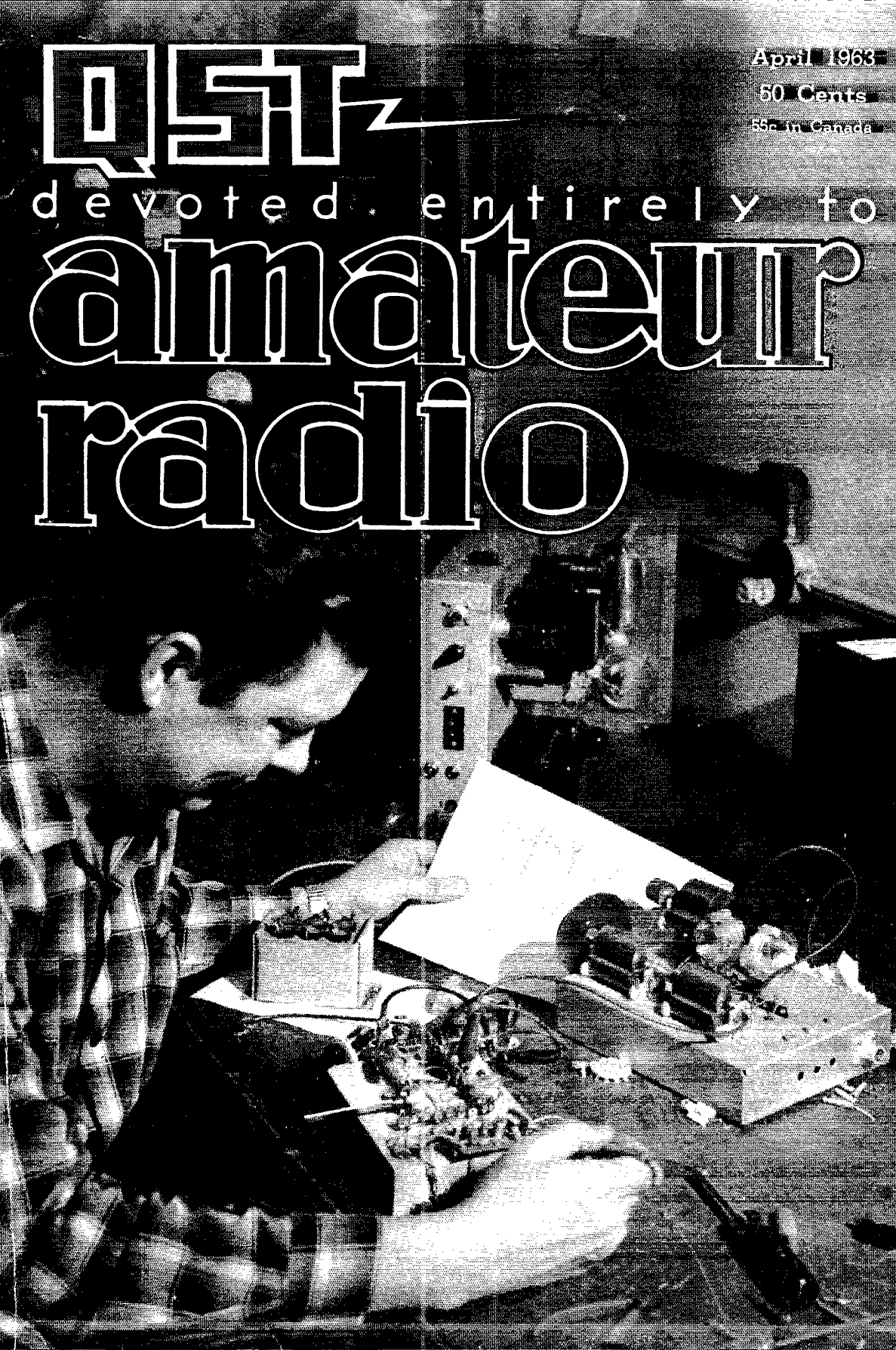
April 1963
50 Cents
55c in Canada

QST

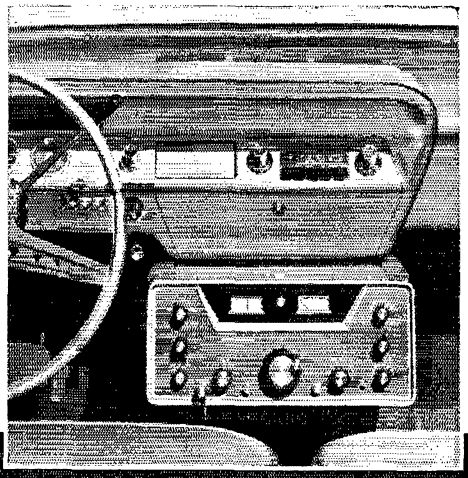
devoted entirely to

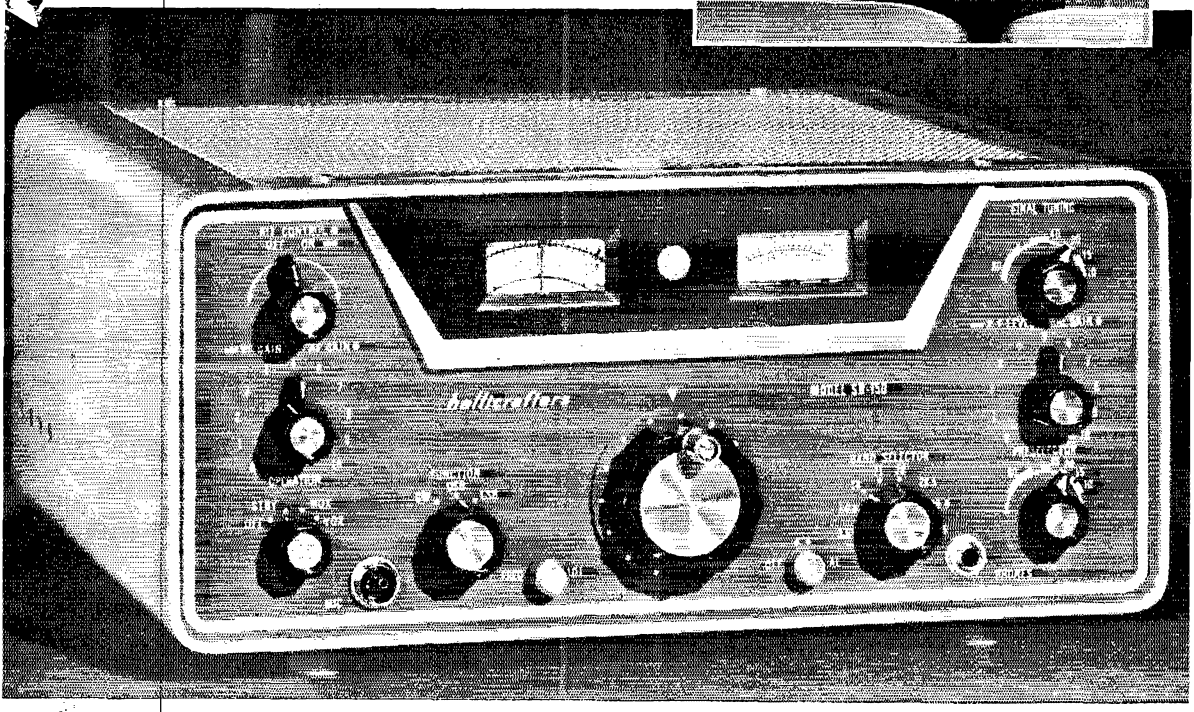
amateur radio



All this performance for only $650.00!

Full amateur band coverage, 80 through 10 meters • Hallicrafters exclusive new R.I.T. (Receiver Incremental Tuning) for ± 2 kc. adjustment of receiver frequency independent of transmitter, and AALC (Amplified Automatic Level Control) • Receiver AF gain and RF gain controls • SSB operation, VOX or PTT . . . CW operation, manual or break-in • 1650 kc. crystal filter . . .





SPECIFICATIONS

Frequency coverage: Eight-band capability — full coverage provided for 80, 40, 20, 15 meters; 10M crystals furnished for operation on 28.5 — 29.0 Mc. Other crystals may be added for full 10 meter coverage without adjustment. Available for operation on specified non-amateur frequencies by special order.

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

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

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

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

Accessories: P-150AC, AC power supply, $99.50. P-150DC, DC power supply, $109.50. MR-150 mounting rack, $39.95.

New SR·150 **Fixed/Mobile Transceiver**

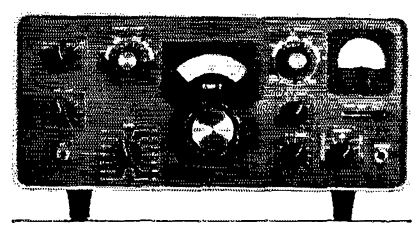
hallicrafters

Overseas sales: Export Division, Hallicrafters • Canada: Gould Sales Co., Montreal, P.Q.

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

LOUDMOUTH !

The Collins KWM-2 Transceiver brags on itself every time it's on the air. Performance alone prompts others to look into it and see if they can find an answer to the question, "How do they do it?" It prompts them to try to duplicate it. This is especially true when one of the features is as significant as single sideband, which was first used in mobile amateur equipment by Collins. In developing the KWM-1 and KWM-2, Collins equipment produced at least 19 industry "firsts". Some have since become standard in all amateur equipment, but Collins KWM-2 is still the only transceiver available which features all 19 in one unit. Use the list below to compare Collins KWM-2 with any other transceiver on the market. See for yourself why Collins KWM-2 leads all others. Then ask your distributor to demonstrate the KWM-2. It's still the best way to learn what the KWM-2 can do for you, and how little it costs to own the finest. ☐ Check these KWM firsts: permeability tuned oscillators, mechanical filters, automatic load control, 1 kc calibration on all bands, crystal controlled front end, Pi network, both sidebands without retuning, lighter unit weight, amateur SSB transceiver, noise blankers, systems engineering, restricted passband on transmit, 0.5 uv for 10 db signal-plus-noise-to-noise ratio, SSB-AVC, transistorized dc power supply, built-in antenna changeover relays, suitcase for portable applications, 100 watts output in a mobile unit and a transceiver which provides for automatic antenna selection. ☐ See your Collins distributor today.



COLLINS

QST

APRIL 1963

VOLUME XLVII • NUMBER 4

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.

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

—CONTENTS—

TECHNICAL —

TE Propagation — V.H.F. Discovery Extraordinary..... 11

How Does TE Work?.....*R. A. Whiting, 5B4WR* 13

Simple Sideband for Six....*Byron W. Stotts, W4KCW* 15

The VO-Can.....*George W. Shuart, W4AMN* 19

A. C. in Radio Circuits.....*George Grammer, W1DF* 22

Two Nuvistor Converters for 220 Mc.
Nicholas D. Skeer, K1PSR 25

An Audio Meter for the Sightless..*Ken Blaney, W6PIV* 28

Pulse: A Practical Technique for Amateur Microwave Work — Part III.....*Robert F. Guba, W1QMN and John T. Zimmer, W2BVU* 31

The HBR-8 Becomes the HBR-11...*Ted Crosby, W6TC* 37

Modifying the HBR-11 for A.M. Phone
Richard T. McCartney, W6GJS 42

Recent Equipment:
Polytronics PC6 50-Mc. Transceiver..... 44

Technical Correspondence..... 46

Technical Topic:
New Propagation Prediction Format..... 47

GENERAL —

It's the Cats-Net.....*John G. Troster, W6ISQ* 36

Oscar Exhibit in Geneva, Switzerland..... 49

Micro-Band F.M.....*John Wasmuth, W8SBQ* 50

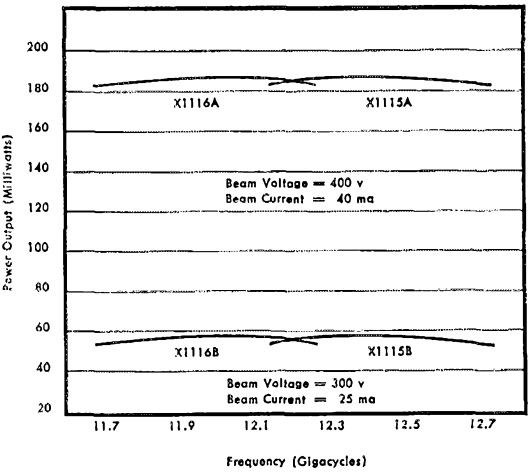
Oscar II: A Summation.....William I. Orr, W6SAI 53

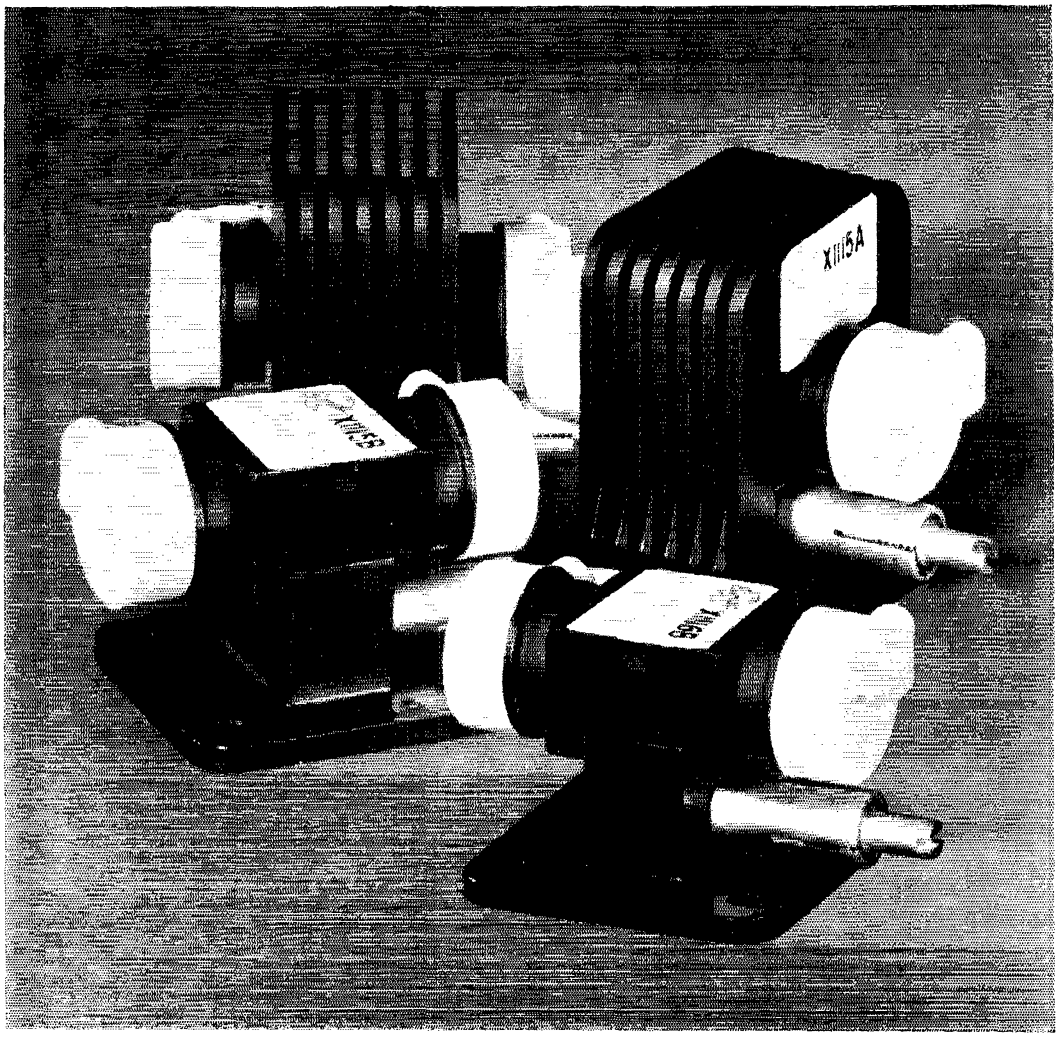
Just One More Guidebook, Please!.....Sonja Kennedy 58

"It Seems to Us ..."..... 9
Coming Conventions..... 10
New England Division Convention..... 10
Hamfest Calendar..... 10
Hints and Kinks..... 48
Happenings of the Month..... 52
Our Cover..... 57
How's DX?..... 60
YL News and Views..... 66
The World Above 50 Mc..... 69
Correspondence From Members. 74
Operating News..... 78
Station Activities..... 86
28 Years Ago in *QST*..... 182
Silent Keys..... 184
Index to Advertisers..... 166

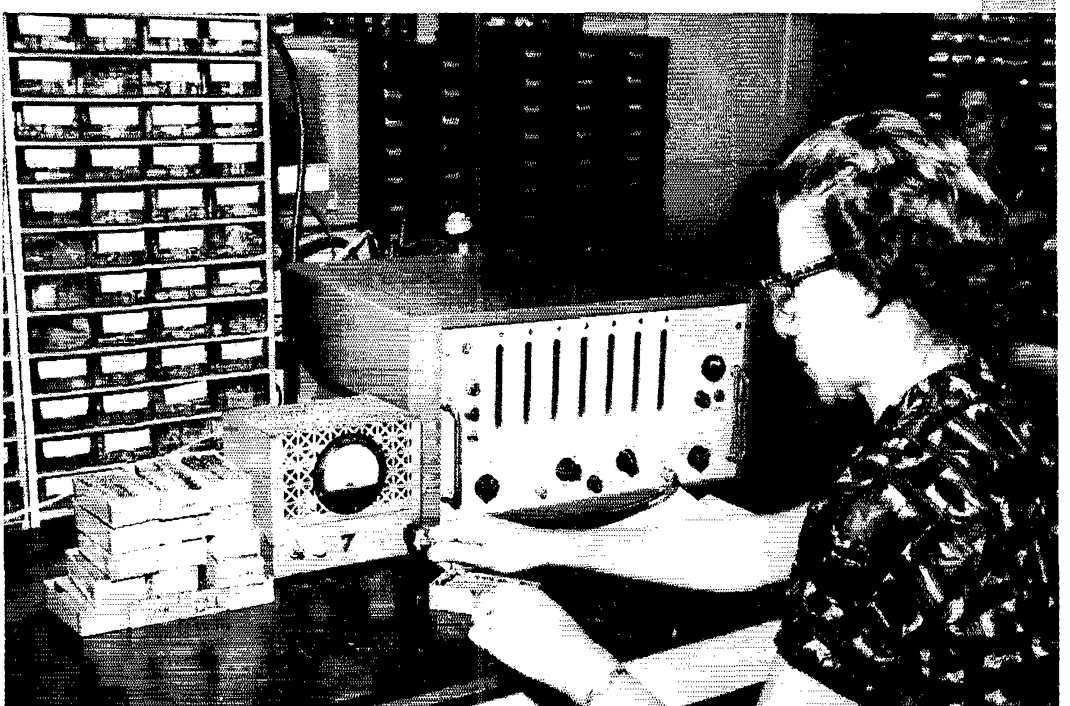
NEW IDEA FROM EIMAC: ku-band reflex klystrons for communications service

Now for your Ku-band requirements, Eimac introduces four new reflex klystrons that will provide exceptionally stable and efficient operation — even in severe environments. These new tubes are the X1115A and B and the X1116A and B. The X1115A and X1115B provide 100 mW and 30 mW power outputs, respectively, at 12.2 - 12.7 Gc, and the X1116A and X1116B provide 100 mW and 30 mW at 11.7 - 12.2 Gc. (See the power-frequency chart below.) All four tubes are low-noise, gridless gun types, ideal for use in microwave relay point-to-point communications, radar and parametric amplifier pumps. And all four tubes feature rugged ceramic-metal construction to ensure long life. In fact, each tube carries a 1000-hour warranty, even for extreme conditions. AFC needs are minimized because of superior temperature-stability characteristics. For more details on these advanced reflex klystrons write: Eitel-McCullough, Inc., San Carlos, Calif. Subsidiaries: Eitel-McCullough, S. A., Geneva, Switzerland; National Electronics, Geneva, Illinois.





Every PR Crystal Gets This Final Rigid Inspection for Accuracy and Stability... Every PR Is Unconditionally Guaranteed



AMATEUR TYPES

FUNDAMENTAL, PR TYPE Z-2—Frequency Ranges in Kcs.: 3,500 to 4,000 (80-M); 7,000 to 7,425 (40M); 8,000 to 8,222 (2M); 8,334 to 9,000 (6M) ± 500 Cycles ...$2.95 Net

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

Third Overtone, PR Type Z-9A, 24,000 to 24,666 and 25,000 to 27,000 Kc., ± 3 Kc. ..$3.95 Net

6 Meters, Fifth Overtone, PR Type Z-9A, 50 to 54 Mc., ± 15 Kc..... $4.95 Net

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

ORDER FROM YOUR JOBBER

Each step in the making of PR CRYSTALS, from the pre-orientation of the raw quartz to the packing for shipment, is checked by a series of rigid inspections. This assures that EVERY PR CRYSTAL IS THE FINEST PRECISION FREQUENCY CONTROL THAT MONEY CAN BUY.

The photograph above shows the final testing of PR Crystals, for activity and frequency. Among other instruments used in testing is the Berkley Frequency Meter, which has an accuracy better than one part in ten million.

Put PRs in your rig today. Your jobber has them for you.

PR Crystals

Since 1934

USE PR AND KNOW WHERE YOU ARE

PETERSEN RADIO COMPANY, INC.
COUNCIL BLUFFS, U.S.A.

Section Communications Managers of the ARRL Communications Department

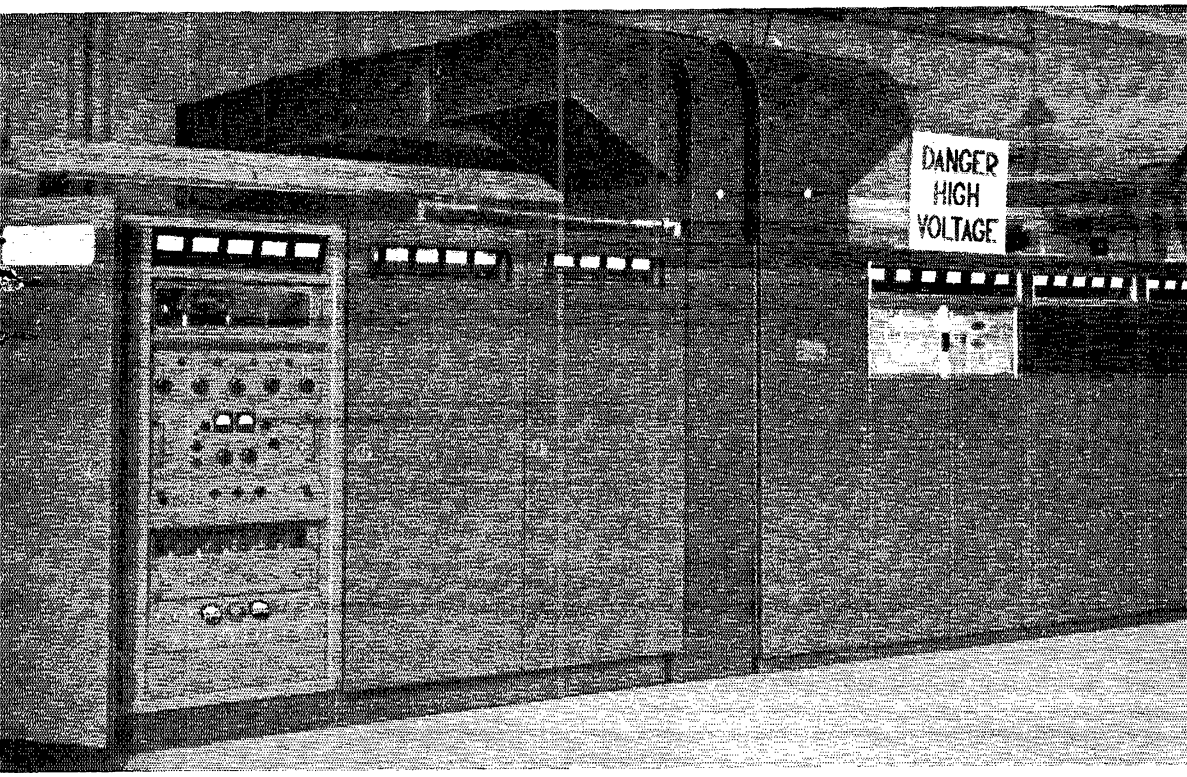
Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*.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

ATLANTIC DIVISION				
Eastern Pennsylvania	W3ZRQ	Allen R. Breiner	212 Race St.	Tamaqua
Maryland-D. C.	W3JZY	Andrew H. Abraham	RFD 1	Smithsburg, Md.
Delaware	K3CKF	M. F. Nelson	505 Milltown Rd.	Marshalltown
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	W3UHN	Anthony J. Mroczka	475-5th St.	Donora
CENTRAL DIVISION				
Illinois	W9PRN	Edmond A. Metzger	1520 South 4th St.	Springfield
Indiana	W9FWH	Donald L. Holt	1312 East 28th St.	Andersou
Wisconsin	K9GSC	Kenneth A. Ebneter	822 Watuna Trail	Portage
DAKOTA DIVISION				
North Dakota	WØHVA	Harold A. Wengel	805-3rd St., S. W.	Minot
South Dakota	WØRRN	J. W. Sikorski	1900 S. Menlo Ave.	Sioux Falls
Minnesota	WØOPX	Mrs. Helen Mejdrich	Route 3	Aitkin
DELTA DIVISION				
Arkansas	K5CIR	Odla L. Musgrove	1321 W. Baraque Ave.	Pine Bluff
Louisiana	W5FMO	Thomas J. Morgavi	3409 Beaulieu St.	Metairie
Mississippi	W5EMM	S. H. Hairston	2321-27th Ave.	Meridian
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. Thetreau	27209 W. Six Mile Road	Detroit
Ohio	W8AL	Wilson E. Weckel	2118 Tuscarawas St., W.	Canton 8
HUDSON DIVISION				
Eastern New York	W2EFU	George W. Tracy	1138 North Country Club Drive	Schenectady
N. Y. C. & Long Island	W2OBU	George V. Cooke, Jr.	3 Daisy Lane	Commack
Northern New Jersey	WA2APY	Daniel H. Earley	216 Grove Ave.	Metuchen
MIDWEST DIVISION				
Iowa	WØNTB	Dennis Burke	1418 Douglas Ave.	Ames
Kansas	WØALA	C. Leland Cheney	8114 Levitt Dr.	Wichita 7
Missouri	WØTPK	Alfred E. Schwadeke	*Edgar Star Rte.*	Rolla
Nebraska	WØEXP	Charles E. McNeel	Route 3, RFD	North Platte
NEW ENGLAND DIVISION				
Connecticut	W1FHP	Robert J. O'Neil	Hard Hill Road	Bethlehem
Maine*	W1GRG	Robert H. Curtis	RFD1	Livemore Falls
Eastern Massachusetts	W1ALP	Frank L. Baker, jr.	85 Solar Ave.	Braintree 85
Western Massachusetts	W1BVR	Percy C. Noble	8 St. Dennis St.	Westneld
New Hampshire	W1YHI	Albert F. Haworth	356 Douglas St.	Manchester
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. Mallet	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 *	KH6ARL	Mike Fern	P. O. Box 107	Lihue, Kauai
Nevada	W7PBV	Leonard M. Norman	652 Utah St.	Boulder City
Santa Clara Valley	W6ZRJ	Jean A. Gmelin	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	W6JPU	Ralph Saroyan	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	Fairmout
ROCKY MOUNTAIN DIVISION				
Colorado	KØTTB	Donald Ray Crumpton	1200 Alexander Circle	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	K4KJD	William S. Crafts	Route 3, Box 233	Athens
Eastern Florida	W4QVJ	George E. Cushing	Box 8045	Jacksonville 11
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	221 East Camelback, Suite P-15	Phoenix 12
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	Forth 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	4553 West 12th Ave.	Vancouver 8, B. C.
Manitoba	VE4JY	M. S. Watson	249 Lanark St.	Winnipeg
Saskatchewan	VE5BL	Jack Robinson	4527 Elgin Rd.	Regina

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

GPT-200K

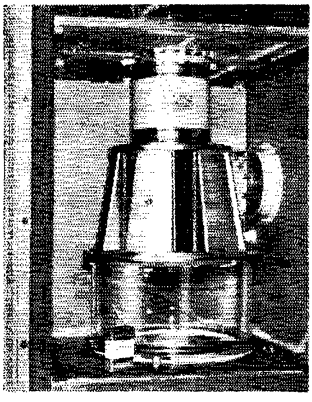
200 KILOWATTS



(AN/FRT-62)

This is a complete general purpose transmitter providing SSB, ISB, AM, compatible AM, CW, FSK and FAX modes of operation. Accuracy and resetability is 1 part in 10^8 per day with tuning in 100 cps steps from 2-28 mcs.

Conservative ratings provide reserve power for maintaining peak power under conditions of complex waveform transmission, such as 64 tone voice frequency modulation, while adhering to signal to distortion ratio of at least 35 db. The final amplifier in the GPT-200K is air cooled. This transmitter is capable of 20 kc bandpass at the 3 db points.



For complete detailed specifications, request TB 1014A.

WORLD WIDE SUPPLIERS OF ELECTRONIC COMMUNICATIONS EQUIPMENT

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, NEW YORK

and Subsidiaries

OTTAWA, CANADA • ALEXANDRIA, VIRGINIA • GARLAND, TEXAS • LA MESA, CALIFORNIA

SAN LUIS OBISPO, CALIFORNIA • LUZERN, SWITZERLAND • POMPANO BEACH, FLORIDA

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 ot 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
1406 West 12th Street, 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 GARY L. FOSKETT, W1ECH
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

PHILIP E. HALLER W9HPG
6000 S. Tripp Ave., Chicago 29, Ill.

Vice-Director:

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. Dannais W2TUK
RFD 1, Arbor Lane, Dix Hills, Huntington, L. I.

