how much easier it is to work them with 800 than with 5 or even 500 watts, I must reluctantly conclude that Lord Acton's celebrated dictum has an application not dreamed of by him: 'Power corrupts, and absolute power corrupts absolutely.'"

Power rates operating ability as well, with W5BUK nominating HC1AGI, with a kilowatt of operating skill, for the "Most ubiquitous," that is being everywhere with the mostest most of the time. HC1AGI was just that for the world's top score with Don McClenon, W3EIS/HC1DC operator, keying 826,677 points to become the *first* winner of the brand new and top DX trophy

NUMBER OF COUNTRIES WORKED BY BANDS

LISTED ARE COUNTRY TOTALS MORE THAN { 20 ON 3.5 Mc. / 50 ON 7 Mc. / 75 ON 14 Mc. / 60 ON 21 Mc. / 15 ON 28 Mc.

(Lower Totals Not Listed)

CALL	3.5 Mc.	7 Mc.	14 Mc.	21 Mc.	28 Mc.
W1BIH	20		85	77	19
K1DIR	23				
W1JYH	21	53	96	66	
K1MLI			96		
K1MOD				63	
W1NJL	28				
W1QMM	20				
W1WY				68	
W2AYJ	22	76	75	62	
K2DCA		52	83	75	21
K2DGT	36	70	76	71	21
W2EQS	23				
W2ESO			78	61	
K2FC			77		
W2FXN			84		
K2GUN	23		79	64	
W2HMJ			79		
WA2IZS*					17
W2WZ			82	65	
W3ALB	22	58	89	75	
W3AFM			76		
W3BYX*		51	77		
W3ECR	37	75	84	80	
W3EIV	26	62		67	18
W3EQA		56			
W3GHM*				60	
W3GQF*		53	75		17
W3GRF	37	73	90	79	15
W3IYE			76		
W3KFQ*		66	76	63	
W3KT				63	
W3MFJ			76	60	
W3MSK*	37	87	118	96	25
W3MSR					15
W3MVB		80		64	21
W3MWC*		67			
W3QQL					15
W3SQX		60	79		
W3TMZ*	35	60	88	72	
W3WJD*		58		62	
W3ZAO	20	50		68	
W4AZK			77		
K4BAI				65	

CALL	3.5 Mc.	7 Mc.	14 Mc.	21 Mc.	28 Mc.
W4DQS	34	68	81	77	20
W4DXI	20			61	
W4HUE		52		65	24
W4JAT			77	61	
W4JFE			86		
W4KFC	42	72	94	80	24
W4KXV*	31	69	102	86	19
K4LPW				68	15
W4OPM			75		
W4RQR	25	59	77	77	23
W4SHJ	21				
K4TML	31	63	76	76	18
W4YWX		51		81	
K4ZKI			76	69	15
W5BRR				70	
W5CKY				75	19
W5WZQ		69		60	15
W6CYI					16
K6EVR*	26	86	94	75	15
W6HJT					17
W6HOC					19
W6IBD			82		16
W6KG					16
W6LDD					15
W6PQW		58			
W6RW*	27	80	98	70	20
W6TZD					18
W6WB					19
KH6IJ			85		
W7PGS			75		
W8FGX		70	81	78	20
W8JIN		71			
W8ZJM	20			69	
W9GIL				60	
W9IRH			81		
W9JGV				62	
W9NII				64	
W9RQM				65	
W9VSO				65	
W9WNV	25	77			
WØBMM		51		61	
WØBTD				73	
WØFDL			77		
WØAIH/VE3	23	65	81	67	

*Multi-operator

Top c.w. score from Africa was 5N2JKO with 1211 c.w. contacts, multiplier of 45, and 163,485 points, plus 50,826 points in the phone contest. Nice going, Mike, on earning two certificates.

in the world, the *Carl-Eric Rosen SM5BUG/9Q5 Memorial Award*, donated by Harry Nadley, W3INH. This trophy is to be presented annually by W3INH to the highest scoring single operator in the ARRL DX Competition as a memorial award to some famed DXer passed away. This year's trophy is in memory of SM5BUG/9Q5 who gave his life in United Nations' service in the Congo as radio operator aboard the aircraft of Dag Hammerskjold that crashed near Ndola, Northern Rhodesia.

U.S.A.-way, Vic Clark, W4KFC, earned top honors with 721,112 points. Here's the way the top W/VE single operator scores over 200K points (200,000 points, that is) stacked up: W4KFC 721K, W3ECR 656K, W3GRF 635K, K2DGT 564K, W4DQS 539K, W8FGX 472K, W3ALB 458K, K4TML 454K, W4RQR 447K, W0AIH/VE3 436K, W1BIH 419K, W3MVB 405K, K2DCA 391K, W1JYH 383K, W3EIV 380K, W2AYJ 375K, W2WZ 345K, K2GUN 299K, W3ZAO 298K, W4HUE 294K, W6IBD 293K, W5WZQ 283K, W4JAT 273K, W3SQX 267K, W5CKY 263K, W6HJT 261K, K1DIR 258K, W8ZJM 256K, K4ZKI 252K, W4AZK 251K, W4JFE 248K, W3IYE 241K, W4YWX 231K, W9WNV 229K, W3MFJ 226K, WA2OJD 226K, W1FZ 224K, W2ESO 220K, W6LDD 219K, W6KG 218K, K4LPW 215K, W9RQM 212K, W2FXN 210K, W7PGS 206K, W0BMM 204K, W5BRR 200K, W3OCU 200K. Fantastic multi-operator station W3MSK did it again to break the magic one-million with 1,102,101 points, operators W3MSK, W3MCG, W3PZW, W3JTC, W3KDP, W4IYR, W3FYS, W6HOH, and K3MZY turning the trick. Following W3MSK were multiple operator stations: W4KXV 754K, W6RW 620K, K6EVR 586K, W3TMZ 480K, W3KFQ 366K, W3WJD 346K.

DX Continental Champions

Single-Operator

C.W.		*Phone*
5N2JKO...163,485	*Africa*	VQ2AT....53,880
KR6AR...201,131	*Asia*	KA2MA...35,560
G4CP....264,300	*Europe*	OE1RZ...126,559
KP4CC...328,866	*No. America*	XE1CV..327,510
VK2GW..205,632	*Oceania*	KW6DG..92,432
HC1AGI..826,677	*So. America*	YV5AGD.252,180

C.W. Call-Area Leaders

Single-Operator

W1BIH	419,676	W9WNV	229,167
K2DGT	564,138	W0BMM	204,980
W3ECR[1]	656,232	VE1EK	15,582
W4KFC	721,112	VE2BV	111,587
W5WZQ	283,716	W0AIH/VE3	436,590
W6IBD	293,262	VE4XO	91,800
KH6IJ	146,520	VE5JV	1164
W7PGS	206,853	VE6HG	20,670
KL7JDO	12,012	VO2NA	11,808
W8FGX	472,752		

[1] W3MFW, opr.

The DX stations really put in a concerted effort this year. These top scorers all topping 100,000 points deserve special mention: HC1AGI 826K, YV5AGD 435K, PY4OD 332K, KP4CC 328K, YN1AA 307K, YV5ANT 269K, ZP9AY 266K, G4CP 264K, HK7ZT 244K, TT2CAH 223K, FP8BX 219K, HP1IE 210K, GI3OQR 206K, VK2GW 205K, KW6DG 203K, KR6AR 201K, GW3JI 198K, JA1VX 196K, OK1ZL 193K, OX3DL 187K, OE1RZ 186K, ON4GL 186K, CE3AG 182K, G6BQ 177K, F9MS 170K, 5N2JKO 163K, F8VJ 162K, G2DC 158K, CE1AD 155K, G2QT 151K, CE3RY 147K, JA1CO 144K, ZK1AR 138K, JA1BWA 137K, OK1GT 126K, CT2AI 124K, PA0ADP 116K, PA0LOU 112K, E16D 102K, VP2AB 100K, and multi-op DL4QF 120K.

The c.w. contest sure makes the DX bands hop. To conclude the c.w. highlights W3URE observed: "The strangest thing was at the end of the contest at 2400 Sunday evening. At 2359 bedlam and DX galore. At 2400, a practically dead band." And thus it is until the ARRL C.W. DX Contest 1963.

Pausing from the sweltering heat of both the weather and the DX Contest, KR6AR tunes in another station. With a 32S-1 and KWS-1 transmitters, 1140 contacts were made during the contest for highest c.w. Asia score. Since December 1960, over 4000 QSOs have been made by KR6AR. February 1963 calls for the return trip to K9EHS.

Phone Highlights

The ARRL DX Phone Contest marches on! High scoring K2GXI sums it up with: "Scores continue to mount despite declining conditions." It's "lots of fun, work, misery, and cussin" according to W6OMR; what a ball! Sideband continues to predominate and grow, perhaps explaining the higher phone scores. Although some of the gang grumbled at waiting in line for s.s.b. exchanges, K6TIP/6 liked his first DX Contest adventure: "As you can see by the miniscule size of the score here, I'm doing this not in any hope of award or glory, but just to keep 'the other baboons on the course' honest, as Stirling Moss has said. Never having entered the DX Contest before this year, I have nothing with which to compare my achievements. Nevertheless, I feel compelled to remark how simple s.s.b. contacts are in the DX Contest, no calling up or down frequency; the only skill involved is timing the call properly. Just holler when nobody else is hollering and you got the answer."

The phone men also tripped up by not hollering enough on 10 meters. "Long openings on 28 Mc. to America. These were not exploited to the fullest advantage by the American stations, consequently comparatively low score on that band." — VQ2AT. "If more people had known 10 meters was open." — W8IBX. "Good to see 10 meters still kicking. Didn't think she would open up this year." — KW6DG.

W2HMJ "nominates CR6CA for special prize for outstanding job of still making QSOs after he had lost his voice," while W9GA1 goes for snappy operating: "My nomination for excellent operating goes to VP5BP — even if I did wait almost an hour for him to call for W9s." KØIKL used her feminine voice to best advantage: "It's loads of fun to join 100 guys to call a rare one and to have the DX station say: 'QRX, fellows. Let's give the YL on frequency a chance.'" Ye gads, OMs, we haven't a chance against that weapon!

Score is the object, and these W/VE single operator top-notchers bested the phone fraternity with 100,000 points and over: W1ONK 351K, K2GXI 349K, K5MDX 255K, W4KFC 249K, W4BVV 242K, W9DUB 179K, K2IEG 174K, W2FXN 157K, W9NZM 121K, K8PUU 120K, W2WZ 117K, W3TLN 112K, K1RTB 108K, W3WJD 105K, W4JFE 104K. And multi-operators: W3MSK 384K, W1HKK 296K, W8NWO 222K, K6EVR 198K, W3GRF 163K, W8NGO 159K, W3KFQ 132K.

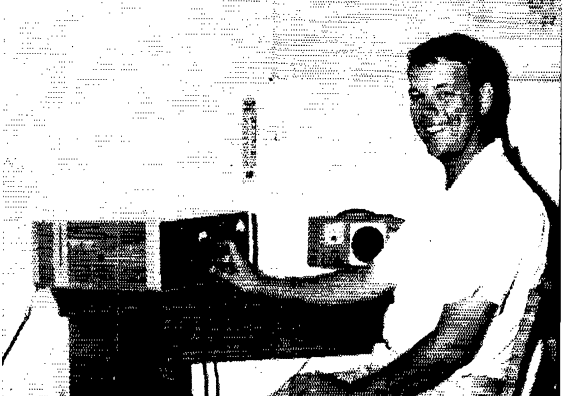
NUMBER OF COUNTRIES WORKED BY BANDS

LISTED ARE COUNTRY TOTALS MORE THAN { 5 ON 3.8 Mc. / 20 ON 7.2 Mc. / 50 ON 14.2 Mc. / 50 ON 21.25 Mc. / 25 ON 28.5 Mc }

(Lower Totals Not Listed)

CALL	3.8 Mc.	7.2 Mc.	14.2 Mc.	21.25 Mc.	28.5 Mc.	CALL	3.8 Mc.	7.2 Mc.	14.2 Mc.	21.25 Mc.	28.5 Mc.
K1RTB	6		52			W3TLN			56	50	
W1BIH	8		54			W3WJD			50	53	
W1HKK*	38	20	66			K4BUJ*	5				
W1NJL	28					W4BVV	16	37	61	62	
W1ONK	28		83	54	32	W4JFE	7		72		
K2DCA				52		W4KFC	14		72	63	35
K2DGT	13					W4LZW				56	
K2FC			58			W5AJY	7				
K2GXI	20	45	69	65	29	K5IKL				96	
K2IEG	25		96			K5MDX	23	32	72		34
W2BQM	13					W5KC	9				
W2CYX			61			K6EVR*	6	25	58	50	26
W2FXN			73	50		K8PUU	8	20	54	54	20
W2GBC			60			W8BF			50		
W2GKJ	6		51			W8NGO*	5		62	53	
W2WZ			61	53		W8NWO*	10	32	63	57	25
W2ZX					26	K9ECE				51	
WA2JBG			52			W9DUB	9		51	62	35
W3ALB	14		57			W9JYJ	6	20	55		
W3AYD			67			W9NZM	11				34
W3GHD			61			W9YSQ				52	
W3GHM*			56			W9YT*	13			51	
W3GRF*	13		68			KØIKL			50		
W3JTC			85			WØBTD	5				26
W3KFQ*	16		52			WØNFA			62		
W3KT			55	53		VE1BC	24				
W3MSK*	27	27	77	72	28	VE2UI	21		55		
W3PHL		55				VE3PV	8				

* Multioperator



Conditions weren't very good to Laos, but Clay, XW8AS, managed to contact a few anxious W/VE stations during the phone contest. Rig is a KWM-2 to a dipole, replaced since by a cubical quad.

ARRL Director Bob Denniston, WØNWX (of VP1JH fame) visits Canadian Director Noel Eaton (right), VE3CJ, at his Cayman Islands VP5BP QTH. Bob, christened "The Golden Fist," managed just a brief c.w. stint with the resultant pileup, with VE3CJ making a serious phone effort, good for nearly 1000 QSOs, 6th highest DX phone score. Understandably enough, Noel claims that a long wire automatically gains 15 db. when it's radiating "de VP5BP."

DX phone scores climbed skyward with these top operators with over 50,000 points earning special mention: XE1CV 327K, YV5AGD 252K, HC1AGI 231K, HI8DGC 230K, KP4AWH 220K, VP5BP 203K, FS7RT 167K, VP5CH 141K, LU1DAB 135K, OE1RZ 126K, PZ1AX 122K, CTIYE 119K, VP3HAG 105K, KW6DG 92K, YV5AKU 89K, KP4AVQ 82K, YV2CJ 62K, G3DO 61K, CO8JK 58K, HK4EB 55K, VQ2AT 53K, HR1MM 52K, F2MO 51K, 5N2JKO 50K, and multi-op CO8RA 141K, VP2GAA 58K.

The Clubs

Having lost three straight to the Frankford Radio Club and last year by a whisper, the Potomac Valley Radio Club could stomach the frustration no more. Dragging all their big guns to the front, the Washington-area crew bombarded all opposition with both barrels to smash the pursuers with 8,160,687 points. Outnumbered by the Frankford Club in entries, 60 to 48, the PVRC needed the really big scores to bag the cocobolo gavel, and outscore Frankford's 6,071,845. The Southern California DX Club maintained mastery over the Northern California DX Club for third place, while the Florida DX Club slipped into fifth with a thundering one-million-plus score. Watch that Florida gang in the future! Also topping one-million was the Order of Boiled Owls of New York who vastly improved their standing. A total of 27 clubs qualified for the listing, with many more ineligible for lack of three entries.

Certificates

Certificates are issued to each ARRL section leader on phone and c.w. and to each single-operator leading a country. A multiple-operator certificate is awarded to the highest scorer in ARRL section or country from which three such entries are received. Here's how many certificates are going out to happy recipients as a result of this year's fracas:

	c.w.	*phone*
Single-operator, W/VE	67	61
Multioperator, W/VE	3	0
Single-operator, DX	89	61
Multioperator, DX	1	0
Club	24	13

Disqualifications

The following are deemed ineligible for score listing or awards. In each case disqualification under contest rule 14 was in view of non-observance of FCC rules as reported by at least two accredited Official Observers, or by a single FCC citation. Such violations as out-of-band operation, phone splatter outside band edges, key clicks and spurious signals, etc. were the criteria for these disqualifications: *C.w.* — K2BMI, W2MUM, WA2TWG, K4LIQ, W5MCO, WA6AYF, W6OMR; *Phone* — W7BTH, K7MLD/2.

Finis

The 1962 ARRL DX Contest surely was a lot of fun, and let's look forward eagerly to the 1963 contest. But let's remind ourselves not to let our eagerness get the better of us in our operating practices, by keeping in mind this DX Contester's Code:

Don't be a DX hog.

X-ert your influence to promote clean operating techniques.

Courtesy is only a word until you practice it.

Obey all regulations.

Never test without a dummy load.

Timely calls mark a good operator, so *listen* first.

Employ proper phone procedure.

Send code properly.

Try your best to set an example for others to follow.

—*J. F. L.*

Twenty-Eighth ARRL International DX Competition

Operator of the station first-listed in each section and country is winner for that area. . . . The multiplier used by each station in determining score is given with the score — in the case of U.S.-Canada this is the total of the countries worked on each frequency-band used; in the case of non-W/K/KH6/KL7/VE/VO entries it is the total of the U.S.-Canada districts worked on each band. . . . The total number of contacts is listed next. . . . The letters A, B, and C approximate the input to the final stage at each station; A indicates power up to and including 150 watts; B indicates over 150 watts, up to and including 500 watts; C indicates over 500 watts. . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . Examples of listings: W3ECR 656,232-296-740-BC-80, or final score 656,232; multiplier 296; 740 contacts; power over 500 watts; total operating time 80 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator listings in each section or country tabulation; calls of participants at multi-operator stations are listed in parentheses. . . . In sections or countries where three or more multiple-operator entries appear, the top-scoring station is being awarded a certificate.

First time in the phone DX Contest yielded highest DX honors for XE1CV with 1214 QSOs, 90 multiplier, and 327,510 points. Carlos, who is secretary of the Mexican amateur society, LMRE, has participated in a couple of XE4, Revilla Gigedo, DX-peditions.

C.W. SCORES

ATLANTIC DIVISION

Eastern Pennsylvania

W3ECR[1] ..656,232-296-740-BC-80
W3ALB ..458,577-251-609- C-70
W3SQX ..267,723-209-427- C-77
W3OCU ..200,072-178-376- C- -
W3EQA ..192,418-178-363- C-46
W3KT ..191,646-163-378- C- -
W3CGS ..162,582-158-343- C-72
W3GHD ..76,720-112-229- C- -
W3ORU ..74,472-113-214- C-45
W3MQC ..63,504-112-189- C- -
W3FDH ..62,790-105-198- C- -
W3IMV ..61,380- 94-220- B-24
K3AIG ..37,485- 85-147- C-20
W3HNI ..26,532- 67-133- C-34
W3BUR ..24,336- 78-104- C- -
W3GRS ..22,311- 67-111- A-15
W3SOH ..20,865- 65-107- A- -
W3CAA ..20,493- 69- 99- A-15
W3YP[2] ..15,132- 52- 97- B-43
W3WUH ..13,050- 50- 87- B-10
K3HTZ ..10,293- 47- 73- A-38
K3JHG[3] ..9462- 38- 83- C- 6
K3JCT ..7320- 40- 61- A- -
W3ADZ ..7056- 42- 56- C- 8
K3JLI ..5313- 33- 55- A-14
K3HYT ..3780- 28- 45- B-15
K3JNP ..3441- 31- 37- A-20
W3NCW ..3360- 28- 40- A-11
K3RFB ..2464- 22- 38- B-20
W3URE ..1836- 18- 34- B- 9
W3HHK ..1620- 18- 30- A-10
K3MNT ..720- 12- 20- B- 7
W3JSA ..630- 14- 15- A- 4
W3LEZ ..330- 10- 11- B- 5
K3LSX ..294- 7- 14- A- -
K3CNN ..264- 8- 11- B- 2
K3OWE ..60- 4- 5- A- 1
K3LWY ..3- 1- 1- - -
W3KFQ (K3JGJ, W3KFQ)
366,605-227-539- C-92
W3WJD (K3s JJG NFA, W3WJD)
345,083-221-522-BC-96
W3MWC (W3s HHK MWC)
276,588-197-468- C-79
W3GHM (W3s GHM KDF NOH)
265,608-204-434- C- -
W3BYX (W3s BYX DAO)
198,390-170-389- B-92
W3DBX (W3s DBX ISE)
179,520-170-352- B-60
K3NUM (10 oprs.)
73,590-110-223- C-80
W3QMZ (K2JXX, W3QMZ)
56,145- 95-197- C-54
W3DAO (W3s BYX DAO GSY)
12,012- 52- 77- C- -

Md.-Del.-D. C.

W3GRF ..635,580-297-714-BC-80
W3MVB ..405,123-249-543-AC-91
W3EIV ..380,316-246-516-BC-80
W3IYE ..241,226-206-391- C-47
W3MFJ ..226,793,179-423- C-75
W3KA ..145,962-153-318- B-47
W3ZQ ..137,538-162-283- C-60
W3QQL ..102,340-140-245- B-40
W3MSR ..96,444-141-228- C-40
W3DRD ..76,200-127-200- C-35
W3AEL ..58,740-110-178- C-25
W3FRZ ..53,835-105-171- C-34
W3AFM ..41,724- 76-183- C-32
W3EVW ..40,500- 90-150- C-20
W3RNY ..37,230- 85-146- C-35
W3WV ..35,064- 72-163- C-67
W3WU ..18,000- 60-100- B- -
W3BKE ..14,382- 51- 94- B-20
W3EPR ..8928- 48- 62- C-18
W3GAU ..5640- 40- 47- B- 8
K3MZY ..3888- 27- 48- B-24
W4EXM/3 ..1653- 19- 29- A- 4
W3FMS ..918- 17- 18- C- 4
W3MEU ..900- 12- 15- A-14
K3JOZ ..663- 13- 17- B- 5
W3BVO ..95- 5- 7- B- 4
W3MSK (9 oprs.)
1,102,101-367-1001-BC-96
W3TMZ (K3NZV, W3TMZ)
480,972-269-597-AC-85
W3GQF (8 oprs.)
277,134-221-418-BC-75
W3AYD (W3s AYD IPO)
52,734- 94-187- C-25

Southern New Jersey

K2DCA ..391,980-235-556- C-67
W2FXN ..210,942-179-406- C-38
K2GHM ..138,165-151-305- C-75
W2GGL ..89,154-127-234-BC-47
W2HDW ..56,970- 90-211- A-20
K2OEA ..48,450- 95-170- A-28
WA2IEK ..42,504- 88-161- C-52
K2CPR ..40,830- 94-145- B-28
WA2BLV ..26,280- 73-120-AB-12
W3DVF/2 ..22,848- 68-112-AC- -
W2QKJ ..18,480- 56-110- B-30
W2SDB ..12,690- 47- 90-AB-20
W2PAU ..9828- 52- 63- C-10
K2BG ..8643- 43- 67- B-15
W2NSJ ..8052- 44- 61- B-14
W2FYS ..7020- 36- 65- B-15
W2DAJ ..4488- 34- 44- B- 9
WA2HSP ..3321- 27- 41- A- 5
W2BEI ..324- 9- 12- - -
WA2HJF ..297- 9- 11- A- 5
K2SQM ..147- 7- 7- A- 2
K2OXN ..135- 5- 9- C- 2
K2HBY ..126- 6- 7- A- 4
WA2IZS (W2QDY, WA2IZS)
216,546-187-386- B-85
WA2KWS (2 oprs.)
5130- 30- 57- B-24

Western New York

W2DSB ..129,600-144-300- C-48
W2YRH ..109,500-125-292- C-60
W2BJH ..95,634-126-253- C-56
K2TQC ..91,392-128-238- B-36
K2LWR ..83,688-101-296- B-56
K2INP ..38,250- 85-150- C-30
W2DOD ..34,286- 79-146- B-20
WA2LDC ..32,964- 82-134- C-26
W2QQ ..19,392- 64-101- B-12
W2LJX ..13,311- 51- 87-AC-50
W2FXA ..9594- 41- 78- B- 5
W2PDB ..7560- 36- 70- C-10
K2DJD ..6435- 39- 55- A- 7
K2KBI ..3219- 29- 37- B-31
W2KAT ..960- 16- 20-AB-10
WV2WGI ..792- 11- 24- A-28
WA2OIL ..108- 6- 6- - -
WA2QMJ ..40- 4- 4- A- -
W2CXM (5 oprs.)
66,690- 95-234-AC-78

Western Pennsylvania

W3ZAO ..298,368-244-444- C-60
W3LIV ..15,675- 55- 95- A-36
K3PZU ..7065- 45- 53-AC-23
W3KQD ..5952- 31- 64- A-15
W3UHN ..1254- 19- 22- A- 7
W3VK ..468- 12- 13- - -
K3NHZ ..429- 11- 13- A- 5

CENTRAL DIVISION

Illinois

W9WNV ..229,467-223-343- C-48
W9NII ..124,122-151-274- B-58
W9IRH ..98,425-127-259- C-68
W9DWQ ..79,296-112-237- C-40
W9JGV ..29,820- 70-142-AC-29
W9WIO ..27,588- 76-121- B-15
K9WRX ..22,776- 73-104- C-19
W9WYB ..20,808- 68-102- C-10
W9QQG ..18,849- 61-103- B-30
K9VPY ..15,552- 48-108- B-36
W9GMS ..12,600- 50- 84- B-32
K9LSN ..12,430- 55- 76- B-22
W9IVG ..5439- 37- 49- C-14
K9MBM ..3030- 30- 39- C-36
W9KHG ..2520- 24- 35- B- 9
W9ZYD ..1932- 23- 28- - 6
K9ZQW ..1539- 19- 27- B-13
W9CLH ..756- 12- 21- C- 2
W9QM ..396- 11- 12- C- -
K9KDI ..216- 8- 9- B- -
K9JSV ..147- 7- 7- A- -

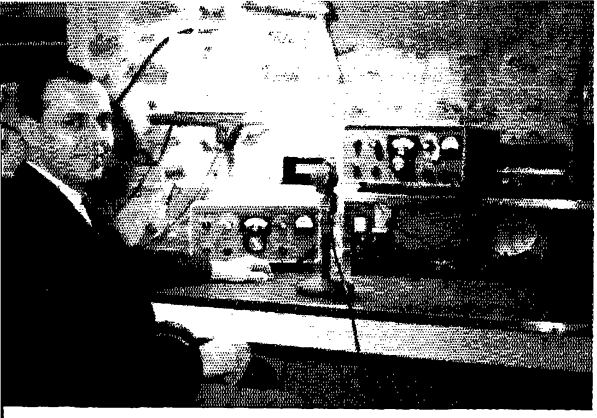
Indiana

W9LKI ..10,062- 43- 78- B-21
K9LVK ..7920- 44- 60- A-30
K9IOO ..528- 11- 16- A-12
K9VRU (6 oprs.)
78,720-128-205- C-96

CLUB SCORES

Club	*Score*	*C. W. Winner*	*Phone Winner*
Potomac Valley Radio Club	8,160,687	W4KFC	W4KFC
Frankford Radio Club	6,071,845	W3ECR[1]	W2FXN
Southern California DX Club	2,803,046	W6IBD	W6KPC
Northern California DX Club	2,145,491	W6LDD	W6SIA
Florida DX Club	1,600,742	W4DQS	.....
Order of Boiled Owls of New York	1,323,639	W2AYJ	K2FC
Connecticut Wireless Assn.	891,804	W1BIH	W1BIH
Lake Success Radio Club (N.Y.)	847,689	K2DGT	K2DGT
Ohio Valley Amateur Radio Assn	777,798	W8FGX	.....
South Jersey Radio Assn	657,346	K2DCA	K2DCA
Niagara Frontier DX Assn. (Mass.)	612,661	K2TQC	K2GXI
Southeastern DX Club (Ga.)	571,422	W4DXI	.....
Milwaukee Radio Amateurs' Club	484,395	W9GIL	W9GIL
Waltham Amateur Radio Assn. (Mass.)	391,272	K1DIR	W1NJL
Nashua Mike and Key Club (N.H.)	321,007	K1RTB	.....
Order of Boiled Owls of Ohio	298,480	W8IBX	.....
Virginia Century Club	230,397	W4OPM	.....
San Diego DX Club	160,281	K6EC	.....
Westpark Radiops (Ohio)	157,035	W8YPT	W8BF
Willamette Valley DX Club (Ore.)	125,581	W7BTH	.....
Chicago Suburban Radio Assn	105,120	W9DWQ	.....
The DX Club (Pa.)	85,614	.....	.....
Columbus Amateur Radio Assn. (Ohio)	56,282	.....	.....
Order of Boiled Owls of New Mexico	53,490	W5CK	.....
Rochester DX Assn	46,769	.....	W2SNI
North Penn Amateur Radio Club	39,243	W3BUR	.....
Horseshoe Radio Club (Pa.)	25,896	W3LIV	.....

[1] W3MFW, opr.



Neat shack layout and operator K2DCA, who earned *three* certificates for the 1962 ARRL DX Contest. Besides winning top c.w. honors in Southern New Jersey, Paul was tops in the South Jersey Radio Assn. on both phone and c.w. A nifty c.w. score of 391,980 was one of the higher U. S. A. scores.

Wisconsin

W9RQM...212,355-195-363-BC-49
W9GIL...164,673-171-321- C- -
W9VZP...152,079-163-311- C-80
W9QYW...89,700-130-230- B-29
W9VSO...79,695-114-233- C-26
W9KXK...53,268- 92-193- C-36
W9HN....47,784- 88-181- C-26
W9RKP....38,250- 75-170- -20
W9SCZ....14,742- 54- 91- A- -
W9RH....13,674- 53- 86- C-23
K9OPF....8100- 40- 70- A-15
K9YBC....5217- 37- 47- B-15
K9VQP....1248- 16- 26- A-22
K9YEL....144- 6- 8- A- 8
W9YT (5 oprs.)
228,096-192-396- C-69

DAKOTA DIVISION

North Dakota

WØSDN....10,209- 41- 83- A-20

South Dakota

WØBLZ....20,790- 63-110- C- 8
WØWUU....1980- 22- 30- B-14

Minnesota

WØMPW...164,673-171-321- C-62
KØBPO....97,464-131-248-BC-65
KØIKL....75,924-111-228- B-58
KØVTG....20,274- 62-109- B-35
WØIJN....918- 17- 18- A-15
WØYC (KØs LAX UXQ)
2430- 27- 30- A-30

DELTA DIVISION

Arkansas

W5GFT....4896- 34- 48- B-22
K5ALU....1701- 21- 27- B-10

Louisiana

W5KC....118,281-161-307- C-61
W5BUK...94,164- 133-236- C-63
W5VSQ....11,985- 51- 81- C-41

Mississippi

W5CKY...263,310-220-399- C-55

Tennessee

K4LPW...215,310-185-388- B-50
W4HOS/4....3567- 29- 41- B-14
WA4BXZ....810- 15- 18- B-29

GREAT LAKES DIVISION

Michigan

W8KSR....79,530-110-241- C-44
K8QJH....77,520-120-216- C-50
W8UCI....62,109-103-201- B-49
W8NGO....36,960- 88-140- B-22
W8EW....25,740- 65-132-AC-29
W8SCU....16,929- 57- 99- C-19
W8YBH....3444- 28- 43- C-19
K8ERO....2952- 24- 41- B-35
W8MRS....390- 10- 13- A- 7
W8SPO....126- 6- 7- A- 2

Ohio

W8FGX...472,752-268-588- C-60
W8ZJM...256,048-208-411-BC-54
W8IBX...112,036-148-255- B-42
W8YPT....91,872-132-232- B-38
W8ZCQ....81,252-122-222- C-32
K8MTI....69,741-123-189- B- -
K8RMK....36,351- 83-146- C-30
W8JSU....35,376- 67-176- C-18
W8KC....24,003- 63-127- B-27
W8JIN....21,939- 71-103- C-12
K8NMG....17,226- 58- 99- B- -
K8SWE....15,552- 54- 96- B-30
W8JAQ....14,811- 51- 97- C-14
W8GMK....13,860- 60- 77- A-20
W8YAH....12,705- 55- 77- B-35
W8DWP....12,699- 51- 83- C-20
W8EBZ....7866- 46- 59- C-19
W8AJW....6552- 39- 56- A- -
K8IPS....4800- 32- 50- A-12
W8KMF....3510- 30- 39- A- 6
K8PYD....1224- 17- 24- A- 9
W8VZE....912- 16- 19- B- 4
K8HTM....504- 12- 14- B- 5

HUDSON DIVISION

Eastern New York

WA2OJD...226,440-185-408-BC-64
W2HO....124,944-137-304- C-46
WA2IGC...31,290- 70-149- A-52
W2NCI....19,488- 58-112- C-14
K2DEM....27- 3- 3- C- 1

N. Y. C.-L. I.

K2DGT...564,138-279-674-BC-92
W2AYJ...375,802-238-527- C-57
W2WZ....345,030-217-530- C-45
W2ESO...220,170-205-458- C-44
W2IRV....166,263-157-353- B-40
WA2TJA..138,600-150-308- C-31
K2FC....129,054-137-314- C-35
W2SUC...122,157-147-277- C-35
W2GKZ...106,173-141-251- C-29
K2YOR....78,120-120-217- C-30
WA2KSD...64,521-107-201-
ABC-59
W2ZKQ....62,832-112-187- C-25
W2KIR....60,822-109-186- B-30
W2HMJ....53,288- 79-224- C- -
W2AZS....40,716- 78-174- C-27
K2ZYR....30,150- 67-156- A- -
W2ICO....29,280- 61-160- B-28
W2OBX....24,075- 75-107- A-20
K2RTH....7749- 41- 63- B-14
W2NCG....6012- 36- 57- A-16
WA2ICP....3969- 27- 49- B-13
K2JOK....3330- 30- 37- A- 6
W2JB....2898- 23- 42- B-12
W2ELZ....2064- 24- 37- B-30
WA2VNW....154- 7- 8- A-14
W2NHH....126- 6- 7- A-11

Northern New Jersey

K2GUN...299,475-225-449- C-74
W2AIW....47,085- 73-222- - -
K2FAC....43,239- 71-203- B-35
W2HUG....26,136- 72-121- A-25
W2EQS....15,876- 63- 84-AC- -
K2EKM....15,582- 49-106-AC-13
W2EHN....14,025- 55- 87- B-15
WA2GIX....8460- 47- 60- B-18
W2JKH....3663- 33- 37- B- -
WA2IDM....3198- 26- 41- A- 8
WA2OGC....1620- 18- 30- B-10
WA2DIJ....858- 13- 22- A- 4
K2QAR....810- 15- 18- - -
WA2MYB....585- 13- 15- A- 4
WA2FBF....270- 9- 10- A- 4
WA2KAZ....270- 9- 10- A- 4
WA2OEY....210- 8- 10- A- 5

MIDWEST DIVISION

Iowa

WØFDL...123,669-151-273-BC-60
KØQDI....10,734- 73-186- A- -
WØBSY....1560- 20- 26- A- 8

Kansas

WØDAE...136,092-148-293- C-48
KØYRQ....33,948- 82-146- C-40

Missouri

WØBMM..204,980-185-336- C-94
WØBTD...118,920-170-292- A-60
WØTCX....58,092-103-188-BC-48
WØGUV....27,888- 83-112- C-41
KØVSH....1455- 33- 45- A-30
KØVUR....213- 9- 9- - -

Nebraska

KØMRS....192- 8- 8- A- 4

NEW ENGLAND DIVISION

Connecticut

W1BIH...419,676-246-570- C-65
W1IKB....94,875-115-275- B-41
K1MLI....82,368- 96-286- C-48
W1QV....41,472- 96-144- C-20
W1WY....19,380- 68- 95- C-18
W1AW[5,6]....10,800- 48- 75- C- -
W1OJR....10,350- 50- 69- B-11
K1NHR....6930- 35- 66- A-12
W1OPB....6405- 35- 61- A-30
W1NTH....4773- 37- 43- B-12
W1BDI[6]....2940- 28- 35- B- 4
K1GZJ....945- 15- 21- - -
K1MIT (K1MIT, W2FU)
816- 16- 17- A-37

Maine

W1GKJ....35,256- 78-154- B-26
W1TJQ (W1s TJQ VYE)
8568- 42- 68- C-33

Eastern Massachusetts

K1DIR....258,687-201-429-BC-73
K1MOD...157,440-164-320- B- -
W1NJL....88,011-127-231- B- -
K1PNN....14,912-116-244- B-32
W1EHT....64,971- 98-221- B-34
W1NS....42,745- 83-173-BC-18
K1NOL....35,696- 72-156- A-40
W1BQL....14,112- 56- 84- A-33
K1MEM....4368- 42- 68- B- 9
W1PLJ....3159- 27- 39- B-20
W1RST....1122- 17- 22-AC- 3
K3JOY/1....3- 1- 1- A- -

Western Massachusetts

W1JYH...383,328-242-530- C- -
W1AEW....55,752-101-184- B-39
W1UUK....22,848- 64-119- A-46
K1SAW....7182- 38- 63- B- -
K1QFC....612- 12- 17- C- -

New Hampshire

W1FZ....224,259-181-413- C- -
K1RTB....210,541-173-442- C-66
K1PIA....1860- 20- 31- A- 5
K1QID....126- 6- 7- B- 3

Rhode Island

K1LDK....25,410- 70-121- B-18
W1RFQ....22,143- 61-121- A-17
K1LPL....15,561- 57- 91- A-15
W1AWE....8610- 40- 72- -14
W1DDD (K1LZW, W1s AUT YRC)....16,050- 50-107- C-25

Vermont

W1QMM..142,350-146-325- C- -

NORTHWESTERN DIVISION

Alaska

KL7JDO...12,012- 42- 96- B-44
KL7DQT....5800- 25- 78- A-13
KL7DEM....4446- 26- 55- A-22

Montana

K7CTI....4446- 26- 57- B- 6
K7ABV....1152- 16- 24- A- 8

Oregon

W7BTH....42,504- 88-162-BC- -
W7GBW...23,010- 65-118- B-17
K7ADL....18,816- 56-112- C-29
W7AC....10,656- 48- 74- C-10
W7HKT....7980- 35- 76- B- -
W7DLR....6528- 34- 64- C-21
W7QY....4557- 31- 49- C- -
W7DIS....4050- 30- 45- A-32
W7GHB....2880- 24- 40- B-12
W7ENW....2700- 25- 36- C- -
W7PLI....1932- 23- 28- A-10
W7IYW....1900- 25- 30- C- -
K7JYE....1260- 15- 28- A-22
K7GIP....92- 4- 8- A- 4

Washington

W7PQE...139,062-147-316- C-60
W7ESN....44,820- 83-180- C-28
W7IEU....9384- 46- 68- B-70
W7MH....9198- 42- 73- -16
K7BVZ....4950- 33- 50- B-26
K7JCI....344- 8- 15- A- 7
K7QWC....80- 5- 6- A- 6

PACIFIC DIVISION

Hawaii

KH6IJ....146,520-148-330- C-60
W7UXP/KH6
6048- 32- 63- A-16

Santa Clara Valley

W6HOC...176,886-186-317- C-55
W6ATO....115,020-142-270- C-80
W6ISQ....106,920-135-264- C-43
W6ZMW...91,080-132-230- C-55
W6SC....72,732-116-209- C- -
W6WX....72,207-113-213- C-51
W6KEV....63,282-106-199- C-38
K6HOR....55,872- 96-194-BC-40
K6BWX....57,873-101-191- C-69
WA6HRS..51,798- 97-178- B- -
K6IEC....25,773- 71-123- C-38
K6VVA....25,185- 73-115- A-13
K6UYZ....16,164- 56- 98- C-50
W6QDE....16,380- 52-105- C-18
K6JC....12,096- 42- 96- B-12
W6HVN....9870- 47- 70- C-38
W6FYM....9798- 46- 71- C-19
WA6DTA....8190- 42- 65- C- -
W6RFF....6105- 35- 61-BC-14
WA6NYK...2448- 24- 34- B-16
W6CLZ....1596- 19- 28- B-11
WA6TCF....1170- 15- 26- B- 7
WA6PMK...1008- 14- 24-AC- -

East Bay

W6LDD...219,375-195-375- C-80
W6KG....218,790-187-390- C-94
W6PQW....36,207- 81-149- C- -
WA6BBJ....14,010- 52- 90- A-20
W6FLT....12,285- 45- 91- C-22
W6IPH....3375- 25- 45- C- 8

San Francisco

W6WB....128,643,137-313- C-38
W6ERS....92,880-129-240- C-80
W6BYB....78,480-120-218- C-55
W6MSM...55,539- 99-187- C-61

VQ2AT ,who was really popular for s.s.b. two-ways, logs another contact with XYL Pat looking on. Art, who led Africa on phone, is still looking for Utah to complete his WAS.

W6GQK....29,216- 86-152- C-30
K6OHJ....37,818- 83-152- C-25
W6GPB....12,393- 51- 81- C-10
W6WLV....1536- 16- 32- A-19

Sacramento Valley

W6ONZ...185,214-172-361- C-66
W6GRX...121,836-142-286- C-62
W6SIA....17,112- 62- 92- C-16
W6BIL....8775- 45- 70- C-38

San Joaquin Valley

W6UJ....120,558-142-283- C-75
W6KJS....92,748-131-236- C- -
W6BVM....46,872- 93-168- - -
W6UDR....44,226- 91-162- C-17
W6EFV....15,300- 50-102- C- -
W6BYH....8241- 41- 67-BC- 7
W6MYP....600- 10- 20- B- 6

ROANOKE DIVISION

North Carolina

W4PLL...135,450-150-301- C-31
WA4FJM....2392- 26- 31- A-30

South Carolina

K4CSB....21,810- 65-112- A-35

Virginia

W4KFC...721,112-310-762-AC-76
W4RQR...117,354-261-572-BC-55
W4JAT...273,861-207-441- C-66
K4ZKI...252,860-188-449-BC-66
W4JFE...248,300-178-465- B-58
W4OPM...120,600-134-300- C-30
K4ORQ...103,296-128-269- C-66
W4WBC....83,979-129-217- C-44
W4BVV....80,396-119-228- C-42
K4SXT....64,584-104-207- A-39
W4ZM....55,536-104-178- C-28
W4VBX....47,100-100-158- C-20
K4WUY....20,340- 60-113- B-15
W4LRN....19,890- 65-102- C-20
W4GF....19,448- 68- 96- C- -
W4SNU....15,732- 57- 92- B-50
W4AMP....11,016- 51- 72- A-28
W4IYR....9585- 45- 71- C-18
W4JJL....5775- 35- 55- C- 1
K4ZVS....5508- 36- 51- A-11
W8SIJ....2268- 21- 36- B-10
W4DLA....588- 14- 14- B- 6
W4VYB....216- 8- 9- A- -
W4KXV (4 oprs.)
754,416-312-806- C-96

West Virginia

W8UMR...25,125- 75-113- A-13
W8BKK....12- 2- 2- A- 1

ROCKY MOUNTAIN DIVISION

Colorado

W0CDP....92,430-130-237- C-58
W0DZH....13,804- 98-149- C-28
K0RTI....280- 10- 10- A-10

Utah

W7BAJ....13,728- 52- 88- A-28
W7POU....6048- 28- 72- A-25
K5UYF/7....897- 13- 23- A- 8
W7EHX (W7s EHX POU)
60- 3- 4- A- 1

New Mexico

W5CK....28,272- 76-121- C- -
K5STL....22,620- 60-127- B-36
K5MAT....12- 2- 2- A- 2

Wyoming

W7PGS...206,853-191-363- C-59

SOUTHEASTERN DIVISION

Alabama

W3CHH/4...22,410- 68-110- C-50
W4SYY....12,420- 46- 90-AB-29
K4BQU....11,025- 49- 75- A-24
K4ZYP....9588- 47- 68- A-25
K4KJD....3612- 28- 43- A-20
W4DS....3348- 31- 36- - -

Eastern Florida

W4DQS...539,280-280-642- C-80
K4TML...154,344-264-575- C-54
W4HUE...294,372-224-444- C-62
W4AZK...251,856-198-424- C-58
W4CHA....44,496-103-144- C-28
W4LVV....35,126- 91-132- C-25
W4QVJ....25,764- 76-113- C-14
K4RQE....12,168- 52- 78- B-41
WA4APB....1134- 14- 27- A-10
W4EEO....684- 12- 19- C- 8
W4RJL....198- 6- 11- A- 6

Western Florida

W4SHW....28,425- 75-127- A-26

Georgia

W4YWX...231,075-195-395- C- -
W4DXI...197,580-185-356-BC-79
K4BAI...179,478-169-354-BC- -
W4BFR....80,610-128-210- C- -
K4TEA....76,464-114-177- A- -
K4BVD....33,792- 88-128- B-10
W4HYW....3108- 28- 37- C- 7
W4BHG....360- 10- 12- B- 3

SOUTHWESTERN DIVISION

Los Angeles

W6IBD...293,262-222-441- C-79
W6CYI...195,144-178-366- C-76
W6TZD...189,502-178-353- C-61
W6FSJ...158,895-165-321- C-64
W6ANN...76,320-120-212- C- -
W6PBI....53,298- 94-189-BC-48
WA6IPY....33,966- 74-153- A-15
W6CYV....21,504- 61-112- C-16
W6OES....19,845- 63-105- C- -
W6VUZ....15,895- 55- 97- B- -
W6NEX....12,903- 51- 85- B-29
W6APH....12,900- 50- 86-BC-15
WA6KMF....8364- 41- 68- A-20
WA6UHM....6188- 34- 62-AC-30
W6DQH....5700- 38- 50- C-34
W6OEO....5100- 34- 50- B-21
K6EGF....4312- 28- 52- A-23
WA6GFE....2898- 23- 42- A-15
WA6TLL....1836- 17- 36- A-23
W6WNR....1248- 16- 26- A-12
K6YYJ....726- 11- 22- B- 4
WA6GDS....684- 12- 19- A- 3
W6IWE....159- 9- 17- A- 3
W6GEB....132- 8- 18- A- 4
WA6HGC....108- 8- 17-AB-50
K6JBP....12- 2- 2- B- 1
K6MQG....3- 1- 1- - -
W6RW (4 oprs.)
620,712-296-699- C-90
K6EVR (5 oprs.)
586,376,296-661- C-91
W6NJU (K6s LKG YRA, W6NJU)
103,930-132-270- C-70
W6AJJ (4 oprs.)
63,180-108-195- C-90

WA6AYU (K6QPH, WA6AYU)
23,316- 67-116- B-70

Arizona

W7ATV....17,628- 98-162- C-36
W7ENA....7869- 43- 61- A-18

San Diego

W6HJT...261,600-200-436- C-71
K6EC....64,848-112-193- B-26
W6CAE....63,138-109-195- C-20
W6CHV....31,995- 79-135- B-35
W6FAY....1377- 17- 27- C- 5
K6CQF....264- 8- 11- B- -

Santa Barbara

W6AGO...118,110-155-254- C-53

WEST GULF DIVISION

Northern Texas

W5DWO...35,313- 79-149- B-44
W5OLG....15,372- 61- 81- C-19
W5QF....3915- 29- 45- A- -
W5HW....1320- 20- 22- A-14

Oklahoma

W5EHY....7920- 10- 68- B-17
K5CPS....1620- 20- 27- B- 8

Southern Texas

W5WZQ...283,716-222-426- B-61
W5HRR...200,220-182-367- C-47
W5ARJ....42,717- 87-165- B- -
W5LJT....16,638- 59- 91- A-24
W5VA....6015- 31- 65- C-26
W5PM....2850- 25- 38- C- 5
W5KLN....130- 10- 15- A-12
W5ACL....3- 1- 1- B- 2
K5BHF (4 oprs.)
13,965- 49- 95-BC-56

CANADIAN DIVISION

Maritime

VE1EK....15,582- 49-106- A-15
VO2NA....11,808- 41- 96- B-20
VE1AEC....3393- 29- 39- B-22
VO1AW....2484- 18- 46- A- 7
VE1AE....2337- 19- 41- A- -

Quebec

VE2BV....114,587-121-316- B-39
VE2AYU....4224- 32- 44- B-28

Ontario

W0AIH/VE3
436,590-245-594-AC-66
VE3ES....66,738- 98-227- A-45
VE3DRB...32,844- 68-161- C-56
VE3AGX...26,304- 64-137- B-53
VE3HB....15,369- 47-109- B-32
VE3RIT?..10,800- 50- 72- B- -
VE3ON....6720- 35- 64- A-11
VE3PE....1938- 19- 34- C- 4
VE3BPS....624- 13- 16- A-20
VE3BWY (VE3s BWY EWY)
22,338- 73-102- C-12

Manitoba

VE4XO....91,800-120-255- B-55
VE4JB (VE4s JB MF)
50,430- 82-205- C-79

Saskatchewan

VE5JV....1464- 31- 48- C-11
VE5PM....3192- 28- 38- B-20

Alberta

VE6HG....20,670- 53-130- A-31

British Columbia

VE7FC (VE7s FC QH)
33,534- 69-161- C-70

AFRICA

Mozambique

CR7IZ....18,675- 25-249- A-12

Spanish Morocco

EA9AP....20,300- 28-242- A-10

Liberia

EL4A....71,496- 36-662- A-24

Algeria

FA8RJ....93,900- 50-626- A- -
FA2GL....6180- 20-103- A- -

Sudan

ST2AR....44,268- 31-134- A- -

Kenya

VQ4HX....13,920- 29-160- A- -

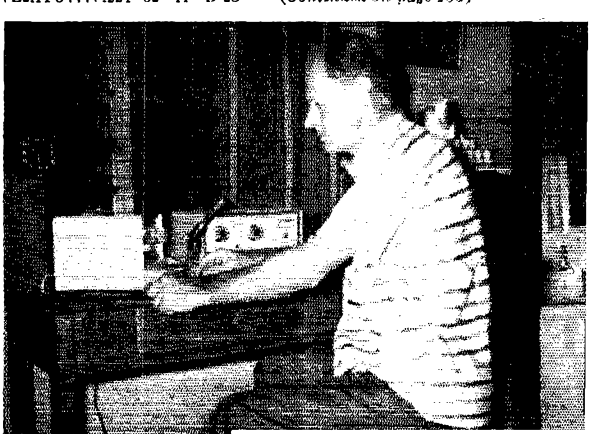
Mauritius

VQ8BM....3060- 17- 64- A-50

Southern Rhodesia

ZE2JS....47,814- 39-410- A-33

(*Continued on page 106*)



W3OVU found operating "from the other side of the fence" as 9G1DT a real pleasure. Operating time was limited by the availability of the generator, but when power was there, 9G1DT with this simple operating equipment really made hay.

2-Meter Moonbounce

OUR COVER

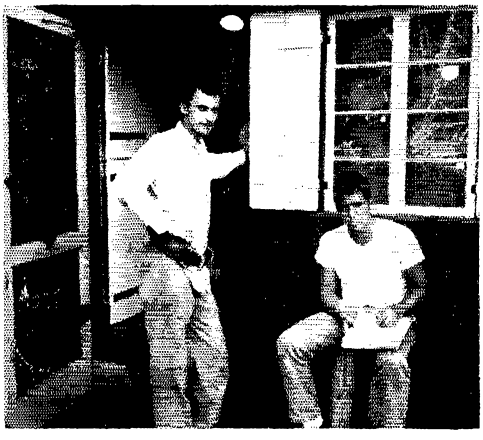
Our cover this month is of as big a 2-meter beam as you are ever likely to see. We couldn't quite squeeze them all into the cover photo, but there are 480 elements quivering in the sunlight. The boom consists of 140 feet of aluminum TV tower, and suspended from it is a small fortune in aluminum rod and tubing.

The first successful effort to reflect signals from the moon used modified Signal Corps radar equipment operating near 110 Mc. The power was high, the receiver complicated, the antenna tremendous[1] — but the signal that came back was not of such quality as to encourage amateurs to think that they could duplicate the feat.

That didn't keep some from trying, and by 1953 W4AO and W3GKP had demonstrated that hams could do it.[2] Using all the power they could muster legally, and a tremendous stacked rhombic aimed at the rising moon, they got signals of a sort back to their own receiving gear. The reception consisted of a wailing indefinite sound that could be identified as a moon echo mainly by its time lag after the one-second transmitted pulses. Moonbounce on 144 Mc. was still quite a way from being a quick-and-easy approach to 2-meter WAS!

Since then a few more amateurs, using various very large 144-Mc. arrays, have succeeded in recording their own echoes from the moon, but actual two-way moonbounce communication over long paths was not accomplished until W1BU and W6HB turned the trick on 1296 Mc. in the summer of 1960.[3] Here again, the signals were extremely weak, barely readable c.w. — but they were identifiable signals from the other side of the continent.

[1] "A DX Record: To the Moon and Back," Kaufman *QST*, May, 1946, p. 65.
[2] "Lunar DX on 144 Mc.!", *QST*, March, 1953, p. 11.
[3] "Coast to Coast Via the Moon on 1296 Mc.!", *QST*, September, 1960, p. 10.



In front of the transmitter shack are W1ZIG and K1HMU We were going to take a picture of the gear inside, but there was just no room for a camera!

The group in back of the W1BU effort had achieved some degree of success with their own echoes on 144 Mc., but apparently nobody else was in the mood to try while they were making their early efforts on that band, and finally they moved to the 1215-Mc. band where there seemed a better chance of success. Little was heard of 144-Mc. moonbounce projects thereafter for quite a spell.

144-Mc. Moonbounce Revived

Not everyone had given up the idea, however. Least of all Ned Conklin, K1HMU, and Chip Brown, W1ZIG, of Farmington, Conn. Big-antenna men from way back, Ned and Chip were determined to pull the 144-Mc. moonbounce trick off. Hampered by the fact that they attend different colleges (Ned is at Yale, Chip at Worcester Tech) they have put in nearly every available minute of their free time for more than two years building antenna systems that make the average big 2-meter beam look like a TV antenna for urban use.

Their first successful antenna was pictured in November, 1951, *QST*, pages 87 and 89. Using 8 24-foot-boom plus-sign Yagis, arranged so that they could be rotated vertically and horizontally, Ned and Chip were on the air several nights at the end of the summer "vacation" of 1961, keeping skeds with W6DNG, Long Beach, Cal. While no complete exchange of information was made, signals were heard each way over this 2500-mile path. We've heard W6DNG's tapes and can vouch for the fact that K1HMU did put in an identifiable signal at Long Beach — the only known instance of 144-Mc. signals being transmitted to a distant point by the lunar route. But back-to-school time forced suspension of the tests before a complete two-way could be made.

480 Elements

Planning continued through the winter, and the first spring weather found W1ZIG and K1HMU hard at work on the antenna-to-end-all-antennas. This would have 16 30-foot Yagis in phase, with crossed elements fed so that they could be used for either right or left circular polarization. You see the results on this month's cover, all 480-elements worth!

(Continued on page 160)

CANADA—HONDURAS/MEXICO

Canadian amateurs may now handle third-party traffic with Honduras and Mexico, under the terms of agreements recently signed with those two countries. With Costa Rica and Venezuela earlier on the list, plus the U. S., this brings to five the total of the countries with which such traffic is permissible. The customary restrictions apply — i.e., the messages must not be of sufficient importance to justify use of public communications services, and of course there must be no direct or indirect financial compensation.

GET APPLICATIONS FROM FCC DISTRICTS

With the transfer to Gettysburg, Pa., of a portion of the amateur license-processing unit, August *QST* announced that henceforth completed examinations by mail should go to the new address. As the item pointed out, however, requests for application blanks and test papers still should be directed to the FCC district office having jurisdiction. Prospective hams who misread the item found that Gettysburg does not carry a supply of forms and papers. Only the completed applications are to be addressed there.

RTTY IDENTIFICATION, PART II

The League has long been concerned with practical difficulties encountered by RTTY enthusiasts in meeting the requirement for dual identification — i.e., a second call-signing on c.w. telegraphy. An earlier request of FCC was denied because of complications our proposal would have caused in the monitoring activities of the Commission. A second proposal, aimed at easing the requirement in RTTY operations without burdening the Commission's monitoring responsibilities, has now been filed as follows:

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

In the Matter of

Amendment of Section 12.82 of the Commission's Rules to Modify Identification Requirements For Amateur Radio Teletype Stations

PETITION FOR RULE MAKING

The American Radio Relay League, Incorporated, by its General Counsel, respectfully requests that Section 12.82 (a) (2) of the Commission's Rules and Regulations be amended so as to make it unnecessary for amateur radio teletype stations to transmit the call sign or signs of the station or stations being called or communicated with by telegraphy using the International Morse Code.

In support whereof, the following is respectfully submitted:

1. Section 12.82 (a) (1) of the Commission's Rules requires amateur radio stations to transmit the call sign or signs of the station or stations being called or communicated with at the beginning and end of each transmission or series of transmissions, at least once every ten minutes or as soon thereafter as possible during a series of transmissions between stations having established communication, and at least once every ten minutes during any single transmission of more than ten minutes duration. Section 12.82 (a) (2) reads as follows:

"(2). The required identification shall be transmitted on the frequency or frequencies being employed at the time and, in accordance with the type of emission authorized thereon, shall be by either telegraphy using the International Morse Code, or telephony. In addition to the foregoing, when a method of communication other than telephony or telegraphy using the International Morse Code is being used or attempted, the prescribed identification shall also be transmitted by that method."

2. An amateur station conducting teletype transmissions now is required by Section 12.82 (a) (2) to transmit the call sign or signs of the station or stations being called or communicated with as well as its own call sign both by teletype and by telegraphy using the International Morse Code. The telegraphic identification requires the interruption of the teletype transmissions, either by hand or automatically. Because the station or stations being called or communicated with and their call signs usually vary with each series of transmissions, automatic means of transmitting the required telegraphic identification seldom may be used. The result is that the telegraphic identification usually must be made by hand, thereby nullifying many of the automatic aspects and benefits of teletype communications.

3. The League, by a petition for rule making filed on August 17, 1961 (RM-277), requested that Section 12.82 (a) (2) be amended to completely eliminate the requirement for telegraphic identification by amateur teletype stations. The Commission, by a memorandum opinion and order released February 26, 1962 (FCC 62-214; 22 RR 1573), denied the petition with the following explanation:

"4. The dual identification requirement is necessary for the Commission properly to perform its duties. Amateur stations are not assigned specific frequencies, and as a consequence, the interference resulting from the overlapping of signals makes identification difficult at best. Infraction notices are issued only upon positive identification. Without the dual identification requirement, positive identification would be very difficult for the monitoring stations, and practically impossible for the Commission's mobile units which are not equipped to receive radioteletype transmissions. It appears to the Commission that the advantage to the Amateur service as a whole in having proper and prompt enforcement of the Amateur Rules and Regulations outweighs any possible advantage to be gained from the relaxation of the present identification requirements."

4. It is respectfully submitted that the Commission's identification needs will be fully met by modifying the present dual identification requirement for teletype operation only to the extent of making it unnecessary for telegraphic transmission of the call sign or signs of the station or stations being called or communicated with by a station conducting teletype transmissions. The Commission's monitoring stations and mobile units, as well as the League's Official Observers, still will be able to identify the transmitting station by the telegraphic transmission of its own call sign. Should the Commission desire to learn the identity of the station or stations called or communicated with, it needs only ask the transmitting station to supply the desired information from the logs it is required to maintain.

5. The benefits from the requested amendment will be most substantial to the Amateur Radio Service. A simple automatic keyer may be used to transmit the required telegraphic identification of the transmitting station each ten minutes.[1] Further improvements and refinements in

(*Continued on page 160*)

[1] A suggestion has been received by the League that telegraphic identification of the transmitting station might be superimposed upon the carrier without interrupting the teletype transmissions. It is suggested that any notice of proposed rule making based upon this petition invite comments and suggestions on such a method of telegraphic identification.

• Recent Equipment —

Waters Q-Multiplier

DESIGNED specifically for the Collins 75S-1 receiver and Collins KWM-2, the Waters *Q* Multiplier/Notch Filter provides a sharp rejection notch that can be manually positioned in the receiver's i.f. pass band to suppress an interfering carrier.

Only one operating control is needed, it being labeled REJECTION TUNING. No on/off control is necessary since the *Q* multiplier can be made inoperative by adjusting the TUNING control to put the notch outside the normal pass band.

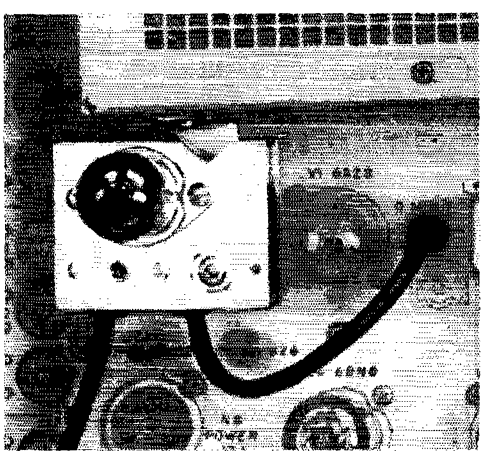
The *Q* multiplier is in semi-kit form, and the kit package includes everything from hook-up wire to a drilling template for the installation. It is a well-packaged and well-thought-out assembly and shouldn't present any installation problems even to the nontechnically-inclined ham. The kit consists mainly of a small aluminum flat-plate chassis, which includes a single tube and several components, the REJECTION TUNING control, which is a small variable capacitor, and miscellaneous leads. It should be pointed out that the tube chassis is already completely wired and that most of the wiring necessary to install the kit is devoted to power pick-up, and the like.

Three separate models are available for the two Collins units. The model 337-S1 is obviously for the 75S-1 receiver, and the 337-M2, for the KWM-2. However, when using the 337-M2 it is not possible to use the Collins PTO unit, an accessory for the KWM-2, because the external PTO shorting plug on the KWM-2 is removed when installing this *Q* multiplier. So Waters has a third model, the 340-PT, which, when installed in the KWM-2, permits the use of the external PTO.

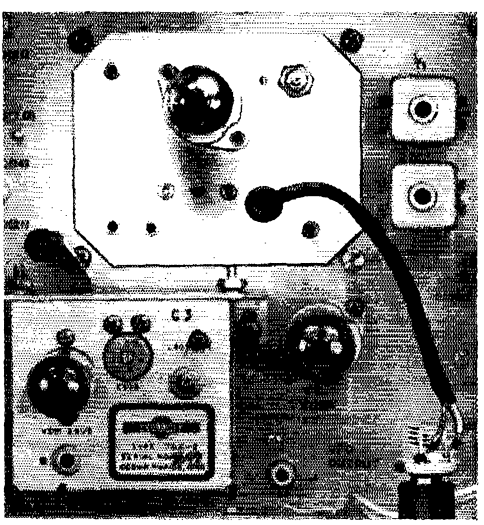
When installing the *Q* multiplier, it is necessary to drill a $\frac{3}{8}$ inch hole in the front panel of the KWM-2, but if the step-by-step instructions included in the kit are followed the finished installation will look "factory installed". An escutcheon plate is furnished and is placed, along with the REJECTION TUNING control, on the KWM-2 front panel. The plate matches the style and color of the original equipment.

In the case of the 75S-1 model, it isn't necessary to drill any holes. Waters has come up with a neat way to double up the a.f. and r.f. gain controls on the 75S-1 so that a hole is made available to mount the TUNING control. The original a.f. and r.f. gain controls are removed from the front panel and a dual concentric potentiometer, supplied with the kit, is mounted in the space formerly occupied by the r.f. gain control. The *Q*-multiplier control is mounted in the old a.f. gain control space.

To install any of the three models should not take more than about an hour. Only hand tools are necessary. When it comes to tuning up



In the KWM-2, the tube and chassis are attached to the front of the final amplifier cage.



The REJECTION TUNING control, a small variable capacitor mounts on the front panel of the 75S-1 receiver. The Q-multiplier chassis mounts in the space originally intended for the Collins Noise Blanker.

the combination, test equipment isn't necessary since the tuned circuit in the *Q* multiplier is set at the factory. One minor adjustment to the bridge-T potentiometer is necessary after installation but this is accomplished by using the receiver as a tune-up device.

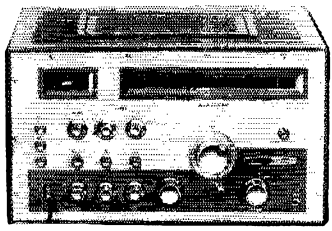
Electrical specifications for all models include a center frequency of 455 kc., and a notch depth greater than 40 db. The notch tuning range is about plus and minus 2.5 kc.

— *E. L. C.*

Waters Q-Multiplier

Height: About 3 inches
Width: About 3½ inches
Depth: About 3 inches
Power requirements: Supplied by the receiver
Price class: Model 337-S1, 337-M2, $35. Model 340-PT, $15.
Manufacturer: Waters Manufacturing, Inc., Wayland, Massachusetts.

Heathkit "Marauder" HX-10 Transmitter



THE Heathkit HX-10 is a complete c.w., a.m. (single sideband with carrier) f.s.k., and upper or lower sideband transmitter. Using two 6146 final amplifiers, it can run 180 watts input on c.w. and f.s.k., 180 watts p.e.p. input on s.s.b. and about 75 watts input on a.m. phone. It is a filter rig, using a 5-Mc. crystal lattice. Included are all of the modern "extras" which seem to have become standard items in s.s.b. transmitters. A choice between voice-operated send-receive control or push-to-talk operation is one of these. A sidetone circuit that provides an audio tone for monitoring c.w. transmission is another.

There are 21 tubes and 9 diodes in the HX-10. All of the necessary crystals for the various heterodyne oscillators are furnished for 80- through 10-meter operation. Although the transmitter has a v.f.o., crystal control can be used. Crystals are not furnished for this type of primary frequency control.

For a rundown of the technical aspects of the HX-10, take a look at the block diagram in Fig. 1. The r.f. portion of the transmitter starts off with the carrier oscillator, V_{2A}, which is crystal controlled and operates at a frequency of 4.99 Mc. A "crystal-puller" capacitor is provided in the circuit so that the oscillator frequency can be adjusted for the optimum point on the slope of the crystal filter, which appears later on in the circuit.

For s.s.b. operation, output from the carrier oscillator is fed into the diode balanced modulator, CR_1CR_2. Here the 4.99-Mc. signal is mixed with audio arriving from the speech section of the transmitter. The 4.99-Mc. carrier is attenuated in the modulator. Over-all carrier suppression is rated at 50 db. below the transmitter's peak output. The double-sideband signal next feeds into the 5-Mc. lattice-type crystal filter, where the upper-sideband frequencies pass through. The unwanted lower-sideband frequencies are suppressed at a rated 55 db. below peak output.

For emissions requiring a carrier, the carrier oscillator signal goes directly to the sideband mixer, V_3. The s.s.b. signal from the crystal filter

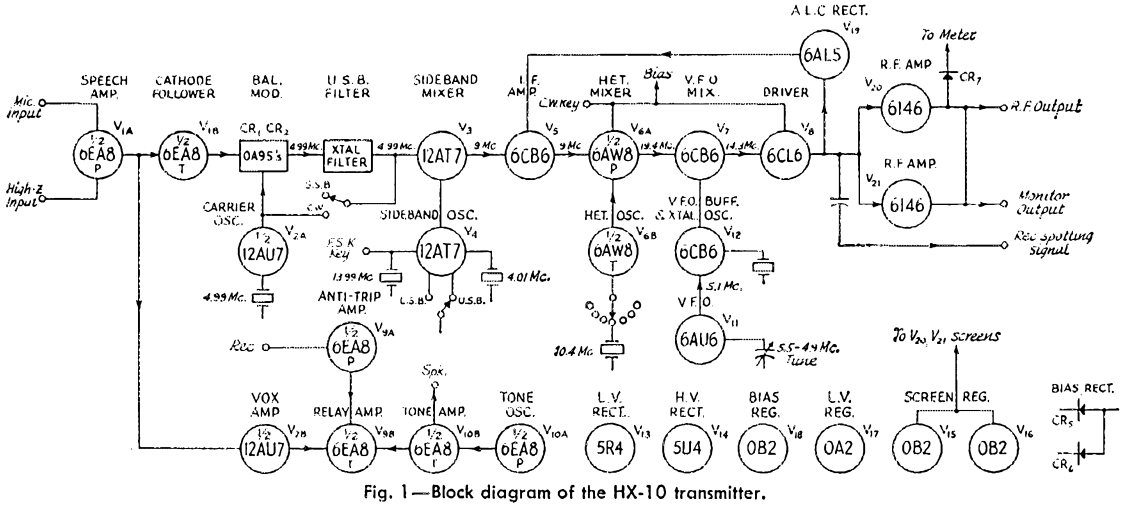
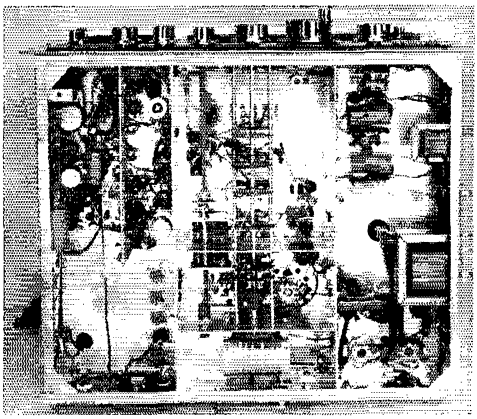


Fig. 1—Block diagram of the HX-10 transmitter.



This bottom view of the HX-10 shows that there is plenty of wiring room in the various compartments. The coil visible in the compartment at the bottom of the photograph is the final-amplifier plate-circuit coil.

(or the c.w. signal from the carrier oscillator) is combined with energy from the sideband oscillators, V_4, in the sideband mixer. The sideband oscillators, V_4, are at 4.01 Mc. and 13.99 Mc. Only one oscillator operates at any given time, depending upon the mode of emission. The proper oscillator is selected by the panel MODE switch. Oscillator switching is accomplished by removing a blocking bias from the grids. The 13.99-Mc. lower-sideband oscillator is used in all modes except upper sideband, when the 4.01-Mc. section is used. The 9-Mc. output from the sideband mixer is quite removed from any ham-band. However, the HX-10 uses triple conversion to reach the operating frequency. After two more stages of heterodyning the signal appears at the desired operating frequency.

The upper or lower sideband 9-Mc. signal is amplified in V_5, a 6CB6, and applied to the pentode section of the heterodyne mixer, V_{6A}. The triode section of this same tube, V_{6B}, operates as the heterodyne oscillator and, depending upon the band of operation, is crystal controlled on a specific frequency between 3.4 and 25.6 Mc. Output from this mixer is still not at the operating frequency and requires one more heterodyning step to reach it. As an example (also shown in Fig. 1), the heterodyne oscillator is at 10.4 Mc.

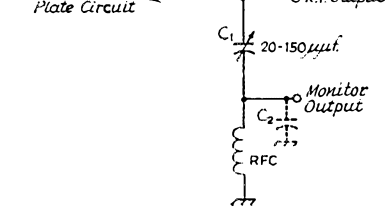


Fig. 2—A jack is provided on the HX-10 for oscilloscope monitoring. Capacitor C_1 is adjusted for the desired output voltage. C_2 is the capacitance of the connecting coax cable and is part of the voltage divider.

for an output frequency of 14.3 Mc. Output from the oscillator is mixed with the 9-Mc. signal from V_5, giving 19.4 Mc., which is still 5.1 Mc. away from the output frequency. The heterodyne mixer is grid-block keyed when in the c.w. mode. On the 80-meter band, the mixer operates untuned as a straight through 9-Mc. amplifier with no signal coming from the heterodyne oscillator.

Probably the most important section of the transmitter from an operating standpoint is the v.f.o. Is it stable? What is the tuning rate? How does the tuning knob "feel"? These questions are usually among the first that are asked about a new transmitter. The HX-10's v.f.o. has certainly been designed for stable operation. There is a 6AU6 pentode in a series-tuned Colpitts circuit in which all of the frequency-determining components have received special attention to minimize the effects of temperature changes and mechanical vibration. For instance, the v.f.o. coil is tension wound on a ceramic form and coated with epoxy, and temperature-compensating capacitors are used in the tuned circuit. The main v.f.o. tuning capacitor has double bearings. Both plate and screen voltages are regulated and the heater voltage for the tube remains on at all times — even when the transmitter is turned off (but, of course, the a.c. line cord must be connected!). Mechanically, the v.f.o. enclosure is formed of 19-gauge cold-rolled steel. Rated overall stability of the transmitter is 100 cycles after warm-up.

The v.f.o. tunes from 4.9 to 5.5 Mc. The large spinner tuning knob is fitted with a heavy flywheel, and a gear ratio of 165 to 1 in the tuning mechanism provides a tuning ratio of about 10 kc per revolution. Spring loading of the gear mechanism minimizes backlash. The edge-lighted plastic slide rule dial has three calibrated scales, each covering 600 kc. All three scales are visible at once, and it's up to the operator to decide which scale to use. The seven band-switch positions on the front panel are marked so that each position ends in one or the other of the numbers 0.5, 0.9 or 0.1. These are the starting numbers on the three dial scales. You then use the scale that starts with the corresponding number. (Example: In the 13.9-Mc. position, the 0.9 scale would be used on the tuning dial). The switch ranges are 3.5 to 4.1 Mc., 6.9 to 7.5 Mc., 13.9 to 14.5 Mc., 20.9 to 21.5 Mc., 27.9 to 28.5 Mc., 28.5 to 29.1 Mc., and 29.1 to 29.7 Mc.

Also associated with the v.f.o. is the v.f.o. buffer/crystal oscillator, V_{12}. When v.f.o. operation is selected the stage operates as a buffer. However, it can also function as a crystal-controlled oscillator. This crystal oscillator feature allows for Novice operation (with the proper power reduction to 75 watts input) and for channel operation in MARS nets, etc. The buffer/crystal oscillator is located in the v.f.o. enclosure and also has its heater voltage on at all times. The necessary frequencies for crystal-controlled operation will be in the 4.9- to 5.5-Mc. region.

Output from the v.f.o. buffer/crystal oscillator is applied to the grid of the v.f.o. mixer, V_7, along

with the signal from the heterodyne mixer, V_{6A}. The resulting signal is now at the operating signal frequency and, in our example shown in Fig. 1, the 19.4-Mc. signal mixed with the 5.1-Mc. v.f.o. signal gives a 14.3-Mc. signal at the plate of the v.f.o. mixer. The mixer plate is tuned by a panel DRIVER TUNE control which is ganged to several other capacitors that tune both the v.f.o. mixer and driver stages.

The operating frequency signal is amplified by a 6CL6 driver. This tube is grid-blocked keyed for c.w. and f.s.k. Two parallel connected 6146's operated class AB_1 are used for final amplifiers. Regulated screen voltage is applied. A pi network is used in the amplifier plate circuit and it is designed for 50-ohm loads, although it can be adjusted for other loads between 50 and 75 ohms, with not more than about a 2 to 1 s.w.r. A fan aircools the final amplifier stage.

An output r.f. voltmeter circuit is included in the final amplifier as a relative output indicator for use in tuning up. It consists of a resistive voltage divider across the r.f. output, with a semiconductor diode rectifier. A panel meter reads the relative power output.

Provision is also made at the final amplifier for oscilloscope monitoring. Fig. 2 shows how a capacitive divider, C_1C_2, is used to obtain r.f. voltage for application to the deflection plates of an oscilloscope. The voltage appears at the monitor output jack on the rear apron. The output voltage can be varied by adjusting capacitor C_1. In Fig. 2, C_2 is the capacitance of the coax cable which connects the scope to the jack.

Also located at the rear of the chassis is a receiver spotting-signal jack. This is a coaxial line loosely coupled to the final amplifier grids. It provides a source of "spotting" signal for the station receiver.

Provisions for f.s.k. operation are made in the HX-10. The circuit in Fig. 3 shows how diodes CR_3 and CR_4 key a capacitor, C_1, in the grid circuit of the 13.99-Mc. oscillator, V_4. When the f.s.k. key is closed, bias is removed from the diodes and they no longer conduct. This effectively disconnects the capacitor and shifts the oscillator frequency 850 cycles for RTTY operation. Information on how to adjust C_1 is outlined in the instruction manual. The capacitor can be set for other frequency shifts, too.

Automatic level control is included in the HX-10 to insure against overdriving the r.f. amplifiers. The a.l.c. rectifier, V_{19}, rectifies the audio voltage peaks when the final amplifier starts to go into grid current. This is applied as bias to the i.f. amplifier, V_5, and decreases its gain, ultimately reducing the driving voltage applied to the final amplifiers.

The speech and VOX circuits give the operator a choice of voice-operated break-in or push-to-talk operation. Included is an anti-trip circuit which, when connected to the station receiver, prevents audio from the receiver's speaker from triggering the transmitter's VOX circuits. Audio inputs to the speech section are designed for high impedance. As mentioned earlier, a tone oscillator

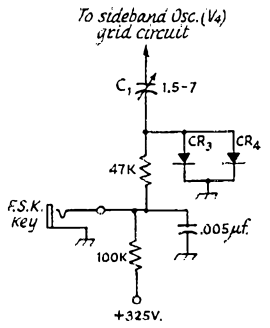


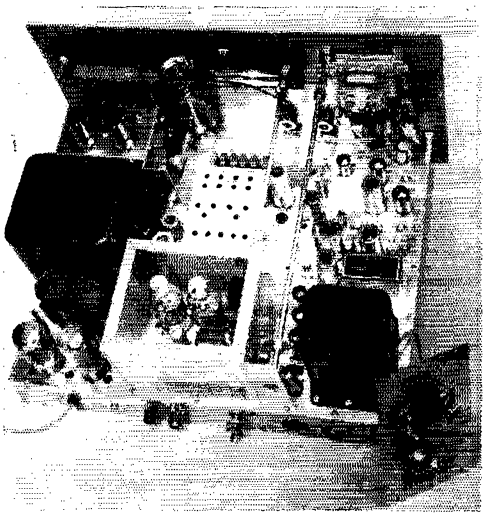
Fig. 3—When in the RTTY mode, diodes CR_3 and CR_4 switch capacitor C_1 in or out of the lower-sideband oscillator's grid circuit, giving an 850-cycle carrier shift.

and tone amplifier, V_{10A} V_{10B}, provide a side tone so that the operator may hear his keying during transmission. Also, the audio tone developed is used to key the VOX system which turns the transmitter on and off automatically with keying. The tone oscillator does not operate when in the f.s.k. mode. In this mode, manual switching between send and receive is necessary.

All the necessary power for the HX-10 is supplied by a built-in supply. A 5R4 high-voltage supply furnishes the final amplifier plate and screen power and a 5U4 rectifier is used in the low voltage supply for the remainder of the transmitter. The 5U4 also furnishes B-plus for the v.f.o. A semiconductor-rectifier supply furnishes bias for the final amplifiers. As shown in Fig. 1, there are four regulator tubes. Two are used for regulating the final-amplifier screens, one for the v.f.o. regulation and one for bias.

A look at the front panel of the HX-10 will show that just about every operating control is included. All of the VOX controls (delay, sensitivity) are on the front panel so that it is not necessary to lift the cabinet lid to make these adjustments. Also included on the front panel are the MODE switch (CW, AM, FSK, LSB, and USB), AUDIO GAIN, DRIVER TUNE, BAND SELECTOR (seven positions), V.F.O. tune, FREQUENCY CONTROL (VFO, XTAL), DRIVE LEVEL, SPOT LEVEL, METER switch (GRID, PLATE, ALC, REL POWR, HV), FINAL LOAD, FINAL TUNE, KEY jack, and MICROPHONE input. Located on the rear apron of the transmitter are several controls and connectors and an accessory socket that provides for receiver muting, external amplifier cut-off bias, and 117 volts a.c. relay power.

The HX-10 shown in the photographs and described here was received fully wired, and for this reason no comments can be made as to assembly of the transmitter from a kit. However, the manufacturer estimates that it would take approximately 60 hours for assembling, testing and alignment. The owner's manual goes into great detail on alignment, operation and calibration. As with other Heathkits, several alternative alignment methods are given, depending upon the test equipment available to the kit builder. For in-



Top view of the HX-10 transmitter. The final amplifier cage cover has been removed to show the 10-blade cooling fan. Rear apron connectors and controls are from left to right: line cord, spotting signal jack, monitor level control, antenna connector (below), monitor jack (above), ground stud, accessory socket, switched 117 volt receptacle, high impedance audio input jack, and f.s.k. key jack.

stance, three methods are described for final-amplifier neutralization, one using a grid-dip meter, another using a v.t.v.m. with an r.f. probe, and a third using the meter in the transmitter, no external equipment being required. The usual step-by-step method along with pictorials are used for the actual kit construction.

The appearance of the transmitter should please even the most discriminating XYL. The cabinet is finished in two-tone "Heathkit green." Heath has changed the finish on the knobs from the dull die-cast zinc finish to a bright chrome-plate.

— *E. L. C.*

Heathkit HX-10 "Marauder" Transmitter

Height: 11⅝ inches.
Width: 19½ inches.
Depth: 16 inches.
Weight: 85 pounds.
Power requirements: 117 volts a.c., off — 4 watts, standby — 200 watts, c.w. key down — 100 watts.
Price class: $335.
Manufacturer: Heath Company, Benton Harbor, Michigan.

Strays

ZE4JO ordered a Collins 75A-4 receiver and here is what happened before he got to use it. The receiver was shipped from the Los Angeles supplier and arrived at Mozambique safely. But a hurricane arrived the day it was being unloaded, and as a result the receiver lay at the bottom of the harbor for four days. After being hauled up, it lay in the wet crate another six weeks before ZE4JO was allowed to claim it. ZE4JO finally got the receiver home and washed it out with a high-pressure garden hose. Then he used a water-soluble oil all over the inside, and more washing. A week in the sunshine (with a 100-watt bulb taking over during the night) dried it out. Replacement of a few small parts, and now the receiver works FB. Quite a testimonial to Collins durability and ZE4JO persistence.

This reminds us of the salvage job the Navy did on the aircraft carrier *Constellation* after the million-dollar fire in Brooklyn. The electronic gear was salvaged by being immersed in a special solvent and then washed. This technique saved an untold amount of electronic gear which originally was thought to be a total loss because of damage by oil, soot, and water during the fire.

—•••—

A ham directory containing info on 2069 amateurs living within a 50-mile radius of Kansas City has just been published by the Heart of America Radio Club, 417 East 13th St., Kansas City 6, Mo. This is a 72-pager, listing the hams alphabetically by call, by name, and by location. In addition, it contains a listing of all the 2-letter call holders in the area, and the names and addresses of 35 amateur radio clubs.

—•••—

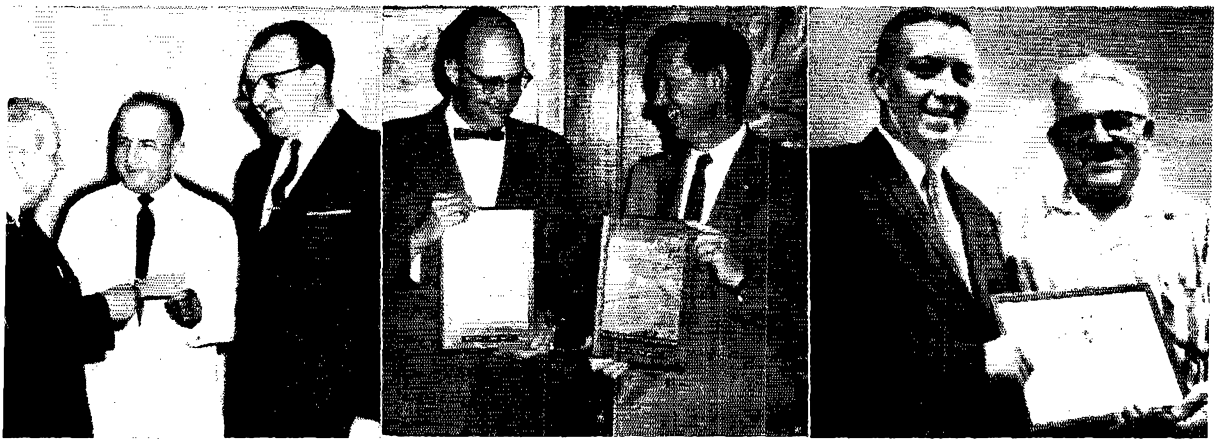
Here's the emblem that W9JW uses on his QSLs to promote international friendship.

IMPORTANT NOTICE

Change of Address

Important postal changes in handling second-class mail matter are now in effect. Please advise us *direct* of any change of address. Four weeks notice is required to effect change of address. When notifying, please give old as well as new address. Your promptness will help you, the postal service and us. Thanks.

Strays



The Chicago Veterans Administration Research Hospital will have one of the finest of ham stations as a result of $10,000 bequest to its radio club from the Robert R. McCormick Charitable Trust, founded by the late editor and publisher of the *Chicago Tribune*. Above, left, the executive director of the Trust, Mr. Philip Hampson, presents the check to Dr. M. J. Schlussel, acting director of the Hospital, while club prexy K9TKW looks on . . . Above center, W6SAI and W6VKP, whose articles were deemed by ARRL's Board to be the best in the February and March issues of QST, admire their cover award plaques . . . Above right, W5URW (l.) receives a special Edison Award citation from SCM W5QEM for his emergency communications work during Hurricane Carla.

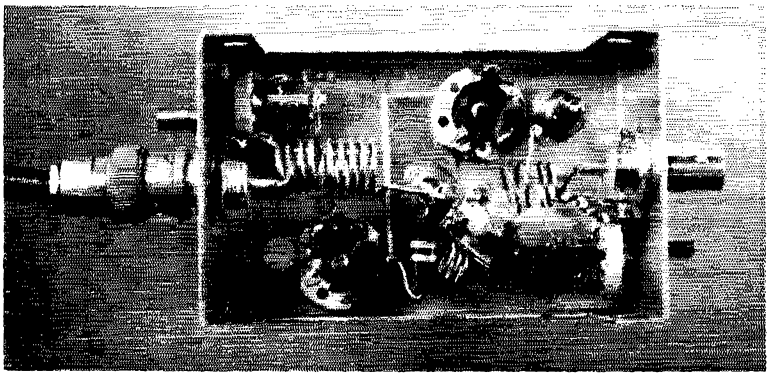
Above left, W6AXI operates the net control station during a special election in Modesto. This was a "get-out-the-vote" operation, with WA6GJA and K6ODA making the rounds of polling places, furnishing transportation for senior citizens and relaying election results . . . Above center is W4TQB, Col. John A. Frizen, who has been named Deputy Chief of Staff for Telecommunications of the Air Force Communications Service . . . At the Kernan Hospital Fair, sponsored by some 28 Lions Clubs in the Baltimore area, the Pikesville Amateur Radio Klub in conjunction with the Maryland State Civil Defense Agency supplied equipment and operators for an amateur station which acquainted thousands of persons with amateur radio. W3NO was in charge of the project, with much of the operating done by himself and W3ESM and W3LEO.

In June members of the Ouachita Valley Amateur Radio Club participated in a live TV show over Louisiana's educational TV station KLSE-TV, Channel 13 in Monroe. Among those taking part were (l. to r.) W5DBG, Mr. Gordon Canterbury (manager of the TV station), and K5TAN.

Frequency Multiplication with Power Varactors at U.H.F.

High-Efficiency Doubling or Tripling Without Vacuum Tubes or Power Supply

BY HENRY H. CROSS,* W100P



Doubler stage using the power varactor. Driven on 216 Mc., it is capable of several watts output on 432 Mc. It requires no power supply or modulator.

VARIABLE-CAPACITANCE diodes having Q at u.h.f. comparable to that of commercial air variable capacitors have been available for some time. The price of the low-power units was such that they were attractive only for parametric amplifiers, or where the smal size, high efficiency, resistance to shock and vibration, or "all solid state" ruled tubes out of consideration.

Silicon power varactors having good heat dissipation and relatively high power capability have recently been produced by Microwave Associates. (The MA-4060A outwardly resembles a standard silicon rectifier, but internally it is quite different.) In many situations where conventionally constructed power tubes do not operate satisfactorily, the power varactor as a frequency multiplier may be considerably cheaper and simpler to build than a doubler or tripler using a disk-seal type of tube. The MA-4060A will give eight watts output at 450 Mc. when driven by a 6146 at 150 Mc. Used in the box described below, it converts a two-meter Communicator into a 432-Mc. transmitter, *without any auxiliary power needed.* The problem of reception at 432 must be solved by use of a separate converter or receiver.