Midwest Division

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

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

New England Division

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

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

Northwestern Division

R. REX ROBERTS W7CPY
37 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

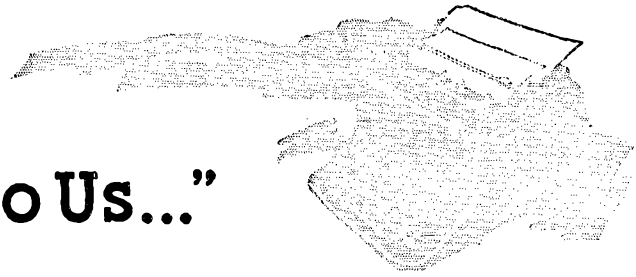
RAYMOND E. MEYERS W6MLZ
Box R, San Gabriel, Calif.

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

West Gulf Division

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

Vice-Director: Ray K. Bryan W5UYQ
2117 S.W. 61st Terrace, Oklahoma City 18, Okla.



"It Seems to Us..."

FCC SETS FORFEITURE RULES

LAST year Congress amended the Communications Act to permit the Federal Communications Commission to levy fines on licensees in the nonbroadcast services for violations of certain regulations. By order of January 30, 1963, FCC amended its rules to establish procedures for these small forfeitures. Specific violations covered are: operation without a license of the proper class, omission of required identification, transmission of a false call sign or false distress call, operation on an unauthorized frequency and excessive deviation, unauthorized communications on distress or calling frequencies, interfering with any distress call or communication, spurious emissions, excess power, rendering an unauthorized communication service or transmitting prohibited communications (e.g., profanity), unauthorized type of emission and failure to respond to written official communications from the Commission.

For each separate offense, the station licensee (and the operator, where he is a different person) may be fined not more than $100. For several offenses within the same 90-day period, the maximum fine is $500 for station licensees and $400 for operators. Notice of apparent liability is to be mailed within 90 days of the occurrence of the violation.

A notice of apparent liability will be sent by certified mail to station licensees or operators whenever it appears they have willfully or repeatedly committed any of the offenses mentioned above. The notice will specify the offense and state the amount of the forfeiture. The licensee may respond within 30 days by paying the fine by check or money order payable to the Treasurer of the United States; may submit a statement denying the offenses and submitting evidence to support his position; may admit the offense but argue for cancellation or reduction of the forfeiture, again with factual reasons and data; or may request a personal interview with an official of the Commission. The Commission may, after review of the above, cancel or reduce the fine or may order it paid in full. If a licensee fails to respond or fails to pay the forfeiture when it becomes due, the case will be turned over to the Department of Justice for prosecution in the appropriate Federal District Court.

It must be emphasized that these procedures cover willful or repeated violations of the rules. The amateur who accidentally violates a rule but who responds promptly and satisfactorily to the official citation will not be fined. Even after a notice of apparent liability, an individual's rights still appear to be adequately protected.

Revocation and suspension procedures have heretofore been the Commission's principal disciplinary tools. Properly used, this additional weapon can be very effective in enforcement of the regulations. We hope the Commission will not hesitate to apply the new procedure in appropriate instances of chronic and blatant infractions in the amateur field.

BOARD MEETING

The annual meeting of the ARRL Board of Directors will be held in Hartford with formal sessions commencing May 3 and preceded by a day or two of informal discussions, inspection of headquarters operations and the like. It is expected the new administration building will be ready for dedication at that time.

One topic certain to be considered is the possibility of asking FCC to return to a more definite system of incentive licensing as has been discussed in the February and March editorials and in the "Correspondence from Members" section of this issue. Members of the League and affiliated clubs are invited to get in touch with their respective directors expressing views on this or any other matter of current interest. The list of directors appears on page 8 of this issue. Members who are not sure in which division they reside can find their state or part of a state listed on page 6 under a division heading. Comments should reach the directors before the last week of April to be sure of delivery and consideration.

QST

NEW ENGLAND DIVISION CONVENTION
April 27-28

The New England Division Convention will be held on Saturday and Sunday, April 27 and 28, at the New Ocean House Hotel in Swampscott, Massachusetts. The two-day convention program will feature displays and demonstrations by leading amateur equipment manufacturers and distributors, technical talks, a laser demonstration, equipment "swap party," FCC examinations, DX QSL bureau, QSL contest, net meetings, ARRL forum, YL activities and luncheon. Speakers will include ARRL president Herbert Hoover, jr., W6ZH; Bill Leonard, W2SKE, of CBS; and Father Daniel Linehan, W1HWK, seismologist and explorer.

Saturday's program will begin at 2 P.M. and finish in the evening with dancing until midnight and a five-act nightclub show. The Sunday program will end with the convention banquet beginning at 5 P.M. and the presentation of the "Outstanding New England Amateur Radio Operator" award (see page 162, January *QST*).

Registration for the two-day convention is $3 before April 10, $4 after that or at the door. Banquet price is $5.50. Overnight hotel reservations should be sent directly to the hotel; the cost is $10 for a single and $15 for a double. Ticket requests may be sent to Radio Convention, — George Stewart, W1ZQQ, 17 Barnes Avenue, East Boston 28, Massachusetts. A stamped, self-addressed envelope will be appreciated.

Alabama — The Montgomery Amateur Radio Club Hamfair will be held Sun., April 21 at the State Coliseum. There will also be a banquet on Sat., April 20 at the Holiday Inn Motel. The cost of the banquet is $4.00 and reservations must be made in advance. For reservations and further info contact Montgomery Amateur Radio Club, P. O. Box 6187, Montgomery 6, Ala.

Alabama — The 10th annual Birminghamfest will be held by the Birmingham Amateur Radio Club, Inc., May 4 and 5. The main event will be held in the Alabama State Fairgrounds on Sun., May 5. For further info contact E. O. Thomas, Birminghamfest, P.O. Box 603, Birmingham, Ala.

California — The Southern California Mobilfest, sponsored by the Wheel-N-Whips Mobile Radio Club of Van Nuys, will be held March 31, at North Hollywood Park, Magnolia Boulevard at Tujunga Avenue. There will be a mobile field-strength contest for 75 and 2 meters, hidden transmitter hunts on 75, 6 and 2 meters, and games and contests for the whole family. Bring your picnic lunch, refreshments served. Time — 10:00 A.M. to 5:00 P.M. Registration $1.00, field-strength contest 50c extra. Write to P. O. Box 2352, Van Nuys, Calif., for further info.

Florida — The 16th traditional weekend-after-Easter Hamfest of the Orlando Amateur Radio Club, Inc., will be held at the Cherry Plaza Hotel, Orlando, Fla., April 19-21. The program includes awards, forums, electronic displays entertainment, and guest speaker Carl Mosley, W0FQY. Admission is $1.00, Sunday luncheon $4.25. Tickets may be purchased in advance from Paul Montgomery, K4JSS, 308 Castle St., Orlando, Fla.

Illinois — The Moultrie Amateur Radio Klub is having a hamfest April 21 at Wyman Park, Sullivan, Ill. For further info contact Moultrie Amateur Radio Klub, Box 44, Sullivan, Ill.

Louisiana — The Southwest Louisiana Amateur Radio Club of the Lake Charles area will sponsor a Hamfest and Fish-fry May 4 and 5 at Prien Lake Park, 5.3 miles southwest of downtown Lake Charles, on Prien Lake Road. Pre-registration fee is $2.50, for which a fish dinner and one other meal will be served. Pre-registrations must be made by April 24. The fee after that date will be $3.00. Hotel or motel reservations will be made if requested. Send registrations to Lou Fontenot, WA5ARV, Route 3, Box 185-DC, Lake Charles, La.

Maryland — The Baltimore and Ohio Railroad Amateur Radio Club will hold its 4th annual banquet on April 20, at Baltimore, Md. Tickets are $3.00, and reservations must be made no later than April 12. For reservations contact Dorothea E. Witchey, K3EHZ, Rt. 1, Box 260-A, Glen Burnie, Md.

Massachusetts — The Quinebaug Valley Radio Club will hold its annual auction on April 20 at 1300 EST, at the Red Men's Hall in East Brookfield, Mass. The auction will be followed by a ham and bean supper at 1800 sharp. The price of this supper is 99¢. 10% of the profits derived from this auction will go to the ARRL building fund. Contact Roger M. Johnston, K1JNS, Route 20, Brimfield, Mass., for further info.

North Dakota — The North Dakota State University Amateur Radio Society is sponsoring a hamfest on Sunday,

(*Continued on page 152*)

COMING A.R.R.L. CONVENTIONS

May 18 — Pacific Division, Fresno, California
May 25 — Wisconsin State, Racine
June 1-2 — Oregon State, Eugene
June 7-9 — West Gulf Division, McAllen, Texas
June 30 and July 1 — Saskatchewan Province, Moose Jaw
July 6-7 — West Virginia State, Jackson's Mill
Aug. 31 and Sept. 1 — Atlantic Division, Washington, D. C.
September 14 — Kentucky State, Lexington
September 28 — Ontario Province, Hamilton
October 4-6 — ARRL National, Cleveland, Ohio
October 11-13 — Southwestern Division, San Diego, Calif
October 26-27 — Midwest Division, Wichita, Kansas
November 29-30 — Delta Division, Lafayette, Louisiana

RECIPROCAL OPERATING PROPOSED

Senator Barry Goldwater, with the co-sponsorship of 23 other Senators, has introduced S.920, a bill to authorize the U.S. Government to enter into reciprocal agreements with other countries permitting amateurs of one nation to operate their stations temporarily in territory of the other. The new concept, worked out after extensive consultation with League officials, drops the original idea of *licensing* aliens and rather proposes that alien amateurs, citizens of and licensed by countries with which agreements would be concluded, would be permitted to use their stations and call signs (with suitable portable designator) in the U.S. A similar arrangement would exist for U.S. amateurs visiting other countries. The text of the bill and a list of sponsors will appear in May *QST*.

Senator Goldwater, ex-6BPI, has renewed his personal interest in amateur radio and is now K7UGA — and an ARRL member.

TE Propagation—V.H.F. Discovery Extraordinary

A Quick Look Backward, Plus Latest Observations on the Cyprus to Southern Rhodesia Circuit

ONE of the finest examples of amateur radio's potential for worthwhile contributions to wave-propagation knowledge was the discovery and early use of transequatorial v.h.f. propagation. By 1947, when the first work of this kind was done, we were beginning to feel that radio-propagation phenomena were fairly well catalogued. Amateurs had sprung some valuable surprises in the past, but would it be very likely to happen again, now that the field had seen such extensive scientific scrutiny? By 1946, for example, there were propagation predictions available to anyone, purporting to show the approximate maximum usable frequency for long-distance communication between any two points on the earth's surface, for any time of day, three months in advance.

They indicated among other things that, as the peak of the sunspot cycle approached, the m.u.f. on certain north-south paths might be getting up close to 50 Mc., come October and November, 1947. So it did, though rather remarkably ahead of schedule, and at hours of the day that were at variance with all preconceived ideas. In late August, XE1KE, an avid ham with no professional propagation interests, found that he could work Argentine stations, notably LU6DO at first, quite regularly on 50 Mc. This was a good two months ahead of schedule, according to the predictions, and more important the contacts were made in late afternoon or early evening, when there should have been no possibility of v.h.f. propagation over such distances. Coincidentally, W7ACS/KH6, near Pearl Harbor, Hawaii, worked VK5KL, Darwin, Australia, an unheard-of haul of more than 5000 miles — and this, too, at 1700 local time, instead of at the midday peak indicated in the predictions.

These events were reported somewhat breathlessly by the writer in *QST*,[1] and word was spread through every available channel, including scientific agencies in Washington and elsewhere. The news created hardly a stir, outside of amateur radio circles, at first. People who knew their radio propagation tended to write off this 50-Mc. DX as some kind of freak occurrence that would not happen again. "Very interesting, but . . . ." The polite brush-off.

Fortunately, the hams who were making the contacts didn't know that such propagation was impossible, so they kept on trying. XE1KE was joined by XE1GE, and soon they were working LUs and other South American amateurs by the score. This kept up all through the fall of 1947, always much later in the day than the hours indicated as high-m.u.f. time in the predictions. Occasionally the band remained open far into the night. Signals were often fuzzy, but almost never weak, and they were in with almost clocklike regularity night after night. What was going on here?

We asked the question repeatedly, in print and otherwise, as the evidence piled up month after month in the pages of *QST*, through the sunspot cycle peak in 1948, and for several years thereafter. Eventually these reports and the work of O. P. Ferrell,[2] long-time observer and reporter of amateur v.h.f. activity, had the desired effect. Scientific attention began to be focused on possible causes of these nocturnal band openings, but by now it was too late to do much about it. Forces were marshalled, however, for major assaults on the problem a few years hence.[3] Some theories were advanced, notably by Villard, which would explain the propagation on the basis of ionospheric conditions above the geomagnetic equator, much along the lines discussed later herein.

With the steep-rising curve of another solar cycle upon us, interest in 50-Mc. DX grew by leaps and bounds in the middle and late '50s. This time there was more universal 50-Mc. interest. Amateurs of many countries of the Far East, especially Japan, were now active on 50 Mc., and they soon showed that theirs was one of the most favored zones of the world for 6-meter openings. Many stations were on in Hawaii, Australia and New Zealand. South American activity levels were much improved. Perhaps most important of all, there was fairly extensive interest in parts of Africa, one area of which would eventually turn out to be an almost ideal spot from which to study the *TE* mode.

This was Southern Rhodesia, where ZE2JV would take his place among 50-Mc. immortals, through his daily beacon transmissions and receiving tests. If Southern Rhodesia seems an unlikely place for a dedicated v.h.f. enthusiast, then how about the Island of Cyprus, especially during the politically-troubled atmosphere of the late 1950s? But ZC4IP and ZC4WR took up the challenge, and the latter went through one of the most remarkable programs of amateur radio observation and investigation ever undertaken.

[1] "The World Above 50 Mc.," *QST*, October and November, 1947.

[2] Ferrell, "V.H.F. Propagation in the Equatorial Region," paper presented at URSI Spring Meeting, 1951, abstracted in *IRE Proceedings*, Vol. 38, p. 719.

[3] "ARRL-IGY Propagation Research Project," *QST*, September, 1956.

"NBS Equatorial Region V.H.F. Scatter Research Project," *QST*, August, 1957.

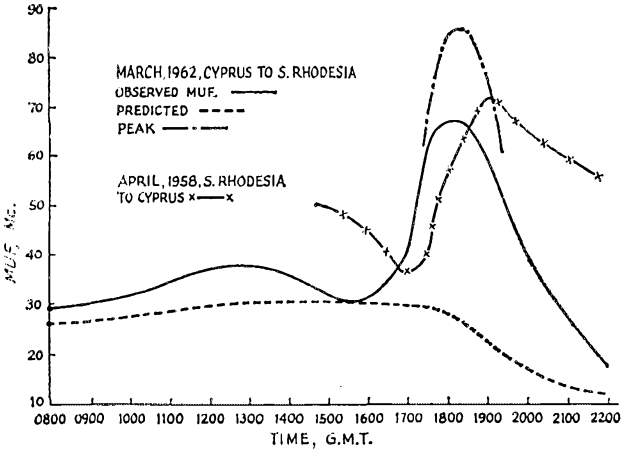


Fig. 1—Transequatorial v.h.f. propagation was still going strong in 1962, as shown by these records made by 5B4WR in March. The observed average m.u.f. for the path from Salisbury, Southern Rhodesia, to the Republic of Cyprus for the month is shown by the solid line. Also shown for comparison is a typical month of the peak years of the solar cycle.

The work of ZE2JV and ZC4WR is well documented in *QST*,[4] and the story need not be repeated here, but the latest evidence gathered, and reported below, is of more than ordinary interest. As it turned out, Cyprus and Salisbury, Southern Rhodesia, through their situation on a north-south line, equally spaced either side of a northerly bulge in the geomagnetic equator, probably are in as good positions as any two spots in the world for observation of v.h.f. *TE* propagation. The work of these two amateurs, carried on daily for several years, entirely as a matter of personal interest, and reported on in detail already, attracted the attention of scientific agencies and resulted in our two friends being recruited for scientific study of the mode in recent times. One result of this latter program, as yet incomplete, has been to show that *TE* propagation of v.h.f. waves may be far less dependent on the solar cycle than has been previously assumed, at least as far as the most-favored areas of the world are concerned.

Evidence is shown in Fig. 1. The line broken by crosses shows the hourly average night-time m.u.f., as observed by ZE2JV in April, 1958. This was a month typical of equinoctial periods during the highest portion of the solar cycle. It will be seen that the normal F_2 m.u.f. to the north from ZE2JV would be above or near 50 Mc. during daylight hours, but would drop off around sunset. Then in the post-sunset period it would rise again, shooting up far above the daytime value, often remaining well above 50 Mc. throughout the night. How would ZE2JV know this? TV and other commercial signals from much of Southern Europe would fill the tuning range of the general-coverage v.h.f. receiver, with which he tuned the frequencies up to 75 Mc. nightly.

Now turn to Fig. 2 for a moment. This is a histogram of the v.h.f. reception records kept by ZC4WR, with the help of ZC4IP, covering 1957 to 1961. The solid lines show the percentage of reliability of evening reception of the 50.04-Mc. beacon signal of ZE2JV, supplemented to some degree by other Southern Rhodesian and South African amateur signals. From this information we see that 50-Mc. reception was possible very solidly in the equinoctial periods through early 1960. There is rather surprisingly persistent 50-Mc. propagation through the fall of 1960 and the spring of 1961, long after the normal F_2 m.u.f. had ceased to reach anywhere near the 50-Mc. band.

Now, for the blockbuster, turn back to Fig. 1. During March of 1962, ZC4WR, now 5B4WR, made daily m.u.f. observations, this time tuning up as far as an 87-Mc. beacon signal now being

[4] Cracknell, "Transequatorial Propagation of V.H.F. Signals," *QST*, December, 1959.
"More on Transequatorial Propagation," "Technical Correspondence," *QST*, August, 1960.

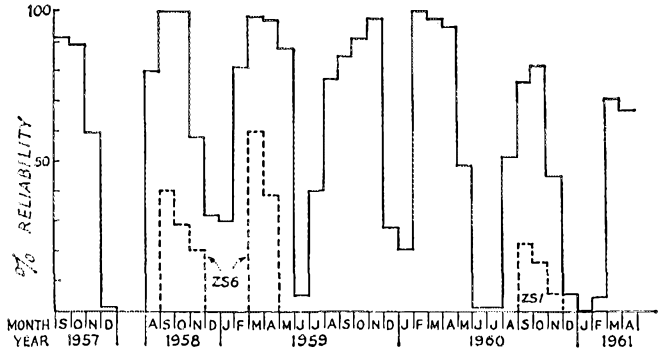


Fig. 2—Histogram showing the reliability of 50-Mc. propagation in the evening hours over the ZE2JV-ZC4WR circuit, as recorded by ZC4WR. Note that propagation is concentrated in the equinoctial months.

provided by equipment operated by ZE2JV as part of a research project sponsored by a scientific agency. The solid line shows the *average* evening m.u.f. observed for the month up to nearly 70 Mc. briefly in the post-sunset period, with the 50-Mc. band being open for nearly 5 hours. On peak evenings, the m.u.f. reached 87 Mc.! This is shown by the broken line with dots.

It is of interest to note that the predicted m.u.f. for the path, shown in a dashed line, flirted with the 10-meter band for several hours, but 5B4WR tells us that the 10-meter band was still holding up well through the early evening hours into June, when he left Cyprus for an extended stay in Britain. Clearly, a great deal of 50-Mc. DX could be worked from Southern Rhodesia, even this late in the solar cycle, if there were use of the 50-Mc. amateur band in Southern Europe and the Mediterranean area. Unfortunately, this is not the case, Europe having given over this portion of the spectrum to television some years ago.

For the balance of this discussion we quote more or less verbatim from a detailed report recently received from 5B4WR, which was also the source of the graphs and other data given above.

— *E. P. T.*

How Does TE Work?

BY R. A. WHITING,* 5B4WR

ANY explanation of the ionospheric mechanism which produces the rise in *TE* m.u.f. after sunset must, of course, take into account the known characteristics of the ionosphere in equatorial regions. Because of the effect of the earth's magnetic field on the ionized layers of the earth's atmosphere, in the vicinity of the geomagnetic equator, they display characteristics peculiar to this region. These characteristics have been observed on ionospheric sounders in areas close to the geomagnetic equator.

One such characteristic is an increase in the degree of ionization of the F_2 region, with peaks in electron density contours occurring at around 15 degrees from the geomagnetic equator. The presence of these high-density zones, plus the higher level of ionization in general, accounts for the higher m.u.f.s observed over north-south *TE* paths. This is illustrated in Fig. 3A for the normal two-hop signal path from Salisbury to Limassol via the F_2 region.

What then of the rise of *TE* m.u.f. after sunset, and the flutter fade observed? Although several explanations have been advanced to account for this effect, perhaps the simplest and most readily understood is illustrated in Fig. 3B. It also has the merit of taking into account the observed behavior of the F_2 region of the ionosphere after sunset in the vicinity of the geomagnetic equator. This manifests itself as an increase in height of the F_2 layer immediately after sunset, accompanied by the breakup of the layer into clouds of ionization, the effect lasting for several hours. Because the echoes returned from vertical-incidence sounders during this period are diffused or spread out, due to scattering by the ionized clouds, the effect has been termed "Equatorial Spread *F*."

The phenomenon is illustrated in Fig. 3B, which also suggests diagrammatically how an increase in m.u.f. is possible. Due to tilts introduced in the F_2 region, the radio wave encounters the layer at a lower angle of incidence than is

* P.O. Box 219, Limassol, Republic of Cyprus.

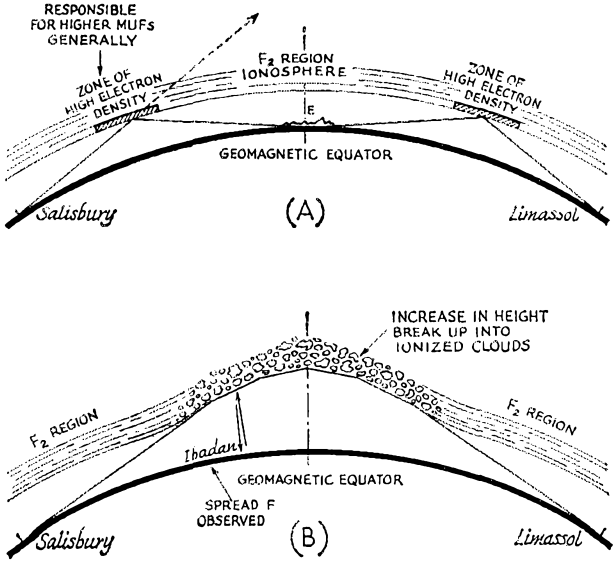


Fig. 3—Normal and post-sunset trans-equatorial propagation between Salisbury and Limassol. The normal path, A, involves two-hop F_2-layer propagation, with a bounce at the geomagnetic equator. The increase in height and breakup of the layer after sunset allow the wave to propagate across the underside of the layer. The result is a diffused multipath signal, showing some distortion but high reliability.

normally possible, and by successive refraction is guided around inside the region to be returned to earth, in this case at Limassol, without an intermediate ground-reflection point.[5] Because of the presence of a higher degree of ionization and the lower angle of incidence, higher frequencies are refracted and the path m.u.f. rises.

The elimination of an intermediate ground-reflection point will reduce signal attenuation, and the scattering from the clouds of ionization produce the effect known as *TE* flutter fade. In fact, Equatorial Spread *F* has become closely associated with the flutter fade noticed on short-wave signals in general, propagated across the geomagnetic equator during the period after sunset. The effect has become known to communication engineers as the "tropical sunset fading effect" — sufficiently descriptive, I think you will agree. The presence of Equatorial Spread *F* undergoes generally the same seasonal changes in intensity and duration as have been observed on the post-sunset propagation of six-meter *TE* signals.[4]

One other aspect of the ionosphere observed in the region of the geomagnetic equator is the presence of a permanent daytime belt of sporadic-*E* which breaks up and disappears after sunset. On the two-hop signal path illustrated in Fig. 3A certain frequencies would be reflected from the top of this layer, on past records as high as 55 Mc. on occasions. If signals are being reflected from the top of this layer, then its disappearance after sunset, by introducing additional attenuation, could account for the rather pronounced dip in signal levels observed on the six-meter band at sunset during the equinoxes. The presence of the sporadic-*E* layer is indicated in Fig. 3A. It has been observed to occur in a narrow belt centered on the geomagnetic equator and bounded by the dip latitudes of 10 degrees north and 10 degrees south. It should be noted that Figs. 3A and 3B are not to scale.

Fig. 4 illustrates the incidence of Equatorial Spread *F* after sunset, as observed at Ibadan, dip latitude 6 degrees south. It also shows the disappearance of sporadic *E* at sunset. It records for both phenomena the percentage of hourly observations when they were observed during

[5] *This is essentially the "billiard-ball mode," proposed by* Villard, Stein and Yeh: "Studies of Transequatorial Ionospheric Propagation by the Scatter-Sounding Method," *Journal of Geographical Research*, Vol. 62, p. 399.

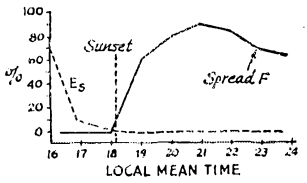


Fig. 4—Percentage of occurrence of Spread F at Ibadan, Nigeria, near the midpoint of the observation circuit and the geomagnetic equator, September, 1958. After Bennington, *Wireless World*, October, 1960.

September 1958. In the case of sporadic *E*, its presence was registered when its critical frequency was greater than or equal to 5 Mc. This graph should be compared with the diurnal 6-meter signal level variation for the same period over the Salisbury-Limassol path.

Uses of TE

Propagation information of the nature discussed provides the amateur a useful tool to extend the range of his contacts in both distance and frequency. From the information presented we now know from what geographical locations we can take advantage of the peculiarities of *TE* propagation, what frequency bands can be used, and the time of day and season of the year when we can expect the best results. The most efficient mode of communication is c.w., in view of the fading pattern encountered, though voice is readable much of the time.

To summarize, on north-south transequatorial circuits over paths symmetrically disposed with respect to the geomagnetic equator and of between 3000 and 4000 miles in length (this may be extended by other modes of propagation), reliable communication is possible using the amateur bands as high as 50 Mc. during the three hours after local ground sunset time in the equinoctial periods. Signals propagated across *TE* circuits during these hours are subjected to a form of rapid fading. Less-reliable communication is possible on frequencies at least as high as 70 Mc. All this is possible using low-power amateur transmitting equipment and without special receivers or antennas. In view of its great potential for reliable communication, it must be assumed that the *TE* mode will take on ever greater importance, as this potential becomes more widely known and appreciated. QST

Strays

Are you an ex-G ham and will you be at the Dayton Hamvention on April 27? If so, contact WSLUZ, who is going to have a little breakfast for you at 0830 that day. In Dayton phone TU 5-7811, or leave your name at the registration desk, or write to him at 8981 Clyo Rd., Dayton 59.

—•••—

The Long Island Tri-Banders ARC has a 6-meter Bunny Hunt the second Friday of every month. The hunts start from Jolly Roger's in Bethpage, N.Y., at 2030 EST. For further info contact Michael Camerire, WN2BHH, 1870 Oakland Ave., Wantagh, N.Y.

—•••—

Any hams acting as amateur radio instructors at summer camps in New York state during this coming summer please contact Robert M. Zitter, WA2PIX, 697 Bruce Drive, East Meadow, N.Y., to see about an inter-camp net.

Fig. 1—The cabinet and the 9 × 10-inch panel are homemade. The meter switch is below the meter. Along the bottom are the audio gain control and tuning controls for the oscillator and doubler. The antenna-loading and amplifier-tuning controls are at the upper right. The switch to the left of the meter switch actuates an antenna relay.

Simple Sideband for Six

Inexpensive A.M./D.S.B. Rig for 50 Mc.

BY BYRON W. STOTTS,* W4KCW

HERE is a simple approach for the 6-meter man who desires to try sideband while still retaining the ability to work a.m. A major proportion of the complexity and expense involved in an s.s.b. transmitter is associated with the elimination of one of the sidebands. Elimination of the carrier is relatively simple. With the carrier only eliminated, both sidebands (d.s.b.) will be transmitted, of course, but on most present-day receivers only one sideband will be received at a time, and the signal will sound exactly like an s.s.b. signal.

Circuits

The r.f. circuit is shown in Fig. 2. An oscillator operating with a crystal in the 8.5-Mc. region triples to 25.5 Mc. in its plate circuit, and drives a doubler to 51 Mc. For d.s.b. operation, the final amplifier uses two tubes in a balanced-modulator configuration which balances out the carrier. On a.m., the mode switch opens the cathode circuit of one of the tubes, and the stage reverts to a single-tube amplifier with carrier restored. The plate-grid capacitance of the idle tube serves as a neutralizing capacitor for the active tube.

* 177 Marillo Lane, North Fort Myers, Florida.

In both modes of operation, the amplifier is screen-modulated by the audio section shown in Fig. 4. This section consists of a two-stage speech amplifier, a phase inverter, and a Class A push-pull output stage using a single 12BH7.

The amplifier runs at 100 watts p.e.p. input on d.s.b., and at about 40 watts on a.m.

Construction

Most of the essential details of construction are visible in the photographs. The standard aluminum chassis is 7 by 9 by 2 inches. Low-level r.f. and audio circuits occupy the left-hand portion of the chassis. The oscillator and doubler tuned circuits are below deck, separated by a shielding enclosure around the doubler components. The amplifier components are mounted

With s.s.b. operation on the increase in the v.h.f. bands, the a.m. man often finds himself on the outside looking in. This little rig will gain you admission to s.s.b. circles with little complextiy or expense.

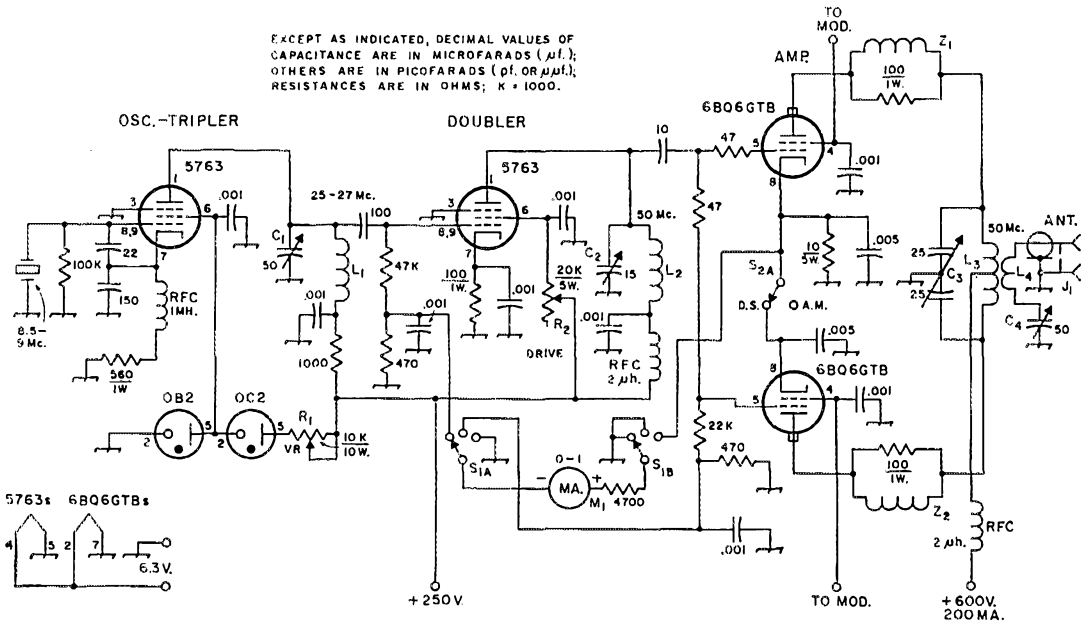


Fig. 2—R.f. circuits of W4KCW's 6-meter a.m./d.s.b. transmitter. Resistors are ½-watt unless indicated otherwise. Fixed capacitors of decimal value are disk ceramic; others are mica or NP0 ceramic.

C_1—Air variable (Hammarlund APC-B-50).
C_2—Air variable (Johnson 15M11/160-107).
C_3—Dual air variable (Johnson 25LD15/167-51).
C_4—Air variable (Johnson 50L15/167-3).
J_1—Chassis-mounting coaxial receptacle (SO-239).
L_1—9 turns No. 20, ⅝-inch diam., 16 t.p.i. (Airdux 516).
L_2—5 turns No. 18, ½-inch diam., 10 t.p.i. (Airdux 410).
L_3—6 turns No. 18, ¾-inch diam., 8 t.p.i., 2-turn space at center (made from 8 turns of Airdux 608 with two center turns removed, remaining sections connected in series).
L_4—3 turns No. 20 insulated, ¾-inch diam., close-wound, inserted between sections of L_3, coupling adjusted as found necessary.
M_1—2-inch d.c. milliammeter.
R_1—Slider adjustable.
R_2—Wire-wound control.
S_1—Single-section double-pole three-position rotary switch.
S_2—D.p.d.t. toggle switch (see Fig. 4 for second pole).
Z_1, Z_2—5 turns No. 22 wound on 100-ohm 1-watt resistor.

on top, at the right-hand end of the chassis, isolated by a large L-shaped shield. The tank and loading capacitors of the conventional link-coupled output circuit are mounted on the front section of this shield. The tank coil is supported from the tank capacitor by its leads. The output coupling coil is also supported by its leads, one lead being fastened to the stator of the loading capacitor, while the other is attached to a ceramic pillar.

Two external power supplies are required. One supplies the amplifier and is rated at 600 volts, 200 ma. The other, rated at 250 volts, 100 ma., supplies the r.f. exciter stages and all audio stages, and provides final screen voltage for a.m. operation. A switch on the panel of the transmitter operates an antenna relay whose auxiliary contacts break the transformer center-tap leads of both supplies.

Adjustment for A.M.

Turn the mode switch, S_3, to the d.s.b. position. With 250 volts applied to the exciter stages, but no plate voltage to the amplifier, adjust C_1 for maximum doubler grid current, and C_2 for maximum grid current to the amplifier. (Full-scale reading is 10 ma. in both grid-current positions of S_1; in cathode-current position full-scale reading is approximately 500 ma.). After tuning, adjust R_2 for an amplifier grid current of 3 or 4 ma. If the VR tubes cease to glow at any point during this adjustment, turn the power off and adjust R_1 for a lower value of resistance.

Turn the mode switch to the a.m. position. The grid current should drop to about 2 ma. with the single tube in use. Connect a dummy load to the output, apply plate voltage to the amplifier, and tune the plate tank circuit to resonance. Adjust the loading control for a cathode current of about 35 ma.

Now check the screen voltage, and adjust R_4 for a screen voltage of 200 volts (turn off the power supply while making the adjustment, of course). If this change results in a change in plate current, readjust the output coupling to maintain a cathode current of 35 ma. at resonance, and then recheck the screen voltage. The correct adjustment is reached when the screen voltage is 200 volts, with the amplifier loaded to 35 ma. with a grid current of 2 ma.

With a steady tone applied to the modulator,

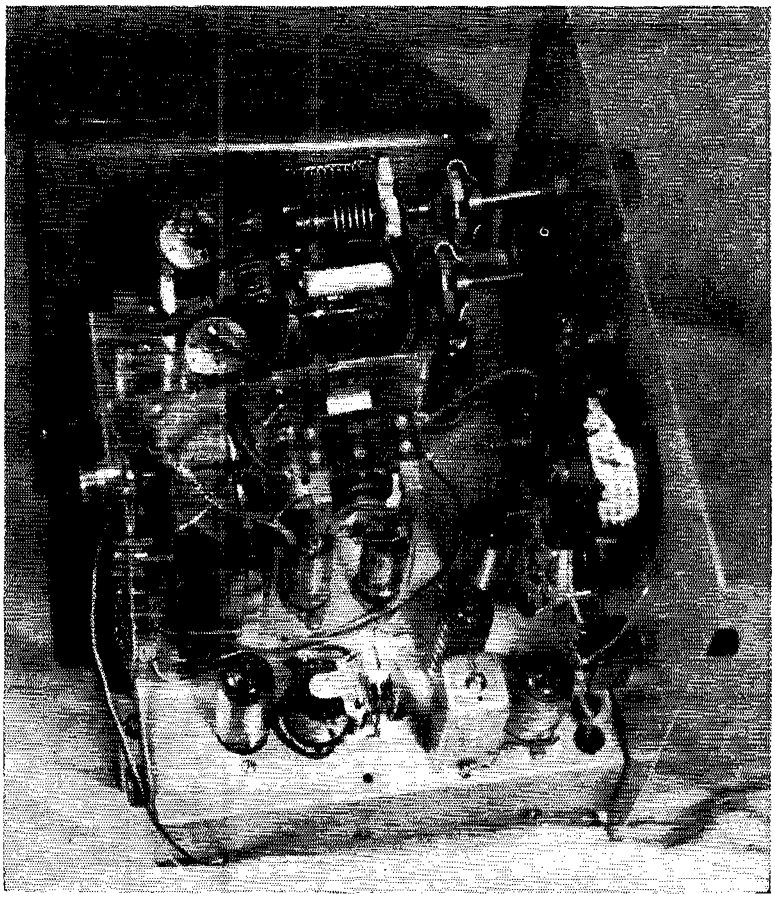


Fig. 3—Interior view of the 6-meter a.m./d.s.b. transmitter. A section of the chassis is partitioned off for the final-amplifier components. The relay in the foreground is used for receiver muting. The one mounted on the wall of the amplifier enclosure is an antenna relay. (Photos by Bob Sloats, K4VCN)

adjust the audio gain control while checking the trapezoid pattern on an oscilloscope. The gain control may be advanced to a point just short of the point where distortion becomes evident.

Adjusting for D.S.B. Operation

Turn the mode switch to the d.s.b. position. The grid current should increase again to 3 or 4 ma., and the plate current, with no modulation,

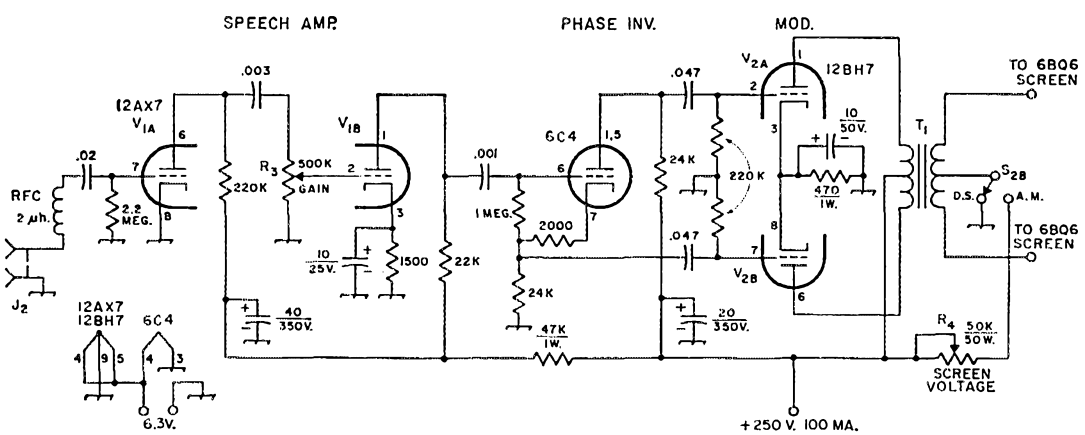


Fig. 4—Circuit of the screen modulator. Capacitances are in μf., and resistances are in ohms. Resistors are ½-watt unless indicated otherwise. Capacitors are disk ceramic or paper, except those marked with polarity which are electrolytic.

J_2—Microphone connector.
R_3—Audio-taper control.
R_4—Slider adjustable.
S_{2B}—See Fig. 2.
T_1—Audio transformer, 5.2 to 1 primary to ½ secondary (Thordarson 20D79).

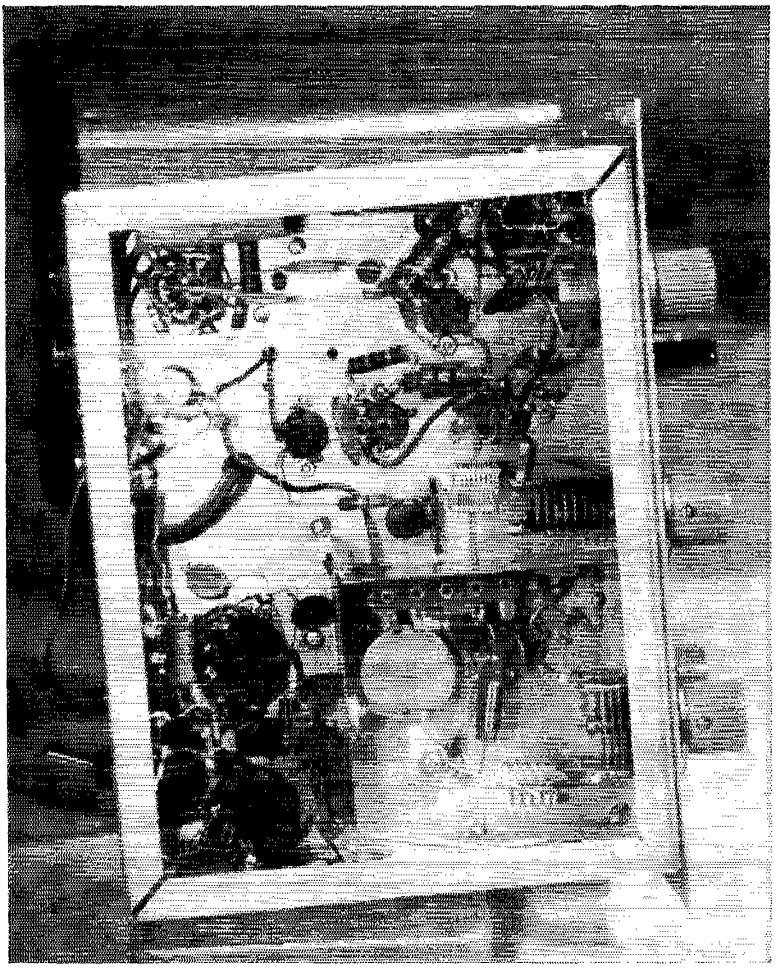


Fig. 5—Bottom view showing the shielding around the doubler-stage components. The large control in this enclosure is the excitation control, R_2. The toggle switch at the rear of the chassis is the a.m./d.s.b. mode switch.

should be about 20 ma. Apply a tone to the modulator and advance the gain control until the plate current is 150 ma. Linearity may be checked with a bow-tie, or double-trapezoid, pattern on a scope as described in the ARRL *Handbook*. With speech applied, the audio gain control may be advanced to the point where the plate current kicks up to 120 to 150 ma. on peaks.

This transmitter has worked out fine in the short time it has been in operation. Checks have shown that carrier suppression is 50 db. or better. At the present time, it is being used with a v.f.o. patterned after the one described in *QST* by W3LCK[1]. The output of this v.f.o. is at 25 Mc., and the first 5763 in the transmitter works as a straight amplifier at this frequency. QST

[1] Beckage, "A V.F.O. for 6 Meters," *QST*, June, 1959.

Strays

Some of our more progressive amateurs feel that there is absolutely no excuse for a knowledge of the code. Note this item, taken from a recent FCC general information bulletin.

The FCC marine office at Tampa, Fla., intercepted an SOS call sent in Morse code on a voice distress frequency. It was reported to the St. Petersburg Coast Guard station, which dispatched a rescue vessel. A boat was found with a disabled motor, and a defective transmitter modulator which prevented the sending of the distress call by voice. Fortunately, the knowledge and skill of the disabled craft's captain were equal to the occasion and, equally important, his coded call was heard by trained ears.

—...—

Free multicolor QSLs are available to ham residents of Delaware. Limited quantities. Contact M. F. Nelson, K3GKF, ARRL SCM, 505 Milltown Rd., Marshalltown, Delaware.

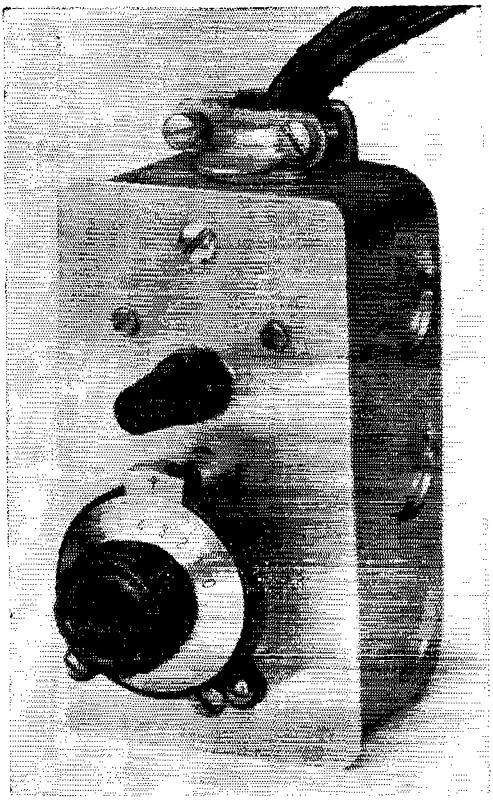
The VO-Can

V.F.O. Stability the Easy Way

BY GEORGE W. SHUART,*

W4AMN/ex-W2AMN

Moving the tuned circuit of a v.f.o. away from heat-producing components isn't a new technique, but it doesn't get as much use as it deserves. With the type of construction shown here it becomes an easy project.



The "VO-Can" is an outboard tuned circuit for reducing frequency drift caused by temperature changes. Built in an a.c. outlet box, it is simple and rugged. The small knob above the tuning dial is the coil slug adjustment for shifting the tuning range to various parts of the 3.5-Mc. band.

So much has been written about v.f.o.'s that one might wonder what more need be said. Most recently, W2YM left little to be accomplished in the way of stability,[1] so we can concern ourselves with the simplicity angle. The principal idea associated with stability is to overcome the effects of temperature changes. Temperature changes in the oscillator tube itself are of little consequence in a circuit having a high order of capacitance in shunt with the tube capacitances. However, the heat radiated by the tube can have a marked effect on the stability of the tuned circuit.

Therefore, the next logical step is to separate the heat-producing components from the tuned-circuit elements, and place the tuned circuit in an area where there is the least *change* in temperature.

Since the most violent changes in temperature occur inside the transmitter cabinet, and the least violent changes take place in the operating room *outside* the transmitter cabinet, the obvious place for the frequency-determining elements is outside the cabinet.

Outboard Tuning

But, one might ask, what has all this to do with simplicity? Well, let's see what we really have to move in order to achieve this temperature stability we've been talking about. Actually, all we have to move is the tuned circuit and its controls.[2] With this system you can start off *cold* and begin CQ-ing just as soon as the tube heaters have reached operating temperature.

The writer likes to get up in the wee hours of the morning and enjoy the minimum of QRM. In winter — even in Florida — the temperature of the transmitting gear is down to 60 or 65 degrees. With the tubes and tuned circuits in one box, you can imagine what happens to the frequency during the first half hour! However, with outboard tuning we can start off ice cold and never get a report of frequency drift.

There has always been a question in our minds as to the actual worth of an elaborate tuning dial on a v.f.o. No one relies on its calibration and begins transmitting without first checking, or spotting, on his receiver, which in turn has previously been checked with the band-edge marker. That is, he doesn't if he wants to keep his license! Therefore, we see little practical need for more than a simple vernier adjustment for the frequency control. Removing the elaborate dial

* 875 15th Ave. So., St. Petersburg, Fla.

[1] Hanchett, "Stability with Simplicity," *QST*, October, 1960.

[2] Long, "Cutting Down V.F.O. Drift," *QST*, August, 1952.

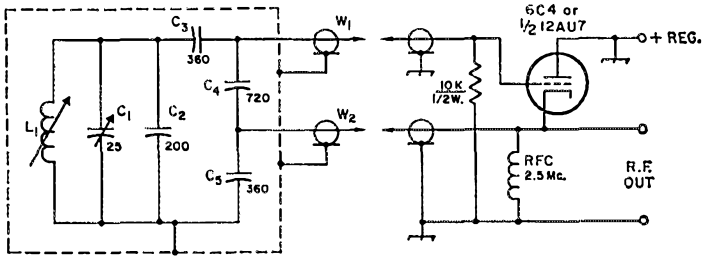


Fig. 1 — The VO-Can circuit, including oscillator tube connections. Capacitances are in pf. ($\mu\mu$f.).

C_1—25-pf. midget variable (Hammarlund APC-25B).

C_2-C_5, inc.—Silver mica.

L_1—23 turns No. 24 d.c.c. close-wound on ½-inch diam. slug-tuned form (see Fig. 2). Alternatively, the National XR-50 form may be used, modified as described in footnote 3; on this form, wind 20 turns of No. 24 d.c.c. or No. 22 enam.

W_1, W_2—Coaxial cable; RG-58/U or RG-174/U (see text).

system further simplifies the gadget. Stripped of such trimmings, we have what we have dubbed the "VO-Can," or variable oscillator can.

All v.f.o.'s that we've come in contact with have very little bandspread on the higher frequencies, simply because they attempt to cover the entire 80-meter band in one swing. We've gone to the other extreme — only 100 kc. for 180 degrees of the dial. With the oscillator operating in the 80-meter band even this spread is not enough on 20 meters, but it is an improvement. Also, since the tuning arrangement is simple, we need more spread for the sake of ease of tuning. Nevertheless, the entire band still can be covered.

Layout

The VO-Can is built in a standard single 4-inch flush-mounting electric-outlet box. The box is heavy, strong, and made to order for our purpose. The result is an approximately 2 × 2 × 4-inch unit that can be kicked around like a football and the only thing noticeable is a slight sign of microphonics when the can is rapped a heavy blow. The cover is made of sheet aluminum 1/16-inch thick. The small dial is an import which works quite well. We didn't have the proper screws and spacers for mounting the dial flush on the cover plate; the setscrew in the dial was too long and struck the mounting pillars of the capacitor. In our next model we will use the type HF Hammarlund capacitor instead of the type APC-B so our dial will mount flush.

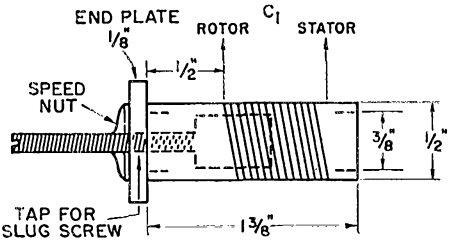


Fig. 2—Dimensions and mounting of homemade coil. The iron slug should be ½-inch long and made for a ⅜-inch i.d. form. Suitable slugs usually are available in "bargain" assortments, or one can be taken from an old coil form.

The fixed capacitors are all silver micas. The inductor was a problem. At first we used a ⅜-inch commercially available slug-tuned ceramic form. But the output was abnormally low, so we then fabricated a form from polystyrene tubing, ½-inch outside diameter and ⅜-inch inside. A small disk of the same material was cemented to one end and drilled and tapped for the slug screw.[3] A spring metal nut was used to hold the form to the panel. A slightly larger end piece might permit mounting with small screws, but the spring nut will still be needed for stability of adjustment.

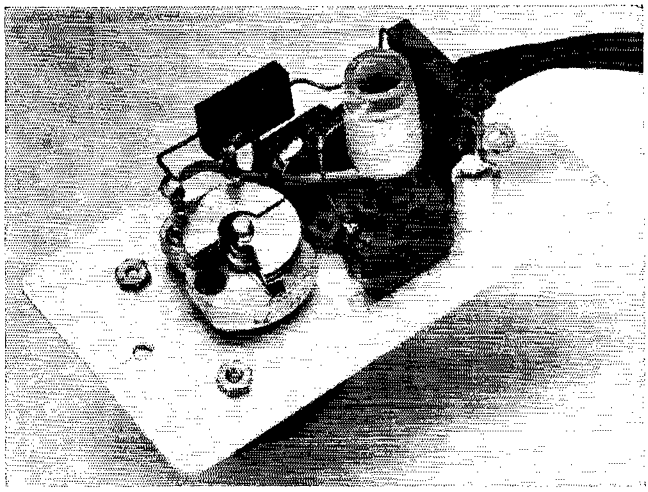
Any kind of small knob may be attached to the slug screw. The slug is ½-inch by slightly less than ⅜-inch and covers the entire 80-meter band independent of the 25-pf. tuning capacitor.[4] Therefore, it is a simple matter to adjust the slug for any particular 100-kc. segment you wish to cover, using the receiver as a guide. For working the low-frequency end of the band, set the slug so C_1 is at maximum capacitance (against the dial stop). For the high end the capacitor should be at minimum, of course. For other segments set the capacitor at mid-scale and adjust the slug to the exact frequency on which you wish to transmit. That will give you over 50 kc. either side, on 80 meters.

To preserve the tuning ratio and frequency range of the VO-Can it is important to use the values that are indicated in the diagram. The capacitances of the cables used between the VO-Can and the oscillator tube are in parallel with C_4 and C_5, and the longer these cables, the more restricted the tuning range of C_1 becomes. However, lengths up to about 4 feet will permit a 100-kc. range. The cable shown in the photographs is RG-58/U. It is rather stiff, and we would suggest RG-174 U, which is half the diameter and should be easier to handle.

To promote mechanical strength and stability, two standoff pillars (½ × 1 inch) were used

[3] This is the form shown in the inside-view photograph, but it has since been replaced by an XR-50, which works fine if the excess length beyond the terminal at the open end of the form is sawed off so the form will fit in the box. Also, the form must be mounted so the first nut is on the *outside* of the box.

[4] This is also true of the coil wound on the XR-50 form.



Coax cables are anchored to ceramic pillars, one of which is visible at the right. The mounting plate is aluminum, cut to fit the outlet box.

to anchor the r.f. cable inside the unit. Despite the cable clamp which is made for the box, an ordinary terminal strip is not good enough. However, the Jones No. 2003 has three terminals and a solid base and is strong enough to meet our needs. Care should be exercised when soldering not to leave solder between the terminals. Here cleanliness pays off as it does elsewhere. Several units built with these terminal strips instead of the ceramic posts proved entirely satisfactory. These latter units used a plain 1½-inch skirted knob for tuning instead of the vernier dial and greatly simplified construction. Because of the 100-kc. spread, a vernier is not entirely necessary.

If the layout is followed, there will be no need for hookup wire. A few inches of bare tinned wire is used to connect the grounding points together and to the rotor of the tuning capacitor. At the point where the two r.f. cables come together they are soldered to a lug which is clamped between the box and the cover plate when the latter is fastened to the box.

After several days of operating the first VO-Can, the note began to roughen and there were signs of a key click. Much checking resulted in the discovery that the shield braid at the oscillator tube end of the two cables was not completely soldered — that is, there were a number of strands of braid that were not caught up when soldering the grounding lead to them. It goes to show that lots of care is needed in this business!

There are two types of outlet boxes — a deep one and a shallow one. Get the deep one, which measures 1⅞ inches. The other is n.g.

Tubes

The feedback (ratio of C_4 to C_5) in the VO-Can has been adjusted for optimum results with a 6C4 oscillator tube. The 6C4 is identical with one section of a 12AU7, so the latter type also may be used. The second section can be used as a cathode follower as in the W2YM circuit.

The output from such an oscillator may be a little low and not sufficient to drive the first tube in the transmitter to full output. In particular, if the output is fed into the crystal socket of the former crystal oscillator in the transmitter, it may not excite the transmitter as fully as the crystal did. The remedy for this is to provide additional amplification in the v.f.o. If a triode-pentode is used, with the pentode section as an amplifier, a 6BH8 is recommended. In our own case, we use the 6C4 and follow it with a 6AQ5 fixed-tuned to 40 meters; this is followed by a second 6AQ5 which can be tuned to either 80, 40 or 20. The output with this arrangement is enough to drive a beam-tube final to 300 watts input.

This system may be designed for operation on other frequencies. For 5 Mc., everything can remain the same except the inductor — less turns, of course.

Correspondence is welcome if a stamped self-addressed envelope is included. QST

Strays

Advance notice to all hams who are scouts — and vice versa. Mark the dates of October 19–20 on your calendar. That's when the sixth Jamboree-on-the-Air will be held. More later.

— • • • —

A 9-page paper on v.h.f. power amplifiers is available free by writing to Department TP, Tung-Sol Electric Inc., One Summer Ave., Newark, N.J. Tell 'em *QST* sent you.

W2DER and WN2DER live just a few doors from each other on the same street in Linden, N.J.

— • • • —

WA6ONH sometimes concludes his QSOs with the invitation, "If you're ever out this way, drop in." Just a week after he worked K1MPN in elusive Vermont, there was a knock on the door. There stood K1MPN, holding his QSL card, the last one WA6ONH needed for WAS!

Basics for Beginners

A. C. in Radio Circuits

Part II — Resonant Circuits and Impedance

BY GEORGE GRAMMER* W1DF

Since the reactance of an inductance goes up when we increase the frequency, while the reactance of a capacitance goes down, it is reasonable to expect that at *some* frequency the reactances of a given inductance and capacitance will be equal. This is so. The frequency at which it happens is called the *resonant* frequency of the combination.

We're rarely able to ignore resonance in radio-frequency circuits. It's important because at the resonant frequency the inductive reactance is balanced out by the capacitive reactance. This leaves us with only resistance operating in the circuit. There's more to it than just cancellation of reactive effects, though, as we shall see.

Fig. 1 illustrates how reactance changes with frequency. In making up this graph we have chosen 5 μh. for the inductance and 50 pf. ($\mu\mu$f.) for the capacitance. The scale chosen lets us show a large range of values, of both frequency and reactance, with constant *percentage* accuracy at any point on curves drawn on it. The X_L curve shows that the reactance goes from about 30 ohms at 1 Mc. to over 3000 ohms at 100 Mc. The capacitive reactance does just the opposite — it goes from 3000 ohms at 1 Mc. to a little over 30 ohms at 100 Mc. Other values of inductance and capacitance would have different actual values, but would behave similarly; the ones picked just happen to be convenient for study.

The striking thing here is that these two curves cross each other at close to 10 Mc. At this frequency their reactances are equal numerically. In other words, the combination of 5 μh. and 50 pf. is *resonant* at 10 Mc. Remember that this is only *one* such combination, picked out simply to show graphically how resonance occurs. Theoretically there is an infinite number of combinations that will resonate at any given frequency. Practically, however, we are confined to certain ranges of inductance and capacitance, because of constructional limitations of actual coils and capacitors.

Series Resonance

With respect to the circuit in which they are used, the coil and capacitor may be connected either in series or parallel. This is shown in Fig. 2. If we have a source of voltage, E, at the resonant frequency and the two are in series, the current is the same all around the circuit. By the Ohm's Law equations for reactance which we gave earlier, the current will cause a voltage to exist across each reactance. These voltages have been labeled E_L and E_C in the series circuit. Strange as it may seem, they can be many, many times larger than the source voltage, E. In fact, they are usually at least ten times as large, and may be as much as a few hundred times as large.

This can happen because the two reactances cancel each other's effects, since they are equal at resonance. Thus around the circuit there is zero reactance. There is nothing, then, to limit the flow of current except the resistance in the circuit. Although we haven't shown any resistance in Fig. 2, there is always some, because no components operate without at least a little power loss. Also, the source of voltage will have an *internal* resistance. But if the total resistance is small, the current will be large, by Ohm's Law. And a large current will result in large, but equal, voltage drops across each reactance. The timing or phase of these voltages is such that the voltage across L has its *positive* maximum at the same

*Technical Director, ARRL.