The high-Q varactor can be thought of as a variable capacitor almost without losses, provided that the instantaneous voltage varies between plus one-half volt and the reverse breakdown point. The main problem in practice is that the varactor capacitance is a function of drive level, which is a function of tuning, which is a function of drive level . . . things sort of interact! On the other hand, because of the high level, power multipliers seem to be free of thermal drift problems. In our experience, no touching up is needed once you have them tuned up properly.

The d.c. voltage-capacitance characteristics and the output voltage as a function of time, for sine-wave current input, are shown in Fig. 1. Once the diode draws conduction current, the theory of operation gets more complicated, but the harmonic output does not cease, so the complications can be ignored for small currents. If the multiplier is retuned each time the drive level is changed, an input-output curve similar to the upper curve of Fig. 2 is observed. For one tuning condition, the lower curve of Fig. 2 applies, and this is the case where a.m. is applied to the input. The function is not perfectly linear, although it might be expected that a perfectly efficient multiplier would have perfect linearity. The detuning gets into the act. In any case, on-the-air tests show that the Gonset and its multiplier sounds very much like a Gonset and somewhat better

* Microwave Associates, Inc., Burlington, Mass.

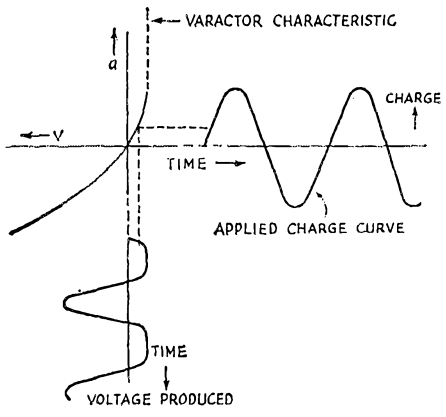


Fig. 1—D.c. voltage-capacitance characteristics and output voltage as a function of time, for sine-wave current input.

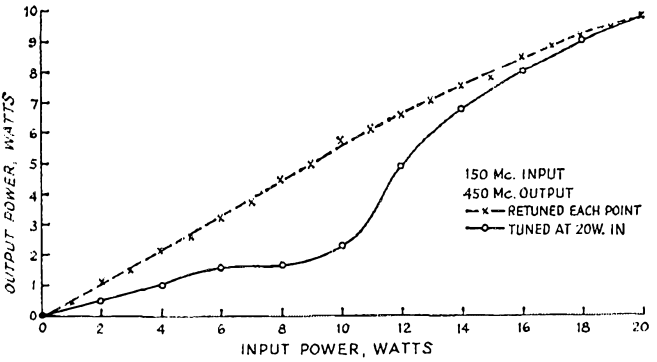


Fig. 2—Power output from a 450-Mc. tripler using a Type MA-4060A power varactor. The solid line shows the power available at various drive levels, when the tripler is tuned for maximum output with 20 watts drive. A uniform efficiency in excess of 50 per cent is possible (dashed line) if the system is retuned for each power level.

than several other 432-megacycle transmitters I have heard.

In the basic circuit, Fig. 3, the drive at frequency f is a sine wave of current, because the input circuit is series resonant, and thus will not permit current to flow around that loop at harmonic frequencies. The charge (current times time) applied to the diode will therefore also be a sine wave. Now the voltage across a linear capacitor would be charge divided by capacitance, but a silicon junction diode has a capacitance which decreases as the back voltage across the capacitor increases, so the voltage across the varactor diode becomes "peaky," somewhat as shown in the lower part of Fig. 1.

A peaked sine wave consists of the fundamental and one or more harmonics. If another series-resonant circuit is connected across the varactor terminals, and properly tuned, a harmonic current may be forced through the *nf* loop at two or more times the drive frequency. (If harmonics higher than the second are desired, another resonant loop seems to improve the operation.)

The main advantage of a nonlinear-reactance frequency multiplier over a nonlinear-resistance multiplier (such as a 6AL5) lies in the fact that a reactance can be nonlinear without having to be lossy. The silicon-junction diodes used here are specially developed to have a low series resistance (2 ohms maximum at u.h.f. for the MA-4060A) and there is no *theoretical* objection to using one to build a doubler of 98 per cent efficiency. For a variable-resistance doubler, the calculated theoretical limit is 25 per cent, although a *switch*, such as a p.n.p.n. diode or a class-C vacuum tube, can convert power with higher efficiency if its series resistance in the "on" condition is low enough.

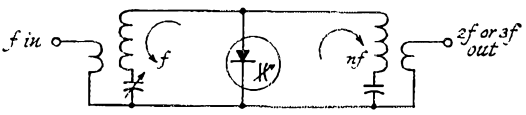


Fig. 3—Basic circuit of power varactor frequency multiplier.

Fig. 4 and the first photo show the doubler W1EHF made for me. This gave W1MHL/1 a Maine 432 contact last June, when driven by a 220-Mc. Gonset IV (tuned to 216 Mc.). The complications *do* help. The trap, L_5C_5, is mostly to simplify tuning; without the trap, changing the output-tuning capacitor, C_3, would also change the tuning of the 216-Mc. circuit. The double-tuned input and output help establish that the measured output power is on one frequency — the right one. When swapping from one transmitter to another, and with various antennas, only C_1 and C_4 need to be readjusted. The bias resistor should be fairly high, though not high enough to make the time constant of the bias network more than a few dozen microseconds.

The circuit of the tripler box used by W1EHF is shown in Fig. 5. There is an intermediate resonant loop on 288 Mc. and two traps, one on the input frequency and one to isolate the 288 from the output tuning. The "idler" at 288 gives improved output. The theory stipulates that such

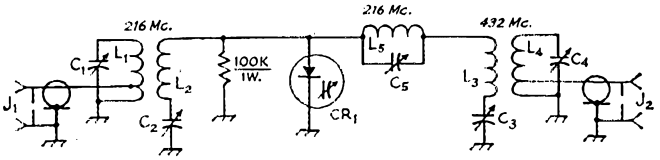


Fig. 4—Schematic diagram and parts information for the doubler from 216 to 432 Mc.

C_1, C_2—8.7-$\mu\mu$f. miniature variable (Hammarlund MAC-10).
C_3, C_4—5-$\mu\mu$f. miniature variable (Hammarlund MAC-5).
C_5—9-$\mu\mu$f. subminiature variable (Johnson 189-28).
CR_1—Power varactor (Microwave Associates MA-4060A).
J_1, J_2—BNC coaxial fitting.
L_1—4 turns No. 20, ⅜-inch dia., ⅜ inch long. Tap at 1 turn.
L_2—5 turns No. 20, ⅜-inch dia., ⅜ inch long.
L_3—2½ turns No. 20, ⅜-inch dia., ¼ inch long.
L_4—2 turns No. 20, ⅜-inch dia., ¼ inch long. Tap at 1 turn.
L_5—3 turns No. 22, ¼-inch dia., ¼ inch long.

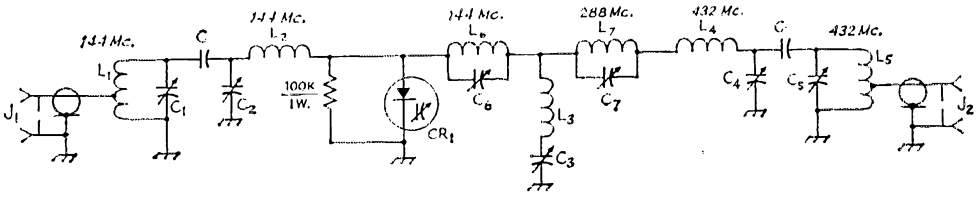


Fig. 5—Schematic diagram and parts information for the tripler from 144 to 432 Mc.

C_1, C_2, C_3—10-$\mu\mu$f. miniature variable (Hammarlund MAC-10).

C_4, C_5—5-$\mu\mu$f. miniature variable (Hammarlund MAC-5).

C_6—13-$\mu\mu$f. subminiature variable (Johnson 189-6).

C_7—9-$\mu\mu$f. subminiature variable (Johnson 189-4).

C—Leads of No. 26 insulated wire, twisted together for 2 turns.

CR_1—Power varactor (Microwave Associates MA-4060A).

J_1, J_2—BNC coaxial fitting.

L_1—9 turns No. 18, 3/8-inch dia., 1/2 inch long. Tap at 2 1/2 turns.

L_2—7 turns No. 18, 3/8-inch dia., 1/2 inch long.

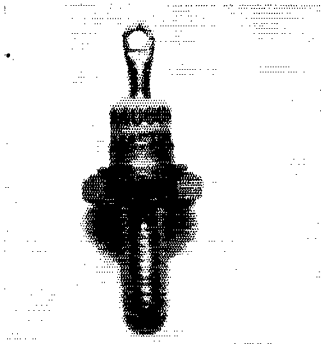
L_3—4 turns No. 18, 1/4-inch dia., 3/16 inch long.

L_4—2 turns No. 20, 1/4-inch dia., 1/8 inch long.

L_5—3 turns No. 20, 1/4-inch dia., 1/4 inch long. Tap at 1 1/2 turns.

L_6—4 turns No. 22, 1/4-inch dia., 5/16 inch long. Tune cold to 144 Mc.

L_7—1 1/2 turns No. 22, 1/4-inch dia. Tune cold to 288 Mc.



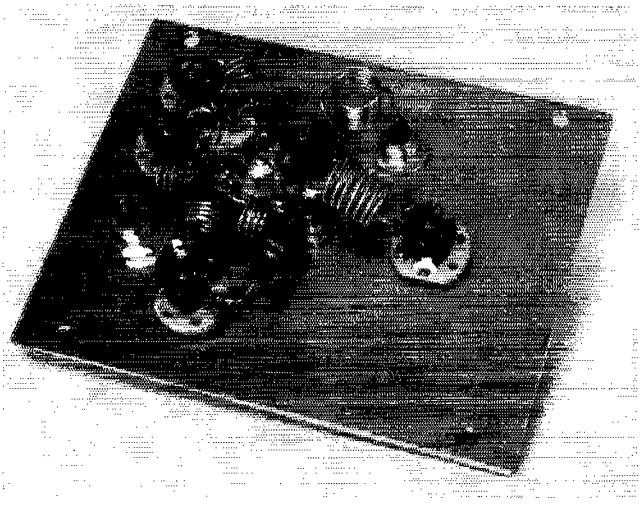
The Microwave Associates MA-4060A Power Varactor, with stud mounting. Over-all height is only about one inch.

an idler is needed; you will find that tripling is not very satisfactory without it. Performance is shown in Fig. 2.

The traps can be made up and tuned with a grid dipper before wiring in place; they do not need readjusting in our multipliers. The best way to tune the rest of the circuit is with an output meter of some sort, on a dummy load or your antenna. A directional coupler at the input is convenient for setting up the input network, but not essential for those who are used to juggling six variables. Final peaking up should be done while modulating (whistle loudly) to tune for best linearity. This is *not* the same as the tuning condition for most output on carrier.

If twenty watts input gives eight watts output on c.w., and no more than ten watts can be obtained with any amount of input, the a.m. rating must be eight watts peak, which corresponds to two watts carrier. As a driver for a 432 final or for f.m. we get eight watts. Thus, a.m. output is comparable to that obtainable from a 6939, while output with f.m. is about what a 5894 or 6252 will give you. You can get these power varactor diodes for just a bit more than the price of the latter tubes at most distributors, but you will *not need heater* or *plate power*, or a socket. We think the diode will last longer.

The small compact size of the power varactor lends itself to easy mounting and the varactor is more adaptable to lumped circuits at these frequencies than tubes are. QST



Power varactor tripler, for 432-Mc. output with 144-Mc. drive.

A Statement From Project Oscar

As of April 20, 1962, the Project Oscar Association has been incorporated under the laws of California as Project Oscar, Inc., a nonprofit organization.

The Board of Directors of Project Oscar, Inc. at their regular meeting of August 23, 1962, unanimously voted that the American Radio Relay League be requested to print the following statement in a prominent position in the next issue of *QST* magazine:

1–Whereas Project Oscar, Inc. is a nonprofit organization of radio amateurs, and is nonmilitary and noncommercial in nature, the attention of *QST* readers and ARRL members is called to the fact that Project Oscar, Inc. does not endorse or sponsor products, nor does it condone the use of its name or the implication that the Project or the program endorses products or manufacturers. All requests for permission to use the Oscar name, satellites, or program for advertising purposes have been declined, and Project Oscar, Inc. disclaims any endorsement, implied or otherwise, of any product or manufacturer.

2–The Board of Directors of Project Oscar, Inc. has been reconstituted and are now the following:

M. C. Towns, jr. K6LFH, Chairman
H. R. McClain, K6SPK, Secretary
R. Esneault, W1HC/6, Treasurer
H. Shepherd, jr. W6QJW*, Legal Counsel
W. I. Orr, W6SAI
F. Hicks, W6EJU
N. Marshall, W6OLO
S. Benson, K6CBK
B. Barrick, W6OON
H. Gabrielson, W6HEK
T. Lott, VE2AGF
H. Engwicht, W6HC*

* ARRL Coordinators, with Jean Gmelin, W6ZRJ, as alternate for Mr. Engwicht.

H. R. McCLAIN, K6SPK, *Secretary*
Project Oscar, Inc.

Strays

During a speech before the Twelfth National American Radio Relay League Convention in Portland, Oregon, on September 3, Rear Admiral Bernard F. Roeder, USN, Director, Naval Communications, announced plans to establish a Navy Military Affiliate Radio System (Navy MARS). The target date for the commencement of operations is Jan. 1, 1963. Complete details will be promulgated soon, but preliminary information may be obtained by writing to the Director, Navy MARS, Office of Naval Communications (Op-945N), The Pentagon, Washington 25, D. C.

—···—

Don't forget to look for Scouts on the air the week end of October 20 and 21. This will be the occasion of the 5th Jamboree-on-the-Air. Shortly before that week end the Boy Scouts World Bureau, 77 Metcalfe Street, Ottawa 4, Canada, may have available a list of calls and frequencies of scout stations taking part. You might drop them a line. As of the first of September we know only of VE3WSB, K2BFW, and VE7JAM.

—···—

The following equipment was stolen from K5IFL (Edwin Deady, 3621 Bryn Mawr, Dallas 25, Texas. Phone collect EMerson 1-6191): a Gonset G-66 receiver, serial no. 705; a Gonset 3-way power supply for the G-66, serial no. PO1097; a Gonset G-77 transmitter (r.f. section only) serial no. 612; and an Electro-Voice 600D mike. The receiver had been modified by the substitution of a 2-inch chrome tuning knob, while the transmitter had the 6146 final tube replaced by an RCA 6293.

—···—

W0CVU, well-known sideblander and an active ham for many years, has been awarded the first Empire DX Certificate (issued by the Radio Society of Great Britain) specifically endorsed for two-way sideband operation. FB!

—···—

If you've been a ham for 40 years or more, perhaps you'd be interested in joining the Old Old Timers Club. Write to Earl C. Williams, W2EG, 507 Wayside Rd., Neptune, N. J., for all the info.

At the ARRL National Convention in Portland, Oregon, over Labor Day week end, Lt. Gen. Francis Griswold, K3RBA, Commandant of the National War College, on behalf of the U. S. Air Force presented a plaque to Herbert Hoover, jr., W6ZH, ARRL president, "for his outstanding and untiring contributions to amateur radio communications." Gen. Griswold told the Convention that without amateur radio the Air Force would not have its present worldwide communications system. They made it possible through their cooperation and demonstration.

Your hope of making a contact by reflection from Echo II depends not only on having a high-gain antenna but knowing just where to point it. The method described here is simple to use, and requires a minimum of orbital information — just two coordinates. Get ready — the balloon should be up this month!

To clear up a point of nomenclature, the project up to the time of successful launching is known as Echo A-12. Once it's up, the sphere becomes Echo II.

Position Prediction for the Echo II Satellite

BY PAUL H. KIRCHNER,* W2YBP

WHEN Echo II is launched this fall, several groups of amateurs will be attempting to communicate via the big balloon. These experiments will require a knowledge of where the satellite will be, and when. ARRL expects to receive regular schedules from NASA of the times and longitudes of the satellite's crossings of the 40th parallel, north latitude, and to transmit these over W1AW. A simple method of using these data to plot the satellite's ground track will be described. The scheme is similar to the acquisition prediction method for Oscar described in an earlier article,[1] and a review of that article is suggested.

The first thing you need is a map of the U. S. (or of the continent where you live). Some types of projection are not suitable, but any map on which all the meridians are straight lines is OK. If any of the meridians are curved, don't use it. The parallels of latitude may be either straight or curved. It's handy to have expendable maps that you can mark up and discard, and these are available inexpensively (2¢ each, minimum order

* 128 Christopher Circle, Ithaca, N. Y.

[1] Walters, Wells, Hillesland, "Project Oscar Measurements and Tracking," *QST*, July, 1961.

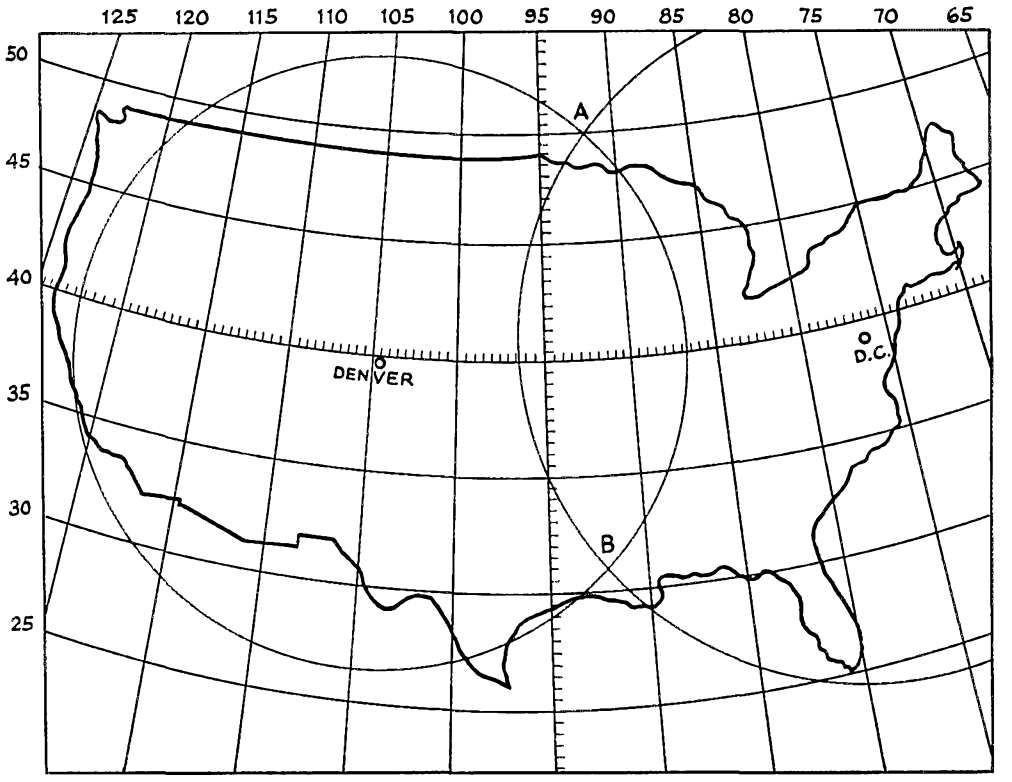


Fig. 1—Your map will look something like this after preparation. Half-degree intervals have been laid off along the 40th parallel and 95th meridian. The sample circles represent two stations having antennas with fixed beam elevation, one at Washington, D. C., and the other at Denver. The elevation angle at the Washington station is 25 degrees and that at the Denver station is 30 degrees. These two could hope to communicate via Echo II only when the satellite track passes close to one or the other of the two intersection points, A and B.

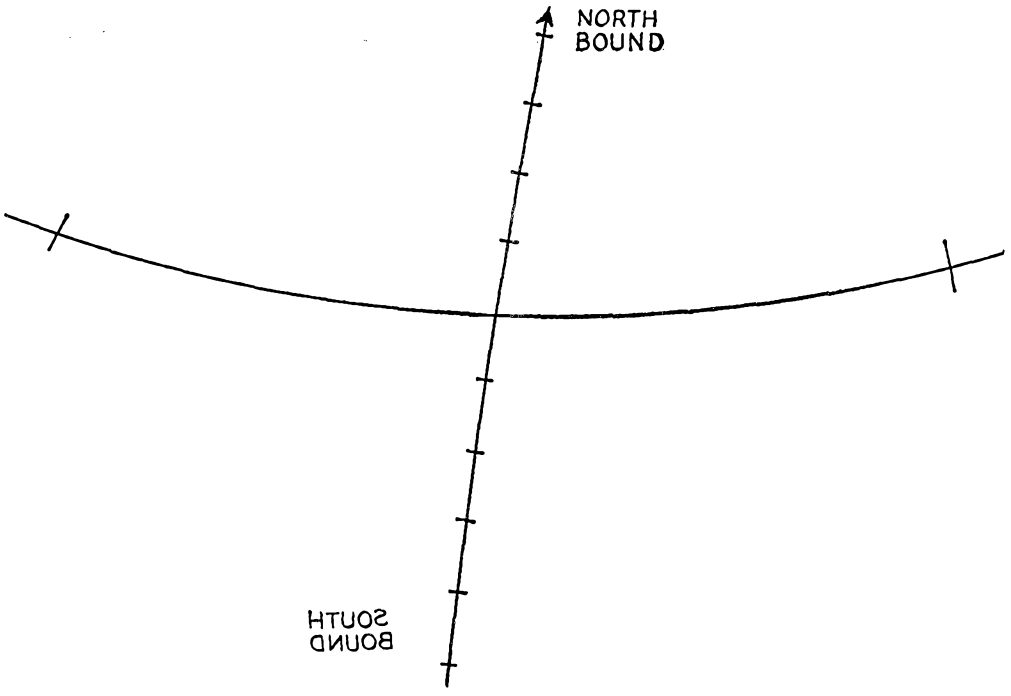


Fig. 2—Overlay for showing satellite track on the prepared map. This should be drawn on transparent material as described in the text. The short lines intersecting the 40th parallel line near the extreme ends indicate points of crossing on the preceding and following orbits.

$2.00 plus postage) from the American Map Co., Inc., 11 West 46th St., New York, N. Y. For U. S. maps order Map No. 1555. Lacking a map, you can get along with just a latitude-longitude grid. In drawing up the grid use 5-degree divisions, and make the longitude spacing only three-fourths as big as the latitude spacing to minimize distortion in the middle latitudes.

Preparing the Map

Now, do the following:

1) If necessary, make small marks on the map along the 40th parallel to subdivide it into ½-degree increments.

2) Do the same along the 95th meridian (or the middle meridian on your map).

3) Mark your location on the map, and the locations of other stations you will schedule.

4) Around those v.h.f. stations which have antenna beams at *fixed* elevation angles only, draw a circle which represents the points where the center of the beam intersects the 750-mile altitude surface. The radius of the circle, in degrees scaled off along a meridian, is obtained from Table I.

The height of Echo II will be somewhere around 750 miles; between 600 and 900 miles these radii are close enough for antennas having gains of 21 db. or less.

The next thing you need is an overlay which, when properly superimposed on the map, will show the ground track of the satellite for each pass. Lay a sheet of plastic, vellum or other transparent material over your map and tape both map and overlay in position on the desk or table. Trace the 40th parallel. Using the table below, plot five points on the overlay and connect them with a smooth line. This line, the satellite ground track, will be straight, or nearly straight, depending on your map projection.

TABLE I

Elevation Angle of Antenna Beam (degrees)	*Radius of Circle (degrees)*
15	20.7
20	17.8
25	15.4
30	13.3
35	11.5

TABLE II

North Latitude (degrees)	*West Longitude (degrees)*			
	$i = 75$	$i = 80$	$i = 85$	$i = 90$
30	98.4	96.9	95.6	94.2
35	96.8	96.0	94.4	94.6
40	95.0	95.0	95.0	95.0
45	92.9	93.7	94.6	95.4
50	90.2	92.2	94.0	95.7

Use the longitude column that corresponds to the satellite's orbit inclination (i). The expected inclination for Echo II is 82 degrees. If it turns out to be substantially different, this information will be included in the bulletins from WIAW. The table is for a middle meridian of 95 degrees, but outside the U. S. you can center it on some other meridian.

Make small marks along the track, going both ways from the 40th parallel, to represent 1 minute of satellite travel. For Echo II the spacing is 3.3 degrees between marks. Pick the 3.3 degrees off your middle meridian. Finally, write NORTHBOUND in a corner, then turn the overlay face down and write SOUTHBOUND in another corner.

Using the Map and Overlay

For each satellite pass of interest, line up the overlay on the map, with the 40th parallels superimposed, so that the track crosses the 40th parallel at the longitude given by the schedule. If it is a northbound pass, use the overlay face up; satellite motion is from south to north. For southbound passes, use it face down; motion is toward the south on these passes.

Here's how you figure out where to aim your antenna. We will assume you have already selected a pass which will occur between you and some other station, and that you have set up a schedule with him. The trick is for both stations to aim their antennas at the same point along the satellite's path, and wait for the satellite to go by. There are three cases to consider.

Case 1. *Both stations have tiltable antennas.* With the map and overlay taped to the table in the proper position, lay over them another sheet of vellum or plastic and draw a line between your station and the other station. Select the point where the satellite crosses this line. The azimuth can be read off using a protractor, and is the same as the azimuth from you to the other station. You might prepare a list of azimuths of other stations in advance.

To find elevation, first measure the distance on the map between you and the intersection point. Lay this distance off along the 95th meridian and read off the number of degrees. Call this G. Let H be the satellite height in miles. Then use the following formula to find your elevation angle, E:

$$\tan E = \frac{(3960 + H)\cos G - 3960}{(3960 + H)\sin G}$$

If the height is between 600 and 900 miles and your antenna gain is 21 db. or less, you can use Table I instead of the formula.

Case 2. *One station has a tiltable antenna, one is fixed.* Instead of selecting the point as above, choose one of the two points where the satellite crosses the circle which you have drawn around the station with the fixed elevation angle. The point to choose is the one which is closest to the line between the two stations. Then both stations read off the azimuth to this point with a protractor, and the one with the tiltable array finds his elevation angle as in Case 1.

Case 3. *Neither station has a tiltable array.* Both stations have circles around them on the map, and the only satellite passes which are useful to this pair of stations are those which pass very close to one of the intersections of the two circles. Each station just reads off the azimuth to this point.

Now if your gear is ready and you understand these instructions, you are ready to go. Many other aspects of satellite-bounce DX have been discussed by Ray Soifer.[2] You'll notice we aren't attempting to actually follow the satellite with the antenna. This might be possible on those passes which are visible, if an assistant is handy. We can expect enough time error in the predictions, however, to make tracking from this information alone unsatisfactory. By aiming at a point where the satellite will pass and waiting, a time uncertainty of a minute or two won't bother us.

The satellite will take 90 seconds or more to pass through your antenna beam. QST

[2] Soifer, "Space Communication and the Amateur," *QST*, November, 1961.
Soifer, "The Mechanisms of Space Communication, *QST*, December, 1961.
Soifer, "The Feasibility of Amateur Space Communication," *QST*, January, 1962.
Soifer, "Amateur Participation in Echo A-12," *QST*, April, 1962.

25 Years Ago this month

October 1937

. . . Ross Hull and R. B. Bourne discussed radio control of model aircraft. George Grammer described a semi-universal 40-watt exciter with stage switching and plug-in coils. Vernon Chambers modernized the simple regenerative receiver.

. . . Other technical articles covered directional antennas for transmitting and receiving, negative-peak modulation control, a versatile emergency transmitter, and a variety of hints and kinks.

. . . Results of the 1937 DX Contest were published. High man in the states was W2UK (he's still setting records, now as KH6UK on v.h.f.).

. . . James Lamb and John Stadler described their visits with various European amateurs on their trip to Bucharest. QST

Strays

Volume III of the *Colorado Ham Directory*, published by the Denver Radio Club at $1.00 per copy, is now available. This 72-page booklet lists Colorado radio amateurs alphabetically by call, name, and location; Denver hams by name; Colorado radio clubs; and various other items of interest. Send your dollar to the Denver Radio Club, P.O. Box 356, Denver 1, Colo.

—•••—

WA2PXU claims what *must* be a "first." He bought a mobile home, and by pure chance the fellow who delivered it was W3ISA. In addition, and again by pure chance, WA2PXU worked W3ISA on six meters, both mobile. So WA2PXU claims he is the first ham ever to talk his home home.

Report on Project West Ford—Or What Happened to the Dipoles?

On October 21, 1961, an Air Force Atlas-Agena B carried into orbit a dispenser package containing 75 pounds of fine copper dipole fibers embedded in naphthalene. The objective was to release the "dipoles" in such a way that they would form a thin, narrow orbital ring about the earth at an altitude of some 2000 miles. These would then serve as reflectors for an experiment in long-distance microwave communication to be conducted by the MIT Lincoln Laboratory, with the support of the Air Force. Because of the world-wide discussion triggered off among leading scientists when this project was proposed, it attracted more than an ordinary amount of attention, particularly among radio amateurs. "Whatever happened to those dipoles?" has been a popular question wherever hams gather, since the launching and subsequent long period of quiet on the newsfronts of the world. Here is the best guess as to the answer, taken from a status report on Project West Ford, issued by the Lincoln Laboratory March 1, and published in the URSI Information Bulletin, No. 130.

The cylindrical dispenser package was to be ejected from its container, once in orbit, in such a way that it would spin on its axis, like a projectile from a rifle barrel, at a rate of about 7 revolutions per second. The dispersal of the dipoles would depend on the way in which they were spun off the outer surface of the cylinder as the solid naphthalene binder gradually evaporated. Since the launching there has been no sign that any dipole fibers have dispersed, and it is believed that a mechanical malfunction at the time of ejection caused the package to be ejected without the spin needed to release and disperse the fibers. Instead, they have remained clustered together in five or six small clumps, which have been tracked for several months by the u.h.f. radar at Millstone Hill in Westford, Mass.

The cause of the malfunction has been determined, and the above hypothesis has been checked out under controlled laboratory conditions simulating the space environment. The design of the experiment has been modified to prevent spin malfunction in any future test, and telemetering of various items of information regarding the operation of the package and its contents will be included in future experiments. There will also be more precise control over the ejection time and position in space, to insure that the life of the dipole belt will be of limited duration. These changes reduce the dipole load from 75 to 50 pounds, and the number of dipoles to be ejected from 350 million to less than 250 million.

Pending the launching of another package, considerable progress has been made with the equipment and techniques that are needed to use the dipole belt for communication. The equipment has been used for transcontinental data transmission by moon reflection, for example, and detailed measurements have been made of the reflecting qualities of the lunar surface. This work has been done in the X Band, at about 8000 Mc. Good-quality voice communication over this circuit, Westford, Mass. to Pleasanton, Cal., has also been achieved, and comparable results are anticipated with the orbiting dipoles.

— *E. P. T.*

Strays

Newfoundland hams recently toured some of the communications facilities at the U. S. Naval Station in Argentina. In the photo at the right (taken at the ham station on the base) Bob Lewis, a CJON-TV newscaster, is seated, while standing (l. to r.) are VO1AA, Robin Davis, VO1BU, and VO1FQ. Highlight of the trip was a close look at some of the gear used by the Airborne Early Warning Squadron.

Second World-Wide RTTY Sweepstakes

October 20–22

RTTY, INC. announces the Second World-Wide RTTY Sweepstakes to be held from 0200 GMT October 20, to 0200 GMT, October 22, 1962. Last year's first such RTTY event was a great success and so all RTTYers should be out in full force for this world-wide competition to determine ability in exchanging messages via two-way radio teleprinter.

Stations will exchange messages consisting of message number, check (RST), time in GMT, and name of state or foreign country.

Be sure to check carefully the log form, scoring sample, and complete SS rules which follow. Logs and score sheet must be received by RTTY, Inc., 372 West Warren Way, Arcadia, California, by December 1, 1962, to qualify.

Rules

1) This is a competition between all stations throughout the world to determine their ability to exchange messages via two-way radio teleprinter.

2) *Contest period:* 0200 GMT, Oct. 20, to 0200 GMT, Oct. 22, 1962.

3) *Bands:* This test will be conducted in the 3.5, 7.0, 14.0, 21.0, and 28.0 Mc. amateur bands.

4) Stations may not be contacted more than once on any one band. Additional contacts may be made with the same station if a different band is used. To encourage multi-band DX operation, the same country may be claimed more than once if contacted on different bands. The same state worked on more than one band may only be claimed once.

5) *Country status:* For the purpose of this contest, KH6, KL7, and VO will be considered separate countries, in addition to the ARRL Countries List.

6) Stations will exchange messages consisting of message number, check (RST), time in GMT, and state or foreign country.

7) *Points:* (a) All two-way RTTY contacts by North and South American countries (including KH6) will earn two (2) points. (b) All two-way RTTY contacts by countries other than in (a) above will receive ten (10) points. Partial contacts do not count. (c) All stations receive 200 points per country worked, not including their own.

8) *Scoring for all stations:* (a) Two-way exchange points times total states worked. (b) Total country points per band times number of continents worked. (c) Add item (a) and (b) above, for your FINAL SCORE.

9) Follow the sample score sheet and log form shown. Log the state only once, the first time contacted. Log the country the first time contacted on each band. To qualify, logs and score sheet should be received by RTTY, Inc., 372 West Warren Way, Arcadia, California, by December 1, 1962. QST

LOG, SECOND WORLD-WIDE RTTY SWEEPSTAKES

Station log of W6TPJ (call) My state or country Calif. Date 20, Oct. 1962

NR Sent	*RST Sent*	*Time Sent*	*Band*	*Station*	*NR Rcvd.*	*RST Rcvd.*	*Time Rcvd.*	*State or Country*	*Exchange Points*
1	599	0205	14	W6CG	2	589	0204	CALIF.	2
2	569	0230	14	VK3KF	6	579	0231	AUSTRALIA	2
3	559	0247	14	W6NRM	?	?	?	—	0
4	599	0300	14	W2JAV	7	599	0259	NEW JERSEY	2
5	579	0514	7	VK3KF	22	569	0514	AUSTRALIA	2

CLAIMED SCORE: (a) Exchange points 8 × 2 States = 16

(b) Country points $\frac{400}{(2 \times 200)}$ × 2 Continents = 800

Add (a) and (b) = 816 FINAL SCORE

This log is correct and true to the best of my knowledge.

Signature

Strays

WN0BYO, in anticipation of becoming W0BYO, printed himself 1000 embossed QSL cards of the highest quality (he's a printer by trade). Only trouble was that FCC gave him the call WA0BYO.

—···—

Up in Vancouver, B. C., some unidentified ham has designed and built a tiny receiver that is worn by the pitcher of a minor league team to receive instructions from the manager. (Say, what we really ought to have is a tiny transmitter that would let us listen in on the "conversations" between players and umpires during some of the rhubarbs!)

Radio Club Announces New

WASP Certificate

The Little Certificate with the Big Sticker

BY JOHN G. TROSTER*, W6ISQ

THE meeting will come to order. Get them guys in from the mobyles and let's get down to business about this new certificate. Who's got some ideas?"

"Charlie . . . ahhh, Mr. Chairman, how about a certificate for working all 50 states?"

"Nah, some outfit already has one like that"

"How about a Worked All Oceans? You know, MM."

"Nah."

"How about Worked All Islands?"

"There's millions of 'em!"

"Well, say work only about 5000, in all oceans, with so many volcanic and coral islands. Extra credit if the volcano blows . . ."

"Come on, you guys, cut it out. Let's get something everybody can get — even with two-meter mobyle. Now start thinking or we'll be here all summer."

"Charlie, ya got it — summer! Summer is vacations. Vacations is Parks. Parks, get it? Worked All Parks."

"Yeah, maybe ya got something there. How about Worked All National Parks? Not bad."

"Noooo, now wait a minute, Charlie. National Parks are no good. What does Rocky Mountain National Park have to do with a radio club in W6?"

"OK, so what about Worked All State Parks?"

"Charlie, ya got it! Worked All State Parks. W-A-S-P!"

"Yeah, that's it. WASP. Terrific, eh? We'll really stick 'em with this, eh? Get it? WASP — stick 'em?"

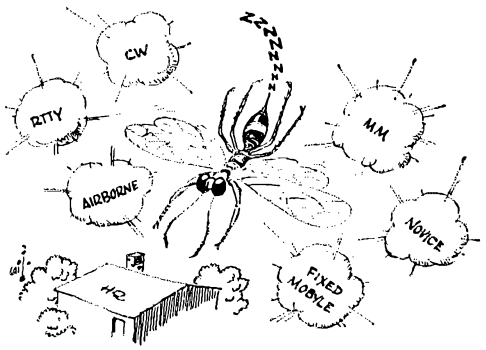
"OK, Charlie, but how about the most important thing? The certificate! That's all anybody wants. It's gotta be a real terrif certif — right?"

"Right. A certificate. We gotta make it big — big! We'll make it a wall mural — fill the whole wall. The greatest certificate ever. Pictures of State Parks, forests, trees, streams, scroll writing. Yeah, we'll dress it up! Lots of colored ribbons and seals. We'll have ribbons and stickers for everything! Yeah."

"Charlie, how about a picture of a big wasp right in the middle of the mural . . . errr, certificate — flyin' through the trees or something?"

"Yeah, that's good. And we'll have a different color ribbon and sticker for each mode, each band, all different powers, fixed mobyle, RTTY, MM, airborne, day or night, winter or summer, different age groups. Tremendous, I tell ya. This is gonna revolt — ah, revolutionize the entire certificate industry!"

"Hey, Charlie, you're lost. Where do ya get MM in the High Sierras?"



"Come on, fella, don't quibble. Think big. If Giglimo Martooni could invent the stuff, we can figure out how to . . ."

"What about that airborne in a State Park, Charlie?"

"You're out of order. Be quiet."

"Charlie, ya think we could get the Governor to sign the thing too?"

"Yeah, sure. We could even get him to be the custodion. I got important connections, ya know. Hey — maybe we could even get the Presid . . . naw, these are only State Parks. Maybe a Senator though."

"Pardon me, Charlie, old boy, but how many of the Park Rangers are hams? How is anybody ever going to work all the parks?"

"Mobyles, fella, mobyles. They go through now and then. Good Field Day . . ."

"But, Charlie, there are 144 State Parks?"

"Listen, fella, ya gotta think big. I tell you, friend, this will be the greatest award ever offered by anybody for anything, anywhere!"

"Hey, Charlie, ya know what we ought to give any guy who can qualify for any part of this WASP?"

"What?"

"Give the guy one of the State Parks — complete with a Ranger. And every new endorsement gets him another Ranger! Ten Rangers gets him a Rangerette."

"That's not funny, fella. Here I am thinking my head to the bone to make a good certif with lots of colored ribbons, lots of endorsements, big stickers and some of you guys . . ."

"Charlie, Mr. Chairman, I think we ought to have it so they have to work club members too."

"Ya mean the club members have to be in the Parks?"

"Nah, just work the members at their home QTH."

(*Continued on page 162*)

*45 Laurel Street, Atherton, California.

Hints and Kinks For the Experimenter

FINGER KEYING

THE article, "A Novel Key for Use with Electronic Keyers," in *QST*, August 1962, is somewhat similar in principle to a key I have used for some time. Although my key is a little less sophisticated than W5HPB's key, it can be used for c.w. "finger keying."

My pair of finger keys is made from two strips of ½ × 3-inch aluminum sheet cut from scrap (brass, steel, etc., may be substituted) and mounted about ¼ inch apart on a wooden base. A side view of the arrangement is shown in Fig. 1. The contacts should have very close clearance and require very little effort to close. A piece of plastic tape on top of each strip provides insulation and gives a softer "feel" to the finger. Since my index finger is the most agile, I operate the dots with it (via the electronic keyer) and the dashes with the adjacent middle finger.

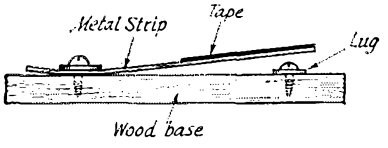


Fig. 1—W9UZS's finger key.

The scope of this type of key using multiple finger operation is not limited to electronic keyers; the keys may be operated without an electronic keyer assist. Perhaps a bank of four keys, mounted in a row and played like a piano with a rolling motion of the fingers, could be used. Or still another version — add a fifth key for the thumb and make all the dashes with the thumb. One's imagination and practice are the only limits to the combinations that can be worked out for the various letters and characters.

— *W. W. Johler, W9UZS*

CONVENIENT CHASSIS TIE-DOWN

MY transmitter is built on a 17-inch wide chassis which barely clears the 17⅝-inch opening in the cabinet. I wanted to install some kind of bracket on the rear of the chassis so that once the chassis was installed in the cabinet it could be clamped down. Because of the clearance problem I could not mount the bracket on the chassis before installing it. If I waited until the chassis was in the cabinet I could not get the mounting hardware into the chassis to attach the bracket. The solution was to use a small hinge as shown in Fig. 2. It is attached to the chassis and folded up. When the chassis is in place inside the cabinet, the hinge is dropped down into place and bolted to the cabinet.

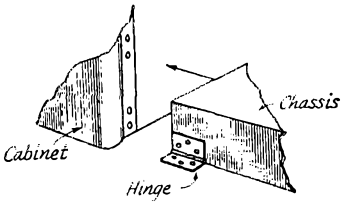


Fig. 2—WA4DQS's hint for chassis tie-down.

— *Capt. William J. Starr, WA4DQS*

THICK-WALL FEED-THROUGH

I HAVE been using coax feed lines for several years and have always used the 2-inch 83-1F coax feed-through connectors to bring the feed line through the house wall, window frame, etc. However, my present home, built around 1778, has extra thick walls that range from two to three feet in thickness and the window frames are over one-half foot in thickness! I devised the simple coax feed-through shown in the accompanying sketch in Fig. 3. It involves the use of two 83-1F connectors and a short length of coax with 83-1SP connectors attached to both ends. A hole, ¾ of an inch in diameter, is drilled through the wall or window frame. The assembly, less one washer and 83-1F nut, is pushed through the hole. When the nut and washer are attached and tightened, the job is completed.

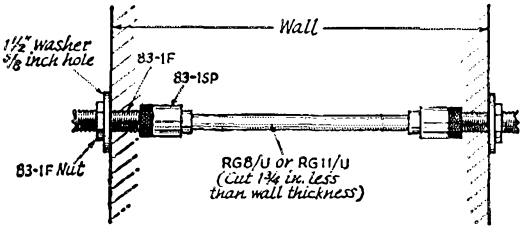


Fig. 3—W4JA's thick-wall feed-through.

— *Gilbert L. Countryman, W4JA*

UNUSUAL MOBILE LOG

AN unusual and useful mobile log for long trips is a common road map. I keep my mobile contacts logged on a road map at the location where the contact was made. This properly locates our position, which is required by regulations, and often provides conversational material for the contact. The information is transferred from the map to the regular mobile log at the end of each day.

— *Leonard M. Norman, W6JLY*

NEW LIFE FOR SLUGGISH AR22 ROTATORS

During low-temperature periods, my AR22 antenna rotator would begin to slow down, and when the temperature dropped below zero it would stop altogether. After some investigating I found the trouble was due to a faulty 100-μf. capacitor in the control box. I removed the capacitor and replaced it with two equal electrolytic capacitors connected back to back, as shown in Fig. 4. (The original capacitor was nonpolarized.)

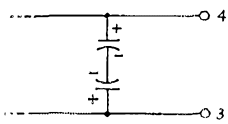


Fig. 4—Circuit showing connection of the electrolytic capacitors to the AR22 rotator.

I used two 400-μf., 450-volt photoflash capacitors, but any good quality type with the proper rating would suffice. After replacing the capacitor, the rotator functioned perfectly at all temperatures.

— *E. Kirchner, VE3CTP*

MOBILE NOISE SUPPRESSION

Coaxial capacitors for ignition spark coil primary filtering must be installed with the shortest leads possible. I found that the capacitors with threaded terminals have the same thread as the screws projecting from the spark coil. The capacitors may be threaded directly onto the coil terminals resulting in no leads at all! Of course, the capacitor's metal case must be grounded to the coil case. This can be done with copper straps soldered to the capacitor and coil cases.

— *James W. Stuckey, W5ZJO*

SURGE PROTECTION FOR DIODES

One way that I have found to protect semiconductor diodes from starting-current surges is to use a thermistor in series with the primary voltage. The circuit in Fig. 5 shows a typical application using a thermistor, RT_1, in the transformer primary circuit. Of course, the d.c. resistance in the transformer winding gives

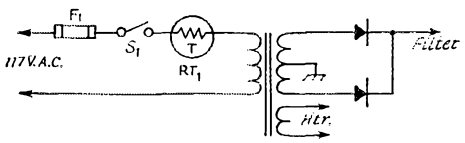


Fig. 5—W4ZXB uses a thermistor for surge protection.
F_1—Fuse of the proper rating.
RT_1—0.49-ohm thermistor (Workman FR .49).

some current limiting. Probably the best application of the thermistor along these lines would be in a "transformerless" power supply.

The thermistor I use has a cold resistance of 80 ohms which drops to about 0.5 ohm when hot. It is a Workman type FR 49 (the number indicates the "hot resistance"), and is available from most radio and television parts distributors as a TV replacement.

— *James E. Goff, W4ZXB*

AUTOMATIC GSB-101 and KWM-2 OPERATION

If the changes shown in Fig. 6 are made to the Gonset GSB-101, it can be used with the Collins KWM-2 (or S-line) for either "barefoot" or amplifier operation.

The GSB-101's antenna relay, RLY_1, comes from the factory wired as shown in Fig. 6A. Change the wiring to that shown in Fig. 6B. The modification requires the addition of two other relays, K_1 and K_2. Relay K_1 is a 6.3-volt a.c. unit keyed from a voltage derived from the KWM-2's accessory socket. The other relay, K_2, has a 117-volt a.c. coil and is connected across the red pilot lamp in the GSB-101.

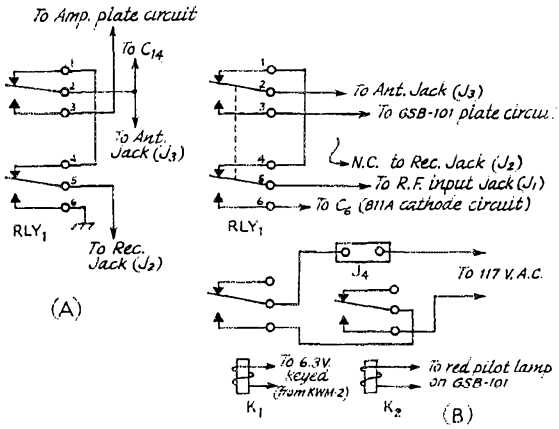


Fig. 6—Modifications to the GSB-101 for automatic operation with the KWM-2. Relay RLY_1 is the GSB-101's antenna relay.
K_1—6.3-volt relay.
K_2—117-volt relay.

When the plate switch on the GSB-101 is in the "off" position, relay K_2 is open. When the KWM-2 goes to "transmit," 6.3 volts is applied to relay K_2, closing it. However, the 117 volts necessary at Terminal J_4 to close RLY_1 isn't present since K_2 is open. Therefore, output from the KWM-2 comes in jack J_1, through the relay RLY_1 (which is not closed), and out to the antenna, for "barefoot" operation.

However, when the plate switch on the GSB-101 is closed, power is applied to the red pilot lamp which closes relay K_2. When the KWM-2 goes to transmit, 6.3 volts is applied to K_1. Now there is 117 volts appearing at J_4 which closes relay RLY_1. The KWM-2 output is now fed to the 811A cathodes and the GSB-101 amplifier is in the circuit.

— *Eugene M. Zimmerman, K1ANV*

Building Fund Progress

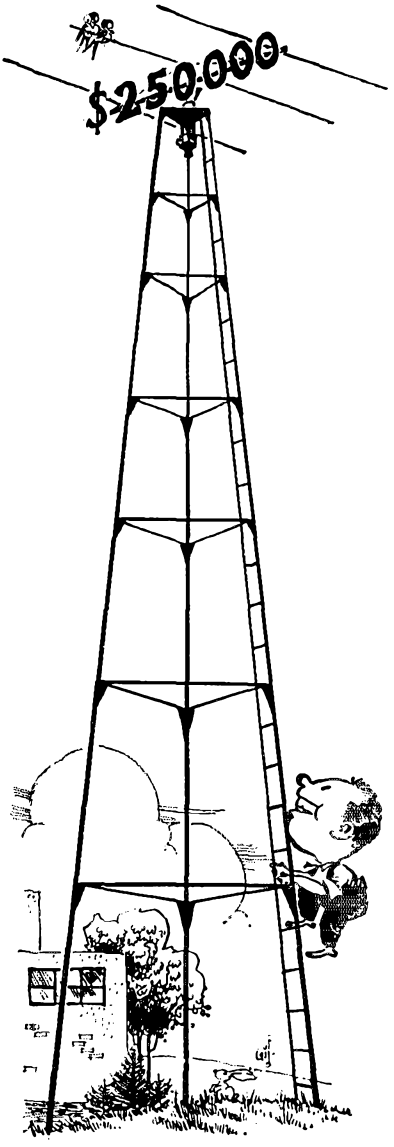
MEMBER contributions to the Building Fund continued their steady, if summer-slow, pace during August, but our little man on the tower moved up only slightly. Most encouraging are plans of a number of clubs for fund-raising projects, some in process and some scheduled this autumn (such as described on the facing page) and of convention or hamfest sponsors to make substantial donations to the Fund (such as the Southwestern Division Convention and the Dayton Hamvention). We expect to see a real boost in the fund drive as we get into the autumn and winter seasons.

—···—

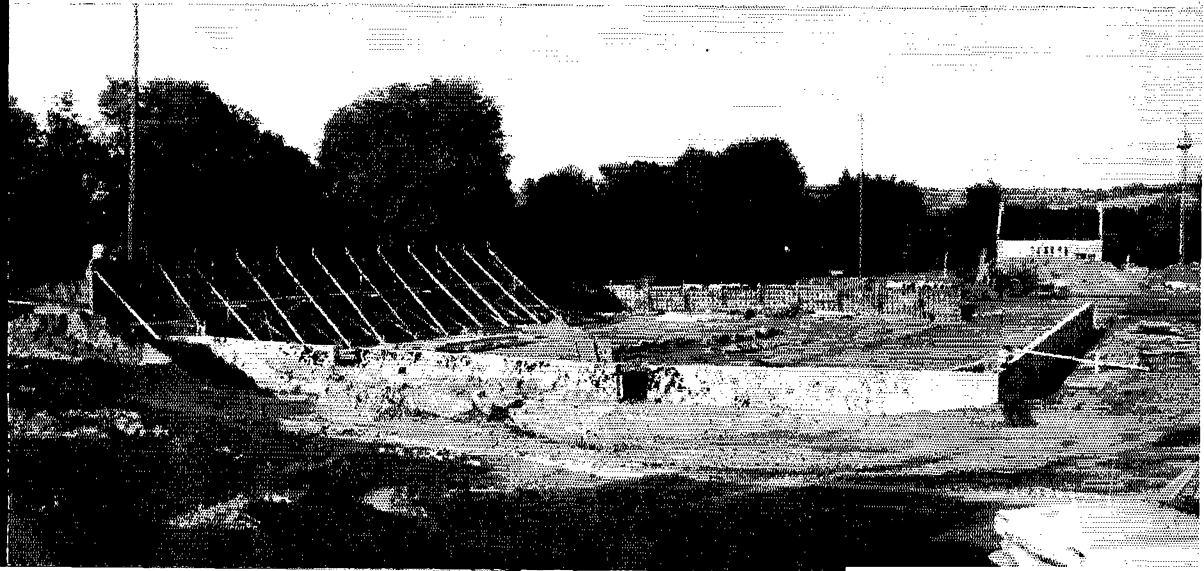
As to the building itself, rough grading has been completed, an extensive storm drainage system is in place, footings and concrete base walls are nearly finished, and the steel framing is due to go up about the time you read this. The structure should be enclosed well before the onset of severe weather, and barring complications the building should be ready for dedication and occupancy in the spring.

—···—

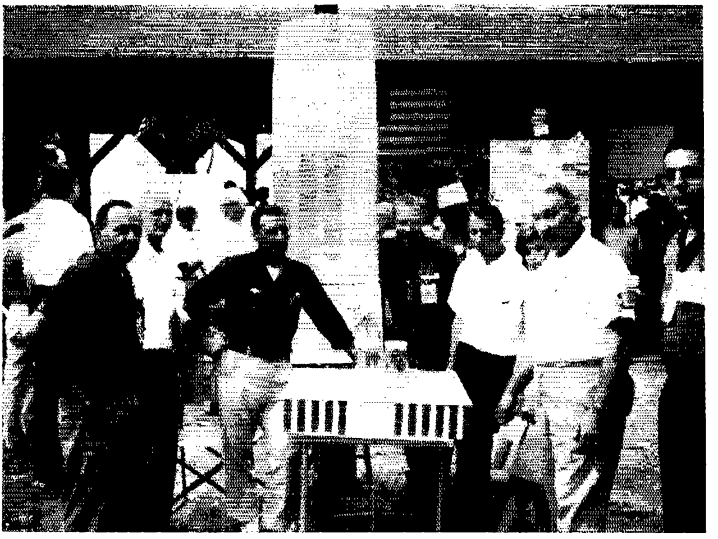
Will *your* name and call be inscribed in the Building Fund record of participants? It should be — and we can provide no better reasons than those in various comments from contributing members, examples of which are on the facing page. If you missed it, a subscription form is in the May issue of *QST*, or another will be sent on request. A helpful reminder: contributions are U. S. tax-deductible. Each individual or club donor receives a handsome certificate of participation in the Building Fund drive. Get yours now, OM!



This is the ARRL Headquarters building, as of August 22. There are no startling day-by-day changes in over-all appearance, but many essential basic operations are being completed. We expect that by the time you see this in print, the steel work will have been started.



Members Are Saying . . .



W3KKN, W2EIF, W3JSD, W2LOY, K3AUH, W3CL and K3IUV at the Operation Building Fund activity of the Pack Rats at their August picnic. The placards at the back of the model were filled with call letters of those participating at "a buck a brick."

At yesterday's Pack Rat Picnic we had the first showing of our new ARRL administration building model . . . All of the Pack Rats had bricks with their call letters on the building and additional friends to the number of 177 contributed for a plastic brick with their call letters thereon. This particular part of Operation Building Fund will be followed by subsequent events, such as a white elephant sale, auctions, viewing of the model and other activities . . . We will forward to you progress reports indicating the status of "our" new administration building and we trust that the new one up there in Connecticut will proceed with like speed. — *K3HWZ*

Even though a new ham, I realize that I would not be a ham if it were not for our wonderful League, and its many contributions to ham radio. I am behind the Building Fund 100%. Here is my contribution; it is not much, but I hope it will help. — *WN0CKK*

Half of the enclosed I would like to donate in memory of the late VE3WM. Bill was a great friend of mine and helped me considerably in ham radio and I know that if he were alive he would appreciate this gesture very much. — *VE3BMZ*

Though I received my General Class license only this morning, my first act is sending my membership to ARRL. Your publications have been so helpful in my studies for the license, as well as so interesting, that it seems to me only fair that I support your activities.

As a further token of my appreciation and recognition of your consistent efforts through the years to assist radio amateurs in all phases of their activities as well as to represent them constructively with legislative bodies, I enclose a check for your building fund. — *WB6AUQ*

Please send me a subscription blank for the building fund. I have already contributed, received the certificate and notification. However, in retrospect, it seems to me that I should be more cognizant of all the things the League has done for ham radio in general and me in particular. Perhaps I'll forego the new tools I thought I needed and add another "brick" to the building instead. I am absolutely positive that the brick will do much more good than the tools. — *K9LKA/W9CPD*

Enclosed herewith you will find a check for the building fund. The members of the Honolulu Amateur Radio Club voted this to the ARRL from their funds with the hopes that it will help and assist in the new building program which we have been hearing about here.

May I on behalf of all of the members of the Club wish you our best with the hope that you will soon be in the new quarters and finally comfortably set up. — *KH6WO*

Enclosed is the August payment on my pledge.

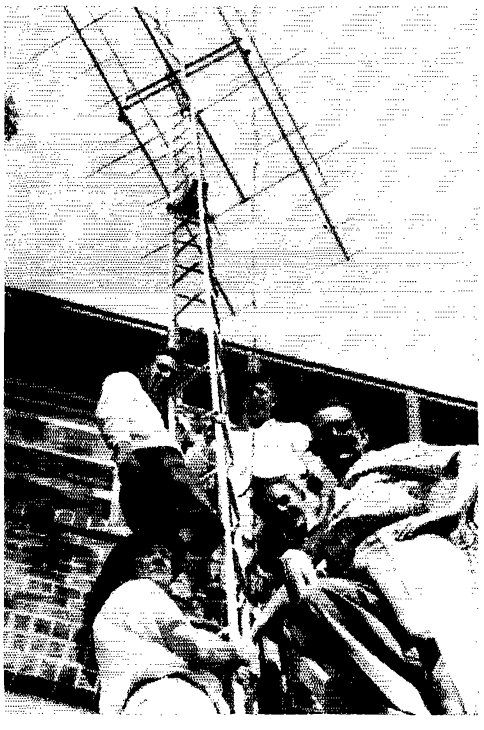
Powerful elements exist that desire the ham bands. Any ham who does not recognize this is naive. Without doubt, they are observing this building drive to gauge our present strength and our response will give them a true evaluation of our willingness to stand behind our only line of defense — the ARRL. A mere number count of the hams in this country gives little insight into the true staying power of the group. — *K6KKG*

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

DURING the month of August we were privileged to have the Massachusetts VHF Society hold their August meeting at our QTH. I don't know how much they learned, but I received a liberal education in everything from "How to be a well-rounded amateur" to "How to be an OO (Official Observer) without losing friends." Senior member at the meeting was W1IO. Bob has been one of the mainstays on the u.h.f. bands for years and his unswerving loyalty to operation and experimentation has been a real service to the v.h.f. fraternity. Just to make sure that the low bands (50 Mc. and up) were taken care of properly, Bob tutored his XYL into becoming K1AAA. Bob says it wasn't really like losing a wife but more like gaining a ham. Jack, W1QXX, president of the Mass. VHF Society and latest Massachusetts 50-Mc. man to work 48 states, points out that the object of the club is to promote interest in v.h.f. at the family level. A large percentage of the membership are husband and wife hams, attesting to the efficacy of the club aims. It certainly was a pleasure to see a ham club demonstrating that there is a place in ham activities for the whole family. Among the many subjects discussed, the following seem pertinent to this column.

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



V.h.f. antenna going up in Canada prior to June contest. On top of tower: 3-element 6-meter beam, 16 elements for 2, 26 elements for 1¼. On tower—top left: John Ebersole, SWL; VE3BGB. Bottom left: VE3CWR, VE3BYU, VE3FBE.

Crystals. The old saw about "what frequency am I on?" comes up every month. It doesn't seem possible that there is anyone who hasn't read at least one dissertation on frequency control. Maybe it just goes by as something that applies to the other guy. Anyway, here it is again! The frequency marked on a crystal holder is placed there by the manufacturer and represents the frequency on which that particular crystal will oscillate under a certain set of conditions. If the crystal has not been abused, it will quite probably oscillate on that frequency under the same conditions. It is very unlikely that your transmitter will be making use of these exact conditions and as a result your actual frequency may be many kilocycles away from the marked frequency. This does not mean that the crystal is bad or that the circuit is bad. It only means that the only way to check your frequency is to measure it. While we are on the subject I would like to point out that phone operators are required to keep their sidebands inside the edge of the band. An a.m. phone signal is generally conceded a six-kilocycle bandwidth and must thus stay at least 3 kc. inside a given band edge. On 50 Mc. this means your frequency must be 50.103 or higher if you are operating a.m. with the accepted bandwidth. S.s.b. stations with good unwanted sideband suppression can, of course, operate much closer if they are using upper sideband.

50-Mc. c.w. band. Big complaint about "nobody listens in the c.w. band." My own personal comment here is "Why should they? There is nobody there that you can't hear just as well in the phone band." This is not entirely correct, however, as there are a few dedicated workers who do indeed inhabit the wide-open space between 50.000 to 50.100 Mc. Mostly the activity is confined to scatter schedules and these efforts do pay off in reliable long-distance contacts. The claim that nobody listens is, however, just not so. All you need as proof is one rare station in the c.w. band, like XE1OE or VE8BY (on the east coast). The truth about the matter is that the preponderance of activity on 50 Mc. is on phone. As a result, a band opening is much more likely to be spotted in the phone band. Hence, anyone looking for a band opening usually listens in the phone band. Once an opening is observed it is possible that something a little more on the rare

side might be found on c.w., but the likelihood is small, as most of the stations capable of c.w. operation are listening for a band opening in the c.w. band where the activity is not sufficient to alert them. The day when you needed a beacon to tell if six meters was open has long since passed. The best way to promote c.w. activity on 50 Mc. is to operate religiously and tell people what you are accomplishing. If you are in fact consistently working more than most others from your area (à la W6NLZ, W6BAZ, K7AAD, etc.), you have a point to make and you will get response.

OOs. "It is a comforting feeling to know that someone is listening who cares enough to try and help you keep your signal legal." I wouldn't say that this is a typical answer from the recipient of an official observer report, but it is safe to say that it typifies the interest of the official observer class. An OO has no ax to grind, has no friends and no enemies. His reports are, to the best of his ability, factual and without bias. His official duties do not include contacting you on the air to advise you, although he will in general be glad to give frequency checks and signal checks in an unofficial capacity, as will any well-equipped amateur. His reports are generally restricted to advising the recipient of a violation of some portion of the FCC rules and regulations. He is not supposed to be perfect but he is supposed to be overly careful in his observations. If you get an OO card, you probably did what it says. Your OOs deserve your support and cooperation. If you think you are qualified to argue with him, why not apply for an OO position yourself? The v.h.f. bands need you.

Moonbounce

Well, KH6UK and W1BU finally made it two-way. I am waiting for some erudite character to figure out how far it is. Don't forget to come to the Syracuse V.H.F. Round-Up as Tommy (KH6UK) will be on display (probably still trying to catch up on three months' sleep). Next stop — Switzerland!

50 Mc.

Reports received from Pete, VE8BY, for the month of July state that six-meter activity has picked up a bit for him, partly because he now is running 150 watts input to the sideband rig. Contacts for the month into Yellowknife included KL7FLB, K7CQI, W7SFK, VE4TL, VE4YW and VE4TX, with KL7FLB being heard or worked twelve times during July. On July 27 Pete heard two W8 stations but was unable to attract their attention after using s.s.b., c.w. and a.m. Best day since his last report was August 1 when he worked VE2AIO (2-way s.s.b.), nine VE4 stations, one VE5, and seven W7 stations. Pete sez: "Seems strange when I have to ask a station to repeat because KL7FLC is causing QRM on the frequency; they don't hear him and yet he's causing QRM off the back of my beam."

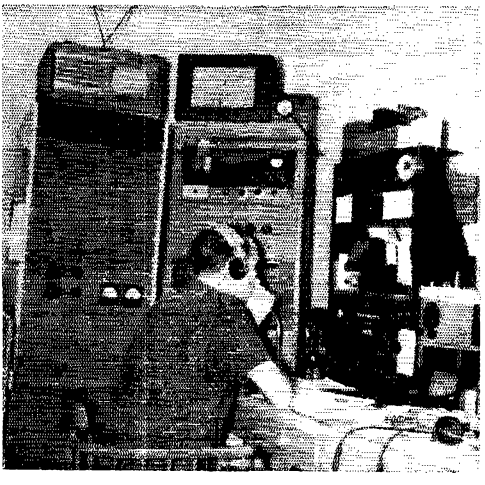
From Quebec, Canada, and VE2AIO, we hear that "In general, six-meter conditions have been very interesting here. Single hop was heard every day during the month of July, at times spotty, but more often than not, very intense openings. Aurora has been noted here every evening in July, usually week auroral openings but those of July 25 and 30 were as intense as any I have ever heard. As far as I am concerned, July has been the most interesting month this year, certainly more openings noted than in either May or June; and whereas the long-skip openings earlier in the year seemed to land into the Southwest and Mexico primarily, in July the long skip openings hopped all around making life most interesting." Among interesting stations either heard or worked by Geoff during July were: W5SFW, W5PVT, VO1DW and WØGNS, all worked on July 6 within a two hour period; CO5CN heard on July 7; VE8BY heard on July 10 and worked on July 26 and August 1. On July 11 KØBCW (Colorado) was worked two-way s.s.b. for a new state at VE2AIO; July 14, heard K4PGL. VP9 working east coast stations. July 19 another new state, Washington, was worked for added interest and on that same day K?6B? was heard calling "CQ" with a very weak and rapidly fading signal. Heard only the one time and not identified. PJ2AA on Aruba was worked on the 22nd and KØTSD in Denver worked on the 29th for another 2-way s.s.b. contact.

Trophy awarded by the Cleveland 50-Mc. DX Club. For details write to K8NUE.

In VE6-land, Bob Henry, VE6DB, says that six-meter activity is considerably better and that there have been frequent openings into W6, WØ lands and a few into W7 and VE4 areas. Word received from Scotty, W5DZF, to alert v.h.f. gang that VP7BO, Lee, will soon be operating on 50 Mc. from the Bahamas and hopes to operate on 144 Mc. at a later date.

We find that in spite of the skip conditions prevailing on 50 Mc. during the spring and early summer months, a number of the 50-Mc. operators in the Detroit, Michigan, area have retained their interest in RTTY. At the present time the following are operating on six-meter a.f.s.k.: K8IPN, K8EUO, K8KYS, K8AMG, K8NTB, K8PZG, W8SWC, K8LXJ, K8AIZ, W8LTW and K8NBG.

WA4BMC sez that 50 Mc. had its share of openings into Lake Worth, Florida during July, having been open on nineteen different days; and K9FNB in Illinois sez that the band was open several times during that month with the best opening being a (almost) day-long-one on July 30 when it was open to the southeast, south, southwest and northeast Dick worked WA21YZ 4 who was mobile at the time. In Pennsylvania, Bill, K3ARR, notes that conditions have been



Can anyone identify this well-known s.s.b., 50-Mc. operator?

220- and 420-Mc. STANDINGS

220 Mc.

W1AJR	11	4	480
W1AZK	9	3	412
W1HDQ	11	5	450
K1JIX	10	3	450
W1OOP	12	4	400
W1RFU	15	5	480
W1UHE	11	4	385
W2AOC	13	5	450
K2AXQ	9	3	240
WA2BAH	4	2	167
K2CBA	13	6	650
K2DIG	4	2	140
W2DWJ	15	6	740
W2DZA	12	5	410
K2ITP	11	5	265
K2ITQ	11	5	365
K2JWF	6	3	244
K2KIB	12	4	300
W2LRJ	10	4	250
W2LWI	12	4	400
W2NTV	12	5	300
K2PPZ	11	4	400
K2QJQ	13	5	540
W2SEU	4	2	150
K2UUR	4	3	105
W3AHQ	4	3	180
W3FEY	10	5	350
W3JYL	8	4	295
W3JZI	4	3	250
W3KKN	10	4	255
W3LCC	9	5	300
W3LZD	15	5	425
W3RUE	9	5	450
W3UJG	13	5	400
W3ZRF	5	4	112
K4TFU	8	4	400
W4TLC	5	1	315
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
W8RNM	8	4	390
W8PT	10	5	660
W8SVI	6	4	520
W9AAG	9	4	660
W9EQC	11	5	740
W9JCS	6	2	340
W9JEP	9	4	540
W9OVL	6	3	475
W9UED	4	4	605
W9ZIH	10	5	500
K0DGU	5	3	425
K0ITF	6	3	515
KH6UK	1	1	2540
VE3A1B	7	4	450
VE3BPR	3	3	300

420 Mc.

W1AJR	11	4	40
W1HDQ	8	3	210
W1MFT	8	3	170
W1OOP	11	3	390
W1QWD	9	3	—
W1RFU	7	4	410
W1UHE	6	4	430
W2AOD	6	4	290
W2BLV	12	5	360
K2CBA	5	3	225
WA2DTZ	6	3	200
W2DWJ	10	4	196
W2DZA	5	3	130
W2HQB	8	4	280
K2KIB	4	2	100
W2NTV	3	2	100
W2OTA	10	4	300
K2UUR	8	3	215
W2VCC	9	4	280
K3CLK	4	4	
K3EOF	6	3	250
W3FEY	7	3	296
W3LCC	2	2	
W3RUE	2	2	96
W3UVG	6	6	4
W4HHK	6	4	550
W4VVE	7	4	430
W5AVG	5	1	425
W5HTZ	5	3	440
W5RCI	11	3	600
W6GTG	1	1	180
W7LHL	2	1	180
W8HCC	3	2	355
W8HRC	3	2	250
W8JLQ	4	2	375
W8NRM	3	2	390
W8PT	6	3	310
W8RQI	4	2	270
W8TYY	9	5	580
W8UST	3		225
W9AAG	8	4	525
K9AAJ	7	3	425
W9GAR	9	4	608
W9OJI	6	3	330
K9ITF	3	2	185

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

2-METER STANDINGS

W1REZ	32	8	1300
W1AZK	28	8	1205
W1KCS	24	7	1150
W1RFU	24	7	1120
W1AJR	23	7	1130
W1MMN	22	8	1200
W1HDQ	22	6	1020
W1IZY	20	7	1180
K1CRQ	19	6	800
W1AFO	18	6	920
K1AFR	17	5	450
W2NLY	37	8	1300
W2CXY	37	8	1360
W2ORL	37	8	1320
W2BLV	36	8	1020
K2GQL	35	8	1365
K2LMG	29	8	1290
W2AZL	29	8	1050
K2IEJ	27	8	1060
K2CEH	25	8	1200
W2AMJ	25	6	960
W2ALR	24	8	1100
W2RXG	23	8	1200
W2SMX	23	7	1090
K2HOD	23	7	950
W2DWJ	23	6	860
W2PAU	23	6	753
W2LWI	21	6	753
K2KIB	21	5	700
W2ESX	21	6	750
W2UTH	20	7	880
W2WZR	19	7	1040
W2RGV	19	8	720
W2RLG	17	6	980
K2JWF	16	6	550
W3RUE	33	8	1100
W3GKP	31	7	1180
W3SGA	31	8	1070
W3TDF	30	8	1125
W3KCA	28	8	1110
W3BYF	28	8	1070
W3EPH	32	8	1000
W3LNA	21	7	720
W3LSF	21	6	800
W3NKM	20	7	730
W3LZD	20	7	650
K3HDW	12	6	1015
W4HJQ	38	8	1150
W4HHK	37	9	1280
W4LTU	34	8	1160
W2XL	34	8	950
W4MKJ	33	8	1149
W4AO	30	8	1120
W4WNH	30	8	1050
W4LVA	26	8	1000
K4EUS	26	7	1130
W4EQM	25	8	1040
W4ATB	25	8	900
W4JCJ	23	6	725
W4VVE	23	6	724
W4RMU	21	7	1080
W4TLV	20	7	1000
W4IKZ	20	6	720
W4OLK	20	6	720
W4LNG	19	7	1080
W4RFR	18	9	820
K4YUX	18	8	830
W4CPZ	18	6	650
K4VWH	18	6	590
W4MDA	17	6	757
W5RCI	38	9	1280
W5FYZ	33	9	1275
W5AJG	32	9	1360
W5JWL	29	7	1150
W5DFU	28	9	1300
W5PZ	27	8	1300
W5LPG	25	7	1000
W5KTD	23	8	1200
W5SWV	20	5	960
W5MIL	16	6	700
W5KFU	13	4	1300
W5FSC	12	5	1390
W5HEZ	12	5	1250
W5CVW	11	5	1180
W5NDE	11	5	620
W5VY	10	3	1200
W5EDZ	8	5	
W5YYO	7	4	1330
W5UNH	6	3	1200
W6WSQ	15	5	1390
W6NIZ	12	5	2540
W6DNG	9	5	1040
W6AJF	6	3	800
W6ZL	5	3	1400
K6HMS	4	3	850
K6GTG	4	2	800
W6MMU	3	2	950
W7JRG	15	6	1280
K7HKD	13	5	1130
W7LHT	5	3	1050
W7OSM	5	2	670
W7JIP	4	2	900
W7JU	4	2	235
W8PT	39	9	1260
W8KAY	38	8	1245
W8SDJ	37	8	1220
W8IFX	35	8	980
W8SFG	34	8	1040
W8LOF	33	8	1060
W8RMH	32	6	910
W8GGH	32	8	1180
W8BAX	32	8	960
W8NOH	31	8	1090
W8SVI	30	8	1080
W8EHW	30	8	860
K8AXU	29		1050
W9LPD	29	8	850
W8WRN	28	8	680
W8DX	26	8	720
W8ILC	25	8	800
W8JWV	25	8	940
W8WNM	25	8	900
W8GFN	23	8	540
K1CRQ/8	22	8	690
W8LCY	22	7	680
W8BLN	21	7	610
W8GTR	17	7	550
W8NRM	17	7	550
W9KLR	41	9	1160
W9WOK	40	9	1170
W9GAB	34	9	1075
W9AAG	34	9	1050
K9AAJ	31	8	1070
W9REM	31	8	850
W9ZHL	30	8	830
W9PBP	28	8	820
W9LVC	27	8	950
W9OJI	27	8	910
W9ZHL	25	8	700
W9BPV	25	7	1030
K9SGD	24	7	1100
K9AQF	24	7	900
W9LF	22	7	825
W9KPS	22	7	690
W9CUX	21	7	800
W9ALU	18	7	800
W9RFB	37	9	1350
W9HHD	31	8	1030
W9SAIJ	29	9	1075
W9LFE	28	7	1050
W9QDH	27	9	1300
W9RUF	23	7	900
W9IC	22	7	1360
W9MOX	22	6	1150
K9TF	21	6	940
W9INL	21	6	830
W9FGC	21	7	870
W9RYG	20	8	925
W9ENC	20	6	1100
W9AZT	18	7	1100
W9JAS	18	6	1030
K9AQJ	16	6	1020
W9IFS	16	6	1100
VE3DIR	10	8	1330
VE3AIB	28	8	1340
VE3BPR	24	7	950
VE3BQN	19	7	790
VE3AQG	18	8	7300
VE3DER	17	8	1340
VE3RW	17	7	1350
VE2ARF	10	4	580
VE7FJ	2	1	365
KH6UK	2	2	2540

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

generally good with 8, 9 and 0's coming through and a few 6's being heard on double hop; and down in Georgia, Walt, W4FWH, says that there were too many openings to mention the peak being around July 7, 8, 9, and 10 when 6's, 7's and 0's were heard and worked. Other openings were mostly to 2's, 3's and 5's. W7ADR observes that 50-Mc. skip has been better this year in Portland, Oregon than last year during the same period with 2's, 3's, 4's and 5's coming in very well. Niles sez that although there was talk in his area of 1's being worked no one has received any QSO verification in the form of a QSL.

In Columbus, Ohio, K8IRR noted openings on July 6, 7, 19 and 22 with the one of the 19th being the best having lasted longest and with all of New England being heard. Out Tennessee way W4HHK relates openings on seven days during July with New England, Michigan, VE3 Florida, Colorado and New York and New Jersey being heard. Paul says that 50-Mc. activity is good but nearly all A3 emission.

We (and all of New England) are happy to report that Jack Wilson, W1QXX, has Wyoming confirmed, making his score 50 states worked on 50 Mc. Sorry to say though that he'll have to rework Hawaii and Alaska before getting 50-Mc. WAS. From Manchester, N. H. and K1PDA we hear of the band opening of July 14 when Dave worked VE4MA, W3BWM and K3NNZ; he also heard VE3CJN and VE2MJ working W9SSU. K9JSB reports an interesting QSO on July 10 when KØMSS, WØYZV, KØSKV (all Nebraska), KØJRM (Iowa) and K9JSB (Illinois) held an hour and twelve-minute contact. Stan is one of those who need only KH6 and KL7 to complete his 50-Mc. WAS.

Down in Pittsburgh, W3BWU reports excellent conditions again this summer. On July 7 within a two-hour period Ed worked CO5CN, K4RNG, KP4BEL and VE1OM. Keith Armstrong, W7UBI, in Boise, Idaho, has passed along some interesting words from KL7AUG and from himself also. Bob, KL7AUG, has been operating 50.095 c.w. only since June 26, running 18 watts to a 6-element beam up 70 feet. He says: "I'm in the process of building an s.s.b. converter to use with my HT-37 on six meters. We'll use a 6146 driving a 4CX250B in passive grid." Bob also stated that he was hearing good signals from the Seattle-Tacoma

(*Continued on page 176*)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Who:

It's not easy to associate the hoop skirts, gas lights and horse-pulled buggies of the Gay '90s with DX. Sherlock Holmes and Dr. Watson were still solving an occasional enigma, and one T. Roosevelt was just getting set to gallop up San Juan Hill. Airplanes? Later. . . .

W9KJ recently produced an instructive review of *My Father, Marconi*, by Degna Marconi [McGraw-Hill, 320 pp., $7.50] for a local gazette. Although the book isn't long on the technical, it flavorfully recreates the Edwardian sphere in which the great inventor triumphed.

Marconi, who liked to consider himself a radio amateur, was essentially a DX hound (there are a few around today). He began sending signals from the attic of an old house in Italy 'way back in the autumn of 1894. These buzzes were finally detected by his brother in a vineyard over the hill, and the DX bug bit 20-year-old Guglielmo hard and deep.

Before concluding preliminary wireless experiments on his father's estate near Bologna he had spanned a mile and a half, and had already devised a directional top-loaded vertical beam to go with his rudimentary induction-coil spark and filings coherer. Marconi then packed up his outfit and went to England, probably the first DXpedition in history, where he communicated a 4-mile distance on Salisbury plain, then 9 miles across Bristol channel. By 1897 he was working Italian warships 12 miles from his station at Spezia. Marconi was beginning to get out!

All this time, like a good DX man, he was modifying and refining his homebrew gear. Thus in 1899 he was able to increase his countries total by working France from South Foreland, England, a 31-mile hop. British battleships doubled this record the same year but they were maritime mobiles without DXCC status.

In 1901 Marconi did the impossible, leaping the Atlantic between Newfoundland and England. But a DX man is never satisfied. The following year he was working distances of 2000 miles at night and 700 miles by daylight aboard U.S. liner *Philadelphia*. Not bad. In 1910 he voyaged to Argentina to copy Ireland on 8000 meters, a 6000-mile path.

The antipodes remained as ultimate DX challenge. Marconi got around to that objective in late 1918 by sending the first wireless traffic from England to Australia. After this he concentrated on wavelength DXploration, coming to appreciate what all hams quickly discover: WAC on 20 or 40 meters isn't quite the same achievement as WAC on 6 or 160 meters.

How many countries did OM Marconi work? Oh, not many by today's standards. But we know he had a wonderful time on all those far-ranging DXpeditions, and we hear he QSLd 100 per cent.

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

What:

Autumn usually means a return to decent DX conditions after the summer let-up, but the pattern for the past year or two has varied from the norm. Ten meters doesn't quite make it, 15 has a few transitory openings, and 20 tries awfully hard but tires itself out by evening. It looks as though 40 and 80 will just **have** to pitch in wholeheartedly this season to help carry the DX load. Seventy-five phone will do its part, and so will 160. But it's certainly a far cry from the late '50s when we had a six-ringed DX circus going all the way down to 6 meters!

Oh, the DX is there, all right. It just isn't so easy and simple to fill the log these sunspotless days — much more finesse and patience called for, higher station efficiencies, and careful selection of mode to match conditions. The following "How's" contributors report doing well on these respective bands:

10 phone: W2ELW.

15 c.w.: Ws 7POU 8YGR, Ks 1JFF 3CNN 5YFU 9SRR, WAs 2JIS 6KHK 6TZN.

15 phone: K9s SRR UKM.

20 c.w.: Ws 2TKG 6JQB 7DJU 7LZF 7POU 8YGR, Ks 1JFF 1LOM 2HJA 2UYG 3CNN 3AINJ 5RCO 5YFU 6TZN 9SRR 9UKM, WA6s HRS JVD KHK TZN, UER, VE7BBB.

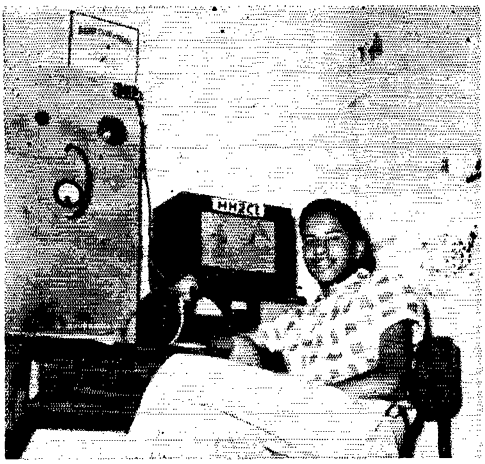
20 phone: W1APA, Ks 1JFF 2TDI, VE7BBB.

40 c.w.: Ws 2TKG 7DJU, Ks 1LOM 2HJA 3CNN 4MYO 5YFU 9JLQ 9SRR 9UKM, WAs 6PIB 6TZN 9AUM, WV6USQ.

80 c.w.: W7DJU.

160 c.w.: W2TKG.

Next month we hope to present the regular crosscheck of DX stations reported active per band if deadline developments permit. For now we'll jump right into the QTH/QSL department and see what the mailbag has to offer in that line. . . .



HH2CE is a c.w. fixture on 14 Mc. where his 25-watter is worked far and wide. Lionel is a member of the QRP Amateur Radio Club mentioned recently in "How's". *(Photo via K8TBR)*

Where:

Asia — "I shall be handling the QSL situation for VS9AAA," states W3IIQO. "John replaces VS9APH who returns to GW3IEQ. I'm still handling Phil's cards for VS9APH and Kamaran VS9KPH contacts." Reg gets monthly log shipments from Aden . . . . . MP4TAO shut down in August but may get back to Abu Dhabi in a couple of years. "DJ1BZ will continue to fulfill my QSL obligations, so anyone who has not yet received my card should contact him. It is doubtful if any cards sent to my old MP4 address will receive attention in the future. There is no post office in Abu Dhabi, so QSLs arriving after my departure may well become a wall decoration in the local bazaar. Found quite a few there!" . . . . . Those Cyprus 5B4s appear to have retained old ZC4 suffixes in most cases and can be QSLd accordingly.

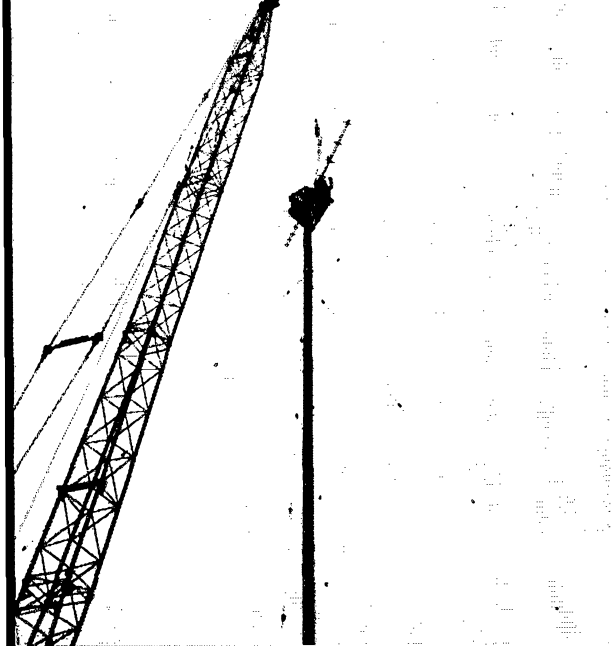
Africa — "I will be QSL manager for FT8AJ," notifies K2UYG. "Have all logs through January 13, 1962, and I expect the rest shortly. Yves has had several hundred contacts since starting up last December and he looks forward to many more W/K QSOs this season." . . . . . OT VQ8AI tells W8KX that International Reply Coupons are most welcome in Mauritius . . . . . NEDXA learns that ZD8RN stands by at home to replace his earlier homemade QSLs with commercial versions . . . . . Newark News Radio Club's *Bulletin* has it that K4TWF is attempting to obtain copies of the XT2Z logs destroyed by fire at his QTH so that he can continue as the station's QSL manager. Meanwhile, there's a fresh XT2Z lead in the listings to follow . . . . . From well-meaning VE1OX: "Sorry to disappoint the boys but in nearly a year I have not had the courtesy of receiving a letter, let alone logs, from EL6E. I am sending everything I have received for Philip to him by surface mail. I hope he will acknowledge his responsibilities." Such lapses of liaison are regrettable but they do come along once in a while to leave a QSL manager holding a hot potato.

Oceania — VR2DS, lately superactive on 20-meter single-sideband, holds to a 100-per-cent QSL policy but insists on self-addressed envelopes and appropriate International Reply Coupons from those who desire direct reply . . . . . KH6DOX was involuntarily designated QSL manager by KJ6CA but Mike has never heard from the fellow. Further check reveals that he left Johnston for Alaska, so KH6DOX is unable to oblige with confirmations . . . . . CT1CB tells W5KHP that somebody arrogated his son's CR8AB label after Joao closed down in mid-July . . . . . W1WPO of the ARRL DXCC Desk affirms that WA6MAZ handles VR3S QSLs only for operator Martin. Newark News Radio Club sources have it that VR3S staffers K6PWJ and K9USL are now liquidating Christmas QSL debts back home.

Europe — Crete's SV0WT has QSL affairs managed by K0RDP who also assists GW2DUR, HH2P, HH2P/3, PJ3AR, VE8MZ and YN1TAT. K2TDI says that SV0WT contacts around May, 1961, may possibly be confirmed through one Bob Stinson, P.O. Box 888, San Marcos, Texas. Furthermore, there's the direct P.O. Box 606, Iraklion, address for SV0WT, as well as the SV QSL bureau — take your pick . . . . . Sven Elfving of SL3ZO renews his offer of such items as U.S.S.R. prepaid airmail envelopes, Russian callbooks and other interesting QSL-grabbing equipments. Check with him for terms . . . . . West Gulf DX Club's newsy organ identifies W4OPM as QSL manager for EI8P, s.a.s.e. or s.a.e.-and-IRCS required.

South America — K9KDI stresses the s.a.s.e. requirement for QSLs confirming his PJ5MB St. Martin work of last month, according to WGDXC . . . . . W1UED of ARRL Hq. points out that K1NAP continues as clearinghouse for KC4-bound QSLs. Carelessness in referring to the *Call Book* results in many cards being sent erroneously to W1NAP's address. Similarly, K4DQS gets a large helping of mail that should be addressed to W4DQS. Until the *Call Book* commences segregating U.S. amateurs by prefix instead of suffix this type of confusion obviously must increase . . . . . Florida DX Club's *DX Report* reminds us that FY7YT's single-sideband QSOs are confirmable through W4JQM, others via W3AYD . . . . . VERON's *DXpress* gives us a return on those tricky LU-Z calls of the far south. The numbers mean nix, but watch the final letter after the "Z". A, G and M go for South Orkneys; I, O and S for South Shetlands; Y for South Sandwich; and most of the rest for various parts of Antarctica proper . . . . . VP4NC announces, "The government of Trinidad and Tobago has authorized a commemorative QSL card marking this country's emergence as one of the newest independent nations. The card will be used by hams in 'the land of the hummingbird' beginning Independence Day, August 31, 1962."

Hereabouts — "Kindly announce that I am QSL manager for H18s CLU and XAG," requests K4BMS. Done, Jim . . . . . From ARRL's East Bay SCM, W6OJW: "Approximately every two months the Nicaragua QSL Bureau sends me a batch of QSLs for W/K/WA/WB/KH6/VE areas. Please announce that s.a.s.e. to me will bring cards to those awaiting such confirmations. YN cards are held one week after arrival, then are cleared through the ARRL QSL Bureau." . . . . . K4ZZP disclaims responsibility for the verification of FM7 QSOs despite recent 7-Mc. evidence to the contrary . . . . . WGDXC indicates that W5NOP can oblige with VP2AP pasteboards when the proper log transcripts arrive. S.a.s.e., to be sure . . . . . WAs 4EPH and 9AIT offer to act as QSL managers for overseas ops in need of such assistance. WA4EPH would prefer an applicant from Europe or South America . . . . . W2TKG wonders if someone can supply QSL hints for verification of QSOs with FA8CR in 1955, KR6AC '59, KH6BDV/KJ6 '59, OD5LB '58, UO5AA '59, VP2AD '55, VP2LH '57 and ZB1KQ '52. And did anyone ever find those 1952 EA9DC logs, if any? . . . . . Re that lend-lease s.s.b. rig bouncing around the Caribbean, W4OPM continues to handle QSLs for this hemisphere, G8KS the rest. WGDXC understands that Joe issued all FM7WQ and DL4FC/DL8 QSLs as of mid-July . . . . . Our "QSLers of the Month" turn out to be GI4RY, HL9s KN KR, HP1IE, KM6CE, PJ2AE and XE2HN as nominated by K6TZX and WA6IRS. QSL managers also are widely applauded, and K6TZX credits ARRL's Sixland bureau as a regular QSLer of the Month every month. And now let's see what the mailbag has to offer in the way of individual specifics.