[1] Part I appeared in March, 1963, *QST*.

In Part I of this series[1] we saw that energy is alternately stored in and released from electric and magnetic fields when alternating current flows in a circuit. The energy storage is associated with the capacitance and inductance in the circuit, leading to the definition of a quantity called "reactance." Reactance expresses the effect of L and C on the way the circuit operates — specifically, it determines the amount of alternating current that will flow through an inductor or capacitor when a known voltage is applied to its terminals.

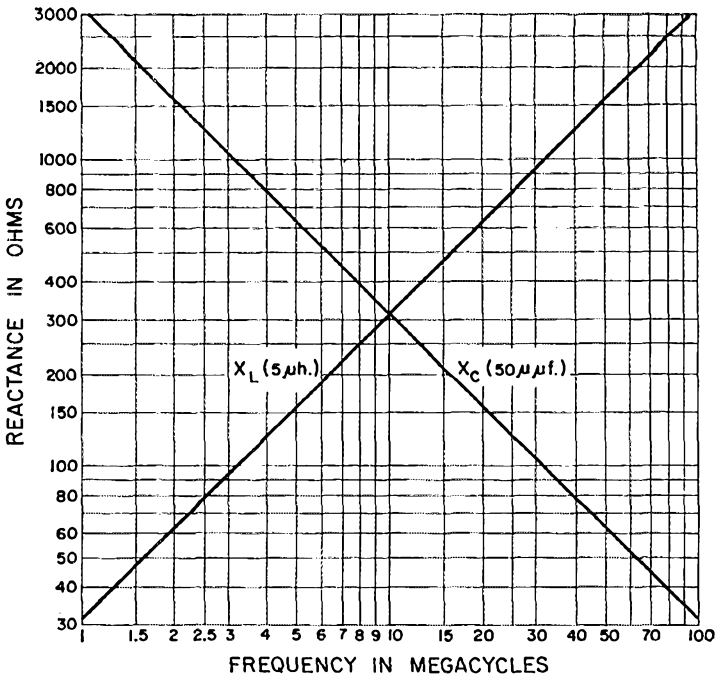


Fig. 1—Illustrating how the reactance of a typical coil (5 microhenrys) and capacitor (50 picofarads or $\mu\mu f$). vary with frequency.

instant that the voltage across C has its *negative* maximum. The two voltages always add up just to zero.

We can look at this another way, which may make it seem more reasonable: These unusually large voltages can develop because of energy stored in the reactances. The energy going into the magnetic field of the inductance is energy coming out of the electric field of the capacitor, during one part of a cycle. Then when it has all been stored in the magnetic field, it starts coming back into the circuit and goes into the electric field. This means that a lot of energy can be handed back and forth between L and C without making it necessary for the source to supply any. Of course, the energy "bank account" came from the source. But after an initial surge, the source has only to supply the actual power used up in resistance.

Parallel Resonance

We have a different, but comparable, state of affairs when L and C are connected in parallel. Here there are two current paths, with the same voltage, E, applied to both. The two branch currents, I_C and I_L, each depend only on the same Ohm's Law formula for a reactive circuit. If the reactance is small and the voltage E is large, each branch current will be large. But the same *voltage* is applied to both reactances (in the series circuit both had the same *current*). So in this case it is the currents that add up to zero around the circuit. Their phase is such that they cancel each other, in the part of the circuit outside the coil and capacitor. In this case, then, there is no current flowing around the circuit as a whole.

A parallel-resonant circuit "looks like" an open circuit to the source of voltage. Compare this with the series circuit, which "looked like" a short-circuit. The reason for this behavior of the parallel circuit is the same as in the series case — stored energy is tossed back and forth between the inductance and capacitance.

These ideas of "short-circuit" and "open circuit" must be taken with caution. They would be literally true if we could have coils and capacitors without any losses. But these components always do have losses. If the losses are very small the series circuit is *approximately* a short circuit, and the parallel circuit is *approximately* an open circuit. Losses mean that the voltages in the series

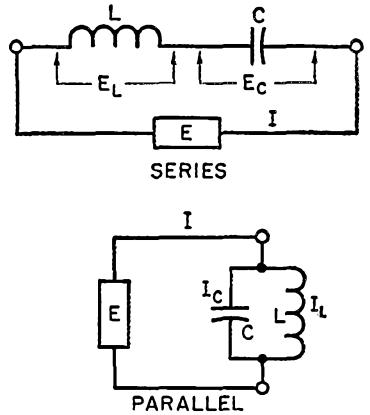


Fig. 2—Series and parallel circuits formed by inductive and capacitive reactances, together with a source of voltage, E.

circuit don't quite balance each other, and the currents in the parallel circuit don't quite cancel each other. Some of the energy is lost each time it is handed back and forth. This lost energy has to be supplied continuously by the source, in order to keep things going at an even rate. The source "sees" a resistance, therefore — a very small one in the case of the series circuit, and a very large one in the case of the parallel circuit.

Impedance

If you've digested what has gone before, you're ready to tackle *impedance*, a word that gets a lot of bandying around in amateur conversations. Its basic definition is simple, but the details are far from being so. In fact, we can't hope to do more than give you a speaking acquaintance with some of them. The inner workings of actual circuits really belong in the field of engineering rather than hobbying. Fortunately, you don't need to know them in order to build and operate amateur equipment.

In broad terms, impedance is a number you get by dividing the voltage applied to a circuit by the current flowing into it. Looking at it by the "black box" method may help clarify the idea. We do not know what is inside the box in Fig. 3; all we do know is that it has two terminals brought out. To those terminals there is connected an a.c. generator having an output voltage E_{AC}, which we can measure by means of the voltmeter V. The current flowing in the circuit is measured by the ammeter A. Suppose we find the current to be ½ ampere when the applied a.c. voltage E_{AC} is 250 volts. Dividing 250 by ½ gives 500 as the answer. Although this is not a d.c. circuit we say that we have 500 "ohms", by analogy to the ohm that represents the ratio of voltage to current (that is, E/I) in d.c. work. But we don't know what's in the box, so we can't say that these "ohms" are either resistance or reactance. It would take more than a simple measurement of current or voltage to determine that, because — as we have seen — there is an element of timing or phase that has to be taken into account. The ammeter and voltmeter don't give any information about phase.

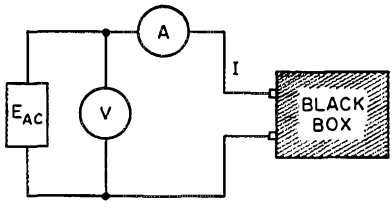


Fig. 3—Simple measurements of voltage and current don't give a clue to what the unknown impedance may actually be.

The fact is that we could get the same answer whether we had 500 ohms of "pure" resistance or "pure" reactance. But we could also get the same answer if the box contained 500 ohms of something that was a combination of both. Such a combination not only can exist but actually is likely to be more common than either alone. The ohms, then, in this case *could* be either resistance or reactance, but more probably would be impedance, the name for the combination.

You can see why things start to get complicated at this point. In pure resistance the current and voltage are exactly in step. In pure reactance they are out of step by exactly one-quarter of a cycle. These are both very special cases. In a *complex impedance* — one made up of both resistance and reactance — the current and voltage may be out of step in any degree between zero and one-quarter cycle. The number of possible cases is infinite.

Resistive Impedance

It happens that in r.f. work we are concerned mostly with resonant circuits. These, as we have explained, "look like" pure resistances when they are exactly tuned to the frequency. Off the exact resonant frequency the resistance is no longer pure, but in many cases the adulteration of resistance by reactance isn't too great. It is customary, therefore, to use the term impedance rather loosely to mean a *resistive* impedance. A resistive impedance is one in which the resistive effects far override the reactive effects — enough so that the latter can be neglected for practical purposes.

You will see references to impedance in amateur publications, with occasional rules and formulas for one or another special case. Don't fall into the trap of thinking that these rules and formulas are wholly accurate. In most cases they won't be. They are nearly always approximations based on assuming that something can be neglected. This is done to simplify them. Properly used, such rules and formulas can be highly useful in practical work. Occasionally, though, they are misused through ignorance of their hidden limitations. Be cautious, therefore, about applying them to cases other than the one they actually are intended to satisfy.

Just remember that impedance is the ratio of voltage to current in a circuit, and that the timing or phase of the voltage and current are, in general, such that part of the energy is dissipated in resistance and part is stored in reactance.

QST

(Part III, to follow in a subsequent issue, will take up resonant-circuit Q and bandwidth. — *Editor.*)

Strays

K7LUV (Arthur Kapfhammer, 1602 S. Mullen, Tacoma 5, Wash.) wonders if there are any of his old buddies from the 13th Communications Squadron in Africa and Arabia during WW II still around.

—···—

Charles Malzone was given his Novice exam by W2BYM, and was issued the call WN2BYM.

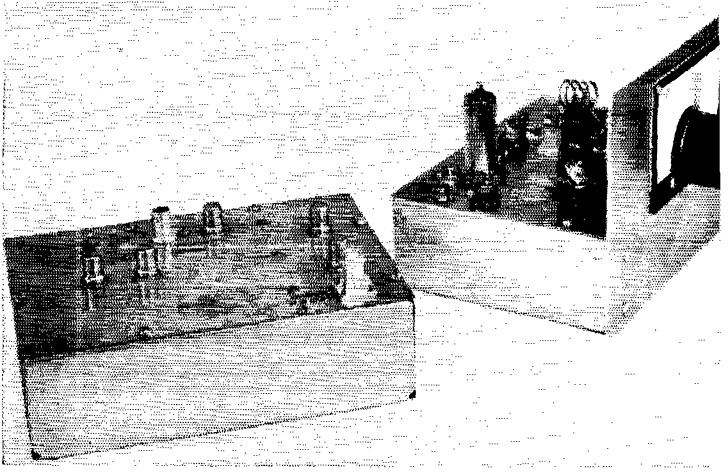


Fig. 1—Crystal-controlled and tunable-oscillator converters for 220 Mc. built by K1PSR and W1CTW. R.f. and mixer circuits in the two converters are similar.

Two Nuvistor Converters for 220 Mc.

Crystal-Controlled and Tunable Models for the Top V.H.F. Band

BY NICHOLAS D. SKEER,* K1PSR

Though the Nuvistor's original application was for TV tuners, v.h.f. enthusiasts were quick to realize that these little tubes had fine possibilities for the amateur. In the relatively short time that they have been available, they have become almost standard equipment for v.h.f. converter use. The 220-Mc. converters described here use 6CW4 Nuvistors throughout, though the 6DS4 may be used interchangeably, for improved overload characteristics. At present activity levels on 220, this may not be a very important consideration in most locations. Two models are shown: a crystal-controlled version by the writer, and a tunable-oscillator design by Cal Hadlock, W1CTW, intended primarily for wide-band reception in conjunction with an f.m. broadcast receiver.

R.F. and Mixer Circuitry

The front-end circuits are basically the same in the two models. Some may question the use of Nuvistors for all purposes, but they perform well as oscillators, in addition to being excellent r.f. amplifiers. Use of a single type throughout simplifies the spare-tube problem, but so far not even the one spare has been needed at K1PSR. The cascode amplifier is the original type used by amateurs, in preference to the simplified one, where the plate circuits are in series. With the circuit shown here, the dissipation of each tube can be controlled independently, and this circuit permits direct grounding of the grid pin of V_2. This is helpful in preventing oscillation in the grounded-grid stage.

With a plate supply of 60 volts and a 47,000-ohm grid resistor, the plate current of V_1 is about 12 ma. A similar value of current is drawn by V_2. Best noise figure is obtainable in the r.f. amplifier when plate input is run at the highest permissible value, but the dissipation of each tube should be held below 1 watt. Nuvistors operated at this level in grounded-grid circuits are notorious for oscillating, and the second stage of this front end was no exception. The simplest cure was to load the second stage plate coil, L_4, with a resistor. This also broadens out the circuit somewhat, which is helpful in an amplifier that should have a 5-Mc. bandwidth.

The r.f. amplifier is coupled to the mixer, V_3, through critically-coupled circuits (L_4C_5, C_6, L_5C_7) for maximum gain with wide bandwidth. C_6 is quite critical, and some type of variable capacitor should be used. One can be made by twisting insulated wires together, a loose twist of about 3 turns being a good starting point. After alignment is completed, the wires forming C_6 should be doped to keep the capacitance from changing.

In the original model, high-quality glass tubular trimmers (JFD) were used for the tuned circuits. These are quite expensive, but other tubular trimmers of similar capacitance may be substituted. Centralab type 829-4 or 829-6 should be suitable.

Injection is coupled to the mixer grid through C_{13}. This may also be made of twisted insulated wires, though its value is not critical. Note that there is no tuned circuit in the mixer plate. If there were, it would have to be loaded quite heavily to achieve the desired bandwidth in the crystal version. It should form an over-coupled circuit with the receiver antenna coil, and this is difficult to achieve, so the tuned circuit was replaced with a resistor. The output is fed to the receiver through a short length of coax, not more than 3 feet. The antenna coil of the receiver then acts as the mixer tuned circuit, and since it is

* P.O. Box 132, Amherst, New Hampshire.

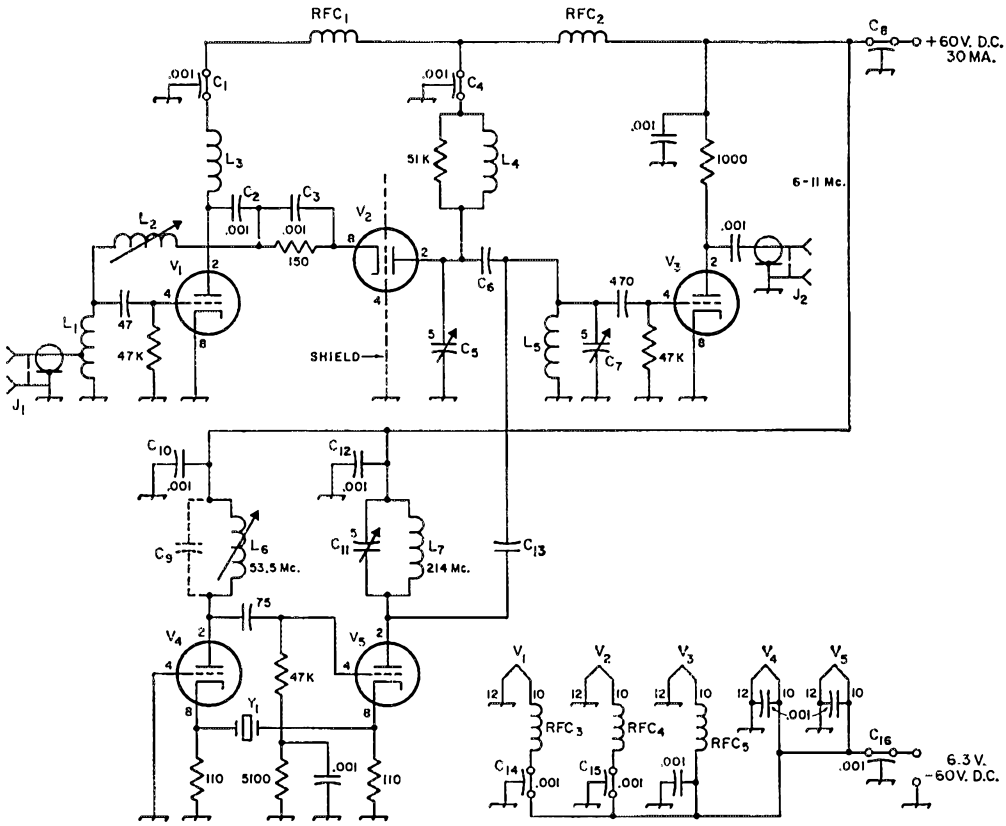


Fig. 2—Schematic diagram and parts information for the K1PSR 220-Mc. converter. Decimal values of capacitance are in μf.; others in pf. Capacitors not described are ceramic. Resistors ½ watt.

C_1, C_4, C_8, C_{14}, C_{15}, C_{16}—0.001-μf. feed-through (Centralab ZB-102).

C_2, C_3, C_{10}, C_{12}—0.001-μf. standoff. See Fig. 4 for mounting of C_2 and C_3.

C_5, C_7, C_{11}—5-pf. tubular trimmer.

C_6, C_{13}—Twisted leads. See text.

C_9—Used only with lower-frequency crystal. See text.

J_1, J_2—Coaxial receptacle, BNC type.

L_1—3½ turns No. 18, 5/16-inch diam., ¾ inch long. Tap at 1 turn.

L_2—13 turns No. 28 enamel, close-wound on 7/32-inch brass-slug form.

L_3—3 turns No. 18, 5/16-inch diam., ⅝ inch long.

L_4—3½ turns No. 18, 5/16-inch diam., ½ inch long.

L_5—2 turns No. 18, 5/16-inch diam., ⅜ inch long.

L_6—11 turns No. 22 enamel, close-wound on ¼-inch iron-slug form.

L_7—4 turns like L_3, ¾ inch long.

RFC_1, RFC_2—0.84-μh. r.f. choke (Ohmite Z235).

RFC_3, RFC_4, RFC_5—10 turns No. 24 enamel, close-wound, 1/16-inch diam.

V_1–V_5—6CW4.

Y_1—Crystal in 53-Mc. range. See text.

usually ganged with other tuned circuits of the receiver, it will always be peaked at any point in the band. A tuned circuit in the mixer plate may be substituted, if flat resonance across the band is not required.

The Oscillator-Multiplier

V_4 and V_5 are used in what is commonly known as the Butler oscillator. Its advantages are many: high-order harmonics can be obtained in the second stage, and tuning of the first, at the crystal frequency, is simple. No detuning is necessary to insure oscillation each time power is applied.

It is not necessary to use an i.f. range of 6 to 11 Mc. Other ranges may be desirable, depending on location, type of receiver, etc. Look through your spare-crystal box and do a little figuring. The converter will work just as well with the injection frequency on the high side of 220 Mc., and this may be better as far as images are concerned. The crystal used at K1PSR is 53.4 Mc., which gives an i.f. of 6.4 to 11.4 Mc. This crystal frequency also is the same as that used in the 1296-Mc. converter described in March, 1961, *QST*, and it has seen service on the Arlington, Mass. CD Net frequency. When changing the i.f., L_6 should resonate at the crystal frequency, and L_7 at the desired harmonic. C_9 may be added if a lower crystal frequency is used. There being no mixer-plate tuning, the range of the oscillator circuits is the only limitation in changing to other intermediate frequencies.

Construction

The base plate and partitions of the converter are made of copper, 0.02 inch thick or heavier.

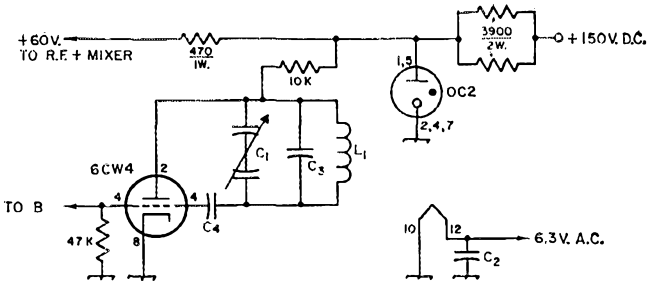


Fig. 3—Tunable oscillator used by W1CTW in a 220-Mc. converter for wideband f.m. reception. The oscillator tunes 133 to 138 Mc. R.f. and mixer circuitry is similar to Fig. 3. Regulator circuit shown may also be used with the crystal-controlled converter.

C_1—6-pf.-per-section split-stator variable. Rotor not grounded (Millen 21906R).
C_2—0.001-μf. disk ceramic.
C_3—5-pf. N750 (Erie N750K050).
C_4—75-pf. ceramic.
L_1—4 turns No. 14, 7/16-inch diam., 5/8 inch long.

Flashing copper, available in most hardware and building-supply stores, is usable. Copper is recommended, as it is easy to work with and can be soldered to without difficulty. All of the soldering in the converter was done with a 50-watt iron. The 200-watt blockbuster was not needed.

The bottom view, Fig. 5, shows the partition, shields and base-plate layout. Be sure that the Nuvistor sockets are mounted with their plate terminals (Pin 2) toward the lower edge of the converter, as seen in the photograph. The shields are then cut, drilled and bent, and notched to fit over the sockets of V_1 and V_2. They are soldered to the base plate and partition.

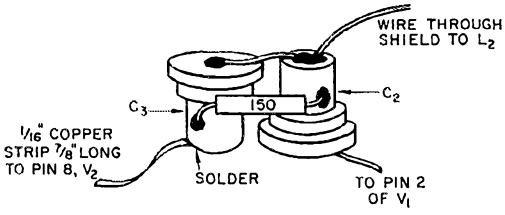


Fig. 4—Detail of the coupling between V_1 and V_2. C_2 is the coupling capacitor and C_3 bypasses the cathode resistor. Both are silver-mica buttons.

Pins 8 and 12 of V_1 and Pins 4 and 12 of V_2 should be soldered directly to the shields.

Note the coupling method between the r.f. stages. The arrangement of C_2, C_3 and the cathode resistor for the second stage is detailed in Fig. 4. The rest of the construction is straightforward L_6 is mounted on an L bracket, but it can be mounted in a hole in the base plate, if the builder so desires.

Alignment

Adjust the oscillator-multiplier portion first. Set L_6 and L_7 to the proper frequencies with a grid-dip meter, and apply power. Connect a voltmeter (0-2 or 0-5 volts, d.c.) to the junction of the 47,000- and 5100-ohm resistors in the grid circuit of V_5, and tune L_6 for maximum indication. About minus ½ volt will do. Connect a 50-μa. meter to the grid pin of V_3 through a ½-megohm resistor connected very close to the grid pin. Dip the mixer grid circuit to 200 Mc. With power on, tune C_{11} for maximum indication, again negative. There should be between 2 and 3 μa. with the multiplier peaked. (1 to 1½ volts negative on the mixer grid.) If it is low or high, adjust the value of C_{13} accordingly.

Alignment of the r.f. stages is best done with the aid of a sweep generator, if uniform response across the band is to be achieved. The value of L_2 and the turn spacing of L_1 should be set to give the best noise figure. All adjustments can be made by the cut-and-try method, if need be, using best margin of signal over noise as the principal objective.

The Tunable Version

A similar converter with a tunable oscillator, built by Cal Hadlock, W1CTW, is shown in Fig. 1. Cal used a fixed i.f. of 87 Mc. to feed a commercial receiver at the low end of the f.m. band, for wideband f.m. reception on 220.[1] His tunable oscillator, using a 6CW4, is shown in Fig. 3. It has low warm-up drift and good mechanical stability. Plate voltage for the oscillator is regulated, the regulator tube being visible in the photograph.

The cooperation of W1CTW and K1RNS during the planning and building of these converters is much appreciated. QST

[1] Hadlock, "Wideband F.M. on 220 Mc.," *QST*, March, 1961.

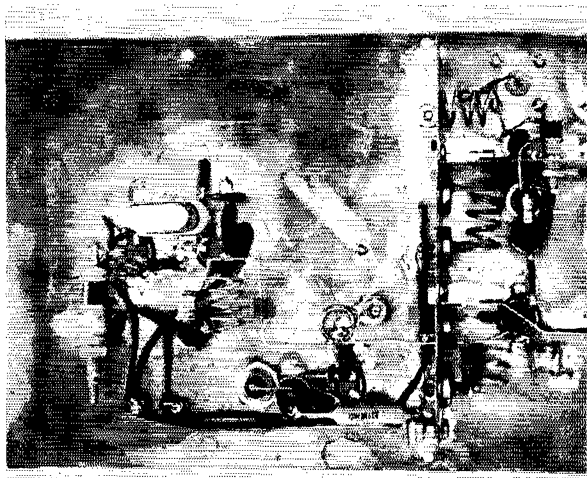


Fig. 5—Bottom view of the K1PSR crystal-controlled converter.

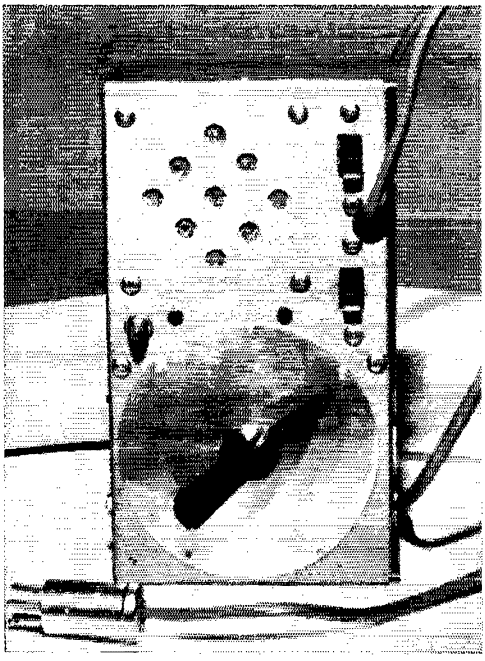


Fig. 1—The meter reader is assembled in an aluminum box measuring approximately 6 by 3½ by 2 inches. The raised markings on the dial plate are the calibration points mentioned in the text and correspond to different readings on a meter. The screwdriver-slotted shaft of R_1 is to the upper left of the dial. Power and calibrate switches are to the upper right. In this instance, the meter cable is terminated in a plug to fit a receptacle in the equipment being metered.

An Audio Meter Reader for the Sightless

Simple Comparator System of Good Accuracy

BY KEN BLANEY,* W6PIV

The meter reader described here is a revision of an earlier model described in *QST* by the author. However, complete information is included for the benefit of those who may have missed the first article, which is no longer available.

In an earlier issue of *QST*,[1] the author described a system by which the deflections of a 1-ma. d.c. meter may be converted to audio tones. This enables a sightless amateur to "read" voltages and currents in any equipment in which the basic metering instrument is a 1-ma. meter, regardless of whether or not the meter is shunted for multirange use. Since the appearance of that article, various hams have used their ingenuity to make it more useful, and this article will include these improvements and adaptations.

Principles of Operation

Fig. 2 shows a revision of the original circuit. The voltage drop across the meter to be "read" is applied to d.c. amplifier, Q_1. Q_2 is an audio oscillator whose frequency varies with the output voltage of Q_1. An output stage (Q_3) has been added to the original circuit to provide a more adequate loudspeaker signal. The original unit operated from a 9-volt supply, but it was found that a wider range of oscillator frequencies for a given current range could be obtained at a lower voltage.

This system, as the original, includes a simple comparator calibrator. The voltage drop across the meter in a transmitter, or other equipment, varies with the current flowing through it. When this voltage drop is applied to Q_1, the tone of the audio oscillator will change as the current read by the meter changes. With the meter reading a certain value of current, the oscillator will produce a certain tone. S_2 is then thrown to the CALIBRATE position, and R_2 is adjusted until the oscillator tone matches the tone obtained with the meter connected. It is then known that the voltage drop across the meter is the same as the voltage from R_2. With R_2 fitted with Braille dial calibrated in terms of meter scale divisions, the current "read" on the dial will be the same as the meter reading provided only that the two tones match. Changes in oscillator frequency over a period of time, caused by changes in temperature or aging of components, will not affect the accuracy of the reading. The calibration is not based on any particular tone, but on the fact that, over the short period of time required to make a reading, equal voltages from the meter and the comparator will produce the *same* tone, regardless of what pitch the tone may have at the moment.

Calibration

To calibrate the dial of R_2, it is necessary to provide some means of setting the meter in the equipment to as many current readings as the

* 1727 38th St., Sacramento 16, Calif.

[1] Blaney, "Meter Reading by Sound," *QST*, October, 1960.

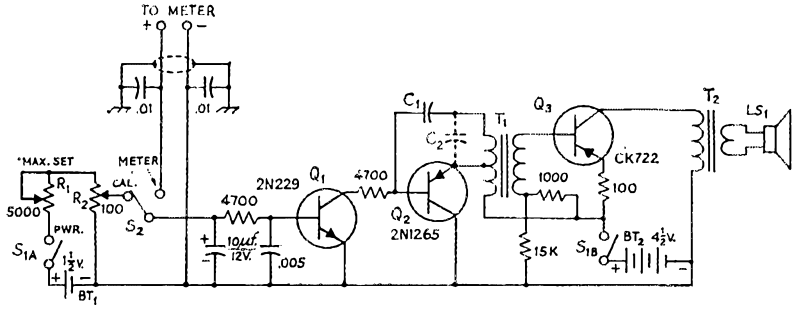


Fig. 2—Circuit of the meter reader. Capacitances are in μf. and resistances are in ohms. Fixed capacitors not listed below are ceramic except that polarity marking indicates electrolytic. Resistors are ½ watt.

BT_1—Single penlight cell.
BT_2—Three penlight cells in series.
C_1—Paper or ceramic capacitor, 0.002 to 0.1 μf. as necessary to set oscillator minimum frequency as described in the text.
C_2—If required, select values within the range given for C_1. See text.
LS_1—2-inch loudspeaker.
Q_1—Sylvania 2N229 or equivalent.
Q_2, Q_3—Raytheon CK722, Sylvania 2N1265 or equivalent.
R_1—Miniature control, screwdriver shaft.
R_2—Linear wire-wound control (CRL WW-101).
S_1—D.p.s.t. slide switch.
S_2—D.p.d.t. slide switch, poles connected in parallel for low resistance.
T_1—Transistor driver transformer, 10,000 to 2000 ohms, c.t., center-tapped secondary used as primary (Thoro XFM-2 or similar).
T_2—Transistor output transformer, 500 to 3.2 ohms (Thoro XFM-3 or similar).

number of calibration points desired. In a transmitter, for instance, this can be done by adjusting the loading, or by tuning off-resonance for the short time needed to spot a calibration point. If other means are not available, the meter readings can be set by connecting a flashlight cell and a variable resistance of about 1500 ohms or more in series across the meter and adjusting the resistance for the desired scale reading.