KG1BO's Hy-Gain log-periodic beam goes atop a 100-foot stick thanks to a huge crane loaned by RCA. K8NFC and an s.w.l. assistant tighten the nuts and bolts.

QST for

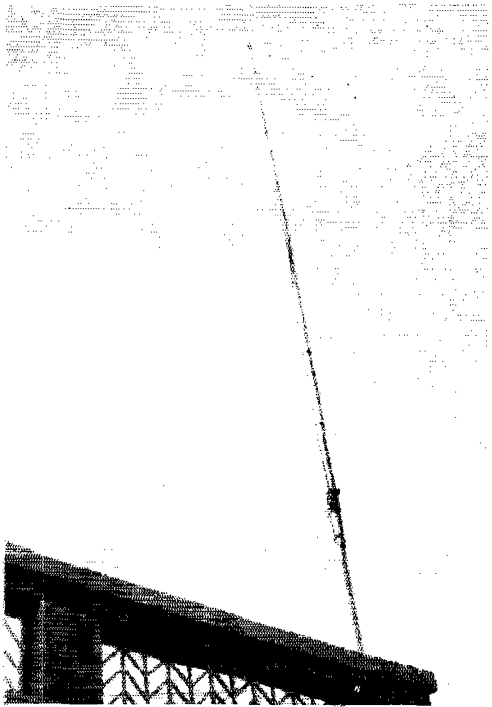
AP5HQ, Tigers Amateur Radio Club, STC, Kohat, W. Pakistan
AP5SS (via AP5CP)
DJ1ZG/M1 (via DARC)
DL4BV, S. Kugler (K1KRY), Hq. & Hq. Co., 507th USASA Gp., APO 34, New York, N.Y.
EA9AP, A. Real, P.O. Box 213, Melilla, Sp. Morocco
EI8P (via W4OPM)
EL2C, R. Pierce, U.S. Embassy, Monrovia, Liberia
FG7XT, P.O. Box 185, Pointe-a-Pitre, Guadeloupe
FP8CA (to K2OJD)
FP8CB (to WA2WBH)
GC2HCD (to G2HCD)
GC3MLR, S. Faulkner, Sentosa, St. Saviours, Guernsey, C.I.
HH7JFR, Box 2, La Romana, D.R.
HI8CLU, c/o U.S. Embassy, Santo Domingo, D.R. (or via K4BMS)
HI8XAG (via K4BMS)
HL9KB, A. Martin, Sig. Sect., Hq. 8th U.S. Army, APO 301, San Francisco, Calif.
HL9KN (via K7KID)
IS1KMU (to I1KMU)
K3TSC/KP6, J. McGill, c/o TGF 8.5, APO 86, San Francisco, Calif.
K4GHA/VO2, D. Nixon, 4082nd Opns. Sqdn., Box 35, APO 677, New York, N.Y.
KØDMU/KB6 (to KØDMU)
KH6DRM/KP6 (via KH6DRM)
KL7DBG/KS6, Det. A, GTF 8, APO 953, San Francisco, Calif.
KR6AR (via OARC)
LX3MA (via DL4-5 bureau, attn. DL4FZ)
MP4QBB, c/o Southeastern DX Club, P.O. Box 749, Atlanta, Ga.
ex-MP4TAO (via DJ1BZ)
PJ3AR (via KØRDP)
PJ5CG (via KØGZN)
PJ5CH (via KØGZO)
PJ5MB (via K9KDI)
SL1CF (via SM1AS)
SU1AC (via W2CTN)
SVØWT (via KØRDP)
TA2BK (via DJ2PJ)
TT8AJ (via K2UYG)
TY2MY (via KV4AA)
VP2AP (via W5NOP)
VP5XG (via G8VG)
VP8GV, Post Office, Port Stanley, Falkland Islands
VQ9AC (via WA2WFW)
VR1K (to VR2DW)
VR2EH (via W8WFB)
ex-VR4CV (via VK4SS)
VR5AA (via W9ADN)
VR5AH, Box 36, Nukualofa, Tonga Islands
VR5HP (via W9ADN)
ex-VS4RM (to G3OEF)
VS5DO, Box 41, Singapore
W5VWU/KJ6 (to W5VWU)
WAØCYJ/KJ6, Det. 1, 1957th Comm., Box 157, APO 105, San Francisco, Calif.
ex-XT2Z (via HB9ZY)
YV5ASP (via RCV)
YV5BCG, D. Martinez, P.O. Box 4997, Caracas, Venezuela
YV5BFJ (via RCV)
YV5BLZ, P.O. Box 2737, Caracas, Venezuela
ex-ZC6UNJ, P. Altorf, 44 de Moucheronstraat, The Hague, Netherlands
ex-ZD8RN, D. Davies, RN, 27 Peak Rd., Clanfield, Hampshire, England
ZK1BY (via W8EWS)
ZK1PK (via W2CTN)
ZS6PC (via WA6AFZ)
5B4CT, P.O. Box 216, Famagusta, Cyprus
5V4MY (via KV4AA)
ex-9M2DB (to GC3MLR)
9NT5O, P.O. Box 27, Kathmandu, Nepal
9Q5JR (via UBA, Belgium)
9U5BB, Box 14, Usumbura, Burundi
9U5CB, Box 1122, Usumbura, Burundi
9U5JH, Rev. L. Little, P.O. Box 76, Kitega, Burundi
9U5PC, Box 18, Ruhengeri, Ruanda
9U5XX, Box 490, Usumbura, Burundi

Nothing necessarily accurate, complete or "official" about the preceding recommendations but they *may* do the job for you. This QTH catalog comes courtesy Ws 1AIPA 1DGL 1HGT 1JFG 1WPO 7LZF 9HIN, Ks 1JFF 1KRY 1LOM 2TDI 2UYG 3CNN 4BMS 5YFU 6TZX, WA6s HRS JVD, club groups DARC (DLs 3RK 9PF), Far East Auxiliary Radio League (KA2EB), Florida DX Club (W4CKB), International Short Wave League, Japan DX Radio Club (JA1DM), Newark News Radio Club (L. Waite, 39 Hannum St., Ballston Spa, N.Y.), North Eastern DX Association (W2DGW), Northern California DX Club (K6CQM), Okinawa Amateur Radio Club (KR6AR), Polar Bears Radio Club (SL3ZO), Universal Radio DX Club, VERON (PAØs FX LOU VDV WWP) and West Gulf DX Club (K5ADQ).

Whence:

Europe — Forty-meter men, this is for you. Radio Society of Great Britain invites radio amateurs throughout the world to participate in the first RSGB 7-Mc. DX Contest, a DX brawl scheduled for (phone) 0600 GMT, October 27th, to 2400, October 28th; and (c.w.) same hours November 3rd-4th. Our object will be to catch as many British Isles brethren as possible, and the serial exchange is the customary RST001, RST002, etc., the "T" omitted on phone. It's a single-operator affair. Scoring for non-U.K. types: 5 points for each station worked; fifty points for every *numerical* British Isles *prefix collected* (G2 G3 G4 G5 G6 G8 GC2 GC3, etc., through GW8); and fifty points for every ten stations worked in each of those prefix categories. Your log transcript should list on one side of each sheet GMT and date, call of station worked, serial sent, serial received, bonus points claimed, and contact points claimed, in that order. To be eligible for certificates of merit offered to high scorers in each overseas country and W/K/VE call area, entries must be submitted to Contests Committee, RSGB, New Ruskin House, Little Russell St., London W.C. 1, England, postmarked no later than November 19, 1962, with the signed statement, "I declare that this station was operated strictly in accordance with the rules and spirit of the contest and I agree that the decision of the Council of the RSGB shall be final in all cases of dispute. I certify that the maximum input to the final stage of the transmitter was —— watts." Ready? . . . . . DL4BV (K1KRY) gets

HL9KB is evidence of a happy ham development in Korea. U. S. military personnel now can qualify for off-base station licenses and HL9 call signs. Al has this 25-watt 14-Mc. c.w. layout and bamboo ground-plane installed at his quarters in downtown Seoul.



MP4BDC prefers multiband a.m. work and occasionally samples single-sideband on 20. Frank is another antenna addict with cubical quads on 10 and 15, a 20-meter ground-plane and dipoles for 20 and 40. MP4BDC has a 138/125-country Bahrein DX tally despite lengthy sessions with North American pile-ups.

his kicks on 15- and 20-meter RTTY. Stan's talking up an HE MI or PX sojourn with friend DL1CG. Neighbor DL4BT, in Schwetzingen, has his beam atop a movie house, and F7AA (K5MXS) says the sound track would be full of Karl's CQs if he didn't stay politely QRT during showings . . . . . WASM-hunters are apprised by SM1AS that he's ready to dish out s.s.b. and c.w. QSOs on 20 meters, also that near-by SL1CF is quite available on 40 c.w. with a ground-plane. Schedules are invited . . . . . W8IBX visited DLs 1PM 9PF and HB9AC while touring Europe with a university choir. Kurt says HB9AC yearns to complete WAS with Delaware, Nevada, Utah and Wyoming QSOs on 14 or 21 Mc., c.w. or sideband. . . . . Club cullings from the Continent: Polar Bears Radio Club sponsors several new certifications for collectors on the bases of working different Scandinavian prefixes, accumulating SL QSLs, etc. Check with SL3ZO for details. . . . LX3MA, operated by DL4FZ and friends, celebrated General Patton's liberation of Luxembourg with an anniversary DXpedition in late July. . . . Ex-5N2AMS and K4TWF are thinking in DX terms of Rockall island, a forsaken bombing range off England.

Asia — AP5CP really has the amateur radio ball rolling in West Pakistan with activity by fellow AP5s AH JA and SS, plus the formation of Tigers Amateur Radio Club (AP5HQ). Check directly with Mohd for scoop on WAT (Worked All Tigers), and WA-AP (Worked All Pakistan)

DM3RBM runs 300 watts to a variety of antennas in Leipzig. Ludwig is a foundry engineer. *(Photo via W5VSQ and WA2HGP)*

LICENSES IN GERMANY

Editor, *QST*:

Since I recently received my amateur license in Germany, I decided to pass along the necessary information. This applies only to the following persons: Uniformed personnel, civilians, and dependents under the command of the:

(1) Commander in Chief, U. S. Army, Europe.
(2) C. in C., U. S. Naval Forces, Europe.
(3) C. in C., U. S. Air Forces, Europe.

This does not apply to:

(1) The Berlin Command. Personnel within the Berlin Command should contact the Signal Officer, Berlin Command.

(2) The United Kingdom, since there are no agreements which permit the licensing of U. S. personnel in that country.

For current information and application blanks for amateur radio and MARS (Army) licenses, contact USAREUR MARS Director, USAREUR Headquarters, APO 403, U. S. Forces.

German licensing requirements:

(1) Hold a valid FCC license of the Extra, General, Advanced, or Conditional Class.

(2) Agree in writing to abide by the German law regarding amateur radio.

(3) Pay the required fees.

(4) Be 18 years old.

German license fees are:

(1) DM 1.00 initial fee (about 25¢)

(2) DM 3.00 per month.

(3) The initial license will not be issued for less than one year or a total cost of DM 37.00.

Completed application blanks will be returned to the USAREUR MARS Director who will request the appropriate Deutsche Bundespost (DBP) office to issue a license. The Oberpostdirektion (OPD) nearest the address of the applicant will advise the applicant that his license is available. The applicant will then pay the necessary fees to a Deutsche Bundespost (Post Office) and forward the receipt to the OPD).

If the amateur desires to renew his license, either monthly or yearly, he will pay the required fees at a DBP office and forward the receipt for the fees and his license to the OPD.

There are three exceptions to the law governing amateurs, which apply to members of U. S. Forces:

(1) A maximum of 500 watts d.c. input power to the transmitter final amplifier stage is authorized.

(2) Amateur radio stations located on U. S. Government property will not be inspected by the officials of the Federal Republic of Germany, but will be inspected by U. S. personnel when necessary.

(3) Disciplinary action resulting from infraction of the regulations will be administered by Hq. USAREUR, USNAVEUR, or USAFE.

Frequency bands and emissions of amateur stations in Germany are:

(1) 3500 to 3800 kc.: A1, A3, F3.
(2) 7000 to 7100 kc.: A1, A3, F3.
(3) 14,000 to 14,350 kc.: A1, A3, F3.
(4) 21,000 to 21,450 kc.: A1, A3, F3.
(5) 28,000 to 29,700 kc.: A1, A3, F3.
(6) 144 to 146 Mc.: A1, A3, F3.
(7) 430 to 440 Mc.: A1, A3, F3.
(8) 1250 to 1300 Mc.: A1, A3, F3.
(9) 2300 to 2350 Mc.: A1, A3, F3.

Notice that there are no required phone bands. However, the following are suggested:

3600 to 3800 kc.
7075 to 7100 kc.
14,150 to 14,350 kc.
21,100 to 21,450 kc.
28,200 to 29,700 kc.

A photostat of the applicant's FCC license must be submitted with his application.

Perhaps this information will be of assistance to servicemen expecting to come to Germany. — *Lt. Horace J. Towler, DL4KW (K4KWW)*
2D How Bn, 78th Arty, APO 751, New York

VP2SM prefers 15-meter phone when the band is decent. Vincent gives his off-the-air hours to the St. Vincent Police Force as sergeant in charge of telecommunications. (Photo via W1WKO)

certifications now available world wide. TARC also will *sponsor a Pakistan Day DX Contest to be held every* March 23rd in conjunction with observances of the national holiday. And so another far-away country leaves the super-rare category! . . . . . "Anyone interested in an HL9 QSL *can find me most often on c.w. between* 14,000 and 14,050 kc., 1200-1500 GMT," declares HL9KB, one of the new off-post breed of Yanks in Korea. Al quickly collected 50 countries and 35 states with his 25 watts and ground-plane *on 20 meters.* "The power situation *isn't too good* at times, and I find myself very frustrated some week ends when the a.c. is turned off entirely." . . . . . WA6HRS credits UM8KAT as a fast 14-Mc. c.w. candidate with weak signal but sharp *ears* . . . . . ZC4s FB and PB enthusiastically hit the bushes during this year's RSGB National Field Day. ZC4CT learns that ZC4PB/p edged out ZC4FB/p, 111 QSOs to 99, and great sport was enjoyed by dozens of ZC4 *(now 5B4) participants on the outing* . . . . . Club offerings from the Orient: Ex-KW8AS (W5ZG) says that KW8-AT can keep Laos workable. WØFWA is out that way, too. . . . MP4QBB was recognized by many as ex-5A5TA (W5LAK). John may sign MP4MAO this month. . . . KA2EB relieves FEARL *News* DX editor KA2AB who rotated Statesward. President KA2AO likewise heads for Hawaii. . . . TA4RZ's usual 14,043-kc. c.w. appearances occur between 2300 and 0230 GMT with a half gallon, 75A-4 and whip antenna. TAs 1AH 2AR and 2BK also abound. . . . G5KW has sideband facilities in Iraq and Jordan but usually sticks to local chats. Ex-JT1s AA and YL also are reported in that area. . . . XU6AL (W6OMP/XU6) has a popular KWM-2 on 14-Mc. c.w. and sideband. . . . Ex-9M2DB continues to look for old on-the-air friends from GC3MLR, mainly 20 s.s.b. . . . W2KEZ/VS9 apparently scored QSOs from Kuria Maria 'way back in '48. . . . UA1CK tried his sideband DX luck as UA1CK/UH8 in August . . . SM5OY, now signing ET3Y, is cultivating a Yemen yen. Meanwhile, a peculiar 4W1AA or two have fun. . . . Nepal's 9NT5O is said to be ex-W6RTK with a KWM-2 on 14,230 kc. . . . The Okinawa Typhoon Net, KR6GH net control, had several busy sessions on 14,155 and 21,255 kc. beginning with a big blow in July.

Africa — Mauritius note from VQ8AI through W8KX: "I'm an old-timer since 1936 and was very active before WW-II with an 18-watt 6L6 Tritet oscillator rig. A photo of my station appeared in March '39 *QST*." Raoul's son now signs VQ8HL. They'd like to get around to rare VQ regions à la W4BPD but circumstances keep them tied to home base where the pile-ups are quite sufficient as it is . . . . . W2ELW says that ZD6HK's new Eddystone 888A receiver and revised 813 final should be about ready for the fray . . . . . TT8AJ stays with 7- and 14-Mc. c.w. as a rule, according to K2UYG . . . . . African addenda via club sources: VQ8AP became St. Brandon isle's VQ8APB briefly in August on 20 c.w. . . . EA9AZ has his DXpeditionary eye focused on Rio de Oro. . . . Most 9U5 action seems centered on 21 Mc. . . . WØMLY/TJ8/TL8/TN8/TT8/TZ8-TY2MY-5V4MY terminated his triumphant ten-kilo QSO African tour in late July. The liaison labors and QSL output of KV1AA kept Dick rolling in high gear. Where next, OM?

Oceania — "I wonder how many U.S. and Canadian hams would survive under New Zealand conditions," muses VE3EMF who recently enjoyed a lively visit with the hospitable ZL gang. "Electronics parts cost roughly three times U.S.A. prices and the cash value of the average wage is approximately half that of the States. You W/Ks and VEs multiply your expenses by six or divide your station cost by six and see what you would have. I'll bet there would be a lot less QRM. Then, too, there are the much more stringent licensing requirements, even for s.w.l.s. There seem to be more 807 rigs in New Zealand than kangaroos in Australia. I saw one capable rig that used all prewar components, and I met another ZL who had earned WAS and DXCC with less than 15 watts." Among the many New Zealanders Ed met was ZL1FG (ex-ZL5AA) who lost his legs climbing the Himalayas with Hillary. Colorful, rugged segment of hamdom, those ZLs. VE3EMF wants to go back there again . . . . . Pacific notes via W1HGT: VR1K

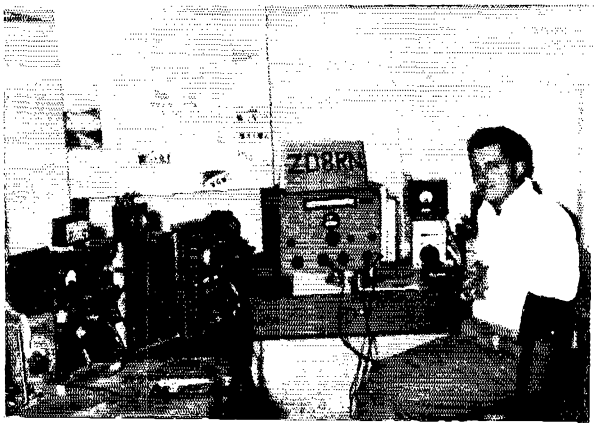
(VR2DW) of Ellice joins Ocean Island's VR1G to double the VR1 ham population. VR1B has returned to VK3IB, and VR1M is back at G3JFF. VK9s AT GK NW and RR are active in Papua but VK9RO now signs VK5RG . . . . . The sideband signal of VR2DS often can be found on 14,275

(Continued on page 166)

VK/ZL Oceania DX Contest

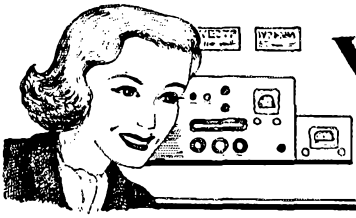
NZART and WIA invite all amateurs to participate in this year's VK ZL Oceania DX Contest. The usual contest rules apply with some major changes to allow QSOs with any Oceania countries as well as VK ZL stations. Contest rules follow.

DATES: Phone: 24 hours from 1000 GMT October 6 to 1000 GMT October 7, 1962. *C.W.:* 24 hours from 1000 GMT October 13 to 1000 GMT October 14. *SCORING: For Oceania stations other than VK ZL:* 2 points for each QSO per band with VK ZL stations; 1 point for each QSO per band with stations in rest of world. *For rest of world other than VK ZL:* 2 points for each QSO per band with VK ZL stations; 1 point for each QSO per band with Oceania stations other than VK ZL. *FINAL SCORE:* Multiply total QSO points by the *sum* of VK ZL call areas worked on all bands. The same VK ZL call area worked on different bands counts as a separate multiplier. *EXCHANGE:* Six figures (five for phone) made up of RS(T) plus QSO number, starting with 001. Example 579001, 589002, etc. *LOGS:* Logs must show date, GMT time, stations worked, band, number sent, number received, and points. Underline each new VK ZL call area contacted. Use a separate sheet for each band. Include a summary sheet to show call, name, address, rig, and score computations; include a statement that all rules and regulations were observed. *AWARDS:* Especially attractive certificates will be awarded to each country (call area in W/K, JA, SM, UA) on the following basis (1) Top scorer using all bands. (2) Top scorers on individual bands. (3) Those with minimum contact requirements to be determined by conditions and activity. LOGS should be posted to reach NZART Box 489, Wellington, N. Z., on or before January 19, 1963.



ZD8RN's brief but spectacular June-July Ascension Island action accounted for 272 DX QSOs with 25 countries and 185 lucky W/Ks in 30 states. Dave used a BC-458A at 25 watts, a CR-100 receiver and long-wire. ZD8JP uses this same shack, gear at left, with new s.s.b. apparatus. (Photo via K2UYG and W9IHN)

October 1962



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

ALL-WOMAN TRANSCONTINENTAL AIR RACE

THE Powder Puff Derby: This is the 16th year • 681 stock model planes participated in past • 1335 contestants flown since 1947 • Power range from 85–400 h.p. • Over 3,265,000 miles flown • Race course over 2500 miles • Flying permitted daylight hours only, v.f.r. conditions • Course completed in specified time • Each make and model handicapped • Scored on elapsed time/ground speed basis • Entrants from all 50 states, Canada, Australia and Europe.

"Purpose: To increase public interest and confidence in the private airplane as a family vehicle demonstrating the ability of pilots from novice to expert.

"Organized in accordance with the Sporting Code of the F.A.I. and with the sporting regulations of the National Aeronautic Association."

Thus reads the official letterhead used by AWTAR, Inc. for the 16th annual race, July 7–11, 1962 — a summation which just hints of the unique event that has occurred annually since 1947.

Usually, in reporting on the Air Derby, here, we have confined comments primarily to a recapitulation of the assistance given by the amateur radio communications net. The complete story of the exciting race and of the remarkable women who fly the race must be sought elsewhere — in newspaper, radio, TV accounts, publicity releases, in aviation publications (The Race Program each year gives, among other information, a description and photograph of each participant in the race.) This year, however, we are indebted to Kay A. Brick, Chairman of the Board of Directors of AWTAR, Inc., for volunteering the following highlights of the air derby itself.

"The race proved to be the highest and fastest on record. One Comanche was flying at 19,500 feet, but Fran Bera, who won for the seventh time, flew the entire race at 15,500 feet. Her speed was 196 m.p.h. while second placer, Betty Miller, averaged 197 m.p.h. (she did not win due to the handicap factor). Although we had upgraded pilot entry requirements, 11 new crews participated. Among the entries was one grandmother team which had 16 grandchildren between them; a mother-daughter team; a flying dentist, Dr. Helen Myers, who is also a Major in the Army Active Reserve. There were 20 states represented and England participated for the first time. That country's entry, Janet Ferguson, is the first pilot from a country other than the U.S. to fly solo, and she flew the smallest ship — a 90 h.p. — over all those mountains, and did very well too, claiming a couple of leg prizes. There were 14 crews from California, 6 from Michigan, and 4 from Pennsylvania. This is an interesting departure, for in the past the majority of crews have come from California. States seldom represented were included this year: Washington, Oregon, Utah, Wyoming, Nevada, Alabama, Kentucky, and Florida. All planes were in way ahead of schedule. Also, it was a very closely contested race in that the scores of those placing 2nd, 3rd, and 4th were apart by only 10ths of a point. Your hams were wonderful and the Rangers did a terrific job. Thanks to your group!"

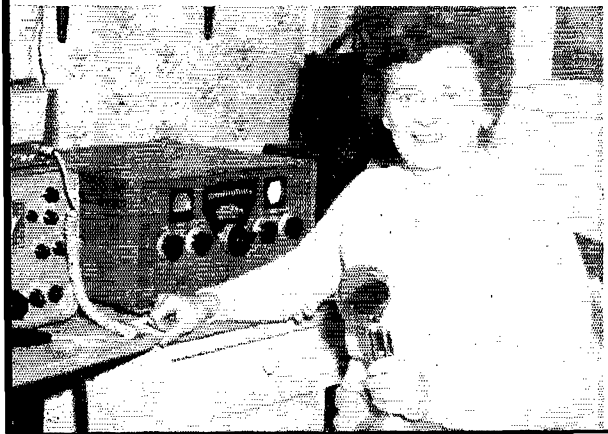
Telephone and teleprocessing devices linked all enroute airports to Greater Wilmington Airport, where an IBM 1620 computer determined the scores. Computers have been used in prior years, but this was the first time that the relative standings of the contestants were available day-by-day.

Amateur Liaison

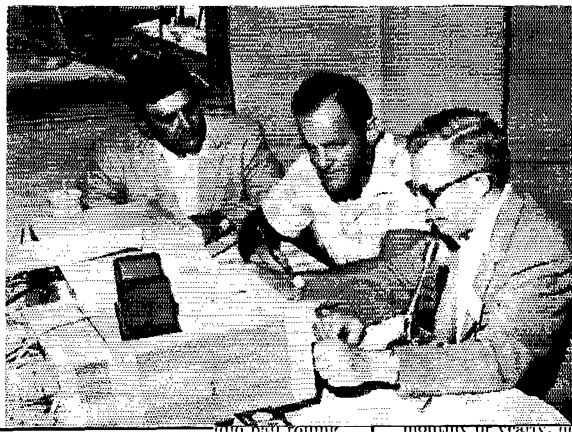
For the eleventh consecutive year, the amateur radio net for AWTAR assisted with communications during the race. Carolyn Currens, W3GTC, of Norristown, Pa., was chairman of the net for the fifth year.

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

Carolyn Currens, W3GTC, chairman of the amateur communications net for AWTAR for the fifth year. Carolyn comments: "Some of the gals go all-out for certificates, but I'll stick to the AWTAR".



K3EMT/3 at Greater Wilmington Airport, Terminus of the Powder Puff Derby. Equipment furnished by Collins. R. to l. Local chairman, K3EMT; K3AMC, Delaware Amateur Radio Club; W3CMR, First State Radio Club.



In California, Elaine Carter, K6SZT, reported that the Derby got off to a flying start at 11:40 A.M. on July 7, after being socked in at the Oakland Airport for over two hours. All aircraft were in the air in 33 minutes (54 ships). Amateur communications at take-off were directed by Gertie Cassady, W6FEA, with BAYLARC YLs W6QGX, W6HHD, WV6WFZ, and K6SZT assisting. Among the race officials was K7ANT, Melba, who was one of the pre-flight inspectors. (One AWTAR flyer, co-pilot Anita Conley of Vallejo, Calif., is a novice ham, but her call is not known.)

Report From Chairman W3GTC

"I can't begin to tell you how fine everyone was and how well the net operated. We worked 75 mostly, but when band conditions were not good we went to 40 meters. There were times when we could not get much — especially the first day. After that things went very well. One of the planes broke down in Peoria — TAR #39 — and through the efforts of the net, parts were procured in Dayton, thus enabling the contestant to rejoin the race. Praises came from the Grand Island stop-over for amateur Larry Abbott, K0JXN, who did a splendid job of relaying and jumping between 40 and 80. An amazing feat, inasmuch as Larry is paralyzed from the neck down. He tunes his rig with an assortment of gadgets held in his mouth. Participation in AWTAR continues to be a marvelous experience for all hams involved."

W3GTC agreed to serve as radio net chairman again next year, making it her sixth consecutive year of service in that capacity!

Stop-Over City Chairmen

Across the country many hams gave enthusiastically of their time in assisting the AWTAR net. A complete list of every ham who assisted with communications is not available, unfortunately, but W3GTC wishes to express her appreciation for the help volunteered by all participating hams along the race route.

The following is a list of radio chairmen of the stop-over cities. (In addition, the calls of hams who assisted are listed where known.)

Oakland, Calif. — Gertrude Cassady, W6FEA, Oakland ARC, W6QGX, W6HHD, WV6WFZ, K6SZT; Fallon, Nev. — T. Sgt. Thomas King, K7MIX, Fallon ARS-K7FEM; Elko, Nev. — Mil Taber, W7QYK, W7VR, W7OIR, W7VIU; Salt Lake City, Utah — W.J.C. Fahey: K7FCN; Rock Springs, Wyo. — Grant Brown, W7BJ; Scottsbluff, Neb. — Howard Poppert, W0VQR, Tri City ARC; Grand Island, Neb. — R. E. Wiles, W0DLL, K0JXN, Grand Island ARS; Des Moines, Iowa — Rev. Winthrop Mager, W0MJII, W0AK; Peoria, Ill. — D. W. Birks, K9IUI, Peoria Area ARC, K9TSX, K9FCC, K9YVG; Dayton, Ohio — Clem Wolford, W8ENH; Pittsburgh, Pa. — John Staude, W3LFQ; Wilmington, Dela. — E. B. Baylis, K3EMT, First State ARC, K3s DTZ, EMT, EWK, JFK, JIX, LEC, LGJ, LVF, OZM, QCN, QDY, QPD, RNO, SMN; W3s CFA, CMR, DEO, FJF, GTC, IVS, LQE, QNR, ST, URR and W6s MUG and OFY.

YLCC Statistics

Custodian of the YLRL YL Century Certificate, Katherine Johnson, W4SGD, (custodian since Sept. 1955) has compiled some interesting statistics on the certificate, as of August 1, 1962.

The first YLCC was issued to OM W1BFT April 9, 1953.
YLCC certificates issued to YLs to date.....300
YLCC certificates issued to OMs to date.....258
Total number issued to date.....558
Endorsement stickers issued to date.....491
Total number of QSLs processed in issuing certificates and endorsement stickers.....80,350

In Peoria, Illinois, K9TSX, K9FCC, and K9YUG operated from the Peoria City CD mobile communications truck. (Unidentified ham snoozing in background between rig shift.)

First issued in each district: (and number of certificate)
W1BFT-1; W2QHH-2; W3JSH-3; W4SGD-5; W5WUX-46; W6WRT-20; W7HHH-8; W8HLF-4; W9CMC-14; W0TAB-19; KL7BJD-154.

YLCC with endorsement stickers of 500 or more have been issued as follows:

YLs — W4SGD-1000; W8HWX 650; K5BNQ-650; K6EXQ-550; K4RNS-550; W4HLF-500; W4VCB/3-500; W5JCY-500; K5OPT-500.

OMs — W2QHH-1200; W9CMC-600.

Thirty husband and wife ham "combinations" have YLCC, and the certificate has been issued to 39 DX stations, including Alaska and Hawaii.

Condensed rules for the YL Century Certificate are as follows: The certificate is issued for contact with 100 different YLs. All contacts must be made within 25-mile radius of the original location. Send list in alphabetical order by operator's last name, showing operator's full name, call letters and date of contact. Enclose postage for return of cards by 1st class mail. Endorsement given for each additional 50 YLs. Application for stickers to be in same form as application for original certificate. This award is for working *different* YLs — same YL worked under different calls counts only once. Send application and QSLs to Katherine Johnson, W4SGD, Box 666, Fuquay Springs, North Carolina.

Custodian W4SGD reminds certificate seekers that a

When her husband's work takes him to far countries around the world, Mrs. Leona Hudgins, WA2UZX (ex-W6TTT), keeps in touch with him via sideband on the DX bands. Leona was licensed in 1958 and now resides in Haddonfield, N. J. Her OM is WA2OQE (ex-W6CIW and W4NUU). *(Photo courtesy OM W4CVO)*

There is no telephone at Girl Scout Camp El-O-Win in the High Sierras in California, but the communications problem is nicely solved by Girl Scout Counselor Sharon Baker, K7EBS, of Tucson, Arizona. Sharon holds daily schedules with W6JPS in Fresno. For the 45-mile hop, six meters has been found to be the ideal band. (Girl Scout Nicole Felton, standing, takes notes for K7EBS.) *(Photo via SCM W6JPU)*

QSL cannot be honored if the call letters of both stations are not on the card. The call letters must be correct, and the QSL cannot have been altered in any way by the applicant. If a YL QSL has been used before, it cannot be honored, regardless of location or change of call. A QSL must carry the usual complete information considered necessary to confirm a contact. Keep duplicate lists of each application. Checking with these is the only sure way of detecting duplications when applying for stickers. Silver stickers will be awarded provided only that the holder of the certificate, in moving more than 25 miles, retains the same call letters that appear on the original certificate. Complete rules for the certificate are available upon request from the custodian.

YL Nets

Do you enjoy participating in a net? Fine — you now have your choice of checking into some 45 different YL nets. Ten years ago, when this column began, there were six nets from which to choose. Yes, Ma'am, YL activity is growing and growing!

The list of YL Nets published below was received from YLRL Vice President Lillian Byrne, K2JYZ. If a net has been omitted, it is unintentional and the NCS is invited to send necessary information to K2JYZ, 24 Stillwell Place, Freeport, New York, and corrections will appear here.

Look over the list and join in the fun. Why not resolve to brush up on your c.w. *this fall? Join a YL c.w. net* and the girls will go all-out to help you build up your speed and confidence.

YL Nets

Please note that in keeping with *QST* policy all time is given in Greenwich Mean Time.

Time (GMT)	*Freq.*	*Name*	*NCS or Manager*
Monday			
1300	3900	Buckeye Belles, Phone	K8MZT
1400	7225	Floridora	K4JZX
1400	3920	U.P. Michigan YL	rotates
1600	7235	Loaded Clothes Line	KØGAS
1800	50.4	Ind. Mich. Petticoat Sisters (IMPS)	K9YIC
1930	3738	Buckeye Belle C.W.	WN8AOK
2300	3800	Oregon YL	W7HHH
0100	50.56	Baylarc	K6SZT
Tuesday			
1330	3900	Blue Ridge	K4CZP
1330	3940	Jayhawker	KØHEU
1400	7215	Floridora Lower SSB	W4UF
1430	145.26	Buckeye Belle	K8NQK/ K8WDZ
1500	50.33	Floridora Southern	K4ACF
1800	50.4	IMPS	K9YIC
1900	3910	HAWK Roost	K9ILK
1500	3820	No. Star YLs	rotates a.m. or s.s.b.
Wednesday			
1330	3900	WRONE-Yankee Lassie	K1LC1
1400	3900	YL Welcome Net	W8ATB
1500	7278	Buckeye Belle C.W.	K8TFG
1600	7123	So. African's Woman's Radio Club Housewives	
1630	7100	C.W.	KØGAS
1800	7260	Buckeye Belle-Phone	K8ITE/ W8HWX
1800	50.4	IMPS	K9YIC
1900	50.65	WRONE 6 meter	W1HOY
1900	14,280	YL SSB	rotates

1900	50.7	CHIX on Six — Phone Akron Area	rotates
2400	3950	C.P. Roundup	K4RHU
0300	146.1	Los Angeles YLRC	K6BUS
0800	—	ZS YL net on 40 meters —freq. unknown	——
Thursday			
1400	7270	Friendly Forty	W3UUG
1400	7260	Georgia Peach	K4KH
1400	3880	TYLRUN	K5BNH
1630	7235	TYLRUN	K5BNH
1800	14,277	Floridora Int'l Upper SSB DX (U.S. YLs check in on rotating basis)	K4ICA/ KP4CL
1900	14,240	Tangle Net	KØEPE
2400	50.64	Buckeye Belles Columbus area	W8LGY/ K8CEN
0100	50.7	Buckeye Belles Cleveland area	K8SOU
Friday			
1330	3600	WRONE YL C.W.	K1IJV
1800	50.4	IMPS	K9YIC
Saturday			
1800	3845	BAYLARC	W6BDE
Sunday			
1400	7225	Floridora Business Girl	K4UIZ
2200	3940	Jayhawker	KØHEU

Feedback

Oooops — our captions for two photographs in the August column were switched. On page 84, lower left, blonde Lou Fontenot is WA5ARV and brunette Eve Gardner operates KA2MM in Japan. Additionally, WA5ARV's husband is W5HCF, not OM K5CRE, as it perhaps was implied. Apologies to all concerned.

(Continued on page 174)

Correspondence From Members-

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

FUNNY BUT TRUE!

¶My place of employment has a subscription to *QST*, and browsing through the August issue the other day, I came across another W6ISQ article. Feeling that he had managed to hit the nail on the head every time in the past, I settled down to read his latest blast. Unfortunately, I as yet have been unable to finish the article, for each time I get two or three sentences into the story, I begin to laugh, at first emitting slight choking sounds, but gradually building into guffaws, giggles, and tears, and I must put down the magazine and run from the library in disgrace, to collapse quietly at my desk until more sobering thoughts (my salary, monthly bills, lousy antenna, etc.) catch up with me.

Give this guy another award; he deserves it. — *George W. Hippisley, jr., W2KIR/1, Needham 92, Massachusetts*

¶I would like to extend my congrats to John Troster, W6ISQ, on his hilarious series of articles in *QST*. I have met many of the characters he describes and a few I know as well as I know myself — hi! I admire his quality of being able to laugh at himself and I think other hams should do the same more often. — *Russ Liebler, W2VOB, Rome, New York*

¶The gentle ribbing W6ISQ gave the Charlie Ex-ray-Queen Roger Mary boys is much needed and I hope he will carry on in the noble tradition of TOM. I copied the following some eight months ago with the intention of sending it on to *QST* but never did. Now ISQ's article prompts me to do so.

"Name here is Abe, (spells) A-B-E, Abe, Able Baker Easy, just like in Abe Lincoln, (spells again) A-B-E, Abe, Abe"

No doubt about it, much of our radiotelephone operating procedure is clumsy and out-moded. We should realize very few hams are receiving us on detector and two-step receivers any more and all have some kind of push-to-talk. Let's try to really communicate! — *Hugh W. Holt, W4TP, Warrenton, North Carolina*

¶Having seen the new phonetic alphabet in the "Strays" in the August *QST*, I am sending in one I have had for years.

A — Anthropomorphic	N — Necrophiliac
B — Beneficiary	O — Ontogenetically
C — Concentricity	P — Parapsychology
D — Differentiation	Q — Quadricentennial
E — Epithalamium	R — Republicanism
F — Fiduciary	S — Santification
G — Gastrointestinal	T — Triskadekaphobia
H — Hypercatalectic	U — Underspeculative
I — Interrogatory	V — Valedictorian
J — Jejunectomy	W — Whimsicality
K — Ketogenesis	X — Xerophthalmia
L — Lackadaisical	Y — Yttriferously
M — Miscegenation	Z — Zinziberaccious

They're all words that you can find in any good dictionary, except possibly triskadekaphobia, which is a morbid or irrational fear of the number or quantity 13. Now I only hope some clod doesn't decide to use that alphabet. There are enough clowns on the air without providing W6ISQ, John Troster, with more fodder for his great satirical cannon. — *Kim A. Boriskin, K1PLG, Burlington, Vermont*

FM FREQUENCIES FOR 2 AND 6 METERS

¶Since commercial users of two-way, wide-band f.m. equipment must convert to narrow-band f.m., many of these crystal-controlled stations are being purchased by amateurs for use on either two or six meters. Usually, no modifications are required for operation in either band depending upon the equipment's frequency range. Clubs and individuals often procure quantities of these stations for local fixed-frequency net operations.

When used locally, frequencies are not too important, but upon occasion those mobiles away from home would like to contact others along the way. Many f.m. amateur groups have selected *146.940 Mc. and 52.525 Mc. as their primary communication channels.* Both frequencies are rapidly becoming standard throughout the country.

If you have not selected a frequency for your newly acquired f.m. gear, consider these frequencies so that visiting mobileers to your community can have a QSO with your group. — *George W. Tracy, W2EFU, Schenectady, New York*

QUIET PLEASE

¶I noticed when I was listening to Oscar II that some hams discussed the passing they just heard. On two meters I have double conversion and to my best judgement they were only 5 kc. above Oscar's frequency. I think they should have waited before they transmitted because I could still hear Oscar. — *Jim Woods, K9RVC, Jacksonville, Illinois*

NETS ON 10

¶Look at your net directories and you may notice that most nets operate on 80 meters. Some meet daily, others on odd days, etc. Every day of the week seems to be covered by some net somewhere. While performing a public service, these nets could also serve the ham fraternity by arranging at least one weekly check-in on 10 meters. This check-in could be an extra one after the regular 80-meter check-in or on 10 instead of 80 once a week.

Two purposes would be accomplished. First, we would increase the 10-meter activity and second, we would have an extra frequency all prepared for our nets in case 80 was jammed up in an emergency.

I realize this means reconnecting our antenna tuners to different antennas and reloading our transmitters to say hello to people we just talked to but think of the day that 10 meters really opens up for that DX it had a while back.

Let's get our nets to check in once a week on 10. — *Daniel J. Kenny, W4GILY, Oxnard, California*

(Continued on page 162)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, WINJM, 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

On-the-Air Plans for October? Join in organized amateur operating in the fall season. This month we hope to say good-by to summer QRN; the fall season holds inviting prospects for traffic netting, exciting DX contacts and rag-chewing. If you don't already hold your SCM's recognition of your activity by appointment as OES, ORS, or OPS, report your station activities and get in line for the one of these posts which best suits you. You will find your SCM's address on page 6 of every issue of *QST*.

The Sweepstakes announcement is scheduled for next *QST*. Follow the Activities Calendar for advance dates on this and other special ARRL activities. Contest rules appear usually in the same month's *QST* in which a given activity takes place. Whether you work in v.h.f. nets or the h.f.'s, you will find in the nets the finest kind of fraternalism. The latch string is always out to any amateur who calls into a net with traffic and just a few minutes each day can be highly rewarding.

Many nets are now registering to get in the new ARRL Net Directory. There are a few vacancies in the Transcontinental Corps of the National Traffic System. The number of BPL listings, with fall, is again in an uptrend. WA-, WB- and recent amateur calls in traffic and net reports show the active participation of this group in the work that makes for public service values and appreciation of the amateur through message handling.

Simulated Emergency Test . . . October 7th–8th. Local ARRL Emergency Coordinators are the key men in the annual test. Each radio test is to involve a *simulated emergency condition*. Check with your EC to see if the date of his test will be as above or a few days earlier or later. A listing of all SECs is given this month, to be contacted for AREC data, if for any reason you can't contact your EC. We're looking for messages to ARRL as a report of group participation. The SET is each year the starting point or first emergency test of a new season. ECs, we hope, will use the test at annual roll call time. All amateurs in stand-by radio groups should get their ECs annual endorsement of their AREC membership cards in this period. It's a challenge to work out a real demonstration of what we can do, and also radio fun.

Emergency Coordinators should sign up Technicians, Novices and all available amateurs, regardless of what bands they work. All are needed. Amateurs with mobiles can ask ECs for both the *Official Mobile Unit* pocket cards and the *Emergency Radio Unit* placards. Use of these helps improve public understanding of our amateur service functions. After each local SET the EC can count up his "points credit" by a simple system explained in a bulletin about the SET sent ECs. Following the test, ECs should discuss and analyze results for the betterment of the whole Corps, now over 36,000 strong. The SET represents ARRL preparedness. Belong to AREC and get in the SET.

Ideas for Clubs. One good way for clubs to find from their members which projects are most popular and useful in program planning is to approach club members or even the local amateur community in advance of any club membership drives, with a questionnaire. We report here the highlights of one such questionnaire. Detailed results were available before the Radio Association of Erie started its membership drive in July. Hank Schneider, W3KPJ, editor of the

29th ARRL Sweepstakes — Nov. 10-12 and 17-19

Next month *QST* will have the complete announcement of the Sweepstakes Contest. This early announcement is for the benefit of amateurs in remote ARRL sections who will not have received the next issue before Sweepstakes. Refer to November 1961 *QST* for contest details. The rules are the same as last year's contest.

If you are anywhere in the League's field-organizational territory (see page 6, this *QST*) you are urged to take part in this popular contest activity. Although not an ARRL section, Yukon-N. W. T. (VE8) counts as a section multiplier in the contest. There are two separate contests, phone and c.w. The total operating time allowed each contestant in either contest is 40 hours. There are section awards, and special Novice awards as well. The week-end periods start Saturday afternoon (2300 GMT) on the 10th and 17th of November.

Contest reporting forms will be sent free to anyone requesting them by mail or radiogram. *Get your requests in early.* Check the full details in next month's issue of *QST*. Good luck.

Tri-State Radio News Letter (Wesleyville, Pa.) got a return of 118 from a mailing of 463 questionnaires. His main coverage was of the third and eighth licensing areas. Responses indicated that about 59% of these amateurs belonged to *some* radio club. Thirty-five "would like to belong"; fourteen "did not care to belong." On the question "Should all club officers be elected by members?" 112 favored this rather than having them appointed by club directors. Forty-seven per cent favored one business meeting a month, more were for two meetings a month. About 85% favored one business meeting and one project meeting each month. Ninety-nine amateurs of the 118 returning questionnaires signified they were members of ARRL; nine that they did not belong.

Check-offs on different kinds of club activities showed an order of popularity as follows: Demonstrations 97, work projects 97, code and theory sessions 95, speakers 80, bull sessions 70, movies 65, cards 14, music 12. Operational: 25% reported ability to work all bands. 96% operated fixed stations, many had mobiles, 70% in this area along Lake Erie could use the v.h.f.s and a large number favored having a net.

ARRL Code Proficiency Program. We're happy at the start of another active radio season to invite all amateurs everywhere, not thus far "certified" to use the monthly W1AW-W6OWP Qualifying Runs to apply for a certificate. Operators qualify at only one speed per test, but can submit as much copy as desired (a) to make sure a full minute without error is submitted and (b) so we can give full credit for the *highest* correct-copy speed turned in. In the 10–35 w.p.m. range covered whenever there's advancement on a subsequent qualifying run an endorsement sticker is issued to encourage all concerned to go to the highest speed we certify!

Hundreds of unsolicited letters thank ARRL for the program insofar as it helps to acquire a license. Increasing numbers of amateurs show CP-ratings with the other awards listed on their QSLs. Such a rating and certification very often is the mark of the operator who has "arrived."

This fall as a special intentive we're going to start giving the calls of those qualifying each month in the 30 and 35 w.p.m. bracket. Because of the great number of issuances at lower speeds we can hardly find *QST* space to show them all.

Certificate Issuances April through July '62. We'll start this off by showing the recent issuances covering the latest four months. An asterisk indicates the award of endorsement stickers for the speed indicated, indicating a step-up from an earlier certification. During 1961 nearly 3500 copies were submitted and checked, the failure rate running at about 12%. W1AW had the greater following of operators, since the transmissions covered more bands but W6OWP picked up 21% over his coverage of the year previous. This dependable over-all program continued to reflect the high interest of many users. The following qualified for ARRL CP certificate recognition Apr. 1962 through July 1962.

ARRL certified at 35 w.p.m.:
W1JBV, K1LBB*, W1NTH*, W1SWX/1*, K2BCD, WA2EDG*, W2ETY, WA2EXP*, WA2FZJ*,K2KBI*, K2SSX*, W3LE, K3OYG*, W4GTX, K4MTL, W4NTE, W5JD, K5PXM, WA6DUG*, W6MMC/7*, W6MYP*, K6VVA*, WA6NYK*, K7BVZ, W7KMU, W8CQN*, K8QHA, W8WGR, W8ZLN, W9BLV/6, WA9AJF*, K9FOQ, W9IFF*, K9OKD*, W9ZAB, WØIJW, KØYBD, GM3OEV, I1GO, L. G. Guillet, John Hackert.

ARRL certified at 30 w.p.m.:
K1LDK*, K1LQD*, W1OPZ*, K1RTV, W1SWX*, WA2PDU*, WA2QPM*, K2QYI*, K2ROM*, K2SBS*, WA2SNY*, WA2SRK*, WA2SZK*, WA2VQV, K3LOW*, K3ODS, W3VYL, W3ZHQ*, WN4CTD, W4EJU, K4KWQ, K4MSM, K4NZE*, K4PFK*, K4WVX*, W5VSQ*, WA6OCW, W6WNR*, W7ESV, W7JOQ*, K7MRP, K7PPX, W7SZM/7*, W8CQN, K8MTI*, WA9AJF, W9KQB, W9OKN, K9ZNC, WØAXS*, WØNWX, VE2SI*, VE4OJ*, VE5JW*, VE7AJ*, DL7JY/W2*, David T. Holmes, jr., Rodger J. Ross*.

* Endorsement Sticker.

Tape-Sent Code Speeds from W1AW. From time to time people ask at what speeds we normally run c.w. bulletins sent at 0000 and 0400 GMT. Eighteen words per minute is the speed. Persons who can copy bulletins solid can be sure they are ready for FCC's 13 w.p.m. General. It is a good margin of safety for which to aim. The preamble to W1AW's tape-sent code practice, which starts after a call to all radio amateurs at 0130 GMT daily, is 10 w.p.m. on the four slow-speed nights (5, 7½, 10, and 13 w.p.m.) and 15 w.p.m. on the three high-speed (15, 20, 25, 30, 35 w.p.m.) nights. About ten minutes of practice material is sent at each of these designated speeds.

Clubs: About Setting up Class Instruction. Last season the Kingsport Amateur Radio Club and the Bays Mountain Radio Club committee (W4PID, W4TYV, W4WQZ) worked up a six-week program. The purpose was to help a group achieve Novice license in 18 sessions with three nights a week study together. All classes met at 7:00 P.M. and were dismissed by 8:30 to accommodate students with school work. Sessions were half lecture and half code work. Each student had to have an audio oscillator by session six. The course started with talks on the history of amateur radio, on FCC and ARRL, and how to operate *well*, not just as some other stations are operated! The KARC got exam papers from FCC to have control of the expiration of the forms; the club supervised exams at the proper time. W4PHQ, W4VOS, WA4BXZ, K4SHY, WA4AHA, W4EUM, W4NLF helped.

Here is the 18-session subject outline: (1) Begin code reception. Continue, each class time. Give history of amateur radio, opportunities and obligations of amateur radio. (2) Explain types of amateur radio licenses, begin d.c. circuits (3) Conclude d.c. circuits (4) A.c. circuits (5) R.f. circuits (6) Review of d.c., a.c. and r.f. circuits.

Begin code transmission; include all remaining sessions. (7) Vacuum tube fundamentals, power supplies, filters. (8) Transmitters. (9) Propagation and reception of radio waves: the FCC. (10) FCC regulations. (11) Review Novice section of License Manual; all previous subjects. (12) Antennas and feed lines. Test equipment. (13) Tuning transmitters and antennas. Station efficiency. Getting most signal per watt. (14) Transmitters. How big? What kind? Operating procedures. (15) The ARRL. Review complete Novice section of License Manual. (16) Simulated code test. Simulated examination. (17–18) Probably split class for two dates, to give code tests and FCC exams.

All clubs additionally can ask ARRL for its further Suggested Course Outline based on the *Handbook* to help students go even further; also we'll be glad to send our CD-158 which details information to help setup code exams along the line of FCC standards. The KARC graduated 30 of 68 starting the sessions.

We Each Share Band Use. Just as the motorist under common sense rule shares his highway with fellow motorists, courteous and careful procedures insuring benefits for all, we amateurs share our frequency bands together. Our rights and interests in the common medium are equal. A good understanding of the rules, customs and procedures and cooperation of all is required in this sharing. Paul Lee, W3JHR, (Md.) puts this nicely in a letter to one out-of-line amateur who appeared to act the "road hog" in his use of amateur frequencies:

". . . We in the amateur fraternity have for many years tried to exhibit tolerance and good sportsmanship towards all. We do *not* sit on or move in on a frequency when in use by others, and name-call these others "jammers." We move off, and carry on our communications on another channel.

"This is part of the code that experienced radiomen live by; it is the only way we can get along, with the bands as *crowded as they are. If others use a more modern and spectrum saving mode of transmission than yours,* at least have the common courtesy to observe their right to operate, as well as your own. The operators who were copying through your remarks with 100% contact were to be commended for their skill and tolerance."

Some Observations on Phone Operating. Voice operation has now come a long way. It's interesting to note how voice operation is divided within the phone bands. Sideband is almost equally half and half with a.m. on 75- and 15-meters. A.m. accounts for roughly two-thirds of phone operation on 40, while s.s.b. again makes up about two-thirds of 14 Mc. domestic phone band operating. We can count on further changes in the complexion of the use of our bands, of course. This, we suspect, will include the substantial and growing s.s.b. use of 10-, 6-, and 2-meters.

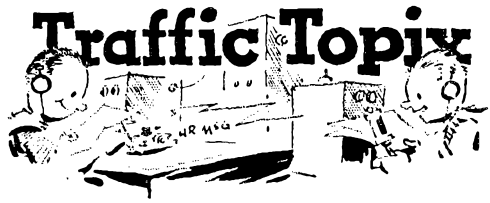
The evolution of equipment comes through engineering, construction, economic considerations, and popular choice. Whichever type of gear we choose to use, operating techniques must conform to getting the best effective results. Reducing interference levels in the bands we work is a two part problem. It takes constant vigilance to have transmitters in perfect adjustment, and operational care to be courteous and avoid making QRM on an already-busy channel. Listening before and in the course of calls is a first essential to minimize conflict in channel use. In sharing the bands successfully we must learn to be brief. You can start off a contact with name and report. The better operators have something to say beyond an RS-report, but these operators certainly avoid speech making. The best ops on the air, we think, are those that get right to the point.

With s.s.b. the importance of proper adjustment, of cutting the gain control back, and not going over the point recommended in the engineering instructions for that particular circuit is just as essential as when you were using a.m.

One manufacturer now provides a scope kit to use with the transmitter, but a review of *The Radio Amateur's Handbook* will disclose a number of ways to use scopes as well as many other practical ideas. Pages 295–302 of the 1962 edition has good information on a.m. checks. See Chapter 11 for sideband techniques. From time to time it's good to check the sideband transmitter with a dummy load using the receiver to check signal quality to see not only that the speech is crisp and clear, but that there are no spurious effects in or outside the band. It may be found that such troubles are a matter of riding the gain too high. Hold the gain close to those values that guarantee linearity and effective operation. Don't always rely on signal reports!

Add OO Credits. In July *QST* we commended ARRL Official Observers for their 1961 results, naming those OOs leading their licensing areas. Because of a clerical error in compiling totals, there were two omissions from our listing. Clint Daws, W3NNC, Trout Run, Pa. sent out 2037 of the cooperative OO notices, helping to keep amateurs out of FCC difficulty. He led the country as well as his licensing area in this work, which was participated in by 318 different OOs. W9NPC (OO, Ill.) should also have been credited with consistent leadership in this cause for his area, reporting 302 notices sent. Kudos to W3NNC and his brother OOs . . . Adding that work incidently brings our total of the OO System to over 24,000 helping suggestions sent out during last year.

—*F. E. H.*



Every phase of amateur radio has its legends, and the traffic game is no exception. We think that one of the fondest legends of the traffic game is the work of one "Dixie" Jones, formerly W4IR, who produced, in the 1930's, an AARS paper called the *Dixie Squinch Owl*. AARS was the Army Amateur Radio System, a sort of forerunner to the present MARS (but all former AARS'ers will tell you

it was *far* superior), and the *Dixie Squinch Owl* was the official paper of the Fourth Corps Area with headquarters in Atlanta.

"Dixie" Jones' Owl Juice, always a part of the paper, became so popular that *QST* reprinted parts of it from time to time. If you will leaf through copies of *QST* in the 30's, you will find them. Old-time traffickers will find them nostalgic, but at the same time there appears the kind of caustic humor, typical of the author, that will probably get a chuckle from anyone.

Take the following, for example — and apply it to electronic keys instead of "splatter bugs":

"Telegraphin' ain't what it used to be. This here editor learned the rudiments of hamography back in the days when men wuz men and made their own dots. Nowadays everybody's got a splatterbug with no weights on it and the guy that's waggin' it don't no more know what it's goin' to make than you do. The race is on to see who can splatter messages around faster than anybody else.

"You set there tryin' to get a message from some mug. You get the preamble by intuition, guesswork and the Grace O'God. He hits the address, eyes a'-rollin', bug a-smokin', goin' to town. The first time through he don't even try to make it right as he knows he is goin' to mess it up. The second time through he slobbers it up and has to go back and repeat it a third time and you sorta strike a average and say to yourself — well, he made it thataway once and thisaway twice so I reckon it's thisaway so you put down what he made it the most and then you look in the postal guide and there ain't no such town in the postal guide or nowhere else so you throw the blamed hamgram in the waste basket where it might as well have been in the first place.

In the good old days, when the script called for a A or a B or a C, why you simply hauled off and sent a A or a B or a C as the case might be, and having made it you stopped fooling with that letter and proceeded to the next one. They done it right the first time. I like the old way best." — *WINJM.*

— • • • —

Someone asks for information on counting bulletins as traffic handled. There is a very simple rule to follow. Bulletins can be counted as traffic *only* when they are individually receipted for by copying stations. This applies both to the originating station and the receiving station or stations, and only when the bulletin is transmitted in complete ARRL message form.

Ordinarily, bulletins are not receipted for, especially ARRL Official Bulletins being transmitted by Official Bulletin Stations, and are not counted as messages transmitted or received.

— • • • —

July Net Reports.

Net	*Sessions*	*Check-ins*	*Traffic*
Mike Farad E & T	53	334	387
Northeast Teen	15	81	60
20 Mtr I.S.S.B.	28	706	1366
All Service	5	40	24
Eastern Area Slow	28	122	33
Northeast Area Barnyard	—	943	10
7290	42	1466	696

— • • • —

National Traffic System. One thing that had to be decided, before NTS was first put into operation, was this: Shall the natural operating habits of available operators take precedence over efforts to implement the system, or shall NTS implementation be sought on the basis of those operators whose natural operating habits fit into it? In other words, shall the individual take precedence over the system, or vice versa?

The answer to this question is so basic that we think it deserves another look. Obviously, NTS could not and cannot work in its projected concept if it is to be subservient to individual operating habits. No system can, and still be deserving of the name. No system, organization or society, voluntary or otherwise, can function or even exist without depending on those whose individual habits fit into it or can be moulded to fit into it. Everything we do which is part of a cooperative plan (as most things are) depends on the *development* of habits or customs that will contribute to the furtherance of that thing, whether we all *want* to do them or not. Society has its morals, professions have their ethics, government has its laws — all these things are not based on individual habits but on over-all *needs*. Any venture in which individuals do not or will not conform is doomed to failure.

NTS depends, for its success, on individual amateurs adapting their operating habits to the NTS structure. Most amateurs operate when or if they feel like it. Their operation is irregular, slipshod, a "spare time" avocation meriting their attention only after other things they consider more important have been taken care of. Some amateurs consider amateur operating of a higher priority than others. A few spend great amounts of time at it. Another small group think enough of it to participate in organized ventures such as clubs, emergency work and regular traffic work (NTS).

Each amateur has a place in NTS commensurate with his own outlook — that is, is it important enough to him to spend regular time on it, to devote some thought to it, to try to interest other amateurs in it. The extent to which NTS and other organized activities succeeds depends entirely on how avidly amateurs are interested in it and work toward its success. They have to get into it, it cannot get into them;

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for July Traffic:

Call	*Orig.*	*Rec'd.*	*Rel.*	*Del.*	*Total*
W3CUL	139	1992	1347	634	4112
K6BPI	98	1943	1816	127	3984
W6YDK	2104	62	44	18	2228
W9JOZ	14	903	917	4	1838
W0SCA	28	680	662	0	1370
K0ONK	115	625	595	18	1353
W7JHA	28	670	629	2	1329
W0LGG	112	546	514	29	1201
K1MZB	1	571	569	1	1142
W8UPH	11	485	421	63	980
W3EML	26	480	415	25	946
W7BA	5	464	426	37	932
W6WPF	36	437	400	37	910
K4AKP	13	438	363	75	889
W7DZX	8	442	402	13	865
W3FEG	127	378	281	19	805
WA2RMP	85	367	260	101	813
W4PL	9	394	367	22	792
W6GYH	148	318	304	11	781
K1NEE	39	375	348	16	778
W9RE	68	351	304	17	770
W3VR	31	371	360	6	768
W8DAU	29	380	281	59	749
W7VIU	13	351	292	59	715
W5QMJ	700	0	0	0	700
W1PEX	30	339	304	25	698
W8CHT	50	295	277	20	642
W9DYG	35	306	251	21	613
K9EZP	15	300	291	3	609
W4AKB	42	314	32	219	607
K6KCB	17	315	267	2	601
K1RYT	268	209	52	51	580
K8SJH	83	280	198	14	575
K0IVQ	21	271	272	10	574
WA2GPT	31	264	241	23	559
K1MZM	16	287	204	43	550
W1TNL	43	249	198	51	541
K6MDD	7	263	230	33	533
W9KQB	19	256	235	21	531
W2EW	240	152	66	69	527
W6EOF	1	265	257	4	527
W7PGY	18	252	231	18	519
W3IVS	5	254	222	32	513
K0ORK	65	226	189	32	512
K0VPH	35	249	221	3	508

Late Reports:

K2UTV (June)	13	814	802	10	1639
W3IVS (May)	14	414	379	35	842
W6FNE (May)	24	275	268	7	574

More-Than-One-Operator Stations

Call	*Orig.*	*Rec'd*	*Rel.*	*Del.*	*Total*
W6IAB	194	1315	1251	57	2817
W5ITPK	0	694	344	0	1038

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

WA4AMC/4 286	W3ELP 119	W9AKV 107
W9NZZ 286	W9TT 119	K9IVG 106
WA4BMC 222	WA4IHH 113	K1KSH, 4 105
WA2TQT 217	K9LGU 113	K9ARW 104
WA2BNF 214	W9SAA 113	W3ZRQ 102
W4SHJ 195	K0GFA 110	Late Report:
K6CIZ 149	W3FN 108	WA4AMC/4
W0HTP 148	W4NTR 108	(June) 143
W3RV 124	WA2CCF/1 107	K3KPZ/3
VE3FAS 121		(Jul.e) 122

More-Than-One-Operator Stations

Late Report:

K6WAH (May) 204

BPL medallions (see Aug. 1054 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K3KDP, W4WHK, K8ONQ, K9CTL.

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

The communications for Alhambra's (Calif.) 17th Annual Hi Neighbor Parade on May 26 were handled by local amateurs under the direction of EC K6SUJ from a van loaned by a local dealer. Pictured above, inside bus are K6SUJ (l.) and WA6ISQ. Sitting on step are (l. to r.) K6KRA, WA6QNN and WV6ZCI. Outside bus (l. to r.) are WA6NTY, K8UUH/8, W6MWP, WA6GDF and WA6HGC.

that is, its successful implementation depends on their interesting themselves in it, because if it must go too far toward adapting itself to their many whims, fancies and operating habits, it loses its "system" aspect and becomes a bunch of amateurs playing.

NTS is a tightly-knit organization, with definite policy lines and flow patterns. If we want to keep it that way, we must avoid too many concessions to individual convenience. To as great an extent as possible, we must decide first the best way to do the job, then *find* the people who can do it that way.

July reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
1RN	59	518	.386	8.8	73.9
2RN	62	489	.455	7.9	94.7
3RN	62	862	.433	7.2	98.4
4RN	62	584	.338	9.4	86.3
RN5	62	429	.211	6.9	78.8
RN7	61	595	.274	9.7	71.5
8RN	61	357	.201	5.9	76.8
9RN	60	968	.620	16.1	66.2
TEN	51	804	.524	15.8	62.3
ECN	17	63	.232	3.7	78.4[1]
TWN	31	376	.436	12.1	69.6[1]
EAN	28	1461	.967	52.2	98.2
CAN	31	1250	.700	40.3	96.8
PAN	30	1300	.683	43.3	97.8
Sections[2]	524	3628		6.9	
TCC Eastern	126[3]	334			
TCC Central	93[3]	976			
TCC Pacific	115[3]	854			
Summary	1201	15848	EAN	11.4	3RN
Record	1918	20350	1.050	15.2	100.0

[1] Representation based on one session per day; others are based on two or more sessions per day.

[2] Section nets reporting (17): WSB (Wis.); GBN (Ont.); SCN (S.C.); SCN (Calif.); MDD (Md.-Del.-D.C.); QMN (Mich.); VN, VSSN, VFN, VN (Va.); CN (Conn.); MSN, MJN, MSPN, MSPN Noon (Minn.); BN (Ohio); RISPN (R.I.).

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

Well, our section net reporting really took a drop in July, the lowest it has been in a long time; and this accounts almost entirely for the poor showing compared to previous years. How about some more section net reports? If you don't have CD-125, send us number of sessions and traffic total of net; also, your NTS liaison.

Eastern Penna. has been 100% present in all 3RN sessions since Oct., 1959. RN5 certificates were issued during July to W4PEX, WA4BLR, K5GTN, K5WNH, W5UMY and W9PHR/5; a new RM promises to improve representation from Mississippi. K7JHA submits his second report as RN7 manager, and it's a honey; RN7 is already looking up. W8DAE submits an optimistic report, and says that West Virginia is doing much better in representation now. We are still looking for a new TEN Manager to bring that net out of the doldrums. VE3BZB holds out hope for improvement on ECN in the fall. W6FEO says QRM from work is keeping his own activity in TWN down, but the net is doing pretty well. W9DYG sends in his usual complete discussion of the month on CAN, saying 9RN deserves to be "tops." RN5 is improving and TEN is slipping. WA6ROF says not much change since last month; TWN is getting liaison assistance from W4UGI/Ø and needs help to strengthen PAN representation; not much sense complaining about conditions because we're all in the same boat.

Transcontinental Corps. W1SMU is all moved and rolling from his new QTH; we note four vacancies in the TCC-Eastern schedule, all Station D (receive EAN traffic from PAN Station J). K4AKP tells us that vacations and newer ops who don't know all the ropes yet are causing some difficulty. Incidentally, Johnny is no longer "acting" TCC Director, Central Area. His permanent appointment is now official. W7DZX commends W6EOT and W8CHT for their fine efforts in maintaining EAN to PAN skeds.

July reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	126	84.9	1043	334
Central	93	88.2	2054	976
Pacific	124	83.1	1705	854
Summary	343	85.1	4802	2164

The TCC roster: Eastern Area (W1SMU, Dir.) — *W1s* EMG NJM OBR SMU, W2MTA, K2UAT, WA2OPG, *W3s* EML FAF, *W4s* DLA FOR, *W8s* CHT ELW UPH, VE3FES. Central Area (K4AKP, Dir.) — *K4s* HIIG AKP, *W9s* JOZ DYG CXY ZYK, K9UGY, WØSCA, KØIVQ. Pacific Area (W7DZX, Dir.) — W5ZHN, *K6s* GID ZYZ, *W6s* EOT WPF HC, *K7s* NWP TBB, *W7s* DZX GMC, *K0s* EDH EDK, *WØs* WHE KQD.

RESULTS, JULY CD PARTIES

The following are the high *claimed* scores. Figures show the score *claimed*, number of QSOs, and the number of different sections worked. Final and complete *official* standings will appear in the *October CD Bulletin*.

C.W.

K4BAI.....205,020-605-67
K2EIU/2.....193,475-577-65
W2JAE.....187,110-567-66
K1ZRA.....183,300-534-69
K4TEA.....181,470-555-66
K9RCF.....182,700-522-70
W9YT[1].....174,850-531-65
K4ZYI.....172,130-534-64
K5HRR[2].....169,000-515-65
K1JDN.....165,750-510-65
K8RMK.....154,375-470-65
W1EOB.....150,280-435-68
W9MAK.....149,160-445-66
W6NKR.....145,590-415-69
W6ISQ.....143,680-442-64
W8VPC.....141,240-421-66
W4MLE.....137,330-437-62
W6WNI.....134,300-388-68
K1LPL.....130-315-382-67
K9ELT.....127,890-400-63
K4RIN.....126,880-412-61
K4JLD.....114,240-357-64
K3JIQ.....113,850-345-66
W9AQW.....113,425-348-65
WØETT.....110,250-346-63
K2SIL.....110,160-402-54
K0QCQ.....109,500-360-60
WA6ECF.....109,200-336-65
W2GKZ.....105,210-327-63
K5OCX.....105,020-350-59
W9QQG.....100,800-331-60
W4PRO[5].....116,510-382-61
WA2NCE.....100,130-319-62
K3JCT[3].....172,530-482-71
W1AW[4].....150,150-455-65
W4PRO[5].....116,510-382-61

PHONE

K2PHF.....12,325- 78-29
W9YT[6].....12,150- 75-30
K8RMK.....9230- 66-26
K4ZRA.....8500- 62-25
WA2NCE.....8125- 61-25
K1LPL.....8010- 60-24
W1FJJ.....6105- 55-21
K4BAI.....6360- 46-24
K2QDT.....5800- 56-21

[1] W9SZR, opr.; [2] K5ABV, opr.; [3] K3IJG, K3JCT, oprs.; [4] K1AJJ, W1ECH, W1WPR, oprs.; [5] W4PRO, K4FMS, WA4DUS, oprs.; [6] K9ELT, opr.

With the AREC

We were mildly surprised, in looking back over past issues of *QST* in search of a suitable topic for this month's column, that the subject of the relation between AREC and RACES has not been discussed in detail heretofore. It has been given so much attention in Emergency and Traffic Bulletins and in talks before clubs and conventions that its absence from this column has not been noted. And we were wondering why we kept getting inquiries about it.

The fact is, the subject doesn't really deserve a great deal of attention. There is no conflict between the AREC and RACES and none should be allowed to exist. The reason any does exist is primarily twofold: first, misunderstanding on the part of amateurs regarding the status of RACES; second, misunderstanding on the part of c.d. people on the status of the AREC. We have tried hard to dispel all illusions on the part of our amateur radio leaders (and to some extent c.d. leaders as well), and now we would like to attempt to do the same thing on the part of all AREC members, or whoever it is that reads this column.

The first thing that needs to be clear is that RACES was created exclusively to serve a civil defense communications purpose, that it was originally intended and still remains a means for amateurs to serve civil defense communications in their own name with their own organization, a sort of wartime continuation of the services performed by the AREC during peacetime. It was *not* intended as a means for civil defense to utilize frequencies in the amateur bands, except through this amateur service. ARRL from the very beginning has lent its full support to the original intent and continues to do so to this day. AREC groups have been urged to contact their c.d. directors and offer their services in starting and implementing the RACES program, and many of them have done so to excellent advantage. Why not? RACES is an amateur service serving civil defense; it is also a civil defense service utilizing amateur radio. It is, in brief, amateur radio's part of civil defense communications.

RACES and the AREC, while having similar aims, can serve a useful purpose in emergency radio communication whether operating in consonance or separately. That is why we have always urged our AREC personnel to sign up in RACES if it exists locally so that they may make their facilities and skills available to serve c.d. if war should break out. It is why we have urged, where possible, RACES amateurs to sign up in the AREC, so that civil defense can benefit from the availability of the greater flexibility and fewer restrictions thereof during peacetime operations. Where the two organizations exist together, whether completely or only partially overlapping, they can then do a complete and efficient job in war or in peace — given proper planning and training, of course.

In some places local c.d. is not organized and RACES does not exist, in which case a local AREC can do the job in peacetime while trying to get RACES started in case of war; and in other places RACES exists without the AREC, in which case it labors under restrictions which could be alleviated by formation of an AREC group. Reciprocity is the solution. Each of these two branches of the amateur service has advantages the other does not have. Each is perfectly capable of realizing and utilizing the advantages of the other; all that is required is a little coordination and cooperation and relaxation of prejudices and partialities.

Whence arises, therefore, any conflict between and among them? They're a "natural" to work together. Let's get to it, before Uncle Sam declares "a plague on both your houses" and looks elsewhere. — *W1NJM.*

— • • • —

In July *QST*, page 91, there was a squib about the activities of the Polk County-Des Moines AREC-RACES group during a flood. We want to correct a mistake: KØHRO should have been KØHRD. Also, omitted as having actively participated were WØUDO, KØIEZ and KØZCA.

— • • • —

On July 15, W4HFF of Tampa, Fla., heard HK5OW requesting assistance in locating a newly developed drug to save the life of a dying man. W4HFF called his local physician and ascertained that the drug was manufactured by Eli Lilly laboratories in Indianapolis. A local representative contacted the home office and extracted a promise of immediate shipment as a public service for the charity patient in Cali, Colombia.

— • • • —

Southern Michigan was threatened by tornadoes in mid-July and amateurs were ready to cope with any disaster. On July 20, the Southern Michigan Net was activated at the request of the Calhoun County sheriff's department to follow storm fronts and keep them informed. None of the storms did any damage requiring communications, although two mobiles went to the Tekonsha area, which was hard hit, and stood by. Besides the two mobiles units, there were 19 amateurs standing by at their home stations, and two portable power units were in reserve in case needed. — *K8AEM, EC Calhoun County, Mich.*

— • • • —

The following material might well be entitled "The Diary of the AREC." It is a thumbnail résumé of reports of special or routine drills and tests and non-emergency activities of various kinds in which amateurs have participated but which we were not able to report herewith in detail for reasons of lack of space. These are the activities that give our AREC and other amateur emergency communications groups the training that enables them to do a worthwhile service when the chips are down. Chronologically, then:

Dec. 21, 1961 — A simulated emergency test based on an actual emergency in the past was conducted by the AREC of Lucas County, Ohio, to show that amateurs could effectively provide communication in such situations. It was a resounding success, with 16 amateurs taking part.

Feb. 12, 1962 — "Operation Ready" was conducted by Redwood City, Calif., c.d. and the entire amateur radio staff, encompassing activities within 10 cities.

On the same date, the Hillsborough Amateur Radio Society provided communication for the annual "Gasparilla Day" parade in Tampa, Fla.

Feb. 14 — Seven operators and 4 mobile units responded to an alert call in Redwood City, Calif. area when it seemed heavy rains might cause flooding. This was a RACES alert, no emergency developed.

Feb. 25 — The Cuyahoga County (Ohio) AREC assisted with the collection of funds for the Heart Society under the direction of W8NZI.

Members of the Central Indiana Mobile Radio Club assisted the Marion County Heart Assn. by providing communication for solicitors. Fifteen amateurs took part.

Mar. 3 — A joint exercise of the Emergency Measures Organization and the AREC in Ontario County, Ont., was conducted on 75 meter mobile and two meters by 8 amateurs led by EC VE3ATI.

Mar. 10 — The Steuben County, Ind., AREC provided communication for a sports car rally sponsored by the Society of Automotive Engineers. Eleven amateurs took part under the direction of K8JPC.

Communications for the "Motorcycle Run" of the Road Riders of Southern California were provided by amateurs of the AREC of Southern California. This is WA6SXG operating WA6HBU/6 at the six-meter position on Ranger Peak.

Section Emergency Coordinators of the Amateur Radio Emergency Corps

The Section Emergency Coordinator is appointed by the SCM to take charge of the promotion of the Amateur Radio Emergency Corps organization throughout the Section. He acts as the SCM's executive in the furthering of provisions for emergency amateur radio communications in every community likely to suffer in case of a communications emergency. One of the duties of the SEC is to recommend the appointment of Emergency Coordinators for the various communities in his Section. Does *your* town have an EC? If not, recommend the name of a likely prospect to the SEC. The SEC invites your questions concerning the status of the AREC in your Section.

ATLANTIC DIVISION				
Eastern Pennsylvania	W3DUL	Emmet W. Kuehner	242 E. Broad St.	Hazelton
Maryland-Delaware-D. C.	W3CVE	Conan W. B. Barger	7512 Foster Ave., S.E.	District Heights, Md.
Southern New Jersey	K2ARY	Norris J. Mundell	345 Laurel St.	Carneys Point
Western New York	W2LXE	John S. Tylec	193 Avon Rd.	Tonawanda
Western Pennsylvania	W3LIV	William T. Tobin	4916 Fifth Ave.	Altoona
CENTRAL DIVISION				
Illinois	W9PSP	Jack Stanton	2632 E. 74th St.	Chicago 49
Indiana	W9SNQ	Leonard M. Chalk	815 West Arch St.	Portland
Wisconsin	W9BCC	Frank L. Guth	128 Ellis St.	Stevens Point
DAKOTA DIVISION				
North Dakota	W0CAQ	Douglas Classon	449 — 16th Ave., So.	Fargo
South Dakota	W0SCT	Lester R. Lauritzen	Rt. 3, Box 32	Centerville
Minnesota	K0KKQ	Lloyd Pearthree	800 — 5th Ave., Wes	Pine City
DELTA DIVISION				
Arkansas	W5KRO	Kenneth M. Goode	63 Carol St.	Pine Bluff
Louisiana	W5MNQ	A. L. Powell	221 Hollywood Drive	Metarie
Mississippi	K5SQS	William R. Butler	Box 8	Alligator
Tennessee	W4WBK	Franklin Cassen	925 North Trezevant	Memphis
GREAT LAKES DIVISION				
Kentucky	W4BAZ	J. R. Wathen, III	391 Mockingbird Valley Rd.	Louisville 7
Michigan	W8LOX	Wilbur S. Stoltz	2118 Starr Road	Royal Oak
Ohio	W8HNP	Arlington A. Garn	5034 Oak Ridge Drive	Toledo 13
HUDSON DIVISION				
Eastern New York	W2KGC	William L. Stahl	Shirley Ave.	Fishkill
N. Y. C. & Long Island	W2ADO	Maurice Mulligan	Box 134	Westbury
Northern New Jersey	K2ZF1	John Banke	P.O. Box 177, Main Rd.	Towaco
MIDWEST DIVISION				
Iowa	K0EXN	Ronald M. Schweppe	609 W. 9	Spencer
Kansas	K0BXF	Robert M. Summers	3051 North 17th St.	Kansas City
Missouri	K0WNZ	Mal. R. C. Gordon	515 S. Monroe	Lebanon
Nebraska	K0TSU	John Spahr	705 W. 28	Kearney
NEW ENGLAND DIVISION				
Connecticut	W1EOR	John L. Henley	RFD 2	Manchester
Maine	W1GRG	Robert Curtis	RFD 1	Livermore Falls
Eastern Massachusetts	W1AOG	Donald F. Guptill	17 Park St. Court	Medford 55
Western Massachusetts	W1BYH/ K1APR	Norman Rivers	18 Saari Pkwy.	Fitchburg
New Hampshire	K1GQK	Howard Hook	RFD 5	Penacook
Rhode Island	W1PAZ	Thomas C. McCormick	1931 Smith St.	Centerdale 11
Vermont	K1DQB	Gerald E. Wood	RFD	Ferrisburgh
NORTHWESTERN DIVISION				
Alaska	KL7BES	Herbert R. Tresidder	1710 Snowcap Drive	Anchorage
Idaho	W7IWU	Alan K. Ross	2105 Irene St.	Boise
Montana	W7RZY	Harry Roylance	Box 621	Harlowton
Oregon	W7WKP	Jesse E. Parrish	P.O. Box 11	Sweet Home
Washington	W7HMQ	Everett E. Young	2217-5th St., S.E.	Puyallup
PACIFIC DIVISION				
Hawaii	KH6CQV	Bill Cameron	810 — 5th Ave.	Honolulu
Nevada	W7JU	Ray T. Warner	539 Birch St.	Boulder City
Santa Clara Valley	W6ZRJ	Jean A. Gmelin	1089 Huntington Drive	San Jose
East Bay	WA6M1E	John A. Howell	1293 Walden Rd.	Walnut Creek
San Francisco	W6KZF	Bill Ray	52 Matilda Ave.	Mill Valley
Sacramento Valley	K6IKV	Antone F. Buzdas	1308 — 38th Ave.	Sacramento
San Joaquin Valley	K6ODA	Heinz King	1926 Chelsea Ave.	Modesto
ROANOKE DIVISION				
North Carolina	W4YMI	Robert C. O'Bryan	Box 3	Pollocksville
South Carolina	W4BCZ	Phillip A. McMasters	5809 Moore St.	North Charleston
Virginia	W4VMA	Roy E. Ridgeley	114 Patrician Drive	Hampton
West Virginia	W8SSA	E. Keith Chambers	P.O. Box 62	Bluefield
ROCKY MOUNTAIN DIVISION				
Colorado	W0SIN	Charles Cotterell	130 South Swadley	Denver 26
Utah	K7BLR	Ronald B. Twelves	1150 Harvard Ave.	Salt Lake City 5
New Mexico	K5QIN	Robert E. Cowan	3806 Gold St.	Los Alamos
Wyoming	W7IHI	Donald T. Wright	1417 Flint St.	Laramie
SOUTHEASTERN DIVISION				
Alabama	W4FQQ	Harry L. Pooker	P.O. Box 1962	Decatur
Eastern Florida	W4IYT	Andrew C. Clark	41 Lenape Drive	Miami Springs
Western Florida	W4MLE	George Thurston	3107 Brock Drive	Tallahassee
Georgia	W4TJS	A. J. Farr	572 Wells Ave.	Hapeville
West Indies (Cuba-P.R.-V.I.)				
Canal Zone	KZ5RM	Roger M. Howe	Box 462	Balboa Heights
SOUTHWESTERN DIVISION				
Los Angeles	K6YCX	Frank P. Merrill, jr.	3131 Riverside Dr.	Pomona
Arizona	K7NIY	George Mezey	P.O. Box 814	Sun City
San Diego	K6JPI	Wes Lees	1321 Tourmaline	San Diego 9
Santa Barbara				
WEST GULF DIVISION				
Northern Texas	K5AEX	Robert G. Bender	c/o OCDM Civil Defense	Denton
Oklahoma	K5KTW	Bill Lund	1220 South Owasso	Tulsa 20
Southern Texas	W5AIR	G. D. Sears	5634 Eskridge	Houston 23
CANADIAN DIVISION				
Maritime				
Ontario	VE3AML	Rowland Beardow	1899 Lakeshore Rd.	Sarnia
Quebec	VE2QN	Felix Edge	2604 de la Fabalse Ave.	Sillery 10
Alberta	VE6FS	Walter Jordan	443 — 19th St., N.	Lethbridge
British Columbia	VE7OM	W. C. Orchard	13733 — 62 Ave., RR 15	North Surrey
Manitoba				
Saskatchewan	VE5IG	Harold Gronsdahl		Congress

Harris County (Houston), Texas, AREC members offered communications facilities for a "Victory over Polio" drive conducted from July 22 to July 29. Over 50 amateurs participated. Above are K5RDP (left), Harris County EC and W5DSF (right) with WA5AUP in the background at Polio Headquarters in Houston.

Mar. 17 — The Cuyahoga County (Ohio) AREC provided mobile communication for the St. Patrick's Day parade of Greater Cleveland. Nine amateurs participated.

The Oakland County, Mich., AREC conducted a simulated emergency test involving a tornado problem under EC K8GHK. Thirteen amateurs were in on this one.

Mar. 25 — The Lehigh County AREC (Allentown, Pa.) supplied communications for a convoy to Ocean City, N. J., on its way to assist in the clean up after the devastating storm on the New Jersey coast. Six amateurs were in the convoy, under the direction of EC K3LKQ.

Mar. 30, 31 — Iowa amateurs set up a watch along the Rock and Sioux Rivers in Rock Rapids and Akron, Iowa, relaying crest information down river so officials would know how much sandbagging would be necessary. Lyon County EC WØNLF led nine other amateurs in this operation.

Apr. 1 — The Shiawassee Amateur Radio Assn. (Mich.) held a simulated emergency test to determine their capabilities in supplying communication between their headquarters and all other communities in the county. Seven mobiles and a number of fixed stations were used. Fifteen amateurs participated under EC K8BDR.

Apr. 13–14 — The Clinton County, Iowa, AREC, put on a demonstration of emergency communications by establishing contact between Boy Scout expositions in Clinton and Davenport, Iowa and passing many messages. Nine amateurs took part under the direction of Assistant EC KØVBV.

April 14 — EC KØUAB and his boys cooperated with the sheriff's department in "Operation Roadblock," a special exercise to close escape routes out of Council Bluffs, Iowa, using a simulated stolen car. Five amateurs took part.

The Cuyahoga County (Ohio) AREC conducted a special training exercise under Assistant EC K8GBH, with the object of locating hidden stations on both 6 and 10 meters. Twenty-five mobiles came out for the event.

Apr. 18. — In the middle of the Southern Michigan Net's regular session, NCS K8AXV called a special drill to ascertain how many mobiles could be activated how quickly. Five mobiles were on the road within moments.

Apr. 27 — Twenty-five amateurs in California's San Gabriel Valley under EC W6NAA provided communications for the Road Riders of Southern California during their motorcycle run (see cut). W6NAA and K6JNP wrote a fine article on the subject which we were unfortunately unable to print.

May 5 — Cuyahoga County (Ohio) provided mobile communications for the VFW Loyalty Day Parade in Cleveland. Operation was on six meters using mobiles and a walkie-talkie, with Assistant EC K8MBW in charge. Nine amateurs were involved.

May 5–6 — Amateurs in Dixon, Calif., provided communications for the Dixon May Fair; four amateurs did the job.

May 14 — A joint drill of the Kings County (N. Y.) AREC and Brooklyn RACES was conducted by EC K2OVN to "shake down" Brooklyn RACES equipment. Sixteen amateurs were in on it.

May 20 — The annual clothing drive sponsored by the Boy Scouts and others was assisted by the radio amateurs of Greater Cincinnati. Forty-eight amateurs participated.

That brings us up to June 1, 1962. We'll try to continue the "Diary of the AREC" in a subsequent issue when we aren't overloaded with reports of actual emergencies. Some day we may even have enough space left over to give some details on these non-emergency activities. We hope so. Many of them deserve it.

—•••—

We hit a low for the year with only 28 SEC reports for June, but it was still two more than June of 1961. The AREC members represented, at 14,331, exceeded last year's figure by almost two thousand and set a record for June. *Ontario* reported for the first time in 1962. Other sections reported: E. Mass., NYC-LI, W. Fla., Tenn., Ind. Mich., Alberta, Wash., E. Fla., Nevada, Ohio, Ore., N. Texas, N. C., S. Texas, S. Dak., Ga., E. Bay, N. N. J., E. Pa., Utah, W. Pa., Los A., Sac. V., Kans., Okla., W. Mass.

This brings us to the half way mark in 1962, so let's see how our SEC reporting stacks up. We are four reports ahead of last year, and we have heard from 14 different sections (12 last year). The progress isn't phenomenal, but it's there. *Nineteen* (not counting those who will now write to protest) sections are 100% for 1962: E. Mass., Mich., Alberta, Wash., Ind., N. Y. C.-L. I., Utah, Ore., N. Texas, Los A., S. Texas, Tenn., E. Fla., Nevada, Ohio, W. Pa., E. Pa., S. Dak., Okla.

The following sections *have not been heard from* up to June, 1962: W. N. Y., Ill., Wis., Ark., La., Miss., Ky., E. N. Y., Mo., Conn., N. H., R. I., Vt., Alaska, Idaho, Mont., San Fran., S. C., Wyo., W. I., C. Z., San D., Santa B., Mar., Que., B. C., Man., Sask.

RACES News

The situation at federal OCD is somewhat fluid, to say the least. There seems to be a total reorganization of federal civil defense in progress, starting with the discontinuation of Conrad and going right down the line. OCD Operational Headquarters at Battle Creek, Mich., is no more, and much of the personnel has been transferred to other government agencies or moved into private industry. At this writing we're not quite sure what is going to happen to RACES, if anything. There was never any particular centralization of RACES matters at federal level, except that accomplished through the efforts of the U.S.C.D. Amateur Radio Alliance, so the fact that no one appears to be actively heading up RACES at the Pentagon (new location of OCD Communications) is no great change. OCD regional offices seem to be still in business, so whatever reorganizational spasms have hit federal OCD have not yet reached regional level.

Right now, it appears that the effects of top-level reorganization never *will* reach local levels. We hope so, but you may be assured that we are keeping in close touch with the situation for whatever information may be forthcoming.

—•••—

On July 20, c.d. authorities in Detroit asked that the Detroit RACES networks be placed on alert with all mobile units to act as weather observers. Eight amateurs responded and remained on duty from 2345 to 0130 GMT, when it was decided the danger had passed. This activity was conducted by W8DOO and K8LOS. RO and Alternate RO for Wayne County Zones 10/12.