The oscillator frequency increases with an increase in meter current, so the first step in calibration is to set the oscillator to deliver a low-frequency tone at zero-voltage input. This is done by shorting the meter-input terminals of the reader, and adjusting the value of C_1. If the frequency cannot be made low enough by adjustment of C_1, the addition of C_2 may be required. Transistors are temperature-sensitive, which, in this instance, results in a decrease in oscillator frequency with a decrease in temperature. To make sure that the oscillator frequency will not drift to a value too low to be usable if the unit is operated at a temperature much lower than the ambient at the time of calibration, the unit may be chilled in a refrigerator just prior to the zero-current calibration.

With the zero-current adjustment complete, the meter should be adjusted for a full-scale reading. R_2 should then be set at maximum (maximum resistance between BT_1 and the arm of the potentiometer). The dial should be marked at this maximum setting. Flipping S_2 back and forth, R_1 should now be adjusted until the oscillator tone is the same in both positions of the switch. R_1 should not be adjusted thereafter except for an occasional check on the full-scale accuracy. In succession, the current through the meter should be adjusted to give other desired deflections, such as half scale, quarter scale and so forth, each time setting R_2 for a matching tone and marking the dial of R_2 accordingly. The dial may be a disk cut from sheet metal. Raised calibration points can be made by using a center punch on the back of the dial, or by cementing or riveting escutcheon-pin heads to the front side.

Using the Meter Reader

This unit is most commonly used connected directly across the terminals of a 0-1-ma. meter (such as is usually found in a transmitter or v.o.m.) which may have various current shunts or voltage multiplier resistors connected to it. It may also be used with a v.t.v.m. by inserting a 1-watt resistor of about 200 ohms in series with the meter inside the v.t.v.m., and connecting the meter-reader terminals across the resistor. The addition of the resistor will have negligible effect on the operation of the v.t.v.m., but it may be recalibrated if necessary. A direct connection across the microammeter in the v.t.v.m. would upset the accuracy seriously.

One ham who can neither see nor hear (WA2-GXI) has been able to use the reader successfully by reducing the oscillator frequency to a very low value, using a 1-μf. capacitor at C_2. He is then able to "read" by feeling the vibrations of the speaker cone.

Some s.s.b. hams use this unit on a Monimatch type of s.w.r. bridge. In this case, the comparator part of the circuit may not be necessary. The meter in the bridge may also be eliminated, substituting a suitable resistor in its place. The null is indicated when the oscillator tone passes through its lowest pitch.

The vane-type meters often used in small inexpensive rigs have too much voltage drop to use directly with the reader. They may be read by connecting a voltage divider consisting of approximately 2000 ohms and 100 ohms in series across the meter terminals, and connecting the

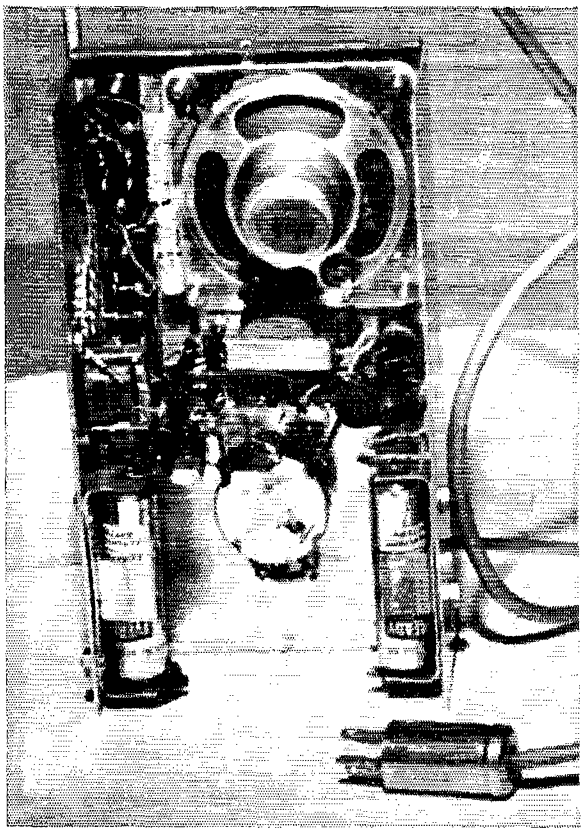


Fig. 3—Rear view with cover removed, showing the general arrangement of components.

reader terminals across the 100-ohm resistor. It may be necessary to connect a large bypass (a 6-volt 50-μf. electrolytic) across the metering leads to avoid ripple modulation of the oscillator in the reader. It is difficult to match a complex tone from the transmitter to the pure tone obtained when the comparator is connected.

Danger — High Voltage

Although it should be obvious, I will repeat a warning included in the first article. Under *no* circumstances should the unit be used with meters that are connected in portions of a circuit that are at potentials of more than a few volts to ground. The meters in most manufactured transmitters are in the cathode circuit, or across a low resistance in the negative high-voltage lead to ground, and so meet this requirement. But there are exceptions, and no attempt should be made to use the unit without first referring to the diagram of your particular transmitter. And make sure that no revision of the original circuit has been made. Extreme caution should be used with homemade transmitters, since many of these have meters in high-voltage leads. An attempt to use the reader under these circumstances invites fatality not only to the instrument, but to the operator as well! QST

Strays

Roy Carter of Highlands, Texas, was injured in a swimming accident several years ago, and is now paralyzed from the waist down. A couple of years ago he became interested in ham radio, and the Baytown Amateur Radio Club stepped in to help. Members gave him instruction in theory and code, and through their efforts he was able to pass the exam and be licensed as W5GFI. Thanks to the generosity of the Baytown Kiwanis Club and the Houston Amateur Radio Club, he was equipped with a fine station. The photos below show some of the activities on the big day when the antenna party was held. In the photo at the left are (l. to r.) K5QVF, K5MWH, W5COW, K5PAP, K5GNK, W5JDD, and W5GTA. In the photo at the right (l. to r.), are W5GFI, W5JDD, K5GNK, Kiwanis Club president Frank Goss, Kiwanian Jim Etheridge, and K5QVF.

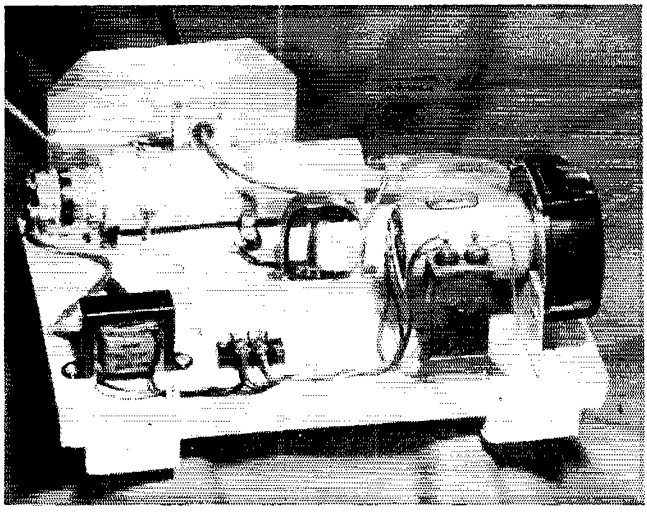


Fig. 1—The r.f. portion of the 2300-Mc. station is assembled on a board which forms the bottom of a weather-proof box. Output and modulator cables are connected through the metal plate at the rear. Air is brought in by the blower through a drip-proof hole in the side of the box. After passing through the oscillator assembly, rear, the air leaves the box through holes in the bottom. All holes are screened to prevent insects from entering. The filament transformer is in the foreground, the pulse transformer near the center.

Pulse: A Practical Technique for Amateur Microwave Work

BY ROBERT F. GUBA,* W1QMN AND JOHN T. ZIMMER,** W2BVU

So far in this series we have discussed the use of pulse emission in amateur communication, and described the means by which pulse modulation may be accomplished. Now we cover more familiar ground: the r.f. portion of the transmitter and the antenna system used in 2300-Mc. communication. The lead photograph of Part I of the series showed the roof-top installation at K1JIX. What follows here is a detailed look at the components of that picture.

The Remote R.F. Unit

The r.f. unit, shown in Fig. 1 with its weather-proof cover removed, consists of a 2C43 re-entrant-cavity oscillator, seen at the rear of the picture, a blower for cooling the oscillator, the 2C43 heater transformer, and the pulse transformer described in detail last month. This compact package can be located close to the antenna system, to reduce transmission-line loss, which would otherwise be prohibitive at 2300 Mc. The only signal connection between the oscillator assembly and the pulse modulator, which may be placed at or near the operating position, is a coaxial cable, to carry the high-voltage d.c. pulses from the modulator to the plate of the oscillator tube.

The oscillator is shown in cutaway form in Fig. 2, along with detail drawings of its component parts. A cylinder (G) mounted on the grid ring of the 2C43 lighthouse tube forms a coaxial line with the outermost cylinder (D) of the oscillator. This acts as an open-ended resonant tank circuit connected between the grid and cathode of the tube. Similarly, the same grid cylinder forms a resonant tank circuit between the grid and the plate (see Item 4 of the bibliography, Part IV). The feedback necessary for oscillation is obtained through the common opening at the ends of the coaxial tank circuits. Beyond this common opening, the plate line (A) is short-circuited to the outside cylinder, for r.f., by the cup-shaped choke assembly (B) mounted on the plate line. The outside cylindrical surface of this cup forms an open-ended coaxial line which, since it is exactly a quarter-wavelength long, appears as a very low imped-

* 376 Central St., West Acton, Mass.
** Slough Road, Harvard, Mass.

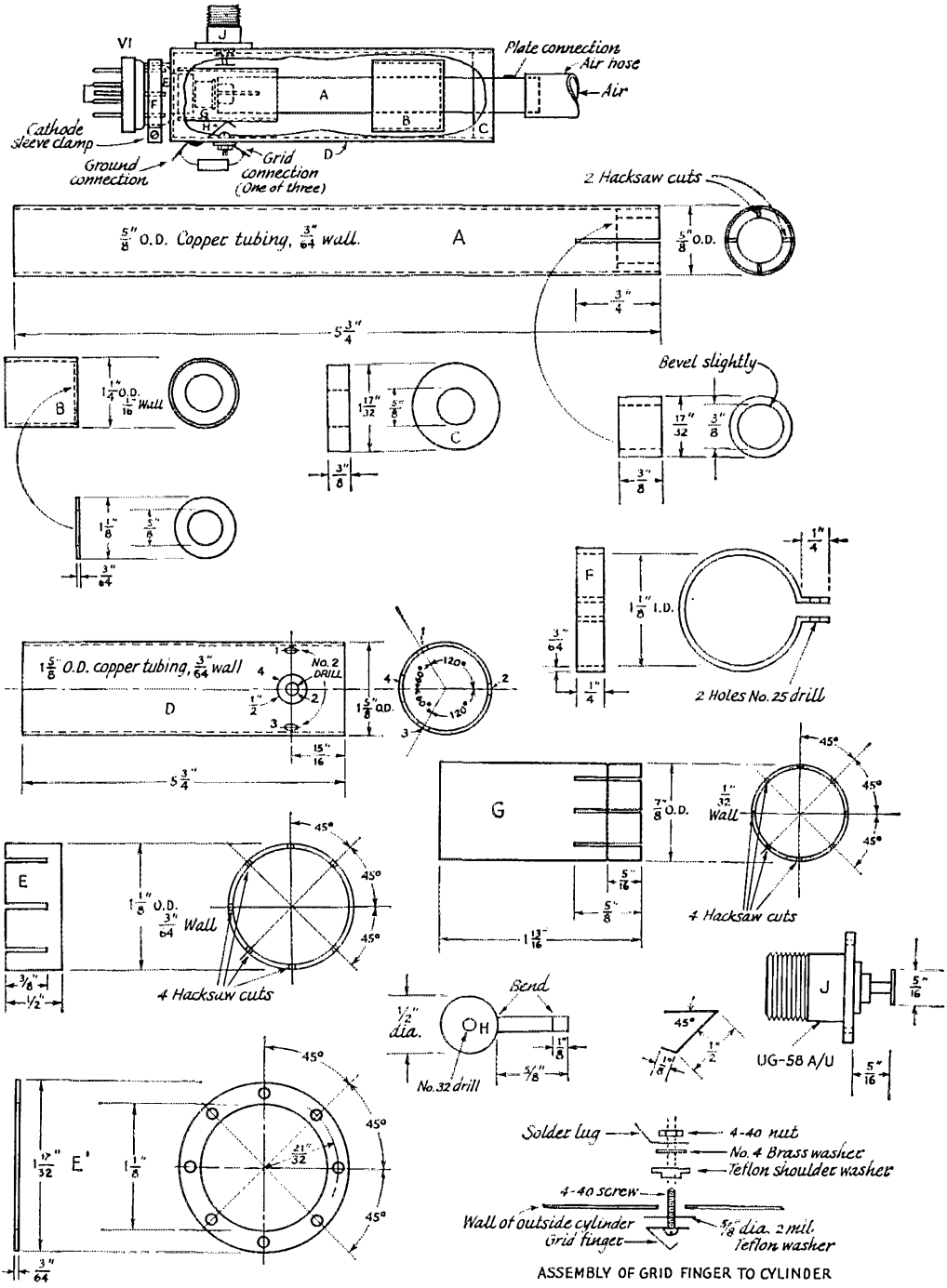


Fig. 2—Cutaway drawing and details of parts of the pulsed oscillator. Component parts are A—plate line and contact; B—plate choke assembly; C—plate line insulator; D—outside cylinder; E—cathode sleeve; E'—cathode end disk; F—cathode sleeve clamp; G—grid cylinder; H—grid contact finger (3 required); J—output probe; modified UG58A/U receptacle with thin disk mounted as shown. All parts except H and C are copper or brass. Cylinders are standard copper pipe diameters. H is thin beryllium copper.

ance to r.f. inside the oscillator. Because of the way the grid and plate lines open into each other to produce feedback, the over-all circuit is called a re-entrant-cavity oscillator.

For plate-pulsed operation, the impedance presented by the plate of the 2C43 to a modulator is approximately 1200 ohms. This impedance is transformed down to 50 ohms by the pulse transformer, T_2 in Fig. 3. Since the output pulse of the modulator is negative, the pulse transformer is also required to invert the polarity of the pulses. The voltage applied to the plate of the 2C43 when it is pulsed is between 2500 and 3000 volts. The peak plate current is two to three amperes, depending on the particular tube used.

Construction of a pulse transformer is described in Part II, but it is likely that a suitable transformer can be found on the surplus market. Any pulse transformer rated for a few microseconds pulse length and a secondary voltage of at least 2500 volts, and having a primary-to-secondary voltage or turns ratio of roughly 1:5, should work satisfactorily.

Antenna System

The antenna feed is designed for operation at a center frequency of 2360 Mc., where a wavelength is exactly 5 inches. Details of the feed are shown in Figs. 4 and 5. It is basically a dipole radiator, fed from a rigid coaxial line having a characteristic impedance of 50 ohms. The disk at the end of the line acts as a reflector, so that there is little forward radiation from the dipole, and the main lobe of the radiation pattern is centered on the direction from which the coaxial line approaches. A parabolic dish antenna can therefore be illuminated with radiation by using the coaxial line to support the feed at the center of the dish.

The manner in which the microwave energy is coupled to the dipole elements from inside the line is interesting. Two half-wavelength slots are cut in opposite sides of the outer conductor of the coaxial line, extending back from the closed end. A short circuit is placed between the inner and outer conductors at the mid-point of these slots. This causes an r.f. potential difference between opposite sides of the inside of the line, which is transferred to the outside of the line by the slots. The dipole elements are excited by this r.f. potential difference. Although the short circuit inside the line is formed by an extension of one of the dipole elements, the dipole element and the short are electrically independent.

The effective origin or center of the radiation from the feed is located between the dipole and the disk as shown by the arrow in Fig. 5. To properly illuminate a parabolic antenna, the feed should be mounted so that this spot is at the focal point of the parabola.

Construction

Re-entrant Cavity Oscillator

The oscillator can be made with hand tools available to the average amateur, using standard-size tubing available in plumbing-supply stores. Tools that will help considerably in the fabrication are an electric drill, Greenlee punches, a tubing cutter, and a propane torch of the type found today in most do-it-yourself workshops. All necessary dimensions are given in Fig. 2. The following comments indicate the proper sequence for assembling the complete cavity.

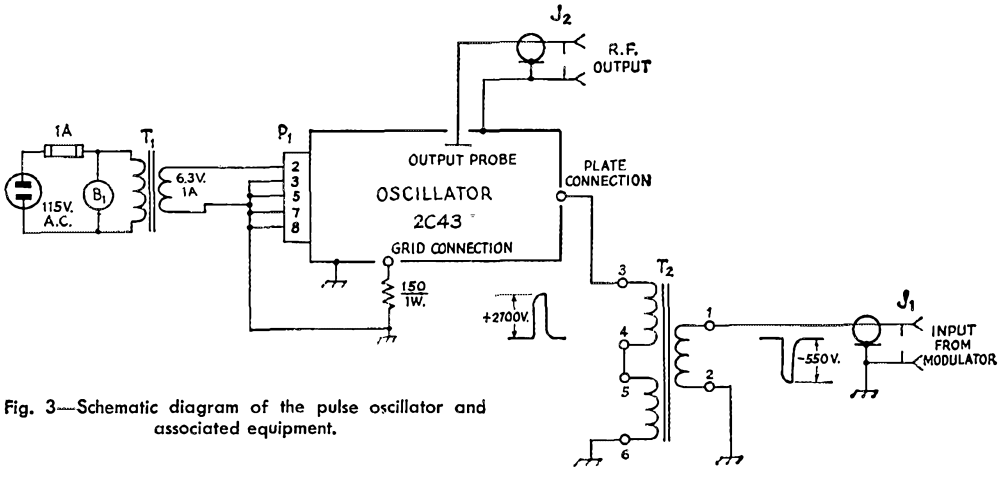


Fig. 3—Schematic diagram of the pulse oscillator and associated equipment.

B_1—Blower and motor assembly, 5 c.f.m.
J_1—Coaxial receptacle, SO-239.
J_2—Modified UG58A/U coaxial receptacle, with output probe. See text and Fig. 6J.
P_1—Octal socket.
T_1—Stancor P6134 or equiv.
T_2—Pulse transformer. See Part II.

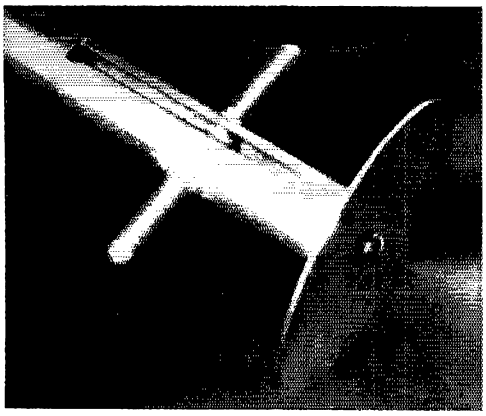


Fig. 4—Close-up view of the dipole and reflector assembly. For constructional details see text and Fig. 5.

Outside Cylinder, D: Be sure to remove all burrs around holes 1, 2, and 3, as the d.c. grid connections are made here. Hole 4 can be made with a ½-inch Greenlee punch if care is taken not to deform the tubing.

Plate Contact and Plate Line, A: The plate contact is made from ½-inch diameter brass rod. Wrap a 1/64-inch copper shim, ⅜-inch wide, around the rod and press fit the rod into one end of the plate line. Solder in place. Next, drill a ⅜-inch hole in the center of the brass rod and then cut two slots with a hacksaw. Remove all burrs and bevel the inside edge of the plate contact to facilitate insertion of the 2C43 plate terminal.

Plate Choke Assembly, B: The outside diameter of the choke ring should be made to fit snugly within the choke cylinder, and the hole in the ring should fit snugly about the plate line. Insert the ring on one end of the choke cylinder, making sure it is flush with the end of the cylinder, and solder. Position the choke assembly as shown in Fig. 2, with the *inside* of the closed end of the choke 4 1/16-inch from the plate end of the line. Make sure that the choke cylinder is concentric with the plate line and then solder in place. To prevent previously-soldered connections from remelting, a dampened rag should be wrapped about these joints before the torch is applied to the new joint requiring solder. This technique was used with good results throughout the assembly procedure. Position the plate-line insulator, C, on the plate line. The outside diameter of the insulator should make a snug but movable fit inside the outside cylinder.

Cathode Sleeve Assembly, E: For convenience, the slots should be cut in the cathode sleeve before it is cut from the tubing stock. Before cutting out the cathode end disk, E', mark the position of the eight air holes but do not drill. It is more convenient to drill these holes after the disk is otherwise finished. Exact inside and outside dimensions of the disk should be tailored to provide a snug fit with the cathode sleeve cylinder and the outside cylinder. Fit the end disk inside the outside cylinder, making sure that the surface of the disk is flush with the end of the cylinder, and then solder in place. Fit the cathode sleeve inside the end disk, as shown, making sure the end of the sleeve is flush with the inside surface of the end disk. It is important that the cathode sleeve be concentric with the outside cylinder. Wrap the outside cylinder with a damp rag to protect the cylinder-end disk joint, and solder the sleeve to the end disk. To secure a snug fit to the cathode surface of the 2C43, bend the ends of the slotted sleeve inward or file out the inside diameter of the sleeve. This will depend on tubing wall tolerances. The sleeve clamp is then made so as to grip the 2C43 firmly after it is inserted into the cavity.

Grid Cylinder, G: The tubing ideally suited for this part is the type used in a hot-water baseboard-heating converter. It is important for proper operation of the cavity that the tubing wall be thin. Score a groove 5/16-inch from one end with a tubing cutter. The purpose is to form a shoulder on the inside of the tube against which the 2C43 grid disk will butt. This operation has to be performed with care so as not to cut through the tubing. Next, cut the slots as indicated. The fingers thus formed are then bent inward slightly until a firm clasp on the grid contact of the 2C43 is achieved.

Output R.F. Probe, J: Mount the probe in the ½-inch hole of the outside cylinder, making sure that it makes a snug connection in the hole, flush against the surface of the cylinder. Two small right-angle brackets should be tailor-made to secure the r.f. connector. Two 4-40 tapped holes are made in each bracket for attaching the connector to the brackets. This assembly is shown in Fig. 6.

Grid Contact Assembly: The Teflon shoulder washers can be hand cut from ¼-inch rod stock using a sharp knife. When the grid contacts are assembled, check to see that the three grid fingers touch the grid cylinder when it is inserted into

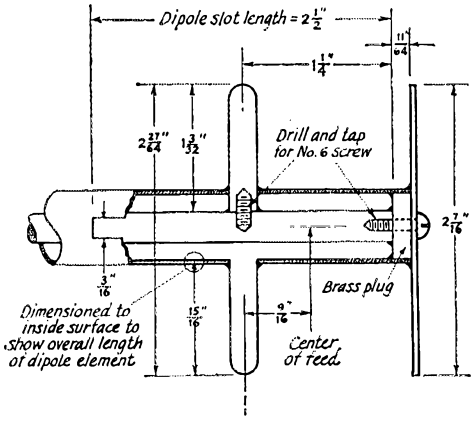


Fig. 5—Dimension drawing of the dipole and reflector assembly. Rigid coaxial line, left, extends to the parabolic dish reflector, and is terminated in a coaxial fitting in back of the dish.

the cavity. The wire used to interconnect the external solder lugs of the grid contacts should be well insulated and kept clear of the outside cylinder, since peak grid potentials of several hundred volts are produced during operation.

Construction of the Feed

Dimensions for the various pieces of the feed are given in Fig. 5. Although several dimensions are given to a 64th of an inch, errors of this amount should not affect performance noticeably. It is important, however, that each dipole element extend exactly the same distance beyond the outside surface of the coaxial line.

The outside conductor of the coaxial line is a standard size of copper water tubing. Its length depends on the size of the parabolic reflector with which it is used. The inside dimensions of the coaxial line make it convenient to mount a "type N" connector (UG-58A/U, as used for the transmitter r.f. probe) on the input end. When this is done, the center conductor is shortened somewhat with respect to the outer conductor (so as to keep the tapped hole in the side of the center conductor lined up with the dipole), drilled in the center to fit over the center conductor of the connector, and tapered or rounded off, as are the ends of the dipole elements.

In assembling the feed, first solder the center conductor to the connector. Two or three washers made from polyethylene foam or Teflon are then placed at intervals along the center conductor, to keep it in the middle of the outer conductor. The outer conductor is then slipped over it, and the longer dipole element screwed on the inner conductor. It may help to solder the No. 6 screw in place in the dipole element beforehand. The disk and brass end plug are then mounted on the end of the center conductor and the shorter dipole element inserted. (The hole in the outer conductor for this element should be made slightly undersize to give a force-fit). At this point, the assembly is complete, and all metal-to-metal joints (including that of the outer conductor with the N connector) should be soldered, using a propane torch. The inside joints of the feed are accessible for soldering through the slots. Finally, the external lengths of the dipole elements should be checked to see that they are the same; if one is longer, it can be filed down to match the other.

Operation

Before connecting the cavity into the circuit, make sure that the 2C43 is seated securely in the cavity and the plate-line contact is fully engaged with the 2C43 plate terminal. Connect the blower to the plate line with a short length of plastic hose and attach the heater, cathode, grid, and plate connections according to the schematic, Fig. 3. Connect the oscillator to the modulator with RG-8/U cable. The length of this cable is not critical. At K1JIX, a 50-foot cable connects the modulator in the shack to the oscillator on the roof, next to the antenna. Apply 115 volts a.c. to the oscillator unit and check for air flow

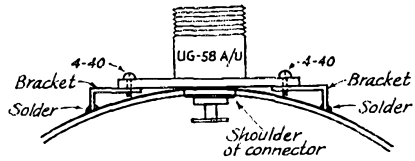


Fig. 6—Details of the mounting of the output probe on the outer cylinder of the oscillator.

at the cathode end of the cavity. A slightly-felt air flow is adequate for cooling. Allow the cathode of the 2C43 at least 60 seconds to come up to temperature before turning on the pulse modulator. When the modulator high voltage is turned on and the key is closed, one should immediately hear the pulse transformer "sing" at the p.r.f.

A simple check for r.f. output can now be made by touching a neon lamp to the center conductor of the output jack, J_2. A second check is to connect the dipole feed to the oscillator with a 5-foot length of RG-8/U or RG-9/U cable and hold a neon lamp near the dipole. The lamp should glow brightly in both cases. Between 1000 and 2000 watts peak-power output can be obtained, depending on such factors as the condition of the 2C43, the degree of coupling by the r.f. probe, and the amplitude of the pulse applied to the 2C43 plate. If output indication such as described above is produced, it is likely that the output power is at least 1000 watts. It was found that silver plating of the entire cavity assembly increased the cost considerably but did not result in any measurable increase in power out.

The remaining and most difficult part of the procedure is determining the actual operating frequency. There are at least three straightforward ways that this may be done: (1) a wavemeter, (2) a slotted line, or (3) the companion receiver. The simplest way is to use a wavemeter. Several types of these are available on the surplus market. The authors acquired a surplus type 402-B coaxial wavemeter which is described in reference 2 of the bibliography, Part IV. This reference is an excellent source of information on microwave equipment and practical techniques useful to amateurs. Included is a description of the slotted line which can be used to determine wave-length in the same manner as a Lecher line. The third method consists of using the companion receiver and calibrating it by means of harmonics from a lower frequency source. Possible sources are a grid-dip meter operating in the u.h.f. range, a 220- or 420-Mc. transmitter, or a 1215-Mc. equipment such as the APX-6.

The operating frequency of the oscillator constructed using the dimensions given here was found to be 2333 Mc. The frequency can be shifted 50 Mc. higher by shortening the grid cylinder length from $1\frac{13}{16}$ inches to $1\frac{3}{4}$ inches. The frequency may be adjusted lower in small increments by sliding the plate line outward on the plate terminal.

Part IV, receiving equipment, will follow in an early issue. QST

It's the Cats-Net

BY JOHN G. TROSTER,* W6ISQ

THE Communications and Traffic Society Net will now come to order. H'ya fellas. Anybody here? Net Control by."

"This is W6WX. Yeah, I'm here. Been updating my tape library. Got every one of Danny's calls punched on tape — even the /MMs. No matter where he goes now I can call him day and night. W6WX."

"Good news. OK, anybody else want to check into CATS Net?"

"Net Control-W6SC. Not much here. Few simple changes in the receiver. Rewired all the r.f.'s, i.f.'s, audio and power supply — W6SC."

"And it still works??? OK, anybody else want to check into the Communications And Traffic Society Net?"

"Net control, this is W6SAI. Not much new here. Been working on my new book, *Invisible Towers For Hams With Neighbors*. Aaaannndd, let's see — got my new two-meter Beer Can Collinear on the invisible tower now — up 71 feet. Looks kinda funny up there all by itself. Police Department outside now arguing whether this is case for local or federal authorities."

"You oughta drink the beer. Maybe the collinear would go away. Haw."

"How ya think I made the tower invisible?"

"Hey, you guys, this is W6FYM. We got an emergency here. Somebody at W6UF's just called and said Bill is hung up on his new beam."

"He's rotating?"

"Naw, he climbed the 110 feet up the tower OK, but then I guess he figured he was Richard Henry Dana or somebody else 'Before the Mast', 'cause he started out the 7-Mc. director like it was a yard arm. So he's about one-eighth wave out reefing air like a real Jack Tar."

"Easy, friends, there's no problem that CATS net can't handle instantly and adequately. W6SAI — will you please step outside your front door and ask the police to call the Fire Department to go up and throw Bill a line or sumpin!"

"Rajah."

"I tell you, there ain't nothin' the old Communications And Traffic Society can't handle. Right? Ha. OK, are there any other check-ins?"

"Net control this is W6CIS. I have one short message for Menlo Park."

"W6CIS this is Net Control. Ahhh, you mean you have a third-party message — like one for somebody else?"