—•••—

Forty members of the St. Louis-St. Louis County RACES turned out on July 29 to provide communication for the St. Louis County police in handling traffic at the County Police Show. Directed from the RACES mobile truck at the field, 18 amateur mobiles were situated at critical intersections to provide a radio network. RACES frequencies on 6, 2 and 10 meters were used under very hot, uncomfortable conditions. This situation gave a small approximation of what could happen in a real emergency. Police were quick to admit that they had neither the personnel nor the communications to handle traffic problems of this magnitude and gratefully acknowledged the help of c.d. and RACES. WØKY headed up the RACES forces.

DX CENTURY CLUB AWARDS

Honor Roll

The DXCC Honor Roll consists of the top ten numerical positions in the DXCC. Position in the Honor Roll is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date of receipt. All totals shown represent submissions received as of the end of the 1st day of the month of July, 1962.

W6CUQ....308/322	W8JIN....306/320	W5ASG....304/317	W7PHO....302/313	W9NDA....300/313
W2AGW....308/321	W8DMD....305/317	W0QVZ....304/315	VE7ZM....302/314	W3LMA....300/312
W3GHD....308/321	W6AM....305/319	W8UAS....304/316	W6GPB....302/314	W1JYH....300/313
W1GKK....308/322	W8BKP....305/317	W6EBG....304/318	W1BIH....302/315	W9LNM....300/314
PY2CK....307/320	W3KT....305/318	LU6DJX....304/317	4X4DK....302/313	W2LPE....300/313
W8BRA....307/320	W3JNN....304/317	G3AAM....303/316	W7GBW....302/315	W4TM....299/312
KV4AA....307/321	W1ME....304/317	GE3AG....303/316	W9HUZ....302/314	W2WZ....299/312
W2HUQ....307/320	W8BF....304/316	W2HMJ....303/315	GX2CO....302/314	W4QCW....299/310
W4DQH....307/320	W7GUV....304/317	W1CLX....303/315	W8KML....301/313	W8LKH....299/311
W9RBI....306/320	W9YFV....304/317	W2BXA....303/316	K2GFQ....301/314	W0ELA....299/311
W8KIA....306/319	W5ADZ....304/316	G2PL....302/314	W8JBI....301/312	W2JT....299/311
		W5MMK....302/314		

Radiotelephone

W3RIS....309/323	W9RBI....305/317	W7PHO....302/311	4X4DK....298/309	W3JNN....297/309
PY2CK....307/320	W8BF....303/315	W8PQO....301/312	W8KML....298/310	W2ZX....295/307
W8GZ....305/317	VQ4ERR....302/315	GX2CO....301/314	W6YY....298/310	W6AM....295/308
		W4DQH....300/311		

From June 1, to July 1, 1962, DXCC Certificates and Endorsements based on contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

New Members

G3HDA....204	DL1AM....121	UB5KED....110	KR6ML....103	K8LNL....101	K8WOT....100
W8DMK....180	G3JKY....118	OK1NR....109	W1HOZ....102	VE3CWE....101	K8YCM....100
K1SHN....173	PY5HJ....114	VQ2VG....109	K4KJC....102	VE7AGC....101	W9NHP....100
ZS6VX....161	UA4KHW....114	UC2WP....107	K6R8Y....102	W1FRX....100	W0DXB....100
K4HJJ....152	UB5FY....113	W2BEL....106	W8KOS....102	W3PVZ....100	G3HIL....100
SM7B1R....137	VQ5GC....113	W9BWM....105	W9KQB....102	K4OLQ....100	DJ5IH....100
W5FJ....129	YU3LB....113	UB5MZ....105	JA7KY....102	K5FIA....100	YU3HY....100
UA4KED....127	DJ8SA....111	W3CAA....104	UA1KBR....102	W5VA....100	ZL1AOV....100
K8ITH....126	DL9KJ....111	K7LHW....104	W3SQX....101	WA6BBJ....100	Z82MH....100
SP2BK....126	W5VSQ....110	YU3CG....104	WA6SBO....101	W7CLS....100	ZS4LX....100

Radiotelephone

W1JFG....242	W1GOX....115	YV2CJ....106	W9BWM....102	W9KWC....101	VE2AYY....100
W9JYJ....168	W6USG....115	G3HDA....105	K1OYM....101	TI2EH....101	VE3AGC....100
W8ALJ....129	W0YYS....110	ZF4JN....104	K4WNL....101	K8AXG....100	DL4FC....100
ZS6VX....121	K5JCC....107	VE7MT....103	W6ZJY....101	K0LFY....100	KP4CK....100
W1JSK....116	W4BWR....106	WA6DET....102	W8QNW....101	W0ZXX....100	

Endorsements

HB9J....312	DL1IN....264	W3KA....233	W4MS....203	ZS5KU....171	W4IEN....132
W8EWS....309	W3ALB....263	W3LPF....233	W6PBL....202	W1NF....170	W8WBT....132
W2GUM....302	W1BAN....262	W4JJL....232	W0VAF....202	W7BPS....170	VQ4WLH....131
W2DS....301	W2ICO....262	W9EHW....232	W2MES....201	W8FAW....170	K3ALD....130
W6LDD....301	W5DA....262	VE2BV....231	W6ZMW....200	K9HOL....170	W5PMK....130
W2SUC....300	W8ZCQ....260	S52AR....231	W0CJZ....200	W4EEU....169	K5STL....130
W6VE....300	DL3RK....259	K1MLI....230	DJ1VS....200	W1FJJ....164	K8ANX....130
W8PUD....300	W4BJ....253	W4ZRZ....230	DL1IA....198	W1APA....163	W6OMR....124
W2ZGB....299	W2TP....252	K8ONV....228	W9AKH....197	W1QV....163	K1IMD....122
W8WZ....296	W9DWQ....251	VE1WL....228	W4SIB....196	W4NJF....161	K8RBH....122
W1HX....293	K0RAL....251	W1MQV....224	WA2ELS....193	W8QNW....161	WA2LWT....121
W2EBO....292	ZS1OU....251	W7BFH....224	W3MQG....191	ZS6ASW....160	W2TSD....121
W9UXO....292	W1ORV....250	W2RGV....223	W8QQH....191	DJ5VQ....159	K3AIG....121
W2NUT....290	W6HIL....250	W5EJF....222	W4AVY....190	K4MPB....155	WA2KSD....120
W4BYU....290	K8LSG....250	H89KU....221	W4EJN....190	W1MD....153	K2OXN....120
W4OPM....290	W9RQM....250	W2PDB....220	W4LZW....190	WA6DUG....153	WA6MWG....120
W6KZL....290	VE6JR....250	W6WX....216	K4WIS....190	W0NGM....153	W7DQM....120
W3RNQ....288	W4NNH....248	DJ2KS....212	G2AJB....182	TI2WA....153	W9NVJ....120
W5LGG....281	PZ1AX....245	W4MS....211	G3HJJ....182	SM5BEU....151	W9UTQ....120
W1BIL....280	W6KUP....241	WA6AMZ....211	OH3NY....182	W4QVJ....150	KP4APY....120
K2UVU....280	K1JDN....241	K7GCM....211	W2REH....181	W7IYW....150	K7AWH....116
W6UOV....280	W2QKJ....241	W1AW....210	K5UXP....180	W8CUT....150	K0IFL....116
W9FVU....280	K6EDE....241	W4NO....210	K6HOR....180	G2HNO....150	WA6KNE....113
W9KXK....280	W9PIO....241	W6LGZ....210	WA6TGY....180	DJ1WT....148	W6BJI....112
W4BQY....277	K9CJK....240	W8KMD....210	W9NZZ....180	K2EAC....146	W9OW....112
W9GFF....273	W9HLY....240	K8OHG....210	W4OEP....176	W6HVN....140	G3KRC....111
W8JSU....272	W6PLK....239	W8RQ....210	W2JWK....173	K7BJE....140	W4HOS....110
W2HSZ....271	W0DEI....239	W5QN....207	K9LIO....172	VE3AGC....140	K4RDE....110
W4GRP....270	EA1BC....239	F3AT....205	VE3LZ....171	K2LGJ....135	K5OJL....110
VE1PQ....270	W4IF....234	ZS6EU....204	EA1GZ....171	W3AFM....135	K9ZQW....110
					ZS6YB....110

Radiotelephone

W8DMD....294	W2LV....251	W3FWD....216	W8WZ....185	F9MD....151	W3ORD....130
TI2HP....291	DL1IN....249	W4GRP....213	W4UWC....183	W0PMU....150	W6KLC....129
W3KT....290	PZ1AX....245	W2HMJ....212	DL3RK....183	VK4RQ....150	W4BQY....128
W8BKP....290	W8WT....240	W2QKJ....212	W3MQG....178	W3LPF....141	XE1HHT....127
W4QCW....283	W1ORV....232	W2RGV....212	H89KU....176	WA2EOQ....140	K9AZB....121
W8UAS....280	W3CGS....232	PA0WWP....210	W3YZI....173	W2FGD....140	W6KUT....114
W9JJF....277	W5KC....232	W4BYU....203	K8LSG....172	W2MOF....140	W7BTH....113
H89J....272	W1WDD....231	K2JFV....201	W8LIZ....170	K0MAS....140	W4BXG....112
KH6OR....271	K1IXG....230	VE1WL....196	K8ONV....163	WA2EOQ....139	W8FAW....112
W2WZ....270	WA2IZS....230	W9UZC....195	W8GUZ....155	G3HJJ....135	W9KNK....111
W0QVZ....270	W1YDO....228	W4MS....194	W4NJF....154	VE3CJ....133	K4BAH....110
W1BAN....261	W1BX....221	W0PGI....194	VE2WY....153	DJ3OJ....133	W7DQM....110
W1LLF....261	W4TDW....221	VE1PQ....190	W4EEU....152	W9JJV....131	W0OVQ....110
W9LNM....260	W1B1H....220	K0RAL....187	WA2ELS....151	W1BHP....130	

Last month in "With the AREC" we reported operation by the Signaleers" in a tornado at Oak Park, Ill. Here is a disaster unit used at the scene of the tornado. That's W9HIC partially hidden by the car, with W9VRP looking on.

A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

Oct. 4: CP Qualifying Run — W6OWP
Oct. 6–7: Simulated Emergency Test
Oct. 13–15: CD Party (c.w.)
Oct. 19: CP Qualifying Run — W1AW
Oct. 20–22: CD Party (phone)
Nov. 2: CP Qualifying Run — W6OWP
Nov. 17: CP Qualifying Run — W1AW
Nov. 10–12, 17–19: Sweepstakes Contest

OTHER ACTIVITIES

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

Oct. 6–7: VK/ZL Oceania Phone DX Contest, NZART (p. 81, this issue).

Oct. 13–14: VK/ZL Oceania C.W. DX Contest, NZART (p. 81, this issue).

Oct. 12–22: Goose Bay QSO Party, GBARC (p. 154, this issue).

Oct. 20–22: Second World-Wide RTTY Sweepstakes RTTY, Inc., (p. 68, this issue).

Oct. 27–28: R.S.G.B. 7 Mc. DX Contest (phone), (p. 79, this issue).

Nov. 3–4: R.S.G.B. 7 Mc. DX Contest (c.w), (p. 79, this issue).

Dec. 8-9: New England QSO Party, Conn. Wireless Assn., (next issue).

SOME CODE PRACTICE STATIONS

Call	Location	Speeds (w.p.m.)	Freq. (kc.)	Time (GMT)	Days
W1EIA	Newington, Conn.	15, 25, 35, 45, 55, 65	3637 &7120	0130	Mon.
K2IBC	Avenel, N. J.	15	3675	2300	MTWThF
W3CVE	District Heights, Md.	10-40	3565 7034 146,250	0100	TF
W3UVD	Jeannette, Pa.	2½, 5, 10 15, 20	3700	0100	SMTWThF
W4RUR	St. Petersburg, Fla.	6, 9, 14, 18, 22	7086 28,050 51,000	0000	TTh
W5ROH	Albuquerque, N. M.	Various	7070	1300	MTThF
K6CCZ	Fontana, Calif.	5, 20	7090	0200	daily
W7IBR	Seattle, Wash.	7, 15	3550	1700	MTWThF

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 nominating form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]

38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....

.....ARRL Section of the.....

Division, hereby nominate.....

as candidate for Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	Closing Date	SCM	Present Term Ends
Vermont	Oct. 10, 1962	Miss Harriet Proctor	Aug. 10, 1962
North Dakota	Oct. 10, 1962	Harold A. Wengel	Aug. 19, 1962
Canal Zone	Oct. 10, 1962	Thomas B. DeMeis	Oct. 1, 1962
Alabama	Oct. 10, 1962	Harvell V. Tilley	Resigned
Colorado	Dec. 10, 1962	Donald S. Middleton	Feb. 14, 1963
Minnesota	Dec. 10, 1962	Mrs. Lydia S. Johnson	Feb. 23, 1963
Sacramento Valley	Dec. 10, 1962	George R. Hudson	Feb. 25, 1963
Eastern Florida	Dec. 10, 1962	Albert L. Hamel	Feb. 27, 1963
Missouri	Dec. 10, 1962	C. O. Gosch	Mar. 1, 1963

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.

Maritime	D. E. Weeks, VE1WB	June 11, 1962
Quebec	C. W. Skarstedt, VE2DR	June 11, 1962
Santa Clara Valley	Jean A. Gmelin, W6ZRJ	Oct. 15, 1962
New Hampshire	Albert F. Haworth, W1YHI	Oct. 26, 1962

In the Montana Section of the Northwestern Division, Mr. Walter R. Marten, W7KUH, and Mr. Ray Woods, W7SFK, were nominated. Mr. Marten received 112 votes and Mr. Woods received 96 votes. Mr. Marten's term of office began Sept. 1, 1962.

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.

SUGGESTED RTTY OPERATING FREQUENCIES

3620, 7040, 14,090, 21,090 kc.

GMT CONVERSION

To convert to local times subtract the following hours:
ADST −3, AST −4, EDST −4, EST −5, CDST −5, CST −6, MDST, −6, MST −7, PDST −7, PST −8, Honolulu −10, Central Alaska — 10.

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 October 19 at 0130 GMT. Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,700, and 145,800 kc. The next qualifying run from W6OWP only will be transmitted October 4 at 0400 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION:* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0130 GMT October 19 becomes 2130 EDST October 18.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

W1AW conducts code practice daily at 0130 GMT on all frequencies listed above with speeds of 15, 20, 25, 30, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 7½, 10, and 13 w.p.m. on other days. Approximately 10 minutes' practice is given at each speed. To check your copy, the texts used on several transmissions are listed below. The order of words in each line of *QST* text is sometimes reversed. To improve your fist, try to send in step with W1AW.

Date Subject of Practice Text from August *QST*

Oct. 3: *Handy 12-Volt D.C. . . . Inverter*, p. 18.
Oct. 9: *Complete Transmitter from an SB-10 . . .*, p. 12
Oct. 12: *12th National ARRL Convention*, p. 20
Oct. 17: *Retrievable Antennas*, p. 34
Oct. 22: *Three-Band Crystal-Controlled Converter*, p. 24
Oct. 23: *Some Tips on Neutralizing . . .*, p. 36
Oct. 26: *A Novel Key for Use with Electronic Keyers*, p. 39

W1AW SCHEDULES

(October 1962)

Operating-Visiting Hours

Monday through Friday: 1 P.M.–1 A.M. EDST.
Saturday: 7 P.M.–2:30 A.M. EDST.
Sunday: 3 P.M.–10:30 P.M. EDST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 4 miles south of West Hartford. A map showing local street detail will be sent on request. On Oct. 28, W1AW will switch to its winter schedule. The winter schedule will appear in November *QST*.

Operating Frequencies

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800 kc.
Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000 50,700, 145,800 kc.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes. Amateurs are respectfully requested to refrain from transmitting on the above frequencies during W1AW bulletins and code practice.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time.
C.w.: Monday through Saturday 0000; Tuesday through Sunday, 0400.
Voice: Monday through Saturday, 0100; Tuesday through Sunday, 0330.

Caution. Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

W1AW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from *and* amateur station in accordance with the following schedule:

Time (GMT)	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0000-0030[1]	.....	14,280	3555[3]	14,100	14,100	7080[3]	14,100
0030-0100	.....	14,280	3555	14,100	14,100	7080	.....
0100-0130[1]	.....	145.8 Mc.	21,330	145.8 Mc.	50.7 Mc.	21,330	.....
0230-0300	.....	.....	.....	1820	.....	1820	.....
0300-0330	.....	.....	.....	3555	.....	3945	.....
0330-0400[1]	.....	.....	3945	7255	3945	7255	3945
0400-0500[1]	.....	.....	3555[3]	.....	3945	7080[3]	.....
1700-1800[2]	.....	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	.....
1900-2000	.....	7080	14,100	7255	14,100	7080	.....
2000-2100	.....	14,280	7080	14,100	14,280	14,100	.....
2200-2300	.....	14,280	14,280	14,280	14,100	7255	.....
2300-2330	.....	7255	.....	21,075[3]	.....	14,280	.....
2330-2400	.....	14,100	.....	3555	.....	14,280	.....

[1] Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 0400, on phone at 0100 and 0330.
[2] Operation will be on 21,075, 21,330, 28,080 or 29,000, depending on band and other conditions.
[3] W1AW will listen for Novice Class licensees on the Novice portion of this band before looking for other contacts.

WHAT IS R.I.T.?

THE INCREASING POPULARITY of transceiver operation on SSB is and has been a mixed blessing. How often have you heard an operator apologize for system inflexibility by saying, "You are a bit off frequency. Will you please tune in on me as I am running transceive."

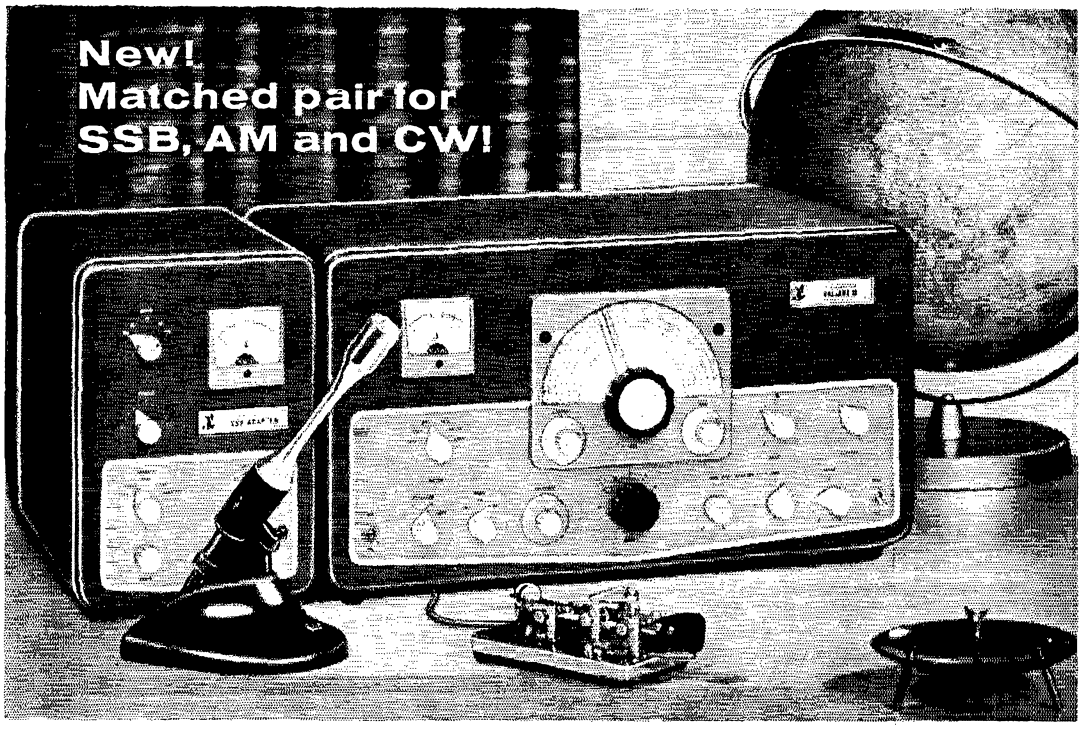
WHAT IS THE REASON for this error in frequency between stations? It can be shown that when tuning SSB even under ideal reception conditions, no two operators will tune exactly alike and under QRM conditions it is common to detune slightly to enhance the signal readability.

WITH A TRANSCEIVER, if you retune your receiver, the transmitter frequency changes also. This causes the station on the other end to retune slightly and if he is also running transceive, "walking" up and down around the frequency can occur.

R.I.T. (Receiver Incremental Tuning) is incorporated in the new Hallicrafters SR-150 Transceiver which at the flick of a switch permits the receiver to be tuned over a few KC without disturbing the transmitter frequency. This is only one of many new features incorporated in the SR-150 which will be announced in next month's *QST*.

R. J. ORWIN, W9YKA

W. J. Halligan W9AC Lewis Marshall K9EBE for **hallicrafters**



Outstanding performance on SSB, AM and CW with absolutely no compromise on any mode!

"SSB ADAPTER"—Here's the filter-type SSB generator amateur operators everywhere have been asking for! Bandswitching 80 through 10 meters . . . more than 50 db sideband suppression . . . more than 45 db carrier suppression! When used with the Viking "Valiant" or "Valiant II" it places 275 watts P.E.P. at your command—gives you the punch and penetration necessary for solid communications on today's crowded bands!

Two compact units and interconnecting cables . . . RF unit is only 8" wide—may be placed on your operating desk—power supply unit may be placed in any convenient location. Unique design features built-in multiplier requiring VFO input only—band-pass interstage couplers require no tuning—design and front panel layout make operation practically "foolproof"! Superb audio fidelity and balanced audio response; excellent sideband, spurious and carrier suppression. Other features: positive VOX and anti-trip circuits with built-in anti-trip matching transformer and adjustable VOX time delay.

Cat. No. 240-305-2—Wired and tested with remote power supply, tubes crystal filter, less microphone. **AMATEUR NET $369.50**

"VALIANT II"—Newly restyled, the "Valiant II" gives you outstanding flexibility and performance in a compact desk-top rig! Bandswitching 160 through 10 meters—delivers a full 275 watts input CW or SSB (with auxiliary SSB exciter or the new Viking SSB Adapter) and 200 watts AM! Low level audio clipping prevents overmodulation and increases modulation level and intelligibility—differentially temperature compensated VFO provides the extreme stability necessary for peak SSB operation! High efficiency pi-network tank circuit—final tank coil is silver-plated. Other features: complete TVI suppression; timed sequence (grid block) keying; high gain push-to-talk audio system built-in low pass audio filter; self-contained power supply; and single control mode switching.

AS AN EXCITER—Drives any of the popular kilowatt level tubes, and provides a high quality speech driver system for high powered modulators.

SSB OPERATION—Provision for plug-in SSB operation with no internal modification necessary. Rear panel fittings provided for VFO output and SSB input, connections for remote control of final amplifier bias and VFO keying through the VOX control of the SSB adapter.

Cat. No. 240-105-1—Kit with tubes, less crystals. . . . . **AMATEUR NET $375.00**

Cat. No. 240-105-2—Wired and tested with tubes, less crystals. . **Amateur Net $495.00**

New Catalog

E. F. Johnson Co. also manufactures other transmitters and accessories . . . all described in our newest amateur catalog. Write for your copy today!

E. F. JOHNSON COMPANY
WASECA, MINNESOTA, U.S.A.
®

FACTORY AUTHORIZED SERVICE Instead of shipping to our factory, equipment to be serviced may also be sent to:

Electrosony Corp.—Empire State Div.
65-37 Queens Blvd.
Woodside 77, New York

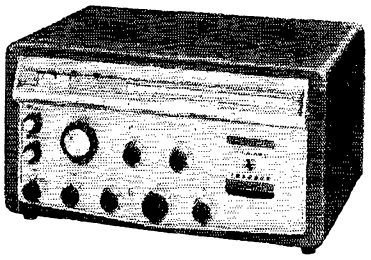
Park-Armature Co.
1218 Columbus Ave.
Boston 20, Mass.

Heights Electronics, Inc.
1145 Halsted Street
Chicago Heights, Ill.

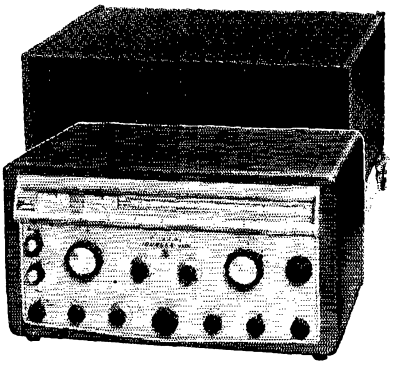
B and S Electronics, Inc.
6326 W. Roosevelt Rd.
Oak Park, Ill.

Radio Comm and Engr.
Pinehurst Place
Charlotte 9, N. C.

Pick your power and features from these popular Viking Transmitters!

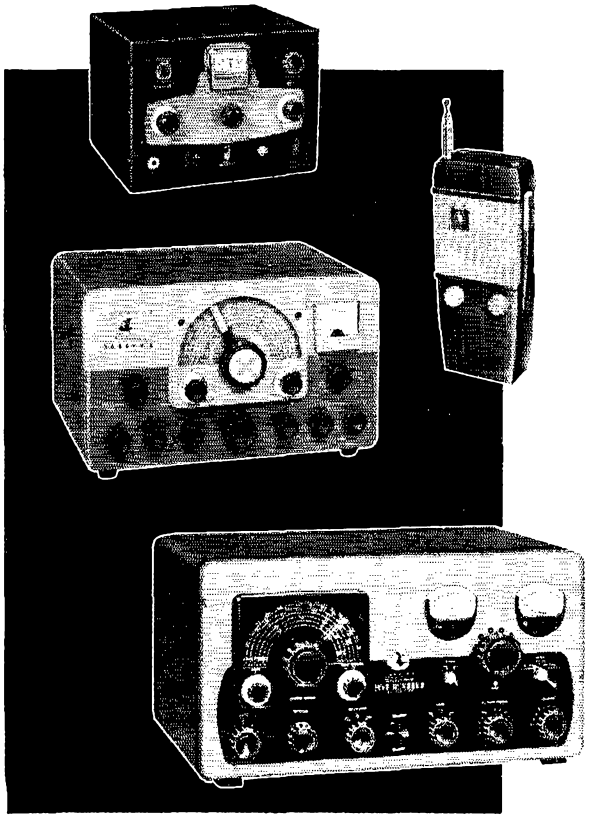


"INVADER"—More exclusive features than any other Transmitter/Exciter on the market! Specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db. sideband suppression, more than 55 db carrier suppression! Instant bandswitching 80 thru 10 meters—no extra crystals to buy—no realigning necessary. Delivers solid 200 watts CW and P.E.P. SSB input; 90 watts AM (25 to 30 watts output-upper sideband and carrier). Built-in VFO—exclusive RF controlled audio AGC and ALC (limiter type) provide greater average speech power. Wide range pi-network output smooth VOX and anti-trip circuits. Fully TVI suppressed. Self-contained heavy-duty power supply. Wired and tested, with tubes and crystals.
Cat. No. 240-302-2 Amateur Net.....**$619.50**



"INVADER 2000"—All the features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply. Rated 2000 watts P.E.P. (twice average DC) input on SSB; 1000 watts CW; and 800 watts AM (250 to 300 watts output-upper sideband and carrier). Wide range output circuit 40 to 600 ohms (adjustable). Final amplifier provides exceptionally uniform "Q". Exclusive "push-pull" cooling system. Heavy-duty multi-section power supply. Wired and tested, with power supply, tubes and crystals.
Cat. No. 240-304-2 Amateur Net.....**$1229.50**

"HIGH POWER CONVERSION"—Take the features and performance of your "Invader" . . . add the power and flexibility of this unique Hi-Power Conversion and you're "on the air" with the "Invader 2000". Completely wired and tested, includes everything you need—complete the entire conversion in one evening.
Cat. No. 240-303-2 Amateur Net.....**$619.50**



"ADVENTURER"—Completely self contained single knob bandswitching 80 thru 10 meters . . . effective TVI suppressed . . . and puts 50 watts of power into a rugged 807 transmitting tube. Operates by crystal or external VFO control. Front panel meter switching permits monitoring of the final grid of plate currents . . . keying is clean and crisp. Wide range pi-network output with tubes, less crystals.

Cat. No.	Amateur Net
240-181-1 Kit	**$69.95**

10 METER "PERSONAL MESSENGER"—Two models: 100 milliwatts for short range; 1 watt for extended range—11 transistors and 4 diodes-super-heterodyne receiver with tuned RF amplifier gives excellent sensitivity two stage transmitter punches signal home, "Quiet" control silences receiver on standby. With battery compartment for penlight cells (less cells) Rechargeable cadmium battery and other accessories available.

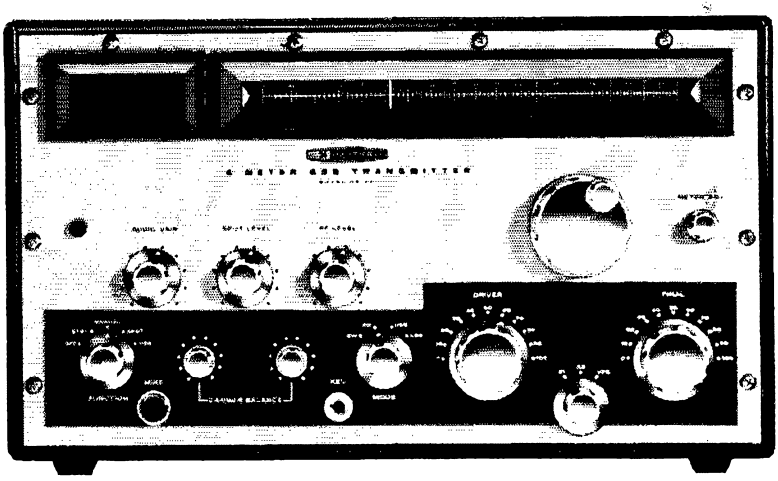
Cat. No.	Amateur Net
242-103 100 milliwatt	**$109.50**
242-104 1 watt	**$129.50**

RANGER II—Now a new version of the popular 75 watt CW or 65 watt AM "Ranger". The Ranger II" transmitter also serves as an RF/audio exciter for high power equipment. Completely self-contained instant bandswitching 160 thru 6 meters! Operates by built-in VFO or crystal keying, TVI suppressed. Pi-network load matching from 50 to 500 ohms. With tubes, less crystals.

Cat. No.	Amateur Net
240-162-1 Kit	**$249.50**
240-162-2 Wired, tested	**$359.50**

FIVE HUNDRED—Full 600 watts CW—500 watts phone and SSB (P.E.P. with auxiliary SSB exciter). Compact RF unit designed for desk-top operation. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 thru 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.

Cat. No.	Amateur Net
240-500-2 Wired, tested	**$1050.00**

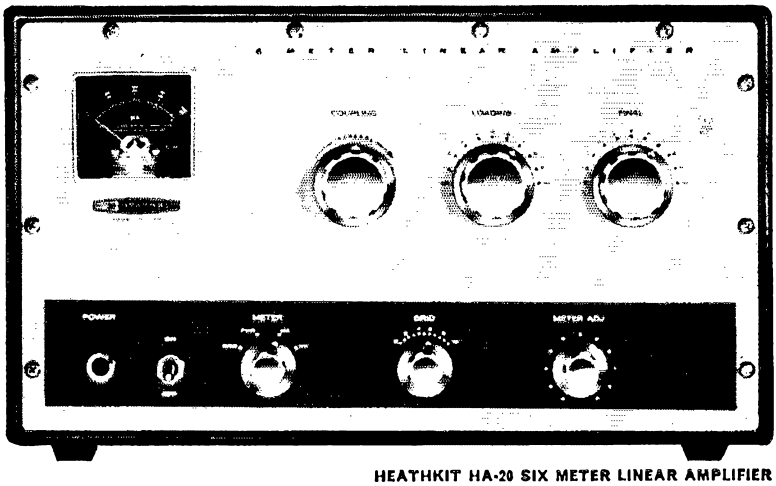


HEATHKIT HX-30 SIX METER SSB TRANSMITTER

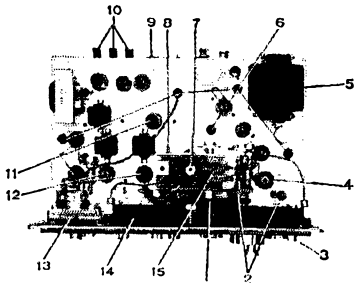
SSB SIX PACK

A NEW EXCITER & AMPLIFIER FOR 125 WATTS PEP ON SIX

HEATHKIT® by Daystrom

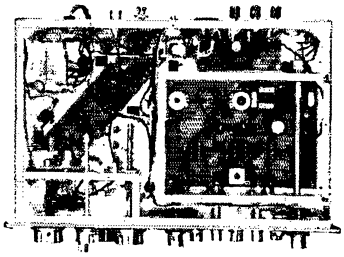


HEATHKIT HA-20 SIX METER LINEAR AMPLIFIER



HEATHKIT HX-30
SIX METER SSB TRANSMITTER

1. Anti-backlash helical gear for smooth VFO tuning. **2.** Adjustable final amp. coupling and loading. **3.** Meter control with push-button over-ride to check carrier null. **4.** 6360 final amplifier for 20 watt PEP RF input. **5.** Regulated power supply. **6.** Five test-point jacks for easy alignment using panel meter. **7.** Low frequency heterodyne VFO electronics on circuit board. **8.** VFO frequency determining components mounted on "heat-sink" plate in enclosure. **9.** Accessory socket for control functions. **10.** Built-in VOX & anti-trip circuitry. **11.** Three audio stages with speech filter. **12.** Phasing type SSB generator heterodyned to output frequency. **13.** Meter indicates relative power output. **14.** Lighted slide-rule dial with 9" per megacycle of bandspread. **15.** Two crystal sockets for net or MARS operation (provides frequency coverage down to 49.8 mc).

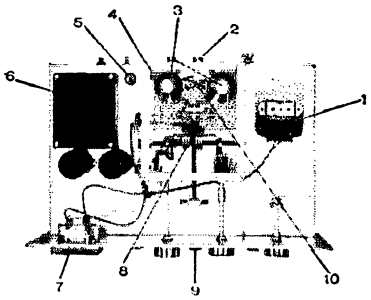


TAKES LESS THAN 30 HOURS TO ASSEMBLE: 3 extra-strength circuit boards and 3 precut, cabled wiring harnesses simplify assembly and insure correct parts placement. Compartmentalized construction and thorough shielding assure stable, reliable performance. Advanced design features provide 50 to 54 mc coverage in four 1 mc segments (crystal for 50 to 51 mc supplied); USB, LSB, CW, AM operation; 50 db carrier suppression; 40 db unwanted sideband suppressions; grid block keying with filter; 50-75 ohm coax output and many more. Overall dimensions only 16⅝" W x 10⅛" H x 10" D.

Kit HX-30, 50 lbs., no money down, $18 mo.....**$189.95**

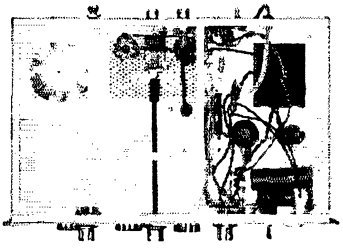
SSB SIX PACK as low as $27 per mo.

Attention all six-meter fans! Here's another Heathkit first! A brand new SSB exciter and linear for six meter operation at sensational savings! Only $289.90 for the pair . . . less than the cost of most transverters. Together they form a complete, high performance 6-meter SSB station designed for maximum efficiency and operating convenience. Check the many features of these two units . . . you'll find them the perfect pair for your station . . . enter your order today and go SSB on Six!



HEATHKIT HA-20
SIX METER LINEAR AMPLIFIER

1. Fan forced-air cooling of final amplifier. **2.** Only 2.5 to 10 watts PEP driving power required. **3.** 125 watts PEP input. **4.** Completely shielded RF circuitry. **5.** Regulated screen voltage. **6.** Solid-state rectifiers for cool, efficient operation. **7.** Metered grid current, plate current, plate voltage & relative power output. **8.** Link coupled RF output, 50-75 ohm coaxial. **9.** 50 ohm tuned grid input to accommodate various levels of driving power. **10.** Neutralized push-pull 6146 final amplifiers.



EASY ASSEMBLY: Clean, open circuit layout permits conventional wiring with less than 10 hours actual construction time. As in the HX-30, a heavy steel copper-clad cabinet provides strength, beauty and superior shielding, measures just 16⅝" W x 10⅛" H x 10" D. Frequency coverage is 49.8 to 54 megacycles. All power supplies are built in. A tremendous value at this low Heathkit price!

Kit HA-20, 43 lbs., no money down, $10 mo.....**$99.95**

FREE 1963 HEATHKIT CATALOG
New edition — more than 100 new kits since last issue— over 250 kits in all.

HEATHKIT by Daystrom

HEATH COMPANY
Benton Harbor 9, Michigan

Please Send FREE 1963 Heathkit Catalog

Name _____

Address _____

City _____ Zone _____ State _____

NOW...PROOF OF DX PERFORMANCE

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-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:

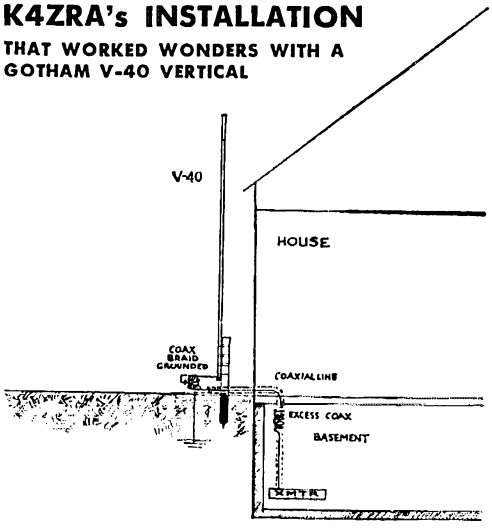
During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (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.

Daniel F. Onley, K4ZRA

K4ZRA's INSTALLATION

THAT WORKED WONDERS WITH A GOTHAM V-40 VERTICAL



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.

ANNOUNCEMENT!

GOTHAM **proudly announces our appointment as an** ***AUTHORIZED FRANCHISED DEALER*** **for** ***ALL LEADING MANUFACTURERS OF TRANSMITTERS AND RECEIVERS.***

We feature a unique plan that absolutely guarantees proper installation and operation.

ORDERS AND INQUIRIES SOLICITED

WHY

THE GOTHAM V-80 IS THE BEST ALL-BAND 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.
- Non-corrosive aluminum used exclusively.
- 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

DO YOU KNOW

1. YOU WILL HAVE NO DIFFICULTY INSTALLING YOUR GOTHAM VERTICAL ANTENNA IN JUST A FEW MOMENTS, REGARDLESS OF YOUR PARTICULAR PROBLEM, SO ORDER WITH CONFIDENCE EVEN IF YOU HAVE RESTRICTED SPACE OR A DIFFICULT SITUATION.

2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED; IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.

3. EVERY GOTHAM ANTENNA IS SOLD ON A TEN DAY TRIAL BASIS. IF YOU ARE NOT FULLY SATISFIED, YOU MAY RETURN THE ANTENNA PREPAID FOR FULL REFUND OF THE PURCHASE PRICE. THIS IS YOUR GUARANTEE OF FULL SATISFACTION.

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..... $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, TECNI CIANS, 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.....

The Class of '62

Gonset sets the pace in the amateur field—*the best for you in '62!*

No doubt about it. The finest communications equipment available—this year and every year for the past quarter of a century.

COMMUNICATOR IV

MODEL #3341—2 METER TRANSCEIVER
MODEL #3342—6 METER TRANSCEIVER
MODEL #3351—220 MC TRANSCEIVER

Completely new—with 20-24 watt input, high level speech clipping and 2 watts of audio. Transmitter is crystal controlled, with provision for six crystals.

GSB-201 SSB RF LINEAR AMPLIFIER

1500 W. P.E.P. SSB-1000 W CW—400W AM. Exceptionally compact, this all new linear amplifier lends itself readily to table-top mounting. It covers 80, 40, 20, 15 and 10 meter amateur bands.

P.E.P. input is approximately twice average d.c. input.

G-76 ALL BAND TRANSCEIVER FOR FIXED OR MOBILE SERVICE

An entirely new unit with transmitter and receiver in single compact housing. AM or CW operation on 80, 40, 20, 15, 10 and 6 meter amateur bands.

GR-212 DUAL CONVERSATION RECEIVER

Variable BFO. Sensitivity: At least 6 db (S+N)/N at 1μv. Slide-rule type dial. Panel-mounted "S" meter.

VFO for 6, 2 and 1¼ METER COMMUNICATORS

Designed for use with all Gonset Communicators, including Models I, II, III and IV. Dial scale calibrated for 50, 144 and 220 mc bands.

GC-105 "GOONEY BIRD" COMMUNICATOR

2 meter complete station, self contained transmitter, receiver, power supply. Completely compatible with Gonset new model 3357 VFO or 6 crystal positions available.

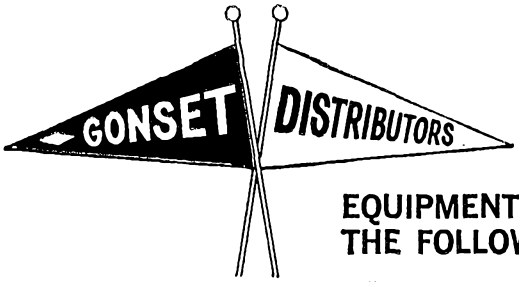
G-50 6 METER FIXED STATION COMMUNICATOR

Complete station "package" for 6 meter operation. Highly sensitive, selective superhet with "S" meter. Transmitter uses 6146 in pi network final at 40-50 watts input. Features built in VFO.

GONSET®
DIVISION OF YOUNG SPRING & WIRE CORPORATION
801 SOUTH MAIN STREET, BURBANK, CALIFORNIA

For the Gonset distributor in your community consult the list on the next page.

DISTRIBUTORS



FOR FULL INFORMATION AND DEMONSTRATION OF GONSET QUALITY COMMUNICATIONS EQUIPMENT WRITE OR VISIT ANY OF THE FOLLOWING DISTRIBUTORS.

EASTERN STATES

CONNECTICUT
HARTFORD
Dressler Electronics
325 Trumbull Street
Hatry of Hartford, Inc.
100 High Street
NEW LONDON
Aikens Electronics Sup., Inc.
531 Broad Street
NORWALK
Norwalk Electronic Sup., Inc.
328 West Avenue
WATERBURY
Bond Radio
439 West Main Street
WESTPORT
Music Systems of Westport
Post Road

DISTRICT OF COLUMBIA
WASHINGTON
Electronic Wholesalers, Inc.
2345 Sherman Avenue, N.W.

FLORIDA
MIAMI
Electronic Wholesalers, Inc.
9390 N W. 27th Avenue
TAMPA
Kinkade Radio Supply, Inc.
1719 Grand Central Avenue

MAINE
AUBURN
Radio Supply Co.
28 Cross Street
BANGOR
Radio Service Lab.
23 Palm Street
PORTLAND
Radio Service Lab
1004 Congress Street

MARYLAND
BALTIMORE
Amateur Radio Center
2203 N. Fulton Avenue
SALISBURY
Standard Electronics Co., Inc.
301 Snow Hill Road
TOWSON
Baynesville Electronics
1631 E. Joppa Road
WHEATON
Electronic Distributors, Inc.
11324 Fern Avenue

MASSACHUSETTS
BOSTON
DeMambro Radio Supply Co.
1095 Commonwealth Avenue
Radio Shack
730 Commonwealth Avenue
BUZZARDS BAY
Buzzards Bay Electronics
196 Main Street
FALL RIVER
Haddad Electronics
121 Pine Street
LAWRENCE
Alco Electronics
3 Wolcott Street
READING
Graham Radio
505 Main Street
SPRINGFIELD
Soundco Electronics
147 Dwight Street

NEW HAMPSHIRE
CONCORD
Evans Radio, Inc.
P. O. Box 312

NEW JERSEY
CAMDEN
Radio Electric Service Co.
513 Cooper Street
MANASQUAN
Charles W. Rogers & Son
Curtis & Union Avenue
MOUNTAINSIDE
Federated Purchases, Inc.
1021 U. S. Rte. 22
PARAMUS
Lafayette Radio
182 Route 17
PATERSON
National Electronics
226–17th Avenue
UNION CITY
Nidisco, Inc.
2812 Hudson Boulevard

NEW YORK
ALBANY
Fort Orange Radio Dist. Co.
904-916 Broadway
AMSTERDAM
Adirondack Radio
185 West Main Street
BUFFALO
Genesee Radio & Parts Co.
2550 Delaware Avenue
CORTLAND
Winchell Electronics
65-67 Clinton Avenue
ELMIRA
Chemung Electronics, Inc.
403 E. Third Street
FREDONIA
Barker Higbee, Inc.
27 Water Street
JAMAICA
Harrison Radio
144-24 Hillside Avenue
Lafayette Radio
165-08 Liberty Avenue
MINEOLA, L.I.
Arrow Electronics
525 Jericho Turnpike
NEW YORK
Arrow Electronics
65 Cortlandt Street
Harrison Radio
225 Greenwich Street
Terminal Hudson Radio
236 West 17th Street
ROCHESTER
Rochester Radio Supply Co.
600 East Main Street

NORTH CAROLINA
ASHEVILLE
Freck Radio & Supply Co., Inc.
38 Biltmore Avenue
RALEIGH
Southeastern Radio Sup. Co.
414 Hillsboro Street

OHIO
ASHTABULA
Morrison's Radio Supply
331 Center Street
CINCINNATI
The Mytronic Co.
2145 Florence Avenue
Steinberg's, Inc.
633 Walnut Street
CLEVELAND
Bernon-Ray Service, Inc.
2118 East 21st Street
Broadway Electric Supply Co.
6209 Broadway, S.E.
Pioneer Electronic Sup. Co.
5403 Prospect Avenue
Radio & Electronic Parts Corp.
3235 Prospect Avenue
COLUMBUS
Universal Service
114 North Third Street
DAYTON
Custom Electronics, Inc.
1918 South Brown Street
Srepco, Inc.
314 Leo Street
DOVER
Southeastern Electronics
Specialists Co.
203 N. Tuscarawas Avenue
FREMONT
Swartzlander Radio, Ltd.
1524 Oak Harbor Road
LORAIN
Pioneer Electronic Supply Co.
1648 Broadway
MARION
Bell Radio Supply
527 N. Main Street
STEUBENVILLE
D & R Radio Supply
215 South Third Street
P. O. Box 670
TOLEDO
Selectronic Supplies, Inc.
3185 Bellevue Road
Warren Radio Co.
1002 Adams Street

PENNSYLVANIA
ALLENTOWN
A. A. Peters, Inc.
231 N. 7th Street
ALTOONA
Altoona TV Supply, Inc.
1720 Union Avenue
ELKINS PARK
A. G. Radio Parts Co.
939 Township Line
PHILADELPHIA
Almo Radio Company
913 *Arch Street*
PITTSBURGH
Tydings Company
933 Liberty Avenue
POTTSVILLE
Moyer Electronics Supply Co.
330 East Norwegian Street
READING
George D. Barbey Co., Inc.
333 North 4th Street
WYNCOTE
Howard C. Buerger Co., Inc.
Rices Mill Rd. & Glenside Ave.

RHODE ISLAND
PROVIDENCE
W. H. Edwards Co.
116 Hartford Avenue

TENNESSEE
NASHVILLE
Electra Distributing Company
1914 West End Avenue

VIRGINIA
ARLINGTON
Key Electronics Division
Industry Services, Inc.
100 South Wayne Street
NORFOLK
Priest Electronics, Inc.
6431 Tidewater Drive

WEST VIRGINIA
CHARLESTON
Chemcity Electronic Dist.
1637 Fourth Avenue
HUNTINGTON
Electronic Supply, Inc.
222 Seventh Avenue

CENTRAL STATES

ARKANSAS
TEXARKANA
Lavender Radio & TV Sup. Co.
522 E. 4th Street

COLORADO
DENVER
Radio Products Sales Co.
1237–16th Street

ILLINOIS
ALTON
Ebinger Radio, Inc.
1022 E. Broadway
CHICAGO
Allied Radio Corp.
100 N. Western Avenue
Amateur Electronic Supply
6450 N. Milwaukee Avenue
Green Mill Radio Supply Co.
145 West 111th Street
Newark Electronics Corp.
223 W. Madison Street
MOLINE
Lofgren Distributing Co.
1212 Fourth Avenue
PEORIA
Klaus Radio & Electric Co.
403 E. Lake Street
Selectronics Supplies, Inc.
801 S. Adams Street
ROCKFORD
H & H Electronic Supply, Inc.
506-510 Kishwaukee Street

INDIANA
CHESTERTON
Northwest Distributing Co.
P. O. Box 7
EVANSVILLE
Castrup's Radio Supplies
1014 W. Franklin Street
INDIANAPOLIS
Graham Electronic Supply, Inc.
122 S. Senate Avenue
Van Sickle Radio Supply Co.
4131 N. Keystone Avenue
MARION
Myers Radio Supply
115-117 West 22nd Street
SOUTH BEND
Colfax Company, Inc.
747 So. Michigan Street

IOWA
COUNCIL BLUFFS
World Radio Lab.
3415 West Broadway
DES MOINES
Radio Trade Supply and/or
Amateur Radio Center
1224 Grand Avenue
SIOUX CITY
Two-Way Radios, Inc.
R. R. #2

KANSAS
WICHITA
Amateur Radio Equipment Co.
1203 East Douglas
SALINA
Electronics, Inc.
227 No. Santa Fe

KENTUCKY
LEXINGTON
Tel-Rad Electronics, Inc.
1401 Delaware Avenue
LOUISVILLE
Mobile Communications, Inc.
Bowman Field

LOUISIANA
NEW ORLEANS
Bell Radio Supply Co.
2625 Tulane
Crescent Electronic Supply
537 South Claiborne
SHREVEPORT
Ports Electronic Parts Co.
2423 Southern Avenue

MICHIGAN
ANN ARBOR
Purchase Radio
327 E. Hoover Street
DETROIT
M. N. Duffy & Co.
2040 Grand River W.
Radio Supply & Engr. Co,
90 *Selden*
Reno Radio Company
1314 Broadway
FLINT
Shand Radio Specialties Co.
2608 Leith
KALAMAZOO
Warren Radio Company
1710 S. Westnedge
MARQUETTE
Northwest Radio of Michigan
1010 W. Washington
MUSKEGON
Electronic Distributors, Inc.
1845 Peck Street

MINNESOTA
DULUTH
Northwest Radio of Duluth
123 East 1st Street
MINNEAPOLIS
Lew Bonn Company
1211 La Salle Avenue
Electronic Center
107–3rd Avenue

MISSOURI
BUTLER
Henry Radio
211 N. Main Street
JOPLIN
Norman Electronics
402 Wall Street
KANSAS CITY
Burstein-Applebee Co.
1012-14 McGee Street
ST. LOUIS
Walter Ashe Radio Co.
1125 Pine Street

NEW MEXICO
ALBUQUERQUE
Radio Equipment Co.
523 Central Avenue

NORTH DAKOTA
MINOT
John Iverson Company
216 Second Street, S.W.

OKLAHOMA
LAWTON
Reynolds Radio Supply Co.
908 "B" Avenue
OKLAHOMA CITY
General Electronic
1032 Classen
TULSA
Radio, Inc.
1000 S. Main

SOUTH DAKOTA
WATERTOWN
Burghardt Radio & Supply Co.

TEXAS
AMARILLO
R & R Electronic Supply Co.
707 Adams Street
CORPUS CHRISTI
Electronic Equip. & Engr. Co.
Box 3687
DALLAS
Amateur Electronics
2802 Ross Avenue
HOUSTON
Busacker Electronic Equip. Co.
1216 West Clay
Gilbert Company
2301 N. Main Street
Madison Electronics
1508 McKinney Street
SAN ANTONIO
Radio & Television Parts Co.
1828 W. St. Mary's Street

UTAH
SALT LAKE CITY
Manwill Supply Co.
2511 South State Street

WISCONSIN
LA CROSSE
Communications Equip. Co.
518 State Street
KENOSHA
Chester Electronic Supply Co.
2012–52nd Street
MILWAUKEE
Allied Radio of Wisconsin
5314 N. Port Washington Rd.
Amateur Electronic Supply
3832 W. Lisbon Avenue

WESTERN STATES

ALASKA
ANCHORAGE
Yukon Radio Supply, Inc.
P. O. Box 406

ARIZONA
PHOENIX
Radio Parts of Arizona
214 So. 11th Avenue
Southwest Electronic Devices
129 E. Jefferson,
P. O. Box 3751

CALIFORNIA
BURBANK
Hagerty Radio Supply
2926 W. Magnolia Blvd.
Valley Electronic Supply
1302 W. Magnolia Blvd.
BURLINGAME
Amrad Electronics
999 Howard Avenue
EL MONTE
Kimball & Stark
709 South Tyler Avenue
INGLEWOOD
Acorn Radio & Electronics
4736 West Century Blvd.
LONG BEACH
Scott Radio Supply Co.
266 Alamitos Street
LOS ANGELES
Henry Radio
11240 W. Olympic Blvd.
Radio Product Sales Co.
1501 So. Hill Street
MANTECA
Fulton Electronics
NORTH HOLLYWOOD
Arrow Sales, Inc.
7035 Laurel Canyon Blvd.
OAKLAND
Elmar Electronics
140–11th Street
ORANGE
Robinson Electronics
922 West Chapman
PALO ALTO
Zack Electronics
654 High Street
PASADENA
Dow Radio, Inc.
1759 East Colorado
POMONA
Com-Center
2134 N. Garey Avenue
RIVERSIDE
Mission Ham Supplies
5472 Mission Blvd.
SACRAMENTO
Calamar Electronics Co.
2163-A Fulton Avenue
Selectronics
4113 Franklin Blvd.
SAN CARLOS
Fortune Electronics Corp.
930 El Camino Real
SAN DIEGO
Western Radio & T.V. Supply
1415 India Street
SAN FRANCISCO
Amrad Supply, Inc.
3425 Balboa Street
San Francisco Radio Supply
1280 Market Street
Zack Electronics
1424 Market Street
SAN JOSE
Quement Indust. Electronics
161 North San Fernando

OREGON
ALBANY
Oregon Ham Sales
409 West 1st Avenue

WASHINGTON
EVERETT
Pringle Radio Wholesale
2101 Colby Avenue
OLYMPIA
Colson Communications
4553 Stewart Street
SEATTLE
Radio Supply Co.
6213–13th Avenue, So.

CANADA

ALBERTA
EDMONTON
Radio Supply Co., Ltd.
10184–104th Street
Sacker Electronics Co., Ltd.
10235–103rd Street

BRITISH COLUMBIA
VANCOUVER
Taylor Pearson & Carson Ltd.
1006 Richards Street

MANITOBA
WINNIPEG
Lee-Bern & Company Ltd.
341-347 William Avenue

NEW BRUNSWICK
MONCTON
Lewis-Price TV Co., Ltd.
15 Mount Royal Blvd.

NEWFOUNDLAND
ST. JOHNS
Electronic Centre, Ltd.
90 Campbell Avenue

NOVA SCOTIA
HALIFAX
Consolidated Supply Co., Ltd.
86 Hollis Street

ONTARIO
DOWNSVIEW
Alpha-Aracon Radio Co., Ltd.
555 Wilson Avenue
FORT WILLIAM
Lee-Bern & Company Ltd.
105 Simpson Street
HAMILTON
Crawford Radio
119 John Street N.
LONDON
C. M. Peterson Company, Ltd.
575 Dundas Street
NIAGARA FALLS
Niagara TV Supply Co.
1525 Main Street
NORTH BAY
Johnson Electric Supply Co.
135 McIntyre Street, East
TORONTO
Electro-Sonic Supply Co., Ltd.
543 Yonge Street

QUEBEC
MONTREAL
Electronic Tube Co., Ltd.
464 McGill Street
Payette Radio Co., Ltd.
730 St. James Street, W.

SASKATCHEWAN
SASKATOON
Radio Supply Co., Ltd.
561 Second Street

DX Contest Results

(Continued from page 51)

ZE8JY....43,461-33-439-A-44

South Africa

ZS6DZ....39,520-38-351-A-26
ZS1O.....12,036-34-121-A- -
ZS6AJO....5376-14-128-A- 5
ZS2E.....1540-20-76-A- 9

Southwest Africa

ZS3EW....12,642-21-204-A-12

Tanganyika

5H3HZ....7128-18-132-A- 7

Nigeria

5N2JKO...103,485-45-1211-A-45

Ghana

9G1DT....12,978-21-210-A-10

Republic of the Congo

9Q5AAA...39,990-30-445-A- 9

ASIA

East Pakistan

AP5CP....1104-8-46-A-35

Formosa

BV2A (3 oprs.)270-5-18-B-56

Iran

EP2BK....55,356-42-447-A-39

Korea

HM4AQ....10,680-20-178-A- -
HM1AP....2556-12-71-A-14

Saudi Arabia

HZ1AB (W1TYQ, W8GCN)
25,191-27-311-B-20

Japan

JA1VX....196,456-52-1263-C-55
JA1CO....144,153-57-843-B- -
JA1BWA...137,394-51-828-A-64
JA7AD....61,152-32-637-A- -
JA5FQ....11,230-38-363-B- -
JA1MJ....32,935-35-314-B- -
JA1CG....31,266-27-383-A-63
JA3CKI...20,790-30-231-A-54
JA1ISB....7506-18-139-A-20
JA7KY....1719-11-143-A-11
JA1HP....3690-15-82-A-13
JA1EM....3600-18-67-A- -
JA1HG....2310-14-56-A- -
JA2DN....1944-12-54-B-9
JA6AKW...980-10-33-A- -
JA9QA....930-5-62-A-21
JA7OJ....690-10-23-A- -
JA8AAC...656-8-28-A-7
JA7AKQ...624-4-52-A-2
JA8GR....434-7-21-A- -
JA1FWQ...128-4-36-A-13
JA1FTL...365-5-25-A- -
JA1DRC...270-5-18-A-5
JA2AIR...225-5-15-A-2
JA9HC....210-5-14-A- -
JA1AXO/3..162-6-9-A-4
JA1EFE....120-5-8-A-3
JA7JW....108-3-12-A-1
JA1CUM...52-2-9-A- -
JA3CED...48-3-6-A- -
JA6BCV...30-2-5-A- -
JA4ARR...18-2-3-A-2

Ryukyus

KR6AR...201,131-59-1140-
ABC-65
KR6LJ....50,061-41-407-C-30
KR6LY....19,110-29-220-A-15
KR6LD....1728-9-64-B-2
KR8AU....108-2-18-A-6

Asiatic Russians S. F. S. R.

UA0JU....12,104-17-238-A-23
UA0KDA...10,620-12-295-B- -
UA0AG....9216-16-192-B-13
UA0KSB....4392-12-124-B- -
UA0KFG....3708-12-104-B- -
UA0LH....3456-16-72-A- -
UA9BZ....3276-14-78-A-26
UA9XG....2340-12-65-A- -
UA9OB....1485-15-33-A- -
UA9FM....1320-11-40-B- -
UA9KEE....220-5-15-B- -
UA0KFG (UA0s EH FE)
39,990-31-410-B- -
UA0KDA (3 oprs.)
22,085-18-410-B- -
UA9JH (2 oprs.)
1495-13-56-A- -

Turkoman

UH8BI....4690-14-112-A- -
UH8BO....1440-9-61-B- -

Kirghiz

UM8KAB...1773-9-66-A- -
UM8FZ....95-5-7-A- -

India

VU2AJ....5472-16-114-A- -
VU2MD....315-7-15-A- -

Israel

4X4DH....11,750-25-157-A- -

Kuwait

9K2AM[12]...17,094-22-259-C- -

EUROPE

Portugal

CT1SQ....16,254-27-201-B-10

Azores

CT2AI....121,000-40-1018-A- -

Germany

DJ2XP....92,352-52-592-B- -
DL1KS....52,290-42-415-A- -
DM2ATL...26,703-27-335-A-33
DJ6RX....22,074-26-281-AB- -
DL4FT....18,135-31-195-A-21
DJ4VO....17,160-44-132-A- -
DL7BK....4026-22-61-A- -
DM3VVL...2112-16-44-B- -
DM3ML....1870-11-57-A- -
DM2BCN...1530-15-34-A- -
DJ2RE....105-5-27-B- -
DL7EN....360-5-24-B-3
DL4QP (DL4s QC QD QV)
120,960-18-810-B-96

Spain

EA4CE....60,228-42-478-A-39
EA5FI....40,596-33-422-A-18
EA4FZ....34,928-37-319-A-35
EA3NQ....19,835-23-301-A-24
EA3LB....4960-16-107-A-30
EA3GF....2490-10-83-B-4
EA5EF....344-8-15-A-10

Ireland

EI6D....102,735-15-764-A-47
EI9J....98,580-53-620-A-22
EI9F....6-1-2-A- -

France

F9MS....170,901-51-1117-A-48
F8VJ....162,074-53-1020-A-45
F8ZF....98,300-50-677-A-39
F2PO....18,630-27-230-A-35
F8TM....17,370-30-193-A- -
F2SQ....8460-26-141-A- -
F3II....1512-14-36-A- -
F2NZ....234-6-13-A- -

England

G4CP....264,300-60-1506-A-54
G6BQ....177,998-61-975-A-53
G2DC....158,088-56-941-A- -
G2QT....151,800-50-1012-A-51
G3EYN...96,192-48-668-A- -
G3APN...15,975-25-213-A- -
G3NIV....3876-12-111-A- -
G3MWZ....1428-12-40-A-9

Northern Ireland

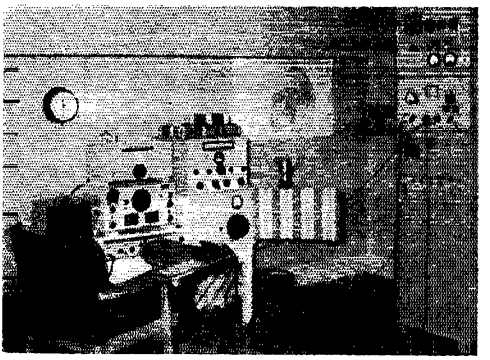
GI3OQR...206,640-56-1230-A-62
GI5UR....17,136-28-205-A-25

Wales

GW3JI....198,432-53-1248-A-86
GW3IJE....3146-13-81-A-7

Hungary

HA6NI....1485-23-195-A- -



100 watts to a 6146 made big noise for Wales' c.w. certificate winner GW3JI with scads of contacts logged on 80, 40, 20, and 15 meters. A terrific effort for 198,432 points!

HA5KFZ....1092-7-52-A- -
HA4KYB....570-5-38-A- -
HA5KFR (3 oprs.)
16,020-15-356-B- -
HA8KCI (3 oprs.)
618-8-27-A- -

Switzerland

HB9JC....51,947-11-424-B-28
HB9DX....36,312-31-356-A- -
HB9NL....12,075-23-175-A- -
HB9UD....6696-36-62-A-24
HB9KC....6630-17-130-B-8

Italy

IT1AGA...11,418-27-144-A-30
I1ER....1599-21-73-AB-20
I1TEB....2310-13-60-A- -
I1WSG....2016-16-42-A- -

Norway

LA5HE....88,805-38-779-A-22
LA6U....16,443-27-204-A-9
LA5SF....8568-21-136-A- -
LA6CF....6480-20-108-A- -
LA4LG....5676-22-86-A-12
LA3HA....5400-20-92-A-14
LA9AF....5076-27-63-A-8
LA8OH....3234-14-77-A-8
LA2Q....672-7-32-A- -
LA1K (2 oprs.)
900-9-50-A- -

Bulgaria

LZ1KDP[8]...3990-15-90-A- -

Austria

OE1RZ...186,816-56-1113-B-58
OE3WB....1872-16-39-A-18

Finland

OH2LA....67,068-36-621-B- -
OH2BAH...17,031-21-272-B- -
OH1VA....6266-26-81-A- -
OH5RZ....4260-12-119-A- -
OH2WI....3477-19-61-A- -
OH3PF....3192-14-76-A- -
OH3PC....2712-12-76-A- -
OH2BC....1800-12-50-A- -
OH1QT....1729-19-31-A- -
OH2YL....235-5-16-A- -
OH1WY....3-1-1-A- -
OH2BZ (OH2s BT BZ)
37,983-39-325-AB- -

Czechoslovakia

OK1ZL....193,401-57-1131-B-54
OK1GT...126,984-52-818-B-60
OK2KAU...36,234-33-366-A- -
OK2YF....27,300-35-260-A- -
OK3KFE[9]..26,244-27-324-A- -
OK2LG....11,928-28-142-A- -
OK1ADM...11,430-30-127-A- -
OK2KGZ...10,192-26-132-A-26
OK1BY....6162-13-158-B- -
OK1SV....2530-11-77-B- -
OK1ADP...1898-13-49-A- -
OK2ABU...1768-17-35-A- -
OK3KGI....1026-9-38-A- -
OK2KJU....756-12-21-A- -
OK3SK....504-6-28-B- -
OK2KGV....405-5-27-A- -
OK1NW....234-6-13-A- -
OK1ZW....96-4-8-A-2
OK1AJT....18-4-4-A- -
OK1NK....12-2-2-A- -
OK3KMS (2 oprs.)
60,996-46-448-A-40
OK2KRO (2 oprs.)
3685-11-112-A- -

Belgium

ON1GL...186,420-52-1202-A-43
ON1XG....21,789-27-269-A-28
ON4CF....4596-12-139-A-14
ON4UO (ON4s TJ UO)
21,141-29-243-A-23

Denmark

OZ7G....69,760-10-581-A-65
OZ2NU....25,813-29-209-A- -
OZ1H....22,770-33-230-A-30
OZ2LX....11,760-35-112-B- -
OZ3SN....6810-15-152-B- -

Netherlands

PA0ADP...116,466-47-826-A-18
PA0LOU...112,050-50-756-A-41
PA0LV....52,644-41-128-A- -
PA0VB....27,360-32-285-A-20
PA0WAC...15,825-25-211-A-9
PA0YN....6240-16-130-A- -
PA0FLX....4356-11-132-A- -
PA0NIR....1030-10-35-A- -

Sweden

SM5CCE...12,496-32-443-B-23
SL5ZL....36,963-37-338-B- -
SM5UU....24,072-34-236-B-24
SM6APQ...12,572-28-150-A-12
SM3CUN...11,220-17-220-B-17
SM3CPM...7820-17-154-A-26
SM3BYJ....6126-18-119-B-13
SM6CWP....5187-19-93-A- -
SM5BEU....4725-15-105-B-12
SM5HT....3918-14-96-A-8
SM5BPJ....3036-11-92-B- -
SM3BNV....2852-9-106-A-7
SM3BBA/5...2576-16-54-A-7
SM7TV....1833-13-47-A-9
SM5KV....1771-11-51-A- -
SM5CAK....1056-11-32-A-3
SM3ATG....360-6-20-A-2
SM6CMU....144-4-12-A-6
SL6BH (SM5CTY, SM6BUB,
SM7CUY).2761-11-84-B-8

Poland

SP6FZ....79,840-18-611-B-42
SP9ADU....14,121-23-214-A-11
SF8MJ....12,246-26-157-A-25
SP4JF....10,325-25-138-AB-11
SP3KBJ....5733-13-148-B- -
SF8YA....5475-25-74-A-6
SP8HR....3888-24-54-A- -
SF8HT....3570-14-87-B-7
SP5ADZ....3514-14-84-A-8

(Continued on page 108)

READY...
to startle the amateur world!

the fabulous HAMMARLUND HX-50

OUTSTANDING FEATURES

VOX & Push-To-Talk Circuitry.

Output Power—Two-tone SSB and CW—50 watts at 10 meters to 65 watts at 80 meters for conservatively rated input of 90 watts DC, 120 watts P.E.P. AM is 25% of SSB/CW values.

3 element Pi network variable output circuit (40 to 80 ohms).

5 position switch for internal or external VFO plus three crystal control frequencies suitable for Novice, MARS, C.A.P., etc.

Built-in antenna changeover, VOX and break-in keying.

Amateur Bands Covered—80, 40, 20, 15 and 10 meters. 160 meter band position provided for use with optional kit.

Complete passband coupler design used throughout low-level stages provides minimum 1 MC bandwidth at the following frequency ranges: 3.2 to 4.2 MC; 6.9 to 7.9 MC; 13.8 to 14.8 MC; 20.8 to 21.8 MC; 27.0 to 31.0 MC.

*FOR EVERYTHING YOU WANT IN A TRANSMITTER... AND **MORE.***

Here is a new, compact, filter-type transmitter you will just have to try to believe! Loaded with design extras to give you more-for-the-money features, the FABULOUS HX-50 upgrades every known standard for operating ease and efficiency.

If you have ever entertained the thought of buying a new transmitter—if you want to move up to the very pinnacle of performance—for only modest cost . . . RUSH to the Authorized Hammarlund distributor nearest you to TRY and BUY the most exciting transmitter in Amateur Radio History.

Just as there is no substitute for quality—there is none for the intrinsic reliability and trust of a famous name—and **Hammarlund** has been a World Leader in communications equipment since 1910.

Leading Hammarlund Distributors have the Fabulous HX-50 in stock . . . READY RIGHT NOW! Convince yourself that this is the very best transmitter you can buy . . . at anywhere near the price!

$399.50
amateur net

Established 1910

HAMMARLUND
MANUFACTURING COMPANY
A Giannini Scientific Company
53 West 23rd Street, New York 10, N.Y.

SP6WM.....828- 12- 23- A- -

Crete

SV0WZ.....10,224- 16-215- A-12

Greece

SV0WI.....5798- 13-150- C- 6
SV0WG.....4564- 14-109- A-12

Iceland

TF3AB.....42,174- 33-426- A- -
TF2WFV.....384- 8- 16- A- -

European Russian S. F. S. R.

UA1DH.....39,585- 35-381- B- -
UA4PA.....13,800- 25-184- B-29
UA4SM.....5888- 16-123- A- -
UA3FG.....4788- 14-114- B- -
UA3TP.....3040- 19- 54- B- -
UA4DM.....1469- 13- 38- A- -
UA1NA.....882- 6- 50- A- 3
UA3KWA (3 oprs.)
15,174- 18-281- B-25
UA4KHW (2 oprs.)
9090- 15-203- B-20
UA1KGC (3 oprs.)
4035- 15- 90- B- -

Ukraine

UB5MZ.....7728- 23-112- A- -
UB5KNF.....2592- 16- 54- A- -
UB5DP.....2496- 13- 64- A- -
UB5KAU.....270- 5- 15- B- -
UB5KED (3 oprs.)
17,199- 27-213- B- -
UB5KAI (2 oprs.)
336- 7- 16- B- -

White Russian S. S. R.

UC2KAA.....3960- 12-111- A-10
UC2AR.....1944- 9- 72- A- 3
UC2KAB (3 oprs.)
15,210- 30-169- B- -

Georgia

UF6KAE.....1195- 5- 82- B- -

Armenia

UG6GL.....3913- 13-103- B- -
UG6AW.....792- 12- 22- B- 2
UG6KAA (UG6s AV WW)
620- 10- 21- B- -

Moldavia

UO5AA.....7632- 24-106- A- -
UO5BM.....2868- 12- 80- A- -

Lithuania

UP2NV.....18,870- 17-374- A- -

Estonia

UR2BV.....5694- 13-153- A- -

Rumania

YO3KPA.....25,200- 25-336- B- -
YO7DL.....2808- 12- 78- A- -
YO9IA.....1599- 13- 41- A- -
YO8RL.....927- 9- 35- A- -
YO3AC.....360- 6- 20- A- -
YO9HH.....120- 4- 10- A- -

Yugoslavia

YU2QZ.....16,124- 29-191- A-28
YU2ADE.....2604- 8-105- A- -
YU1KMN.....1242- 9- 46- A- 5

NORTH AMERICA

St. Pierre & Michelon Is.

FP8BX.....219,240-56-1305- A- -

Panama

HP1HE.....210,276-54-1298- A-11

Honduras

HR1MM.....18,858- 31-479- B-22

Puerto Rico

KP4CC.....328,866-59-1858- B-50
KP4CH.....17,541- 23-700- A-33

Greenland

OX3DL.....187,209-61-1023- B-18
KG1BM.....14,280- 17-281- B- 7
OX3KW.....14,064- 16-293- A- -

Sint Maarten

PJ2ME.....57,669- 17-129- A-10

Costa Rica

TI2CAH.....223,788-68-1097- A- -

Antigua

VP2AB [10].....100,548- 49-684- A-15

Bermuda

VP9EP.....68,985- 27-861- A-20

Nicaragua

YN1AA.....307,368-72-1423- A-23

OCEANIA

New Caledonia

FK8AH.....225- 3- 25- A- 1

Wake Island

KW6DG.....203,776-64-1127- C-27

Marshalls

KX6AJ.....30,870- 36-343- A-17

Australia

VK2GW.....205,632-64-1071- A-65
VK2APK.....66,582- 54-411- A-50
VK3AXK.....35,488- 32-370- A-30
VK3AXB.....29,799- 33-301- A-56
VK3ARX.....17,226- 29-198- A- -
VK2VN.....14,322- 22-217- A-10
VK2RA.....3705- 19- 65- A- 7
VK4XW.....3417- 17- 68- A-14
VK4SS.....1980- 15- 44- A- -

Fiji Islands

VR2DK.....34,596- 31-376- A- -
VR2EA.....19,575- 25-261- A- -

Sarawak

VS4RM.....918- 6- 52- A- 4

Cook Islands

ZK1AR.....138,915- 63-735- A-44
ZK1BS.....94,224- 52-601- A-28

New Zealand

ZL1NG.....38,760- 10-323- A- -
ZL2PM.....19,197- 27-237- A- -
ZL1AFW.....15,066- 27-183- A-18

SOUTH AMERICA

Chile

CE3AG.....182,715- 65-937-AC-25
CE1AD.....155,925- 55-945- B- -
CE3RY.....147,735- 49-1025- C-37
CE1BD.....95,864- 46-695- B-32
CE3CB.....501- 7- 21 A- -
CE2OF.....180- 8- 20- - -

Bolivia

CP3CD.....10,725- 13-275- A- -

Uruguay

CX6CB.....32,620- 28-389- A-19

Ecuador

HC1AGI [10].....826,677-93-2963- B-63

Columbia

HK7ZT.....244,725-65-1255- A-60
HK3AH.....21,748- 23-359- A- 7

Argentina

LU6PK.....54,460- 28-652- A-30
LU7CW.....431- 7- 22- A- 2

Peru

OA4BR.....33,966- 37 306- C-12

Brazil

PY1OD.....332,856-67-1657- A-62
PY1ADA.....92,630- 59-520- B-10
PY4AP.....62,522- 43-485- A-16
PY4ABH.....32,000- 37-291- A-13
PY7AKQ.....5832- 12-162- A- -
PY1BNA.....2937- 11- 89- A- -
PY1FM.....1026 8- 19- A- 3
PY2BZD.....60- 4- 5- A-10
PY7AFA.....18- 2- 3- A- -

[1] W3MFW, opr. [2] WA2JJH, opr [3] K3JCT, opr. [4] W0YCR, opr. [5] W1ECH, opr. [6] Hq. staff — not eligible for award. [7] VE3BFA, opr. [8] LZ1E18, opr. [9] OK3WX, opr. [10] K1AA, opr. [11] HC1DC/W3EIS, opr. [12] W3RYX, opr.

Phone Call-Area Leaders

Single-Operator

W1ONK	351,600	W9DUB	179,394
K2GXI	349,980	W0BTD	61,404
W3TLN	112,395	VE1BC	83,763
W4KFC	249,039	VE2UI	51,450
K5MDX	255,816	VE3ES	23,064
W6KPC	22,311	VE4XO	10,800
W7DQM	11,092	VE5RU	8370
W0CUC/KL7	96	VE6HG	8520
K8PUU	120,744	VE7EH	14,994

Venezuela

YV5AGD..435,150-75-1934-BC-59
YV5ANT..269,445-55-1633- B-52
YV5BKA..15,618- 19-274- A-16
YV5BFZ.....6783- 19-120- A- -

Paraguay

ZP9AY.....266,104-62-1434- A-70

PHONE SCORES

ATLANTIC DIVISION

Eastern Pennsylvania

W3WJD...105,714-126-280-BC-42
W3ALB...96,480-120-268- C-70
W3KT.....89,100-108-275- C- -
W3EQA...70,741-109-219- C-45
W3GHD...37,548- 74-169- B- -
W3FDH...30,996- 84-126-BC- -
W3ZSS...30,222- 73-138- C-30
W3PHL...22,035- 55-139- C-18
K3ARC...22,110- 67-110- C-22
W3NM.....13,489- 47- 97- C- -
W3OCH...13,489- 47- 97- C- -
W3NAM...12,150- 45- 90- C-19
W3BYX...10,125- 45- 75- B-25
W3QIR.....9944- 48- 76- B-19
W3GRS.....6120- 34- 60- A-15
W3IMV.....6120- 30- 68- B-15
W3WUH...5664- 32- 59- B-15
W3QLW...5100- 34- 50- B-15
W3HHK...2184- 23- 36- A-12
W3QMZ...2280- 20- 38- C-19
W3JSA.....624- 13- 16- A- 7
K3HYT.....588- 14- 14- B- 9
W3LEZ.....360- 10- 12- A- 5
W3EVW.....270- 9- 10- C- 2
K3JCT.....12- 2- 2- A- 1
W3KFQ (K3JCJ, W3KFQ)
132,678-126-351- C-36
W3GHM (W3s GHM KDF NOH)
73,161- 91-268- C- -

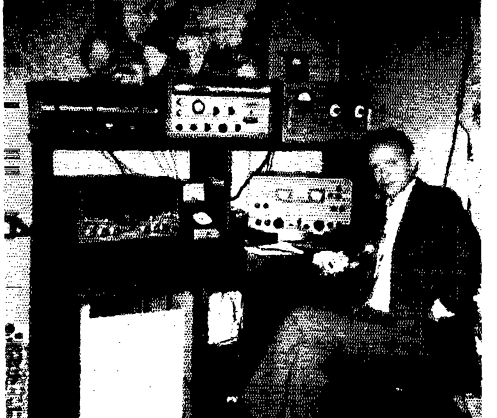
(Continued on page 110)

Md.-Del.-D. C.

W3TLN...112,305-127-295 B-17
W3JTC....77,265- 85-303- C-59
W3IYE....59,994-101-198- C-36
W3AYD....52,962- 91-194- C- -
W3EIV....23,256- 68-114- C-21
W3ZQ.....3936- 32- 41- A-10
W3FMC....3510- 30- 39- C- 8
K3CBW....1650- 22- 25 A-10
W3TMZ....1410- 20- 24-AC- 3
W3DRD.....765 15- 17 C- 7
K3JOZ.....540- 12- 15- B- 4
W3BVO.....48- 4- 4- B- 3
W3MSK (5 oprs.)
384,153-231-557- C-70
W3GRF (5 oprs.)
163,680-155-352- C- -

Southern New Jersey

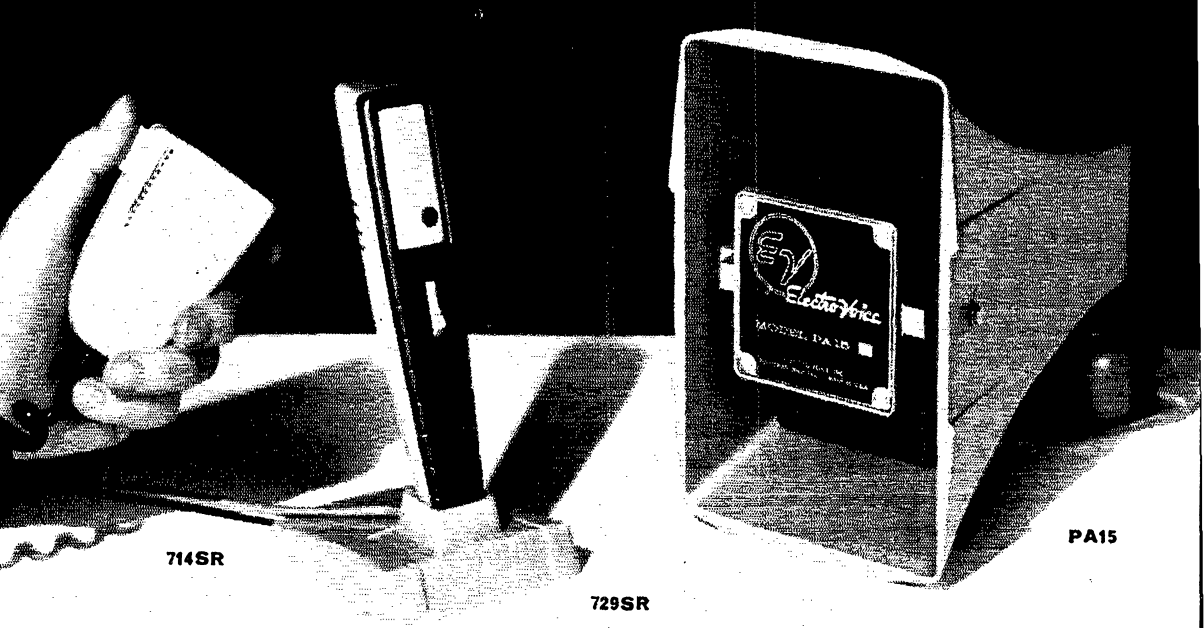
W2FXN...157,035-145-361- C-11
K2DCA....99,946-121-276- C-37
W2ZX.....60,738-106-191- C-17
W2QKJ....25,821- 57-151- B-27
WA2IZS...16,254- 63- 86- B-15
W2DMR...12,300- 50- 82- C-25
WA2EIY....1524- 29- 52- A-12
W2SDO.....3348- 31- 36- C-18
K2HBY.....396- 11- 12- A- 4
K2ODZ.....120- 4- 10- B- 5
W2BEI.....18- 4- 4- - -
K2OXN.....27- 3- 3- C- 3
WA2KWS (2 oprs.)
2625- 25- 35- B-18



OE1RZ has turned in the top phone score from Europe two consecutive years, this year scoring 126,559 points. Rene, an s.s.b. advocate, used a TA-33 and long wire antennas to do a fine job during the contest.

Amateur / CB / Industrial 2-Way Radio Operators . . .

DON'T WASTE A WATT!



714SR

729SR

PA15

Add an E-V microphone and speaker to significantly improve your communications.

When You Talk...

these E-V microphones guarantee smooth, carefully tailored response that eliminates power-robbing peaks—allows maximum useful modulation to better cut through noise and interference. For highest effective output from your transmitter, select one of these Electro-Voice microphones.

MODEL 714SR Ceramic Mobile Microphone

All-new hand-held design. Unbreakable Cycolac® case withstands roughest handling—feels comfortable at any temperature. Ceramic element is unaffected by extremes of heat, humidity. Panel mounting bracket included. Hi-Z output -55 db. Shielded coiled cord. DPDT switch. Net price $9.90.

MODEL 729SR Ceramic Cardioid Microphone

Improves base station performance at remarkably low cost. Cardioid pickup pattern cuts out room noise, improves VOX action, permits greater working distance from microphone. Ceramic element rugged enough for mobile use. Handsome case fits easily in hand, or slips quickly into desk stand or floor stand adapter provided. DPST switch. Hi-Z output -60 db. Net price $15.90. Without switch (Model 729) $14.70.

When You Listen...

an E-V communications loudspeaker adds useful volume and articulation to your fixed or mobile receiver. Carefully controlled band-pass of compression driver and horn improves efficiency, cuts distortion and overloading, eliminates unwanted noise.

MODEL PA15 Communications Loudspeaker

Rugged, die-cast construction ideal for outdoor or indoor use. Outperforms typical cone speakers. Install with no circuit changes. Impedance 8 ohms. Universal swivel mount. Net price $18.00.

Electro-Voice

ELECTRO-VOICE, INC., Commercial Products Div.
Dept. 1022-Q, Buchanan, Michigan

Send me the new E-V communications products brochure and address of my nearest E-V communications specialist.

NAME_____

ADDRESS_____

CITY_____ STATE_____

Western New York

K2GXI....349,980-227-514- C-88
W2QWS....38,473- 79-163- C-26
W2SNI.....7560- 36 70-BC 28
W2EDE.....2376- 24- 33- B- -
W2UTH.....1587- 23 23- B- 5
K2TQC.....147- 7- 7- B- -
WA2KIZ.....48- 4- 4- A- 3

Western Pennsylvania

W3ZAO....37,884- 82-154- C- -
W3LPF.....9960- 40 83- C-18
W3LIV.....3444- 28- 41- A-12
K3ELL.....396- 11- 12- B-11

CENTRAL DIVISION

Illinois

W9NZM...121,989-157-259- C-67
W9JYJ.....95,904-144-222- C-82
W9JJV.....23,433- 73-107- C-58
W9IVG.....20,022- 71- 94- C-25
W9GAI.....16,000- 64- 81-AC-48
K9YWY....11,115 57- 65- A- -
K9BJM.....1794- 23- 26- C- 4
W9EU.....720- 12- 20-AC- 3
W9CRN.....504- 12- 14- A- -
W9WIO.....468- 12- 13- B- 4
K9ZQW.....390- 12- 13- A- 9

Indiana

K9ECE....65,601-111-197- A-70
W9YSQ....60,480-112-180- C-38
K9VRU (9 oprs.)
25,488 72-118- C-96

Wisconsin

W9DUB...179,394-174-347- C-80
W9GIL....77,859-123-211-BC-60
W9VSO....10,998- 47- 78- C- 9
W9KXK...10,656- 48- 74- C-24
W9EQP.....9555- 49- 65- C-22
W9YT (4 oprs.)
91,653-137-223- C-59
K9JJR (K9s JJR JJS, W9RHT)
44,688- 98-152- C-60

DAKOTA DIVISION

North Dakota

WØJWL.....7128- 44- 54- B-32

South Dakota

WØWUU.....420- 10- 14- B- -

Minnesota

WØMPW...56,175-107-175- C-54
KØIKL.....34,320- 80-143- C-50
KØVTG.....986- 17- 20- B- 7
WØIJN.....972- 18- 18- A-15

DELTA DIVISION

Arkansas

W5LCI.....8580- 44- 65- C-11
K5ALU.....4092- 31- 44- B-21
W5GFT.....1254- 19- 22- A-16

Louisiana

W5KC.....34,056- 88-129 C-35
W5AJY....10,788- 58- 62-AC-22
K5QXR.....8127- 43- 63- A-28
W5LDH.....6273- 41- 51- C-10

Mississippi

K5MDX..255,816-209-408- B-73
W5CKY.....300- 10 10 C- 2
W5HKU.....80- 5- 6- A- 6

Tennessee

K4LPW....23,256- 68-114- B-25
W4OGG.....363- 11- 11- A- 3

GREAT LAKES DIVISION

Kentucky

W4JRW....19,602- 66- 99- C-21
W4EPD.....2430- 27- 30- B-12

Michigan

K8PUU...120,744-156-258-BC-75
W8GG.....4155- 33- 45- C- 8
W8MRS.....1071- 17- 21- A-14
W8NWO (W8s NWO TWA ZTJ)
222,717-187-397- C-90
W8NGO (4 oprs.)
159,852-154-346- B-76

Ohio

W8NXF...57,645-105-183- B-43
W8BMX...50,193- 99-169- B-51
W8BF.....36,792- 84-146- C-19
W8BKO....34,446- 79-158- C-27
W8SMQ....29,151- 79-123 B-21
K8RMK....27,528- 74-124- C-35
W8HQK....27,050- 69-131-AC- -
K8LNL....18,240- 64- 95- B-32
K8PYD.....7913- 41- 65-AC-18
W8JAQ.....5472- 38- 48- C- 8
W8TTN.....2025- 25- 27- A-10
K8NMG.....1377- 17- 27- A- -
W8AJW.....1311- 19- 23- A- -
W8GMK.....1134- 18- 21- A-12
W8PJN.....714- 14- 17- A- -
W8IBX.....75- 5- 5- B- 1

HUDSON DIVISION

Eastern New York

WA2JBG...56,070- 89-210- C-48
W2GBC....34,440- 60-192- C-32
W2NQR.....1980- 22-30- B- 5
K2DEM.....48- 4- 4- C- 3

N. Y. C.-L. I.

K2IEG....174,960-162-362- C- -
W2WZ....117,612-121-324- C-31
K2FC.....68,478-101-226- C-30
K2DGT....58,320- 90-216- C-18
W2BQM...46,550- 95-164- C-33
W2SUC....28,908- 66-146- C-19
W2HMJ....12,513- 43- 97- C- 8
W2GKZ....12,495- 49- 85- C-10
K2YOR.....6120- 34- 60- B-10
W2ESO.....5700- 38- 50- C- 6
W2ZKQ.....2208- 23- 32- C- 4
W2TUK.....2001- 23- 29- C- 3
WA2TJA.....390- 10- 13- A- 5
W2RDD.....270- 9- 10- C- 1
WA2FIT.....243- 9- 99- B- 2
W2ELZ.....3- 1- 1- B- 2
WA2TNX (Wa2s PLO TNX)
34,569- 69-167- C-28

Northern New Jersey

W2CYX....25,803- 61-141- C-25
W2FFQ.....7680- 40- 64- B-48
W2JKH.....2415- 23- 35- B-12
W2JSX.....2184- 24- 33- B-16
W2MNW.....714- 14- 17- - -
WA2OGC....360- 10- 12- A- 3
WA2KAZ.....27- 3- 3- A- 2
WA2IDM.....12- 2- 2- A- 1

MIDWEST DIVISION

Kansas

WØALA.....2349- 27- 29- C-12

Missouri

WØBTD....61,404-119-172- A-57
WØNFA....36,984- 92-134 C-36
KØUWZ.....4185- 31- 45- A- -

Nebraska

KØWSR.....675- 15- 15- A-12

NEW ENGLAND DIVISION

Connecticut

W1BIH....80,784-132-206-AC- -
W1ICP[2].....1500- 30- 50- C- -
W1AYR.....3948- 28- 47- B- 5
W1WY.....765- 15- 17- C- -
W1AW [2].....297- 9- 11- C- -

Maine

W1GKJ....17,472- 64- 91- A-27
W1FDL.....319- 11- 11- B-10

Eastern Massachusetts

W1ONK..351,600-200-586- -74
W1NJL....22,896- 72-106- B-30
K1IMD....22,713- 67-113- C-31
K1DIR....15,486- 58- 89- B- -
W1EJE.....9618- 48- 67- A-16
K1MLO.....7800- 40- 65- C-12
K1MEM.....1824- 19- 32 B- 5
W1PLJ.....231- 7- 11- B- 9
W1HKK (5 oprs.)
296,241-191-517- C-77

Western Massachusetts

W1RF.....54,614- 83-226- C-32
W1LIB.....17,160- 55-104- A-11
W1JYH.....576- 12- 16- - -

New Hampshire

K1RTB...108,480-120-316- B-52
W1FZ....84,032-104-276- C- -

Rhode Island

W1QCO....14,274- 39-122- B-18
W1DDD (K1LZW, W1s AUT YRC).....714- 14- 17- C- 5

Vermont

K1POA.....5425- 31- 61- A-13

NORTHWESTERN DIVISION

Alaska

WØCUC/KL7
96- 4- 8- B- -

Montana

W7QPK.....9576- 42- 76 C-27

Oregon

W7DLR.....702- 13- 18- C- 6
W7DIS.....27- 3- 3- A-11

Washington

W7DQM...11,092- 47- 79- A-20
K7HJN.....1860- 20- 31- C-28

PACIFIC DIVISION

Santa Clara Valley

K6UXV.....9324- 42- 74- B-25
W6HOC.....8526- 49- 58- C-15
W6WX.....588- 14- 14- - -
W6ISQ.....180- 6- 10- C- 3
W6HVN.....84- 4- 7- C- 5

East Bay

KL7DTB/6..6042- 38- 53- C- -
W6KG.....4182- 34- 41- C-16
W6PQW.....2310- 22- 35- B-11
W6IPH.....1080- 18- 20- A- 4

San Francisco

K6OHJ.....12,324- 52- 79- C-20
W6YEJ.....2772- 28- 33- A-31
W6GQK.....969- 17- 19- C- 7
W6ERS.....405- 9- 15- A-30

Sacramento Valley

W6GRX....17,160- 65- 88- C-46
W6SIA.....13,983- 59- 79- C-22
W6OMR.....5100- 34- 50- C-25
K6TIP/6.....147- 7- 7- C-13

San Joaquin Valley

W6UDR.....4692- 34- 46- C- 9
W6BVM.....2373- 21- 38- - -
W6UJ.....288- 8- 12- C- -

ROANOKE DIVISION

North Carolina

K4BUJ (5 oprs.)
41,280- 80-172- C-72

South Carolina

K4BMS....95,226-118-269- C-47
W4DPN.....216- 8- 9- B- 8

Virginia

W4KFC...249,039-201-413- B-71
W4BVV...242,688-192-422- C-85
W4JFE....104,247-117-297- B-66
W4ZM.....18,600- 50-124- C-11
W4NJF....17,280- 64- 90-AC-30
W4RQR....15,045- 59- 85- C- 8
K4ORQ....15,000- 50-100- C-15
W4HVU....13,965- 57- 82- B-32
W4VBX....13,377- 49- 91- C- -
K4WUY.....1275- 17- 25- A- 6
W4GF.....1152- 16- 24- C- -

West Virginia

W8UMR...13,005- 51- 85- A-16

ROCKY MOUNTAIN DIVISION

Colorado

WØAGX.....972- 18- 18- A- -
WØCDP.....243- 9- 9- B- 2
KØVCK.....18- 4- 4- B- 1

New Mexico

K5IKL.....61,632- 96-214 B-52
W5PQA.....9384- 46- 68- C-19
K5UYF.....1701- 21- 27- B- 4

SOUTHEASTERN DIVISION

Alabama

W4LZW....61,938-111-186- C-48
W4OEP....32,250- 86-125- - -
W4RLS....27,975- 75-125- B-30
W4DS.....3330- 30- 37- - -
K4KJD.....507- 13- 13- A- 6

Eastern Florida

K4WIG....61,800-100-206- C-60
W4LIU....18,915- 65- 97- A-52
W4PJG....15,660- 58- 90- C-30
W4EEO.....1863- 23- 27- B-10
W4RJL.....3- 1- 1- A- 1

Western Florida

W4SHW.....1968- 24- 28- A-12

Georgia

W4BFR....16,926- 62- 91- C-20
K4TEA....10,530- 54- 65- A- -

SOUTHWESTERN DIVISION

Los Angeles

W6KPC....22,311- 67-111- C-36
WA6IPY....7215- 37- 65- A-28
W6WWQ....5670- 42- 45- C-22
K6YRA.....4992- 32- 52- C- -
W6CYV.....2940- 28- 35- C- 5
WA6AYF....1575- 21- 25- C-12
K6ICS.....588- 14- 14- A- 7
K6UFX.....510- 12- 15-
ABC-7
WA6HGC.....540- 12- 15- B- 3
W6VUZ.....36 3- 4- B- 1
K6MQG.....27- 3- 3- - -
K6YYJ.....3- 1- 1- B- 1
K6EVR (K6EVR, W6GFE)
198,000-165-100- C-80

Arizona

W7ENA.....702- 13- 18- A- 8

San Diego

K6CQF.....3- 1- 1 A-

WEST GULF DIVISION

Northern Texas

K5GGU.....2178- 22- 33- A-45
W5MOY.....468- 12 13- A- -
W5IIW (K5FPT, W5IIW)
10,764- 52- 69 A-22

Southern Texas

K5JZY....21,868- 71-104- B-75
W5SU.....13,542- 61- 76- B-35
W5ELN.....2520- 28- 30- A-25
K5LGH.....243- 9- 9- A- 2
W5ARJ.....108- 6- 6- B- -

CANADIAN DIVISION

Maritime

VE1BC....83,763-123-235-
ABC-50
VE1ADA....9660- 35 92- A-14
VE1DB.....540- 12- 15- - -

Quebec

VE2UI....51,450- 98-175 B-60
VE2AMW...14,309- 41-123- A-14
VE2AFC....8613- 33- 87- A-22
VE2ANK....8120- 40- 69- A-32

Ontario

VE3ES....23,064- 62-124- A-31
VE3PV.....6810- 38- 60- A- -
VE3PE.....1500- 20- 25- B- 4
VE3CYF.....330- 10- 11 A- 5
VE3DGX.....243- 9- 9- B- 7
VE3BWY (VE3s BWY EWY)
29,520- 80-123- C-30

(Continued on page 170)

INTERNATIONAL **AMATEUR CRYSTALS**

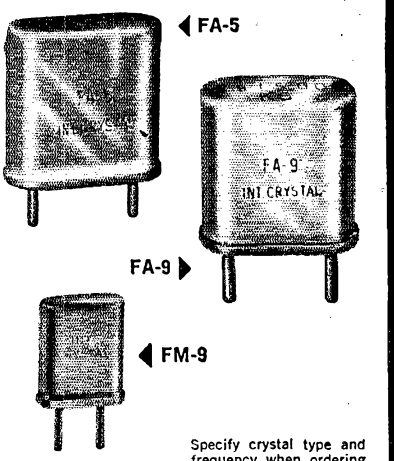
Amateurs throughout the world depend on International crystals for precision frequency control.

Manufactured by the same highly skilled craftsmen who produce International commercial crystals for the broadcast industry, two-way radio communication, and our space and missile program.

International Amateur Crystals
1000 kc to 137 mc — .01% tolerance

Wire mounted, plated and hermetically sealed in metal holders. FA-5 and FA-9 are HC/6U pin type. The FM-9 is an HC/18U pin type.

Priced from $3.30 to $10.00

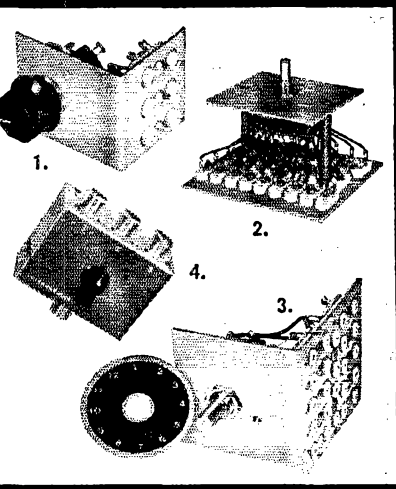


Specify crystal type and frequency when ordering.

	FA-5 and FA-9	FM-9
Fundamental	* 1000 - 1499 kc * 1500 - 1799 kc * 1800 - 1999 kc 2000 - 9999 kc 10000 - 14999 kc 15000 - 20000 kc	Not available Not available Not available 9000 - 9999.999 kc 10000 - 15000 kc 15001 - 19999.999 kc
Overtone (3rd)	10 - 14.99 mc 15 - 29.99 mc 30 - 59.99 mc	Not available 20 - 39.99 mc 40 - 59.99 mc
Overtone (5th)	60 - 75.99 mc 76 - 99.99 mc Not available	60 - 89.99 mc 90 - 100 mc 101 - 109.99 mc
Overtone (7th)	100 - 137 mc	110 - 137 mc

* Allow three to four day processing.

the PERFECT combination for FREQUENCY CONTROL



INTERNATIONAL **CRYSTAL SWITCHES**

When you design or build . . . combine International crystals and crystal switches. Switches available from 3-position to 24-position. For antennas and laboratory work use International coaxial switches.

Priced from $2.75 to $19.50

1. S-121 Triple Socket Crystal Switch. Cat. No. 150-126.
2. AC-44 Single Pole, 24-Position Crystal Switch. Cat. No. 150-131.
3. 12-Position Crystal Switch. Cat. No. 150-163.
4. 3-Position Coaxial Switch. Cat. No. 100-112.

Write today for International's Free catalog of precision made crystals and equipment.

INTERNATIONAL CRYSTAL MFG. CO., INC.

18 NORTH LEE • OKLAHOMA CITY, OKLAHOMA

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

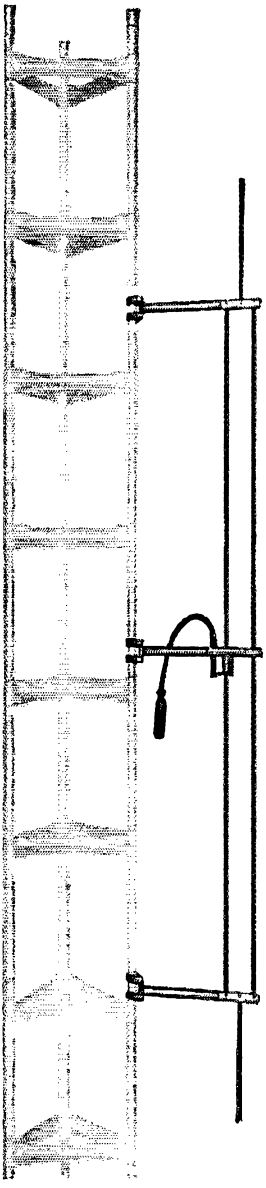
EASTERN PENNSYLVANIA—SCM, Allen R. Bremer, W3ZRQ–SEC: W3DUI. RM: W3EML. PAM: K3BHU. V.H.F. PAM: W3SAO. New appointees are W3MFY as OO and W3FLP as OPS. K3RFH lost his high-voltage transformer during the CD Party. W3FEY is looking for skeds to the south on 432 Mc. K3NLW has been missing out on traffic because of the loss of his antennas. Vacation did not stop W3ID from his regular bulletin skeds. W3GRS has to learn c.w. all over again because of his new electronic keyer. W3AHZ added a 2-meter ground plane to his expanding antenna farm. K3CNN is now up to 58 awards. Juniata and Mifflin County 6-meter mobiles furnished communications for parades at the Port Royal Centennial. A new linear was installed by W3LC. W3JKX found the 30-watt Field Day rigs work OK for traffic handling. K3MVO is sporting a new Valiant II. K3JSX and the Susquehanna Valley group have formed a 6-meter traffic net. Interested operators, contact W3SGI, RD 1, Sunbury. Delaware County AREC has formed a 2-meter net and W3FLP is looking for recruits. K3MNT/3 is now operating out of Saylors Lake. Aside from hamfests and traffic, W3IVS is plagued with an avalanche of rig breakdowns. W3EML still is trying to figure out who all the League Officials were visiting his shack on July 28. At the meeting on that date a Pennsylvania State AREC plan was formulated and is now past the embryo stage. It was printed and mailed to all ECs and emergency key personnel. Anyone interested may obtain a copy by sending requests to the SEC or SCM. A portion of the plan calls for an AREC net drill every Sun. morning on 3850 kc. at 9 A.M. and 3610 kc. at 9:30 A.M. Its purpose is to train newcomers and pass traffic. Details are to be announced. Officers of the Philmont Mobile RC are: W3CDY, pres.; W3GOW, vice-pres.; K3DJE, treas.; K3GNJ, secy. W3DUI is now 70 years young. Net managers please note, Daylight Saving Time ends Oct. 27. Traffic: W3CUL 4112. W3EML 916. W3VR 768. W3IVS 513. K3MNT 330. W3FLP 250. K3JSX 212. W3RV 182. W3ZRQ 162. K3MQE 137. K3JJG 100. W3HNK 94. K3MVO 90. W3UJU 80. K3ONW 75. W3JKX 69. W3AXA 40. W3NNL 30. K3BHU 22. W3ITI 21. K3ANU 19. K3JHF 17. W3OY 14. K3HTZ 13. K3CAH 11. W3LC 10. K3RFH 10. W3BFF 7. W3ADE 4. K3AKN 4. K3EOU 4. K3CNN 3. W3DUI 3. W3EU 3. W3AHZ 2. K3JJJ 2. W3EEN 1. W3GJA 1. K3LKR 1.

MARYLAND-DELAWARE–DISTRICT OF COLUMBIA—SCM, Andrew H. Abraham, W3JZY—Asst. SCM Del.: Skip Nelson, K3GKF. SEC: W3CVE. RM: K3JYZ for MDD Traffic Net which meets on 3649 kc. (new frequency) at 0000Z daily. The MDDS (slow) Net meets on 3649 kc. at 0130Z daily; MEPN on 3820 kc. M-W-F at 2300Z on Sat. and Sun. at 1800Z. Del. Emg. Net meets on 3905 kc. at 2230Z on Sat. *Del.*: Major activity for K3AXW is v.h.f. K3EWK handled three messages. K3GKF is having a rough time getting DX-QSL cards for 7-mc. contacts. W3JFR checks into MEPN-DEMN-PFN. K3OZM sent his traffic report via MDD, 86 messages handled. *M-DC.*: W3BWT and W3AKB are remodeling. Ep had a wonderful time while in Florida. W3BKE says that the new transmitter works fine on 160 meters. W3CDQ has the Apache modified and is on 7-mc. W3CVE is busy getting the AREC nets working for the hurricane season. K3DCP reports that W3YYB is back on the air from a new QTH. Jean Pierre and XYL Monique (FG7XL) visited with several amateurs in the Baltimore Area. W3YZI and K3DCP received their WAA Award from Brazil. K3DNU has his DXCC certificate. W3EBF lost his "A" frames and window antenna in the storm. The MEPN handled 17 pieces of traffic. W3ECP was hospitalized in July for surgery. Van is back on the air after a fast recovery. W3GNQ lost his tower and had a hard time getting it back up. W3EQK is very busy with some interesting work. Art is having trouble with his final. He reports that Dave White (retired R.I.), in Baltimore, is putting up a 100-ft. steel tower to support several amateur beams. W3OEV is busy topping trees for a new antenna. K3GVE made his first CD Party. W3IVC also made his first CD Party. K3JYZ put out a very fine MDD Net bulletin. The MDD Net will hold a picnic at Patapsico State Park. K3KHA is in the military service. W3LE says there is plenty of 10-meter phone activity in the Baltimore Area every night. Lou and K3MLX and XYL had the extreme pleasure of visiting Prince Naingyal (AC3PT) and his fiancee, Miss Hope Cook, in Washington, D.C. W3RMD has a new Apache. K3JDF is working RTTY. W3IF is gathering certificates. W3IAC, from the FARC, reports 1163 contacts from the Field Day site. K3LLR got his General class ticket. K3NAS sends in a report. K3NZV is busy working DX. W3OHI built up a power supply for a general use. K3OXW has an Apache. K3QFG has his CP-25 sticker. Phil works at the National Bureau of Standards. K3SFT has completed a v.f.o. W3TN made the BPL. K3TLE is the call of the Northern MD Brass Pounders of Taneytown, Md. K3LTA is a new ham in Carrol County. W3YZI had Jean Pierre and XYL Monique (FG7XL) as guests. W3ZAQ is preparing for the fall activities. W3ZNW is making some changes in his antenna farm. K3GZK is off the air because of power line QRM. K3PRN. K3DNO and K3LLR send in nice OES reports. W3ZCD is on 6-meter sideband. The Washington County RACES group is getting acquainted with the new Poly-Comm 6- and 2-meter sets. Traffic: (July) W3TN 264. K3QFG 127. K3JYZ 94. K3OZM 86. W3IVC 79. K3MQP 52. K3OWX 32. K3WBJ 28. W3JFR 27. W3ZNW 26. W3EOV 24. K3OSX 23. W3ECP 17. W3QZZ 15. W3NO 11. W3BKE 10. W3OHI 10. K3AXW 8. K3DCP 6. K3LLR 5. W3EBF 4. K3EWK 3. (June) K3KPZ/3 126. K3KPZ 5. K3AXW 2. (May) K3JYZ 51.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG–SEC: K2ARY. PAM: W2ZI. RMs: W2HDW and WA2VAT. New appointment: W2ZVW, Beverly, as EC for Burlington County. Ed is ex-SCM of N.N.J. NJ Phone and Traffic Net totals for July: 31 sessions, QNI 456, traffic 127. K2CPR still is chasing awards. W2BZJ, Pennington, has been assisting W2RG with the N.J. CD Sunday C.W. Net on 3534.5 kc. New operators in Cumberland County, reported by WA2ARJ, are WA2YYC. WA2YYD. WA2OYW and WB2APT. WA2WLN is a new NJN member. WA2KWB, Yardville, is planning more power on 15-meter phone. NJN's annual outing was attended by 22 members and many guests. The net's July totals were 31 sessions, QNI 561, traffic 362. WA2GQZ is manager. SCARA news: K2HBA is vacationing in Europe. K4SQR/2 is expected back from Florida. WA2KWM is home from the hospital. K2CIR is *SCARA News* editor-in-chief. WA2LBL has moved to Princeton. The following Gloucester Co. ARC members furnished communication during the Pitman July 4th Parade: K2GHZ. W2KE. K2AQL. W2PLD. K2UUY and WV2TSG. W2SUA has been assigned work in Washington, D.C., for a short time. W2PAV. Westmont, expects to be in France for the next year. Congrats to K2BZK, who has received his flying license. We wish W2JAV a speedy recovery from a recent illness. K2MOV, Delance, is home on a visit from Rei-Nanmur (Marshall Islds.) K2ECY, Riverton (KX6AM), expects to return home soon. The SJRA and Gloucester Co. ARC have plans for bigger and better hamfests this year. It is hoped that next month we will be able to announce the appointment of an EC for Camden and Gloucester Counties. Traffic: (July) W2RG 159. W2ZI 33. K2CPR 19. W2BZJ 17. WA2WLN 10. WA2ARJ 9. WA2-BLV 8. WA2KWB 2. K2SOX 2. (June) K2SOX 18.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK–SEC: W2LXE. RMs: W2RUF, W2EZB and W2FEB. PAM: W2PVI. NYS C.W. meets on 3670 kc. at 1900; ESS on 3590 kc. at 1800. NYSPTEN on 3925 kc. at 1800; NYS C.D. on 3610 kc. and 3993 kc. at 0900 Sun.; and 7102.5 kc. at 1930 Wed.; TCPN 2nd call area on 3970 kc. at 1900; IPN on 3980 kc. at 1600; 2RN on 3690 kc. at 0045 and 2345 GMT. Appointments: WA2KQK OO. W2QHQ ORS. W2IDM OES. Endorsements: K2UZJ and W2ZRC ORS. K2BBJ OPS. The NYS C.W. Net held a

(Continued on page 114)



C-P COMMUNICATION ANTENNA SYSTEMS

—mean

CERTIFIED PERFORMANCE!

CAT. NO. 320-509, FREQUENCY RANGE 30-54 MC*

BASE STATION SIDE-MOUNT ANTENNA

*Exact frequency must be specified

Cat. No. 320-509 Side-Mount 2.5 db Gain Antenna is designed for applications requiring an antenna which must be side mounted on existing or new towers. This antenna has essentially a cardioid pattern and has approximately 2.5 db gain in the forward direction. High strength aluminum alloy is used for all antenna parts, except the mounting clamps, which are made of stainless steel. All insulators are made of the best available materials for the various uses involved. Each antenna is supplied cut to the desired operating frequency and is assembled ready for installation.

SPECIFICATIONS

Electrical:

Nominal input impedance	50 ohms
VSWR	1.5:1
Bandwidth	±1.0%
Maximum power input	500 watts
Flexible terminal extension	18 in. of RG-8A/U
Termination	Type N male with Neoprene housing
Lightning protection	Direct ground

Mechanical:

Radiating element material	6061-T6 aluminum
Insulated support material	Phenolic
Feed point insulator	Polycarbonate
Overall length	10 ft. at 50 Mc, 16½ ft. at 30 Mc
Spacing from tower	8"
Rated wind velocity	100 MPH
Lateral thrust at rated wind	45 lbs. at 30 Mc
Weight	15 lbs. at 30 Mc

Stainless Steel Mounting Clamps supplied to mount antenna on round tower legs 1 in. to 1½ in. diameter.

SINCE 1933

COMMUNICATION ANTENNA SYSTEMS FOR AMERICAN BUSINESS

Communication Products Company

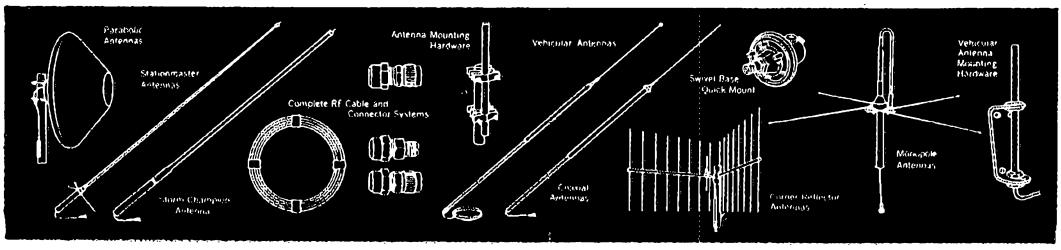
DIVISION OF

PHELPS DODGE ELECTRONIC PRODUCTS

CORPORATION

MARLBORO, NEW JERSEY — Telephone HOpkins 2-1880 (Area Code 201)

LOS ANGELES 65, CALIF. — Telephone CHapman 5-1143 (Area Code 213)



Station Activities

(Continued from page 112)

picnic at W2MTA's QTH. The net handled 6700 messages last year; also donated to the ARRL Building Fund. Clara, W2RUF, has resumed the post of Net Manager of NYS C.W. Many thanks to W2FEB, who steps down after a fine job. W2ZRC is the proud papa of a baby girl. K2HUK and W2EFU attended the North County RC Picnic in Norfolk. It's roundup time in Syracuse (v.h.f.). The first part of October is reserved for the largest v.h.f. meeting in the U.S. Check your reservations now. In case you haven't heard, amateurs are no longer required to monitor for Conelrad. NYS hams will be receiving instructions and forms for ordering 1963 call letter license plates in the mail within a few weeks. Novices excepted. A word of caution: under present regulations all holders of special plates can have the privilege rescinded for one speeding violation or similar offense. Enjoy your new plates and let's show the people of New York State that radio amateurs are *safe drivers*. W2EMW has 265 countries worked with 30 watts. Are you causing unnecessary QRM by running a full gallon to talk crosstown? WA2WEE became a member of the QCWA. The RARA *RAG* plans to expand its coverage to include club meeting information for the Niagara frontier area. Club Secretaries in the Buffalo, Niagara Falls and Lockport areas are requested to send information to WA2KND, 153 Mason Ave., Rochester 15, two weeks prior to the first of the month in which the meeting will be held. Material for this column such as hamfests, picnics, etc., or for the hamfest calendar in *QST*, must be sent in at least two months prior to publication. (Example: this is being written the first week of August for the October issue). Traffic: (July) W2OE 461, W2FEB 116, W2RUF 112, K2SIL 97, K2RTQ 80, WA2HOH 73, W2RKU 62, WA2KQC 39, K2OFV 37, K2AFE 28, W2RQF 24, W2MTA 20, WA2HSB 19, W2QHQ 18, WA2DAC 12, K2HOH 10, WA2UCI 10, K1BVI/2 9, WA2OGI 8, WA2UFI 8, WA2KZQ 7, WA2GLA 5, K2MQA 4, W2EMW 2. (June) WA2GLA 10.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: W3WRE. Asst. SEC: W3KUN. RMs: W3KUN and W3NUG. The WPA Traffic Net meets Mon. through Fri. at 2400 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets at 2330 GMT on 3585 kc. Mon. through Fri. We wish to thank W3WRE for her efforts as SEC this past year and the swell support on WPA and 3RN traffic nets. W3WRE and W3WRC are moving to W6-Land. In the near future we expect to have a replacement for the SEC job. K3AKR reports copying four Oscar II passes and K3CFA reports copying thirty-five Oscar II passes. K3OQQ is a new General around Butler. K3RGY now is mobile on 6 meters. The Steel City ARC reports via *Kilowatt Harmonics*: K3AXO and K3RKW are a father-and-son team; the club station (W3KWH) received the trophy from the Breeze Shooters for winning its recent ground wave contest. W3SYY is accepting a teaching position at St. Francis College, Loretto, Pa. W3TIF is back on 15-20-meter s.s.b. with a Tribander beam. The group from W3PIE recently held a Good Fellowship Dinner. The Etna RC reports via *Oscillator*: W3TOC has an all-band vertical; K3RAD is on 2 meters; K3GQX now is mobile on 6 meters. KN3TUP is the son of W3NRE. W3UFR now is on 2 meters. The Bedford County ARC reports via *Shorts*: The club's picnic at Shawnee State Park was a success with W3YA as a guest; K3KYT has his 40-meter beam on a tower now. Coke Center RC reports: W3JW has a KWM-2 in his new car; K3NOU is touring the country; W3THY soon will be on the air from the Uniontown County Home. The Centre County AREC/RACES 6-Meter Net assisted the Alpha Fire Company in its annual parade. Anyone desiring Field Day Forest County QSL cards for working W3LMM/3 may have same by dropping W3LMM a card. The Western Penna. Mobiliers will have its Sixth Annual Fall Round-up Fri., Oct. 19, 1962, at 8 P.M. in the Wilkensburg Boro Building, Ross and Hays St., Wilkensburg, Pa. Mobile stations can check in on 29.360 and 50.4 Mc. Traffic: (July) W3WRE 189, W3KUN 117, W3NEM 88, K3DKE 51, W3OEO 51, K3EDO 41, W3IYI 39, W3LSS 38, W3MFB 30, K3HKK 27, W3NUG 21, K3HID 11, K3COT 5, W3UHN 5, W3SMV 4, W3KWO 3. (June) W3NEM 84.

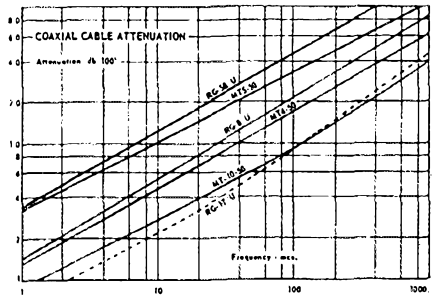
CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, W9GME. RM: W9USR. PAM: W9RYU. EC of Cook County: W9HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CDT. Many of the gang in this section are enjoying their vacations at this time and our RM has reported that she and her OM (K9OJG) and three harmonics have returned after three weeks in Alaska. W9TEM, the Chi-

(Continued from page 113)

Power Lost in Coax is Gone Forever!

See article by Michael Ferber in April, 1959, Q.S.T.



Reduce This line loss with

Mosley Lo/Ten Coaxial Cable

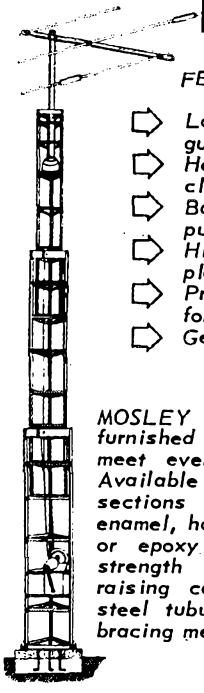
- Light Weight!
- Higher Tensile Strength!
- 30% Lower Attenuation!
- 20-Year Life Expectancy!
- Suitable For Direct Burial!

Mosley Type	Similar To
MT 4-50	RG- 8/U
MT 5-50	RG-58/U
MT10-50	RG-17/U

Lo/Ten is manufactured for Mosley by *Times Wire and Cable Company*, Division of International Silver Company, and is familiar to coaxial cable users as T-Line. Lo/Ten is distributed by Mosley through exclusive arrangement with *Times Wire and Cable Company*.

NEW! COMPLETE LINE OF MOSLEY TOWERMASTERS

see and hear



FEATURES:

- *Low friction section guides!*
- *Heavy steel safety clips!*
- *Ball bearing metal pulleys!*
- *Hinged steel base plate!*
- *Pre-drilled rotor plates for mast!*
- *Geared raising winches!*

MOSLEY TOWERMASTERS are furnished in many designs to meet every ham requirement. Available in 10 and 20 foot sections with triple coated enamel, hot dipped galvanized, or epoxy resin finish. Extra strength galvanized aircraft raising cables, high strength steel tubular leg and channel bracing members.

THE Mosley CM-1

receiver is the first low priced receiver with double conversion and crystal controlled first oscillator. It is also the first receiver with 5 dual-purpose tubes of one type and 4 semi-conductor diodes which perform all functions usually requiring 12 or more tube sections. See this really new design concept in amateur receivers now on display at your dealer.

CM-1 Receiver . . . . . Amateur Net $ 182.70
CMS-1 Speaker . . . . . Amateur Net $ 16.95

ASK YOUR DEALER FOR FULL SPECIFICATIONS

Mosley OR WRITE *Electronics Inc.*

4610 N. LINDBERGH BLVD. - BRIDGETON, MISSOURI

cago Area Radio Club Council's station, operated at the International Trade Fair at McCormick Place and gave a very interesting display of ham radio. K9OCU is now WOEEE and stationed at MSM, Rolla, Missouri. W9APK took a bride Aug. 25. Congratulations. W9GFF received his WAVO certificate. A new Novice call in Decatur is WN9EOG. W9VPE has received a QSL card confirming his c.w. contact with Major Yuri A. Gargarin, the first man to conquer space. K9ZHA has left for Susanville, Calif., to attend forestry school. WN9DKL is now General Class. W9BPG has a new 2-meter rig and a telerex antenna with a 50-ft. tower. The SRO DX Club had a celebration on W9ZNY's new boat *Honey Two* with W9BWM, K9AZB, W9SRJ and W9YTQ as guests and members who made DXCC this year. K9JAW has a new Mosley TA-33 and an HT-32. W9JID is mobiling with a Gonset 76. W9PBY runs RTTY regularly now on all bands. K9VQA is now operating on 1215 Mc. and would like to hear from others interested in this frequency. K9CNE was home on leave from the Navy. K9DDA finally made WAS. The Northwest Amateur Radio Club of Evanston provided communications for the Boy Scout Council Camporee between the campsite and the Evanston office. A new Chicago call heard was WN9ELN. K9MTE has a new rotary dipole for 10-15-20 meters. W9YYG, W9MAK, W9QQG, W9EET, W9NPC and W9NIU were scorers in the April CD Party. New appointees are K9QIZ as OO, WA9EJA and W9BPG as OESs. The North Central Phone Net handled 155 messages, the ILN traffic count was 250 and the CAEN was 182 for the month of July. ILN's June total was 316 and the CAEN's April traffic was 202. This column's sympathy is extended to the family and friends of W9KDP, who passed away recently. K9EZP and W9AKV are recipients of the BPL Award. Traffic: (July) K9EZP 608, W9AKV 252, K9UOV 233, W9USR 191, W9JXV 190, K9KZB 122, K9DRS 100, K9JSV 73, K9OCU 72, W9MAK 54, K9OAD 54, WA9DEW 48, K9ZQT 44, W9AZ 41, K9UCG 41, K9LXG 14, K9CRT 14, W9PRN 12, K9RAS 12, K9TVA 2, W9IDQ 1, K9RHU 1, W9UCZ 1. (June) W9USR 288, W9IDA 135, K9VUL 24, K9TVA 12, K9RAS 10.

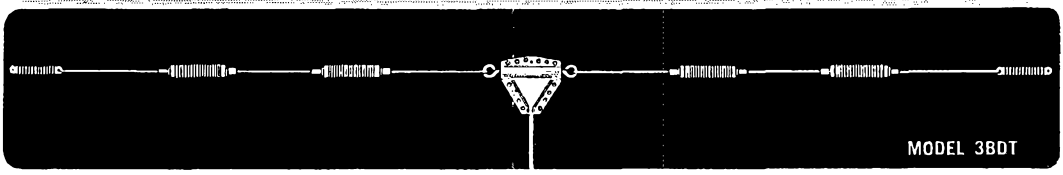
INDIANA—SCM, Donald L. Holt, W9FWH—Asst. SCM: Clifford M. Singer, W9SWD. SEC: W9SNQ. PAMs: K9KTL, K9CRS, K9GLL. RMs: W9TT, W9VAY, K9WET. Net skeds (all times in GMT.): IFN, 1300 daily and 2300 M-F on 3910 kc.; ISN (s.s.b.) 0300 daily on 3920 kc. QIN (training) 0000 M-W-F on 3715 kc.; QIN daily at 0300 and RFN at 1300 Sun. on 3656 kc. New appointments: WA9BEU, EC of Putnam Co.; W9JSV, EC of Parke Co.; K9EFY, EC of Carrol Co.; K9DXQ as OES. With deep regret the following Silent Key is reported: John J. Doherty, K9YON of Geneva, Ind. The QIN would like more stations to participate in the south and central portions of the state. There are 596 stations on 52.525 wide-band f.m. nationally of which 292 are in Indiana, reports W4CTU/9. WA9AVW is a new General in Harrison Co. The IRCC Annual Picnic, because of bad weather, was held in a covered bridge at Highland Park with a very good number present. Sunny skies blessed the WVARA annual picnic at Turkey Run State Park with a tremendous turnout. WA9BVL is the new station of W9AB. Those making BPLs: K9ARW, W9JOZ, W9RE, K9IYG, W9TT and W9NZZ. Making BPL this month makes 119 BPL's for W9NZZ. *Amateur radio exists as a hobby because of the service it renders.* July net reports: IFN 289, JSB 516, QIN 227, QIN (training) 2, RFN 106. Hoosier V.H.F. 103, 9RN 968 with Indiana represented 100 percent, QIN Honor Roll: W9TT, K9EZP, K9SGZ, K9ARW, W9ZYK, K9DNY, K9WWJ. Traffic: W9JOZ 1838, W9RE 9 770, W9NZZ 479, W9ZYK 143, W9TT 288, K9RWQ 142, K9ARW 139, K9IYG 139, K9SGZ 133, K9DHN 118, W9QYQ 100, W9BUQ 76, K9ZLA 76, K9KTL 64, K9CRS 61, W9MM 60, K9BHH 59, K9OET 58, K9YIC 51, W9OG 49, W9FWH 43, K9GLL 38, W9PMT 38, W9DOK 34, W9EJW 28, K9ZLB 27, W9AWH 26, W9RTH 25, W9BTZ 21, W9SNQ 24, K9KFM 22, K9WET 21, WA0RWL 19, K9DUV 19, W9ETI 17, W9QLW 15, K9JZW 13, W9BDP 12, W9CC 10, K9HYV 10, W9DKR 9, K9WWJ 9, K9HYV 8, W9IMU 8, K9MWC 8, W9YYX 8, W9DZC 7, K9UEF 6, WA9AVW 5, W9AQW 4, K9SSI 4, W9YEW 4, K9VBA 3, K9YZC 3, W9AB 2, WA9ALL 2.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC: W9BCC. RMs: W9VIK and W9VHP. PAMs: W9NGT, W9NRP and W9SAA. Nets: WIN, 3535 kc. 0115Z daily, WSSN 0030Z 3535 kc. Tue. through Sat., BEN 3950 kc. 2100Z daily, WSBN 3985 kc. 2100Z daily. Endorsed appointments: W9AXS, W9UFY and W9KWJ as ECs; W9CXY, W9LFK and K9GDF as ORSs; W9NRP and K9GDF as OPSs. K9UTQ received his Armed Forces Day certificate. WA9AOI is building a 75-meter hand-held transceiver. W9OTL is working out very well with his 2-watt mobile. W9FBC and K9YKL are active on 2 meters. The Milwaukee AREC, along with the Oshkosh Club, provided communications for the American Legion Convention at Oshkosh. K9HBT

(Continued on page 118)

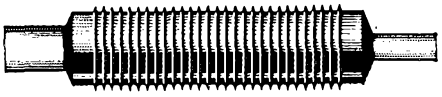
hy-gain multi-band DOUBLETS

...the doublets that are different!



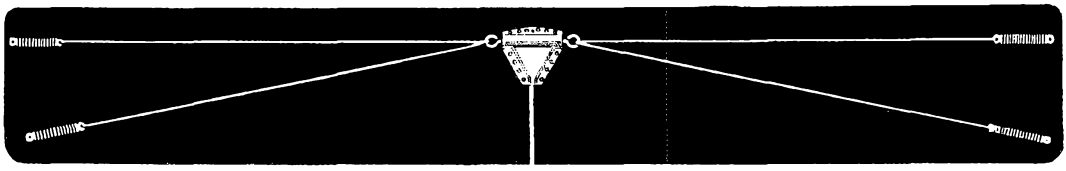
TRAP DOUBLET takes up to 500 Watts AM, 1 KW PEP

Here's the answer to unsurpassable doublet performance – new Hy-Gain Trap Doublet – engineered to deliver true half wave resonance at every design frequency. Featuring a matched set of Hy-Gain Slim Line traps for each band, various sections of the doublet are effectively isolated so that a true electrical ½ wave length exists on all bands. Antennas can be adjusted for phone or CW. SWR 2:1 or less at resonance on every band. Fed with 52 ohm coax (not supplied).



Traps used in doublet are reliable Hy-Gain Slim Line traps that have merited user acclaim from daily use in over 100,000 units throughout the world. Complete unit guaranteed to equal the performance of any multi-band doublet system and to withstand winds up to 100 mph. The Hy-Gain Trap Doublet is the ideal system for any Ham with multi-band capability.

Trap Doublet for 10-15-20-40-80M, Model 5BDT.....$34.95
Trap Doublet for 10-15-20M, Model 3BDT.....$17.50
Trap Doublet for 10-15-20-40M, Model 4BDT.....$24.50

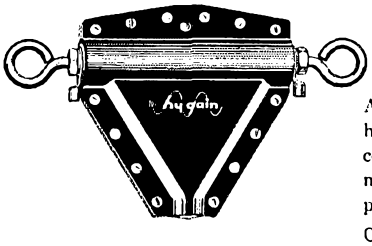


TRAPLESS DOUBLET takes unlimited power on 40 & 80M

Complete antenna system, single 52 ohm coax fed, and constructed of copper clad steel stranded wire, cycolac insulators and coax center insulator assembly. Fan configuration eliminates traps, increases band width and is virtually impervious to all weather conditions. Takes unlimited power. SWR less than 2:1.

Fan Doublet for 15-40-80M, Model 2 BDP.....$19.95

HY-GAIN CENTER AND END INSULATORS



Lightweight, strong, weatherproof Hy-Gain doublet insulators are available separately for the Amateur who wants to construct his own doublet. Insulators are molded from high impact cycolac plastic. Center insulators accept either ¼" or ⅜" diameter coax cable and are furnished with iridite-treated hardware in accordance with military specs. 7" end insulators feature heavy serrations increasing leakage path to approximately 12".

Center Insulator, Model CI, Wt.: 4 oz.....$ 3.95
End Insulator, Model EI, Wt.: 3 oz.....$ 1.00

See your favorite HAM distributor for full engineering data

hy-gain antenna products

8403 NE HIGHWAY 6, LINCOLN, NEBRASKA

is working 6-meter scatter. W9DFS has a new antenna on 6 meters. W9IHR has a new G-76. W9HAG has a new homebrew v.f.o. W9HQT is putting up a new beam for 20 meters. K9GSC worked KP4 on 6 meters. K9MLD has a new HT-31 linear. W9KQB received the "Royal Order of Arters" from the Morning Watch Net. K9PKQ is active on 6 meters. The c.w. nets are looking for more members, and liaison stations who can work both the phone and c.w. nets. W9MWQ is working on his tower and beam. K9LGU and W9SAA made the BPL in July. Traffic: (July) W9DYG 613, W9KQB 531, W9SAA 171, K9LGU 156, K9GSC 145, W9VHP 145, K9IMR 90, K9BLN 89, W9YT 49, K9TRB 45, W9WGN 44, K9BWL 39, W9CBE 37, K9DOL 36, W9MWQ 28, W9NRP 28, W9DWJ 22, K9GDF 18, K9ZMU 18, K9WVM 13, W9VIK 12, K9BOJ 11, W9IHN 10, W9HPC 9, WA9AOL 8, W9iqw 8, W9OTL 7, W9UEB 5, K9WIE 4, K9OCA 3, K9UTQ 3, (June) WA9AOI 2.

DAKOTA DIVISION

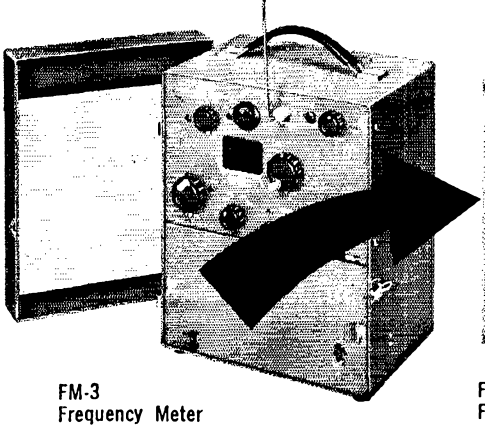
NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: WØCAQ. PAM: KØTYY. RM: KØQWY. The North Dakota 75-Meter Phone Net reports for July, 19 sessions with 362 check-ins; 47 pieces of formal traffic and 11 informal handled. The net control stations for the summer were KØJNB, KØQYD, WØBHF, WØGQD, KØMHC. KØMPH and KØAJW. WØYCL was Acting PAM because KØTYY was off the air. A new call in Williston is WNØDGQ. KØTFB has returned to Williston after a year's active duty with the National Guard. KØIVQ has received his second BPL award. Between 80 and 90 hams turned out for the picnic at Garrison sponsored by the Minot Amateur Radio Association. Traffic: (July) KØIVQ 574, KØITP 34, KØJNB 34, WØIRN 24, KØGGI 14, WAØAYL 12, WØYCL 9, KØMPH 4, WØCZL 3, WØMQA 2, KØYWD 2, WØBHT 1. (June) WØIRN 38, WØHSC 5, KØMPH 5.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: WØSCT. WØSCT has not missed a monthly report as SEC in the 37 months of his appointment. WØENC sends in regular reports as OES. New equipment: KØWEM and KØWEN have a Swan 120 mobile; WØFNM has a Gonset mobile; WØBXO purchased a GR-212 for the club; WNØCWW and WNØCWX have an HQ-170; also an HQ-170 for WNØCWY and WNØCWZ. New General Class tickets: KØFKJ, Dell Rapids; KØIBX, WAØAGD, WAØBMW and KØJHJ, all of Sioux Falls; WAØBPT, of Brookings. WNØCPX and WNØCPY are newly-licensed at Platte. KØYAA, Brookings, earned his first commercial phone. WØLXQ purchased an Apache from KØTKN, who is going mobile. KØVIZ renewed his OO Class IV certificate. WAØCFC, Fulton, received his General Class ticket. WØPMA's activities were curtailed by the mumps. Traffic: (July) WØSCT 270, KØBMQ 56, WAØAOY 26, KØBSW 26, KØALT 18, KØVYY 15, WØBQS 10, WØGWW 9, KØKOY 8, KØZBJ 6, KØZTV 6, KØGZZ 5, WØFJZ 4, WØYVF 4, KØHQD 2, WØNNX 2, KØYJF 2. (June) KØZTV 25.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles Marsh, WØALW. SEC: KØKKQ. PAMs: WØGCR, KØEPT. RMs: KØUXQ, WAØADX. MSSB Net Mgr.: WØHEN. All ECs and AREC members please take note: Lloyd Peartree, KØKKQ, of Pine City, is our new Section Emergency Coordinator. KØORK, an OO, made BPL and in his monthly report listed thirteen violations. The Rochester Radio Club's Annual Picnic had an attendance of 125 hams and their families in spite of the cold, rainy weather. The Mankato Radio Club Picnic also had a good turnout with about 130 in attendance. WØAIH has moved to Virginia. KØPIZ is building a linear using a pair of 813s. By the time you read this our former phone NCS and EC, WØTCK, will be married. OES KØAKC vacationed in VE-Land. KØEVW had surgery in Rochester. The father-son team, WAOs CAI and CAH, put up a folded dipole antenna. WØBBY spent the summer at Lake Washington. WØTUS/VPO can be heard from Walker. A new Novice in Janesville is WNØDFT. KØZZR does a lot of 20-meter work with our boys in the service and sees that they get an opportunity to talk with their families at home. WØTJA is building a plate-modulated 6-meter rig for his home station. WØTYH travelled in the Northwest and attended the World's Fair in Seattle. KØOTH returned from his summer stay in Colorado. WAØBPE rebuilt his antenna system. WØURQ and family and Asst. SCM WØALW and family vacationed in the Black Hills of So. Dakota. KOs VPJ and UOZ, YL operators, along with WØATO, can be heard on s.s.b. WØJMH, Clara, is one of our "OT" YL operators, still active on phone nets. Traffic: (July) KØORK 512, WAØABU 253, WØBIV 226, KØWPK 198, KØRCF 152, KØJFJ 125, WØHEN 124, KØVTG 121, WØKJZ 100, WØATO 88, WAØADX 76, WØKLG 46, KØVPJ 34, WØALW 33, WØUMX 31, KØGCJ 30, KØZKK 23, KØMGT 20, WØWMA 20, WØGCR 18,

(*Continued on page 120*)

YOUR GERTSCH FM-3 FREQUENCY METER CONVERTED TO MEET FCC REQUIREMENTS



FM-3
Frequency Meter

FM-3A 2-Way Communication
Frequency Meter

— factory conversion provides direct reading of all allocated channels in the 150-170 mc band

All Gertsch Model FM-3 frequency meters can now be factory-converted to measure and generate *all* assigned channels in both 150-170 mc, and 450-510 mc bands.... with ±.00025%(2.5ppm) accuracy. Instrument features a single 1-mc crystal which is easily standardized against WWV.

Converted units can also be operated as standard FM-3 instruments through 20 to 1,000 mc, at .001% accuracy.

Conversion includes: an all transistorized converter module, a new front panel and carrying case, and a built-in amplifier (with speaker). Also, a front-panel jack allows input of external audio signals, such as those from a Gertsch Model DM-3 deviation meter. Space for a DM-3 is provided in the case.

Compact size — only 13½" W x 11½" D x 13¾" high.

New Gertsch frequency meters are also available in both battery operated and AC power supply units. New meters incorporate same features as converted instruments.

Send for literature on FM-3A series.

Gertsch

GERTSCH PRODUCTS, Inc.

3211 South La Cienega Boulevard, Los Angeles 16, California/UPton 0-2761 · VErmont 9-2201

WAØAAM 16, KØEPT 14, WØTHY 11, WØBUO 9, KØZRD 9, KØPIZ 5, KØCNI 4, KØUBA 4, KØFLT 3, KØLWK 3. (June) WØBIV 204, WØKLG 76, KØGPI 27, KØZKK 18, KØUBA 1.

DELTA DIVISION

ARKANSAS—SCM, Odia L. Musgrove, K5CIR—PAM: W5DYL. RM: K5TYW. Another month has come and gone and fall is just about here, and with the cooler weather activity should begin picking up on all the nets. The OZK Net and the RN5 Net needs more c.w. operators. Activity on the Arkansas Emergency Phone Net has been good all summer but little traffic was handled. The net met 26 times with 1001 checking in. It is with much regret that we list W4CV among the Silent Keys. He was one of the oldest operators in this part of the country and was a member of the Arkansas Emergency Phone Net. All members are requested to attend the South East Arkansas Amateur Radio Club's annual election meeting. Traffic: K5SGG 10, K5IPS 8, W5NTV 5, K5ABE 4, K5CIR 2, W5DYL 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—The Springhill Radio Club is making application for its club station license and is requesting the call W5GHF, held by Robert E. Barr, Louisiana SCM, 1950-1954. K5ELM, K5QNK and K5WOD are working on mobile sideband units. W5DVV is the first YL in New Orleans to get DXCC and CHC. Shirley uses a 100V driving a Johnson KW Desk to a 20-40-meter beam, RTTY, too, and a Swan for mobile. W5BLE is back on v.h.f. with a homebrew Nuvistor converter and a modified Johnson 6N2 for s.s.b. use with his 100V. W5BGL is back from Alaska. K5UYL had his ORS-OPS appointments renewed. W5NDV was reappointed ORS-OPS. W5CEZ is back home after a nice vacation visiting harmonics in N.J. and taking in W1AW while up east. K5ESW is operating /2 from Ocean City, N.J., with a Sixer and a three-element beam. We were sorry to hear of the passing of W5BUZ. K5OVR reports that radio club plans are progressing in Alexandria. K5CTR has the 3-400Z final completed. K5CZV has been very active on MARS. W5KAT has noticed some connection between 2-meter band openings and severe fading in the 4000-Mc. commercial microwave band. W5KRX has been active handling traffic. The Jefferson ARC has taken possession of a real FB clubhouse in Metairie. A new Novice in Metairie is WN5DUL, Helen, who is building a DX-60. W5NUH has been reappointed OPS. W5SUM is working on a new Pelican. W5CEW is listening to s.s.b. more and more. W5BV has trouble tuning his new store-bought final. Make sure that your ARRL appointment is current. Check the expiration date. Traffic: (July) W5CEZ 238, K5QXV 230, W5MXQ 55, K5CZV 26, W5EA 8, W5NDV 6. (June) W5KRX 176, K5QXV 143, W5CEZ 116.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—SEC: K5SQS. Hamfest activity in the section is really booming. The Jackson gang just put on a real humdinger. The Saturday dinners are being well attended too. WA5ALL is now on from Pontotoc sporting a General Class ticket. He won the Novice Roundup in our section the last time out. K5RUO reports that K5ZRK is a new licensee from Jones County. Larry is 12 years old and can be heard on 6 meters. K5RUO and K5UBL are running 100 watts on 6 meters now. New appointments in the section are K5RUO as OO, K5WSY as PAM and OPS and W5AMZ as ORS. Other appointments are available. Write in for them. K5YTA reports that the Magnolia Net had 504 to check in last month and handled 20 formal and 75 informal pieces of traffic. K5FNV is on from Brooksville. K5MDX reports more DX was worked via WØMLY. Nice going, Dave. Traffic: K5MDX 2, K5WSY 1.

TENNESSEE—SCM, David C. Goggio, W4OGG—SEC: W4BWK. PAMs: W4LLJ, K4WWQ. RM: W4OQG. Traffic: TN, 3635 ke. 47 QTC; TPN, 3980 ke. QTC 60; ETPN, 3980 ke. QTC 48. New officers of the Loudon County ARC are K4UFD, pres.; K4DAA, vice-pres.; K4WRV, secy. Many thanks to the secretary, Betty Blankenship for the monthly club news. New appointments: K4WUH as EC; W4LLJ and K4WUH as OPSs. We are looking for OES applicants. Anyone on v.h.f. with good monitoring equipment to make detailed observations for analysis by ARRL is eligible. With deep regret we report W4BQK, Jonesboro, and W4CV, Memphis, as Silent Keys. Hamfest attendance: Whitehaven (Delta) 204, Crossville (Oakridge) 155 and Kingsport (Bay Mt.) 122. Coming events: Oct. 6-7 the S.E.T. Alert. All ECs, please report your activities to W4WBK. Oct. 13-15, C.W. C.D. Party; Oct. 20-22, Phone C.D. Party. All appointees are eligible. We are pleased to announce that for the first time in ten years, all appointees in this section hold a valid current appointment. The new manager of the Sideband Net is K4WWQ, president of the Delta Radio Club. W4UVU is building a new

(*Continued on page 122*)

great response

Naturally. This smart ham is using a University Model 70. It's dynamic! Now his QSO's are more frequent with better quality. You'd be surprised at the compliments he gets. He's also improved his SSB transmissions . . . found the perfect budget-minded way to increase peak power and intelligibility. And he doesn't have to swallow this microphone to be heard. All he does is sit back, relax and speak normally. The Model 70 does the rest. Why not let it do the same for you. Comes complete with integral 15-foot 3-conductor shielded cable, Model SA10 slide-on stand adapter and cloth carrying bag. Check the 'specs'. No other dynamic of its type can match the great Model 70! Only $29.95*

SPECIFICATIONS

Frequency Response: 50-14,000 cps (which extends to a usable limit in the 18,000 cycle region). *Impedance:* 30/50; 20,000 ohms. *Output Level:* 30/50 ohms: —50 db/1 mw/10 dynes/cm²; —143 db EIA sensitivity rating; 20,000 ohms into high impedance input; 28 mv/10 dynes/cm². *Hum Reference:* —120 db/.001 gauss. *Dimensions:* 1-5/32" maximum diameter, 6" maximum length. *Shipping Weight:* 2¼ lbs. *Finish:* Acrylic silver-gray and non-reflecting black.

*Model 71 also available with on-off slide switch $34.95.

Write for new 12-page catalog with complete details on the entire University Modular Microphone line. Desk T-10, University Loudspeakers, Inc., 80 South Kensico Ave., White Plains, New York.

UNIVERSITY.

A Division of Ling-Temco-Vought, Inc.

445-Mc. TV converter. K4JXG would like to hear from all interested in starting an RTTY section net. Address 1641 Kendale (Memphis). EC W4VNU reports the Roane County ARC assisted the Kingston Boat Races on 6 meters. OES K4KYL soon will complete a stacked 10-over-10 on 144 Mc. Your SCM would like information on the correct name, mailing address, name and address of the president, name of the secretary and meeting night of each Tennessee club. Support your local emergency net or state section net. Amateur radio operates for the public's service. Traffic: K4AKP 889, W4PL 792, W4ZJY 68, W4OQG 65, W4PQP 57, W4OGG 33, W4PFP 32, W4LLJ 30, W4MXF 27, K4AQA 26, K4OUK 26, K4WWQ 24, K4WUH 15, W4TZG 14, W4JVM 12, K4VOP 11, W4VTS 11, K4TAX 10, W4HPN 8, K4LTA 7, W4TYV 6, W4UIO 6, K4CPC 5, K4JXG 4, W4SGI 2, W4UVU 2, W4VNU 1.

GREAT LAKES DIVISION

KENTUCKY—SCM, Elmer G. Leachman, W4BEW SEC: W4BAZ. PAM: W4SZB. RM: W4CDA. V.H.F. PAM: K4LOA. New antennas are going up, rigs are being rebuilt and numerous hamfests are being held. Six-meter activity continues to grow. Ashland (WA4-AXN) contacts Lexington (WA4AXM) also WA4AAJ, WA4HKI, K4WMV, K4TTI. WA4INW K4VEZ has contacted W4AOZ, K4ZUU and W4VLA. K4LOA, our good PAM, should be able to set up relays via these stations. Western Kentucky reports via K4WOL. We need more contacts. RM W4CDA says the going was rough this summer. K4GSU is starting his junior year of medical school at U. K. K4KIS is Asst. EC for Boyle County. W4BAZ wants coordinated activity among all ARRL appointees. The SCM does also. Any suggestions? The Eastern Kentucky Amateur Radio Society (EARS) has a membership of over thirty and is going strong, says WA4APU, reporting for the secy. K4HHG still is traffic champion with a tie in to all major regional nets for cross-country traffic. Feed it to him, boys. K4WJI attended Field Day in Louisiana with W5AVT. Former SCM W4JUI is building more s.s.b. gear and is going mobile on 20 meters. The MKPN has an early session (6:30 A.M. EST) for early birds—later session at 8:30 A.M., all on 3960 kc. Traffic: K4HHG 118, K4KWQ 61, K4DFO 36, W4CDA 17, K4LOA 13, W4ISF 12, W4KJP 11, W4EON 10, W4BEW 9, W4VDN 9, WA4CQG 8, K4WJI 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: W8LOX. RMs: W8EGI, W8QQU, W8FWQ, W8KMQ. PAMs: W8CQU, K8LQA. V.H.F. PAM: W8PT. Appointment: W8WVL as ORS. K8JQP is hospitalized and partly paralyzed from a stroke. K8AEB has a new 75S-3 and a Valiant II. This OT goes back to 1914. W8PCR lost his Hi-Gain vertical by lightning. The FARL still issues "Tin Lizzy" Awards. Contact K8PCD on this. 60 percent of these are on v.h.f. Most clubs now take color slides of their FD activities. Many clubs now have regular transmitter hunts during the summer. During FD, W8ACW worked all bands except 6. K6EFO, ex-W8YIZ, and K7KCH, ex-W8BVY, were back in Michigan on visits. Sorry cannot report all the radio picnics held this summer! W8BAN thinks that 6-meter men not using s.s.b. are missing a good thing. W8DTZ says that: The "5 O'clock Country Cousin Clam Bake" is an informal 10-meter net, Fling Area, that runs from 5 to 6:30 P.M., mostly mobile. W8EFF, K8UOU and K8TXI, are sparkplugs, and 42 different stations have checked in, with some DX. "Project Monitor," same group, monitors this 10-meter band from early morning to 9 P.M.; to help out-of-town mobiles through the Flint area. W8NOH/6 is on 14,075 at 9 P.M. EST. Glad to hear that W8CRM is getting over his heart attack. Recently attended a nice U.P. Hamfest at Munising with over 200 present. K8YQF and K8YQE (father and son) and W8UJC are on 432-Mc. TV with W8MPR nearly ready. W8PT has a good sked nightly with W9AAG on 432 Mc. W8MBH says that 11 stations in this area are using RTTY, a.f.s.k., on 50 Mc. K8PBA now has 900 watts on 144 Mc. all modes. Mrs. W8VPC is doing fine after an operation. It's about time that W8EGI junked that 6L6 buffer! K8GOU suggests that ARRL special membership certificates be issued for each 5 years of consecutive membership. W8EMD is working on a new shack on his "Aurora Acres." Traffic: (July) K8HLR 230, W8IXJ 147, K8KMQ 142, K8PKU 71, W8BEZ 57, K8QKY 52, W4-DSE 47, W8HKT 46, W8EU 39, K8TFE 36, W8FX 35, K8ZZW 34, W8EGI 28, K8NJW 26, K8QLL 21, W8TBP 19, K8VDA 17, WA8AFV 14, K8IUZ 12, K8KQV 12, K8GOU 11, K8GJD 10, W8ACW 7, W8AUD 6, K8LZF 6, W8RTN 5, K8KVV 2, (June) K8PKU 113, K8QKY 32, W8MAI 4, WA8CNT 1.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE. SEC: W8HNP. RMs: W8BZX, W8DAE, W8WTP and K8ONQ. PAMS: W8VZ, K8KSN and K8UNB. The Ohio Phone and Buckeye Nets lost an

(Continued on page 124)

NEW Sonar—MONO-BANDER

SSB transceiver for any one Amateur Band 80 to 10

- 50 db unwanted sideband suppression; and 60 db carrier suppression
- Receiver has 1 microvolt sensitivity for a 10 db s/n ratio
- Receiver employs full time AVC
- 180 watts P.E.P., 160 watts C.W.
- Collins 2.1 kc mechanical filter
- Four way meter function
  1. "S" meter 2. Transmitter P.A. Grid
  3. Transmitter P.A. Plate
  4. Transmitter "A.M.C."
- Driver stages employ electronic tuning
- "A.M.C." (automatic modulation control).
- Vox/anti-vox/push-to-talk
- Upper/lower sideband
- Heavy gauge iridited aluminum construction
- Separate models for 10-15-20-40 or 80 meter band (Commercial frequencies available within this range)

"With 1 crystal for 200 kc coverage. Less power supply and less mike. (Crystal available to cover additional 200 kc segment.)" **$395.00***

World famous for Quality in electronics

SONAR RADIO CORPORATION

73 Wortman Avenue, Brooklyn 7, New York

SONAR RADIO CORPORATION

73 Wortman Avenue • Brooklyn 7, N.Y.

Please send me complete information on Sonar "Mono-Bander."

NAME_____

ADDRESS_____

CITY_____

STATE_____

active member in an auto accident in Tennessee as K8QHH joined the Silent Keys. Columbus ARA's *Carascope* informs us the club held its Annual Picnic, and its code and theory class has been terminated. W8IBX toured Europe with the Capital Univ. Choir and he had eyeball QSOs with HB9AC, OE7RQ, DL1PM and DL9PF. Dayton ARA's *R-F Carrier* states the club held an auction. The ARC of Ohio State University's *WSLT Log* tells of the 831-ft. long wire antenna the club used on FD. K8AOP received his General Class license, K8SQK received his CP-25 sticker, K8MTI received his CP-30 and vacationed in Texas, where he met 5N2AMS. W8UPH received HTH, Cardinal E, Novice and Twin Cities Awards. Canton ARC's seven-page *Feedline* had 19 pictures of FD, and reports W8RHY, WN8RJJ, WN8RZC, WN8DST, WA8DRT, WN8ECJ, WN8EEX and W1UEX/8 are new hams. K8DQW received his General class license, W8UNE has his HBR-16 completed, W8NAL has a new TA-33-Jr, W8YAB vacationed in the Smoky Mts., W8RTR has a new HQ-170 and a TH-4 beam. K8YLK vacationed in VE-Land, the club was advised they had won the Ohio Council's 1961 SS Trophy and W8LCA has the new Collins S Line. We learned that 97 took the General Class examinations at the Lancaster Hamfest with 33 passing the code. Greater Cincinnati ARA's *The Mike and Key* informs us that WA8ECQ talked on Astronomy, K8HHY has moved to Michigan and W8FN was in the city for a month. Clermont County ARC completed its radio school with W8GAL, W8OWP and K8SYS as instructors and had a nice write-up with a group picture in the local newspaper. Your SCM attended the Buckeye Net Picnic in Mt. Vernon, where 16 traffic-handlers met to discuss better traffic methods and to get ready for the winter season's heavy traffic. Springfield ARC's *The Q-5* states that K8WQE, a build-your-own man, showed and discussed a linear final he built, the stork brought W8KPZ a baby girl and K8DCR moved to Colorado. Parma RC's *P.R.C.Bulletin* mentions that K8ZBL received his General Class license, the Cuyahoga County AREC Picnic was attended by about 50 amateurs and their families with the *Outstanding Award Certificate presented to* W8TNB by W8VFU, K8ASK joined the Silent Keys. The Seneca RC held a hidden transmitter hunt. K8BXT sends these news items: W8KAK spent a month in Wales, K8KHS is going to college in Tennessee, WA8EDM has a ham family with WA8BBE XYL, WA8AVL YM and WA8BRD YL; also K8ORG has a ham family with the XYL *as* WA8EDN *and two sons as* WA8BBH *and* WN8EDR. WN8EBJ and WN8EEY are new hams in Ross County as well as WA8EEI and WA8EFX, on 6 meters. Toledo's *Ham Shack Gossip* names W8DN as its Ham of the Month, the Toledo Area hams furnished communications during the Mills Trophy Race, K8RGK is out of the hospital, K8QAY and family visited the World's *Fair*, W8HJF *completed a training course at* Ft. Lee, Va., and W8TTM is now WA4FPR, W8CHT, W8DAE and W8UPH made the BPL in July, W1NBC visited with WA8AJD. Thanks go out to Findlay RC's *WSFT News*, Warren ARA's *The Q-Match* and South East ARC's *Ham Fax* for their bulletins. Traffic: (July) W8UPH 980, W8DAE 749, W8CHT 642, W8BZX 266, K8SQK 149, K8ONQ 47, K8PBZ 14, K8RXD 32, K8BNT 24, W8LZE 19, W8AL 18, K8MTI 18, W8IBX 16, K8KLA 8, K8RYU 6, W8HZJ 4, K8KNS 4, K8DDG 3, W8WYS 3, WA8AJD 2, K8BHH 1. (June) W8PMJ 20, W8QCU 19, W8LZE 13. (May) W8LT 68.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMS: W2PHX and K2QJL. PAM: W2IJG. Section nets: NYS on 3670 kc. nightly at 0000 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc. nightly at 2300 GMT; MHT (Novice) on 3716 kc. Sat. at 1800 GMT; Inter-club on 28.690 Mc. Mon. at 0130 GMT. Appointments: K2IM as EC and WA2UZK as OPS. Endorsements: WA2EKE as OBS and K2DEM as OO and OPS. A Nuvistor converter and hundred watts on 2 meters is reported by K2DNR. K2SJN has a new SB-10 rig with an SX-101A and is doing fine on s.s.b. Nice to meet so many NYSPTEN members at the North Country Radio Club Picnic at *Norfolk July 14*. A delegation including K2SJN, W2AAO, W2APF, K2SJO, W1UED and W2EFU met with Motor Vehicle Commissioner Hulse on July 24. About Oct. 15, all New York State amateurs except Novices will receive application forms by mail for their new 1963 call letter license plates. An additional five dollar charge over the regular registration fee is required and amateurs are requested to return forms and payment within ten days. The call letter plates will be mailed back in January and old plates should be returned to the Department of Motor Vehicles upon receipt of new ones. A word of caution is in order; one speeding violation or similar offense will cause the holder to lose his special plates. The same color as 1962, but designated

(Continued on page 136)

Fun with electroluminescence...

Shortly after the firefly invented phosphorescence, Sylvania invented PANEL-ESCENT® electroluminescent lighting. The source of this cold light is a thin, flat sheet that radiates a soft, green glow when excited by ac. Increasing the voltage and/or frequency increases the brilliance.

Thereafter, one thing led to another--from Nite Lites to radio and clock dials. Then it occurred to us, if we segmented the active areas, we'd have a new and highly practical type of readout device. This resulted in the development of two simple EL (electroluminescent) panels--one with 7 segments that can form the numerals 0 through 9 plus a decimal point;

Fig. 1

and one with 14 segments, to form the complete alphabet. These are shown in Fig. 1. Applications of these EL panels are virtually limitless. For instance, though you would have to have rocks in your head to attempt it in your own workshop, you could construct a pointerless transmitter or receiver scale providing a direct readout of frequency or degrees. In fact, Beckman Instruments, Inc., has adapted Sylvania EL to an entire line of electronic counters and timers which automatically provide digital readouts with decimal point and units of measurement,

Fig. 2

such as MC, KC, mSEC or SEC. In use, it looks like the illustration of Fig. 2.

Recently, we've gone a step further, and developed X-Y Grid Panels for position-plotting displays. They use conductive strips placed at right angles to each other. When the strips are excited, a point of light is produced at the intersection. This point of light is moved from one area to another by selective excitation of the strips. They're available with resolutions as high as 50 lines/inch--which isn't TV, but still pretty nice for making graphics of a sort, depending upon how many cross points you excite simultaneously. You'll get the idea of how the thing works from Fig. 3. If you think you have a possible use for these gadgets in your commercial designs, we have a booklet titled "Sylvania Electroluminescent Display Devices"

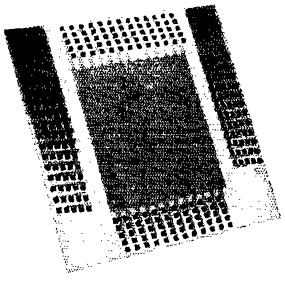


Fig. 3

that's pretty comprehensive. You can get a copy by writing the Electronic Tubes Division, Sylvania Electric Products Inc., 1100 Main St., Buffalo 9, New York.

73,

Bob Lynch

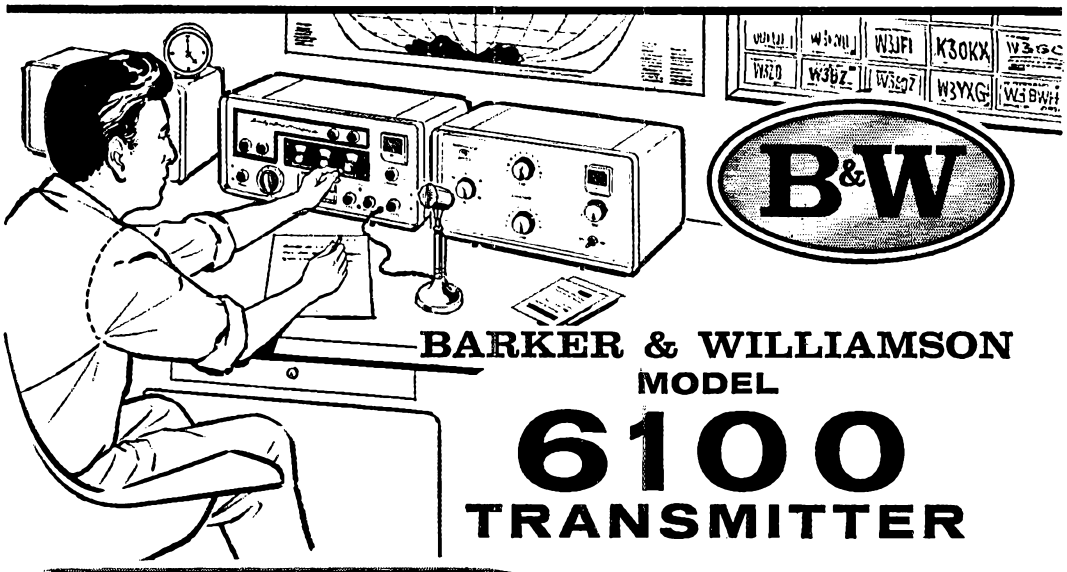
K2RMN

'63, they are very attractive so let's show the Commissioner and people of New York State that radio amateurs are safe drivers. Traffic: (July) W2EFU 223, WA2UZK 206, W2DQW 144, W2THE 136, WA2HGB 131, WA2MID 88, K2SJN 63, W2PKY 34, W2URP 33, K2MPK 17, W2PHX 10, WA2YHA 7, K2DEM 6, (June) K2UTV 1639.

NEW YORK CITY and LONG ISLAND—SCM, George V. Cooke, jr., W2OBU—SEC: W2ADO. RM: W2WFL. PAM: K2HCU. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0015 GMT nightly; NYCLIPN, 3908 kc. at 2230 GMT nightly; V.H.F. Net, Tue.-Wed.-Thurs. 145.8 Mc. at 0100 GMT and Fri. through Mon. on 145.25 Mc. at 0000 GMT; Mike Farad Net 7238 kc. at 1700 GMT; All Service Net at 1800 GMT Sun. on 7270 kc. The Q5 Net operates on 3935 kc. at 2100 GMT. BPL certificates went to WA2RMP, WA2GPT and W2EW for high traffic scores and to WA2TQT for originations and deliveries. This is W2EW's 28th consecutive award for monthly high traffic points. Section net certificates have been awarded to WA2QJU, WA2IUQ and WA2RMP, who also received recognition as the highest scorer outside of Connecticut in the recent Connecticut QSO Party. About Oct. 15 all radio amateurs in New York State, except Novices, will receive forms for ordering their new 1963 call letter license plates. The name and address on the amateur license must agree with the motor vehicle registration. A non-notarized affidavit enclosed with the registration form must be filled out and returned at the same time stating that the applicant holds a valid amateur license and its expiration date. It is urged that applications be returned within ten days accompanied by the usual fee plus an additional five dollar charge. Plates then should be received prior to Jan. 31, 1963. A word of caution: Under present regulations *one speeding violation is cause for rescinding* special license plate privileges. Enjoy your new plates and let's show the public *that radio amateurs are safe drivers.* WA2TQT has installed a new three-element Telrex and an AR22 rotator. K2UBG is mobile on 75 meters with an Elmac 67. WA2EXP received QRP Club Nr. 20. W2EIC worked W6JWD and discovered him to be an old W2 buddy of 25 years ago. An SX-100 has replaced the *S-108 in* the setup at WA2KER's shack. WB2BGS acquired a new license and a bride all in several weeks. WA2WXJ has received his General and is operating all bands with a Globe Chief. WA2PMW worked KL7EBM in Kodiak, running a Gonset G50 and a four-element beam, on 50.3 Mc. Dotty, K2DNY, can be heard on 2 meters with a new GC105 Communicator and is active also as Alternate Net Control on the NYCLI V.H.F. Traffic Net. WA2QEB has gone s.s.b. using an SB-10. WA2GJT now has 21 states confirmed s.s.b. on 50 Mc. WN2CWQ, a new ham in Little Neck, is 10 years old and the cousin of WA2VPJ. W2QPQ has become a charter member of the Amateur Radio Editors Association, recently formed by W8BAH. Alice, WA2VVV, is a new station reporting into the 2-Meter V.H.F. Net, covering the Staten Island Area. The July Bunny Hunt of the Mid-Island 6-Meter RC brought out 20 cars and 65 ardent people and was won by WA2MHJ and his teammate son, K2UWR. WA2GFP reports a new net called the Mystic Midnite Moronic Modulators on 50.225 Mc. Sun. at 0000. WA2BLH traded his KWS-1 and 75A-4 in the basement for the S/line so he could join the family upstairs. K2OZH has taken unto himself a bride. Final plans for the HARC Hudson Division Convention on Oct. 13 are completed. I do hope, as *your SCM, to meet all of you there and talk up section* activity at the series of meetings scheduled and at the ARRL Booth. Traffic: (July) WA2RMP 813, WA2GPT 559, W2EW 527, WA2TQT 431, WA2QJU 249, K2UBG 81, WA2IUQ 63, K2THY 55, WA2EXP 45, WA2GAB 43, W2DBQ 40, WA2RUE 36, WA2LJS 23, K2AAS 21, WA2GFP 16, W2JGY 16, W2JC 14, WA2WYH 13, WA2EFN 11, K2SPG 11, W2EIC 10, K2ASP 8, WA2IMH 7, WA2FUL 6, W2EIC 3, WA2SYD 3, W2IAG 3, WA2WIH 3, WA2KER 2, W2PF 2, WA2PMW 2, K2PQY 2, (June) K2SPG 32, WA2WYH 2

NORTHERN NEW JERSEY—SCM, Daniel H. Earley WA2APY—SEC: K2ZFI. RM: WA2GQZ. PAM: K2SLG. V.H.F. PAM: K2VNL. The section nets, time and frequency: NJN, 2300Z daily 3695 kc., NJPN, 2200Z daily 3900 kc.; NJ 6&2, 0200Z on Thurs. and Sun. 51.15 Mc., 2100Z Tue. and Sat. on 146.70 Mc. Net sessions attendance and traffic: NJN 31, 561, 362; NJPN 31, 456, 127; NJ 6&2 13, 80, 21. New appointments in July: ORS WA2LUD, OPS WA2ZQH, EC WA2GBW, OES WA2JCQ, OO K2VNL. Renewals: ORS W2CVW, OES K2OEI. We want to welcome K2OEI into the NNJ section. We forget to add WA2KIY as a new OBS. K2OKA wants to find a TVI committee in the Metuchen Area. WA2MYB got the

(Continued on page 128)



BARKER & WILLIAMSON

MODEL

6100

TRANSMITTER

SSB - CW - AM

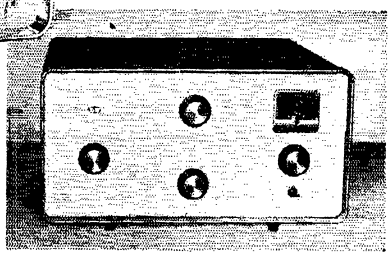
With the

ALL NEW

CRYSTAL CONTROLLED

FREQUENCY

SYNTHESIZER



MODEL

LPA-1

GROUNDED GRID 1 KW LINEAR AMPLIFIER

The B&W LPA-1 Grounded Grid Linear Amplifier is the ideal companion high powered final for Model 6100. The LPA-1 produces a signal of extremely low distortion because of a unique negative feed-back arrangement.

MODEL 6100 - *A NEW STANDARD OF FREQUENCY STABILITY*

Engineered and built for outstanding performance and lasting satisfaction. The B&W 6100 is unsurpassed in stability, sideband suppression, signal quality, talk-power and many other features.

It is the first SSB amateur transmitter employing a crystal frequency synthesizer.

Send for colorful, descriptive brochure.

BARKER & WILLIAMSON, Inc.

Radio Communication Equipment Since 1932

BRISTOL, PENNSYLVANIA • STillwell 8-5581

highest N.J. score in the Conn. QSO Party. It's 17,000 QSO's completed for W2EWZ. I guess anybody who is anything got a picture of Eileen's (K2AGJ) new shack. WA2SRK is working on a 150-watt amplifier. WA2CCE is chief tech. at WFMU (91.1 Mc.). We haven't forgotten those who have applied for appointments but we are going to change RMs and this has confused the issue. Someone says that W2JUU (trustee K2UCY) is QRMing Oscar. W2OXL blew an r.f. choke but will be on soon. K2UKQ wants to pass on 73 to her old Novice buddies. K2VNL, K2UCY and W2OPB. Congratulations, grandma. K2SBS received his 30-w.p.m. sticker. The Windblowers V.H.F. Society, Inc., will hold its eighth annual Big Blow Sept. 29, 1962, on 2 meters. Stations will be in Sam's Point, N.Y.; Redding Ridge, Conn.; Lake Arcadia, N.J.; and High Knob, Penna. Anyone contacting all three will get a certificate. W2ERZ says so. The NJN had an outing Aug. 4 and a good time was had by all. K2AGJ won a call book. W2NAK got a *Mobile Handbook* and W2BZJ and WA2SRK both won lightning calculators. There were 22 net members and 33 guests attending and the fishermen in the group caught 33 fish. A good time was held by all and I think the only casualty was the SCM's sprained ankle when he got going faster than the water skiis. All the NJN members wish to thank WA2GQZ for the work he did in arranging the outing. A lot of the good traffic men in the N.N.J. section were all over the country for the summer but K2UCY was here and made BPL in July. WA2KRC finally got the beam up and says it's swell. Watch out, DX. The South Amboy Radio Assn. provided communications between an airfield in Monmouth Co. and the sky divers airplane in a celebration commemorating the first Air Mail flight between South Amboy and Perth Amboy fifty years ago. Haven't we come a long way. Traffic: WA2SRK 253, WA2BNF 236, WA2JTZ 216, WA2KRC 210, K2VNL 210, WA2APY 207, WA2OVK 111, WA2GQZ 78, WA2LUD 77, WA2WSB 73, W2CVW 55, WA2CCE 49, K2JTU 39, W2TFM 38, W2QNI 27, WA2ZQH 24, WA2AKM 18, K2SLG 16, W2CFB 13, W2ABL 10, WA2IGQ 9, W2OXL 5, K2QGP 5, W2NIY 3, W2EWZ 1.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke* WØNTB—SEC: KØEXN. PAM: WØPZO. RM: WØDUA. OOs: WØQVZ, KØAZJ, KØAKQ, KØWWO, KØYUT. WØNWX visited old friends in the Caribbean during his vacation, among them several VPs and a KV 4. This, along with his activities on 2- and 160 meters kept him busy. WØKHB, WØLSF and **KØHGH** are among the many Iowa hams visiting the Seattle World's Fair. July reports, 160-Meters, Net: QNI 588, QTC 30/31 sessions. 75-Meter Net: QNI 1259, QTC 196, sessions 26. The Fallcorn Net still is breathing, thanks to KØHGH and KØUAA. Traffic: (July) WØSCA 1370, WØLGG 1201, WØHTP 150, KØMMS 145, WØPZO 56, KØRHI 36, KØBGP 35, KØAFI 24, WØREM 24, KØAFG 20, KØKAQ 18, WØBTX 16, WØYDV 13, WØFMZ 8, KØUAB 6, KØZLN 6, WØGQ 5, WØBDR 4, WØNTB 4, KØUAA 4, WØQVZ 3, KØVDY 2, WØNWX 1, KØQKD 1. (June) WØPZO 73, KØAFG 12, WØNGS 3. (May) WØPZO 126.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: KØBXF. Asst. SEC: KØEMB. RM: WØSAF. PAM: KØEFL, V.H.F. PAM: WØHAJ. Nets: KPN, 3290 kc. Mon., Wed., Fri. 1245Z. Sun. 1400Z, 18 sessions: QNS 381, high 42, low 9, average 21.16; QTC 68, high 12, low 0, average 3.71; NCSs WØORB, FHU, KØGII, YTA, EFL, QKS, 3610 kc. daily 0030Z, 31 sessions: QNS 166, high 9, low 2, average 5.11; QTC 79, high 9, low 0, average 2.17; NCSs KØBXF, EFL, IRL, YTA, WØQGG, SAF, FNS, TOL, KSBN, 4 sessions: QNS 31, high 10, low 6, average 7.3; QTC 2, high 2, low 0, average 2. KØFSW has a new fuvader and is working DX. WØOJV and his new Swan are mobiling with great results. WØFON and his XYL as well as his KØIZW, XYL and family attended the World's Fair. KØEMB is back from an eastern trip after installing company equipment. We wish to thank KØJWW, WØWFD, WØABJ, WØALD, WØASY and WØFDJ for their splendid help on KPN. Without our faithfuls we would fail. *Wanted*: C.W. operators interested in keeping the QKS Kansas C.W. Net, on 3610 kc. daily at 0030Z, one of the best. Traffic: (July) WØSAF 216, KØEFL 57, WØFNS 27, WØABJ 24, KØYTA 21, KØGII 20, KØLHF 20, WØTOL 14, KØEMB 13, KØHVG 13, KØRWC 8, KØQKS 4, WØWFD 4. (June) KØYTA 79, KØQKS 7.

MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØWNZ. RMs: WØOUD, KØONK. PAMs: WØBYL, WØTPK, WØLEE (V.H.F.). Net reports: (July) PON (Mo.) (3810 kc. 2100 GMT M-F), 20 sessions; QNI 206; QTC 108; NCSs: WØHVJ 11, KØBWE 5, KØPIQ 2, WØTXC 1, KØVIQ 1. Mo. SSB (3963 kc. 2100 GMT Tu-Th), 9 sessions; QNI 122; QTC 57; NCSs: WØPXE 5, WØOMM 4. MSN (3517 kc. 2200 GMT M-F, 1400 GMT

(Continued on page 130)

your choice of 2 GREAT EICO® TRANSMITTERS...

designed by Hams... for Hams...

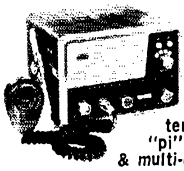
to the highest Ham standards

90-WATT CW TRANSMITTER* #720
Kit **$79.95** Wired **$119.95**
*U.S. Pat. #D-184,776
"Top quality"—ELECTRONIC KITS GUIDE
Ideal for veteran or novice. "Clean" 90W CW, 65W AM-phone with EXT plate modulation. 80 through 10 meters.

60-WATT CW TRANSMITTER #723
Kit **$49.95** Wired **$79.95**
"Compact; well-planned layout. Clean-sounding, absolutely hum-free carrier; stable." — ELECTRONICS WORLD.
Perfect for novice or advanced ham needing low-power standby rig. "Clean" 60W CW, 50W AM-phone with EXT plate modulation. 80 through 10 meters.

TRANSISTOR CODE PRACTICE OSCILLATOR #706
Complete with battery
Select variable tone, flashing light, or both together. Phone jack for private use. Efficient speaker: clean loud signals.
Kit **$8.95** Wired **$12.95**

New! **CITIZENS BAND WALKIE-TALKIE #740**
Complete with rechargeable battery and charger. 9 transistors, 1 diode. Full superhet. U.S. made.
Kit **$94.95**
Wired **$79.95**



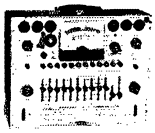
CITIZENS BAND TRANSCEIVERS U.S. Pat.
770 Series
Superhet; prealigned xmitter osc; match antennas by variable "pi" network. Single & multi-channel models.
From Kit **$79.95** Wired **$109.95**

HIGH-LEVEL UNIVERSAL MODULATOR-DRIVER #730
Kit **$49.95** Wired **$79.95**
Delivers 50W undistorted audio for phone operation. Can plate-modulate transmitters having RF inputs up to 100W. Unique over-modulation indicator. Cover E-5 $4.50.

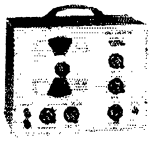
GRID DIP METER #710
Kit **$29.95** Wired **$49.95**
Includes complete set of coils for full band coverage. Continuous coverage 400 kc to 250 mc. 500 ua meter.

PEAK-TO-PEAK VTVM #232
& exclusive *UNI-PROBE®
Kit **$29.95**
Wired **$49.95**
*U.S. Pat.
VACUUM TUBE VOLTMETER #221
Kit **$25.95** Wired **$39.95**

DC-5MC LAB & TV 5" OSCILLOSCOPE #460
Kit **$79.95**
Wired **$129.50**
5" GENERAL PURPOSE SCOPE #427
Kit **$69.95** Wired **$109.95**



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
ELECTRONIC INSTRUMENT CO., INC.
3300 NO. BLVD., L.I.C. 1, N. Y.
Export Dept., Roburn Agencies, Inc.
431 Greenwich St., N.Y. 13, N.Y.

EICO, 3300 N. Blvd., L.I.C. 1, N. Y. QST-10
☐ 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.

Name.....
Address.....
City.....Zone.....State.....
Add 5% in the West.

ENGINEERS: Excellent career opportunities in creative electronics design. Write to the Chief Engineer.
VISIT EICO ROOMS 518 & 522, NEW YORK HI-FI & MUSIC SHOW, OCT. 2-7.