"Right. A message originating in Florida addressed to a party in Menlo Park."

"We don't have any stations in CATS from Menlo Park."

"Ya got W6WX. He's in Menlo."

"Oh yeah. Guess he is. Well, what's the message say?"

"It's about a time of arrival. Say is this the Communications And Traffic Society Net that is

listed in the National Roster of traffic nets? Maybe I got the wrong frequency."

"W6CIS from Net Control. Stand by, old man. Say Howard, W6FYM — call me on the land line, will ya."

(Rrriinnnggg) . . . "What do ya want?"

"Look, Howard, we got a *real* emergency on our hands! This fella wants us to handle a message. He must be crazy. We haven't handled a message in ten years. Now come on, you're the president of the Society, what are we gonna do?"

"You know anybody who knows how to handle a message?"

"Heck no. Do you?"

"Well, not in CATS Net anyway. We had a fella once a few years ago, but he . . ."

"We gotta get this fella off our backs, Howard."

"I got it, I got it. Now look, it's simple. We'll do this . . . buzzzzz . . . buzzzzz . . . got it? OK, you call those four fellas on the phone and I'll call this group. Call back in 5 minutes. Stall W6CIS off a minute or two."

"Ahhhh . . . W6CIS from Net Control, Stand by, old man. Little trouble here with the, ahhhh, doubler. Be with ya in a second . . ."

* * *

"Where's that phone book? Lessee, W6KG lives across the bay . . . yi, a toll call, but it's worth it . . . Lloyd, we gotta fella checking into the net who wants us to handle a third-party message . . ."

"A *what???*"

"Yeah, that's right, a third-party message. Yeah, I know we don't, but he saw the Communications And Traffic Society Net listed in the book and . . . well, here's what we want to do . . . you vote in favor? Good."

* * *

"Howard, ya get ahold of your boys?"

"Yeah, all voted in favor of the motion. Go ahead with the net."

"This is Net Control. Anybody else want to check into the CATS Net?"

(Continued on page 146)

* 45 Laurel Street, Atherton, Calif.

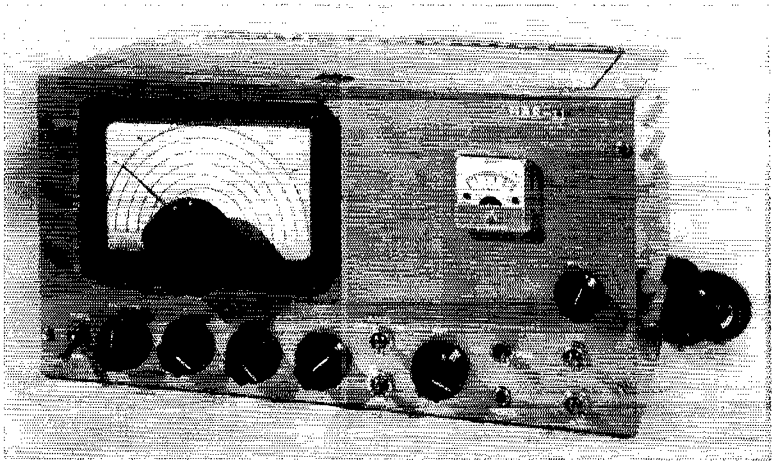


Fig. 1—Panel layout of the HBR-11. Controls along the bottom are the send-receive switch, S_1, antenna trimmer, C_{11} r.f. gain, R_1, mixer gain, R_2, i.f. gain, R_3, a.g.c. switch (above), S_4, calibration oscillator switch (below), S_2, audio gain R_4, phones/speaker switch, S_5, phone jack, J_1, and in the column of three at the right, b.f.o. tuning, top, C_{12}, b.f.o. switch, S_6, and a.c. power switch, S_3.

The HBR-8 Becomes the HBR-11

Adding R.F. and I.F. Stages, A.G.C. and Accessories

BY TED CROSBY,* W6TC

Adding three more tubes brings the HBR-8, described last month, into the performance class of the popular HBR-16—at lower cost and with smaller dimensions.

THE basic aim in the HBR-8 circuit, as described in an earlier article,[1] was to provide a "minimum-requirements" receiver — one that would be as simple as possible to build, yet would offer a satisfactory level of performance under the conditions commonly met on the amateur bands. In the HBR-11, three tubes, with associated circuits, have been added to the HBR-8 in order to include those additional features necessary for really top-flight reception. The fully-expanded receiver circuit is given in Fig. 2.

The additions include: (1) a 6AZ8 with the pentode section as a tuned r.f. amplifier and the triode section as a calibration oscillator, (2) a second stage of 100-kc. amplification using a 6BJ6 pentode, and (3) a 12AT7 double triode with one section diode-connected for use as an a.g.c. rectifier, and the second section used as an S-meter amplifier.

Obviously, these tubes can be added singly or in any desired combination, at any time. In my opinion they are all of equal importance, although the sequence of their installation is strictly a matter of individual preference.

The tuned r.f. stage noticeably improves the selectivity, signal/noise ratio, and sensitivity of the receiver, and eliminates the image-frequency-response problem as well. The convenience and usefulness of the calibration oscillator is obviously apparent. In passing, the 6AZ8 pentode has its suppressor tied internally to one side of the heater, and the No. 5 pin must be grounded, as shown in the diagram, if the tube is to function properly. The cathode resistor is not bypassed.

The additional stage of 100-kc. r.f. amplification adds appreciably to the over-all receiver gain, and narrows the passband (increases selectivity) substantially.

The advantages of an automatic gain control circuit and the operational convenience of a good S-meter circuit are well known.

The correct chassis and panel locations of the additional tubes and associated components are indicated in the photographs.[2] The available space is quite limited in spots, but is nevertheless sufficient.

Practically all that was said about the construction of the HBR-8 in March *QST* applies equally well if the builder is starting from scratch

* 10126 Colwell Drive, Sun Valley, California.

[1] Crosby, "The HBR-8 Communications Receiver," *QST*, March, 1963.

[2] Exact locations are given in the templates mentioned in Footnote 2 in the March article. Order from W6TC.

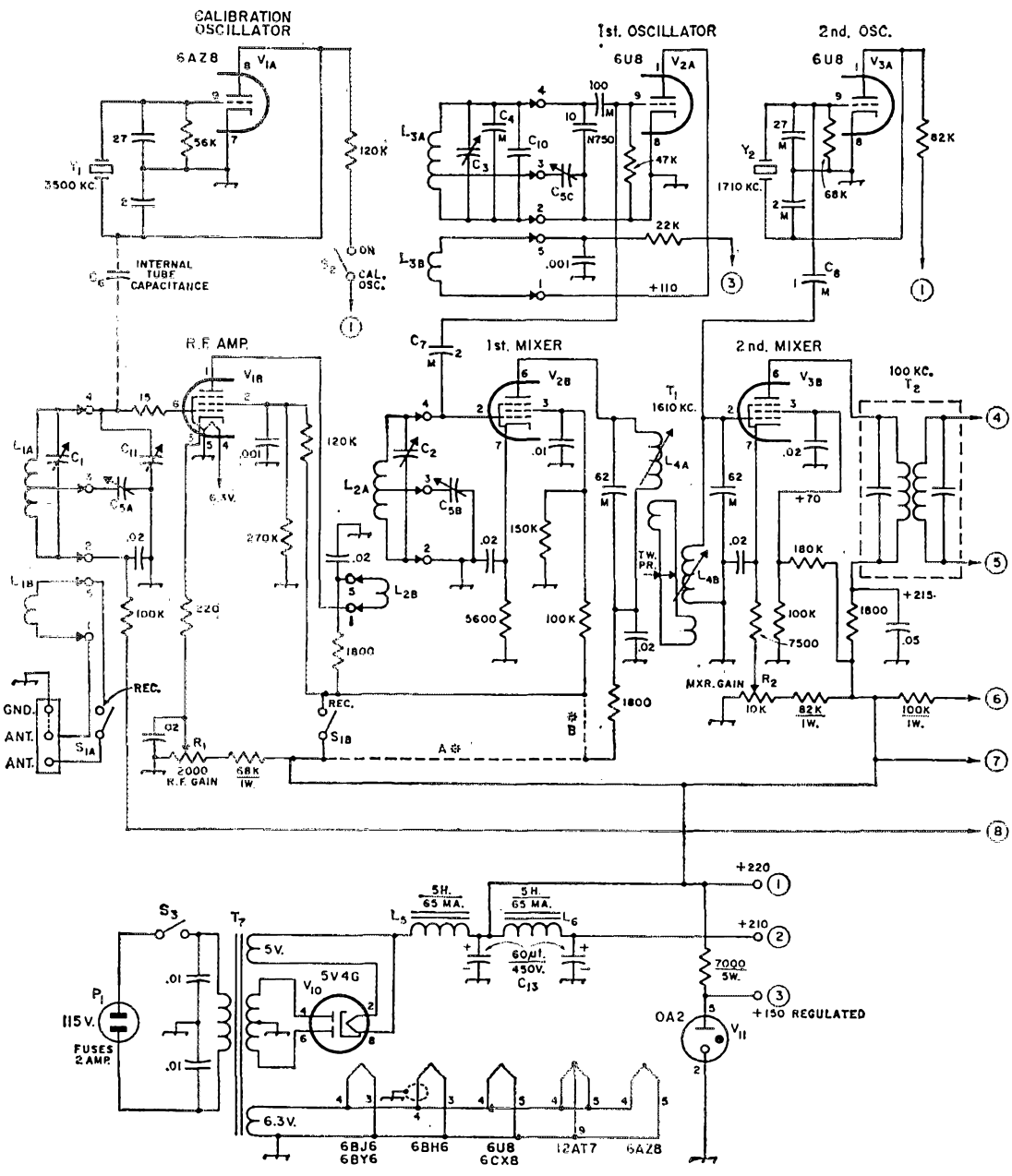
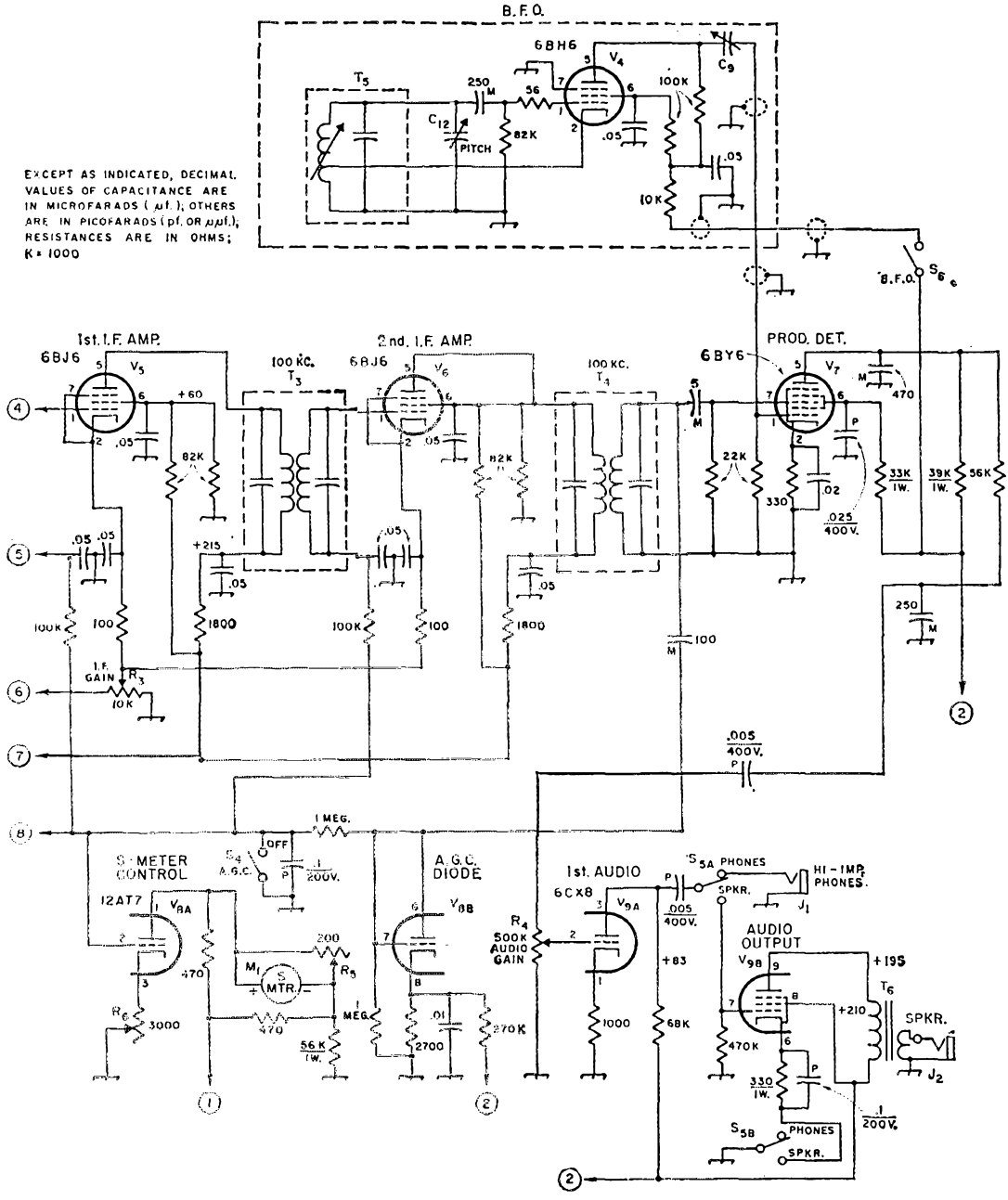


Fig. 2—Circuit revisions and additions to convert the HBR-8 into the HBR-11. New circuits are in red. Circuit designations not listed below are in the HBR-8 circuit, March 1963 *QST*. Coil data for the HBR-11 also are given in March *QST*.

C_1—See coil chart.
C_6—Internal tube capacitance; external capacitance not required.
C_{11}—15-pf. variable (Hammarlund MAPC-15B).
L_1—See coil chart.
M_1—0-1 d.c. milliammeter, D'Arsonval movement (Lafayette TM-11 or equivalent).
R_1—2000-ohm wire-wound control, not over 1¼ inches in diameter. (Centralab WW or equivalent).
R_5—200-ohm wire-wound control, same type as R_1.
R_6—3000-ohm wire-wound control, same type as R_1.
S_2, S_4—S.p.s.t. toggle.
T_4—100-kc. i.f. transformer, slug-tuned (Miller 1710).



with the HBR-11, and therefore will not be repeated here. Instead, it will be assumed that the HBR-8 has been completed and is now to be modified.

Changes in the HBR-8 Panel

First, remove the panel from the chassis and dismount the tuning dial. Then drill the panel for the additional controls (see Fig. 1) and remove the burrs from the holes. For appearance's sake, the mixer gain control in the HBR-8 was centered under the dial, but it should now be moved to the right so the r.f. gain control can occupy its former position. This necessitates a minor rearrangement of the wiring underneath the chassis. The r.f. gain control is mounted on the front wall of the chassis and equipped with a hex-nut spacer as in the case of the other similar controls. These spacers also are used with the calibration-oscillator and a.g.c. off-on toggle switches.

The MAPC-15B used as the antenna trimmer, C_{11}, has a shaft which is too short for this type of mounting. Instead, make a hole in the chassis front sufficiently large to clear the capacitor and mount it directly on the panel.

The location of the S meter is a matter of per-

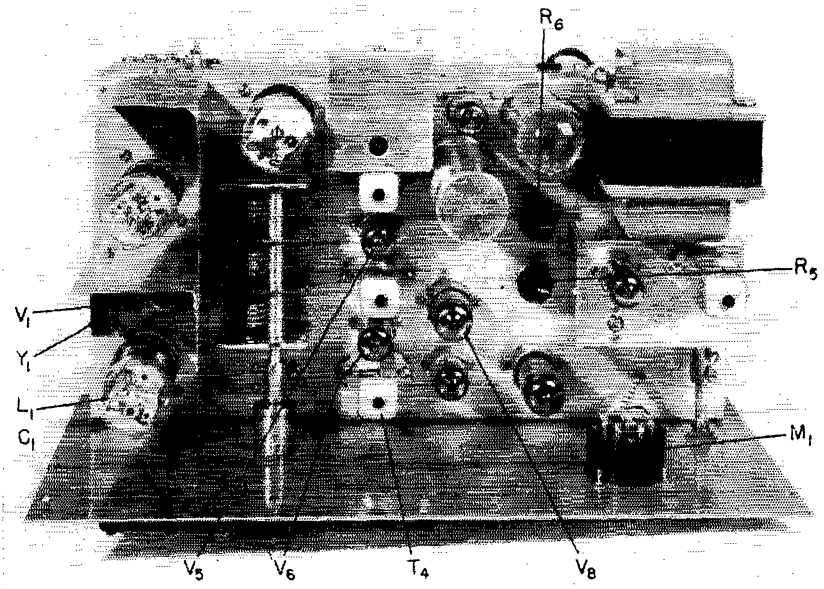


Fig. 3—The HBR-11 chassis layout. Components not identified here are labeled in the corresponding HBR-8 photograph in March QST. (Note: In Fig. 3, page 14, March 1963 QST, the b.f.o. injection capacitor, C_9, was incorrectly labeled C_{12}. C_{12} is the panel b.f.o. pitch control.)

sonal preference. However, it must not be mounted so high up on the panel that it will strike the upper front flange of the cabinet when the chassis is inserted in the cabinet. The S meter must be a 0–1 D'Arsonval-type milliammeter; other types will not function properly.

Circuit Pointers

So there will be no confusion as to the correct rewiring of those portions of the circuit affected, Fig. 2 shows the complete schematic of the expanded receiver. Even so, the chance for error does exist, and particular care should be exercised in the rewiring job. This admonition does not necessarily apply to builders who decide to skip the simplified version entirely.

The wiring of the HBR-11 becomes a rather "hairy" proposition at some spots, because of the somewhat cramped quarters encountered. For this reason a small-sized soldering iron with tip to match is a "must." Forget about tie points altogether; there is simply no chassis space available for such additional niceties. The wiring job is so direct and compact that it is completely self-supporting, with no need for additional rigidity, if it is done with solid No. 18 wire. The one exception is the multi-terminal tie point used for the power-transformer leads.

It is important that the available "vertical" space under the chassis be utilized to the fullest extent. Mount the various resistors and capacitors vertically rather than horizontally. Also, orient the tube sockets for short and direct grid and plate leads.

A twisted-pair line, similar to that used between the two 1610-kc. links, is used between the S meter and the under-chassis wiring proper. The illuminated dial face of this meter doubles as a receiver off-on indicator as well. The S-meter dial-light wiring schematic is included with the meter by the manufacturer.

HBR-11 Alignment

Practically speaking, the alignment procedure is identical with that described previously for the HBR-8. The calibration oscillator is substituted for the transmitter exciter stages, and the S meter obviously makes the external v.o.m. unnecessary.

The prealignment capacitance setting of C_1, the r.f. stage band-set capacitor, will be slightly lower than was true of C_2. This is because of the additional parallel capacitance in C_{11}, the antenna trimmer. C_{11} should be set at half capacitance before peaking C_1, so the maximum adjustment range will be available in the antenna trimmer when the receiver is in use.

The additional 100-kc. transformer, T_4, is pretuned exactly as were T_2 and T_3.

The S meter must be made operational before using it as a visual resonance indicator during alignment. To do so, place all tubes except the 12AT7 in their sockets, turn on the receiver, and allow a two- or three-minute warm up. Put the a.g.c. switch in the "on" (open) position, and then adjust R_5 for a full-scale reading on the S-meter dial. Next, insert the 12AT7 in its socket and let it reach normal operating temperature. Then

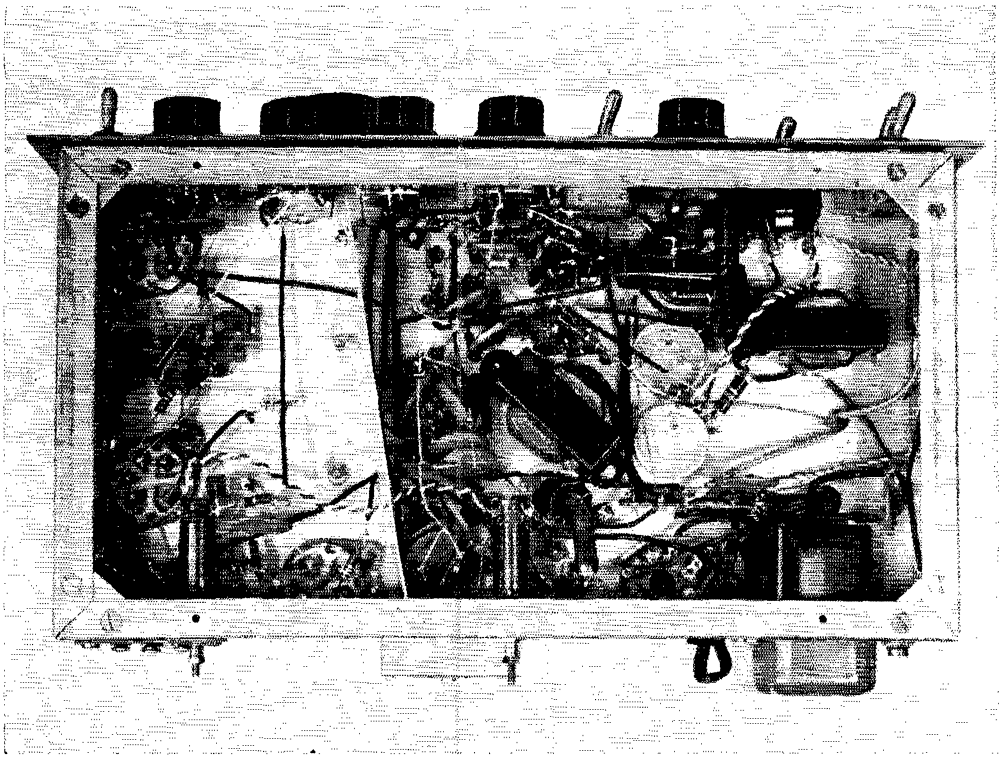


Fig. 4—Compare this bottom view with the similar view of the HBR-8 in March *QST* to spot the locations of added components. The r.f. amplifier coil socket is in the upper left corner, with the socket for V_1 about midway between it and the coil socket below. Variable resistors for the S-meter circuit are in the center of the section to the right of the shield. The socket for the a.g.c./S-meter tube, V_8, is immediately above the filter choke to the left of the variable resistors. Small components are supported by socket terminals and bus wiring (No. 18); the only tie-point supports are in the power-supply section in the lower right corner.

adjust R_6 for zero reading on the S-meter scale. The S-meter circuit is then correctly adjusted and the actual alignment can proceed.

Once the alignment is completed, it is important to the subsequent optimum performance of the receiver that the primary-secondary spacings (coupling) of the three plug-in coils receive some further experimental attention, especially L_2 and L_3. The L_{2A}-L_{2B} coupling should be such that the r.f. amplifier is just below the oscillating point when the a.g.c. switch is off and the r.f. gain control is fully advanced. So adjusted, the resultant regenerative condition existing in the r.f. stage noticeably improves both the gain and selectivity of that part of the circuit. The r.f. stage tends to be increasingly regenerative as the L_2 primary-secondary coupling is increased (spacing decreased) up to the point where the tube goes into sustained oscillation. Retarding the r.f. gain control a bit will compensate for a slightly overcoupled situation, obviously. This particular coupling adjustment can be correctly done only with the chassis mounted in the cabinet.

The L_{3A}-L_{3B} coupling must be near correct if the 1st oscillator is to be completely stable. With overcoupling the oscillator feedback will be excessively high, and sudden jumps of as much as several hundred cycles to a higher or lower frequency will result. If the over-coupling is severe, multiple oscillations (squegging) will ensue, evidenced by a closely-spaced series of beat notes or heterodynes as the band-set capacitor, C_3, is rotated. Conversely, if the feedback is insufficient, the 1st oscillator will be unstable, evidenced by an almost continual series of positive and negative frequency excursions, but minor in character and frequency deviation as compared with an overcoupled condition. Actually, the 1st oscillator feedback is no more critical than it was in any of the previous HBR receivers; the L_3 primary-secondary spacings given in the coil chart in March *QST* will lead to highly-satisfactory results 99 out of 100 times, I assure you. Countless numbers of HBR builders will bear me out on this. The additional information has been included here for those who will be satisfied with nothing less than the ultimate, insofar as the receiver's performance is concerned. Zero-beating the 1st oscillator against the crystal-controlled calibration oscillator provides a positive means for checking the stability of the 1st oscillator.

Conclusion

The purpose of the HBR-8 article was two-fold.

It was prepared not only in the effort to present a really worthwhile replacement for the small, low-priced units masquerading as communications receivers today, but also in the hope that it would do much to break down that ever-present "thou shall not touch" attitude as well.

As for the HBR-11, it is an excellent receiver, fully capable of upholding the good name of its predecessors in every respect. The HBR-16 does have slightly more over-all gain [3] and a bit narrower passband than does this miniaturized adaptation. But it costs more and is somewhat more difficult to build — especially the version using the large Eddystone dial. Comparatively small-sized physically as the HBR-16 actually is, it still is a rather bulky unit when compared with its little brother. Relatively few communications receivers are small enough to qualify as portable jobs, and yet are good enough to give topnotch performance as the regular home-based receiver as well.

This particular constructional project has been presented with every confidence in its worthiness, not only from the standpoint of its practicability, but as a most interesting and educational project as well.

Drawn-to-scale drilling templates will be available, as previously mentioned.[2] In addition, 8 by 10 inch commercial-quality originals of the photographs of the HBR-11, as well as large-sized schematics of both versions of the receiver, can be secured. Also, Ed Kent's "HBR Notes" are most helpful in this instance. A stamped envelope will bring further details — but please fellows, *not for free*. As much as I might wish it were otherwise, I am a Crosby in name only!

Good luck, and good hunting. QST

[3] Thanks to the cooperation of Bill Courtney, K6GEK, Chief Engineer of J. W. Miller Co., in developing new 1610-kc. coils for 7/4, there is now little difference in the gain of the two receivers. The new coils are wound on ceramic forms, and resonate at 1610-kc. with approximately 3/8 inch of the threaded tuning rod protruding, as compared with 1/2 inch in the original resinite form. The new form will be supplied on all orders for the type 1731 coils.

Modifying the HBR-11 for A.M. Phone

BY RICHARD T. McCARTNEY,* W6GJS

HAVING worked at the Los Angeles ABC-TV transmitter with Ted Crosby for many years, I have for some time been aware of his communications receiver design work, and the outstanding performance of his HBR line of receivers. Inactivity in recent years, because of the restrictions imposed upon the average apartment dweller, delayed the construction of my own HBR-16 pending the time when I could move to a more suitable location.

This change of address is in process as this is written. Even so, my own version of the HBR-16 will continue to be one of those things I will get around to at some future date. The HBR-11 is the delaying factor in this instance. "Old Cros" continues to come up with something new so regularly that I cannot keep up with him.

* 1959 No. Harding Ave., Altadena, California.

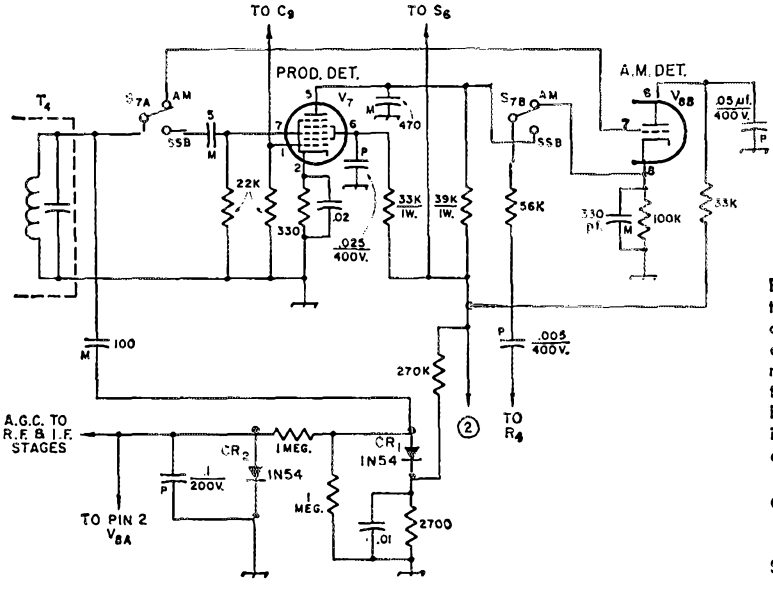


Fig. 1—Circuit modifications to the HBR-11 for installing an a.m. detector. Changes and additions are in red; components and wiring in black are the same as in the original HBR-11 circuit. On capacitors, P indicates paper tubular, M indicates mica. New resistors are ½ watt.

CR_1, CR_2—High back-resistance diode (1N54 or equivalent).

S_7—D.p.d.t. toggle.

Two things came to my mind as soon as I saw the HBR-11 and had experienced a session at its tuning dial. How could so much performance have been enclosed in such a small package, and just how soon would it be possible for me to start building one for myself? Apparently, here was the combination home-based receiver and portable unit I had been kicking around mentally for some time. Citizens-band coils definitely were possible. Eventually, coils for the marine-band frequences were a possibility. This little receiver was for me. But quite obviously, I was to be one of those builders who needed an a.m. detector.

A schematic of my modifications appears in Figs. 1 and 2. The a.m. detector is nothing more than the infinite-impedance detector used in the original HBR-16. The two triode sections of the 12AT7, V_8, now serve as the S-meter amplifier and the infinite-impedance detector, respectively. The a.g.c. diode circuitry now becomes a germanium-diode arrangement instead. As was to be expected, the infinite-impedance detector performs perfectly. The same thing is true of the modified a.g.c. circuit. A brief explanation of its operation perhaps is in order.