S), 24 sessions; QNI 142; QTC 167; NCSs: KØONK 9, KØFPC 6, KØVPH 5. KØGFA 4. MEN (3885 kc. 2400 GMT MWF), 13 sessions; QNI 317; QTC 192; NCSs: KØVPH 5, KØONK 4, WØTPK 3, KØWNZ 1. SMN (3580 kc., 2200 GMT Su) 5 sessions; QNI 17; QTC 10; NCSs: WØOUD 5. MON (3580 kc. 0100 GMT, Tu-S), 26 sessions; QNI 182; QTC 177; NCSs: WØOUD 11, WØKIK 6, KØFPC 4, KØVPH 4. WØRTW 1. It is with considerable regret that we must report the resignation of KØLTP and KØLTJ as SEC and Asst. SEC, respectively, because of a change in QTH to Texas. KØWNZ, the new SEC, already is doing an excellent organizational job. WØTPK was elected PAM/MEN Mgr. to succeed KØWNZ. Appointments: As SEC, KØWNZ; as PAM/MEN Mgr., WØTPK; as OES, WØRVA; as OO (Cl. II and IV), KØPYB. Endorsements: As PAM (v.h.f.), WØLFE; as OBS, WØKCG; as OO (Cl. III and IV), KØJPL; as ORSs, KØFPC and WØWYJ. As OO (Cl. I and IV), WØWVH; as OO (Cl. III and IV), KØVXU; as ORS, KØRPH; as OES, WØIFC; as OO (Cl. I and IV), KØOYU; as Asst. SEC; as PAM/MEN Mgr., KØWNZ; as OES, KØLCB. Cancellations: As SEC, KØLTP; as Asst. SEC, KØLTJ; as PAM/MEN Mgr., KØWNZ; as OES, WØIFC; as OO (Cl. I and IV) KØOYU; as OPSs, WØEEE and KØLTJ; as ORSs, KØHIM, KØBLJ and KØVBU. Appreciation is expressed to the following OESs for fine reports: WØCMI, KØLCB, WØRVA, KØFPC; also to OOs KØJPL and WØWVH. Traffic: KØONK 1353, KØVPH 508, KØFPC 334, KØGFA 171, WØKIK 80, WØOUD 62, KØVIQ 57, KØUWZ 51, WØOMM 44, WØPXE 40, WØBUL 31, KØVBT 26, WØRTW 23, KØWNZ 23, WØBVL 17, WØAYB 16, KØRPH 15, WØGBJ 4, WØOVV 2, WØWAP 1.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTSU. New appointment: KØYDS as ORS. Morning Nebraska Phone Net, KØDGW NC, reports QNI 569, QTC 99. Nebraska Emergency Phone Net, WØHXH NC, reports QNI 550, QTC 31, new members KØAMY, WØFTW and WØNOW. The Western Nebraska Phone Net, WØNIK NC, reports QNI 543, QTC 49, 100 per cent check-in WØDVB, WAØAES, KØAIE and KØBMQ. The Nebraska Section C.W. Net was on informal roll call during the summer but became active again Sept. 1. The Central Nebraska Amateur Radio Club's Annual Hamfest was held at Halsey Park July 22 with about 50 in attendance. The Annual North Platte Hamfest was held at Cody Park Aug. 5 with about 100 in attendance. All ECs and AREC members are urged to check into the Central Nebraska AREC Net each Sun. at 0830 CST on 3960 kc. KØPZS is NC. Traffic: (July) KØYDS 68, WØOKO 60, WØFNH 59, KØDGW 53, KØKJP 48, WØNIK 35, WØLOD 28, KØYZP 18, KØZEO 18, WØEGQ 17, KØGAT 17, KØMISS 14, KØUWK 13, WØYFR 13, WØVZJ 10, WØGGP 9, KØMZV 8, WØSJF 7, WAØBES 6, WØCGH 6, WØNOW 6, WØWKP 4, WAØAES 3, WØHOP 3, WØAHB 2, WØDSU 2, KØFJU 2, WØKFY 2, KØVTD 2. (June) KØVDS 27, KØSBV 11.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr., W1CHR—SEC: W1EOR, RM: W1KYQ, H.F. PAM: W1YBH, V.H.F. PAM: W1FHP. Traffic nets: CPN, Mon.-Sat. 1800. Sun. 1000 on 3880 kc.; CN, daily 1845 and 2000 on 3640 kc.; CVN, Tue., Thurs. and Sat. 2030 on 145.98 Mc.; CTN, 0900 on 3640 kc., all local times. W1BDI has been putting gear together for son WN6YGN. K1BSY is converting a DX60 to 6 meters. The Tri-City ARC plans a hamfest on Oct. 20, Crocker House, New London. W1QV is Chairman. K1GZJ and W1YNP are new s.s.b.ers. W1NTH is s.s.b.ing and just made DXCC. K1s OJZ, ONW and K2DDZ/1 are new on CPN. K1PUG has been Acting EC for Thomaston. K1QPN is building a 20-15-meter quad and is active in CPN with a new 300-watt rig. K1UPE built a 40-meter vertical in the cellar and can't get it out! KN1UVR is using a Knight T-60. KN1UVT is in the service. KN1UWR is having TVI problems. K1SBB is relocating the shack. K1RTS likes his 2-meter 7-over-7 beam. K1PKQ enjoyed the July CD Party. W1OJR made his first sport parachute jump and continues to add to his DX record now at 272/265. K1TTA has his General, thanks to K1EAO. A new YL in Waterbury is KN1WSN. KN1WKC's father is a new Novice, KN1WWV, in Hamden. K1HTV caught Oscar II on 23 passings. The Hamden ARA operated FD from Gaylord Mt. W1UWV experienced unusual QRM—lions roaring and elephants trumpeting from local circus animals. W1TYQ has been visiting the States on leave from Saudi Arabia. K1IVR should be back on the air soon. K1HUH traded in his DX-40 for an Invader. K1TBC got married and will live in So. Carolina. His brother, K1RVL, has a new 6 and 2 converter and broad beam—no front-to-back ratio! K1WTB runs a Heath Comanche on 6 with an eight-

(Continued on page 132)

HERE'S THE VHF COMBINATION THAT BEATS 'EM ALL!

For DX or contests . . . for scatter, aurora or satellite tracking . . . for "rock-crusher" reports or just plain "chewing the rag" . . .

Put yourself behind this power-packed Clegg VHF ham station . . . **we guarantee** you'll "out-talk", "out-receive" any other commercially-built amateur VHF transmitter and receiver now available!

Take, for instance, Clegg's ZEUS VHF Transmitter. It gives you full coverage of the amateur 6 & 2 meter bands and associated Mars frequencies, with maximum TVI suppression. Automatic modulation control with up to 18 db of speech clipping provides magnificent audio with "talk power" greater than many kilowatt rigs. This beautiful unit with its ultra-stable VFO is the ultimate in VHF equipment for amateur and Mars operation.

Clegg's all new INTERCEPTOR VHF Receiver, designed for the serious operator on these bands offers performance features unmatched by presently available equipment for these frequencies. Exactly matching the famous Zeus Transmitter, the Interceptor offers reception with virtually no cross modulation. Nuvistor RF stages provide an extremely low noise figure with high sensitivity. Stability is ideal for the exacting requirements of SSB and CW.

Write for Complete Information!

Amateur Net Prices:
ZEUS, $695.
INTERCEPTOR, $473.

MONDAY, OCTOBER 1
Coming Soon!
Clegg's new Venus 6 Meter SSB Transceiver also Clegg's new Thor VI & II 50 watt Transceivers for 6 & 2!

Clegg LABORATORIES

502 RT. 53, MT. TABOR, N. J. • OAkwood 7-6800

element beam. K1LOM is building a kw. s.s.b. amplifier. W1LIG converted a T-23/ARC-5 to 6 and 2. K1LAL is building a 420-Mc. transceiver. K1BHY is strictly a DX hound. W1KAM is concentrating on DX also. W1ASK is getting the urge to be active again choosing 2 meters. I'm unable to run for SCM again after my term expires Dec. 9. You should all give serious consideration to a qualified replacement and nominate him for election. Contact me if you want details on needed qualifications and required duties. Connecticut deserves a top section leader so give this project serious thought. *Then act.* Traffic: K1MZM 550, W1VVA 134, W1AW 122, W1RZG 119, WA2CCF/1 108, W1NJM 96, K1GGG 91, K1PPF 88, K1EIC 66, K1DGK 65, K1HTV 59, W1OBR 55, K1HVV/1 52, W1EFW 51, W1YRH 37, K1QPN 34, K1HTV 32, W1FXS 30, K1PUG 30, K1LFW 24, W1CUH 20, K1MBA 16, W1BDI 13, W1QV 12, W1LUH 11, K1TTA 10, W1BNB 9, K1ONW 7, K1ONZ 6, K1QVX 6.

MAINE—SCM, Albert C. Hodson, W1BCB—SEC: W1GRG. PAM: K1ADY. RM: K1KSG. Thanks to all for their assistance and especially to Net Control Stations during the past year for their patience under adverse conditions. K1MZB established a record in traffic handling with a count of 566 messages for the International Girl Scout Roundup at Button Bay, Vt., and a total for the month of 1142. Most were relayed directly to their respective call areas by Bob. He also is c.w. operator for *Cumberland County RACES headquarters.* Many 2-meter openings were enjoyed during July with openings to W2s from points in southern and coastal Maine. Six-meter openings were reported by K1GPJ with contacts as far as the West Coast. Sorry to report W1HMW as a Silent Key. K1ADY, W1EXD, W1CBV and K1DTW found the Pinehill golf course a good spot for the mobiles between rounds. Ellsworth and Knox County Radio Clubs were presented ARRL affiliation charters July 12 by New England Director Milt Chaffee. W1EFW, W1GPY received special recognition for his excellent performance while on duty with the U.S.S. *Tills.* Traffic: K1MZB 1142, K1LPC 295, K1MDM 27, K1BZD 17, K1DYG 14.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—SEC: W1AOG. Reports were received from EC's W1ACB, W1AAU and K1ICJ. K7OTR, W1BIO and W1ALP visited W1AKN and his son, K8MZD, was there, too. W1JBP is a Silent Key. The Whitman ARC is new. Officers are W1HAU, pres.; K1CHC, secy.; K1TZC, treas. The club will have another school for theory and code this fall. The Massasoit ARA and the Lexington HS Radio Club are now affiliated with the ARRL. W1OFK, while on vacation at Manomet, met K1PLU. K1ELY now is in No. Andover. K1BUF and W1ZQM were married and now live in Somerville. W1SVU is a new OO. K1TFV, ex-WA6KHA, has an SX-71, VLF ARC-5. K1KEC was mobile on a trip. K1MOD has a Valiant transmitter, an SX-100 receiver and a TA-33 jr. beam on 20 and 15 meters. W1NF has a new Plymouth and will have a 2-meter rig in it. K1DYA would like to make skeds with DX stations on 6 meters and will have a Telrex four-element beam for 6 meters. K1VBN is up in New Hampshire. K1RHY passed the General Class exam. K1ICJ, our Sharon EC, sends in a very nice report and says their net is on 51.9 Mc. K1UZM is treasurer of the Mass. V.H.F. Society. The club met at K1AAA's in July and had a time at W1KCO's QTH. K1VUT passed the General Class exam, as did K1SPP. The Massasoit ARC held a Family Day Picnic. K1HFG sent out a club bulletin. KN1YAS is a YL. The EM2N had 22 sessions, 166 traffic, 242 check-ins. K1VBN's father is K1WYN, K1DFJ had a nice write-up in our local paper. KN1WUB has an HT-40 transmitter and an R-55 receiver. K1OJQ is out of the service and has a Valiant. W1BB is busy on 160 meters. W1DDX has an a.m. and s.s.b. rig for 2 meters and is working on one for 220 Mc. K1JJU has been in the hospital but is coming along. K1OGD has a Valiant. K1KPD is on all bands. W1PEX made the BPL again. W1BGW has worked 12 new countries in the past few months. W1AUQ is up in Montreal. K1PVV has a Valiant and an NC-109. The 6-Meter Net had 284 stations, 43 traffic. EM75N had 221 stations, 74 traffic. The Tewksbury ARA's experimental ground communication is being conducted by K1LQJ. The REC Net is on Mon. nights at 7:30 on 147.325 kc. This is an open net and W1AAU says anyone is welcome to check in. The Dedham C.D. Net held a meeting with W1SH, RO, and W1AAU, EC. W1JLL, up in New Hampshire, kept in touch on 2 meters with his Dedham net. By the time you read this your SCM will have a new QTH, and I will advise all nets and clubs of same. Traffic: (July) W1PEX 698, W1ZSS 187, W1AWA 174, W1OFK 150, W1DGM 98, W1EMG 87, W1EAE 80, W1SIV 44, W1VYS 31, W1AOG 27, W1AUQ 23, W1AU 23, K1DGI 22, K1QNZ 17, K1LCQ 12, W1FJJ 11, W1GEK 5, K1BGK 4, K1OCD 4,

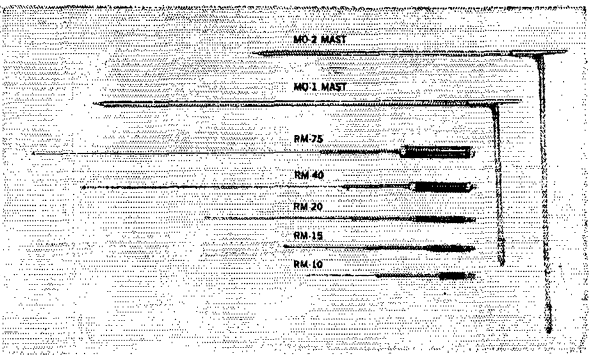
(Continued on page 134)

GOOD MOBILES GO...

HUSTLER

10-15-20-40-75 METERS

NEW-TRONICS MOBILE ANTENNA



● *Now, Get Fixed Station Reports with the "HUSTLER"*

Buy only the mast and resonators for the bands you operate. No need for matching devices, no feed line length problems. Use any length of 52 ohm cable. This is a new, efficient concept of center loading. Each of the five resonators has a coil specially designed for maximum radiation for a particular band. Center frequency tuning is by means of an adjustable stainless steel rod in the resonator.

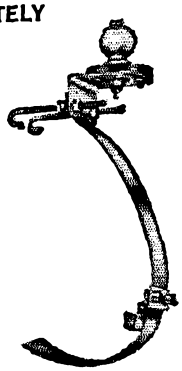
The 54-inch fold-over, heat treated, ½-inch aluminum mast permits instantaneous interchange of resonators. Mast folds over for garage storage. When opened to full height, the two sections of the permanently hinged mast are held rigidly in position by a shake proof sleeve arrangement. Mast has ⅜-24 base stud to fit all standard mobile mounts. Power rating is 75 watts dc input A.M. — 250 watts PEP input for SSB.

ANTENNA ASSEMBLY CONSISTS OF 1 MAST and 1 RESONATOR

Part No.	Description	Total Height of Antenna	Amateur Net
MO-1	54" Mast folds at 15" from base	(For Rear Deck or Fender Mount)	$ 7.95
MO-2	54" Mast folds at 27" from base	(For Bumper Mount)	7.95
RM-10	10 Meter Resonator	Maximum 80" — Minimum 75"	5.95
RM-15	15 Meter Resonator	Maximum 81" — Minimum 76"	6.95
RM-20	20 Meter Resonator	Maximum 83" — Minimum 78"	7.95
RM-40	40 Meter Resonator	Maximum 92" — Minimum 87"	9.95
RM-75	75 Meter Resonator	Maximum 97" — Minimum 91"	11.95

ANY MAST OR RESONATOR MAY BE PURCHASED SEPARATELY

FITS MORE CARS THAN ANY OTHER BUMPER MOUNT!



MODEL BM-1 Flat alloy steel strap fits tightly against any shape bumper yet is inconspicuous. Length of strap permits its attachment to both large and small bumpers.

Assembly is held in place by two "J" bolts at the top of the bumper and strap clamp at the bottom. "J" bolts may be inserted between top of bumper and car body where clearance is as low as ¼".

Whip receptacle assembly consists of a heavily chrome plated 1½" die cast Zamak ball with ⅜-24 thread. Adjustable so as to maintain whip in true vertical position. Black phenolic base. All metal parts of the bumper mount are heavy cadmium plated. $6.95

See these outstanding NEW-TRONICS products at your electronics distributor. If he cannot supply you send check or money order for immediate delivery. Write for literature on the complete NEW-TRONICS line.

NEW-TRONICS CORP. 3455 VEGA AVENUE CLEVELAND 13, OHIO

K1RHY 4, W1BGW 2, W1GMT 2, W1SVU 2. (May) K1MVN 32.

WESTERN MASSACHUSETTS—SCM, Perry C. Noble, W1BVR—SEC: W1BYH/K1APR. RM: K1IJV. PAM: K1RYT. You will note that our section has a new Phone Activities Manager, K1RYT/K8BDZ, David Angel, Green River Road, Williamstown. He is a newcomer to our section but has had plenty of experience in phone nets having been NCS of the Ohio Phone Net for quite a few years. Let's get behind him and get a good West. Mass. phone net going once more. RM K1IJV reports that WAIN cleared 65 messages during July with the high stations in attendance being K1SSH, K1PES. W1BVR and K1LBB. K1RNI, K1RNH and W1FBF moved up from Tech. to General Class. K1TLY and KN1WGN are working on a 420-Mc. TV transmitter. KN1WVK is a new Novice in Gardner. K1JQT has a new Globe Scout and V.F.O., and will be operating from Hiram College in Ohio come fall. W1BYH/K1APR is now on sideband with GSB-100 and is working on a linear. New officers of the Montachusett Amateur Radio Club are W1BYH/K1APR, pres.; W1MDS; 1st vice-pres.; W1JTL, 2nd vice-pres.; and K1KBS, secy-treas. Following is the list of our Emergency Coordinators. Get in touch with the one nearest you and get signed up in the Amateur Radio Emergency Corps! W1AMI, Henry Loiselle, 501 Grafton St., *Worcester;* W1BKG, Milton A. George, 35 Ridgeway Ave., *Pittsfield;* W1BYH/K1APR, Norman L. Rivers, 18 Saari Pkwy., *Fitchburg;* W1DEV, William L. Dunn, 35 S. Prospect St., *Lee;* W1EFC, Charles R. McLain, 89 Dennison Lane, *Southbridge;* W1HRV, Osborne McKeraghan, 22 Mutter St., *Easthampton;* K1LNC, Edwin Petzolt, 190 West Broadway, *Gardner;* W1LRA, Alden E. Bosworth, 10 Noble Ave., *Westfield;* W1NLE, Robert A. Adolphson, 38 Larkspur St., *Springfield;* W1OBA, John H. Kenney, 75 Alger St., *Adams;* W1OY, Morris Kasanof, 420 Sumner Ave., Springfield (for *Westover AFB*); K1PCW, Ely W. Wyman, 316 Log Plain Rd, E., *Greenfield;* and W1RFU, William Rosner, Cadwell Dr., *Wilbraham.* Traffic: K1RYT 580, W1BVR 135, K1IJV 133, K1LNC 107, K1SSH 68, K1PES 43, K1JQT 38, K1LBB 34, W1EFC 4.

NEW HAMPSHIRE—SCM, Ellis F. Miller, W1IIQ—SEC: K1GQK. PAM: K1NXV. GSPN meets Mon. through Fri. 2300 and Sun. 1330 on 3842 kc. CNEN meets Mon. through Sat. 1030 on 3842 kc. NHN (c.w.) meets Mon. through Sat. 2330 on 3685 kc. Appointments: K1NXV as PAM, W1ARR as OPS and ORS. We are pleased to announce the appointment of K1NXV as PAM. Roger is a loyal Net Control of the GSPN and as such qualifies for the job. Good luck, Roger. We are sorry to lose W1TFS from our midst. Ty has been transferred to Alaska. Hope we can work you on 20, Ty, when you get settled. By the time this report is printed SCM elections may have been held. Please let me thank you one and all for the splendid support given me during my term of office. It has been really appreciated. The Midstate ARC held a cookout at K1NXV's on July 29. Swimming, waterskiing, horseshoes and pranks were the order of the day. The chocolate-covered pickles were the gastronomic event of the day. Needless to say, all had a bang-up time. K1PDA still is going strong on 50-Mc. DX. Traffic: W1TA 64, W1QGU 52, K1DQM 39, K1IIK 13, W1AGM 9, W1BYS 8, K1NYS 6, K1OGU 6, W1SWX 2.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: W1PAZ. RM: W1SMU. PAM: W1TXL. The RISPN reports 30 sessions, 443 QNI, 79 traffic. The NCRC of Newport installed new officers at its Annual Meeting July 14 at Newport. W1JFF was installing officer for the following officers: W1TXL, pres.; K1DPY, vice-pres.; K1IRK and KN1VQO, program; W1MMX, membership; W1WLG, certificates, W1ETM and K1PTV, code and theory; Phil Gaudett, sr., publicity. K1TPK spent his vacation at Stow, Mass., working portable 1 and while there worked 22 states. The W1AQ Club of Rumford reports that it has new cement steps with the club call tiled in the top step. K1RLE was elected a club member. The W1DDD Club of Woonsocket has received civil defense equipment and is sponsoring a drive to get more members into the RACES program. K1TTD of the club has a new General Class license. During the recent Newport Jazz Festival the following amateurs provided radio communication with the c.d. and local police: W1s TXL, JFF, MMX, ETM, JAF, WLG, LUO, K1s UCT, EGE, PHO, STB, OZI, GRC, MYU, RPC, JED, PTV, DZX, LRR, MCT, IRK, ELI, NJT, and KN1s VQO, TDE, WQN. Traffic: K1NEF 778, W1TXL 541, K1DZX 30, K1GRC 19, K1SXY 15, K1TPK 8.

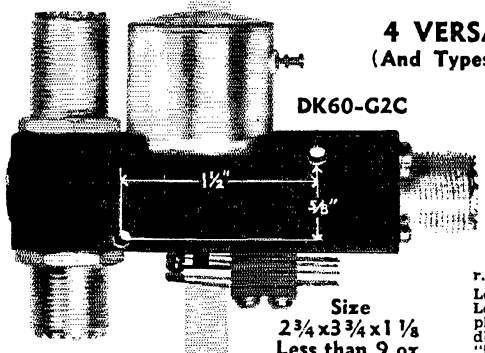
VERMONT—SCM, Miss Harriet Proctor W1EIB—SEC: K1DQB. PAM: W1HRG. RM: W1KRV. Vermont amateurs appreciate the assistance of the many operators outside the state who relayed and delivered the more than seventeen hundred messages originated at aa(*Continued on page 136*)

DOW-KEY GUARANTEED

UNCONDITIONAL GUARANTEE
(We will repair if faulty within 1 year)

DK60 SERIES COAXIAL RELAYS

4 VERSATILE MODELS, A.C. or D.C.
(And Types C, TNC, BNC, N, UHF Connectors)



DK60-G2C

Size
2¾ x 3¾ x 1⅛
Less than 9 oz.

★ All Relays in weatherproof boxes for exterior installation.

★ Ganged, multiple position switch arrangement available for remote control selection of antennas.

STANDARD RELAYS WITH TYPE UHF CONNECTORS INCLUDE:

- DK60—SPDT r.f. switch.
- DK60-G—SPDT r.f. switch with special "isolation" 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 "isolation" connector in de-energized position.

DK60 SERIES from $12.45

r.f. SPECIFICATIONS:

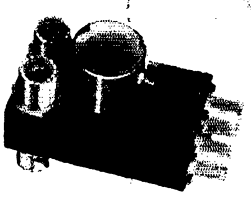
Low VSWR: less than 1.15:1 from 0 to 500 mc. **Low Losses:** Pure silver contacts. Parts in crucial positions plated with fine silver. **Low Cross-Talk:** (greater than 80 db) in DK60-G and DK60-G2C through use of patented "isolated connector" (in energized position). **High Power Rating:** (a) 1 kw 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:

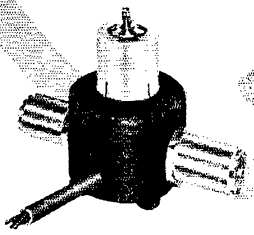
Wide Variety of Coil Voltages: 6,12,24,32,48,110,220 D.C. coils at 2.0 watts; 6,12,24,110,220 A.C. volts at 6 volt-amps, 50-60 cps. (Special voltage or resistance available on request.) **Less Than 50°C Temperature Rise Above Ambient:** Maximum operating temperature is 100°C except on special order. Auxiliary contacts available for power control — DPDT at 5a. 110 v A.C. on DK60-2C and DK60-G2C.



DOW-KEY NEW DK2-60 DPDT r.f. SWITCH

For switching two coaxial lines simultaneously. Specifications similar to DK60 series.

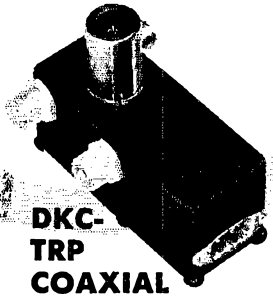
DK2-60 .. $19.00



DOW-KEY RFB PREAMPLIFIER

50 to 70 ohm impedance matching "broadband preamplifier." Increases over-all gain by 1 to 6 "S" units on all bands (1.5 to 30 mc.). 1-⅜" x 1-⅜" x 2-¼". Wt. 10 oz. Bring up weak signals!

RFB .. $10.75



DKC-TRP COAXIAL ELECTRONIC TR SWITCH

Operates in 1.8 to 30 mc. range, 120 v. A.C. Low VSWR, TVI proof, rated maximum legal power.

DKC-TRP $27.75

DKC-71 SINGLE POLE SIX-THROW COAXIAL RELAY

REMOTE SELECTION OF R.F. SOURCES

Weatherproof, electro-magnetic, less than 1.1:1 VSWR at 100 mc, 1 kw power rating, available in UHF, N, BNC, TNC & C connectors. Continuous duty, over 1,000,000 operations. 5-¾" x 2-¾", silver plated connectors.

DKC-71 .. $49.50

SPECIAL CATALOG FOR MILITARY AND INDUSTRY AVAILABLE

DOW-KEY COMPANY
700 DLRS. & DIST. IN U.S. & CAN.

THIEF RIVER FALLS MINNESOTA

Button Bay Girl Scout Roundup. Many thanks to all in the state who did the many needed jobs, both large and small, with the assistance and leadership of K1-DQB. We wish we could name everyone. W1UXK is active in Bennington, both fixed and mobile. The CVARC has applied for a club station. The club has provided communications for three swim meets, doing it on 420 Mc. New amateurs in Chester are KN1UZG and KN1-UZK. Welcome to them, as well as to KN1WNE, KN1-WRP and KN1WSS in the Newport Area. The BARC held International Field Day under the leadership of W1HRG.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—The FARM Net meets at 0200Z on 3935 kc. The Gem State Net meets at 0300Z on 3580 kc. The Intermountain Weather Net meets at 1345-1420Z on 3970 kcs with W7-DLW as net manager. K7LLA was appointed EC of Twin Falls County to succeed W7SGS, who moved to Utah. Friends of W7VQC set up a rig in his bedroom and he's handling traffic while recuperating. W7EEQ's rig is silent; she fell in her kitchen and broke 4 ribs and injured her right arm. K7KRO was elected president of the WIMU Hamfest for 1963. K7HLR, editor of *Hambone News*, would like comments on issuing a "Worked Idaho Counties" certificate. W7BSP is Idaho's first CHC member and W7GGV is the first YL member. New amateurs are KN7s TNS, TTH and K7PLU. W7-GSF and family visited K7KBY, his buddy in the Pacific during WW II. FARM Net traffic: 49; Gem State Net traffic: 45. Traffic: (July) K7KBY 78, W7FBL 63, K7NNM 37, K7OAB 30, W7VQC 23, W7GGV 14. (June) W7EEQ 7.

MONTANA—SCM, Ray Woods W7SFK—SEC: W7-BOZ. PAM: W7YHS. RM: K7AEZ. The MPN meets on 3910 kc. at 1800 hours M-W-F; the MSN meets on 3550 kc at 1830 hours TTS; TSN meets M through F at 1200 hours on 7230 kc. The Glacier Hamfest was well attended and the Butte gang did a real fine job. W7UWY vacationed in Eastern U.S. K7ECF is back after his trip to the hospital in California. Missoula hams met at the *home of W7JIZ and had a fine picnic.* W7CLB and W7-CLC will move to Harlowton in the interest of the Minitman Missile Project. Eleanor Mead, the XYL of SK W7LCM, visited W7NPV and W7OOY at Harlo. W7BOZ had a short visit from his brother Ollie, who is now stationed in Hawaii. K7MEG is heard with a new Heathkit linear. W7IDK is putting out some "Gobblety Gook." Miles City radio officers are W7YUP, pres.; K7JLM, vice-pres.; K7KJH, secy.; and K7JLL, act. mgr. W7BOZ and W7SFK, with their wives, spent several days in old ghost towns rock hunting. Quite a few Montana hams attended the Four-State Hamfest at Macks Inn in Idaho. W7QYA and W7VMB went from the Glacier Hamfest to the World's Fair at Seattle. Traffic: K7EWZ 160, W7SKF 2, W7BOZ 1.

OREGON—SCM, Everett H. France, W7AJN—SEC: W7WKP. RM: W7MTW. Section nets, times GMT:OSN, 3585 kc, 0230 Tue.-Sat.; OAREC, 3585 kc, 0330 Wed.-Thurs.; AREC, 3875 kc, 0300 Tue.-Sat.; OEN, 3840 kc, 0200-0300 daily; AREC V.H.F., 50.550 Mc, 0400 Fri. W7ZFH, OSN manager, reports sessions 20, attendance 212, traffic 118. BRAT Awards went to W7MTW, W7-ZFH and K7IWD, also to K7DYY and K7SQC for 100 per cent attendance. OAREC, sessions 7, counties 5 with a total attendance of 33, traffic 5. AREC V.H.F., sessions 4, attendance 42. The Portland Roses held its first Field Day in June located on top of Mount Scott, using the club call K7UER. The YLs and XYLs made 200 contacts using surplus gear and a gas-operated field *generator and a Communicator on 6 meters. Station* operators were W7ZMN, W7REU, W7GRC, W7ZKY and W7HPT. The Southern Radio Club of Grants Pass held its Annual Picnic with 63 adults registered. K7PUV is working DX on 40-meter c.w. with 80 watts input and an inverted "V" antenna. K7DVK now is using an eleven-element 220-Mc. Yagi. Activities were slow during July and your SCM took a little vacation from the daily networks. Traffic: (July) K7IWD 266, W7ZFH 101, W7MTW 54, W5RVN 44, K7JVN 22, W7DEM 21, W7AJN 17, W7MAO 14, W7BVH 10, K7PUV 4, W7YG 4, W7DIC 1. (June) W7BVH 8.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—SEC: W7HMQ. RM: W7AIB. PAM: W7LFA. Nets in the Washington sections are WSN-3535 kc, 0200Z; WARTS-3970 kc, at 0130Z; CBN-3960 kc, at 0230Z; NSN-3700 kc, at 0400Z. About 200 attended the annual hamfest of the Washington Amateur Radio Traffic System (WARTS) at Lake Wenatchee, with QPZ taking home the top prize. A new 6-meter net on 50.4 Mc, Mon. through Sun. at 2000 PDST has been established with K7PIG as temporary mgr. Members of the Radio Club

(Continued on page 138)

AMECO LEADER in COMPACT, QUALITY HAM GEAR

NUVISTOR PREAMPLIFIER
for 27, 28, 50, 144 or 220 MC.
Lower noise figure
Over 20 db gain.

Model PV—Uses 6CW4 Nuvistor. Improves gain and noise figure of present converter or receiver. Specify frequency.

Model PV Wired & tested **$13.95**

Model PH—Uses 6CB6 tube—for any frequency or ham band, 2 to 27 MC. Wired & tested **$13.95**

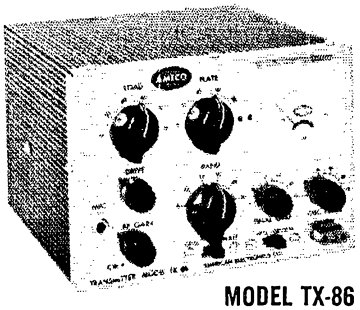
MOBILE CONVERTERS

Require only 12 volts B+. Crystal controlled. For any FM or AM frequency or band from 2 to 54 MC. **Model CLB**—for 6 meters or citizens band. **$24.95**
Add $1 for any other frequency

Model CLB

SquelchANLimiter

A combination squelch & noise limiter. Requires only 12V B+. Model . . . SNL-12, for 12V or SNL-6, for 6V, **$17.95**. Noise Limiter alone, Model ANL-6 or ANL-12, **$7.95**



MODEL TX-86

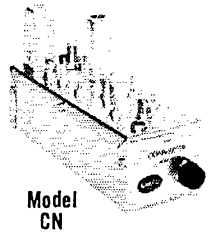
COMPACT 6 thru 80 TRANSMITTER

SCOPE PATTERN SHOWING 100% MODULATION OF TX-86

The TX-86 is an attractive, compact (only 5" x 7" x 7") transmitter that can handle 90 watts input on CW and 90 watts peak input on phone on all bands. It is ideal as a fixed or mobile unit. The new modulator circuit produces modulation that cannot be distinguished (with a scope) from push-pull plate modulation (see photo above).

Tube lineup:—12BY7 oscillator, a 6BQ5 buffer, a 6146 final modulated by a 12AX7 and a 6AQ5. Power requirements of 6 V at 3.2A or 12 V at 1.6A and 300 V at 75 ma. plus 600 V at 150 can be supplied by PS-3 for fixed use or W612A for mobile. Smaller power supplies can also be used. Other features include: Final operates STRAIGHT-THRU on all bands, push-to-talk mike jack; Pi-net output ckt., true potentiometer drive control (no detuning of circuits), can take crystal or VFO.

Model TX-86K Kit (specify 6 or 12 V)..... **89.95**
Model TX-86 Wired (specify 6 or 12 V) **119.95**
Model PS-3 Power Supply, Wired **44.95**
Model W612A 12 V Mobile Minn.-Honeywell Power Supply **54.95**



Model CN

NUVISTOR CONVERTERS
For 50, 144 & 220 MC
High Gain, Low Noise

$49.95 wired **$34.95 kit**

Two Nuvistor RF stages, a Nuvistor mixer and a 6J6 osc. give lowest noise figures and high gain. Ameco convertors do NOT become obsolete as their IF output is easily changed to match any receiver. All CN models (CN-50 for 6 meters, CN-144 for 2 meters and CN-220 for 1¼ meters) are available in ANY IF output. (Specify IF output in order.) Specs. Noise figure 2.5 db at 50 MC; 3.0 db at 144 MC; 4.0 db at 220 MC. Gain 45 db average, image and spurious rejection—better than—70 db. IF rejection—better than 100 db. Power required—100 to 150 V at 30 ma, 6.3 V at .84 A. See PS-1 Power supply.

CB-6

Tube-type low noise, high gain converters. IF easily changed. Specify IF.

CB-6K — 6 meter kit, 6ES8-rf Amp., 6U8-mix./osc. ..only $19.95

CB-6W—6 meter wired & tested $27.50

CB-2K—2 meter kit, 6ES8 1st rf amp., 6U8—2nd rf amp/mix. 6J6 osc. only $23.95

CB-2W—2 meters wired and tested. $33.95

Model PS-1—Matching Power Supply—plugs directly into CB-6, CB-2 and all CN units. **PS-1K—Kit .....only $10.50**

PS-1W—Wired $11.50

EASY TO UNDERSTAND AMECO BOOKS

Amateur Radio Theory Course	$3.95
Amateur License Guide	.50
Radio Operators' Lic. Guide, EL 1-2	.75
Radio Operators' Lic. Guide, EL 3....	1.75
Radio Operators' Lic. Guide, EL 4..	1.25
Amateur Log Book	.50
Radio Electronics Made Simple	1.95

CODE PRACTICE MATERIAL

Ameco has the most complete line of code records, code practice oscillators and keys. Code courses range from start to 18 W.P.M. and are on 33, 45, or 78 r.p.m. records. Model CPS oscillator has a 4" speaker and can be converted to a CW monitor.

Code courses on records .....from	$ 4.95
Model CPS-Code oscillator, Kit	13.75
Model CPS-Code oscillator, Wired	14.95
Telegraph Keys .....from	1.00

Write for complete details on code courses and other ham gear.

Ameco equipment is available at all leading ham distributors.

Dept. Q-10

AMECO EQUIPMENT SALES CORP. **178 HERRICKS RD. MINEOLA, L.I., N.Y.**

Affiliated with American Electronics Co. and Ameco Publishing Corp.

of Tacoma held a family type picnic at the QTH of HF on Hood Canal. W7RGD is doing a nice job on communications during the salmon bakes at Pt. Defiance State Park. The WSN had 22 sessions 192 QNIs and 114 QTCs in July. The NSN had 25 sessions and 203 QNIs with 101 QTCs and has 47 members. W7BTB reports tests are being conducted on the 10- and 160-meter bands for nets during the coming possible blackouts. K7PIG received his Official Experimental Station appointment. K7JRE is a new ORS in the Bellevue Area. W7AIB took a business trip to Pittsburgh, Pa. W7IEU has just completed a net history of the Northwest Slow Speed Net (NSN). W7AMC has donated the Moose Horns he won last year at the Waterton Lakes International Hamfest to the group as a perpetual trophy. K7s PVF and PVG are sporting a new Invader 2000. W7OEB and family were visitors to the World's Fair in Seattle and Ev took home a TH-3-Tribander. W7CXJ and family took in the Glacier Hamfest. K7OFW and W7CUD have their new Heath s.s.b. rigs on the air. W7CWN has finished his new v.f.o. W7SAB installed a new 6-2-meter beam. K7CWO and his new XYL are living in Richland. K7-GGQ is moving to Montana. W7JBN again is being heard on NSN. W7NO, of Port Townsend, joined the ranks of Silent Keys. K7BKY operates portable from a fire lookout in Southwestern Washington. K7QMG still is looking for rare DX on 6 meters. The 6-meter gang is thinking of starting Bunny Hunts again. K7ODC heads communications for the junior fair in Sumner. W7MCU is working out a call system for Pierce County AREC; also sports a New Yorker with AF-68 and PMR receiver. W7HMQ was elected president of the Puget Sound Council of Amateur Radio Clubs. K7USO is making lots of QSOs from the World's Fair in Seattle. W7WHV and her OM attended the Lewis County ARC and Northwest Amateur Radio Communications System Picnic near Olympia with about 37 other hams. W7NWK has his new Knight V-44 v.f.o. working. K7JHA, W7-BA, W7DZX and W7PGY made the BPL in July. Traffic: K7JHA 1329, W7BA 932, W7DZX 865, W7PGY 519, W7GIP 224, W7APS 159, W7OEB 149, W7GYF 61, W7-AMC 35, W7IEU 33, K7MWF 29, W7AIB 20, W7JC 11, K7JRE 4, W7BTB 2.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—K7-ICW found some good 50-Mc. openings during June, with his XYL, W7SNP, working the DX. Their new eight element 6-meter beam is doing a fine job. K7NYU and KN7QZM are new members of the Las Vegas AREC 2-Meter Net using Heath "twoers." K7KRH is using 4E27s in the final of the new 6-meter s.s.b. rig. K7AIN and KN7TYE showed color slides of their stay in Ethiopia at the last SNARC meeting. The latter is a new ham in Las Vegas. W7SHY has returned to Fallon after a stay in KG6-Land. Nevada Achievement Certificate No. 80 was awarded to W7DZB. W7MWF now is in Boulder City. K7FBM, Fallon, and W7VIU, W7QYK and W7VR handled Powder Puff Derby traffic through Nevada. The son (ex-KN7LFM) of W7KOA and XYL W7QYL broke his leg in a fall in Ruby Mts. and was missing four days. He is recovering nicely in Elko Hospital. Traffic: W7VIU 715, W7PBV 10.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—The Monterey Bay RACES Net is called on 147.16 Mc. at 0100 GMT Tue. (Mon.) by W6HXY of Watsonville. Some 30 members check in regularly from around the Bay, Gilroy, and Hollister with liaison stations from San Jose, Carmel Valley and even Oakland RACES. Seems like everyone took a vacation in July. K6DYX tried it in June but got snowed out of the High Sierra. W6NVO had good luck salmon fishing up Trinidad way. K6BBF is back from the Seattle Fair. W6ZLO has returned from his extended motor trip to the East Coast. W6DEF is flying with the family to N.Y.C. and D.C. K6ZCR has been taking short trips to Clear Lake, Carmel and Big Sur with visits to ham friends and club meetings. W6RSY has a new T-150 Knight transmitter. W6AUC is out of the hospital after a hernia operation brought on by hoisting a heavy transmitter. K6MTX has been working WA2WUV on an RTTY sked. W6VMY still is burning because work made him miss the V.H.F. Party. K6KCB, RM, is forced to resign as RN6 manager because of the job. We have a new OO, W6ASH of Los Altos. Traffic: (July) K6KCB 601, K6GZ 190, W6-YBV 141, W6RSY 100, W6DEF 92, W6AUC 87, WA6EIC 65, W6AIT 54, K6DYX 54, W6OII 32, K6YKG 23, WA6-TNY 21, W6RFF 18, W6UVB 15, K6EQE 9, W6ZLO 7, K6ZCR 6, K6VQK 4, WA6OLQ 1. (June) W6UW 19.

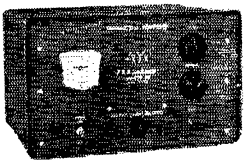
EAST BAY—SCM, B. W. Southwell, W6OJW—WA6-RGD is setting his sights on going RTTY. WA6MXJ and K6QXY have their joint tower up 100 feet and have only 30 feet to go before installing dual spiralrays. WA6-VAT has a new modulator and is running out of wall

(*Continued on page 140*)

P & H PRODUCTS

TOP'S IN VALUE/QUALITY/PERFORMANCE

the VHF TWINS



MODEL 2-150 TWO METER TRANSMITTING CONVERTER

Converts the output of your 10 to 100 Watt SSB, AM or CW exciter to TWO METERS, retaining all exciter features. POWER INPUT to 7854 final: 175 Watts PEP on SSB, 165 Watts CW, 90 Watts Linear AM. Built-in 3 section power supply. Quiet forced air cooling. 50 ohm input/Output.

MODEL 2-150 Complete with tubes and crystal $329.95

MODEL 6-150 SIX METER TRANSMITTING CONVERTER

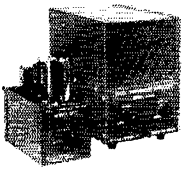
Converts the 20 Meter output of your SSB, CW or AM exciter to SIX METERS, retaining all exciter features. POWER INPUT to 8117 final: 175 Watts PEP on SSB, 165 Watts CW, 90 Watts Linear AM. 50 ohm input/Output. Built-in 3 section power supply. Quiet forced air cooling.

MODEL 6-150 Complete with tubes and crystal $299.95

MODEL LA-400C LINEAR AMPLIFIER

This popular 80 thru 10 Meter Bandswitching Linear gives you 800 WATTS PEP on SSB; 400 Watts CW, FSK or FM; 230 Watts Controlled Carrier Linear AM or 185 Watts Constant Carrier AM. Uses four 1625s (or 837s on request) in GROUNDED GRID. Low Z 50-70 Ohm input and output. Drive it with any 20-100 Watt exciter. Built-in power supply using 816s.

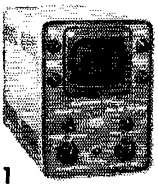
MODEL LA-400C Complete in Kit form..... $179.95
Wired and Tested Complete.. $219.95



MODEL AFC - 1 and AFC - 2 AUDIO FILTER COMPRESSOR AMPLIFIERS

INCREASES TALK POWER and PREVENTS OVER-MODULATION. Works on AVC principle, with up to 50 DB compression. Single knob control. Dual circuitry also allows it to be used between receiver and speaker for constant level reception. Model AFC-1 requires external power supply. Model AFC-2 has built-in power supply and 3 step filter. Model AFC-2CW is designed for extremely sharp CW reception.

MODEL AFC-1 (less power supply)..... $32.95
MODEL AFC-2 Complete..... $54.95
MODEL AFC-2CW Complete..... $54.95



MODEL DI - 1 RF DISTORTION INDICATOR

Designed for correct adjustment of linear amplifiers, SSB exciters and transmitting converters. 3" scope tube displays RF trapezoid or envelope patterns. Simple in and out connectors for 50-70 ohm coax. No tuning required. Handles any power 5 to 2000 watts. Any band 160 thru 6 Meters. MODEL TT-1 accessory plug-in two tone oscillator unit provides the ultimate method of transmitter adjustment.

MODEL DI-1 Complete (less two-tone oscillator) $99.95
MODEL TT-1 Two-tone plug-in oscillator unit $19.95

MODEL 6 - 160 HI POWER RF CHOKE

An extremely husky RF Choke for use in any type amplifier. Inductance; 162 uh at 1 KC. Current rating; 2500 Ma. 5000 V. dc insulation. Effective on all bands 160 thru 6 Meters.

MODEL 6-160 ..... $3.85

MODEL AR - 1 TRANSCEIVER ANTENNA TRANSFER UNIT

Solves the problem of using your transceiver to drive a linear amplifier. Front panel switch provides operation of; transceiver to antenna; transceiver to linear to antenna; with receiver to antenna connections automatic in either case. Small and compact. Extremely low loss. Four coax connectors on rear. Requires 6.3 V ac (provided by KWM-2 jack) or can be used in various other equipment combinations as an antenna relay.

MODEL AR-1 ..... $32.50

Prices slightly higher west of Rockies.

WRITE FOR COMPLETE INFORMATION ON ALL P & H PRODUCTS

P & H ELECTRONICS INC.
424 Columbia • Lafayette, Ind.

space for awards and QSLLS. WA6VAT is a new OBS. WA6LGE got his HTH-25 and HTH-50 Awards. WA6PRX, WA6LGE, W6IZU, WA6LGD, K6OKO and K6MIS participated in the July 4th Boat Parade in Vallejo; all but K6OKO and K6MIS were maritime mobile. WA6MIE has a new Swan rig on 7 Mc. WA6KUK is recuperating from a detached retina eye operation. K6GK, 68 years old, has joined the Peace Corps and will teach radio communications to the people of Malaya. K6YSS has a new QTH and put up a vertical. W6TYM is the new trustee of the LARK Club. The MDARC meets at the Red Cross Center on Ygnacio Valley Road, one mile east of Walnut Creek, the 3rd Fri. of each month. WA6LVX/6 is teaching electronics at summer Camp in Yosemite National Park. This is Mariposa County for WACC award aspirants. The HARC meets the 2nd and 4th Fri. nights at the club house. Write Box 113, Hayward, Calif., for directions. New members of the HARC are WV6ZXU, WV6ZXS, WV6WXM, K6SFY, WV6ZXK, WA6MJY and ex-9ALG. WA6RXN has his General Class ticket. W6NYK is portable 4 in Tennessee. WA6JCS is on 50 Mc. The HARC had a 24-member turnout for FD location operation. WA6PKN is building 50-Mc. gear. K6SPP blew 2 transistors in his mobile power supply after his return home. WA6GPB is roving ambassador of the Early Worms Net. WV6ZXU has a new Eico rig and an RME-4700. WV6ZXK had the thrill of his first contact recently. W6IFF visited Canada and the World's Fair. W3WAU/6 is moving to Florida. WA6LSU is a new General call in Hayward. W6ICR/Ø is vacationing in Nebraska. K6VXJ has returned from a trip to KH6-land. WA6KUN was discharged from active reserve call-up with the USN Aug. 1. The XYL of K6SPP is studying for her ticket. K6TKL is awaiting his SWAN dealership franchise. WA6NLG is interested in starting a club in the Milapitas Area. *Coming soon*, the Greater Bay Area Hamfest. Contact your club secretary for information. W6OJW is sweating out the last few QSLLS for his USA-CA-500 award. Traffic: (July) WA6RGD 277, W7QOH/6 15. (June) WA6RGD 356. (Apr.) WA6WHR 8.

SAN FRANCISCO—SCM, Wilbur E. Bachman, W6BIP —*S.F. Club*: WV6VLX, the new editor, is doing a fine job. K6IPM resigned as vice-pres. because of a heavy work sked. W6AGN now is a Silent Key. WA6IVM offers to help anyone interested in learning the code. SE 1-3533 any Sat. A.M. *BAYLARC*: YLs WA6JGR, WA6PKP. W6BDE, K6NIW and W6GQC gave such good support to the S.F. Club on 6 meters during FD. *Humboldt and Far West Club*: WV6GYC has a new YL. W6FBK is getting along okay after being very ill in the hospital. Joe Conroy has charge of obtaining a building for club meetings for the Far West Club. W6SLX visited the YL and grandchildren in Sonoma. *Marin Radio Club*: K6LCF says the club had its station active at the Marin Art and Garden Fair. Emphasis was on MARS but both ham and MARS frequencies were used on s.s.b., a.m., c.w. and RTTY. Amateurs are invited to see the Hamilton Air Force station in Bldg. 442 any day during the regular weekly business hours. *Tamalpais Radio Club*: W6MQQ spoke on s.s.b. as used in Telephone Co. servicing. He illustrated his subject with slides. More than 20 showed up for the club's FD. DL9LJ, of Kiel, Germany, visited the club at one of its regular meetings. WA6BXV soon will return from overseas bringing a new XYL. SEC W6KZF notes, "Be sure your local club net is signed up with C.D. Thus members participating in drills or actual emergency operations are covered by State Compensation Insurance in case of accident. Keep in touch via the AREC Net, 3900 kc. 10:30 A.M. Sun." *Notes*, W6KZF now has a 3-kw. 110-v. a.c. generator. W6GQA faithfully participates in Frequency Measuring Tests. K6LHV reports 6-meter opens to KF-KØ. WA6BPN has been doing lots of c.w. operating on 6 meters lately. K6OHJ's new address as of November will be 2306 Monserat Ave., Belmont. WA6MDL put up a new antenna on 75 meters, then a new 40-meter 3/4 vertical supporting a 75-meter dipole on top of it. WA6ADX observes that 6 meters was very active because of good band conditions. W6DEF, Northern Calif. Net, requests that all net business mail be addressed to WA6DAU, Dee Rigg, Clovis, Calif. WN6ABI is a new call in the HAMS ranks. There was a fine turnout at the HAMS meeting for guest speaker W6BF. WA6NDZ worked K7LPB on 6 meters. WA6ROJ listened in on 2 meters and made observations of Cosmos II on 20.006 kc. W6GQA and W6FDU were active in the July CD Party. Traffic: WA6MDL 62, W6GGC 12, W6JWF 10, K6OHJ 10, W6GHI 8.

SACRAMENTO VALLEY—SCM/Asst Director, George R. Hudson, W6BTY—Asst. SCM/SEC: Antone F. Buzdas, K6IKV. ECs: W A6ONK, K4VPN/6, K6BNB, K6GOT, W6LSW, K6BYS. OBSs: W6AF, K6HHD, K6EIL, WA6CJU. OOs, W6WLI, K6ER, K6HEZ, W6ZJW, K6EIL, WA6NAU, W6FTH, W6GDO. ORSs: W6WGO.

(*Continued on page 142*)

POLY-COMM®

6

TRANSCEIVER

Nuvistorized 14 tube Dual Conversion Transceiver	$299.50
Nuvistor Preamp	13.95
Mini-Load VFO	59.95
DC Power Supply	29.95
Prof. Mobile Mike	16.95
Mobile Mounting Bracket	5.95
TOTAL VALUE	**$426.25**

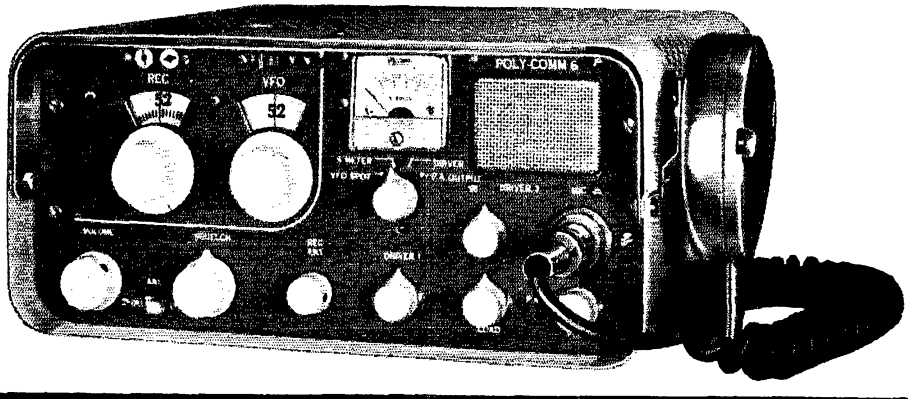
now only $319.50

"outperforms others costing more, because it's worth more!"

What's the catch? There isn't any. $299.50 is the full price for the new Poly-Comm 6 AC model. It's a new type of transceiver animal . . . **THE EQUIVALENT OF A STEER THAT'S ALL STEAK.** Dual nuvistor rf amplifiers insure unparalleled sensitivity (.1mv at 6 db S/N). Exclusive MINI-LOAD VFO with adjustable differential capacitor maintains virtually zero drift under any and all adverse conditions. And that's not all . . . it includes 10 watt RF output, ultra sensitive squelch and noise limiter, illuminated S meter that doubles for tune up, 14 tubes, 10 diodes for top performance, teflon wiring, weather-proof speaker and steel case. Even the microphone and mounting bracket is included and there's no extra charge for CD units. What else do you have to pay? Nothing, unless you want the AC/DC model and that's only $20 extra. In every respect Poly-Comm is the choice of professionals for top performance and value. We suggest you see your dealer now while the low price still prevails.

Additional facts and specs available on request. Write

POLYTRONICS LAB Inc. 388 Getty Avenue • Clifton, New Jersey



W6CEI, K6YZU, PAM; W6GQS, OES; W6PIV, OPSs: W6WGO, K6EIL, W6PIV, W6GQS, WA6PVT, WA6ONK. A tip of the hat to WA6SJD, Aerojet ARC's new prexy, and his committee for hosting a bang-up Sacramento Valley inter-club meeting. Honored guest and speaker was Mr. Handy, W1BDI, Vice-Pres. and Communications Manager of ARRL. W1BDI was introduced to Valley hams by Mr. Engwicht, W6IIC, ARRL Pacific Division Director, who was accompanying the ARRL Official to Pacific Division sections prior to Mr. Handy's departure for the National ARRL Convention in Portland. WB6AMV/K6ROU is state fingerprint examiner and a newcomer to Sacramento. K7DGF, from Seattle, passed through on the way to Stockton and will operate portable running 5 watts on 6 meters. K5LAZ/6 at home station runs a KWM-2 driving 4/1000Z and 15 watts on 2 meters with a twenty-element spiralray; on mobile Dave runs a KWM-2 and a Communicator IV in a 1952 ½-ton truck and packs along enough food for one man for 30 days! WA6PVT vacationed in Seattle. W6WGO reports new Mission Trail Net officers are W6RHA, prexy; WA6JKB, vice-pres.; W6RXX, secy.; and K6RZM, treas. K6LFH, senior engineer and designer of the Oscar Group, was featured speaker at the recent MARS club meeting at Sacramento's McClellan AFB with over 150 in attendance! W6KTB has a new G-76 on the air. WA6NDL, W6GTG, WA6DGH, W6QPX, W6VHT and K6ZFI were heard working the RAMS Net frequency while mobiling to the fair in Seattle. W6QHP and family are mobiling to Utah and trying out a new HX-20. Traffic: W6WGO 73, K6HEZ 29, WA6PVT 16.

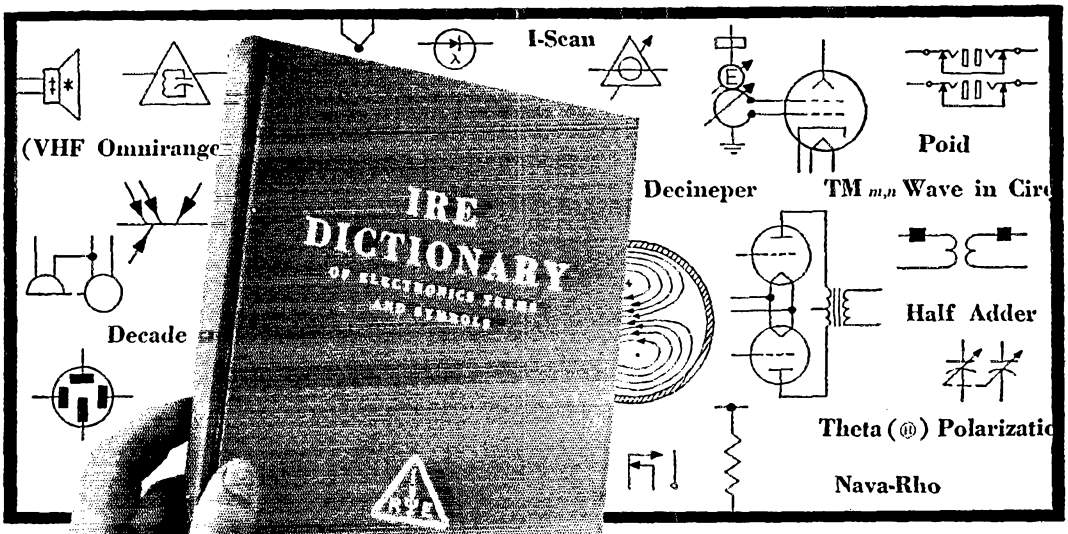
SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—W6BVM is trying to break 300 countries. WA6OYP has a Swan, and will be mobiling soon. WA6GJA is on 2 meters mobile. The Modesto gang is going to use 10 meters for mobile communications. W6FXV is on 75 meters with a home-built transceiver. W6PXP is heard on 20-meter s.s.b. working VR3s. W6KTW is on 20-meter s.s.b. with a beam reading for KH6-Land to talk with his son. W6JPS is on 6 meters daily holding skeds with K7EBS who is at the Girl Scout Camp. W6ZFN has an SX-101. K6QOK is on 40 meters with an SX-99 receiver and his rig is giving him trouble. The newest call around town, General Class, is WA6RQB. K1LVW, ex-K6SNA, is back in Modesto and is on 2 meters. WA6FUF has reported to the Navy for a 2-year term. WA6LTK is on 6 meters from Rio Vista. W6NCG is the call of the f.m. 2-meter repeater located on Mt. Breckenridge. Talk in frequency is 146.06 and talk out is 146.9 Mc. This is f.m., not a.m. The SJVN had an election and the following officers were elected: W6CUA, pres.; K5CWB/6, net mgr.; WA6IYU, asst. net mgr.; WA6BXW secy.-treas. The club reports 838 check-ins, 86 contacts, 26 traffic, 17 QST, 2 phone calls and 13 bulletins. Traffic: W6ADB 146, W6JPS 57, W6EFB 20, K6AXV 2.

ROANOKE DIVISION

NORTH CAROLINA—SCM, N. J. Boruch, W4CH—SEC: W4YMI. RM: K4CPX. VHF PAM: W4ACY. We regret to announce as Silent Keys W4US, of Wilmington, one of our real old, old-timers, and K4TPZ, of Black Mountain, former manager of NCN. K4QFV and W4BUZ are putting their OBS appointments to good use by retransmitting many O.L. Bulletins. W4BUZ also reports running propagation study and scheduling daily at 10 A.M., 3 and 6 P.M. K4WVP is constructing a 220-Mc. converter and adds that 220-Mc. activity is growing in Burlington. W4OAB suffered extensive damage to his antenna arrays during the Charlotte storm. W4BAW is hard at work on his k.w. linear and announces that the Coastal Carolina Emergency Net is now operating each evening at 7:30 on 3905 kc. As usual, WA4FJM and W4FUI made their fine OO reports. K4JYN tested 10-KMC. and 1250-Mc. signals with good results. K4LTG was appointed Radio Officer for New Hanover County C.D. Known as the CRAB Net, and operating nightly on 50.2 Mc. for over two years now, are the following stations in the Wilmington Area: K4RVD, W4OQS, W4KYB, W4VNK, W4EC, W4LWS, K4SRM, K4VGY, WA4GBW, WA4SLG. Congratulations to W4MDA, who received his A.B. from U.N.C. and has accepted a position at New Hanover High School to teach Spanish. Traffic: K4CPX 109, WA4FJM 105, W4BDU 70, W4BAW 64, W4LSX 59, K4IEX 57, K4YCL 33, WA4ANH 25, K4QFV 25, K4MPE 11, WA4DAA 6.

SOUTH CAROLINA—SCM, Lee F. Worthington, K4HDX—PAM: K4KCO. RM: W4PED. Nets: C.W. (SCN) 3795 kc. 1200 GMT; A.M. (SCEN) 3930 kc. 0030 GMT; S.S.B. 3915 kc. 0100 GMT. My thanks to the ARRL members for their confidence in electing me SCM. We all owe a vote of thanks to the outgoing SCM, W4GQV, for over four years of devoted work. New appointments: W4VIW as OO Class I; K4FPF as OES.

(*Continued on page 144*)



GET THIS NEW ELECTRONICS DICTIONARY FOR YOUR BOOKSHELF!

3,700 *terms officially defined, many illustrated, in IRE's authoritative reference work*

Letter and graphical symbols also explained

CHECK YOURSELF:

From Absolute Delay to Zoning (Stepping), there are over 3,700 electronics terms you need to be aware of. How many do you actually know? How many can you define? Some terms have more than one meaning; are you sure you have the right, the scientifically accurate, the IRE Standard definition?

There's no need to carry around 3,700 definitions in your head. Have them handy on your bookshelf, instead, in IRE's Dictionary of Electronics Terms and Symbols. Every term accurately defined; many illustrated by simple, grasp-at-a-glance diagrams.

PART I of the new Dictionary is compiled from 37 IRE Standards on electronics terms, organized and published by The Institute of Radio Engineers over an 18 year period. Each definition cites the Standard from which it was taken; where a term is used in more than one field, and has more than one meaning, each is listed under a separate entry.

PART II of this 225 page volume is a Dictionary of Symbols, made up of five IRE Standards: Letter Symbols for Electron Tubes; Letter Symbols for Semiconductor Devices; Graphical and Letter Symbols for Feedback Control Systems; Graphical Symbols for Semiconductor Devices; and Graphical Symbols for Electrical Diagrams. A four-page index to graphical symbols is included.

THE INSTITUTE OF RADIO ENGINEERS
1 East 79th Street, New York 21, N. Y.

Please send me ..... copies of your complete new Dictionary of Electronics Terms and Symbols.

☐ I am an IRE member. Am enclosing $5.20 per copy.
☐ I'm not yet a member. Am enclosing $10.40 per copy.

Name.....

Company.....

Address.....

City.....State.....

K4KCO has been endorsed to continue as PAM. W4AKC is running for reelection as Vice-Director of the Roanoke Division and deserves our full support. The Spartanburg ARC assisted in recovering model planes via 75-meter mobiles at the All Dixie Model Air Meet on July 7-8. K4FYI *is the new* SCEN net mgr. W4TLC reports poor conditions on 220 Mc. during July. The Mike & Key Club of Greenville staged a hamburger fry on Aug. 10. All S.C. clubs are urged to forward their Field Day scores to the SCM for state recognition. W4VIW is installing s.s.b. on 80-2 meters and reports 6 meters open in July. The DX ARC of Camden held a picnic Aug. 26. Traffic: K4OCU 83, W4AKC 50, K4WOI 46, WA4DGH 39, W4ANK 35, K4LND 18, WA4CSO 12, K4YFK 10, W4VIW 4.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM: H. J. Hopkins, W4SHJ. SEC: W4VMA. RMs: W4LK, K4ITV, W4IA, W4SHJ, W4QDY. PAMs: W4BGP, W4UFX, K4JQO. Your Director, SCM and Asst. SCM attended the VFN picnic at Gordonsville in July and the Hamfest at Winchester in August. W4UFX was elected the new manager of VFN and K4JYL asst. mgr. K4TSJ reports DX 56/45 with WAC. Newcomer WA2EBR/4 *is trying to get set up.* K4QIY is activating the club station. OBS W4OWV reports a busy month. W4ZM likes the new Virginia-Locator, as do many others. The *Virginia Ham* is being sent to more and more of our active (net) members. W4OID, EC, of Eastern Shore, is lining up his AREC gang. W4QDY is endeavoring to get his AREC group on 10 meters without much luck at this writing. Two missing traffickers showed up recently —K4KNP and K4JKK. Interest is picking up rapidly in the VAH-500 and the Virginia Merit Awards for traffic work. W4JUJ picked up 2 new countries and worked both the Phone and C.W. CD Parties. In the Washington, D.C., Area W4NVX is working on a new rig and W4WBC is busy putting together a Marauder with too many pieces. Hi. W4FOR changed rigs, celebrated two birthdays as well as the arrival of Nr. 2 grandson, then wondered what was the matter with his traffic total. W4NTR reports a nice traffic total in the Intercontinental Tfc. Net. W4RHA gives his half-gallon credit for helping with the traffic totals. W4PTR is a new ORS in Lynchburg and is ready to go on 160 meters if necessary for traffic. Traffic: (July) W4DLA 301, W4SHJ 283, W4RHA 262, W4NTR 240, W4FOR 221, W4WDZ 160, W4LK 139, K4RNH 115, W4ZM 86, W4NVX 82, K4ITV 46, W4PTR 42, WA4BIK 41, W4QDY 30, K4FSS 28, K4IIP 28, K4TSJ 22, W4IA 18, K4AL 12, W4JUJ 12, W4CVO 11, W4OWV 9, WA2EBR/4 8, K4SGQ 6, W4BZE 5, WA4DUW 5, K4JKK 4, K4MLD 4, W4TE 3, W4KX 1. (June) W4ZM 104, K4RNH 84, WA4BIK 60, K4PQV 54, W4CFV 18, K4JQO 4, K4QIY 1. *(May)* K4JQO 17.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8SSA. RM: K8HID. PAM: K8CFT. ECs, ORSs and OPSs are needed. WVN C.W. meets on 3570 kc. at 0000 GMT and WVN Phone on 3890 kc. at 2330 GMT. W8ZWM is a new OBS in Elkins and K8PJC is OBS in Hinton. The Phone Net reports 12 sessions, 334 stations and 34 messages. C.W. Net reports 12 sessions, 72 stations and 47 messages. W8LD, ex-W8JKN, now teaching in Baltimore, will be on s.s.b. from Buckhannon after September. K8ZPR, now active on 3890 kc., will be glad to give you Hancock County. K8CSG is back home after Army service. K8JLF will be inactive while attending Duke. K8MQB received the new CHC award. K8BIT finds time to work RTTY along with his duties as editor of *Splatter*. All West Va. amateurs interested in Centennial QSLL cards should contact T. D. Foster, K8HID, Tornado, West Va. K8TSB's OES reports are outstanding. Fairmont, Morgantown, Clarksburg, Grafton and Wheeling are now linked on 144 Mc. A dependable link is needed with the Kanawha Valley. Have you and your club made a contribution to the ARRL Building Fund? Traffic: K8UQY 45, K8LOU 23, K8CSG 22, K8JLF 14, K8ELH 12, W8JM 5, W8JUE 5.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: WØSIN. PAMs: WØCXW, WØIJR and WØGNK. RMs: WØFEO, KØDTK. OBS: KØDCC. Send activity reports to 920 West Adams Pueblo, Colo., by the 5th of each month. Congratulations to the DRC for a very successful Rocky Mtn. Division Convention. WØBWJ, Division Director, reported that there were 417 registrations. The speakers were KL6KG, 5N2AMS and ZL1AAX. Also on the program were W6SAI, W1LVQ and KØOOA. WØSIN, Colorado's SEC, writes that he has not heard from many of the ECs for a period of six months or longer. ECs are requested to keep their SEC informed. *The CTNN is in the red and needs an editor.* Any volunteers should write to the SCM. TWN moved to 7060 kc. for the summer. WØKQD is recovering from surgery. The Colorado Springs hams were on hand to provide communications for the Pikes Peak Annual Auto

(Continued on page 146)

The only electronics home study program that guarantees*...

A Commercial FCC License ...Or Your Money Back!

No other electronics home study program can equal that offered by Cleveland Institute. And that's why we make this exclusive guarantee:

***Completion of our Master Course prepares you for a First-Class Commercial Radio Telephone License with a Radar Endorsement. If you fail the FCC examination for this license after successfully completing the Master Course, you will receive a full refund of all tuition payments. This guarantee is valid for the entire duration of your enrollment period.**

This Course Is Designed Specifically For Men With Previous Electronics Training or Experience and Provides...

- Advanced electronic theory and math. (You will receive a special 10" Electronic Slide Rule and complete instructions).
- Special training in the practical application of electronics skill in such advanced fields as Computers . . . Servo-Mechanisms . . . Magnetic Amplifiers . . . AC Circuit Analysis . . . Pulse Circuitry . . . Color TV . . . Radar . . . Advanced Measuring Techniques . . . Industrial Electronics . . . Instrumentation . . . Automation . . . Radio Telemetry . . . Semiconductors.

Get This Handy Pocket Electronics Data Guide Free...

Conversion factors, formulas, tables and color codes at your fingertips. Yours without obligation, simply for responding NOW to this opportunity to improve your future.

Send This Coupon Today →

Cleveland Institute of Electronics

1776 E. 17 St., Dept. QT-10, Clvd. 14, O.

Accredited by the Accrediting Commission of the National Home Study Council
(An Accrediting Commission Approved by the U. S. Office of Education).

Three Free Booklets Tell How CIE Training Opens The Door To Unlimited Opportunities

More Reasons How CIE Will Help You Get Ahead in Electronics

Job Service . . . every month, for three years, CIE will supply you with a listing of hundreds of job opportunities. High paying, interesting jobs . . . with top companies throughout the world. See how CIE training opens a whole new world in electronics opportunity.

Electron Bulletin . . . every month, every student receives a free copy of this informative bulletin. Keeps you up to date on what's going on in electronics.

Cleveland Institute of Electronics
1776 E. 17 St., Dept. QT-10, Cleveland 14, O.

I want to know more about your electronics home study training program. Please send me your free booklets described above plus your handy pocket Electronics Data Guide. I understand there is no obligation. I have had training or experience in electronics as indicated.

☐ Military ☐ Broadcasting
☐ Radio-TV Servicing ☐ Home Experimenting
☐ Manufacturing ☐ Communications
☐ Amateur Radio ☐ Other

I'm now working in_____
I want to know about the following area of electronics_____
(please print)
Name_____ Age____
Address_____
City_____ Zone____ State____
QT-10

Race. They had a fine plan and all went well. Traffic: (July) WØNIT 3, KØWWJ 3. (June) WØFEO 200.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, W7OCX. SEC: K7BLR. W7s OCX and QWH and K7s BLR, OIP, MPQ and NCA represented Utah at the recent Rocky Mountain Division Convention in Denver. W7OCX received the coveted A-1 Operators certificate at the convention. W7BAJ has a kw. linear and is interested in RTTY. K7NWP says that the fishing is too good to spend much time hamming; even so Marty has a traffic total of 417 this month. The Utah Amateur Radio Club has won the first annual award for the highest Utah club Field Day score. The trophy is presented by the Utah Council of Amateur Radio Clubs. A club keeps the trophy permanently only if it can win three consecutive years. Traffic: K7NWP 417, W7OCX 54, W7QWH 4.

NEW MEXICO—SCM, Carl W. Franz, W5ZHN—SEC: K5QIN. V.H.F. PAM: W5FPB. K5FMF has started the Novice section of the New Mexico Brass Pounders on 3737 kc. at 1400 daily. Here is a chance for Novices to learn good operating procedures and at the same time carry out the traditional public service of the amateur. There are a number of Emergency Coordinator appointments open in various locations in our section. Those interested in coordinated emergency activities, please contact K5QIN. Sixteen hams and families from Albuquerque and Los Alamos attended the Division Convention at Denver. Our thanks to the Denver ARC for a nice time and a warm and friendly welcome. The 1963 Convention Committee is hard at work for next July. W5WZK is chairman. Our new President, Herbert Hoover, jr., W6ZH, has confirmed that he will attend. The 4th N.M. QSO Party will be held on Jan. 26 and 27, 1963. The Chamber of Commerce/Caravan Club tourist message service is going over with a bang. Local amateurs and ARCs made the press, TV and other publications 16 times in 42 days. How about some reports for this column, gang? Traffic: W5ZHN 218, W5WZK 48, K5LDT 2.

WYOMING—SCM, L. D. Branson, W7AMU—SEC: W7HH. The Pony Express Net meets Sun. at 0800 MST on 3920 kc.; the YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc.; the Wyoming C.D. Net meets Wed. at 1900 MST on 3537.5 kc.; the TWN Net daily at 2000 MST on 7060 kc. SEC W7HH attended the WIMIU *Hamfest* in Big Springs and reports a large group in attendance and everyone seemed to have a good time. W7AMU still is under the doctor's care but has his new teeth. Quite a crowd from Casper attended the Picnic at Cheyenne Aug. 12. Both Cheyenne clubs made a joint meeting of the Picnic. W7LVU has a new SB10 with linear doing a nice s.s.b. job. W7BHH has returned from Yellowstone Park. W7MGM has new Gonset Twins with a fine signal. Traffic: W7AMU 18, K7ONK 16, W7DXV 12, W7GZG 11, W7IVU 9, W7BHH 8, W7HH 6, W7EUZ 3, W7HDS 2, K7TPQ 2.

SOUTHEASTERN DIVISION

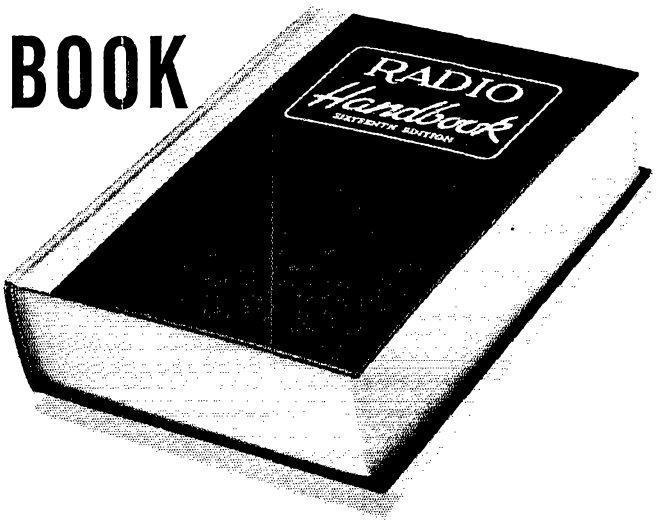
ALABAMA—SCM, Harvell V. Tilley, K4PHH—SEC: W4FQQ. RM: K4YUD. PAMs: K4BTO, K4PFM, S.S.B.: K4KJD. Congratulations to new hams WN4HIG, WN4HJJ, WN4ITE and WN4IUV. K4FQG has a new SX-71. K4WOP is on 6 meters with a Sixer. K4BOK has a new HT-37. The U. of A. ARC has resumed activity. The AENM in July had the largest month on record for attendance. K4OIW has located in Jasper. K4FQG operated portable from Camp Winnataska, Ala., recently using an AF-67. K4ZTT has a new TA-33 jr. The mobile ARC has purchased a Heath Sixer for hams who are in the hospital. W4PIA has put up a five-element beam for 6 meters. W4VGV is on 2 meters with a Heath tower. A new 6-meter station in the Anniston Area is WA4AQQ, running a Globe Scout with an HQ-110 and a converter. K4KZM is using two new beams, a 6-meter and a tri-band beam for 10, 15, and 20 meters. Traffic: (July) K4WWP 83, K4FZQ 75, K4LNA 68, K4WOP 61, K4AOZ 55, WA4BDW 50, K4PFM 43, WA4BSE 28, K4DJR 24, K4KJD 21, K4WHW 21, K4NKT 20, W4CIU 18, K4BRZ 16, K4UMD 13, K4DSO 11, K4SAV 10, K4GXS 9, K4ZYO 9, K4ZTT 8, K4BTO 7, WA4BTA 5, K4JDA 4, K4KDE 4, W4MI 4, W4RLG 4, W4WGI 4, K4PHH 3, K4TDJ 3, WA4EDF 2, K4WSS 2, K4AAU 1, WA4AVM 1, W4DFE 1, WA4EEC 1, WN4ITE 1, K4RIL 1. (June) K4NUW 43, K4FQG 41, W4ZNI 7, K4AAU 2.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: W4IYT. RM: K4KDN. RM RTTY: W4EHU. PAMs: 40 W4SDR; 75 K4LCF; V.H.F. W4RMU; S.S.B. W4CNZ. Skip conditions on 40 meters have played havoc with FMTN and have remained consistently bad. GN still is on the secondary frequency of 3650 kc. K4BRU is back in Orlando after five years in Japan. Don't know exactly how many years "young" K4ILB is but

(*Continued on page 148*)

NEW (16th EDITION) RADIO HANDBOOK

—clear, concise theory ...extensive new data for designing, building, and operating radio equipment



In the latest "Radio Handbook," you get comprehensive data on every subject listed below, plus original new design and construction articles. The 16th Edition is thoroughly revised, and brought abreast of the latest in technical progress.

Broadest coverage in the field . . . complete information on building and operating a tremendous variety of high-performance equipment items. All data clearly indexed. 805 pages, all text, with hard covers.

$9.50* Book #16R

at your distributor

CONTENTS INCLUDE: AC & DC Circuits • VT Principles • Transistors & Semiconductors • VT Ampls • High Fidelity • RFVT Ampls • Oscilloscopes • Special VT Circuits • Radio Receiver Fundamentals • Energy Generation • R-F Feedback • Amplitude Modulation • FM & Radio Teletype Transmission • Sideband Transmission • Transmitter Design • TV & BC Interference • Transmitter Keying • Radiation, Propagation & Transmission Lines • Antennas • HF Antenna Arrays • VHF & UHF Antennas • Rotary Beams • Mobile Eqpt. Design & Install. • Receivers & Transceivers • Low Power Transmitters & Exciters • HF Power Ampls • Speech & AM Eqpt. • Power Supplies • Workshop Practice • Electronic Test Equipment • Radio Mathematics & Calculations

NEW AMPLIFIER DESIGNS

- Complete Grounded Grid Amplifier
- 3-1000Z Linear Amplifier
- 4CX1000A Amplifier
- 813 Grounded Grid Amplifier
- 7094 Amplifier
- Tri-Band Linear Amplifier
- KW-2 Amplifier (economy g-g circuit)
- 4-400A General Purpose Amplifier
- Kilowatt All-Purpose Amplifier
- Transformerless 25-Watt Music Amplifier (Hi-Fi)

NEW TRANSMITTER DESIGNS

- 50 Mc. Transistorized Xmitter
- 200-watt Deluxe Tabletop Xmitter
- VHF Strip Line Amplifiers
- "9T0" Electronic Keyer

LATEST IN RECEIVERS AND TRANSCEIVERS

- Bandpass Filter Receiver
- 10-15 Meter Transceiver
- 2-6 Meter "Siamese" Converters
- Deluxe Mobile Transceiver
- DX Communications Receiver

All above units are modern in design, and free of TVI producing problems.

*Order from your favorite electronic parts distributor.

If he cannot supply, send us his name and your remittance, and we will supply; foreign, add 10%.

EDITORS and ENGINEERS, Ltd.

Summerland 7, California

Dealers: Electronic distributors, order from us. Bookstores, libraries, newsdealers order from Baker & Taylor, Hillside, N. J. Export (exc. Canada), order from H. M. Snyder Co., 440 Park Ave. So., N.Y. 16.

from the skeds he keeps he is good for another 40 years at least. W4BBZ had bugs in his bahn box—termites no less which "fixed" it good. Our estimable Doctor of Forestry, K4ZIF, now is studying electronics at high school. W4BNE's outline of rigs reminds me of the layout at Army Sigs WTA on Corregidor. WA4KZX now is Chief of Communications for the Salerno Zone of CD. You *are*. AREC aren't you? K4ILB is now NA7IIB ot CG Auxiliary. Traffic: (July) W4AKB 607, K4SJH 575, WA4-BMC 460, W4TUB 393, WA4AMC/4 311, K4BY 260, WA4-IHH 222, W4NDL 178, W4KIS 172, W4EHW 136, W4CNZ 115, K4RNG 104, WA4CJC 101, K4FMA 88, K4KDN 82, WA4AME 77, WA4BGW 77, K4YOQ 72, W4IYT 47, K4-NVD 45, K4AKQ 44, W4CWD 43, W4MIN 43, W4LDM 42, W4URX 42, K4MTP 39, W4KCG 37, K4YLX 36, W4BKC 33, K4ILB 32, K4JWM 32, W4HRC 30, K4JZU 30, K4MZR 28, W4HFR 25, W4ZAK 25, K4LVE 23, K4-ENW 22, K4COO 21, K6SNX/4 19, WA4IJH 18, W4VCX 18, K4AX 17, W4BBZ 16, K4OSQ 16, WA4BYP 15, WN4-ESS 15, WA4GBM 15, WA4FGE 13, WA4AZZ 12, W4LSA 12, K4ZIF 11, K4NTA 10, W4BNE 9, W4EAT 9, WA4-KZX 8, W4NGR 8, W4UEO 8, W4AYD 7, WA4COR 7, K4FQP 7, WA4HCJ 7, W4ULH/K1ONW 7, W4DFZ 6, W4DGL 6, WA4IVC 6, K4IWT 6, W4QVJ 6, WA4BAW 5, WA4ISJ 5, K4AHU 4, K4NXW 4, W4ERM 3, W4HGO 3, K4UKF 3, K4BHL 2, W4SVI 2, K4PVP 1. (June) WA4AMC/4 157, K4ILB 42, W4NGR 39, WA4BGL 24, WA4HCK 23, W4HRC 22, K4NVD 19, K4YSP 18, W4-KCG 17, K6SXX/4 16, WA4AII 14, WA4BGL 12, K4GUE 9, K4ODS 9, K4ZIF 9, K4LVE 7, K4PPX 7, K4QQE 7, K4CMK 6, WA4AIH 5, K4DBT 4, W4RIK 4, K4VGD 4, WA4AMV 3, W4DTS 3, W4UEO 3, K4UKF 2, K4BHL 1.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: K4UBR. Panama City: The 2-Meter C.D. Net now meets Wed. at 0230 GMT on 147.3 Mc. WA4FIJ and WA4FJF completed WAS. Their 6 & 2 beam is now up 55 ft., and they have a Big Wheel 2-meter mobile antenna. WA4-GJO is on 6-meters using Elmac gear and halo. WN4-IMC is a new ham. K4MZA has joined the 2-meter gang. K4VFY recently was appointed OO. Blountstown: K4-UNT and WA4CIH are on 2 meters; K4KHV and K4YSQ have gone mobile on 75 meters. K4DHK is on 40 and 10 meters; WA4AKT is on 10 and 75 meters. Madison: W4PBO is having rig trouble. WA4GHE has gone s.s.b. Tallahassee: A new RACES Plan is almost complete. K4YPI is the RO. Alternates are W4GAA, K4OHR and W4MLE. WN4DCN received his Conditional Class ticket. K4ARK has a new 75S-1. W4MLE is now listening on an HQ-170. Fort Walton/Eglin AFB: The EARS held an FB picnic; W4RKH won a prize. WA4IYH is a new ham on 2 meters. W4SRX has moved the operating room and meeting place to a new air-conditioned QTH in Bldg. 44, EAFB, Pensacola: K4-DDD has been appointed EC for Escambia County. He is also RO for RACES. K4QAC is NCS for AF MARS 6-Meter Net on 49.98 Mc. Tue. and Thurs. at 7 P.M. K4FOG has been ill in the hospital. A 2-meter net now meets Thurs. at 7:30 P.M. on 145.44 Mc. Crystals are available from the V.H.F. Club. The Corry Field Club call is now WA4ECY. Traffic: (July) K4VFY 102, K4-KHC 68, W4BVE 59, WA4FIJ 23, W4GAA 22, W4MLE 10, W4ZGS 4. (June) W4MLE 25.

GEORGIA—SCM, James A. Giglio, W4IG—SEC: W4TJS. RM: W4DDY. PAM: W4KR. New officers of the Georgia Cracker Radio Club are: W4KR, pres.; W4PCF, vice-pres.; K4ZSZ, 2nd vice-pres.; K4FRM, 3rd vice-pres.; W4MZO, secy.-treas.; W4ZD, historian. The Columbus Amateur Radio Club has completed a roster of all hams in the Columbus Area. Write K4RHU for a copy. W4EVG is sporting a new all-band GG amplifier. The Georgia Peach YL Net has moved from 7260 kc. to 3860 kc. each Thurs. at 0900 EST. K4FRM reports good DX on 40-meter c.w. with low power. The Georgia Cracker Mobile Net meets each Sun. on 3995 kc. at 1330 EST with K4DKY as NC. For the benefit of those who believe in "finders-keepers" we have a report that K4-ZYI found a snake in his exciter! And K4UJS is now using a portable home-brew 80-meter c.w. transceiver to help meet traffic skeds. Lucky W4TT continues to win prizes at the hamfests. Happy new home-owners are K4WNH and W4ENW; also K4LIU and K4YMR. We hear that K4KBZ now has a 4-1000 GG amplifier to go with his Eico 720. And W4NAG now has a 20-A on s.s.b. The annual meeting of the Georgia Single Sideband Association will be held Oct. 20 and 21 in Macon, Ga. New appointments: W4KR-PAM, W4YFR-EC, W4YE-ORS and K1KSH/4-ORS. Traffic: K4ZYI 437, K4MCL 297, W4DDY 223, K1KSH/4 127, K4QPI, 123, K4UJS 36, K4-NGI 32, K4BAI 15, K4RHU 10, W4BZ 6, K4FRM 5, K4BVD 3, W4LG 3, K4BWQ 2.

WEST INDIES—SCM, William Werner, KP4DJ —C.D. Radio Officer: KP4MC. QSL Mgr.: KP4YT. All the friends of Alicia, KP4CL, join in her sorrow at

(Continued on page 150)

RME

COMMUNICATIONS EQUIPMENT

THIS RECEIVER EXTENDS YOUR ABILITY

The ultimate test of any receiver is in its ability to extend the skills of the operator. The instant you fire up the RME 6900 you experience a new, widened scope of operating ease and performance. Weak signals on crowded bands are heard as you've never heard them, sideband signals are tuned at the flick of a switch, parameters of selectivity and sensitivity unheard of in most *other* receivers afford *you* receiver excellence designed to KEEP your RME 6900 *new* for years to come. The RME 6900 is designed and built to be the best TODAY AND TOMORROW. At RME we just don't believe in building in obsolescence, we'd rather build quality and performance. See your favorite amateur distributor for a demonstration of our proudest product.

Spec sheets are available from Dept. 88:

G. C. ELECTRONICS CO.
400 SOUTH WYMAN STREET
ROCKFORD, ILLINOIS, U.S.A.

A COMPLIMENT TO ANY HAM SHACK

up to 30 db GAIN

PEAK UP YOUR RECEIVER

Is your present receiver the weak link in your shack? If so, the matchless gain and signal to signal plus noise ratio improvement provided by the RME DB 23 is the answer for you.

SIMPLE TO INSTALL self contained power supply, SIMPLE TO OPERATE select your band and one control matches antenna and provides maximum preselector gain.

The styling and performance of the DB 23 assures you your investment will never be outdated. See it, try it at your local distributors. Or, use coupon to request a full spec sheet on the DB 23.

FREE CATALOG

(Send to GC Electronics Co., 400 S. Wyman St., Rockford, Ill.)

Please send me the latest RME Catalog of Amateur Equipment including the 6900 and DB 23.