The 12AT7 a.g.c. diode in the unmodified HBR-11 circuit has a reverse-current conductivity of zero; consequently, the positive delay voltage developed across the 2700 270K voltage divider of the HBR-11 never appears at the a.g.c. bus. However, the 1N54 germanium diode, CR_1, Fig. 1, although it does have an exceptionally high front-to-back ratio, has a back resistance low enough to allow some of the positive delay voltage to appear on the a.g.c. bus during some no-signal intervals. The second 1N54, CR_2, conducts whenever this voltage tends to appear, preventing the a.g.c. bus from going positive during any such no-signal interval.

In my receiver, the a.g.c. off-on switch was eliminated and a d.p.d.t. detector-transfer switch, S_7, was substituted instead. If the a.g.c. switch is retained, it should be installed in the location originally indicated for the calibration-oscillator off-on switch, the latter then being mounted above the chassis in line with the phones-speaker switch, and underneath the S meter. The lead dress from the calibration-oscillator switch is not critical.

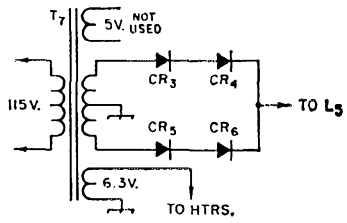


Fig. 2—Semiconductor rectifiers substituted for the 5V4G in the HBR-11 power supply. The rectifiers, CR_3 through CR_6, must be capable of handling a peak-inverse voltage of at least 750, total, in each string, and should be rated at 100 ma. or more. W6GJS uses International Rectifier type 1N1096, rated at 600 volts p.i.v., with two diodes in each string.

Silicon-Diode Power Supply

Heat is always a problem in equipment design. Ted's HBR-11 is almost unbelievably stable despite the large amount of heat dissipated inside the small cabinet. Much of this internally-generated heat originates in the 5V4G rectifier tube. Also, a cooler-running power transformer would result if the 5V4G filament load was eliminated.

As diagrammed in Fig. 2, silicon diodes replace the 5V4G rectifier tube in my version of the HBR-11. Two 600-p.i.v. diodes, series connected, in each leg of the high-voltage winding seemed to represent the best compromise between cost and safety factor. The diodes are mounted on a vertically-positioned multiterminal strip which is located underneath the power transformer and requires very little space. Because of the lower internal resistance of the diodes, as compared to the 5V4G, the d.c. voltage from the filter will be approximately 10 volts higher than originally indicated. No surge-limiting resistors in series with the diodes are required with this choke-input type filter.

As you can guess, Ted tuned my receiver and looked over this article prior to its publication. It has his approval, he assured me.

As for the performance of my own HBR-11, the answer is easy. Ted wasn't kidding at any portion of his article. This is a wonderful little piece of gear. QST

Strays

More stolen equipment. A KWM-1, Serial No. 860, was stolen from the car of K2MZJ on Feb. 12. A reward is offered for its return. If you have any info on the whereabouts of this gear, contact Abe Green, 271 E. 28 St., Paterson, N.J. Phone MU-4-4364.

—•••—

Having trouble with that bug slipping around on the operating table? Don't want to pour Coke on the table to stick the bug down? WN6BIG suggests that you use rubber cement. It'll hold the bug firmly, and if you move the key to another spot, you can rub away the excess rubber cement with your finger. Neat.

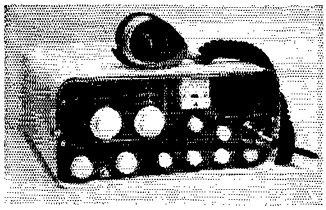
Now, we hold down *our* bug by moistening its rubber feet with . . . uh, that is, we wet them with . . . well, heck, we spit on 'em. Works.

—•••—

Last November in the Brentwood-Bel Air fires, K6RXU lost *all* his possessions. He would be very happy if anyone who has worked him at K6RXU, K2BNI, K2GXV, or W1HMU would send him a duplicate QSL. New QTH is 979 Teakwood Rd., Los Angeles 49, Calif.

• Recent Equipment —

The Poly-Comm PC6



THE Poly-Comm PC6 is a transceiver for the 50-Mc. band, having a physical resemblance to the two-band 62B, described in *QST* for April, 1962. A similar model for 144-Mc. use was being readied for the market at the time this was written, and has since been announced. By building for one band in each model, the designers were able to make several marked improvements over the earlier two-band version, while retaining the desirable features.

The block diagram shows the tube lineup and stage functions in the PC6. In the receiver 6DS4 and 6CW4 Nuvistors, V_1 and V_2, in a cathode-coupled r.f. amplifier, feed a 6CW4 mixer, V_3. Injection from a tunable 6CB6 oscillator, V_{11}, covering 44.495 to 48.495 Mc., gives an i.f. output at 5405 kc. The mixer grid circuit is gang-tuned with the oscillator circuit to avoid the need for broad-banding, with its increased possibility of overloading and spurious responses. There is a 6BJ6 5405-kc. i.f. stage, V_{16}, and then a second mixer-oscillator, V_4. This is a 12AT7, with the oscillator portion crystal controlled at 4950 kc., to give 455-kc. mixer output. There are two 455-kc. amplifier stages, a 6BJ6, V_5, and the pentode portion of V_6, a 6CM8. Diodes are used for detector, a.v.c. and noise limiter. A 12AX7 squelch and first audio, V_7, completes the receiving lineup.

In the transmitter, a 6CB6 oscillator, V_{12}, operates with crystal or self control between 8.33 and 9 Mc. Two 12BY7s, V_{13} and V_{14}, triple to 25 and double to 50 Mc., driving a 7551 final amplifier, V_{15}. The doubler and final have pi-network tank circuits. Output on 50 Mc. is approximately 10 watts. The modulator uses paralleled 6BQ5s, V_8 and V_9, which also serve as the output amplifier for the receiver. Speech amplification is provided by a 6BJ6, V_{10}, and the triode portion of V_6.

Send-receive control is by means of the switch on the hand microphone, though an external control independent of the microphone can be installed if the operator desires. The receiver and v.f.o. tuning controls are side by side in the upper left portion of the panel. The receiver dial scale has marks every 100 kc., but these are omitted on the v.f.o. scale. This seems to be good psychology, emphasizing as it does the need for checking the v.f.o. frequency by some other means when working near to band edges.

Just above the v.f.o. dial is a switch for selection of v.f.o. or crystal control. A crystal socket occupies a similar position with respect to the receiver dial. (Incidentally, an FT-243 crystal in this socket blocks the operator's view of the receiver scale, unless the PC6 is tilted upward at an appreciable angle.) A combination S meter and tuning meter and the small built-in speaker occupy the upper right portion of the panel. A meter-function and v.f.o.-spot switch is just below the meter.

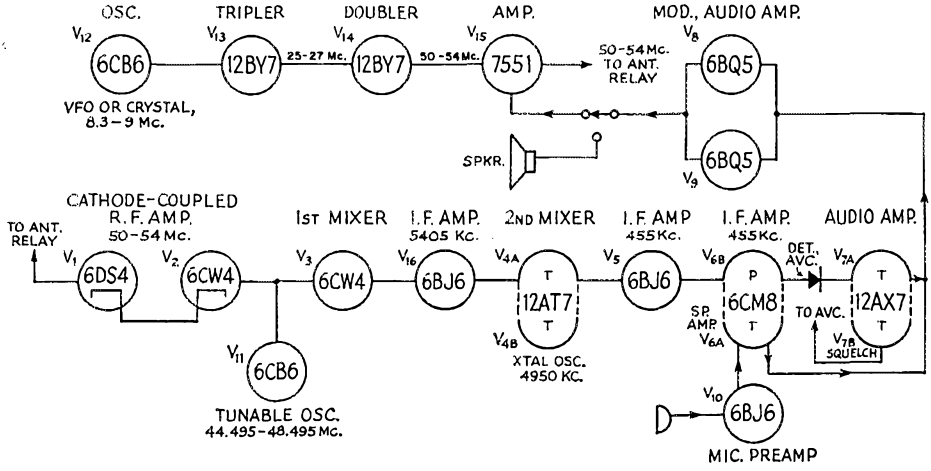
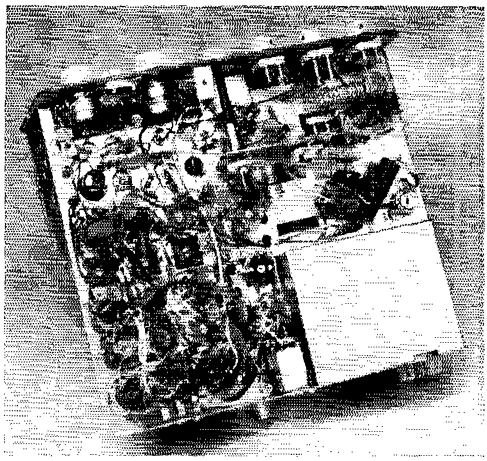
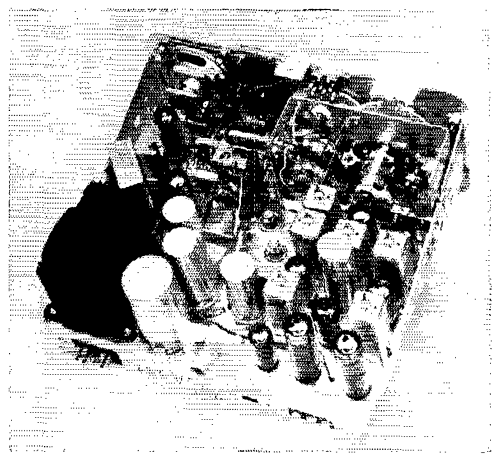


Fig. 1—Block diagram of the PC6 50-Mc. transceiver.





(Left) Interior view of the PC6, with the cover removed from the v.f.o. and receiver-tuning circuits, upper right. The balance of the receiver layout is at the lower right of the picture. Transmitter circuits are at the upper left, and power-supply components at the lower left. (Right) Bottom view of the Poly-Comm 50-Mc. transceiver. Transmitter tuned circuits are visible at the upper right. The receiver occupies most of the side of the picture.

Receiver volume and squelch level controls are at the lower left. Between them is the noise-limiter on-off switch. Smaller knobs at the lower center and right side are for receiver antenna trimmer and transmitter tuning. The built-in carrying handle swings up into the top of the case above the panel. A mounting clip for the microphone can be attached to the case at any spot the owner likes.

The power supply has silicon diode rectifiers, and provision for 115-volt a.c. or 12.6-volt d.c. input. Two power cables are supplied, choice being governed by the power source to be used at the time. The screen voltage applied to the transmitter oscillator and the tunable oscillator in the receiver is regulated by means of separate pairs of NE86 neon bulbs in series. Total power consumption is 90 watts, *receive*, and 140 watts, *transmit*, when operating from the a.c. line. On battery power the drains are 10 and 16 amp., respectively. A convenient mount for attaching to the under side of a car dash is supplied.

Performance

The PC6 is considerably better than its two-band predecessor on several counts. Stability in both the v.f.o. and receiver oscillators is much improved, the transmitter stability being as good as will be found in any but the very best v.f.o. transmitters on 50 Mc. The note, while not perfectly T9, is acceptably pure, and frequency shift of the signal by the voice modulation is substantially nil. Warm-up drift is apparent, but slight, and the short drift cycles on each transmission that characterized earlier models of this line have been all but eliminated.

Receiver sensitivity is adequate, and the selectivity is all that one could use comfortably in mobile or casual home-station operation. We encountered no spurious signals or oscillator birdies in the course of quite a few hours of operation of the PC6. Most of this was during portions of the 1963 V.H.F. Sweepstakes, when the going is about as rough as is likely to be encountered in 6-meter work.

Still missing: provision for c.w. keying, and reception of c.w. or sideband signals. It is believed that these modes could now be accommodated, with the improved stability of the PC6. In fact, the writer proved that c.w., at least, is practicable, when a lone Maine station showed up in the contest on c.w. Quickly swinging the v.f.o. down to his frequency, we called him by pumping the push-to-talk switch on the microphone. The whisper of his c.w. was strong enough to make solid copy, and the section multiplier was added to the W1HDQ log. K1NTC said that it was by no means the worst c.w. he had to copy that day, though he was somewhat taken aback by the erratic nature of the sending! We had less luck a few contacts later when a station attempted to raise W1HDQ by calling on s.s.b. —*E. P. T.*

Polytronics PC6 50-MC. Transceiver

Height: 5 inches.
Width: 11 inches.
Depth: 10 inches.
Weight: 15 pounds.
Power requirements: 115 volts a.c., 140 watts on transmit, 90 watts on receive; or 12.6 volts d.c., 16 and 10 amp., respectively.
Price class: $330.
Manufacturer: Polytronics Lab, Inc., 388 Getty Ave., Clifton, New Jersey.

• Technical Correspondence

MORE 50-MC. MOONBOUNCE EXPERIMENTS

Aylmer
Quebec
Canada

Technical Editor, *QST*:

The purpose of this letter is to give corrections and additions to a previous one,[1] and to describe further 50-Mc. moonbounce experiments at VE3BZS/2.

In the formula for the Doppler shift, the transmitter frequency, f, should have been expressed in cycles, not megacycles. Also, it was mentioned that the antenna was usually aimed optically. However, the following formulae were referred to when the moon was obscured by clouds:

$$\sin E_T = \sin L_T \sin D + \cos L_T \cos D \sin H_T$$

$$\sin A_T = \frac{\cos D \cos H_T}{\cos E_T}$$

where E_T is the elevation of the transmitting antenna
A_T is the azimuth from true north
L_T is the latitude of the transmitter
H_T is the hour angle of the moon, and is approximately $\frac{360}{(transit)} \times t$, where t is the time in hours after local mean time of moonrise at the equator, and *(transit)* is the time in hours between ephemeris transits of the moon (approx. 25 hours).

Similarly for the receiver.

The formulae are approximations, since E_T is the elevation of the moon at the earth's center, not at the station. However, the difference is less than one degree, at most. Also, the local hour angle definition may not be standard.

The moonbounce experiments were continued with different antenna polarizations to see if improvement could be obtained. It was pointed out by Soifer[2] that crossed Yagi antennas transmit and receive the same sense of elliptically-polarized radiation. Thus, theoretically, assuming specular reflection of the radio wave at the moon's surface and therefore reversal of the sense of the polarization, the antenna used in the experiments previously described should not have received the transmitted echoes. Neglecting effects of the ionosphere and lunar surface, the fact that some echoes were received is probably attributable to ground reflection effects and/or transmission of elliptically-polarized waves due to mismatch in the antenna system.

A trial was made recently using two of the crossed Yagis transmitting radiation polarized in one sense and the other two receiving in the opposite sense. Stronger and more frequent echoes were recorded, even though the system gain (neglecting the problem of reverse polarization) was only one-fourth that previously used.

Another trial was then made with the four antenna units transmitting vertically. This was chosen over horizontal to have the major lobes of the upper and lower bays as nearly coincident as possible, in the event of ground reflection. During this trial the moon was obscured, and some power-line interference was present, but results were the best so far.

The 50-Mc. trials were brief and incomplete, but results seem to indicate that the echo amplitude varies widely; that the average signal-to-noise ratio of the echoes is less than that given by the formula in the previous letter; that, when using circular polarization, improved performance results if the transmitting and receiving antennas have opposite polarizations; and that, with the system parameters used, no distinct advantage between circular and linear polarization was noticed.

— *Alan Goodacre, VE3BZS/3*

[1] "50-Mc. Moonbounce Experiments," Technical Correspondence, *QST*, May, 1962, p. 49.

[2] Soifer, "Research, Tracking and Reporting, Project Echo A-12," *QST*, June, 1962.

DOUBLE-CONVERSION V.H.F. CONVERTERS

R.D. 1, Box 70
Constantia, N. Y.

Technical Editor, *QST*:

The dual-conversion v.h.f. converter technique described by W1EYM in February, 1963, *QST*, page 18, has an additional advantage that was not pointed out in the article. By increasing image rejection, the noise figure of the converter may be improved, since any front-end noise power contributed by the image response acts to degrade the signal-to-noise ratio. This factor alone would justify incorporating dual-conversion techniques into v.h.f. converters.

The ideal dual-conversion system may, however, be somewhat different from that outlined by W1EYM, in that his first-mixer output frequency is high enough to result in poor image rejection in the second mixer, particularly in converters for the 144-Mc. band and higher frequencies. This difficulty is corrected, while retaining the advantage of using a single crystal oscillator for both mixers in the examples shown below. Here a single oscillator is used, but it is followed by one or more frequency multipliers for the first injection frequency, allowing the first mixer to operate at nearly the ideal frequency. The oscillator itself furnishes the injection for the second mixer.

It seems to this writer that the importance of image-frequency noise rejection has not been stressed sufficiently.

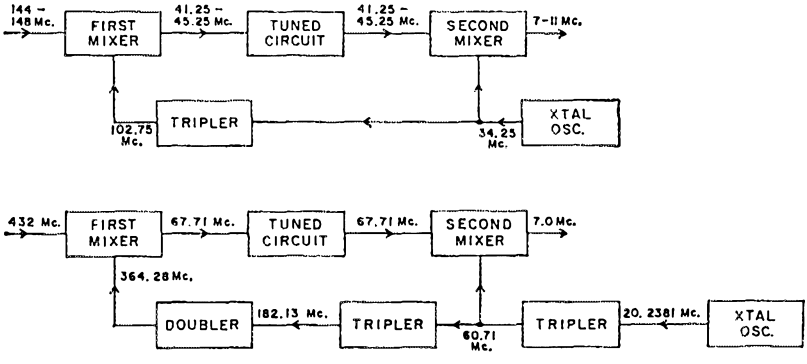


Fig. 1—Block diagrams of typical converters for 144 and 432 Mc., using the double-conversion system described by W2ZKF. In the 144-Mc. version a crystal oscillator and a tripler supply injection for the first mixer, and the oscillator itself, provides the injection for the second conversion. In the 432-Mc. lineup an oscillator at 60 Mc. could be used, if desired. Two frequency multipliers are used to develop the desired injection frequency for the first mixer. In these double-conversion setups the mixers are operated at close to the optimum frequencies in each case, resulting in good image rejection throughout.

Lack of selectivity between the r.f. amplifier and mixer results in r.f. stage noise from the image frequency appearing in the i.f. output. W9VTO pointed out in February, 1955, *QST*, page 132, that noise-figure measurements will be in error if image rejection is poor, but it has not been made clear that there may be an actual degradation of noise figure, rather than just a measurement error. Note that filtering ahead of the first r.f. stage (such as a coaxial filter at the input) does not help, since the majority of the image noise is generated in the r.f. stage.

— *Bruce C. Keene, W2ZKF*

TWIN-LEAD BALUN

9372 Hillview Road
Anaheim, California

Technical Editor, *QST*:

I have found a Twin-Lead balun useful on occasion when it is desired to feed an unbalanced antenna using a balanced line, such as 300-ohm Twin-Lead. The arrangement to be described also performs the function of impedance matching, and is easily constructed using Twin-Lead or open-wire line of arbitrary characteristic impedance. It is the transmission-line equivalent of the lattice or bridge network mentioned in a few texts (see, for example, Laport, *Radio Antenna Engineering*, 1952 edition, page 427) in which equal reactances of opposite sign are used, as in Fig. 2A. For the configuration of Fig. 2A the input resistance for a resistance termination of R_L is given by X^2/R_L.

The inductances in Fig. 2A can be replaced by shorted lines less than $\lambda/4$ long and the capacitances by open lines less than $\lambda/4$ long. Since the input reactances of lossless shorted and open lines are given by the familiar relations

$$X_s = Z_0 \tan \theta_s \text{ for the shorted line and}$$
$$X_o = -Z_0 \cot \theta_o \text{ for the open line,}$$

it is a simple matter to compute the length of line for a given transformation ratio. Since $X_s = -X_o$ in this particular case, $\theta_o + \theta_s = 90°$ or $\lambda/4$, so that the matching balun can be made of two $\lambda/4$ lengths of line, tapped and severed in the appropriate places, resulting in the configuration shown in Fig. 2B. The design formulas are given in Fig. 2B.

This Twin-Lead balun works best at moderately high frequencies below u.h.f. At low frequencies the line lengths are fairly long and lumped constants are probably preferable. At ultra high frequencies, small errors in measurement, radiation from the short circuit, etc., all contribute to spoil the degree of balance achieved unless very careful construction is used and adjustable sections employed.

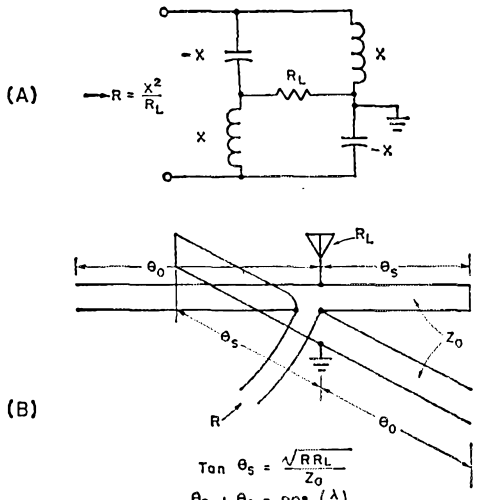


Fig. 2—(A) Impedance-matching balun and (B) the same circuit using transmission-line reactances.

The balun is, of course, reversible, permitting a balanced lead to be fed from an unbalanced input. The same design relations apply.

— *R. W. Johnson, W6MUR*

• Technical Topic

New Propagation Prediction Format

BEGINNING with the January 1963 issue the monthly propagation predictions issued by the Central Radio Propagation Laboratory of the Bureau of Standards have taken on a new look. They also have a new name — "CRPL Ionospheric Predictions" instead of CRPL Series D. The change is not just in appearance; the method of making predictions has been overhauled, too.

The amateur who has used the prediction charts in the past will immediately recognize a significant change: The "zone" idea has been discarded, and the familiar E, I and W are no longer with us. The world maps (modified cylindrical projection) with their m.u.f. contours look the same, superficially, but are now drawn worldwide for 2-hour intervals beginning at 00 UT. You pick the map for the time of day at which you want to gauge the propagation possibilities, put on the overlay that traces the signal path, and that's it for that month. The traditional control-point method is used for determining whether the path will be closed or open, using the F_2-4000 m.u.f. map.

An innovation is a new set of prediction maps centered on the North and South poles. These, however, are given for only two times, 00 and 1200 UT. They are used in the same way as the others — except, of course, that the signal path must be traced from different basic maps.

The new series omits the *E* layer predictions that formerly were included. Deviations from the norm in the regular *E* layer are so minor that it is no longer considered necessary to make predictions on a short-term basis. The *E*-2000 m.u.f. is obtained from a nomogram based on the sun's zenith angle and the current running-average sunspot number. The nomogram and charts giving the zenith angle are included in Handbook 90, *Handbook for CRPL Ionospheric Predictions*, which replaces Circular 465, the former "instruction book" for using the predictions.

For predicting long-distance propagation by the F_2 layer the new method should be easier and quicker than the old. There is no change in the cost of the predictions —15 cents per copy or $1.50 per year ($2.00 foreign). Handbook 90 is 40 cents per copy. Both are available from the Superintendent of Documents, Washington 25, D.C. — *G.G.*

Hints and Kinks For the Experimenter

FIBERGLAS SOURCE

ALMOST any sports shop that repairs Fiberglas fishing rods usually is an excellent source for transmission-line feeder spreaders. These shops usually have a large collection of odd lengths of Fiberglas rod available at a nominal charge. Fiberglas has excellent electrical characteristics, is easy to cut, notch and drill. You probably can find many other uses for it around the ham shack.

— *Leslie L. Sterling, W7GBL*

TWOER OR SIXER BAND MONITOR

THE device shown in Fig. 1 consists of a small display motor mechanically coupled to the tuning dial of a Heath Twoer or Sixer. As the motor turns, it tunes the receiver back and forth across the band, allowing the operator to monitor the entire band without touching the controls. When a station is heard or when it is desired to tune the receiver manually, the wire is pulled out of the hole in the tuning dial.

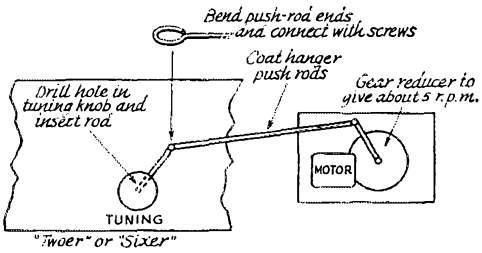


Fig. 1—K2YSN's automatic band monitor.

The linkages are formed from an old coat hangar; the motor and gear drive were salvaged from a store advertising-display sign. I mounted my drive assembly in an 3 × 5 card file box. It was necessary to cut a slit in the side of the box to allow for movement of the "push rod."

— *Bruce Block, K2YSN*

SOLDER REMOVING TIP

A DESOLDERING technique which has appeared recently in several publications involves the use of a syringe bulb and a short length of small diameter spaghetti, or better yet, a short length of Teflon tubing.

The tubing is connected to the syringe and the joint to be cleaned of solder is heated with a soldering iron. The "squeezed" syringe is brought near the connection and then released. The suction will pick up the excess solder and draw it into the tube. In the case of spaghetti, the first ½ inch or so is cut off, since it will now be stopped up with solder. With Teflon tubing, the solder may either be shaken out, or poked out with a piece of wire. In either case, the connection will be left free of solder.

— *D. P. Marlow, K7ASY*

ANOTHER NUT STARTER

HERE is an old trick that still works — it might save you a bit of bother. Did you ever try to put a nut into a spot where your fingers or your long-nose pliers wouldn't go? Just take a short length of solder, flatten the end a bit, and force it part way into the nut threads. Bend the solder into the form necessary to get down to that inaccessible bolt, and there you have it. Now all you have to do is to get at the bolt head with a screwdriver! If you can't do that, you had better move the whole works.

— *R. O. Deck, jr., W9JVI*

STORING DRILL-CHUCK KEYS

MANY ways have been suggested for keeping track of drill-chuck keys. These have ranged from using a rubber band around the body of the drill to actually welding a magnet to the case of the drill for holding the key.

A more reliable and safer way to do the job, and one that I have used for many years, is to tape the chuck to the power cord near the plug end. This scheme requires that the a.c. plug be removed from the electrical outlet when changing drills, and this reduces the possibility of accidental triggering of the motor switch.

— *Harold E. Davis, W8MTI*

SLUG-TUNED COIL KNOB

FOR small slug-tuned coils that need frequent adjustment, try using the top from an old push-button spray can for a knob. Just put a few drops of cement in the knob hole and press onto the shaft. Some of the spray-can tops have a small arrow that can be used as an indicator.

— *Paul Jacobs, K9LXX*

CLEANING LITZ WIRE

IT is important, when using Litz wire, that none of the individual strands be broken when making a connection and that each strand be cleaned of all enamel. The easiest method I have found to do this is to heat the end of the wire until it is red hot and then plunge the red-hot end into an alcohol bath. This method is superior to using fine sandpaper as there is no risk of breaking the wires and they are all cleaned and ready for the solder.

— *R. F. Wright, jr. W2YZT*

Oscar Exhibit in Geneva, Switzerland

THE recently completed building of the International Telecommunication Union in Geneva, Switzerland was the scene of the most recent exhibit of the Oscar beacon satellite. Held under the auspices of the International Amateur Radio Club of the ITU (4U1ITU), the European Region of the International Amateur Radio Union (IARU), the Swiss Amateur Radio Association (USKA), and the American Radio Relay League (ARRL), an exact model of the Oscar satellites which were placed in orbit during December, 1961, and June, 1962, was displayed for a two-week period beginning February 9. The model on display was actually the backup satellite which would have been launched into space had either Oscar I or Oscar II failed.

The satellite, placed in a prominent section of the lobby, was artistically displayed to give an illusion of flight. Surrounding the satallite were the flags of the countries from which amateur tracking or reception reports were received. Illustrated panels, with texts in both French and English, described the satellite, its purpose, and the results so far achieved. The Geneva exhibit was designed by Herbert Wahlberg, SM5ANV, Werner Wolter, DL1YJ, and Ted Robinson, ex-HS1UN. Several other members of the International Amateur Radio Club assisted in assembling the exhibit.

In connection with the opening of the Oscar exhibit, February 9 was celebrated as a Special Activities Day devoted to amateur radio. An all-day technical program held in the Administrative Council Chamber of the ITU included welcoming addresses by Dr. M. B. Sarwate, Deputy-Secretary-General of the ITU, John Gayer, DJØHW, Chairman of the International Frequency Registration Board, Alfred Schadlich, DL1XJ, of the IARU, Hans Buhler, HB9XJ, of USKA, and Dr. M. Joachim, OK1WI of the International Radio Consultative Committee (CCIR).

Among the invited speakers were Dr. Smith-Rose, noted British inonospheric scientist, who discussed the role radio amateurs have played in the field of radio wave propagation; Dr. Miya of Japan who spoke about v.h.f. and u.h.f. propagation; Dr. Menzel, HB9AAB, who discussed present propagation conditions in the various h.f. bands allocated to amateur radio; and Dr. Hovath of the Hungarian Ministry of Communications, who spoke about amateur radio in Hungary. Various aspects of the Oscar amateur radio satellite program were discussed by George Jacobs, W3ASK, Herbert Wahlberg, SM5ANV, and Igor Dolozel, OK1KKA. The technical discussions were followed by a film presented by Al Embrechts, W2YEJ/HB9, which depicted amateur radio in South America, and which also included some beautiful scenes of the little-photographed Inca country of Peru.

The guests of honor at the Special Activities Day ceremonies were the Swiss radio amateurs who participated in the Oscar beacon satellite program. Taking part in the program in Geneva were Bernard Pellaton, HB9WB, Bernard Zweifel, HB9RO, and Aldo Zollinger, HB9LG. Franco Crespi, HB9ZE and Alfred Egger, HB9BX, who also copied signals from the Oscar satellites, were unable to attend the ceremonies.