NAME_____

ADDRESS_____

CITY_____ STATE_____

DEPT. 88

the death of her mother. Officers of the newly-formed El Morro Radio Club are KP4ASL, pres.; KP4BDO, vice-pres.; KP4ASK, secy.-treas.; KP4BCA, corr. secy. Meetings are held at the Porto Rico Iron Works every other Thurs. at 7:30 P.M. The club "net" meets the 1st and 3rd Thurs. on 28,740 kc. at 7:30 P.M. KP4BCA has applied for appointment as AREC Emergency Coordinator for San Juan District. He can operate mobile using an AF-68 and a Morrow converter. KP4AFL reports to the C.D. Net each Sat. at 1700 GMT on 7205 kc. KP4GN has a G-76 mobile, plus Collins 51J4. KWS-1, Globe King and a model 15 teletype. KP4ASL has AF68, PMR8 mobile and a Valiant 75A-3 for a home station. KP4-AXD and KP4BAN are active on 50 Mc. KP4AXD also is mobile on 50 Mc. KP4CH brought a Courier amplifier from New York and is on all bands. KP4ASK is using a Heath Tenner mobile on 28,715 kc. at 3 watts. KP4CH skeds K2KGU on 14,080 kc. KP4GN owns a TV relay station (translator) operating on Channel 8. KP4CGB, at USCG Base in San Juan, is now NCS of the Antilles Weather Net, operating daily at 1045 GMT on 3815 and 7245 kc. KP4CGB delivers weather reports received on the net direct to USWB via teletype where they are posted along with other reports for pilot information. The Coast Guard Base at San Juan has KP4AOO, KP4-AKW, KP4BEA, KP4BHR, KP4BIE. W4RUX/KP4-CGB, WA2ZMC/KP4, K1DZB/KP4 and K8MDK/KP4. KP4AOO, KP4BEA and KP4CGB have ordered HT-37 transmitters. Traffic: (July) KP4CGB 380, KP4WT 120. (June) KP4CGB 313, KP4BAU 10.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—Asst. SCM: Lyle G. Farrell, W6KGC. SEC: K6YCX. RMs: W6BHG, WA6ROF. PAMs: W6ORS, K6PZM. The following stations earned BPL for the month: W6WPF, W6GYH and K6MDD. Congrats, fellows! New officers of the Rio Hondo Radio Club are: WA6MLI, pres.; W6AHY, vice-pres.; WA6ODF, secy.; K6RDQ, treas. WA6ODF will be signing /5 from Texas for a few weeks. K6UMV is working on a B.S. degree at night school. W6OZ has just completed 34 months of code practice on the air. Congrats, Dick! WA6HUO is working up a big AREC Drill for San Fernando Valley. W6UGA is back in business on the v.h.f. bands, the eggs hatched that were in converter! W6AM is putting up new antennas at the "Ranch"! K6UYK is engaged in the National Soaring Contest. K6IWV is heading out for a vacation in September. WA6MFH put up an eleven-element Spiral-ray on 6 meters. W6VOZ participated as /Ø on the Pikes Peak Auto Race. WA6ROF is attending Riverside City College. W6CK is back home in Hemet after a stint in the hospital in San Francisco. WA6DJB has a VHF-126 for 2 meters. New officers of the Downey Amateur Radio Club are: WA6DCF, pres.; WA6MAT, vice-pres.; WA6-MQF, secy.; WA6NER, treas. A new reporter this month is WV6YSL, who has just completed his first 6 contacts. Support your section nets. On e.w., the Southern California Net (SCN) meeting at 0300 GMT on 3600 kc. daily; on phone, the Southern California Six Net (SoCal 6 Net) meeting at 0230 GMT on 50.4 Mc. daily. Traffic: (July) W6WPF 910, W6GYH 781, K6MDD 533, K6IWV 408, K6SUJ 300, K6OZJ 288, W6QAE 275, WA6DJB 232, K6YVN 226, WA6ODF 153, WA6JDB 124, WA6WTK 106, WA6ROF 96, W6BHG 95, WA6KAW 44, WA6CKR 25, WA6AAH 11, K6UMV 11, W6UGA 6, K6-UYK 6, WA6MFH 5. (June) WA6VIK 9. (May) W6FNE 574, K6WAH 464.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—Asst. SCM/SEC: George Mezey, K7NIY. PAM: W7OIF. RM: W7LND. The Copper State Net meets at 1930 MST Mon. through Fri. on 3880 kc.; The Grand Canyon Net Sun. at 0800 MST on 3880 kc.; The Tucson AREC Net Wed. at 1900 MST on 3880 kc.; The Cochise County AREC Net each Sun. at 1400 MST on 7260 kc.; The Tucson 2-Meter Net at 1000 MST on 145.35 Mc.; The Arizona Interstate Net, C.W. Mon. through Fri. at 1900 MST on 3555 kc. Because of the efforts of W7RFE and a group of Arizona radio amateurs, the annual hamfest, formerly held at Montezuma Wells, was held this year at Ft. Tuthill, a park area located five miles south of Flagstaff, Ariz. Old-timers will recall Montezuma as the annual gathering place of amateurs, not only from Arizona but from California, Nevada, New Mexico and Texas. After 15 years it was discontinued because of Federal regulations regarding the use of park facilities. This year, after much favorable publicity, the annual get-together was reorganized and the amateurs met for three days in the Ft. Tuthill recreational area. More than 300 people were present. It will be held again next year sometime in July. K7EBS is chief radio operator as well as counselor at the El-O-Win Girl Scout Camp, Dinkey Creek, located in the Sierra Nevada Mountains of California. Having no telephone service, all communications are handled by K7EBS/6 through W6JPS in

(Continued on page 152)

QUALITY BEGETS QUALITY*

TODAY'S expanding "Amateur Horizons" are all in the VHF-UHF spectrum. The pathway to the future for reliable long range communications lies with today's experimenters and operators in the 50,144,220,432, and 1296 megacycle (and higher) amateur bands.

TROPO·SCATTER • METEOR SCATTER • IONOSPHERIC SCATTER MOON BOUNCE

TODAY'S VHF/UHF amateur is a new breed of ham. He's an experimenter, a builder, a tinkerer, and he's a first class OP. He has to be when he's working with signal-to-noise ratios that are so low as to defy measurement!

TODAY'S VHF/UHF amateur has accepted the challenge of improving and extending long-haul beyond-the-horizon VHF/UHF communication circuits. He demands the finest in equipment. If he can't buy it, he will design and build it himself.

TODAY'S UHF/VHF amateur is 40,000 strong. He is part of the fastest growing, most expansive facet in amateur radio today.

TODAY'S VHF/UHF amateur is tomorrow's hope today!

TODAY'S VHF/UHF amateur reads and believes in his very own, exclusively VHF/UHF, publication. **VHF HORIZONS.*** If you do not already subscribe—you should. If you aren't a participating advertiser—you should be.

VHF HORIZONS

Published by Horizons Publications, Inc.—P.O. Box 1557 Oklahoma City 1, Oklahoma

STAFF—Jim Kyle, K5JKX, Managing Editor—Bob Cooper, K6EDX/W5KHT, Publisher—Russ Miller, W5HCX, Associate Editor

Technical Editors—Bob Grimm, K6RNQ—Paul Wilson, W4HHK—Len Garrett, W7JIP—Ernie Manley, W7LHL

Research Consultants—W6NLZ, W4GJO, W6BJ1, W4UCH, W0KMV, W5FYZ, W5JWL, W5SFW, W6FZA, VE6HO, W5UKQ

Send complete VHF Horizons marketing data. We are interested in advertising to this market.

Firm Name.....

Address.....

City..... Zone..... State.....

Attention:.....

☐ **Enter my 1 year (12 issue) subscription to VHF Horizons. $4.00 enclosed. Start subscription with the current November edition.**

☐ **Send free subscription data.**

Name..... Call.....

Address.....

City..... Zone..... State.....

Mail to HORIZONS PUBLICATIONS P.O. Box 1557—Oklahoma City 1, Okla.

Fresno, California. Traffic: WØWHE/7 213, W7AMM 42, K7RUR 2.

SAN DIEGO—SCM, Don Stansifer, W6LRU—The three Orange County clubs who sponsored the 1962 Southwestern Division Convention donated $300 to the ARRL Building Fund from monies received. W6PM was the guest speaker at the July Orange County Club meeting and spoke about Mexican amateur activities. The early August meeting of the Newport Club included an auction and was presided over by W6WSW. WA6PDE is now on 6 meters and building a rig for 432 Mc. WA6ZOW, in Orange County, had a traffic total of 111 for July, highest in that area in some years. W6YDK, with one operator, originated 2104 pieces of traffic during July. W6IAB reports the transfer of operator K5UVP to Lincoln, Nebr., and that a new ham shack is under construction. K6BPI hit a traffic total of 3984 during July. Who said the summer months were low for traffic? W6IEY, OES, reports much short skip on 6 meters during July. K6GJM reports operating mobile marine on 6 and 2 meters in the channel near Catalina with eight other operators, and making 53 contacts on both bands. W6JQB, Los Angeles SCM, visited me in Mono County while on vacation. Plans are taking shape in San Diego for the Southwestern Division Convention to be held there in 1963. K6RWM is now out of the Navy and has returned to Iowa, with his family. Traffic: K6BPI 3984, W6IAB 2817, W6YDK 2223, WA6CDD 97, WA6ZOW 111, WA6PDE 6.

SANTA BARBARA—SCM, W. C. Shelton, K6AAK—This will be my first report as SCM in approximately 25 years as I served the ARRL in this same capacity in the middle thirties. It is great to be back again and hope that I can be of some service to you and this great fraternity of ours. I would like to take this opportunity to outline some of the plans I have for the section. However, to see these plans fulfilled I will need the assistance and cooperation of every active ham in the section. I have three objectives in mind to assist the section in keeping ahead of the other sections in the division. (1) To see the ARRL membership double. (2) Increased activity in ARRL affairs. (3) Every club an affiliate and 100 per cent ARRL membership. I plan to visit every club at least once a year or more often if necessary to keep you informed of the section's affairs and to offer you any assistance necessary in making these plans a reality for the good of our fraternity. Please forward your activity reports so the section can receive recognition.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, W5NFO. SEC: K5AEX. PAM: W5AYX. RM: W5LR. Congratulations to the Corpus Christi ARC on the excellent manner in which they handled the 32nd Annual Convention of the West Gulf Division Aug. 3-5. Every operation was performed so smoothly that you would think it was planned by professionals rather than by a group of volunteers. More than 350 pre-registered and all attended the pre-convention party. John Huntoon, W1LVQ, General Manager ARRL, gave an interesting talk on the organization of the League. W5AWT was presented a plaque for the highest amateur award and a proclamation by the Governor of Texas designating Aug. 5 as Mel Boatman Day was marked by the sounding of air raid sirens in Corpus Christi. The Magic Valley Amateurs won the bid for the 1963 convention to be held in McAllen. San Antonio, Houston and Ft. Worth also bid for the honor. W5DX won the award for the oldest license, dated 1917. Code speed winner was WA5APS. Home-brew equipment contest winner was K5KDN. Aug. 10 marked the end of my second term as your SCM and I want to thank my assistants, appointees and other contributers of news and activities reports for their help in making my job possible. I sincerely hope you will continue to help your SCM in the future. Traffic: W5BKH 134, W5GY 108, K5PXV 102, W5LR 78, K5SXK 59.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—SEC: K5KTW. W5IER informs us that the new emergency center at Sand Springs is ready for operation. Stephens and Craig Counties have had their RACES plans approved. The appreciation of all Oklahoma amateurs goes to Governor Edmundson for his proclamation, setting aside the week of June 24 to 30 as Amateur Radio Week in Oklahoma. The following stations sent reports to the SCM of Field Day activities: W5GU, W5CDF, K5LRU, W5NS, K5IRO, W5PAA, W5OX and W5HTK. The latest list of 2-meter stations we know about includes K5CKO, K5AUX, WA5ASX, W5YLH. W5MGZ is the new Custer County EC. W5CZB, K5CAI and W5KY deserve the thanks and appreciation of all

(*Continued on page 154*)

WORLD'S MOST ACTIVE MARKET PLACE FOR HAM GEAR...

means you always get the newest at HARRISON

PROGRESS CREATES CHANGE Nowhere is this more evident than in Electronics. Hardly a day passes without bringing some new development in circuitry, components, materials, or technique. Manufacturers take prompt advantage of this flow of improvements to constantly up-grade the performance of their equipment. The receiver or transmitter coming off the production line today may be just slightly better, or it may be vastly superior to the same model made yesterday.

This is why you get another big plus benefit when you deal with "Ham Headquarters, USA"!

Here, the sales volume is so tremendous (we sell more Collins, for example, than any other dealer in the world!), the turn-over so rapid, that you always get the very latest improved production.

HARRISON MEANS MORE MODELS—BIGGEST INVENTORY Name the new model and you can bet that Harrision has it if available anywhere—the make you want, the model you want, the deal you want. We keep trucking companies extra busy to be certain that our ham friends can see more gear, compare more features at "Ham Headquarters, USA".

HARRISON MEANS HIGHEST TRADE-IN ALLOWANCES Right now our Harrison ham experts are waiting to show you the very latest gear, answer any questions you may have. They'll also tell you about the highest trade-in allowances waiting for you (made possible by Harrison's brisk turnover of used equipment), about your Harrison Charge Account that lets you s-t-r-e-t-c-h payments up to 18 months or more (no down payment because your trade-in is always enough).

Hurry on in. Discover for yourself why it always pays to shop at "Ham Headquarters, USA", why "Harrison" means you save with safety.

73, *Bil Harrison*, W2AVA

HARRISON

225 GREENWICH STREET
NEW YORK 7, NEW YORK
BArclay 7-7922
(LONG ISLAND: 144-22 HILLSIDE AVE., JAMAICA—RE 9-4102)

Oklahoma amateurs for their faithfulness in emergency work with the weather net. Our sympathy to W5PHC in his recent sorrow. K5DYF has become a Silent Key. K5FKV has completed his new home. W5JMQ has a new high-power linear with a pair of 813s in the final. Old Man Lightning has been after K5OOV, but the beam rotator was the only casualty. The Oklahoma State Convention will be held at Lake Texoma Lodge, Oct. 27 and 28 and is sponsored by the Oklahoma City V.H.F. Club and a few Texoma Area amateurs. W5EHC and W5HXT are in Washington on TDY. K5ZEP is busy building audio tuners. K5LUT is a new amateur at Poteau. K5IXS is radiating signals from Oklahoma City. K5KTW has a new 813 amplifier with a good signal on both s.s.b. and a.m. K5RCW, OBS, moved to Chicago, where he is going to school taking advanced training in the electronics field. W5UGO is a new OES. We have reluctantly accepted the resignation of K5JGZ as RM. Lee has been very active on the c.w. nets for many years. Traffic: (July) K5TEY 106, W5JXM 86, K5IBZ 56, W5JMQ 50, W5DRZ 42, K5ZCJ 37, K5ZEP 28, K5OCX 26, K5ZFF 20, K5AUX 17, WA5BNG 15, K5OOV 10, W5CCK 9, K5JOA 8, K5LZF 7, W5PNG 6, W5UYQ 6, W5FKL 5, K5RWL 5, W5EHC 1. (June) W5HTK 1038, W5QMJ 700, K5TEY 115, W5DRZ 61, K5AUX 58, K5IBZ 41, W5JMQ 41, K5OCX 41, W5CCK 31, W5FEC 26, K5LZF 26, K5JOA 23, W5PML 17, K5ZCJ 16, K5FQJ 11, K5ZEP 11, K5DMS 9, W5FKL 9, W5UYQ 8, W5PNG 7, K5OOV 5, K5BAT 4, W5WAF 4, W5EHC 1.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: W5AIR. Thanks to the Reynolds Metal Amateur Radio Club for putting me on their mailing list for the K5JUR bulletin. The latest addition to the club's shack is a new 30L1 linear. WA5BEY, WA5AUB, WA5CXX, WN5BOO and WA5DFG all passed the General Class examination. This is a sample of the good work the gang at Reynolds are doing. Anyone missing the West Gulf Division Convention at Corpus Christi missed a good one. We certainly owe AQK, HQR and their committees a rousing vote of thanks for all the work that went into this. Also thanks to LCDR Bartlett, W5IAA, and his cast for the good Wouff Hong imitation. WA5AUA is on vacation at Las Vegas. Good luck, Gene. BRZ is mobiling around on his vacation. W5MVL and family are vacationing on the Coast. K5GPR is a new OES. K5RDP is the new OO for the Houston Area. The Stephen F. Austin Amateur Radio Club is setting up a 2-meter net for emergency use using all homemade equipment. WA5BFZ and WA5DQG have new General Class tickets. I wish that someone from each club would send me just one news item each month and then we would be able to fill up our space.

CANADIAN DIVISION

GOOSE BAY QSO PARTY

Oct. 12-22

All amateurs are invited by the Goose Bay Amateur Radio Club to participate in the annual Goose Bay QSO Party which commences at 2400 GMT Oct. 12 and ends at 2400 GMT Oct. 22. All bands and either phone or x c.w. may be used. The exchange will consist of RS(T), name, and QTH. A WAG (Worked All Goose) certificate will be awarded to all. W/VE stations reporting QSOs with four GBARC members during the contest period, and to all other stations reporting QSOs with three GBARC members. QSL cards are requested from all stations during the 10-day period to help club members qualify for trophies. Send reports to Jack Willis, VO2NA, Awards Manager, Aeradio, Dept. of Transport, Goose Bay, Labrador, Canada. The following VO2 stations are members of the GBARC: *VO2s* AA AH AI AV DP HA NA PC RC RN UA, and VE1MW/VO2.

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. E. W. Street, VE1EK, and H. C. Hillyard, VO1CZ. Newly-elected officers of the NBARA include VE1BL, pres.; VE1AFP and VE1AEB, vice-pres.; VE1MZ, secy.-treas. Recent transfers include VE1DO to New York, VE1ACY to Montreal, VE1GI to Newfoundland and K1NPS/VO1 to the W3 district. VE1AFP has acquired W-CONN and YLCC certificates. Recent visitors to the section include K2SQM, VE3LK, VE6DW and K1AFF. VO1CZ, VO1DW and VO1AE were active in a recent 6-meter opening. VO1FO has constructed a 200-watt linear for fixed or mobile use. New calls include VO1DB. VO1DJ is now on phone. VE1QA has transferred to the VE7 district. VO1NA has added

(*Continued on page 156*)

WAVO, WPX 300 C.W. and DLD 100 to his award collection, bringing the total up to 70. VE1AFP has a new Tower. Do you use GMT when logging? Nova Scotia amateurs wishing to obtain QSL cards made available by the N.S. Tourist Bureau should write immediately to the Secy., NSARA, P.O. Box 663, Halifax, N.S. *Do not* contact the Tourist Bureau. Traffic: VE1OM 11, VE1ES 9, VE1AEB 4.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The Disaster Communications Unit in Hamilton is tops in activity and exercises. This unit is cooperating with the Red Cross in that city on 2 meters. How about other centers getting on the beam? Two is the apparent answer to the local communications problem. What with all the club projects during the past winter, it should be a cinch to organize. Possible EC's, write VE3NG or VE3AML re appointment. Clubs also please take note. Put your 2-meter gear to work. We regret to announce the passing of one of North America's leading DX men, VE3HB, of Toronto and Oakville. He was a member of the Ontario DX Assn., the Nortown and Westside Radio Clubs, and was treasurer of the Ontario Amateur Radio Federation, Inc. soon to be known as the Radio Society of Ontario. VE3AUH is portable at Sundridge. VP5GH and VP5VI, from Jamaica, were visitors to Ontario recently. VE3DUU is out of the hospital. The Amateur Radio Club of Sarnia did very well on FD. VE3CEB is on 75-meter mobile. VE3AK had his rig hit by lightning. VE3ECN is now in Israel. VE3CFR is on 2 meters. Scarboro and Nortown get together for transmitter hunts and will hold a picnic soon. VE3ESE is now OES in Toronto. The Scarboro ARC is very active on 2 meters assisting the local Parks Sports programs. VE3FAS made his first BPL. VE3EZC and VE3EZI are both Class A. We regret to report VE3DFZ is a Silent Key. VE3NG and VE3BD were guests on the HMCS *Victoriaville* while the ship was in Toronto. Unmodulated carriers are a nuisance to all of us. May we remind you that the D.O.T. regs. require all of us to identify our signals. VE3AGG is Class A now. Traffic: (July) VE3FES 835, VE3FAS 345, VE3NG 196, VE3CFR 129, VE3DPO 98, VE3GI 48, VE3DRF 46, VE3BSY 43, VE3AYR 39, VE3EHL 32, VE3AML 31, VE3AUH/3 28, VE3BAQ 28, VE3BZU 26, VE3APK 25, VE3ELQ 21, VE3FES/3 20, VE3DWN 16, VE3DU 13, VE3BUR 12, VE3DH 11, VE3AKQ 7, VE3AUU 4, VE3VD 4. (June) VE3BSY 36.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Asst. SCM: Jean P. Achim, VE2ATL. In July three persons were electrocuted and four burned while raising a tower at Chateauguay. The *Press* reported the owner an "amateur" but actually he held a Citizens Radio license. Regardless, the accident emphasizes the importance that extreme care must be taken when working near power lines. The annual RAQI Convention at Chicoutimi was a great success, with 400 attending. VE2s AZF, SC, BG, BE, BDV, AG, AVY, AQV, AGQ, TM and ACH attended the outing at Burlington, Vt. VE2SC won the 75-meter transmitter hunt. *Don't forget the 5th Jamboree-on-the-Air, Oct. 20 and 21.* VE2BHH, at Camp Bnai Brith, Petit Lac Long, finds ham radio helpful traffic-wise. VE2JJ is now posted in Mont Joli. BLT is busy with complicated electronic equipment. AQV is on 10-meter phone. VE2ATL reports: VE2BJV is experimenting with QRP on 80 meters. VE2BMW is a newcomer at St. Jerome. VE2BCL heard Cuba on TV during a nuclear explosion. VE2BBR and VE2TZ are active mobiles. VE2BAA est actif sur 20-m. c.w. VE2AJV et VE2PY ont installé un Gamma Match chez VE2BKI. VE2BAM est un nouvel amateur, gradué des cours du C.J.O. VE2IM et VE2IK ont fait des expériences sur 2 m. de Saint-Jean Port-Joli. Ils ont entendu les stations suivantes: VE2ABA, DZ, BBC, AI. VE2ALH est le "manager" du Que. Fone Net. VE2BCZ se rétablit d'une maladie dans un hôpital du Pérou, après avoir été porté disparu pour 2½ semaines. Traffic: VE2DR 100, VE2BHH 42, VE2BFT 37, VE2AUU 33, VE2AJD 31, VE2BG 30, VE2AGQ 28, VE2AQV 26, VE2ALE 24, VE2EC 21, VE2BDV 14, VE2AMA 10, VE2AKK 9, VE2TA 8, VE2CP 6, VE2ATL 4, VE2BFB 3, VE2MR 3, VE2BDP 2.

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FS. PAM: VE6PV. RM: VE6AEN. ECs: VE6FK, VE6SS, VE6ABS. OOs: VE6HM, VE6NX, VE6PL. OBS: VE6HM. ORSs: VE6BR, VE6WG. OPS: VE6CA. OESs: VE6DB, VE6HO. Yours truly will be away on holidays in October, so send your September reports to VE6PV, 3016-6th Ave., So. Lethbridge. Start planning now for the '63 Glacier-Waterton International Hamfest to be held in Waterton National Park, the third week end of July '63. We now have legal counsel in Canada for amateur legal advice only. Our PAM reports that while band conditions are not very good these days he would like to see more of you try for the

(Continued on page 158)

Section Net certificates. Our SEC reports that you are all doing a fine job these days and says not to forget the province-wide test coming up this fall. The 1962 International Hamfest was successful with VE6AO walking off with the top prize, a new receiver. VE6FK is busy getting things ready for the AREC Picnic. Don't forget, fellows, to send in your donations for the building fund. OESs report some openings on 6 meters with some long skip coming in. Traffic: (July) VE6HM 163, VE8MA 112, VE6AEN 14, VE6TG 9, VE6FK 8, VE6BA 6, VE6CA 4, VE6UH 3, VE6PV 2, VE6SS 2, VE6VE 2, VE6ADZ 1. (June) VE6BR 47.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB —VE7JD and VE7APC were on a fishing trip and worked portable with low power and good signal reports. VE7JQ, ORS, reports the old rig won't stand many more CD Contests. VE7ALU is too busy pushing box cars to find time to operate. VE7AAF, RM, who is out on a Surrey trip, writes that he is doing fine and hopes the Whirly-bird brings him in a 6AX5 so he can fire the Ranger up. VE7DH is deserting phone and is on c.w.; he even sold his s.s.b. rig. VKØIK, ex-VK2VK, VK4VK, is now VE7DU. The Calgary Stampede certificate is one for the shack. VE7BBB now has DX YL #86. That gal has so many certificates the OM will have to move his over. VE7RR and Beulah have taken up residence in Richmond. The gang that attended the hamfest at Coconnally Park reports it was a great success. But it is advised not to ask VE7LC how much custom duty he paid for a $2.00 purchase. VE7OM, our SEC, is looking for those promised Forms 7. Come on gang, sign for those big things coming for the winter. Traffic: VE7DH 6.

Ultimate Exciter

(Continued from page 14)

synthesizer to the same frequency and note the low-frequency beat, seldom more than 100 cycles, between the two. And this can be done consistently.

I use this exciter to drive a 6146 which, in turn, drives a pair of 4X250Bs in the final. The final operates as a linear for s.s.b. operation, or as a Class C plate-modulated amplifier for a.m. The latter type of operation requires some power in driving the final tubes to grid current. The broad-banded 6146, run on about 250 volts, furnishes adequate excitation. For Class C final operation, full carrier is reinserted as provided in the s.s.b. exciter.

This exciter is in use practically every week end on both a.m. and s.s.b., so don't be surprised if I zero your frequency with a crystal-controlled signal! QST

Power Supplies

(Continued from page 32)

In Fig. 12, with a line frequency of 60 c.p.s., the critical inductance for *each* winding is

$$L_{CRIT.} = \frac{R_B}{4560} \text{ henrys,}$$

where R_B is the bleeder resistance in ohms. This inductance is just one-fourth the inductance required for a full-wave rectifier with the same bleeder resistance, so that the total inductance required (both windings in series) is identical with the full-wave case. For the same load current in the two cases, the choke should be somewhat larger for the voltage multiplier. It must carry twice the load current (in, however, only one winding at a time), so that for the same winding loss it must be made with larger wire. QST

Leo I. Meyerson
WØGFQ

OM, TRY OUR NEW "METEOR" SB-175 FOR TWO WEEKS IN YOUR SHACK

You Be The Judge

I'LL TAKE THE RISK

AND SEND IT TO YOU POSTPAID

METEOR
SB-175
TRANSMITTER

$99.95 WIRED Less P.S.

ALL MODES-MOBILE-FIXED

175W-CW, 100W-AM, 140W (PEP) DSB

"NOVICES AND ADVANCED OPERATORS. . .I want YOU to try the Meteor. Don't let high cost equipment keep you from enjoying your hobby. Try this powerful, but low cost 175 Watt Transmitter for 2 weeks and really enjoy all modes, 175 Watts CW, 100 Watts AM, 140 Watts (PEP) Double Side Band. Just a simple "flick of the switch" for 75 Watt Novice Power. You must be 100% satisfied or return the Meteor postpaid to me for full refund."
Leo I. Meyerson, WØ GFQ (Special offer for a limited time only.)

THE METEOR IS FACTORY WIRED. Beautifully designed and operates on all Bands, 80 through 10 meters with 100% modulation. ● One Knob Band Switching ● Provisions for Crystal or VFO ● Mobile Mounting Eyelets provided ● Exceptionally Compact ● 5" High x 11-7/8" Wide x 8" Deep. ● Wt. 10 lbs.

***Power Requirements:* 600 VDC @ 300 MA, 300 VDC @ 150 MA *and* 6 *or* 12 V *Filaments. Write for* WRL's complete Cable and Power Supply units for the Meteor – – Kit or Wired.**

- BIG TRADE ALLOWANCES ON METEOR
- NEW GUARANTEE ON ALL USED EQUIPMENT. OVER 1000 PIECES IN STOCK.
- PERSONAL SERVICE -- CHARG-A-PLAN -- LOW MONTHLY PAYMENTS.
- BUY NOW . . . TRADE NOW . . . AT WRL AND REALLY SAVE

NO MONEY DOWN

Send for our exclusive Charg-A-Plan Credit Blank; pay nothing down and only small monthly payments with economical Add-On privileges.

WORLD RADIO LABORATORIES, INC.
3415 West Broadway Council Bluffs, Iowa QST-10

Leo, at your risk, ship me the ☐ Meteor at $99.95. ☐ Include A.C. power supply & matching cable $41.20. Enclosed is my check for $_____. ☐ Ship on my established Charg-A-Plan account. ☐ Here is my order, send Charg-A-Plan App.

Name_____ Call_____
Address_____
City_____ State_____

Send for "specials" flyer and used equipment list.

Phasing/Filter Generator

(Continued from page 42)

to use maximum filtering in the power supply. A good double-section filter has been found necessary.

It is felt that the combination of phasing and filtering gives such good results with a minimum of pitfalls that it is well worth consideration by any home constructor. It is capable of results equal to those of any commercial unit, and the exciter will test the selectivity of any receiver. Best of all, the results are easy to duplicate as attested to by the fact that several successful conversions have been made.

Acknowledgments are due to KH6BCX who suggested the dual system so long ago that he will probably have forgotten about it; to VK2AJZ who constructed the "Package" on which all of the original experimental work was done; to VK2AST who complicated the subject by introducing mathematics; and to all others who can see any evidence of their work in this unit.

QST

2-Meter Moonbounce

(Continued from page 52)

Such an array defied rotation by conventional methods, so a circular track was built from cedar logs cut especially for this purpose. Supports at opposite ends of the main horizontal member of the array run on automobile wheels resting on this track. Rotating the array requires the coordinated efforts of several strong pushers on each end. Elevation of the array can be controlled by ropes from the ground.

In a small prefab building at the edge of the clearing is a kilowatt transmitter, with a pair of 4X250Bs in the final, precisely frequency-controlled just inside the low end of 144 Mc. Receiving is done with a parametric amplifier ahead of a 417A converter.

As we go to press, K1HMU is banging away at W6DNG at propitious times, on schedule and with the highest hopes. Whether a 2-meter moonbounce QSO is the result or not, we thought you'd like to see this example of an all-out amateur effort, the motives behind which are not unlike those attributed to Sir Edmund Hilary, when he was asked why he climbed Mt. Everest. "Because it's there!"

So is the moon . . . and few people have reached for it with more determination than K1HMU and W1ZIG.

— *E. P. T.*

Happenings of the Month

(Continued from page 53)

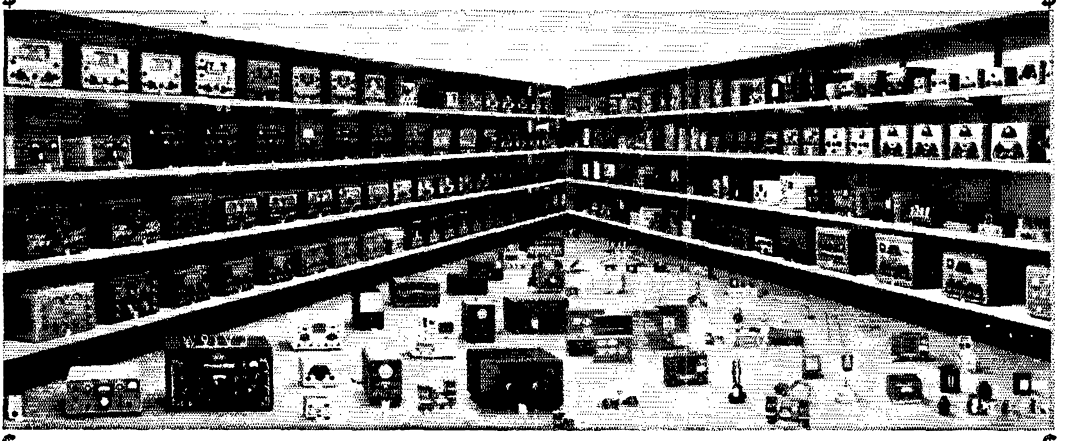
teletype equipment, techniques and operating procedures will be possible. The all-too-scarce frequencies will be used more efficiently. More amateurs may be attracted to teletype operation. Thus, the Commission will further the advance of the Amateur Radio Service without making more difficult its monitoring duties and responsibilities.

6. The requested changes may be accomplished by

(Continued on page 162)

SAVE BIG

ON NATIONALLY ADVERTISED BRANDS



CREAM OF THE CROP

All our merchandise is EXTRA CLEAN with few hours of use. Each unit is carefully checked. Tubes, capacitors and components that do not come up to manufacturers' specs are replaced with the best. Receivers and transmitters are completely realigned and calibrated. Units you receive are in top-notch condition.

HT30—**$149.75**
SX100—**$174.50**
SX101A—**$269.95**
NC303—**$297.50**
HRO50T—**$199.50**
HRO60—**$279.50**
HQ110—**$149.50**
LA400—**$69.50**
G66B&3-Way supply—**$129.50**
G77A&3-Way supply—**$144.50**

POLICY ON ALL LIKE-NEW EQUIPMENT

★ **TWO-WEEK TRIAL**—You must be completely satisfied or return for FULL REFUND, less transportation charges.

★ **GUARANTEE**—All gear carries a 90 day guarantee.

★ **TRADES**—Trade your present gear on a like-new receiver or transmitter.

AF67—**$77.50**
AF68—**$129.75**
PMr6A—**$49.75**
MOHICAN—**$99.50**
CHEYENNE—**$77.50**

WE BUY EQUIPMENT FOR $$$ CASH!

WEEKDAYS.....1-9 P.M.
SATURDAY.....9-6 P.M.
OR BY APPOINTMENT AFTER HOURS
PR 1-8616 **TU 9-6429**
BUSINESS PHONES WITH QTH EXTENSIONS
Plenty of Free Parking

TRIGGER **ATTN: W9IVJ** QS 1062
7361 W. NORTH AVENUE
RIVER FOREST, ILLINOIS
(suburban Chicago)
AMOUNT ENCLOSED.....
SHIPPED FOB RIVER FOREST

RUSH THE FOLLOWING.....
.....
.....
NAME.....
ADDRESS.....
CITY.....ZONE.....STATE.....

ORDER BLANK to *trade ur present gear *ordering above units *selling ur gear for cash

amending the second sentence of Section 12.82 (a) (2) to read as follows:

"In addition to the foregoing, when a method of communication other than telephony or telegraphy using the International Morse Code is being used or attempted, the prescribed identification shall be transmitted by the method of communication being used or attempted and the call sign of the transmitting station also shall be transmitted by telephony or telegraphy using the International Morse Code."

WHEREFORE, the premises considered, it is respectfully requested that the Commission institute a rule making proceeding to amend Section 12.82 (a) (2) as set forth herein.

Respectfully submitted,
THE AMERICAN RADIO RELAY LEAGUE
INCORPORATED
By (s) ROBERT M. BOOTH, JR.
Its General Counsel

August 24, 1962

WASP Certificate

(Continued from page 69)

"OK, that's good. We should get in the act too. Right? OK, so this is it. Our club will present the Worked All State Parks award, WASP. The Little Certificate With the Big Sticker. Get it, you guys? All they have to do is work a station in each of the . . . ahhh . . . 144 State Parks. Endorsements, stickers, ribbons for everything. Right? Then they have to work some of us club members at our home QTH. OK?

"Hey, Charlie, how many members should we have 'em work?"

"How about 53?"

"Fifty-three? My gosh, Charlie, we only got 27 members!!!!"

"So it takes a little longer. Now all in favor say . . ." QST

Correspondence

(Continued from page 85)

¶Here are a few more observations on the use of 10 meters:

1. Cross polarization doesn't work well in groundwave communications. Horizontal antennas should be used due to the widespread use of beam antennas.

2. The effects of cross polarization are less pronounced when long wire antennas are employed to receive vertically polarized signals. (I have one 240 feet long).

3. While the band goes dead after sundown on days it is open, time and again it opens to the west around 2230 EDT and re-opens until midnight with very strong signals. These signals can come in with a bang or build up fairly slowly out of the noise.

4. Stations on high points can work s.s.b. over distances of 100 miles quite readily on ground wave. The average for a number of stations in all types of locations is 60 miles or so. The same should apply to c.w.

5. The ratio of s.s.b. to a.m. stations on ten is astonishingly poor. When we have an opening, the ratio of s.s.b. to a.m. is approximately 1 to 75 or worse. . . . *Dana A. Griffin, W2AOE, Summit, New Jersey*

HOW ABOUT 15?

¶Ten meters is not the only dead band on the high frequencies: lately all I hear on 15 is the novices on the c.w. portion. Some of the OMs should go on

(Continued on page 164)

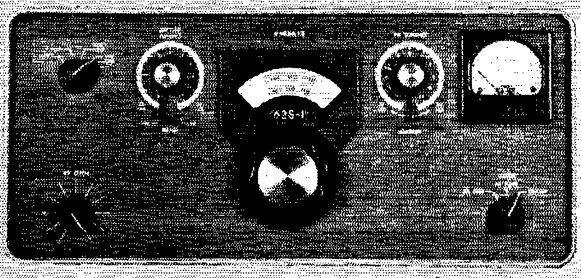
NEW

By

COLLINS

From

HARVEY RADIO



COLLINS NEW 62S-1 VHF CONVERTER

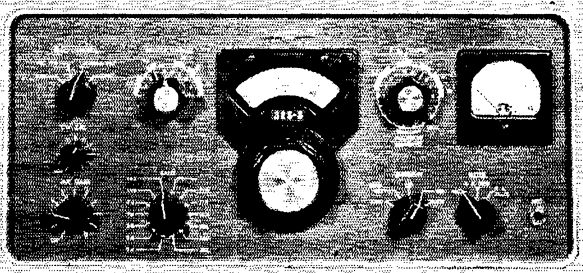
Doubles your present frequency coverage with full 6 and 2 meter operation. Covers 49.6 to 54.2 mc and 143.6 to 148.2 mc. ■ ALC built in ■ Switch from HF to VHF, from 6 to 2 all from the front panel — no cable changing ■ No need to buy extra crystals ■ Fits CC-2 suitcase ■ Uses high voltage from 32S-1 or KWM-2 power supply — 160 watts PEP ■ **Available in December!** Order now for early delivery ■

Amateur Net **$895.**

COLLINS NEW 32S-3

Real value for the discerning Ham . . . It features keyed carrier on CW ■ Adjustable keying hardness control ■ A zero-beat spotting control ■ ALC ■ Easier access to patch cords ■ Sidetone level adjust ■ For SSB or CW ■ Have the cleanest signal on the air ■ Order now for October delivery ■

Amateur Net **$750.**



Take a tip from Harvey . . . trade up to Collins quality and performance today. Collins means high value . . . more amateur pleasure!

hrc **HARVEY** ESTABLISHED 1927 **RADIO CO., INC.**

103 West 43rd Street, New York 36, N. Y./JUdson 2-1500

Visit our new subsidiary, **FEDERAL ELECTRONICS, INC., Vestal, N. Y.,** for all your industrial needs.

15 or 10 instead of the 20-, 40- or 75-meter bands, which are now over crowded.

Think of listening to one contact alone without so much QRM on your frequency from other stations. It can happen, just by using the other less popular bands. — *Mark Shurr, W.12UBII, Brooklyn, New York*

NEW AWARD

¶Just a line to let you know I would like to see the award "Heard While Copying W1AW" in full force. What really throws me is the fellow that repeats the same characters in step with W1AW. I would be glad to send this echo an award but for some reason he never signs his call. Maybe this is part of the old saying, "there always had to be one." — *Jack Kissinger, KN3TYJ, Carlisle, Pennsylvania*

IDENTIFICATION REQUIRED

¶Please inform our bilingual hams that the FCC requires that station identification be made in the English language. Recently after hearing about a W3 who got a citation because he identified his station in Spanish I wrote to the FCC inquiring about the subject. Here is the reply I received: "When Commission-licensed amateurs are making transmissions in other than the English language, they shall transmit station identification in English. There is no objection to transmittal of station identification in both English and the foreign language being utilized for the communication.

"In the event of harmful interference to a safety service by an amateur station, our monitoring personnel must identify the amateur station quickly and this would not be feasible unless our licensees identify in English."

Since Sections 12.82 and 12.105 of the Regulations specify plain language I had assumed that identification in any language was legal. Apparently other hams have thought likewise. From now on I will identify both in English and Spanish in all my contacts with Latin America. Muchas gracias, amigos. — *Reinaldo Ghigliotti, W2NYO, Elmhurst, New York*

HELLO TEST

¶I had a sked with my cousin on 14.1 Mc. I turned on my receiver and very close to this frequency I heard a very loud signal. It was someone testing an electronic keyer obviously with the B-plus on sending a steady stream of dits and signing a call every ten minutes! Sure, this type of operation is legally OK — but taking up a frequency for over 10 minutes in such a way is not in the true ham spirit.

If you want to test such equipment, the oscillator of the transmitter, with the B-plus off, will do okay, and without disrupting the band. — *Mike Lefhoe, K3LWY, Philadelphia, Pennsylvania*

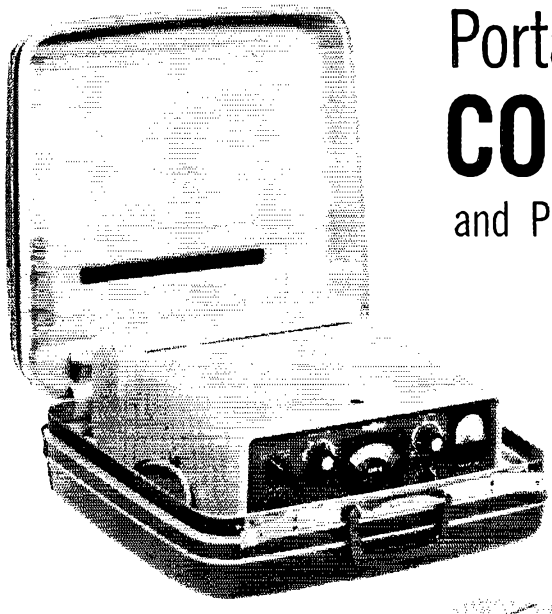
GET YOUR PERMITS

¶Perhaps it is an oversight but I've seen nothing in *QST* to indicate any special permits required for amateur radio operation in National Parks. Acadia National Park in Maine has one of the choicest locations on the east coast for v.h.f. operations from Mt. Cadillac. While there I found out about the permit required and from local hams understand it is being enforced. The idea is to preserve the natural beauty and not mar it by masts, wires, etc., at least in the tourist season. Also probably they don't particularly like to have roadways and parking lots clogged by gabbing hams.

I believe that for special events such as a v.h.f. field day or contest, permission for towers, etc. could probably be gotten, if such occurred out of season. — *Charles H. Willard, W2EZB, Utica 3, New York*

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



Portability Plus Power...

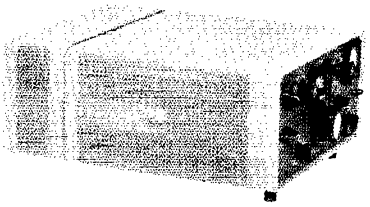
COLLINS KWM-2

and PM-2 Portable Power Supply!

Your ham shack goes where you go with the KWM-2 Transceiver and the Portable Power Supply. In your den at home, for the mobile unit in your car, or for use aboard a boat or plane, the KWM-2 means a complete, superior SSB station.

Collins KWM-2 Transceiver covers all amateur bands from 3.4 to 29.7 mc with 1 kc accuracy. 175 watts P.E.P. input on SSB; 160 watts on CW. Weighs only 18 pounds.

See the entire Collins S/Line... stop in soon.



Collins PM-2 Portable Power Supply with built-in auxiliary speaker connects directly to the KWM-2 to give you a rig that operates on either 115 or 220 volt ac. Formed plastic-lined Samsonite suitcase provides shock-resistant protection for the KWM-2, the PM-2 and accessories. Your complete portable station weighs less than 45 pounds.

KWM-2 Transceiver
$1150.00

LECTRONIC WHOLESALERS INC.
9390 N.W. 27th AVE. • MIAMI 47, FLA. • Phone OXford 6-1620

LECTRONIC WHOLESALERS INC.
2345 SHERMAN AVE., N.W. • WASHINGTON 1, D.C. • Phone HUdson 3-5200

LECTRONIC WHOLESALERS INC.
1301 HIBISCUS BLVD. • MELBOURNE, FLA. • Phone PArkway 3-1441

LECTRONIC WHOLESALERS'
DALTON-HEGE, INC.
938 BURKE ST., WINSTON-SALEM, N.C. • Phone PArk 5-8711

5N2s AMS and DMS, a famous DXpeditionary duo, inspect VCC's display at the May ARRL Roanoke Division Convention. (*Photo via WA4BIX*)

kc., Wednesdays, 0800-1200 GMT . . . . . Club organs supply further Pacific patter: ZK1BY is FO8AN-VP2VB/mm of *Vasme I, II* and *III* fame. Danny tried out his new call from Raura Tonga and Manihiki. . . . ZL4JF departs the Campbells but expects to have a sideband outfit cooking from the Kermedecs before year's end. . . . VK9GK expects to join the s.s.b. fun from Papua shortly. . . . KB6CL and associates anticipate some British Phoenix DX doings, and the Guam gang intends further Marianas flings as KG6RD, Rota, etc. . . . VR5AA, who uses c.w. and sideband with an HT-37 and HT-41 combo on 15 and 20, gets over to ZM7 now and then. . . . W8WHQ remarks on the potent 7105-kc. signal put out by KX6NG of Roi Namur island around 0800-1000 GMT. An inverted Vee beamed our way. . . . After a stint at the University of Scotland and G3OEF, ex-VS4RM hopes for assignment to more rare DX points. . . . VR4CV knocked off for Australia in September, according to the vine.

South America — Contrary to the CE1AGI photo caption in July's "How's", W3EIS is associated with HC1AGI and has never been to Chile. Nor does CE1AGI frequent 160 meters. Don remarks, "Probably the mix-up occurred because of the similarity of the calls HC1AGI and CE1AGI. There are also CE3AGI and OA4AGI. The letters 'AGI' stand for Año Geofisico Internacional in Spanish, or International Geophysical Year in English. These calls were assigned in 1957 to the Minitrack stations in Quito, Santiago, Antofagasta and Lima. The latter station has now had its call shortened to OA4AG, and the government of Ecuador has canceled HC1AGI. We have received authorization to use HC1DC at the Quito Minitrack station and hope to continue active under this call." . . . . . PY4AP fired up first as PY4ADC, switching to his present call a year later in 1961. He now has a 7-Mc. DX record of 106/89, 153/116 over all, most of these countries worked with 807s at 100-150 watts and dipole . . . . . From VP4NC: "The recent tragic crash of a 707 on a Guadeloupe hillside provided some of the most difficult traffic handling chores in a long for time members of the Antilles Emergency Weather Net. NCS KP4CGB at the U.S. Coast Guard Base in Puerto Rico called in early, raising VP4NC and FG7XL. Later VP3YG, FG7XE, VP2MC and VP2GAQ completed the net that carried first news and confirmation of the tragedy. FG7XL, OM and XYL, provided direct contact with the airport at Pointe-a-Pitre. Monique was still handling traffic six hours after the accident despite the fact that she with many others on the island lost close friends in the crash. French and English, c.w. and phone, were used as necessary to speed the traffic."

Hereabouts — Regarding our August mention of the QRP Amateur Radio Club, secretary-recorder W6CIS

(Continued on page 168)

writes: "The thing has grown so rapidly it's almost out of hand. It has climbed to 264 members as of last night. The 'committee' agrees with me that it's too much for one man, and that we will have to find a good representative in each call area to put out his own newsletters, etc., at least for the time being. I will continue to issue membership certificates. It's lots of fun — apparently the 'little people' (power-wise) feel they have found something for them. For example, we have VK3NC who has well over 200 countries with only eight (8) watts input." . . . . . WA2QMJ thinks that DX men ought to keep an ear on our National Calling and Emergency Frequencies and would like to see the idea expanded to include International ECFs as well. Dave points to the regular news items concerning urgent pleas for drugs, etc., relayed and delivered by world-wide amateur radio . . . . . W6JBQ says that WA6VUI (W6LRU) operated from Mono country last month to help the gang along toward WACC (Worked All California Counties). Ohio-88, another counties deal, encouraged W8YGR to *go after* K8MTI and W8IBX who visited Vinton county, and K8ITH in Morrow . . . . . W8YGR deplores the breed of phone operator who can't seem to read code in a pinch, even far below the renewal-requirement speed. Eleven-meter types? . . . . . KØs GZN and GZO expect to use single-sideband on Curacao and Bonaire in January or February as PJ5s CG and CH, respectively . . . . . "About those superlocations you mentioned in the August issue — I've got one," asserts K1LOM. "Virtually no QRN at all and I invariably work every station I call, DX or Stateside, with 599 reports while running only 75 watts." Make way for the gold rush, OM . . . . . W1BB, our 160-meter specialist de luxe, is all set of the 1962–'63 low-band season, even down to a special 160-meter QSL printing . . . . . W9YIX uses a Zepp that has been hanging undisturbed for 20 years. Anybody got an older flattop? . . . . . Club localisms: XE1CV *mentions possible Socorro XE4 goings-on in January.* . . . VP2KJ hopes to score more c.w. and s.s.b. Anguilla QSOs. . . . More than 400 West Gulf DX Club "Ranger" certifications have been issued to overseas DXers since the club inaugurated the award in 1955. QSOs with 25 WGDXC members are required. DX stations can check with W5FJ for details . . . . . Don't forget the New England DXCC Dinner scheduled at Motel 128, Dedham, Mass., for the 6th of this month. W1BAN can supply information on request.

Ten Years Ago in "How's DX?" — Jeeves analyzes some *QST* statistics and finds that new confirmed countries per year are hard to come by when one reaches ARRL DXCC Honor Roll status . . . . Twenty-phone reports dwell on FL8MY, FR7ZA, HZ1s SD TA, JY1OG, KAØIJ, KT1s DD PU, MI3s AB LK RC UG VG, OE13AL, ST2NW, SUs 1AS 5CC 5EB, TA2EFA, VK1PN, VSs 2CB 2CY 2DB 7WE, W5MUP/KS6, YA5XY, YIs 2FD 3BZL, ZC6UNJ ZDs 4AX 4BC 4BF 9AA and 4W1MY . . . . Twenty c.w. also is fruitful: AP2L, B1AB, C3s AR MC, CR5JB, CU3YY, ET3R, FN8AD, I5A, I1YCC/Trieste, KH6CB/KJ6, KM6AH/KB6, MF2AG, MI3US, OQ5RA, SUs 1GG 5BM, TA3AA, VK1EM, VSs 2CR 5ELA 7NX 7YL, VU7FK, YI2AM, ZA3KAA, ZC2MAC, ZD4AB, 9S4s AD and AX, ... Fifteen features KC6QY, KT1UX and others . . . . Forty's best are VPs 4LZ 8AJ and VR2CO . . . . Capt. Kurt Carlsen, W2ZXM/mm, keeps 28-Mc. on the DX map . . . . Odds 'n' ends: YI3BZL claims a 4-hour "WAS". . . . W0ELA had rough going in Brunei as VS5ELA. . . . W6MLY scored 632 4W1MY QSOs, and 160 as FL8MY. . . . AC4YN, contrary to earlier rumors, is reported alive and well in Tibet after the Red take-over. . . . VS9AO (ex-MT2E) made five rare QSOs from Kamaran island . . . . Halp! Jeeves & Co. are harassed by real Tennessee Valley Indians. QST

Strays

W6HTA is operating maritime mobile on board the USS *Scanner*, a radar picket ship, off the west coast of the U.S. The four hams aboard (W6HTA, WA6YEY, K5QDR, K7RLC) are looking for QSOs on 7, 14, 21, 50, and 144 Mc. They say their QSLs are a bit different.

—•••—

A ham by the name of Doc Flister
With bourbon had tied on a twister.
He tried, in delusion,
To give a transfusion
To his rig for its bleeding resistor.
— *W1HAK*

—•••—

K4IGW is very appropriately named — *Will I. Hamm.*

Mail the coupon today for your FREE copy!

FREE!

FOR '63

LAFAYETTE RADIO ELECTRONICS

1963 CATALOG NO. 630

388 Giant Size Pages

42 years of serving the Amateur

IT'S FROM THE "WORLD'S ELECTRONICS SHOPPING CENTER"

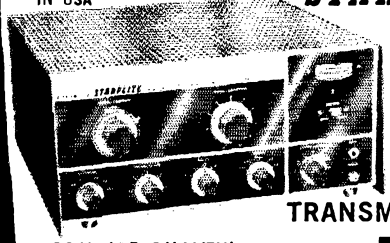
HERE IT IS . . . the exciting, all-new 1963 Lafayette. 388 giant-sized pages. The largest in our history . . . Thousands of items. 24 hour service at the lowest, money saving prices.

Select from large variety of — **Amateur Equipment • Citizens Band • Test Instruments • Mobile and Fixed Station Equipment • Amateur Accessories and Parts Antennas • Tape Recorders • Hi-Fi • Tubes • EXCLUSIVE LAFAYETTE KITS and much more.**

3-IN-1 EASY PAY PLAN — choose the plan that suits you best. No money down, up to 24 months to pay.

SATISFACTION GUARANTEED OR MONEY REFUNDED

MADE IN USA



STARFLITE™

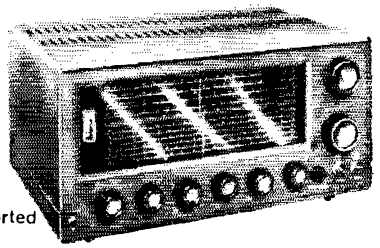
90 WATT PHONE and CW TRANSMITTER KIT

COMPARE QUALITY! COMPARE PRICE!

KT-390 **79.50** NO MONEY DOWN

• 90 Watts Phone or CW on 80 Thru 10 Meters • Built-in 3-Section Low-Pass Filter • Clear, Chirpless Grid Block Keying

Dollar for dollar you can't beat this new Lafayette Starflite transmitter. Easy to build and operate, it glistens with quality and performance all-over. Features in addition to those listed above: 5 crystal positions and provisions for external, VFO, illuminated edgewise panel meter and pin-net work output for proper antenna match. Buy one now — we know you'll be satisfied with it.



Imported

THE LAFAYETTE HE-30

Professional Quality Communications Receiver

• 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

99.95 NO MONEY DOWN

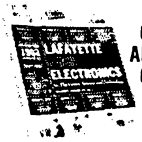
Sensitivity is 1.0 microvolt for 10 db. Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER. TUBES: 6BA6—RF Amp, 6BE6 Mixer, 6BE6 OSC., 6AV6 Q-Multiplier—BFO, 2-6BA6 IF Amp., 6AV6 Det-AF Amp. ANL, 6AQ5-Audio output, 5Y3 Rectifier.

LAFAYETTE RADIO

Please include shipping charges with order

111 JERICHO TURNPIKE, SYOSSET, L. I., N. Y.

New York, N.Y.	Jamaica, N.Y.	Newark, N.J.	Bronx, N.Y.	Paramus, N.J.	Boston Mass.	Plainfield, N.J.	Scarsdale, N.Y.
100 6th Ave.	165-08 Liberty Avenue	24 Central Avenue	542 E. Fordham Rd.	182 Route 17	110 Federal Street	139 W. 2nd Street	691 Central Pk. Avenue



CUT OUT AND PASTE ON POST CARD

LAFAYETTE RADIO Dept. VJ-2
P.O. Box 10 Syosset, L. I.

Send me the **FREE** 388 Page 1963 Catalog No. 630

NAME .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

Manitoba

VE4XO....10,800- 48- 75- B-15

Saskatchewan

VE5RU.....8370- 45- 62- A-16
VE5GF.....7503- 41- 61- B-20
VE5JV.....1224- 17- 24- C-12
VE5DA.....48- 4- 4- A- 2

Alberta

VE6HG.....8520- 40- 71- A-27

British Columbia

VE7EH... 14,994- 49-107- A-25

AFRICA

Angola

CR6CA....35,316- 36-327- A-11

Mozambique

CR7GF.....252- 7- 12- B- 3

Liberia

EL4A.....180- 5- 12- A- -

Algeria

FA8RJ.....3- 1- 1- A- -

Northern Rhodesia

VQ2AT.....53,880- 40-449- A-17

Kenya

VQ4HX....21,083- 29-243- A- -

Sierra Leone

ZD1JWC.....1872- 12- 52- A- 6

Southern Rhodesia

ZE8JY.....1890- 14- 45- A- -

Nigeria

5N2JKO...50,826- 43-394- A-27

Mauritania

5T5AB.....6915- 15-155- B- 7

ASIA

Iran

EP2BK.....2058- 14- 49- A- -

Japan

KA2MA[3]...35,560- 35-339- B-10
JA1BWA....11,745- 27-145- A-25
JA1CWP.....5280- 16-110- A- -
JA1FSL.....3528- 14- 84- A- -
JA1BUI.....72- 4- 6- A- -
JA3BEA.....18- 2- 3- A- -
JA9UU.....3- 1- 1- A- 1
JA0HC.....3- 1- 1- A- -
JA6YAX (2 oprs.)
105- 5- 7- A- 3

Ryukyus

KR6GF[4]...14,200- 25-190- C-13
KR6IJ.....4230- 15- 94- C-10
KR6LD.....36- 2- 6- B- 1

Laos

XW8AS.....1749- 11- 53- A-12

EUROPE

Portugal

CT1YE...119,350- 50-801- B-62
CT1UO.....1716- 13- 44- A-12

Germany

DL6DS....34,336- 29-396-BC-18
DL6JJ.....180- 4- 15- B- 5
DL4QF (4 oprs.)
26,824- 28-320- B-29

Spain

EA3JE.....25,312- 32-264- A-31
EA4GZ.....4013- 13-105- A- 4

Ireland

EI4AK.....1650- 10-155- A-11
EI9F.....12- 2- 2- A- -

France

F2MO.....51,904- 32-541- A-10
F7B1.....42,825- 25-571- A-22
F7OB.....33,100- 10-279- A-16
F3II.....6264- 12-174- A- -
F9EP.....1920- 16- 10- A- -

England

G3DO.....61,020- 36-565- A-22
G3MEA....39,295- 29-462- B-26
G3LNT....28,080- 26-366- A-30
G3NFV....22,308- 33-227- A-33

Northern Ireland

GI4RY.....60- 4- 5- A- -

Scotland

GM8MN...42,636- 38-374- A-24

Switzerland

HB9DX.....912- 8- 38- A- -

Norway

LA4TE....17,226- 22-261- A-12
LA6CF.....2541- 11- 77- A- -
LA3K.....231- 7- 11- A- 4
LA8D[6].....72- 4- 6- A- -

Luxembourg

LX1HM.....1116- 9- 42- A- 3

Austria

OE1RZ...126,559- 47-899 B-52

Finland

OH5SM....24,360- 29-280- B-24

Czechoslovakia

OK3KGL.....336- 7- 16- A- -
OK2KAU.....300- 5- 20 A- -
OK2ABU.....3- 1- 1- A- -

Belgium

ON4XD....10,659- 17-209- A- -

Denmark

OZ5JT.....32,130- 30-357- A- -
OZ3KE.....1690- 10- 57- A- 7
OZ4FT.....108- 4- 9- A- -

Netherlands

PA0PRF....8280- 12-230- A- -
PA0HBO....3570- 17- 70- A- 7
PA0LV.....2250 15- 50- A- -

Sweden

SM5BPJ...22,100- 26-281- B- -
SM5CZQ.....2959- 11- 90- B- 9

Poland

SP5PO.....495- 5- 33- A- -

Iceland

TF2WGD....2160- 9- 80- A-17

European Russian S. F. S. R.

UA1DZ....23,604- 28-281- B- -
UA3FG.....5421- 13-139- B- -

White Russian S. S. R.

UC2AA.....8164- 13-212- A-12

NORTH AMERICA

Cuba

CO8JK.....58,128- 56-346- B-37
CO8RA (2 oprs.)
141,236- 68-693- A-71

St. Martin

FS7RT....167,301- 87-641- A-27

Dominican Republic

HI8DGC..230,434-58-1334- A-44

Honduras

HR1MM...52,947- 37-477- B-47

Puerto Rico

KP4AWH.220,728-68-1083- A-15
KP4AVQ...82,524- 46-599- C-20

Greenland

OX3AI.....3570- 17- 70- A- 8

Guatemala

TG5HC.....7830- 29- 90- A- -

Grenada

VP2GAA (8 oprs.)
58,578- 26-758- B-48

(*Continued on page 172*)

Caymans

VP5BP	203,552-	68-990-	A-21	

Turks & Caicos

VP5CH	111,189-	57-835-	A-25	

Mexico

XE1CV	327,510-	90-1214-	AC-	-
XE1ZE	19,344-	16-103-	B-	7
XE1EV	1368-	16- 91-	A-	-
XE2BC (4 oprs.)	24,672-	48-172-	A-18	

OCEANIA

Marianas

KG6AKZ	8058-	17-158-	C-	6

Wake Island

KW6DG	92,432-	53-587-	C-20	

Australia

VK2AHT	7252-	28- 87-	A-21	

Cook Islands

ZK1AR	7452-	27- 92-	A-20	

SOUTH AMERICA

Chile

CE1AD	17,238-	34-169-	B-	-

Ecuador

HC1AGI[6]	231,264-	73-1056-	B-34	

Colombia

HK4EB	55,965-	41-457-	A-15	
HK3LX	384-	8- 16-	B-	-

Argentina

LU1DAB	135,168-	14-1021-	B-37	
LU7MAY	12,075-	25-162-	A-32	

Peru

OA1W	44,850-	50-300-	A-32	

Netherlands West Indies

PJ2CR	30,208-	32-317-	A-21	

Brazil

PY2BGO	2142-	17- 42-	B-11	
PY3AFO	132-	4- 11-	A- 1	

Netherlands Guiana

PZ1AX	122,332-	68-601-	B-18	

British Guiana

VP3HAG	105,792-	64-551-	A-29	

Venezuela

YV5AGD	252,180-	90-934-	BC-56	
YV5AKU	89,568-	48-622-	B-	-
YV2CJ	62,556-	52-405-	A-33	
YV5AKP	15,810-	32-166-	A-	-
YV5AHG	8904-	28-106-	A-14	

Paraguay

ZP5CG	1350-	10- 45-	A-	-

[1] W1WPR, opr. [2] Hq. staff — not eligible for award. [3] K2JOZ, opr [4] K5JPV, opr. [5] LA6VH, opr. [6] HC1DC/W3EIS, opr.

ARRL thanks the following amateurs for submitting check logs. *C.W.* — W1GYE K1OOV W1RWU K1UDU K2DNN K2QHL W3ARK W3QLW W4LYV W4RBZ K4SDS W6AM W8HA W9IZ K9MBM VE2YA OK2LN OY7ML OZ4FF OZ5WJ OZ7KV PAØQM PAØWDG SM3CJD SM5BFE SM5CZQ SM6JY VK5EX VP5BP YO5-195; *Phone* — W2HXF W2OUY W3AKC W3UHN W4QD W4RBZ K5DEC WA6GLD W9AOW VE1EK VE3DYB VE8BC G3OEY GI4RY OK3KMS ZL1HY ZS6DK.

Hamfest Calendar

(*Continued from page 10*)

Merritt Preston, chief of pre-flight operations, NASA Manned Spacecraft Center, Cape Canaveral, will be the featured speaker at the main banquet. Perry Williams, W1UED, will be present from ARRL Hq. *Costs* — Registration, $2.00; main banquet, $5.00; s.s.b. dinner, $5.00; YL luncheon, $2.25. Make your hotel reservations directly with the Hotel Sheraton-Cleveland. Convention registration and banquet tickets from Cleveland Amateuradio Convention, Box 5167, Cleveland 1, Ohio. Pre-registration deadline October 10.

Pennsylvania — The fifth annual banquet/hamfest of the Mahanoy Valley Brass Pounders Club will be held October 27 in the Hometown Fire Company hall on Route 45, one mile north of Tamaqua, Pa. Talk-in frequency 50.64 Mc. FCC will give General Class exams at 1600. Pennsylvania-Dutch style ham and turkey dinner will be served at 1800, followed by professional entertainment and dancing. Attendance by advance registration only, prior to October 20, $4.00 each. No tickets sold at the door. For info and reservations, contact Jim Miller, K3KNP, 98 Railroad St., Giardville, Pa.

Pennsylvania — The Tri-State Sidebanders are sponsoring a dinner on Saturday, October 20, at Johnny Garneau's Smorgasbord Restaurant, 3800 William Penn Highway, Monroeville, Pa. (one mile west of Pittsburgh interchange on Route 22) beginning at 1830. Cost per person $4.00. Reservations must be made prior to October 13. Contact D. R. Shafer, K3COU, 233 Marshall Drive, Pittsburgh 35, Pa.

Pennsylvania — The Western Pennsylvania Mobileers will hold their sixth annual Fall Roundup on Friday, October 19, at 2000 in the Wilkinsburg Boro Building, Ross and Hay Streets, Wilkinsburg, Pa. Mobile stations check in on 29.36 and 50.4 Mc. For further info contact Tom O'Toole, W3SHT, Pittsburgh telephone WA-2-0987.

South Carolina — The Rock Hill, S.C. ARC will hold its annual hamfest at Joslin Park, Rock Hill, S.C., on Sunday, October 14. Contact W. L. Jennings, W4UNP, P. O. Box 90, Rock Hill, S.C., for further info.

RADIO SHACK | TOP TRADE-INS on hallicrafters Equipment!

SX140 AMATEUR BAND RECEIVER

New design — low cost! 6 bands; full line of features. A perfect match for HT40 transmitter at right! High sensitivity and selectivity; crystal calibrator; band edge marker; crystal oscillator circuit; 25:1 tuning ratio; full controls. 13⅜x8½x6⅝".

20K44DX807, Kit, Sh. wt. 11 lbs.....**$114.95**
20K44DX803, Fully Wired **$139.95**

HT40 Amateur Band Transmitter

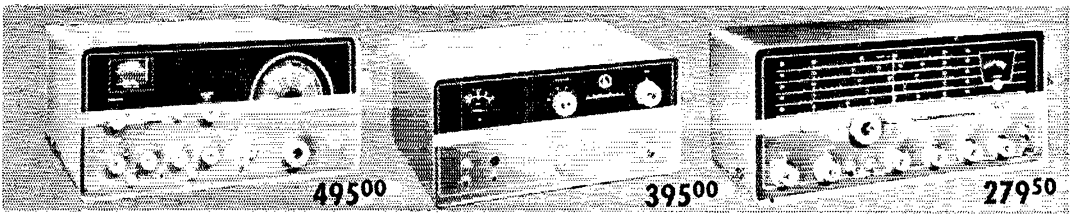
A feature-packed CW/AM transmitter! 75 W peak input, AM slightly less on 6 m; 6, 10, 15, 20, 40, 80 m output; CW/AM transmissions; TVI-filtered; xtal controlled, provision for external VFO; 52Ω harmonic suppression tunable pi network & more. 13⅜x8⅛x6⅝"

20K44DX806, HT40K Kit, Wt. 19 lbs. **$89.95**
20K44DX802, HT40W Wired **$109.95**

HA5 Powered Heterodyne VFO

Deluxe self-powered heterodyne type VFO. Extreme stability, versatility. Illuminated dial calibrated for amateur bands 80 thru 2 meters, may be calibrated to WWV. 3:1 tuning ratio. Output freq. range: 3.5-4.0 mc, 7.0-7.5 mc, 7.8-8.3 mc, 8.333-8.833 mc; 5.0-5.5 mc VFO range. 7x5x8½", Wt. 8 lbs.

20K44DX810, Model HA5 .....**$79.95**



HT37 Phasing Type Transmitter

Modern design, phasing type side band generator unit at a moderate price! Single sideband, continuous-wave, and AM output on 80, 40, 20, 15, 10 meters. 144W plate input; unwanted sideband down to 40db at 1kc; distortion products down 30db; instant CW calibration, precision VFO & more! 19¼x9x15½".

20K45DX349, Ship. wt. 82 lbs. **$495.00**

HT41 Linear Kilowatt Amplifier

Compact unit, employs 2 tetrodes with 250W plate dissipation. Input 50-75Ω matching, can be driven by 20 to 100W. Full wave rectifier, exceptional regulation. 80-10 m coverage; adj. pi network output; metered circuits; RF output meter; stand-by bias supply. Power in SSB/CW 1 kw DC through 20 m. 19¼x9x17½".

20K45DX498, Sh. wt. 97 lbs. **$395.00**

SX111 Dual Conversion Receiver

Top performance! Selectable sideband receiver covers 10-80 meters in 5 bands with a sixth band for 10mc crystal calibration with WWV. 5 steps of selectivity from 500 to 5000 cps with 1μv sensitivity all bands; tee-notch filter, plug-in 100kc crystal calibrator etc. 11 tubes plus rectifier. 8½x18½x11".

20K45DX325, Ship. wt. 40 lbs. **$279.50**

MAIL COUPON — TODAY!

RADIO SHACK CORP. 10D
730 Commonwealth Ave., Boston 17, Mass.

☐ #20K44DX807 ☐ #20K44DX803 ☐ #20K44DX806
☐ #20K44DX802 ☐ #20K44DX810 ☐ #20K45DX349
☐ #20K45DX498 ☐ #20K45DX325
☐ Send FREE 1963 Catalog

Name.....
Address.....
City.....Zone.....State.....

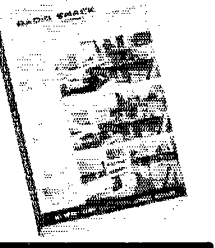
☐ Check ☐ Money Order ☐ C.O.D

Modernize Your Station For Less Money!
Trade Your Old Equipment For Top Dollar!

FREE Extra Value **1963 CATALOG**

Radio Shack's Famous Bargain Train — At Your Fingertips!

. . . and what's more: It's easy to buy with Radio Shack's Revolving CHARGE ACCOUNT!



RADIO SHACK

BOSTON, MASS. 167 Washington St. REgent 4-1000
WEST HARTFORD, CONN. 39 South Main St. ADams 6-5441
BRAINTREE, MASS. South Shore Plaza VIctor 3-9200
SYRACUSE, N. Y. 2057 Erie Blvd. East 446-4990
BOSTON, MASS. 730 Commonwealth Ave. REgent 4-1000
NEW HAVEN, CONN. 230-234 Crown St. STate 7-7121
STAMFORD, CONN. 29 High Ridge Road DAvis 5-4371
PROVIDENCE-CRANSTON, R. I. 1301 Reservoir Ave. Opp. Garden City

YL News and Views

(Continued from page 84)

Contest For All YLs
23rd YLRL Anniversary Party

CONTEST PERIOD

C.W. —

Starts: October 24, 1962 1700 GMT (1200 EST)
Ends: October 25, 1962 2300 GMT (1800 EST)

PHONE —

Starts: November 7, 1962 1700 GMT (1200 EST)
Ends: November 8, 1962 2300 GMT (1800 EST)

Eligibility: All licensed YL and XYL operators throughout the world are invited to participate. YLRL members *only* are eligible for the cup awards. Non-members will receive certificates. Only YLRL members are eligible for the Corcoran award.

Operation: All bands may be used. Cross-band operation is not permitted. Only one contact with each station will be counted in each contest.

Procedure: Call "CQ YL".

Exchange: Station worked, QSO number, RS or RST, ARRL section or country. Entries in log should also show the time, band, date, transmitter and power. Please know your own ARRL section or country. (Section list available for s.a.s.e. to V.P.)

Scoring: (a) C.w. and phone sections will be scored as separate contests. Submit separate logs for each contest. (b) Multiply number of contacts by total number of ARRL sections and countries worked. (c) Contestants running 150 watts input or less at all times may multiply the results of (b) by 1.25 (low-power multiplier).

Awards: Highest c.w. score — gold cup. Highest phone score — gold cup. Highest phone log and c.w. log in each district and country will receive a certificate. Highest combined phone and c.w. score, YLRL member only, will receive Corcoran Award.

Logs: Copies of all logs must show claimed score, be signed by the operator and postmarked no later than Nov. 22, 1962, and received no later than Dec. 6, 1962, or they will be disqualified. Send copies of logs to Lillian Byrne, K2JYZ, 24 Stillwell Place, Freeport, Long Island, N.Y. No logs will be returned. Be sure it is a *copy* of your log you send in for confirmation.

[*Vice President's Note:* It is recommended that all YL nets close for the contest period, inasmuch as net contacts do not count. Also, *all* YLs are urged to participate in the c.w. section of the contest. Give the c.w. YL operators a contact! — K2JYZ]

Coming Events

YLRL Anniversary Party — The 23rd annual contest for all YLs. C.w. section Oct. 24-25; Phone section Nov. 7-8. See rules this column.

Ladies Day — The second Monday of each month is reserved for just plain YL ragchewing on all the bands. Let the laundry go in favor of a fun day of YL QSOing.

YLRL President Onie Woodward, W1ZEN, announces that the 4th International Convention of the YLRL will be held sometime in 1964 and will be sponsored by the Buckeye Belles of Ohio. It's too early to buy your tickets yet, but keep it in mind when formulating long-range plans.

Strays

WA2NJC thinks he may have solved the problem of negative resistance — insert the resistor in the circuit backwards.

The World Above 50 Mc.

(Continued from page 76)

area from June 1 to 25 between 0200 and 0600 GMT. Lately evening signals have been nil but activity is being heard quite frequently from W6 and W7's (particularly Arizona, Idaho and Utah) from 1600 to 2100 GMT at his QTH. However, as Bob sez: "Very few tune the c.w. end of the band." Keith agrees with the foregoing sentiment as do many others who write us concerning c.w. operation and band openings. Must be that the openings to many of the c.w. operators are not concurrent as each and every one sez the same thing. "No one ever tunes the c.w. end of the band." Incidentally, that's the place to look for Ed, W1HDQ. He operates 50.02/50.08. Keith also sez that activity in Idaho has been given a boost with K7AAV on in Idaho Falls, and that on July 18 W7EGN worked his first Idaho station when he worked W7UBI. "Only 3 or 4 openings to the east coast this season with first hop hitting Nebraska, Iowa and Illinois. There have been several good evening openings into VE4 and VE5 areas lately with VE4's CX 4, RV, MA, YW, TX and VE5MG being worked." Listed among the 2-way s.s.b. contacts Keith has made this year are KØREE, WØQIN, KØCJX, WØPFP, K6GJD, K6IXL, K6BOM, K6YDF, WA6DBA, K6KFY, K6RAW, K6UBT, K6VLM, WA6-DTH and WA6CTL.

Among our many faithful correspondents has been Ray Clark, K5ZMS, from whom we have just received a final report from Duncanville, Texas. "Here is my final report from this QTH. I have been QRT since the 10th of the month. I've sure had a good time working from this QTH and wish I could thank all the gang I've worked for the many fine rag chews I've had all over the country. I have my 522 ready for two meters when I get back and I plan on getting on six also, of course. I have been doing some tabulating and come up with the following figures for band openings from the latter part of April to July 10. Openings are as follows Ø-30; 9-27; 8-34; 7-29; 6-17; 5-10; 4-35; 3-20; 2-16; 1-10; XE-15; CO-11; KP4-5; VE5-1; VE4-7; VE3-2; VE1-3." Thanks, Ray, for the many lengthy reports which you've taken "time out" to write us to and sure hope we'll be hearing from you again in the not-too-distant future. Report from Emil, K3MZO, says that six has been very good this summer and that he has worked CO5CN and KP4AXC. Groundwave has also been good to Plymouth, Pennsylvania as he has been working W4KLC in Fairfax, Virginia every Sunday. A post card received from KL7ECT reports the interesting news that KL7FLB, Bob, is operating at 50.045 Mc., A1, and will shortly be operating on 50.250 Mc., A3; also, KL7FLC, 50.050 Mc., A1, shortly to be operating on 50.183, A3. Both stations on the air about 0900 GMT.

WA8BHB in Coloma, Michigan, has been on 50 Mc., since the end of May, 1962 and during the period between May and August has worked 26 States and VE1. John has also heard but not worked Cuba and Mexico. Word received from Bob Leo, K7KOK in Bozeman, Montana, sez that he has been operating 50.180 and 50.164 Mc. since June 11; has worked about 100 stations in twenty states. Bob is running 100 watts to a homebrew 829B rig, has an 8-element beam 70 feet high, and is located at the field site of Montana State College.

A letter from the much-needed state of Maine and K1NTC says that sporadic *E* has been very good in Maine this year. Curt (K1NTC) and his mother, K1NTD, have heard and worked XE1OE and heard CO2GX many times, and both W7VDZ and W7UFB were worked by K1NTC on July 6. The 19th of July came up with a double-hop opening into Maine when K7KHU and K7NQR in Washington were both worked. K8DTU was also worked on that day and gave Curt the news that he had worked both KL7AUV and VE8BY during July. K4CBM in Naples, Florida, reports band openings daily since June 5 (until July 16) with California being

(Continued on page 178)

HAM and INDUSTRIAL TOWERS

Tri-Ex

All Tri-Ex Towers and accessories feature a triple coated finish for maximum weather protection; (1) iron phosphate rustproof undercoating, (2) newly designed durable epoxy resin prime coat, and (3) baked auto-type enamel finish coat.

HM SERIES
CRANK-UP/CRANK-OVER
2 WAY HINGE OVER TOWER

New Two-Way-Hinge-Over Pilot Base, either in concrete or earth mounting models, eliminates climbing . . . eliminates cranes or A-frames . . . eliminates "antenna parties" (one man job) . . . gets your beam up faster . . . gets you on the air faster.

3-STEP INSTALLATION

1—Install foundation unit either directly in earth excavation, or concrete, as desired.
2—Attach upper base unit and fasten tower to lower bracket.
3—Raise tower to vertical position with 9-to-1 winch on pilot base, swap holding bolt positions, and you have a hinged, crank-up/crank-over SELF-SUPPORTING tower. That's all there is to it!

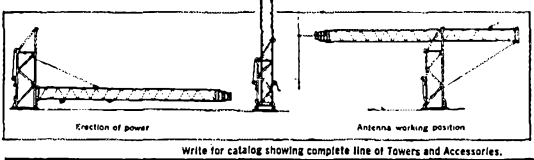
The new Tri-Ex series is available in 37 and 54 foot models (actual full height is exclusive of mast). Design of tower permits use without guying, and the unique 30-degree bracing of alternating design assures highest degree of strength and wind resistance.

HEAVY DUTY SERIES

Model HDM-237	2 Section	37 feet
Model HDM-354	3 Section	54 feet

See your distributor for complete literature and prices on the complete line of Tri-Ex Towers, or write direct to:

TRI-EX TOWER CORP.



Erection of power — Antenna working position

Write for catalog showing complete line of Towers and Accessories.

Tower Raising and Lowering and Rotating Unit for HZRN Series
Model RLRH-50

HZRN SERIES
ROTATING TOWER

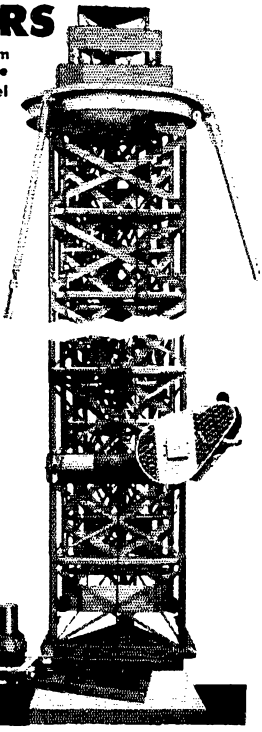
The new HZRN Rotating Tower is completely redesigned for smooth, frictionless rotating and raising and lowering. Featuring increased strength and greater weight, it meets and surpasses RETMA and UBC Building Standards.

The complete tower and antenna rotate on twelve large, sealed precision ball bearings at the 20' level, and on a heavy duty, flange type, self-aligning ball bearing at the base. No guying is necessary.

The tower is equipped with a 35 to 1 Timken roller bearing, sealed worm gear drive raising winch. You can motorize for full remote control with the aid of Tri-Ex accessories.

All HZRN Series towers are shipped complete with rotating base, 2 roller chain sprockets and drive chain, crank, and 3 concrete anchor rods and braces. Full engineering calculations and data are available upon request.

Model	Height	Weight
HZR-237N	37'	510 lbs.
HZR-354N	54'	805 lbs.
HZR-471N	71'	1235 lbs.



TRI-EX TOWER CORP. 2920 W. Magnolia, Burbank, California

C & G
PROUDLY PRESENTS
These Two NATIONAL RADIO PACE-SETTERS

TWO OUTSTANDING RECEIVERS IN THE NATIONAL RADIO LINE THAT HAVE THE FEATURES AND BRING IN THE SIGNALS!

NC-270

Precision double-conversion 80 through 6 meter amateur receiver featuring rock-like stability and unchallenged VHF performance. Five degrees of variable IF selectivity, including selectable SSB with product detector, 1.0 uv sensitivity, 60 db deep T-notch filter, built-in 100 KC calibrator, crystal-controlled 2nd converter. More features than any other receiver in its price range.

$279.95 am. net.

NC-190

The 540 KC—30 MC general coverage receiver that tunes like a ham-band-only unit. 1.0 microvolt sensitivity, double conversion with five main tuning ranges, 5.0 KC, 3.0 KC, and 600 cycle variable IF selectivity, full SSB/CW AGC and product detector, 60:1 bandspread vernier drive and National's exclusive dial selector, providing instant choice of calibrated amateur or foreign broadcast bands.

$219.95 am. net.

C & G ELECTRONICS CO.

Northwestern headquarters for National

2502 Jefferson Avenue
Tacoma 2, Washington

2221 3rd Avenue
Seattle 1, Washington

heard twice and with openings ranging from all day sessions to just a short evening period. During the second week in July K4CBM worked 23 states and Puerto Rico. K1VBN who is operating portable in Bethlehem, New Hampshire for the summer says that he has had only three QSOs during July. Terrain is mountainous and antenna is only a 50-Mc. dipole about 15 feet high. (That's Grafton County, too!)

In Plymouth, Mass., K1DYA reports the opening of July 6 when he heard Alabama, Tennessee, Georgia, North and South Carolina, Virginia, West Virginia, and Nova Scotia. According to Al, K7ICW, sporadic *E* improved over the month of June with signals having stronger strengths and wider areas being covered. The first openings to VE3, VE4 and VE5 in 3½ years were noted on July 16. On that same date K2OFN was worked on c.w. when no one else in the eastern part of the country was working anything beyond 0 land. Larry, K5ERQ, in Rhome, Texas, reports hearing CO2GX on July 13; W9SRT/4 and WA8CZC heard on July 17; K7HAA worked on July 20. Larry also observed visually what apparently was an aurora on July 20, but only locals were heard. W7NPV reports from Harlowton, Montana, that he observed openings on 10 days during July. However, he was absent from the station for another 10 days, so probably missed a few. During the openings he did hear fourteen states were worked and July 18 was the best of all when Vern copied signals for 12 hours.

South Dakota and W0ENC come forth with the news that 50 Mc. was open into that state on 26 days during the month of July. On July 5 all call areas and CO2 were heard; July 6 all call areas except 1-land were heard; July 9 all call areas except 6-land; July 10 all call areas heard between 0600 and 0900 local time. From Louisville, Kentucky, WA4CQG writes that he noted openings on 9 days during the month and that 18 states were heard or worked during this period. Increased A1 and A2 activity in that area. Tobe, K1PYI, sez that the first few days in August were noteworthy because of excellent temperature inversion conditions. During the late evening and early morning hours he worked consistently down the Atlantic coast on a.m., c.w. and s.s.b. On August 1 he worked VE2AIO, two-way s.s.b. with 59 aurora reports and 54 groundwave reports. Between August 3 and 6 forty-seven W2's, about a dozen W3's and five W4's were worked via temperature inversion. Farthest south was K4QNF in Elizabeth City, North Carolina. To date Tobe has worked 42 states 2-way s.s.b. K1NTC also reported the excellent conditions to the southwest on the night of August 6 when a number of stations were worked in New York and New Jersey, from Maine.

144 Mc. and Up

The Perseids Meteor Shower has enabled a number of the 144 Mc. & Up devotees to increase their states-worked total by keeping skeds during the shower and making good. Ernie Brown, W5FYZ, kept four skeds during the recent shower, all on 144 Mc. and was fortunate to be able to make solid QSOs with all four stations; K2LMG, W7JRG W4VHH and K8AXU. This brings his total states worked up to thirty-three. Ernie comments that this shower was the best Perseids for him for at least three years, with a greater number of 15- to 30-second bursts and signal strengths unusually good. He also sez: "I use a 2.4 bandpass on my receiver for m.s. and if it hadn't been for different characteristics of their signals, W2AZL and K2LMG would have been a little rough to separate. Carl was on 144.013 and Dave was on 144.014. There was about a one-second delay between pings for them, but on sustained bursts they were banging each other pretty well!"

K2LMG also reports a "good shower," having made contact with two of his three skeds. Lucky stations were W5FYZ in Louisiana and W5KXD in Texas; unlucky one was W0ENC in South Dakota with whom Dave was unable to complete a contact. From K8AXU we hear that his only m.s. contact was with Ernie, W5FYZ, the others just didn't pan out. However, Al also notes the band opening on 144 Mc. on August 10 when he was hearing everything from Ohio to Minnesota; he heard the Columbus boys working W0IFS and giving him 89 reports, but Al was unable to even hear a beat note on him. On the 11th however, Al had better luck when he worked W9JFP in Wisconsin and also Illinois and Indiana. The night of August 14 also turned into an opening and Al worked W0EMS in Nebraska; the following morning was very good and a cross-band contact (144 Mc., 432 Mc.) with W9ZIH in Chicago was successful. Anyone wanting a meteor shower sked with Al for the November shower? Line forms to the right. QST

A.R.R.L QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.

W2, K2 — North Jersey DX Ass'n, P.O. Box 303, Bradley Beach, N. J.

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.

W4, K4 — Thomas M. Moss, W4HYW, Box 20644, Municipal Airport Branch, Atlanta 20, Ga.

W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.

W6, K6 — San Diego DX Club, Box 6029, San Diego 6, 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 — Ray P. Birren, W9MSG, Box 510, Elmhurst, Illinois.

WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.

VE2 — George C. Goode, VE2YA, 188 Lakeview Avenue Point Claire, Montreal 33, Quebec.

VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent Hamilton, Ont.

VE4 — D. E. McVittie, VE4OX, 647 Academy Road, Winnipeg 9, Manitoba.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave. Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 833 10th St., N., Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 1291 Simon Road, Victoria, B. C.

VE8 — George T. Kondo, VE8RX, C. Dept. of Transport, P.O. Box 65, Fort Smith, N. W. T.

VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.

VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.

KP4 — Joseph Gonzalez, KP4YT, Box 1061, San Juan, P.R.

KH6 — John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, Hawaii.

KL7 — Alaska QSL Bureau, Box 6226, Airport Annex, Anchorage, Alaska.

KZ5 — Ralph E. Harvey, KZ5RV, Box 407, Balboa, C. Z.

(Cards for SWLs may be handled via Leroy Waite, 39 Hanum St., Ballston Spa, N. Y.)

Silent Keys

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

W1JBP, James F. Organ, Brockton, Mass.
K1LVM, Stephen D. Youman, Medway, Mass.
W1NW, Allen W. Jones, Somerville, Mass.
W1VX, Oliver E. Merrill, Wollaston, Mass.
W2BFF, Lawrence Cubberly, Trenton, N. J.
W2BLS, Carroll S. Banfield, Rutherford, N. J.
W2FIY, Charles T. Dieffenbach, jr., Tenafly, N. J.
K2FM, ex-W1CF, Lee W. Clifford, Plainfield, N. J.
K2HQ, William C. Nesbitt, Port Washington, N. Y.
W2ILL, Joseph F. Mullin, New Milford, N. J.
W2IVG, Louis J. Hefele, jr., Pearl River, N. Y.
K2SGC, Donald B. Devane, Weehawken, N. J.
W2SHL, Arthur J. McKinstry, Browns Mills, N. J.
W2WTS, Howard F. Barkley, Maplewood, N. J.
K3JIY, Paul C. Wittig, West Lawn, Pa.
W3QD, Albert Rapp, Philadelphia, Pa.
W4BMR, David M. Heath, Fort Lauderdale, Fla.
W4CV, Crockett Ellis, Memphis, Tenn.
W4DPD, James D. Longfield-Smith, Lake Wales, Fla.
WA4FRP, Hans Lenkway, Miami, Fla.
W4NAD, William E. Sampson, jr., Richmond, Va.
W4PAJ, Charles E. George, Portsmouth, Va.
W4PDS, Edwin C. Wilbur, Largo, Fla.
W4ULH, William A. Pritchett, Florence, S. C.
W5BUZ, Ralph H. Palmer, Starks, La.
K5KFE, Doyle E. Ware, jr., Baytown, Tex.
W5ZAB, Joseph A. Pullen, Houma, La.
K5ZIT, James R. Brett, Randolph AFB, Tex.
W6DLU, James F. Anderson, Los Angeles, Calif.
W6SVU, Edward R. Smith, Alhambra, Calif.
WV6TAA, Daniel L. Shull, Rosemead, Calif.
W7BQX, Ernest E. Kohler, Eastsound, Wash.
W7JAR, Francis J. Trebby, Spokane, Wash.
W8DRE, David E. Irwin, Olmsted Falls, Ohio
W8LAM, Harry C. Valentine, Cleveland, Ohio
K8PZE, James A. Bower, Chester, W. Va.
K8QHH, John P. Walter, Youngstown, Ohio
K9MAD, Jerry R. Hahn, Arlington Heights, Ill.
W9NRX, Joseph J. Kircher, Milwaukee, Wis.
K9WJJ, Donald F. Lasley, Princeton, Ind.
K9YOX, John J. Doherty, Geneva, Ind.
WØJAH, Zeph B. Willison, St. Louis, Mo.
KØJBR, William M. Kent, Omaha, Neb.
VE1EY, William W. MacLean, Sackville, N.B., Canada
VE3IIB, Harold L. Benson, Oakville, Ont., Canada

FEEDBACK

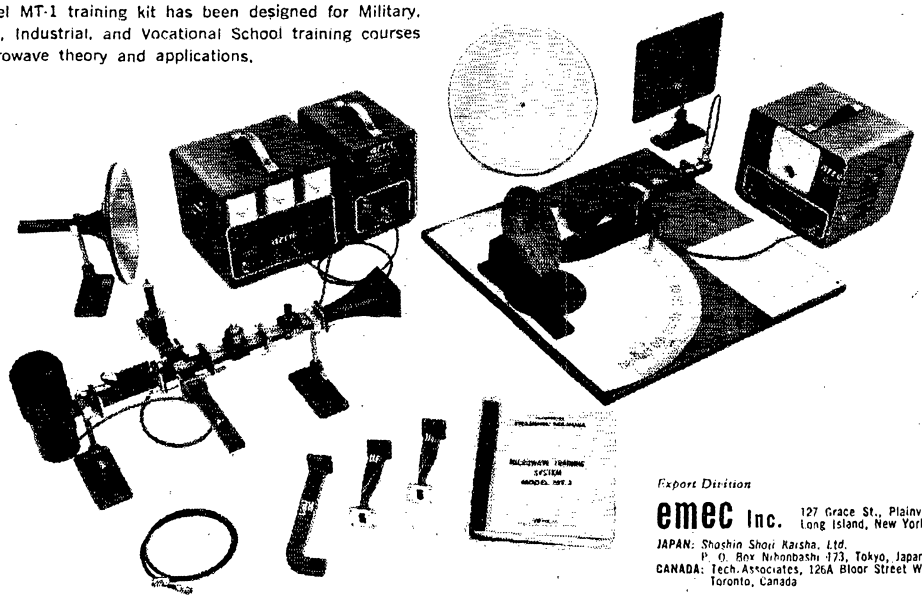
In the sideband-generator circuit diagram of K9YHT's article, page 29 of the September issue, the connection labeled with a circled 2 going to the 0.1-μf. capacitor and 33K resistor should be deleted.

—···—

In the circuit of the despiking filter of W9YVZ's 12-volt d.c. to 110-volt a.c. inverter (Fig. 3, page 19 of the August issue), the choke should have a value of 0.1 mh. instead of 10 mh.

A COMPLETE MICROWAVE TRAINING KIT...

Model MT-1 training kit has been designed for Military, College, Industrial, and Vocational School training courses in Microwave theory and applications.



Export Division

emec Inc. 127 Grace St., Plainview, Long Island, New York

JAPAN: Shoshin Shoji Kaisha, Ltd.
P. O. Box Nihonbashi 173, Tokyo, Japan
CANADA: Tech. Associates, 126A Bloor Street West, Toronto, Canada

---

arra ANTENNA & RADOME RESEARCH ASSOCIATES
27 BOND STREET, WESTBURY, L. I., N. Y. Phone No. (516) EDgewood 4-8770

TELEWRITER FREQUENCY SHIFT CONVERTER

NEW MODEL "K" $189.00
CABINET $14.50

Audio input. Output jacks on front for Magnet and Keyboard. Keyer tube keys magnet directly (no relay). Loop and bias supplies built-in. Wired sucket provided in converter for polar relay for keying transmitter, or external relay may be used. Distortion control on panel. Automatic Mark hold in absence of signal. Copies any shift 100 to 1000 cycles. Toroid inductors. Dual eye indicator. For further information and reconditioned teletype list, write Tom, W1AFN. *Cable Address: Alltronics Boston*

ALLTRONICS-HOWARD CO. BOX 19 BOSTON 1, MASS. (RICHMOND 2-0048)

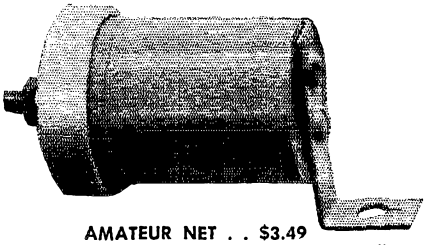
On display at Harvey Radio Co. 103 West 43rd St. N.Y.C.

NEW TYPE MOBILE GENERATOR FILTER

No Tuning adjustment necessary. Fixed tuned to eliminate mechanical changes of tuning due to generator vibrations.

Will safely handle 35 Amps Continuously.

Operation remains unchanged indefinitely due to complete epoxy encapsulation.



High "Q" design gives maximum noise rejection.

Rapid and convenient mounting on the generator terminal of engine without the aid of special tools.

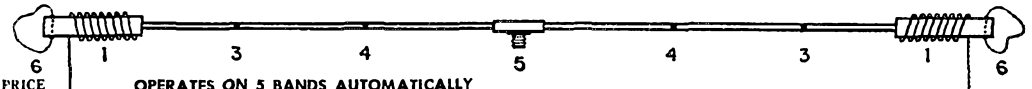
Available for 6 meters, 10 meters, citizens band and marine frequencies. Other types made to order.

AMATEUR NET . . $3.49

See your local distributor or write us directly for the supplier in your area.

GOLD LINE CONNECTOR INC., P.O. Box 983, Pearl St. Ext., Norwalk, Conn.

LRL-66 ANTENNA 66' LONG. 80 THRU 10M ● Power rating 2 Kw. P.E.P. or over on 80, 40, 15 On 20 and 10 1 Kw. P.E.P. Transmitter input

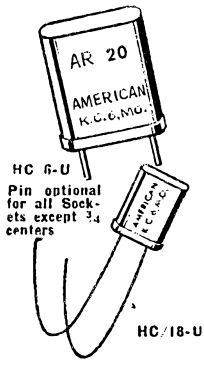


PRICE $30.00 f.n. Cont. USA, ppd.

OPERATES ON 5 BANDS AUTOMATICALLY
1. Loading coils for 80 & 40M doublet operation
2. Adjustable ends to set 80 meter resonance
3, 4. Decoupling stubs for 20 & 10 meters
5. Center insulator with female coax connector to take PL-259 plug
6. Fittings on insulators to tie on rope

LATTIN RADIO LABORATORIES • Box 44 • Owensboro, Kentucky

* TWO-WAY * COMMUNICATION CRYSTALS



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%	$5.00
1000 KC to 2000 KC	.002%	$7.50

Write for quantity discounts —

AMERICAN CRYSTAL CO.
P.O. Box 2366—Kansas City 42, Mo.
Telephone—Victor 2-5571

Ready Right Now!

the fabulous
HAMMARLUND
HX-50

COME SEE... COME BUY...
THE NEWEST AND THE BEST

ONLY **$399.50** Amateur Net

TAPE RECORDING INDUSTRIES

1101 E. Grand River, East Lansing, Mich.

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"**

LEARN CODE!

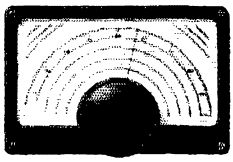
SPEED UP Your RECEIVING *with G-C*
Automatic Sender

Type S
$32.00 Postpaid in U. S. A.

Housed in Aluminum Case. Black Instrument Finished. Small—Compact—Quiet Induction type motor. 110 Volts—60 Cycles A.C

Adjustable speed control, maintains constant speed at any Setting. Complete with ten rolls of double perforated tape. A wide variety of other practice tapes available at 50c per roll.

GARDINER & COMPANY
STRATFORD • NEW JERSEY



CAT. #598

Full Vision Dial—Epicyclic, ball bearing drive, smooth in operation, free from backlash or binding. Reduction ratio 10 to 1. Measures 6" by 4⅛" with 3/64" lip. A separate scale with 5 blank lines is provided for logging principal amateur wave-bands. Easy to mount with small cut-out. **Price $8.00 Postpaid.**

EDDYSTONE

By
Stratton & Co., Ltd. (Eddystone) Birmingham, Eng.
MANUFACTURER OF THE FAMOUS #898 GEARED SLOW MOTION DRIVE

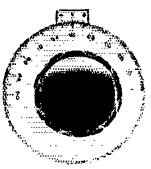
OTHER COMPONENTS:

*Communications Type Loudspeaker in steel case.	$15.00
*Diecast Boxes for effective radio frequency screening.	$ 4.00
*Receiver Mounting Blocks.	$ 3.00 pr.

All Prices Postpaid

Detailed Catalogue available from:

BRITISH RADIO ELECTRONICS, LTD.
1742 Wisconsin Avenue, N.W.
WASHINGTON 7, D. C.



CAT. #843

Vernier Slow Motion Dial—Anodised satin finished hard aluminum dial, 4" diameter. The driving head, of an improved ball-bearing epicyclic type totally enclosed, gives a reduction ratio of 10 to 1. **Price $6.00 Postpaid.**

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, available in the pin style emblem only, 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, 5/8" 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

the fabulous
HAMMARLUND

HX-50

COME SEE...
COME BUY...

ONLY
$399.50
Amateur Net.

THE NEWEST
AND THE BEST

ELECTRONIC EQUIPMENT & ENG. CO.

Corpus Christi, Texas
Victoria—Harlingen—Brownsville

CQ de W2KUW

We will pay for every good
304TL $10.00

Sent to us before Dec. 31, 1962

Other large transmitting tubes & equipment also needed. ARC-GRC-PRC-MN-TS-UR. 51V-X-Y-388-390

TED DAMES CO. • 308 Hickory St., Arlington, N.J.

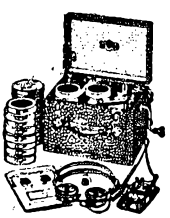
FACTORY AUTHORIZED SERVICE

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-sixth year.

DOUGLAS INSTRUMENT LABORATORY
176 Norfolk Avenue — Boston 19, Mass

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.

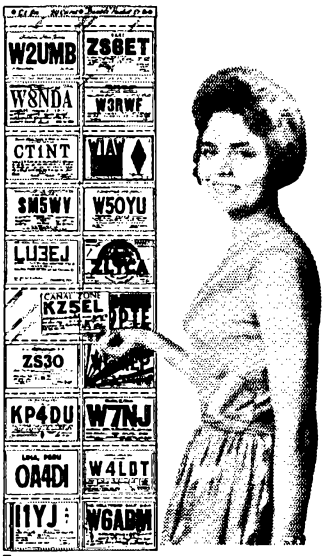
ENDORSED BY THOUSANDS!

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.

NEW EZ-IN QSL CARD PACKET



FRAMES
20 CARDS
IN CLEAR
PLASTIC

•

POCKETS OF "DOUBLE" PACKET OPEN AT FRONT CENTER FOR EASY INSERTION OR REMOVAL

•

1 PACKET
35¢
3 PACKETS
$1.00
10 PACKETS
$3.00

POSTPAID and GUARANTEED BY:

TENN. PAPER & BOX CO.

P. O. BOX 198 — GALLATIN, TENNESSEE

the fabulous
HAMMARLUND

HX-50

COME SEE...
COME BUY...

ONLY
$399.50
Amateur Net

THE NEWEST
AND THE BEST

EVANS RADIO

"Your Friendly Supplier"

Route 3A, Bow Junction
Concord, New Hampshire

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.

(6) A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, N.Y.

STORM Warning Stations. Send $2.00 for our book on making 12 Weather instruments. Saco Press, Box 2513, South Bend, Ind.

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 26th year. 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

TRIGGER. Cash paid for ham equipment. 7361 W. North Ave., River Forest, Ill. PR 1-8616. Chicago #TU 9-6429.

TOROIDS: Uncased 88 Mhy. like new. Dollar each. Five/$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

SOUTHERN California: Transmitters and receivers repaired, aligned. Bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllogg 8-0500.

WANTED: Two or more 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

CASH For your gear! We buy, trade and sell. We stock Hammarlund, Hallicrafters, National, Johnson, RME, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply Inc., 506-510 Kishwaukee St., Rockford, Ill.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N.Y.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA. Wayne Nelson, Concord, N.C.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase W8KP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Johnson, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halstead St., Chicago Heights, Ill. Tel. SKyline 5-4056.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

KWS1, $900. W2ADD

DETROIT Authorized distributor offers amateur equipment new and used from Collins down. Volume purchases permit bargain prices on new units at old prices while they last. Hallicrafters HT-37, $450.00; SX-101A, $399.50; SX-111, $249.50; HT-40, $99.95; HT-40K, $79.95; SX-140K, $94.95; Collins 75S3, $620; all new, not demos., full warranty. Write or phone for prices. Pay cash and save money! Reference D & B Radio Supply & Eng. Co., RSE Ham Shack, Keese, W8VSK, 90 Selden, Detroit 1, Mich. Tel. TEmple 1-3171.

QSLS? WPE? Finest and largest variety samples 25¢ (Refunded). Callbooks: American $5.00, Foreign $3.00. Religious QSL samples, 20¢. Sakkers, W8DED, Box 218, Holland, Mich.

C. FRITZ QSLs guarantee greater returns! Samples, 25¢ deductible. Box 1684, Scottsdale, Arizona (formerly Joliet, Ill.).

QSLS. Twenty exclusive designs in 3 colors. Rush $3.85 for 100 or $6.90 for 200 and get surprise of your life. 5 days' service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

$1.00 Frames 60 QSL cards in clear plastic! See picture on page 192 this issue. John Thomas, K4NMT, Box 198, Gallatin, Tennessee.

QSL-SWL-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Catalog with samples, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, Box 375 M.O., Toledo, 1, Ohio.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSL Cards. Call-letter D-cals. Samples 10¢, or send 25¢ for extra large selection and free "Danger, High Voltage!" card. Dick, W8VXK, Rte. 4, Gladwin, Michigan.

QSLS-SWLS. 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS, SWLS, WPE. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLS, SWLs. XYL-OMs (sample assortment approximately 9¾¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

SUPERIOR QSLS, samples 10¢. Ham Specialties, Box 823 Bellaire, Texas

PICTURE QSLs. Cards of your shack, home, etc., Made from your photograph. 1000, $13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLS, 300 for $4.35, Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSLS-SWLS. Samples free. W4BKT Press, 123 No. Main, McKenzie, Tenn.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLS. Samples dime. Rubber stamps: name, call and address $1.35. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS, $2.50 and up. Samples 10¢. RBL Print M.R. 12, Phillipsburg, N.J.

QSLS. Free Samples. W7IIZ Press, Box 183, Springfield, Oregon.

QSLS, SWL's that are different, colored, embossed card stock, and "Kromekote". Samples 10c. Home Print, 2416 Elmo, Hamilton, Ohio.

CERTIFIED QSLS-SWLS, unique designs, speedy service. Catalog 25¢ (refundable) Certified Printing, Box 1023, Whittier, Calif.

QSLS. Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 10¢. Agents for Call-D-Cal decals. K2VOB Press, 62 Midland Blvd., Maplewood, N.J.

QUALITY QSLS. New designs monthly. Samples 10¢. Giant, 25¢. Savory, 172 Roosevelt Rd., Weymouth, Mass.

RUBBER Stamps. $1.00. Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N. J.

QSL-SWL Samples 25¢. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS-SWLS. 3-colors 100 $2.00. Samples dime. Bob Garra, Lehighton, Penna.

1½" CALL QSLS (2 sides printed). 100, $2.75. Sample free. Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

HUNDRED QSLS: 80¢. Samples, dime. Meininger, Jesup, Iowa.

ATTRACTIVE QSLS: Large variety of styles, cartoons, colors. Personal ham stationery. Samples 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn 13, N.Y.

RUTGERS Vari-Typing Service, 7 Fairfield Road, Somerset, N.J.

QUALITY QSLS. New designs monthly, samples 10¢, Giant 25¢, Savory, 172 Roosevelt Rd., Weymouth, Mass.

ATTRACTIVE QSLS: Large variety of styles, cartoons, colors. Personal ham stationery. Samples 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn 13, N.Y.

QSLS, 3-color glossy, 100- $4.50. Rutgers VariTyping Service, 7 Fairfield Rd., Somerset, N.J.

QSLS, Free samples, W6EZL Press, 12622 South 8th St., Garden Grove, Calif.

QSLS-SWLs. The type I personally use for immediate and 100% response DX or otherwise on any band. Very reasonable. Samples 10¢ refunded. Joe Harms, WA4FJE (ex W2JME/W1GET/W3COP), 905 Fernald, Edgewater, Fla.

RUBBER Stamps for hams, sample impressions. Hamm, W9UNY, 542 North 93rd, Milwaukee, Wis.

100 QSL Cards $1.00. Lewalski, 1367 Perkiomen Ave., Reading, Penna.

QSLS. Nifty, thrifty, dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

DON'T Buy QSLS until you see my free samples. Bolles, 7701 Tisdale, Austin, Texas.

RUBBER Stamp, Call, Name, Address. Case, ink pad. $1.00. Perry, K4ISA, Box 8080, Allandale, Fla.

RUBBER Stamps, 3 lines $1.00. Travis, Box 612, Austin 63, Texas.

WANTED: Hallicrafters SX-42. VE3DQP, Box 2411, Postal Stn. D, Ottawa, Ont.P., Canada.

LOOK. Look for sale. One ART-13 non-modified with power supply, in steel floor rack. Also Johnson Ranger; Johnson Viking II CDS; Johnson Viking Courier, all like new. Priced to sell because I have too much equipment. H. H. Parker, W5GDJ, P. O. Box 218, Buffalo, Texas.

TOROIDS: 88 mhy, with mounting hardware. Uncased; like new. Information sheet included. $1.00 each, 5/$4.00 postpaid. KCM, Box 88, Milwaukee 13, Wis.

APACHE, Perfect, $175.00. Will ship. WA6VSC, 16 LaSalle, Moraga, Calif.

SX-100, R43, HT-30, exceptionally good condition. Best offer. Mervyn Ely, 1404 N. Kenmore, South Bend, Ind.

CUP-CORE Inductances, excellent for sharp or band-pass 50 to 100 Kc, I.F. or B.F.O. Very high Q. Unused, cased, adjustable; solder terminals. Type 1, 2.9 Mh., Type 17, 3.7 mh. Dollar each postpaid U.S. Circuit suggestions included. H. Woods, 2346 Clover Lane, Northfield, Ill.

MY Fifty-foot fold-over tower built for less than fifty dollars. Send three dollars for specifications, drawings, instructions and photographs. Satisfaction guaranteed or money refunded. Jim Brigman, W4IEN, Norcross, Ga.

XTAL-CONTROLLED 21 Mc converter for sale. See November 1959 CQ, p. 100, $15.00. W3GHS, Hauff, 420 S. Lewis Road, Royersford, Penna.

QSTs need all early issues; CQ all issues 1945. W4ID, 461 3rd Ave., Sea Park, Eau Gallie, Fla.

CHANGE X-tal frequency, including plated type. Safe method, ammonium bi-floride, containers, holders, instructions, complete, $1.00. Deluxe model, $2.00. Ham-Kits, Box 175, Cranford, N.J.

WE Pay cash for used 2-way radio equipment. State model, price, quantity and condition. Communications Service, 3209 Canton, Dallas, Texas. Tel. RI 7-1852.

WANTED for personal collection, QSTS January through August 1916. W1CUT, Box 1, West Hartford 7, Conn.

TUBES Wanted. All types, highest prices paid. Write or phone. Lou-Tronics, Inc., 131 Lawrence St., Brooklyn 1, N.Y. Tel. UL 5-2615.

WANTED: All types military aircraft ground radios, teletype and test equipment, GRC, PRC, etc. Have all types amateur gear for trading, purchases or cash. Phil Rickson, K2HJC, Morrisonville, N.Y.

WANTED: Old wireless gear, tubes, magazines and catalogs before 1925. Amateur or ship equipment only. Please give complete information including prices. My purpose is to buy this equipment, put it in first-class shape and make it available either on a museum or demonstration basis to all amateurs who didn't live and operate during this era. W5VA, T. Frank Smith, P.O. Box 840, Corpus Christi, Texas.

WANTED: Late model car with ham gear installed, commercial or home brew. SSB preferred. Cash deal. No trades! Send full particulars to Albert J. Bertolisi, 382 Fulton St., Farmingdale, N.Y. Tel. CH 9-0923.

SOUTHERN California: KWM-2 with AC supply, extra crystals. $995. Prefer not to ship. W6BLZ, 528 Colima St., La Jolla, Calif.

PROCEEDINGS Of the I.R.E. 1914 through 1949, 1923, 1928, 1931, 1932 complete. Will sell any copy or copies. Excellent price on entire lot. Mrs. Miriam Knapp, W1ZIM, 191 Beechwood Rd., West Hartford 7, Conn. Tel. 521-2055.

WANTED: All types of aircraft or ground radios. 17L, 618F or S 388, 390, GRC, PRC, 51J, RVX. Especially any item made by Collins Radio, ham or commercial. Also large type tubes and test equipment in general. For fast cash action contact Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

HAM Discount House. Write us for lowest prices on ham equipment. Factory sealed cartons. H D H Sales Co., 327 Greenwich Ave., Stamford, Conn.

SALE: Collins 75A-4 receiver, serial 2319, in gud condx with .8, 2.1 and 6 kc. filters, $495. Irwin Reed Weir, K2POI, 559 Grant Blvd., Syracuse, N. Y.

SELL: Hallicrafters SX-100, $175.00; Heath Cheyenne, Comanche and UT-1; BC-221; BC-604. M. H. Klapp, W2EQV, 17 Kenosha St., Albany 9, N.Y.

FOR Sale cheap: QSTs 1917 to 1960. One or a hundred. Send your list to Rasmussen, Box 612, Redwood City, Calif.

SELL Or trade: Friez dual traverse weighing type, recording rain and snow gage. New condition. Weekly record. W1LWV.

TELREX 56-149-3 el. beam, like new, $50. W2DVH, 61-58 71 St, Middle Village 79, N.Y. Tel. HI 6-6373.

304TL tubes wanted. Also other xmtrg and special purpose tubes. We will buy military or commercial transmitters and receivers with designations ARC, GRC, URR, 51 and MN. Air Ground Electronics Co., 64 Grand Pl., Kearny, N.J.

FOR Sale: Complete instructions including 28 p. booklet and 26" x 36" schematic for converting the ART/13 transmitter to AM and SSB. $2.50. Satisfaction guaranteed. Sam Appleton, K5MKI, 501 N. Maxwell St., Tulia, Texas.

ATTENTION Mobileers! Heavy-duty Leece-Neville 6 volt 100 amp. system, $50; 12 volt 50 amp system, $50; 12 volt 60 amp system, $60; 12 volt 100 amp. system, $100. Built-in silicon rectifier alternators 12 volt 60 amps, $100; 12 volt 100 amps, $125.00. Guaranteed no ex-police car units. Herbert A. Zimmerman, Jr., K2PAT, 1907 Coney Island Ave,, Brooklyn 30, N.Y. Tel. DEwey 6-7388.

RUTGERS Vari-Typing Service. 7 Fairfield Road Somerset, N.J.

MUHL Antenna traps now available; 80 thru 15M bands can be used on 88 foot lot with recommended configuration. Amateur net, $18.00 pair. Send for literature. Muhl Engineering Co., Box 105, Greenville, Ohio.

YLRO Specials, QMs. Reasonable. Nice designs, samples dime. W2DJH Press, Warrensburg, N.Y.

ARRL Building Fund needs your support! K6PQD/5.

WANTED: Heathkit HH-1 Legato speaker system. August Wickland, 308 Monroe St., Kalamazoo, Mich.

MAIL $3.00 annual membership dues and save with these free services; automated QSL card mailing (save more than dues); exciting contests, fast becoming major ham events; club endorsement; unlimited incoming QSLs; convention activities. Send dues, ask for free brochure. Continental QSL Club, P.O. Box 92, Dabel Station, Dayton 20, Ohio.

FOR Sale: AF-67, PMR-7 and M-1070 p/s with Shure mike, antenna relay and manuals. Beautiful condition, $269. SX-24, $59; ceramic mike, $12. WØFSH/9, 940 Saylor St., Elmhurst, Ill.

75A4 with four filters, $595; KWS-1, $990; Collins 302C-1 wattmeter, $75; D-104 with PTT stand, $25; Telex boom crystal mike/headset, $25; American D4T dynamic mike, PTT stand, $15; bug, $10; Bliley 1000 Kc xtal, $10; Marion MM3 VU meter, $15; Variac V20 220 volts 8 amps, $75; Collins 10 in. spkr, $10; Dumont 27A 5-in. 'scope, $50; T Transitron T/R switch, $10. Want complete "S/Line". Miller, 88 Stonewall, Fairfield, Conn.

SELL: Hallicrafters SX-100 with speaker, like new; Elmac AF67 with power supply, EV-727 mike. Sell complete $250. W1FQA, 45 Oak St., Cohasset, Mass.

FOR Sale: HQ-129X spkr, in excint condx, realigned, updated, 15M band spread, new tubes, $125.00; Johnson 122 VFO, $20; Vibroplex blue racer chrome deluxe in excint condx, $15. Wanted: 2 meter Gonset Communicator, TC99, 50 ft. tower. Dick Marsino, W2UGM, 66 Columbus, Closter, N.J. PO 8-1884.

TRIBANDER Beam, Gotham, 20-15-10, $40; AR-22 rotor w/100 ft. cable, $30; 200 ft., RG8/U, $20. Glenn, K2SNJ, 31 Claremont, Searsdale, N.Y.

6 Mtr. SSB adapter, 2E26 final, 14 Mc. input; pwr. supply, $30; 6 mtr. converter 10-14 Mc. output, $8.50; 6 Mtr 60W xmtr, 829B final 6L6 mods., $35.00; 6 mtr. tunable converter, 7 Mc. output $10; 75 mtr. 20 W. mobile xmtr, 12V fil., $15. F.o.b. W6RET, 8831 Sovereign Rd., San Diego 23, Calif.

FOR Sale: Collins 75S-1, 32S-1, 312B-4, mikes: EV-911; Astatic 10C; Q-multiplier; Vibroplex key; all exc. condx., $900. Gar Tomlin, K1IDR.

SELLING Out station: All in A-1 condition and purchased recently: Hallicrafters SX-111 with matching R-48 spkr. DX-60, Heath VFO, Model 153-B Hy-Gain Beam Antenna with mast sections, Dow-Key relay, and coaxial cable. Electro-Voice mike, $300 takes all or none. Must pick up. Call Tom, K9BJB, HU 5-5718, Brookfield, Ill.

TRADE Colt .22 Frontier Scout, like new condx, for Novice transmitter. Jim Hulett, 3785 Scranton, Beaumont, Texas.

AIRPLANE: Trade beautiful Piper Tripacer 135HP, only TT325 hours. Arc Omni Value 5KBux. For Collins, other top ham equipment. Good telescope. Cash. W8VZ, Marietta, Ohio.

SELL: AF67, PMR7, Model M1470 pwr. supp., ant., center loading coil, 10 to 40M, mike, all manuals, in excint condx, $200. Glenn Winters, K5SYM, Box 125, Bull Shoals, Ark.

SELLING Out: KWS-1, 75A4, station control, beam, Tel-rex rotor, miscellaneous. All in new condition. High serial numbers. All letters answered. Frank Lindsay, 1326 10th St., Holdrege, Nebraska. KØMVY.

SK-20 Tunable Preselector, calibrated 3.5-30 mc., boosts reception 3 "S" units. Complete kit, cabinet, built-in pwr. supply, $18.98 postpaid. Holstrom Associates, Box 8640-T, Sacramento 22, Calif.

CONTEST QSLS! Special quantity prices. Cleancut layout designed to bring you maximum return. Send for samples. Saedi Unlimited, P.O. Box 44, River Grove, Ill.

WANTED: Electrical part manual Signal Corps power unit PE-141A. W4NFC.

RANGER, $175.00. W6RDK, Sacramento 25, Calif.

COLLEGE: Will sell SX-110 with external speaker and Heath QF-1, $125.00; Globe Scout Deluxe, $110 or both for $200. Guy Hoose, WA2JWP, 24 Pinehurst Rd., Albany 5, N.Y.

SIMPSON 479 TV sweep and market generator, $225.00; Eico TV color scope, $55; 100-watt Variac, $3; 1-2 ARF meter, $2.00; Phone dial, $1. W6EHZ, 14945 Dickens St., Sherman Oaks, Calif.

HELP! Made DXCC. Now want boat. Sacrificing entire station at giveaway prices. 75A-4, Telrex beam, etc. Send for list of stupendous bargains. K5JCC, Peter Roussel, 6515 Brompton, Houston 5, Texas.

WANTED: BC348, give condition and lowest cash price. Dan Lee, 3167 E. Green St., Pasadena, Calif.

HQ-145 Rcvr. with xtal cal. and clock for sale. Only 9 months old, in excint condx. No scratches or modifications made. Like new. Price $200 cash. No shipping sry. Alan Harvey, WA2UVM, 106 Willis Ave., Syracuse 4, N.Y. Tel. 468-5242.

SELL: H. B. rig, 125W, 110W mod, 4-65A/809 VFO 80 thru 10, TVI suppressed, $75. D. Klinger, W3KBR, 801 S. 60th St., Harrisburg, Penna.

COLLINS KWM-2, like new, $900. WA2BKT, Al Mandel, 1701 Albemarle Rd., Brooklyn, N.Y.

BC221T frequency meter with AC supply, $50; 3000 watt 115VAC light plant, $150; Hickok 288X signal generator, $75; Heath audio generator $25; BC453, $10; BC603 and AC supply, $10; RCA cool KW mod, xfrmr, $25; BC610 mod. transformer, $20; 75A4 spkr, $10; 12VDC to 115VAC 200 watt inverter, $35; UTC plate transformer 4,800 VCT at 1500 ma., $50; RCA 12VDC Vibrator supply for AVT111, $15; 1 mf 6000VDC capacitors, $1.50; new tubes at bargain prices, 4X150 and socket, 833 and socket, 3C24, 832A, RK65, GL 446A. M. D. Haines, 1316 S.W. Military Dr., San Antonio 21, Texas.

HT32A. Cables, SX101 Mark III, R46B spkr, Dow relay, RG58/U, balun coils, D-104C mike, RG59U, excellent in every way; now on air. Back to college. Will deliver within radius 300 miles and help set it up. First $800 takes all. Doug, WØVCQ, 1002 N. 12, Fargo, No. Dakota.

SELL Mohawk, Apache and accessories, $425.00. Excellent condition. Bob Snicer, 217 Osborn Rd., Albany 5, N.Y.

TRADE For gud rcvr: Lionel "O" gauge, 2 track, freight, passenger, automatic switches, scenery, etc. Cost $375.00. All inquiries honored. S. Spino, 156 Bateswood Rd., Waterbury, Conn. K1SCN.

QSTS 1928-1962 30¢ each. K1LPL, 108 Whitehall, Providence 9, R.I.

FOR Sale: Good SX-99 with spkr, $95. New DX-20 with xtal, $30. Will ship postpaid, just bought. Blue Racer deluxe bug, $22.50. Write KN1YAH, Box 136, North Haven, Conn.

WANTED for office file. RTTY Vol. III, No. 6 (June 1955). W1IKE c/o ARRL Hq.

GSB-100, $320.00; HQ170C, $270. Both perfect. 458 VFO, Central conversion 160 through 10, $18. W5RKR/4, 5540 Berryhill, Norfolk, Va.

WANTED: Filter capacitors, oil filled 4000 VDC, W5LGD, Bob Rutter, 4013 Cleveland Pl., Metairie, La.

FOR Sale: NC-125 receiver with manual, matching speaker, Heathkit Q-Multiplier, and Texas Crystal 100 Kc transistorized calibrator, $125.00. Would like to purchase clean SX-101A. Paul Wade, Rte. 2, Kevil, Kentucky, Phone 488-2227.

FOR Sale: GSB-101 linear, new, $235.00. Transmitter, pair 833's, with 3000 volt 1 amp. power supply, built in BC610 cabinet, $250, new 4-400A tube, $25; power supply, 2000 volts at 500 Ma., $50. Collins coax relay, $15. James Craig, 72 E. Sixth, Peru, Indiana. GR 3-9306.

SELL: Solid mobile and other gear for best offer whole or part: TBS-50C with 12 volt transistorized power supply; RME MC-53 for 2, 6, 10 feeding Gonset Superceiver; 6M Halo; HQ-170; Viking Valiant; 75 ohm filters; Heathkit SWR bridge. W1QUO, 53 Austin St., Leominster, Mass.

APACHE—Gud condx! $150 or best offer. Radio Club sacrifice. You pay shipping. K1BSB, Edgar Mack/Pres., RFD #1, Box A-37, Litchfield, Conn.

SELL: Gonset G-28 ten mtr. transceiver. Heath Sixer month old. Both perfect. Al Peterson, 6710 No. Oconto, Chicago 31, Ill. Tel. SP 5-1886.

WANTED: National Preselector type PSK for FB7 receiver. Jack Shiels, W3OKP, 3212 Chestnut St., Murrysville, Penna.

JOHNSON Viking "500", factory wired, in exc. condx. $550: Johnson KW Matchbox w/s.w.r. meter, new, $65: NC-300 rcvr, new condx, $215; Telrex 3-el. 20 mtr. beam, $50; 3-el. 10-mtr. beam, $20; 45 ft. Rohn Tower, $30; D-104 mike w/switch stand, $15; Vibroplex Lightning Bug, $10; new Eimac 4-400-A, $35; 40 spare tubes, 811-A, 866A, etc. For above equip., $30. Cash and Carry, W3LTU, D. Phillips, 49 E. Grandview Ave., Sellersville, Penna. Phone AL 7-2027 after 5 PM.

FOR Sale: HT-37, $340. Lewis Goekler, K9IFR, 915 N. 7th St., Marshall, Ill.

SSB Heath HX-20, professionally wired and tested, beautiful rig, $298 F.o.b. Waterman Pocketscope S10A, $40; Astatic T3, never used, $10; D-104 mike, $10. F. H. Garrahan, W3QZ, 1445½ Wyoming Ave., Forty Fort, Penna.

"HOSS TRADER Ed Moory" is leaving the "barn door" open. No reasonable offer refused for the following used items: Swan-175, KWM-2, Drake 2-B, HT-37, 75A-4, HQ-180-C, 75S-3, 32S-1, 30L-1 and 20-A. "Package Deal" new Ham-M rotor and used TH-4 beam, $175; "Packaged," New HT-37 and used Drake 2A, $595; "Package deal" New KWM-2 with used 516F-2 and 30L-1 for $1495. Can deliver Swan and Sonar transceivers also Collins 32S-3's and 62S-1s. "Horse Thief Specials"—new RCA color television, $299: Viking Valiant, $299; Viking Ranger, $179; HQ-140XA rcvr, $139. Terms cash. Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas, phone WHitney 6-2820.

1924-1962 complete file QST's. Make offer. W6FBW.

LIKE New, one owner, Collins 75A3 with Jensen housed speaker, packed for shipment. F.o.b. Fayettesville, N.C. $300. Box 70, T. Hunter, W4EBM.

SELL: HT32B, excellent condx, $550. SX101A, $300. Fred Gwyer, 6 South Stone, La Grange, Ill.

SELL: Elmac AF67 in gud condx, $100; Johnson Valiant in mint condx, $300. W4SAC, 14421 Biscayne Dr., Leisure City, Fla.

A-1 Reconditioned equipment. On approval. Trades. Terms. Hallicrafters S-107, $69; S-85, $79; SX-99, $99; SX-100, $199; SX-111, $179.00; SX-101A, $269; Hammarlund HQ-100, $129.00; HQ-110, $169.00; HQ-160, $229.00; HQ-170, $259; HQ-180, $329; Valiant, $279; NC-300, $199; NC-303, $299; Collins 75S-1, $329; 75A-3, $349; 75A-4, $499; 32S-1, $499; KWS-1, $995; Central 10A, $79; 20A, $149; National, Gonset, Elmac, Heath, Johnson, RME, many others. Write for list. Henry Radio Co., Butler, Mo.

QSTS to highest bidder: 147 copies 1947 to 1959. Also CQs, 54 copies 1948 to 1959. Marv Mincer, W9HJH, 1733 N. Spencer Ave., Indianapolis 18, Ind.

SWAP: BC 610-E, on the air. Want Gonset Communicator Six meters. Write W1DDZ.

TBY: Ultraportable 6 meter transceiver, Batteries, power supply, case, headset, mic., all accessories. Best offer. WA2AQB. Rick Merwin, Staatsburg, N.Y.

GOING Mobile for college. Must sell my NC-303. In perf. condx. Under 1 year old. $300. Dain, K8MLR, 932 Renwood Dr., Kettering 29, Ohio.

FOR Sale: HT-37, gud condx, 1 year old, little used. I need the money, $350.00. John Lassig, 2025 Bingle, Houston 24, Texas. K5GFV.

SELL one Heath linear kit, Warrior. Box same as factory packed; was opened to check parts and returned to box and sealed. Linear goes to best offer when getting check. Rodio, 466-55th, Bklyn 20, N.Y.

TRADE: BC-610 with BC-614 speech amp. in xclnt condx for Apache or equiv. or sell for best offer. K8HRX, 959 Kohler St., Kenton, Ohio.

SELL: DX-20 and homebrew modulator. Knight VFO, dozen xtals, all gud condx, $60. You pay postage. WA4EPH, 314 Jamestown Rd., Williamsburg, Va.

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.

WESTERN Electric 416B tubes. Guaranteed. $10 each, postpaid. Jim Ariana, Box 285, Kincaid, Illinois.

VARIACS: Large quantities brand new factory cartons. 120 volt types: W2 @ 2.4 amps, $15; W5 @ 6 amps, $18; W10 @ 10 amps, $31; W20 @ 20 amps, $48; also 240 volt types: W5H @ 2 amps, $21.50; W10H @ 4 amps, $33; 20H @ 8 amps, $50; W30H @ 12 amps, $75; other models available. F.o.b. Los Angeles. No C.O.D.s. Westates Electronics, 6344 Arizona Circle, Los Angeles 45, Calif.

FOR Sale: Johnson 250-23-3 275 watt Matchbox, $50; Johnson 250-30 kilowatt Matchbox with Heath SWR built-in, $90: Johnson T-R switch, 250-39, $16, All like new. Amos H. Carmical, K4IZU, 521 Fieda Road, Memphis 17, Tenn.

FOR Sale: QSTs, April 1932 to Dec. 1950. Best offer. Daniel J. Umholtz, W2ZAL, 392 Armstrong Ave., Jersey City 5, N.J. Tel. HE 4-2486.

SELL: AF-67, PMR-7 and M-1070 Pwr. supply. In vy nice condx. Ready to operate, no bugs. I bought all new in January 1959. Includes 12VDC relay, all coax outfits and power cables, instrux. $200.00. K4KHE, Larry McCreary, RFD 4, Franklin, Ky.

FOR Sale: BC-610E complete with tubes and coils for 10-15-20-40-80 BC614E speech amplifier, antenna tuner. Collins 310B, all manuals. Want $400. W4AJT, C. Weldon Fields, 2707 Fairway Dr., Greensboro, N.C.

WANTED: Johnson KW without desk. Also factory wired Ranger for driver. Raymond W. Andrews, K2KZJ, 110 Sickles Road, RD #2, Elmira, N.Y.

SELL: Hy-Gain 2-el. Tribander, $30; Prop pitch motor, xfrmr, selsyns, $25; Eimac VC50-20 vac. cond., $5; 16 sets of 5 lattice xtals, $5; 2 meter and 10 meter xtal cont. converters, $10; QST run 1946 thru 1961; CQ 1949-1954. Make offer, W. R. Hatchard, W3KHU, 2306 Marlyn Dr., Wilmington 8, Del.

MOBILE Morrow Twins, MB, 560A xmtr and MBR-5 rcvr. Ant. ant. matcher, both P.S. all cables, speaker, microphone, etc. Spare dynamotor, 50 hours use, ready to go. $300; M-1 Mu Western teletype converter like new, $87.50. Instrux books for all equipment. KØAEK, 6551 E. Dakota, Denver, Colo.

WANTED: Commercial or surplus airborne, ground, transmitters, receivers, Testsets, 618S, 18S, 17L, 51R, ARN14 GRC PRC, BC, ARC, Bendix, Collins, others. RITCO, Box 156, Annandale, Va.

UNBUILT Heathkit Seneca, National 303, converters for six and two, Hy-Gain beams for 6 and 2. All new cost $300. Asking $225. Michael Myster, WA2UNE, 295 Grand Ave., Lindenhurst, N.Y. Tel. TU 8-8598.

WANTED AC Coil for HRO50T. Name your price. Wells Chapin, 118 Woodmancy, Fayetteville, N.Y.

TRADE Two new 4-400A for six meter mobile rig. Write WA8DHU/7, 4542 Orcas, Seattle, Wash.

LINEAR 2 KW P.E.P. built by Eimac using 4CX1000A with pwr. supply, $500. See November 1957 QST. Pick up deal only. Jack Anderson, 126 Fairway Gate, Roslyn Harbor, L.I., N.Y. Phone HT 4-1149.

SELL: Altec-Lansing 605A 15" speakers w/Altec 854A/B matching enclosures in walnut. The ultimate theatre stereo speaker system for home use. Must sacrifice for $300, the pair. Also have Blaupunkt pushbutton FM-AM-SW car radio, for 6 or 12V neg. or pos. ground w/installation kit $95; Heath HD-20 crystal calibrator, $8 and Lafayette KT550 100-watt stereo amplifier modified, $75. WB2CEQ, Fred Salzman, 293 Monmouth Ave., New Milford, N.J.

NOVICE Sale: Knight T-50, $26; Hy-Gain 14AVS mint condx, $17.00; Skillman bug, $5; Skip McElfresh, 61 W. South St., Jackson, Ohio.

SELL: Collins KWM-1 DX adapter 399B-1 complete with one extra crystal. Best offer. O'Brien, W2EQS, 48 Prospect, Westwood, N.J.

SSB Viking Pacemaker, vy clean in appearance, late model with all-factory modifications, $175.00. Hess, W8GTT/1, 50 Warren Rd., Framingham, Mass.

FOR Sale: SX-28, $60; Gonset G76 with AC supply, $300; Gonset GSB201 lin. amp., $300. W1QBI, Richard Lindquist, Atkins St., Middletown, Conn. Tel. BE 7-3354.

WANTED: Cabinet only from B&W L-1000A; Eimac SK500 airsocket, Cardwell 1500 mfd., variable cond, B&W 850A coil 2.1 kc filter for 75A4. Anthony Martinka, 3723 Magnolia Ave., Chicago 13, Ill.

KWM-1, newly factory reconditioned, 516E-1 DCPS, 516F-1 ACPS, mobile mount, mike, cables, bumper mount, Triband whip, $690. Delivered via air anywhere. W4SWY, 9100 S.W. 61 Court, Miami, Fla.

CLEANING House: 522 xmtr completed converted. 6 volt Leece-Neville generator and rectifier. Carter Dynamotor. Tubes. Send for list prepaid envelope. W2HNG.

WANTED: LWM-3 or other homebrew multiband mobile SSB transceiver; 3 Gonset G-II citizens and transceivers, hardly used. $120. K. Schulz, 4655 Broadway, Gary, Ind.

GOING Overseas. KWM-2, 312B-5, CC-1, PM-2 and SM-1. In mint condx. 11 months old. Pair 4-400As linear with power supply, TH-4. Package deal: $1595.00 cash. James DeMott, Box 571, Shaw AFB, S.C.

FOR Sale: Hy-Gain 10M beam, $10; 15M, $15; Heath EA-2 Hi-Fi amplifier, $20; Miller AM tuner, $10; PE-103, $10; 5 Heath 'scope, $10, as is. K5CCO, Box 119, Sapulpa, Okla.

FROM Anyone driving to Mexico will buy good mobile rig. "REVMEX", Apartado 2807, Mexico City, D.F. I.

HEATHKIT Apache, $225; Mohawk $250, both for $450. In A-1 condx and guaranteed. Unused BC654, $15. F.o.b. Portland, W7CJR, 662 N.E. Royal Ct., Portland, Oregon.

GLOBE CHAMPION 300-A, Hammarlund HQ-150, $200 each or nearest offer. Both in perf. condx, little used. Butterworth, K3AKB, 2708 Gaither, Washington 21, D.C.

HT-32 $375; SX-101A with matching spkr, $360.00. Exc. equipment. Willard Fiscus, 1 Maiden Lane, Lynnfield, Mass.

GLOBE KING 500 C. Exclnt! $489.50. Will ship. Ed Noble, Gilman City, Mo.

MOBILE For sale: Ham or citizens band Stancor ST 203. A 10-11 meter Xmtr, Gonset 10-11 meter converter, Pioneer Dynamotor Best offer. K2GDE, 1321 East Broad St., Westfield, N.J.

HALLICRAFTERS HT-40 transmitter 80 thru 6 c.w. and AM TVI filtered; Hallicrafters SX-140 rcvr matches xmttr. Both brand new in sealed cartons with factory guarantee. Bargain at $175 for both. Rev. Richard Schachet, 135030, 232 St., Springfield Gardens, P.O. Jamaica 13, L.I., N.Y.

VHF Geloso 2M VFO transmitter $25; National 6 M converter, $20; Filter King 6M converter, $25; CE 20A MM1 'scope, 75 mtr. Swan: Heath pwr. supply. Make offer. Bob Heil, 402 Border, Marissa, Ill.

75A-3 Available. W1AW now using latest Collins. For sale the displaced 75A-3 with 3 kc. filter, provision for second mech. filter. Best offer over $300. Contact ARRL, Att: Ed Handy, 38 LaSalle Rd., West Hartford 7, Conn.

HEATHKITS for sale. Apache, $225, Mohawk $250, SB-10, $75 and Johnson KW Matchbox with SWR indicator $125; MM-2 RF analyzer with 50 Kc IF amp., $100. All units unscratched and in new cond. Priced F.o.b. Goodin, 486 Hollyhill Dr., Lexington, Ky.

FOR Sale or trade. Heathkit DX-607, like new, used vy little. Also an Eico oscilloscope, Model 470. Will trade either or both items for DX-100 or DX-100B in gud shape. Make offer. Darwin A. Leek, K0IDD, Algona, Iowa.

SELL: Eico 720, factory wired in orginal carton, $80. WA2KSJ, 4324 Wickham Ave., NYC, FA 4-6865.

SELL: SX-16 with spkr, DX-40, Hy-Gain vertical. Gud condx. All for $150 or separate. WA2MKI, 400 Seeley Rd., Syracuse, N.Y.

COLLINS 75S1 still new: little used: perfect. F.o.b. $400. Shipped in original carton. Write 6K Locas, 8420 51 Ave., Elmhurst, L.I., N.Y.

S-38C, NR66C772, $32; NC-33, NR2150313, $35.00; working condx, postpaid Continental USA. Want Blue Racer bug, Drake 2B; state price, model and serial, condx. W6MMC/7, Box 412, Sedona, Ariz.

SELL: HQ129X. Best offer over $105.00; Viking 6-2 meter converter, $35.00; no shiping, sry. Must pick up personally. Fred Corliss, 6431 Ave. A, New Orleans 24, La.

VIKING I, shielded and filtered, in gud condx, $90. W2NKH, Huntington, 70 Greenlawn Rd., L.I., N.Y.

ONE Pacemaker, $225; 1 LA400B, ampl., $100; Gonset III 2-mtr. with xtal and mike, $175; AOK. On air, 1 Harmon Kardon No. TA10 AM/FM Tuner with amplifier, $65; 1 corner cnedl, spr, $20; Sry, will not ship. Ross B. Hunt, W2WEY, 14 Byron Pl., Livingston, N.J.

WANTED: C-E 600-L linear. Also 6 Kc filter for 75A4. All replies answered. Stan Cokas, 16 Edgehill Rd., Swampscott, Mass.

WANTED: 850A inductor and swing, choke, 5-25, Hy 500 Ma. Joe Klize, Benud, Ill.

ATTENTION: Amateur Radio equipment repaired, work guaranteed. L & S Electronic Technicians, WA2QQG, Sam Levinson, 393 South 3rd, Bklyn, N.Y. Tel. EV 4-7564.

QST: 1932 thru 1952 complete except 4 issues in 1942. $50.00 F.o.b. W7MR, Hereford, Ariz.

TERMS Available on reconditioned units! Babcock MT-5A, $49; KWS-1, $995; KWM-1, $449; 32V-3, $349; 30S-1, $995; AF-67, $114.95; King 500C, $499; Commander mobile, $59; G-77, $159; HT-37, $375; TBS-50, $49.95; DX-40, $59.95; Valiant, $329.00; 75A-3, $379; 75A-4, $450.00; 75S-1, $349.00; HRO60, $299.50; NC-188, $99.50. Write Leo, WØGFQ, WRL, Council Bluffs, Iowa.

FOR Sale: Heath Apache and SB-10 perfect. No drift. Extra 6146s and other parts. KØHWK, Alburnett, Iowa.

NEW 75A4 noise blankers; Collins 136C-1 complete with step by step instructions. Any kit builder can install. $49. New Collins KWM-1 mobile mount, never unpacked, $39. Wanted KWM-2 or KWS-1 and 75A4 combination cash. WØNHP, Richard E. Mann, 7205 Center Dr., Des Moines, Iowa.

WANT to buy manual for Digital Instrument Co., Model 955 counter; sell Heathkit GC-1 receiver, $85; D-104 mike PPT stand, $20; Simpson testers models 378, 373, 362 $15 each; 260 with leather case, $25; Triplett 630NA, $50; Weston 982 TVM, $45; Paco T60 tube tester for latest tubes including Nuvistors, $30; S-50 scope, $30; Hickok 890 transistor tester, $90; 6000 tube tester, $110; CRT adapter, $5; CA-4 adapter, $30; 690 gen., $90; Gonset 3010 tuner 40-50 Mc, FM 12 volt, $30; Riders TV Vol. 3, 5, 6, 7, $15; Precision E-310 S-Sq. wave gen., $100; 78 VTVM, $40; Lampkin 103B, $175; Robert Ireland, Pleasant Valley, N.Y.

HQ-180C receiver. In mint condx, approximately 19 months old, little used. First certified check for $290. Brand new Hornet TR-10004 beam. Box never uncrated, $90. F.o.b. Okc. 2 heavy duty extremely rugged 10-element Taco channel 2 in. built balun yagis. Designed for 2 inch ice loading 150 m.p.h. winds, 72 ohms. Phasing harnesses for stacking supplied. Original cost $265. each. Brand new, never assembled. The pair for $200. F.o.b. Okc. Caribbean Video Co. P.O. Box 244, Oklahoma City 1, Okla.

MUST Sell College bound: Ameco CN-144W 2-meter converter, $38; International FCV-1, 6 meter converter, $13; Hy-Gain 2-meter, 10 element beam, $13; Heathkit Model MM1 VOM, $30; Heathkit model AR-3 rcvr, $35. All are in excellent condx. K8-VEX, Box 385, Wayland, Mich.

CUSTOM Building. Ham gear, VHF specialists. Converters, power supplies, etc. Free quotes. Frontier Electronics, Orr 1, Minnesota. WØHPS, Everett Hoard, WØPYC, Frankie Hoard.

BEST Offer over $25 takes perfect Heath OM-3 5" oscilloscope. Relay for receive and transmit. Monitoring. Manning, Box 563, Riverside, Mich.

DX-100, Excl. condx, with DX-100B modifications. Local sale only. sry. $150.00. WA2CTB, 82-23 246 St., Bellerose 26, N.Y. FI 7-4468.

VALIANT, Excellent, $275. Hal Crispell, 4261 Santa Cruz, San Diego 7, Calif.

B&W 5100B and 51SB-B with B&W CA-1 compression amplifier, mint condx, $350.00. R. Carlsen, W2ISD, 45-42 Utopia Pkwy, Flushing 58, L.I., N.Y.

HT-32B bought Oct, 26, 1961. Used vy little. $550.00 or your best offer. K3CQV, Bernard Schwartz, Huntingdon, Penna.

SALE: New power supply, will deliver 600 watts at 2.1 Kvdc. Send for info. K7NKD, 1539 W. Virginia Ave., Phoenix 7, Ariz.

SELL: Lattice filter AM-SSB homebrew 14 Mc. 9-tube receiver, $40.00; excellent Viking Courier, $135.00; HB self-contained 600 watt GG all-band amplifier 814's, $120; SSB generator cheap and easy with VFO and power supply, $75. W4NWW, 122 Beverly Place, Greensboro, N.C.

HQ-145C, $210; Eico 720, $65; wanted: Matchbox and/or SWR bridge, WA2ZVJ, 2115 East 27th St., Brooklyn, N.Y. Tel. SH 3-2525.

TRADE! Homebrew 80-10M 100W c.w. xmtr. Want Globe Scout, W4ASP, Rte. 2, Owensboro, Ky.

75A4 serial #5795, in mint condx, with 3.1 Kc filter in original carton, $550; Jennings 1000 MMF vacuum variable, 7500 volts, $75; DX-100 transmitter, $125.00; Stancor A-3899 Multimatch modulation transformer 1000 watt audio power insulated for 15000 volts, $50; Navy black wrinkled BC-459 new unused, $10; new 1625's, three for $1.00; HDVL coils 40 and 80 meters, $7.00 each; Johnson split-stator 100DD90, 9000 volt 100 mmf, variable, $5. Ed Schmeichel, W9YFV, 190 E. North Ave., Elmhurst, Ill.

QUITTING Ham Radio. For sale F.o.b. Viking Ranger I, factory-wired, like new, $150.00; NC-183D with prod. det., $180; Viking II factory-wired, $130.00; Johnson 6N2 with HB PS and mod., $125.00; Dow-Key ant. change-over relays, $8.00 each; B&W ant. switch, $8.00; Astatic D-104 with "C" stand, $15.00; Collins crystal cal., $12.00; speaker for 75A3, $10; SX-28, $80. Other items. Write Gerald Skeen, Statts Mill, W. Va., Tel. ES 2-6957.

TOWER 50 ft. crank-up, $49; 20'40 Birdcage, $39. Both $75. W4GMN, Box 371, Lebanon, Va.

WANTED: Good used 50W Globe Hi-Bander, 6/2 meters, $75.00. W3LOR, 116 Georgetown Ave., Pittsburgh 29, Penna.

FOR Sale: Plastic laminating press, Warner model 100B, used for pictures, licenses, etc. Good condition. Jack Chichester, 33 Cedar Road, 9800 W. Joliet Rd., La Grange, Ill.

SCR 522. Converted, 2 meters and mounted, 14 x 19 rack panel. Meter and control dials, $58.00. F.o.b. Pittsburgh, W3MTK, 314 Tassel Lane, Pittsburgh 36, Penna.

VIKING II in good operating condx and appearance. Will sell for best offer or first certified check for $135.00. See results CW DX contest. Lewis Prescott, W1RFQ, 15 Loring Drive, Lincoln, R.I.

NEED Following issues of QST: Oct. 1940: July and August 1930; Also CQ for Jan. 1957 and Jan., Feb., March, May 1945. W6OZE, 440 East Front St., Covina, Calif.

WANTED: DC-34, DC-35 type crystal units for BC-669 set. 1690 to 3190 Kc. Pearce, W5ACH, 427 Mayflower St., Baton Rouge 2, La.

NEW Johnson 500, $685; mint Hammarlund 145-C, $185; new DeLuxe Vibroplex, $18.50. Health OM-3 oscilloscope, $45.00. WA2LIM, Flushing, N.Y. Tel. IN 1-1779.

USED Mobile equipment for sale. Gonset G-77-PMR7 rcvr with power supplies and gear. Make offer. Charles E. Glass, 224 Newbridge Ave., East Meadow, N.Y.

SELL: Eico 720 c.w. xmtr, $80; Eico 730 modulator, $55. Gonset G-43 rcvr. $150. Louis C. King, R.D. 2, Box 249, Seaford, Del.

SELL: Viking Ranger II and NC-190. Both new in original cartons. Best offer. W. H. Wiley, 1519 Pass Rd., Handsboro, Miss.

SELL: 100-V, 515; Heath 2M converter, $25; E-V 630 dynamic mike, $15. W5BLE, 1427 Louisiana Ave., New Orleans, La.

SELL: Collins 32V2, Extra 4D32, $234.00; SX96 with prod. detr., $125.00; D104 mike, stand, $20. In exc. condx. W8-BTW, 7390 Sawmill Rd., Worthington, Ohio.

KWM-2-516F pwr. supply, 516E-1 pwr. supply, HT33A linear amp., all like new, original cartons, $1300, takes all, pkg. deal. Mel Murray, W9EUY, 7129 W. Farragut Ave., Chi. 31, Ill. Area code 312 NE 1-1262.

FOR Sale: Comco 2-Way radio equipment on 35 mc., FM. Exc. condx. Guaranteed 20 mil. radius. 180 watt base with tone squelch, 40 watt mobile, 2 antennas. Cost $1500. Selling price, $750. Can use a Gonset 201 linear as part payment. Nat Capon, 217-35 47th Rd., Bayside 61, L.I., N.Y.C. Tel. BAyside 5-7200.

WANTED: Manuals, schematics, information: Navy model TCK transmitter, L. Coleman, WA2BMM, N. Pearl St., Canandaigua, N.Y.

RANGER Push-to-talk plus microphone, $180; SX-99 spkr and Q-multiplier, $90. Johnson T-R switch, $10. vy gud condx. K1HXY.

FOR Sale: SX-100 in mint condx, recently factory recalibrated and realigned, with matching R-46B speaker. Will include 30 ft. of RG-8U coax. Asking $220. Howard Shieber, K2UZT, 142-10 Hoover Ave., Jamaica 35, L. I., N.Y.

MOBILE: All-band complete station: Multi-Elmac AF-68, PMR-8, M-1070 Universal pwr. supply, R-47 spkr, Dow-Key 12V relay; *Turner 350 C, PTT mike*; Hellwhips, 10 & 20, heavy duty mount, all cables and manuals. Hardly used, in mint condx. Need the money. $300. Gerald Kolton, K9GBH, 1801 W. Armitage, Chicago 22, Ill.

HEATHKIT SSB Mobile package, HX-20, HR-20, HP-20, HP-10, EV-729SR, $350; Heathkit 5C-1A, $100. Leaving U.S. F.o.b. John Jellema, W8SWN, Zeeland, Michigan.

FOR Sale: Collins 75S-3A, serial 10348 with xtals covering major short wave bands, $720; 312B-4, $160. W8BBA/6, 17552 Kittridge, Van Nuys, Calif.

WANTED: Collins 51J-3, R-388, R-390A, 75A-4, SP-600, teletype, Kleinschmidt, test equipment. Cash, or trade for new amateur equipment. Write: Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

FOR Sale: Like new GPR-90 receiver. No reasonable offer refused. Will deliver within 100 mile radius of NYC. H. Smith, 276 W. 117th St., NYC, N.Y.

WANTED: January 1937, Proceedings of IRE. Name your price. W4BZX, RFD 1, Box 332, Columbia, S.C.

SELL: Gonset G66B, 12V power supply, new tubes, $125; Gonset G77 new tubes and new vibrator, $150 or both for $250; Gonset Communicator III, 6 meter, cables and mike, $185; Elmac AF67, $80; Super Pro 400SX, 1250 Kc—40 Mc with power supply and cabinet, not surplus, $135; B&W 380B TR switch, $15; Millen DeLuxe VFO $50; Millen 500 watt final, coils and tubes, $60; Millen 2-6-10 xmtr with pwr. supplies and modulator, $175; Heath Seneca, $145; may consider some trades but prefer cash. J. B. Forman, P.O. Box 1032, Grand Central Stn., NY 17, N.Y.

SELL: 75S-3 with speaker. Want 51J-4 or 75A-4. Consider trade. Sell 32S-1, 516F-2, 30L-1. All new 1961. Excellent condx. W2AEB.

FOR Sale: Science & Invention, complete run; Radio Craft, complete run; Wireless Age, 1913 to 1925; Popular Radio and other Television and Radio magazines. Send for list. Mrs. Dorothy Simpson, 85-39 152nd St., Jamaica 32, L.I., N.Y.

SELL: Gonset 2 mtr. Communicator VFO amplifier; Superceiver Super Six converter; 2 mtr. mobile converters. Commander xmtr. VFO, FM mobile tuner. All 12v. Johnson mobile xmtr VFO. Want late G76. W1AMK.

SELL: Drake 2B xtal calib. Q-mult. and speaker, 1 week old, $270; Eldico SSB 100F, $400; RME 4303 CB walkie-talkies, pair $80; all like new and f.o.b. Lamb, W3VDE, 1219 Yardley Rd., Morrisville, Penna.

QUICK Sell: Pair No. 5/125b Eimac pentodes, gud, used, $11 ea or $20 the pair; new surplus S-C dynamotor 12 volts inp. and 680 at 210 ma. outp., $9; Triplett No. 341 r.f. ammeter 2 amps., $4.50. All postage paid. W30JW, Pittsburgh 6, Penna.

WANTED: Collins 75S-1 and 32S1 with pwr. supply; or any other reasonable SSB combination. New York, New Jersey and Connecticut area only. WA2NYO, Jeff Gilbert, 162 Mackenzie St., Brooklyn 35, N.Y. (212) NI 8-7784.

GLOBE-KING 500C. In exc. condx. $425.00. K8LTT, 153 Jefferson Park Dr., Huntington, W.Va.

COLLINS Owners work AM! Wired kit, $5.00. Instant switching! Install in five minutes! Kit Kraft, Harlan, Ky.

SELL: Allied tape recorder, $145.00 value, $70; Super Six, $20. Details. Write K5DZE, 316 South 11th St., Columbus, Miss.

GLOBE Scout 680, $60. Drake lo-pass, $4.00. Tribold, KØMBO, Cooperstown, N.D.

SELL: DX-100B, gud condx, $165.00. Ship collect. Herbert Cobb, W1ROU, Harris Dr., Southboro, Mass.

MOHAWK: Expertly wired, in perf, condx—$220. W4ZSV, 225 Shirley Ave., Warrenton, Va.

HQ-170 mint condx. Best offer takes it. Ed Lauster, WA2MXW, 209-14 82nd Ave., Queens Village 27, L.I., N.Y. Tel. HO 8-5320.

OCTOBER Ham Tube Specials: 2C39A, $6.50; 4X150A, $8; 4-65A, $8; 4-125A, $16; 4-250A, $28; 4-400A, $26; 4-1000A, $65; 5894, $9.95; 6146, $1.95; boxed and guaranteed. Stamp for list. Lou-Tronics, Inc. 131 Lawrence St., Brooklyn 1, N.Y.

MUST sell because of family quarrel: entire station—ST P-50 transmitter and modulator, R-44/ARR-5 VHF rcvr. 2 ARC-5 (6-9.1 Mc) rcvrs, 1RT-19/ARC-4 2 meter transceiver, 1-60 ft. crank-up tower, assorted meters, 1- 4-250A, 2-701As, 6-1625s, assorted hardware, 1 Triplett 630-PL VOM, etc. Package local deal only. Must dispose of this quickly. $250 or best offer. You pick up with trailer. WA6SSK, 11137 Van Buren Ave., Los Angeles 44, Calif.

WANTED: 75A4. Will pick up within approximately 200 miles of Chicago. Please give condition, serial number, filter frequency, and price. All replies will be answered. No dealers. L. E. Krafft, K9ZWJ, Rt. 4, Elgin, Ill. SH 1-2197.

2E26 10m-80m. VFO or xtal, mobile rig. Minus mike es xtals. Includes Dynamotor 6v. system. K2JTT.

SALE: Globe Scout xmtr, $50; Knight VFO, $10; Electronic keyer, paddle, $10. Lot price: $65. K2KJV. Phone 212 WE 3-8338. Write: L. Lester, 2241 Creston Ave., Bronx 53, N.Y.

WANTED: 75A4, KWS-1 or Collins S line. State serial numbers, condx, extras and price. Also want Roberts 990 or Revere stereo. K2HWP. 125 Amherst Ave., Syracuse 5, N.Y.

SX-101A and HT-32, $575. Factory-wired Viking II and VFO, $195; Central Electronics Mod. B slicer, $30; Hallicrafters TO keyer, $40. W2DHB, 119 Goldenrod Ave., Franklin Square, N.Y. Tel. IV 1-3470.

SALE: C.E. 10A exciter complete and operating with QT-1, E.C.O., 75 and 20 meter coils and manual. $75.00. WØHNG, Box 485, Coffeyville, Kans.

COLLEGE Bound. Must sell NC-303, $300; Ranger II, $220. Both year old and in exclnt condx. K6SXA, 4209 Burrell Way, Sacramento, Calif.

A-1 DX-100 with 75 meter SSB exciter bonus, $145.00; Miller R9'er with coils, $9.00; pair 810's, 805's, 813, 250THs, offer. 75 meter 6146, 6L6's transmitter, $12.00; E-V Good, $7.00; BC-625 transmitter, $7.00; BC-312 pwr. supply, $6.00. W4QCF, 401 Waterloo St., Warrenton, Va.

HALLICRAFTERS S-38D receiver, $40; Gotham V-80 vertical, $10. You ship. KØDFL, 1501 Plass, Topeka, Kans.

EICO 720 transmitter with three 40-m xtals and instrux book. In perf, shape and expertly wired; $65.00. Heath balun coils, $7. Will ship. R. R. Polk, 338 W. Culver, Scottsdale, Ariz.

SELL: Factory-wired Valiant, low pass filter. In excint condx, $250.00. Jack Simpson, 4409 Canton, Lubbock, Texas.

BARGAINS in excint condx: HT-32B, NC-303, Millen grid dipper, reasonable offers considered. R. B. Cooper, 132 Guild St., N.E., Grand Rapids 5, Mich.

Original, $10; Electro-Voice 729, $10; need money. Must sell! entire rig: $500. WA2DYK, 138 Baker Hill Rd., Great Neck, L.I., N.Y.

GOING Portable! KWS-1, $875; 75A4 with NB, $550; Globe 6N2, $85; Tecratt 6M xmtr, $30; Six meter transceiver AC/DC supplies, $45; SB-10, ARC-5, list of goodies. W4API, Box 4095, Arlington 4, Va.

SELL: Poly-Comm "62" B complete, 6N2 transceiver in excellent condx, $230; Instructograph with 40 tapes, like new condx, $30; original cost over $80. Astatic 10D mike, $15. Must sell, college bound. Robert Caliva, WA61QV, 6927 Cedar St., Huntington Park, Calif.

FOR Sale: Heathkit Apache, $200; National NC-303, $335; Vibroplex Original, $10; Electro-Voice 729, $10; need money. Must sell! Entire rig: $500. WA2DYK, 138 Baker Hill Rd., Great Neck, L.I., N.Y.

COLLINS 75A-4 recvr Serial No. 4921, in excint condx, $500. Kenneth H. Engstrom, W5CUM, 833 Oak Forest Dr., Dallas 32, Texas.

75S-1 excellent, $385; HT-37 purchased new, never used, $370. El-Key, $8. R. Cassutt, 10234 Vista La Cruz, La Mesa, Calif.

PACEMAKER, $325.00; SX-100, $200. Little used, in exclnt CONDX. G. Fenning, W2ZDQ, 11 Piermont Terr., Wayne, N.J.

HAM BUERGERS—Used Equipment, Money Back Guarantee. Astatic JT30 Mike, $7.95; B&W 370, $79.95; B&W 51SB, $165.00; Gonset 6 Meter Linear, $90.00; Hallicrafter SX101, Mark 3, $274.95; HT33A, $449.95; HT32, $350.00; FPM200 Complete, $1500; SR34, $274.95; Hammarlund HX500 new, $555.00; Johnson VIK 1, TVI proof, $124.95; National NC300, $244.95; NC303, $359.00; RME VHF 152A Converter, $49.95. Trades . . . Write for FREE List. Ham Buergers, Wyncote, Pa. CA4-1740.

FOR SALE. BC-639A Receiver Tunable 100-156 Mc. S-Meter, BFO, 115VAC Power Supply $75.00. RA-42A 250v Metered Power Supply $15.00, Tapetone 2 Meter and 220 417A Converters $65.00 each. 6 Meter 417A Converter $45.00. Same with Regulated Supply $65.00. Prop Pitch Motor $20.00. Budd Crystal Calibrator $10.00. Telrex 6 Meter Beams 3 Element (new) and 4 Element $10.00 each. Instructograph Code Machine $10.00. TG34 Tape Puller $15.00. ICA Code Oscillator $10.00. Carborundum Dummy Load $15.00, New #117 Powerstat $15.00, Mon-Key $10.00. New Maverick 6 Meter Filter $12.00, Frank Grosso, K2MLB, 45 Rock Spring Avenue, West Orange, N.J.

75A-4. Clean; $475; Ranger, nearly new, $175; GG 813s, $100; McCoy 48B1 filter, $30; DX35, $25; accessories and parts. Sry, no shipping. Harris. K6ZYZ, Concord, Calif. Tel. area 685-5485.

DELUXE 813 transmitter per January 1954 QST. Improvements. Rack mounted power supplies and modulator. Complete with Variac, relays, meters, and control box. First $150.00 takes all. F.o.b. Guthrie, Okla., W5SAR.

WANTED: 4000-0-4000 or 3500-0-3500 VAC, 500 Ma. or more power transformer. Larry Kleber, K9LKA/W9CPD, Belvidere, Ill.

CRYSTALS Airmailed: SSB, MARS, Marine, CD, Novice, CAP, Net, etc.—Custom finished FT-243, .01% any kilocycle 3500 to 8600 $1.49, (10 or more same frequency FT-243, 99¢), 1707 to 20.000 Kc, $1.95. Overtones above 10 megacycles. Fundamentals 10 to 13.5 megacycles $2.95. Add 50¢ each for .005%. Add 65¢ each for HC-6/u hermetics. QST Projects (FT-243): "SSB Package" five mixer $9.95, seven matched filter (FT-241-A) $9.95; "DCS-500", "IMP", "Phasing" $9.95 per set. Write about crystal needs. Airmailing 10¢/ crystal surface 5¢. Crystals since 1933. C-W Crystals, Box 2065-Q, El Monte, Calif.

FOR Sale: FW Valiant, $315; Ranger, $175; NC-300, $240. All little used, in exc. condx, and on the air. Will ship if necessary. Dan Vermut, 83 Blackheath Rd., Lido Beach, L.I., N.Y. GE 2-0707.

SELL: Hallicrafters S-86 (Mark I), $75; Ameco 2-meter converter, new, $25; together, $90. Dave Menke, WNØBRG, 1190 Broadway, Cape Girardeau, Mo.

TRADE: Good used Eimac 4-1000A for 115 V AC 15 to 20 amp. Variac. Jack Slais, KØTJW, 1204 Fernleaf Dr., St. Louis 26, Mo.

SELL: Hallicrafters SX-101, MK III, like new condx, $225.00. WA2GKA, 466-55th St., Brooklyn, N.Y.

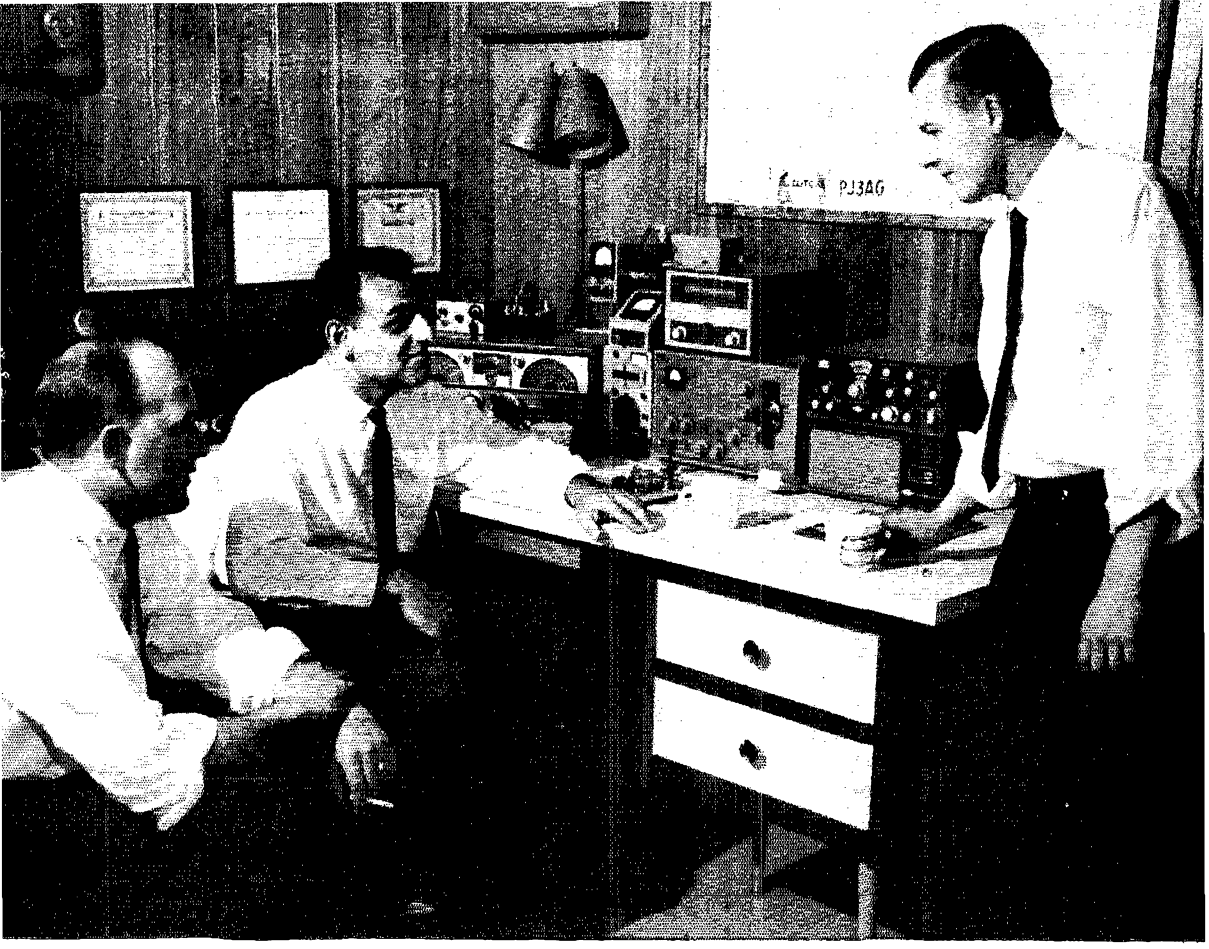
FOR Sale: Type 516E-1 12 volt pwr. supply for KWM-1, like new with set of cables and connector, $160; Mobile Mount for KWM-1 complete two sets of full length cables and connectors, in exc. condx, $50; Collins type F-250-Z2 mech. filter, new for KWS-1 and matched pair of 250 Kc crystals, new for SSB, same unit; four new 4X150A tubes, each $15. All items guaranteed. Will ship. Sy Hernandez, W2BBSA/1, 62 North Main St., Essex, Conn.

KWM-1, AC power supply; Collins speaker, console with SWR meter, etc. In exclnt condx W9JKC, 634 Vernon Ave., Glencoe, Ill.

NEW Demonstrators: HT-32B, $575; SX-115, $450; HT-41, $315; B&W LPA1 with MU, $315. Used, in mint condx, Viking Ranger, $175; SX-96, $150; S-72, $50. W2WEE, Edward Muska, 77 Union St., Colonia, N.J.

SELL: DX-40, $55; V71, $16.00, extals, $1.50. P.E. Novice station-of-month rig. K1VMT, 46 Oak Hill Drive, Arlington, Mass.

Index of Advertisers



George Lucas, W1ZYS, "Pops" Karentz, W1YLB, and Ray Churchill, W1VBI, enjoy an infrequent eyeball QSO at "Pops'" Millis, Mass., QTH.

FIELD ENGINEERING WITH A FUTURE

Assignment: Advanced Radar, Worldwide

It is unusual for the three people pictured above to get together in the same ham shack — more often all three are on far-ranging domestic or foreign assignments supervising Advanced Capability Radar installations for our armed forces.

George Lucas, W1ZYS, is currently Raytheon's resident field engineer at Boeing, Wichita, Kansas. He has advised and instructed on new ACR alignment techniques at many major Air Force bases in the U. S.

Ray Churchill, W1VBI, specializes in high speed bombing radar aboard B-52's. He may be at Loring AFB, Maine one day, Edwards AFB, California the next.

Pops is the Field Project Supervisor of Air Force Programs for Raytheon's Electronic Services Operation. Pops served in a wide range of field engineering assignments prior to his promotion to Project Supervisor and is currently responsible for field programs requiring the services of a large group of field engineers. George Lucas and Ray Churchill are members of Pops' highly capable and fast moving field team.

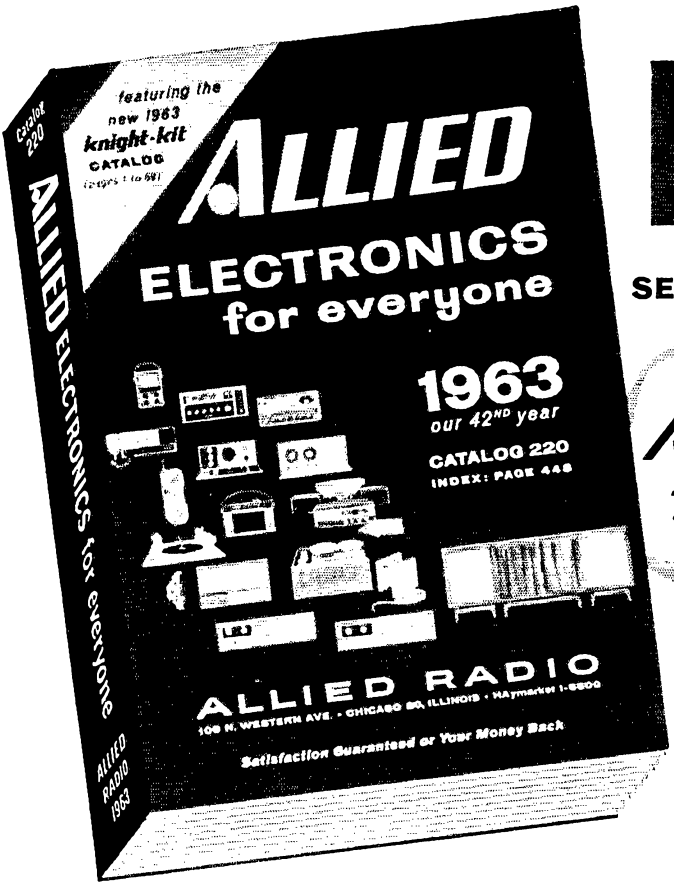
It is possible you too can qualify for a Raytheon field engineering future.

Requirements include an E.E. or its equivalent in practical experience in guided missiles, fire control, radar, sonar or communications equipment.

Among Raytheon benefits: attractive starting salary with regular merit reviews; life and hospitalization insurance; retirement plan; educational and relocation assistance.

Sound interesting? For complete details, write Mr. R. E. Guittarr, Electronic Services Operation, Raytheon Company, Equipment Division, Northwest Industrial Park, Burlington, Mass. An equal opportunity employer.

RAYTHEON



FREE

SEND TODAY FOR YOUR

ALLIED 1963 CATALOG

464 PAGES
WORLD'S LARGEST
ELECTRONICS CATALOG

•

BIGGEST SELECTION
BIGGEST SAVINGS

Everything IN ELECTRONICS FOR THE AMATEUR

get every buying advantage

FOR THAT BEST DEAL on all the newest equipment you want, write or call Don Koby, W9VHI, c/o ALLIED, or stop in at our ham shack and meet Joe Huffman, W9BHD; Joe Gizzi, W9HLA; John Chass, K9LOK; Tasker Day, W9QBB. *In Milwaukee:* Lowell Warshawsky, W9NGV.

HAM-TO-HAM HELP—our staff of more than 50 Hams goes all-out to give you the help you want. Whether you write, call or visit us in person, you'll like the friendly attention and interest you get *all-ways* at ALLIED.

NO MONEY DOWN: Now! More Buying Power with Your Allied Credit Fund Plan

ALLIED RADIO
serving the Amateur for 42 years

- **Ham Receivers and Transmitters**
- **World's Largest Stocks of Station Supplies**
- **New Build-Your-Own Ham Knight-Kits®**
- **Citizens Band 2-Way Radio**
- **Electron Tubes and Semiconductors**
- **Test Instruments and Meters**
- **Everything in Stereo Hi-Fi**
- **Tape Recorders, Tape & Accessories**
- **Everything in Electronic Parts, Tools & Technical Books**

FREE

SEND FOR YOUR COPY TODAY!

ALLIED RADIO, Dept. 42-22-K
100 N. Western Ave., Chicago 80, Ill.

☐ Send FREE 1963 ALLIED Catalog

Name_____
PLEASE PRINT

Address_____

City_____ Zone____ State_____

NATIONAL'S NEW NCX-3

the Transceiver!

Complete SSB, AM and CW coverage of the 80, 40, and 20 meter amateur bands!

Full 200 watts PEP! ***Every desirable operating feature!***

NATIONAL ONE YEAR GUARANTEE

Now from National — a brand-new Transceiver concept that brings you the three most popular amateur bands at a price equivalent to economy single-band units! No need to compromise on only one band — no need to spend a $300 to $800 premium for coverage of the two steadily deteriorating high frequency bands! The handsome, rugged, NCX-3 complements both your car and the ham shack, and provides you with a solid 200 watts of SSB punch — plus — every feature National could think of for easy, relaxed ham band operation — vox or push to talk, CW break-in, SSB/CW AGC, S-meter — even a separate AM detector! The specifications below really tell the story . . . study them carefully and see your National dealer as soon as possible. We're devoting additional production facilities to the NCX-3 to assure maximum delivery rate, and will start delivery December 30 — don't postpone your enjoyment of the new NCX-3 — get your advance order in now!

NCX-3 SPECIFICATIONS

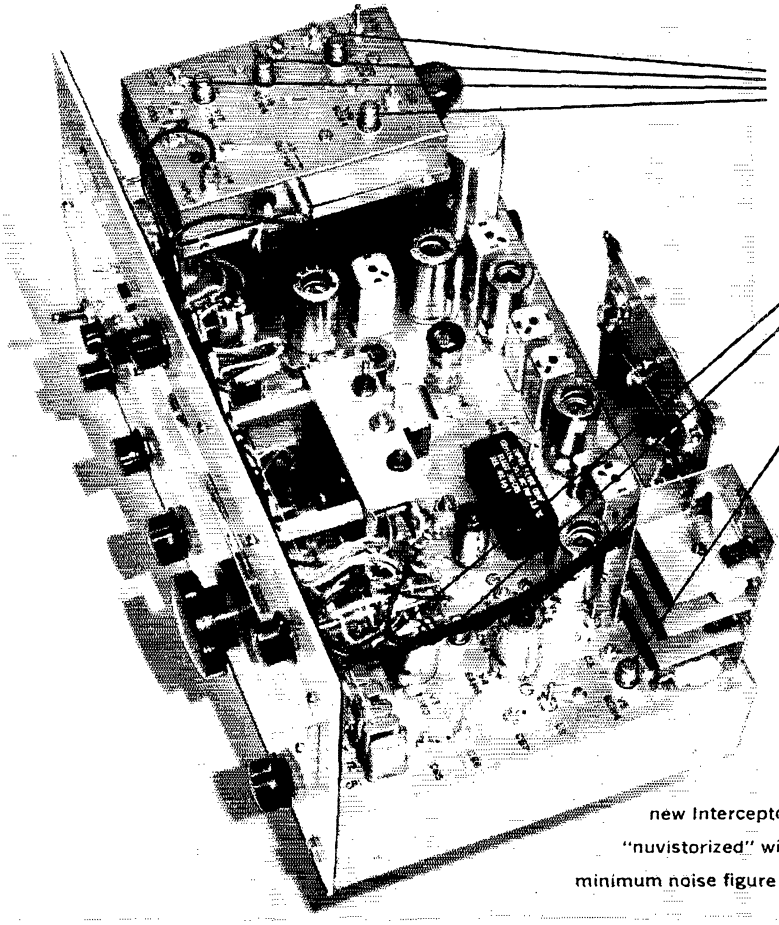
Frequency Range: 3.5, 7.0, 14.0 Mc. amateur bands • Types of Emission: SSB (LSB 80 and 40 meters, USB 20 meters), AM (SSB with carrier inserted), CW • R. F. Power Input: 200 watts SSB PEP, 180 watts CW, 100 watts AM • R. F. Power Output: 120 watts SSB PEP, 108 watts CW, 30 watts AM • Output Impedance Matching Range: 40-60 ohms • SSB Generation: 5200 Kc crystal filter; bandwidth 2.5 Kc at 6 db • Frequency Stability: 400 cyles long-term after warm-up • Suppression: carrier —50 db; unwanted sideband —40 db • Operating Facilities: all modes — full AGC and S-Meter on receive; SSB-VOX or PTT transmit, product detector on receive; AM—VOX or PTT transmit, separate diode detector on receive; CW — grid block break-in transmit, product detector on receive • Audio Input: High impedance, low level • Controls: Front panel — Main Tuning, Band Selector, Audio Gain, R. F. Gain, Microphone Gain, Mode (off, SSB, AM, CW, tune), Carrier Balance, Driver Tune, PA Tune, PA Load; Rear panel — Vox Sensitivity, Anti-Vox, Vox Delay, Bias Adjust, Vox Input, PTT Input, Key, Phones, Ext. relay • Metering: PA cathode current on transmit; S-Meter on receive • Receiver Sensitivity: 1.0 μV. for 10 db S/N ratio • Receiver Selectivity: 2.5 Kc at 6 db • Receiver Audio Output: Better than 2 watts; 3.2 ohms • Size: 6" H., 13¾" W., 11¾" D. • Shipping Weight: 20 pounds • Power Requirements: 700 V.D.C. @ 300 ma., 280 V.D.C. @ 100 ma., —80 V.D.C. @ 10 ma., 12.6 V. @ 5A. • Tube Complement: 17 tubes, 4 diodes; parallel 6GJ5's in final amplifier. Mechanical: ⅛" solid extruded aluminum front panel; perforated steel enclosure; cadmium plated steel chassis; chromium plated steel mobile mounting bracket. • Main Tuning Ratio: 45:1, employing planetary and split gear drive. • Finish: Front panel — Hydro-etch off-white matte with brushed aluminum trim; Knobs — Mil-Spec, matte black; Enclosure — gray-blue wrinkle enamel. • Accessories: NCXA 115 V.A.C. power supply/speaker console; NCXD 12 V.D.C. power supply • Price: Your National dealer has complete price information ready for you — call him today for a very pleasant surprise! (at the same time, why not check his trade-in allowance on your present AM or SSB rig toward a new NCX-3?)

National Radio Co., Inc.®

National Radio Company, Inc., Melrose 76, Mass. Dept. 0000 -O-10
A Wholly Owned Subsidiary of National Company, Inc.
World Wide Export Sales: Ad Auriema Inc., 85 Broad St., N.Y.C. Canada: Tri-Tel Assoc., 81 Sheppard Ave. W., Willowdale, Ontario

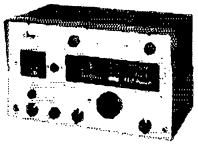
"Nuvistorized" BY CLEGG

NEW INTERCEPTOR RECEIVER USES 7 RCA-6CW4 NUVISTORS IN THE "FRONT END"



Actual size, RCA-6CW4

"Front end" of Clegg's new Interceptor receiver is completely "nuvistorized" with RCA-6CW4's, offering minimum noise figure on both 6 and 2 meters.



If you're really serious about 6 and 2 meters, check out the operating capabilities of Clegg's Interceptor—the all-new VHF receiver featuring 7 RCA-6CW4 high-mu nuvistor triodes in its rf, converter, and if sections.

About the size of a thimble, these self-shielding triodes provide outstanding amplifier, oscillator, and mixer service in amateur gear. Because of their low noise and high signal-gain characteristics, RCA 6CW4's help pull in those weak signals. And the nuvistor design, featuring RCA's "Dark Heater" for long and dependable performance, assures exceptional uniformity from tube to tube, ruggedness, and long-term stability.

The new edition of RCA TRANSMITTING TUBES (TT-5) has been extensively revised and contains data on over 180 tube types. It includes maximum ratings, characteristics, and typical operating values, power-tube circuit-design considerations, as well as tables for quick, easy tube selection. Also included are circuit diagrams for transmitting and industrial applications and new design information on linear rf amplifiers for single-sideband service. Available from your RCA Electron Tube Distributor or Section J-37-M, Commercial Engineering, RCA Electron Tube Division, Harrison, N. J.

(Optional List Price: $1.00)

RCA-6CW4 nuvistors are available from your RCA Electron Tube Distributor.

RCA®

THE MOST TRUSTED NAME IN ELECTRONICS