Several hundred visitors viewed Oscar, the radio amateur satellite, during the first few days of its stay in Geneva. Oscar's visit to Geneva received prominent press coverage in Swiss newspapers, and on Swiss radio and television. Oscar was the first satellite program in which Swiss nationals had participated. The Oscar exhibit in Geneva was another tangible demonstration of amateur radio's ability to pioneer new methods and techniques in the field of radio communication. It was also another example of the increasingly effective international cooperation on a technical level which is being achieved by radio amateurs throughout the world. QST

Hans Bühler, HB9XJ, speaking from the Administrative Council Chamber of the ITU extends greetings on behalf of the Swiss Amateur Radio Association (USKA) to the large number of radio amateurs and their friends who attended a Special Activities Day program in connection with the recent Oscar exhibit in Geneva, Switzerland. To the left is ITU official John Gayer, DJØHW, and to the right are ITU officials Dr. M. Joachim, OK1WI and Dr. W. Menzel, HB9AAB.

Gazing at the Oscar beacon model on display recently in Geneva, Switzerland are (l. to r.) Igor Dolozel, OK2KKA; Herbert Wahlberg, SM5ANV; George Jacobs, W3ASK and Werner Wolter, DL1YJ. Beneath the satellite are the flags of the two dozen countries from which Oscar tracking and reception reports were received.

Micro-Band F.M.

A Solution to the QRM Problem

BY JOHN WASMUTH,* W8SBQ

The current near-saturation of some of our bands and the many discussions of possible solutions make this report something more than timely. Look for complete constructional details at some later date.

IF YOU have been wondering about and perhaps "cussing" those mysterious "unmodulated" carriers heard on or near 3810 kc. during the past six months, wonder no longer. You have been lucky enough to monitor a series of test "micro-band" f.m. transmissions by members of the "Coffee Dunkers of Detroit."

The Coffee Dunkers of Detroit is a small radio club of twelve members that is dedicated to furthering the art of amateur radio. Before a member is accepted, he must have earned a 35 w.p.m. code-proficiency certificate, hold an Extra Class license, and have either built all his equipment or have a completely-equipped Collins station. The club is dedicated to research and the development of new techniques, and it is a rare day when a "Dunker" can be found in an idle rag chew.

As the sunspots began to fade, the Coffee Dunkers decided that something had to be done to insure use of the 10-meter band, and all members have made extra efforts to conduct interesting QSOs on the 10-meter band. Their Tuesday evening technical forums are an inspiration to all hams tuning in.

As part of our research program, we decided to resurrect some old modes of transmission and check them again thoroughly, to make certain they really should have been discarded no matter how out of vogue they might have become.

Each member took a different mode and developed appropriate equipment, and an historic Tuesday night net was planned for many weeks in advance. Assignments were as follows: c.w., W8HHV; RTTY, W8ZRZ; a.m., W8EIM; spark, W8AM; TV, W8CEY; d.s.b., W8HAI; f.m., W8MPZ; n.f.m., W8SBQ; ground audio, W8CBM; laser light, W8CU, s.s.b., W8PHJ.

The second Tuesday of October we attempted to communicate by these various modes, and great local interest was generated. W8AM's transmissions drew much excitement on all bands and brought tears to the eyes of more than one old timer. The highly technical results will be reported in a forthcoming issue of the *Proceedings of the I.E.E.E.*, with the exception of W8CBM's ground-audio studies, which turned out to have some interesting sidelights.[1]

All of the foregoing is merely background for reporting the truly outstanding achievement of the entire project: microband f.m. My station, W8SBQ, was operated on n.f.m. at 28.815 Mc. W8CBM, who has elaborate monitoring and measuring equipment, made a qualitative report that indicated the clipping to be quite effective, the audio quality excellent, and the bandwidth exactly 6 kc. In reporting to the group relative to my method of developing the n.f.m. signal, I mentioned that I was using a reactance modulator on a 160-meter v.f.o. and had to set the gain very carefully, since in doubling four times to 10 meters very little initial deviation was required.

On this point W8HHV commented, "I'll bet your 160-meter oscillator is hardly wiggling at all." With this remark, it dawned on me that if my bandwidth was only 6 kc. on 10 meters after a frequency multiplication of 16 times, the signal must be only *375 cycles* wide on 160! Why not *transmit* a signal with only 375 cycles deviation and frequency multiply *in the receiver!* All the Dunkers grasped the implications immediately as I expounded on the potentiality, and a secret off-the-air meeting was immediately called. All members set to work designing and building frequency-multiplying i.f. amplifiers. While various approaches were used, all were successful. The simplest, as shown in Fig. 1, consists of a converter, to heterodyne the signal to 50 kc., followed by two semiconductor-diode quadruplers and a semiconductor discriminator operated at 800 kc. Old-fashioned vacuum-tube frequency multipliers can be used, but the semiconductors are more compact and efficient. The 75-meter 375-cycle transmissions are of course obtained by reducing the deviation on the 160-meter v.f.o. to 187 cycles.

In all tests, excellent results were achieved with the transmitter emitting 350-cycle deviation signals. The technique is simple, foolproof, and an obvious solution to the QRM problem. In the early stages of the game, one can expect the signals to go unrecognized by most amateurs, and merely cussed by them as unmodulated carriers. The cost of converting an existing a.m. or c.w. transmitter to m.b.f.m. is practically nil, since it requires only the addition of a reactance modulator to the existing v.f.o. The v.f.o. should be stable, of course.

An i.f. multiplying converter can be built to Coffee Dunker approved specifications for about $27 if all parts are purchased new, and for con-

* c/o Detroit Insurance Agency, Fisher Building, Detroit 2, Mich.

[1] Blett, "Harvesting Fishworms for Fun and Profit," *Michigan Agricultural Report No. 24680*, March, 1963.

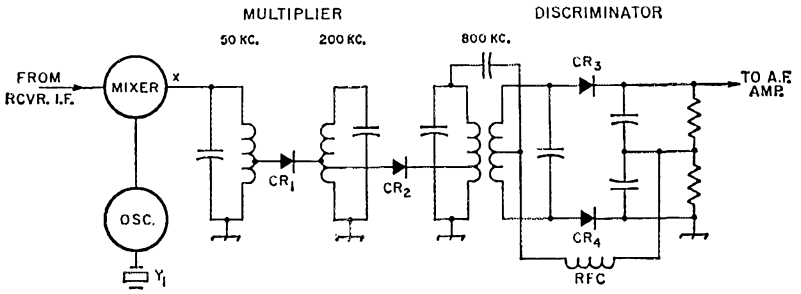


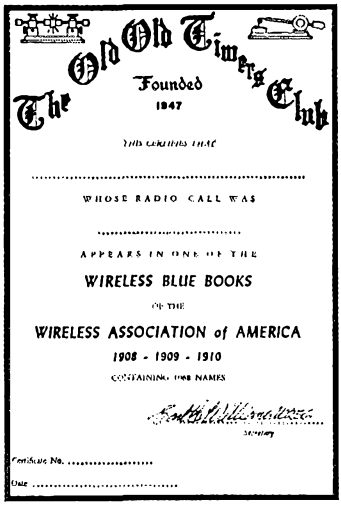
Fig. 1—Typical schematic of an m.b.f.m. receiver converter. The frequency of the crystal, Y_1, will be the receiver i.f. plus 50 kc. When sharp filter is used, for maximum selectivity, it is inserted ahead of 50-kc. circuit at "x".

siderably more if you have a well-stocked junk box. If available, a filter of 400- to 500-cycle bandwidth should be inserted at point "x" (Fig. 1) to give maximum selectivity during reception. However, whether a filter is used or not, it can be seen that 16 m.b.f.m. channels are available where only *one* a.m. or *two* (maybe 2½) s.s.b. channels are available before. Since all of the output power is concentrated in a very narrow channel, the communications effectiveness is even greater than that of s.s.b. This simple solution to the phone QRM problem will make it possible to reduce the phone allocations and increase those for c.w. and other backward modes.

Any Coffee Dunker will be glad to assist you in getting your station converted. While commercial rights are reserved, all hams are freely authorized to build m.b.f.m. equipment for their own use. See you on m.b.f.m.! QST

Strays

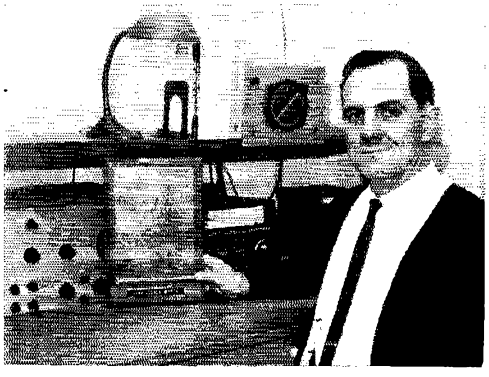
Those of you who are county-happy and looking for rare Ohio counties — see the Ohio news in Station Activities this month.


The Old Old Timers Club
Founded 1947
This certifies that
.....
WHOSE RADIO CALL WAS
.....
APPEARS IN ONE OF THE
WIRELESS BLUE BOOKS
OF THE
WIRELESS ASSOCIATION of AMERICA
1908 - 1909 - 1910
CONTAINING ... NAMES
.....
Secretary
Certificate No. .....
Date .....

The above certificate is being awarded by the Old Old Timers Club to those whose names appear in the three pre-government call books issued by *Modern Electronics* in New York in 1908, '09, and '10 (but dated 1909, '10, and '11) and called *Wireless Blue Books*. There are 1068 names in the three books, but to date only 16 certificates have been issued. If you qualify, send your name, address and present call (if any), and old call (if known) to Harold V. B. Voorhis, 60 Remsen St., Apt. 9C, Brooklyn 1, N. Y.

The following item, taken from an FCC general information bulletin, lends some credence to the Templeton Case, which some of you may have heard of?

A broadcast station received a complaint from a "captive" listener that the station's programs were blanketing the entire dial on his receiver. Before the FCC Baltimore office could investigate, word came of the complainant's shamefaced discovery that the inside cord on the dial of his set had broken, causing the tuning condenser to remain stationary when the dial was turned.



A recent *QST* cover plaque award winner (the League's Board of Directors each month chooses what it thinks to be the best article in the current issue and awards the chromed plate which was used to print that issue of *QST*) was John Isaacs, W6PZV, for his article on a filter-type sidebander in the November issue.

Happenings of the Month

SUMMARY OF FCC CITATIONS

During the months of October, November and December 1962, the FCC issued 307 Official Notices of Violation to amateurs, as compared with 248 in the previous quarter. Below we tabulate the number of violations, definition and section of the rules which was violated:

No. of citations	*Rule violated*	*Section no.*
164	Frequencies and types of emission	12.111
50	Purity and stability of emission	12.133
30	Sidebands confined within band	12.113
25	Transmission of call signs	12.82
14	Power supply to transmitter	12.132
8	Classes and privileges of license	12.23
6	Notice of portable mobile operation	12.91
2	Requirements for portable/mobile	12.90
2	Frequency measurement; regular check	12.135
2	Good engineering and good amateur practice	12.151
2	Log keeping	12.136
1	Retention of logs	12.137
1	Radio station log (RACES)	12.244
1	Availability of station authorizations and operator licenses (RACES)	12.243
1	Availability of operator license	12.25
1	Availability of station license	12.68
1	Points of communications	12.101
1	Broadcasting prohibited	12.103
1	Codes and ciphers prohibited	12.105
1	Modulation of carrier wave	12.134
1	Quiet hours — third notice	12.154
1	Obscenity, indecency, profanity	12.157
1	Willful or malicious interference	12.160

The complete text of the amateur regulations may, of course, be found in the *Radio Amateur's License Manual.*

AMATEUR LICENSE SUSPENDED

The General Class amateur operator license of Andres Calandria, K5MVP, of New Orleans was suspended for one year for a number of offenses occurring in 1961. The suspension notice, originally issued in January, 1962, cited Mr. Calandria for failure to identify his station; broadcasting music, singing and other material; operating with an unmodulated carrier; failure to keep a complete log; failure to operate in accordance with good engineering and amateur practices; transmission of unidentified signals; and causing deliberate interference to the operation of other amateur stations. The amateur requested a hearing, which was held on May 22-23, 1962, but the hearing examiner upheld the original suspension and it finally became effective on October 19, 1962 after time for appeal had passed.

[*Rules governing the Amateur Service, Sections 12.82, 12.103, 12.134, 12.136, 12.151, 12.159 and 12.160*]

NATIONAL CONVENTION CLUB DISPLAYS

Attention, clubs — the 13th ARRL National Convention to be held October 4-6, 1963, in Cleveland will feature, in addition to the usual commercial exhibits, unusual displays by a number of radio clubs. If your club has a display you feel would be of interest to other amateurs, get in touch with the ARRL National Convention Committee, P.O. Box 5167, Cleveland 1, Ohio.

During W6ZH's trip to Europe (see page 66, QST for March, 1963) our president visited the headquarters of the *Vereniging voor Experimenteel Radio Onderzoek in Nederland* (VERON), in Amsterdam. Here he is shown chatting with VERON president PAØDD.

The Honorable Robert Bonner, attorney general of British Columbia (center) congratulates VE7ALE, president of BCARA, as the first call letter license plates are distributed in the Province. Also present: Jack Striha of the Motor Vehicle Branch; VE7DV, chairman of the license plate committee; and VE7GE, member of the Legislature who presented the case to the government.

Oscar II:

A Summation

BY WILLIAM I. ORR,* W6SAI

OSCAR II, the world's second radio amateur space satellite, was launched from a regularly scheduled space vehicle at 0032 GMT, June 2, 1962. The launch was accomplished without incident, and the first amateur stations to report acquisition of Oscar II's 100-milliwatt, 145-megacycle beacon were KL7FLB and KL7FLC as the satellite crossed the northern polar regions of the globe during the initial orbit.

All instrumentation at the launch site indicated that the package had achieved orbit; however, radio propagation conditions between the launch site and Oscar Control station, W6EE, deteriorated rapidly before launch and the 7-Mc. s.s.b. link failed a few moments before "blast-off"! The coded launch message finally reached W6EE via five separate relay stations, one of which was a mobile operator driving along the coast highway north of San Francisco! The launch message barely arrived in time for relay on 14-Mc. to W4ABY who held an open channel to the South Pole tracking station, operated by radio amateurs at KC4USB, Marie Byrd Base, Antarctica.

Acquisition of Oscar II at the Antarctic tracking station was not achieved. KC4USB reported no reception of signals on or near the beacon frequency. Had the Oscar II satellite failed to achieve orbit? Had the electronic equipment failed at the last minute? A thick pall of gloom swept over the anxious amateurs manning W6EE as the Hq. clock crawled on, ticking off an eternity until Oscar II would theoretically pass over KL7FLC on Arlis Ice Island at the top of the world. This would be the last planned acquisition of orbit #1 for Oscar II, and the task of "finding" the tiny satellite (handicapped by an unknown orbit and inclination) would be vastly complicated. Unknown at the time was the fact that the orbit inclination caused the satellite to pass the Antarctic land mass out of range of the radio amateur tracking station so carefully monitoring the frequency of Oscar II. Finally, 80 tense minutes after launch, the electrifying news of acquisition was received from KL7FLC. Oscar II was in orbit about the earth!

Preliminary tracking reports from Alaska and Hawaii indicated that Oscar II had been launched from the parent vehicle in a southerly direction, at an inclination of approximately 73 degrees with the equator. The initial period of the satellite was established as 90.55 minutes, indicating a lower orbit than that of Oscar I.[1]

Coincident with confirmation of orbit, W6EE was activated on 144, 14, 7 and 3.5 Mc. Wire cables were sent out to all Oscar Overseas Coordinators[2] indicating that orbit had been achieved and initial orbital predictions were bulletined from W6EE on a 24-hour basis. All original prediction messages were tape-recorded and punched on teletype tapes, the tapes then being sent to W6ASH and K6JTC for relay to W1AW.

The last reported reception of Oscar II occurred during orbit #295 at 0910:30 GMT, on June 20, 1962 and was logged by WØBGY at Cloquet, Minn. when the tiny satellite was northbound over the central United States and Canada. Twenty minutes later the satellite should have been heard while passing in the vicinity of

* Project Oscar, Inc., Box 183, Sunnyvale, Calif.

[1] Oscar 1: A Summary of the World's First Radio Amateur Satellite, Orr, Sept., 1962 *QST*, p. 46.

[2] Oscar II Flight Imminent, June, 1962 *QST*, p. 43.

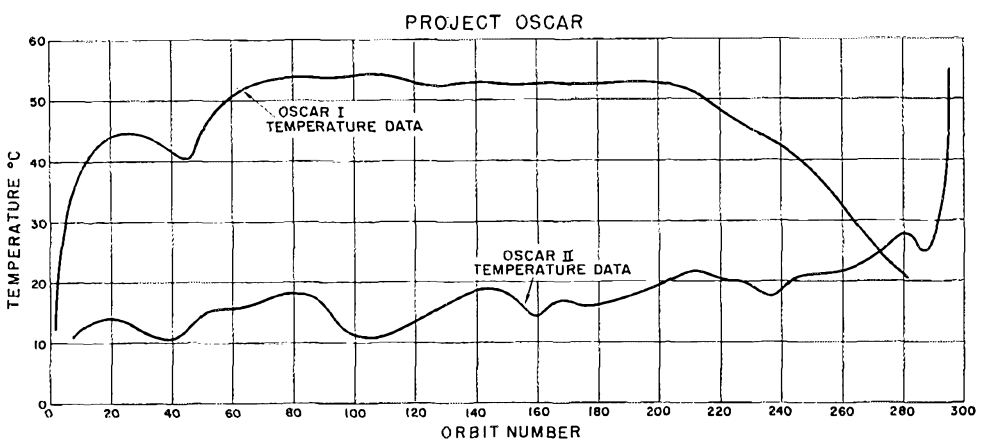


Fig. 1—A comparison of the Oscar I and Oscar II temperature curves as derived from the telemetered data logged by nearly one thousand tracking stations. Modifications to the thermal conductivity of Oscar II based upon the flight of the first satellite provided a relatively constant package temperature until the satellite began to drop into the atmosphere of the earth at approximately orbit #288.

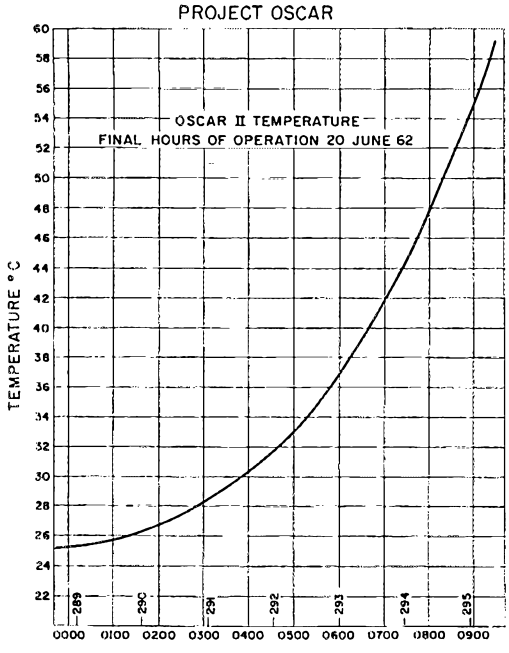


Fig. 2—The internal temperature of Oscar II rose quickly and smoothly during its final orbits. During orbit #295 temperature rise was so rapid that telemetered data changed noticeably during a single overhead pass. WØBGY, of Cloquet, Minn., was the last station to hear Oscar II during orbit #295, as satellite disappeared between passage over northern polar regions.

Helsinki, Finland. Negative reception reports were received from OH amateurs and other European tracking stations on the expected pass, and the action of the observed satellite temperature makes it seem likely that Oscar II failed during this orbit as a result of aerodynamic heating of the package (Figs. 1 and 2). The study of the temperature of Oscar II is interesting, especially when viewed with respect to the temperature information obtained from Oscar I.

Satellite Temperature

A primary environmental condition affecting an orbiting object is heat which may arise from internal power dissipation, aerodynamic effects, and from external radiation. Accordingly, it is necessary for the space-package designer to have data on this facet of his equipment's performance. The temperature telemetry system of Oscar I and II satellites has provided good temperature data and has demonstrated the capability of radio amateurs in the art of gathering and interpreting telemetry information.

Temperature telemetry for the Oscar satellites is achieved by the use of a pulse rate measuring system.[3] The timing pulses which control the operation of a code generator are produced by a temperature-sensitive free-running multivibrator. The net output of the "clock" multivibrator and the generator is a string of dots (pulses), suitably spaced to form the word HI (. . . . .). Thirty-two clock pulses are required to complete a code sequence, with the code cycle repeating itself endlessly as long as the "clock" runs. The speed at which the HI's are sent is controlled by the temperature of thermistors mounted on the printed wiring board of the satellite package, and the indicated temperature is that of the contents of the package.

The "clock" pulse generator of Oscar II differed slightly from that of Oscar I in that the second satellite was immune to battery fluctuations, by virtue of Zener diode regulators incorporated in the clock circuit. The observed data, therefore, was very nearly independent of battery voltage up to the point where the Zener regulator lost control and the keying became erratic. This point was not reached during the lifetime of the satellite. The measured satellite temperature is a balance between the initial heat of the object, the heat received by direct radiation from the sun, the internal heat generated by the circuitry, and the heat lost by radiation from the surface of the satellite.

The temperature findings obtained from the reduced telemetry data of the Oscar I flight were put into effect for the Oscar II package. First, the voltage regulation of the electronic system was improved to make the "clock" independent of battery voltage. Second, the surface treatment of the package was altered to lower the working temperature. This was accomplished by covering the metal shell with a layer of adhesive-backed aluminum foil. The dark, absorptive striping was then painted over this surface. The ratio of striped area to aluminum area was adjusted to provide the desired heat flow.

As a result of the changes in the surface treatment, the temperature of Oscar II ran appreciably lower than Oscar I (Fig. 1). The Oscar II temperature curve drifted higher throughout the flight, with a rapid rise as re-entry time approached. Fig. 2 shows the indicated temperature of the package during the last six orbits.

Two marked dips appear in the temperature pattern of Oscar II (at orbit 40 and orbit 100). The first dip coincided in time with the temperature dip noted in the Oscar I flight, although the

At this neat station, VE2UQ made many observations of Oscar. He's holding a map with plastic overlay which allowed him to plot the orbit paths.

[3] The Oscar Satellite, Gabrielson, Feb. 1962 *QST*, p. 21. Project Oscar: A Report, Stoner, Feb. 1962 *CQ*, p. 24.

magnitude of the former was only half of that of the latter. The second dip in Oscar II temperature was larger than the first one but had no counterpart in the Oscar I data. There can be little doubt that the same phenomenon caused the temperature dips in both flights. Continued investigation of the temperature variations may throw additional light on this subject.

The general, upward drift in the internal temperature of Oscar II was probably caused by aerodynamic heating, which was less noticeable in the flight of Oscar I. A basic difference between the flights, severely affecting the package temperature, was the different orbit altitudes. At the end of the flight of Oscar I when its batteries expired, Oscar I was considerably higher in altitude than the initial altitude of Oscar II. The lower altitude of Oscar II subjected it to greater atmospheric drag forces which, in turn, led to greater friction heating as a result of the satellite colliding with air particles.

The temperature of Oscar II rose very rapidly during orbits 290–295. By the early portion of orbit 295, the telemetered data indicated the internal temperature of the satellite had reached 54° C and was climbing rapidly when the satellite signals were last heard. As some of the electronic components were reliable to only 60° C, failure of the equipment was imminent as the radio amateur tracking stations in Minnesota (WØPAM, WØBGY, and WØJHS) bade farewell to Oscar II. With the last reported internal temperature at 54° C, the outer shell temperature of the satellite was probably in excess of 100° C during the final observations. Orbit 296 would have passed almost directly over the Oscar Control Tracking Station near San Francisco. Both radio and visual observations of the satellite by W6EE and others were attempted at the predicted time with negative results.

Oscar II Data Processing

The major effort required to process the raw data of the Oscar I flight was lightened by the help of Bill Walters, W6MKE, of IBM, San Jose. Bill managed to arrange for computer time to be made available for the reduction of flight and telemetry information. Various key-punch forms were made up and all data was fed to the computer. Once the cards were punched, the mass of data could be rapidly scanned for important characteristics of the flight.

The raw data accumulated by the Control Center was turned over to Ed Hilton, W6VKP. Ed and his chief assistant, 15-year-old daughter Barbara, reviewed all the data sheets and checked them for errors. By the time this efficient team completed its work, the tracking forms were in shape for key-punch operators to handle. The IBM computer cards were coded in such a way that information on all important facets of the individual report could be extracted at will by the computer for rapid evaluation. The original reports were filed in the call-letter sequence if further information was required.

The computer card deck can provide material for any number of studies and investigations, limited by the availability of computer capability and programming ability, and these cards will be made available to any qualified individual wishing to perform special studies. Arrangements should be made through Project Oscar, Inc.

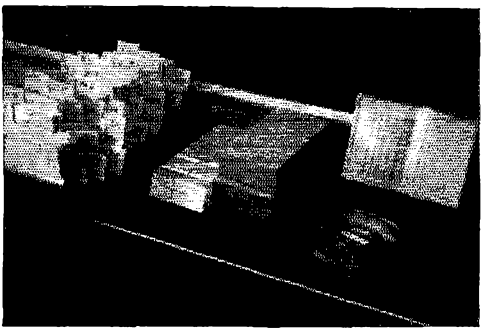
Data processing crew received raw data from W6VKP in correct form to "feed" to IBM computer on punched cards. Harley Gabrielson, W6HEK (left); Bill Walters, W6MKE (center); and Jim Whitfield, K6BHN (right) coded data so that all important facets of Oscar II flight could be extracted rapidly from the computer for rapid evaluation.

A noticeable improvement in the quality and accuracy of reports could be observed when the Oscar II data was compared with the earlier data gained from Oscar I. The later reports showed an improvement in the technical capability of many reporting stations, and a large increase in the number of doppler reports. The geographical distribution was also significantly different for the two operations. Of the 461 stations reporting Oscar I, only 111 were outside of the continental USA. For Oscar II, there were 685 reporting stations, with 282 of them outside continental USA. Of additional interest, was the large number of "old timers" — two-letter calls and calls familiar from the pre-war days of 2½- and 5-meter v.h.f. activity — who were active in the Oscar tracking programs. A total of 955 different observing stations were involved during the two operations.

Tumble and Roll

Occasional reports of signal fluctuations of Oscar II were received that led to the conclusion that the package was tumbling, or rolling in space. These reports were inconclusive and no accurate data was obtained until Lance Ginner, K6GSJ, made an oscillograph recording of one pass during which a modulation of the signal amplitude is clearly discernible. The "roll modulation" appeared to be about 30%, with peaks occurring at 33-second intervals, indicating a complete roll of the package every 66 seconds. Tumble data were inconclusive, which would seem to indicate that the package was rolling rather slowly about an axis very close to the axis of the antenna rod.

One amateur in particular did a great deal of excellent polarization measurements — E. C.



"Raw" data in received reports (left) was transcribed to IBM punched cards (center) for rapid evaluation. The computer provided a printed tabulation of Oscar II flight (right) as well as a permanent file on magnetic tape (foreground). Punch cards are available for special studies.

Kunze, WØWVM, of St. Paul, Minn.[4] His elaborate equipment and painstaking observations indicated that Oscar II's general position in space was such that its antenna lay in a plane parallel to the equatorial plane of the earth.

Reception of Oscar II

Tracking reports of Oscar I and II point to consistent reception at horizon ranges close to 1250 miles. The shortest reception range of Oscar II would have been about 84 miles, directly overhead during orbit 295. The signal source of the second satellite developed a power of 140 milliwatts radiated from a half-wave dipole in free space. The space loss corresponding to the mentioned ranges runs from about −118 decibels to −140 decibels. Under these conditions, the received signal power should be between 1.8×10^{-14} and 20×10^{-14} watts. For comparison, 1 microvolt into a matched 50-ohm termination is 2×10^{-14} watts. Obviously, a dipole or ground plane receiving antenna coupled to a receiver having a reasonably good noise figure (plus a relatively quiet location!) could enable the observer to track Oscar II out to the radio horizon. Signal strength reports of Oscar II ran from "just audible in the noise" to "50 decibels over local noise." The latter report is well within the realm of possibility with the combination of a high gain receiving antenna, a quiet location, and a low-noise receiver having a narrow i.f. response.

In general, the horizon was the limiting factor in the reception range of both Oscar satellites. It is quite common in reviewing reports from a group of stations in one locality to find that the loss of acquisition time to agree among the observers within ten seconds or less. When loss time approached, the signal would drop abruptly out.

Numerous cases, however, were verified in which the signal dropped sharply out and then seconds later reappeared at a relatively low strength for a few seconds before fading out completely. It is believed that these instances were true cases of beyond-horizon reception, but the mechanism is obscure. It could be knife-edge diffraction, tropospheric bending, or ducting in a temperature inversion environment. A verified report of over-3000-mile reception of Oscar II was noted by EA4AO in Madrid, Spain, who logged the satellite on orbit #17 when Oscar II was over the island of Madagascar! Reception was probably by means of trans-equatorial scatter.

The effects of antenna polarization and multiple lobing were noted by several observers. As the satellite passed through the lobes of the receiving antenna the signal was often lost or very weak for short periods of time. Passes directly overhead were troublesome for some stations, particularly if their beam antennas could not be elevated. The signal would completely disappear, only to be heard later as the satellite was receding.

During the life of Oscar I (December, 1961), KL7FLC on Arlis Ice Island reported an aurora phenomena. He was far enough north to be able to hear and observe Oscar I during each pass. During times of auroral activity, the satellite signal could not be heard, proving the v.h.f. signal did not pass through the aurora. The situation for Oscar II was quite different — in the month of June 1962. No reports have been received concerning inability to receive the signals because of auroral activity. Unfortunately, the inclination of the orbit of Oscar II reduced the opportunity for observation at lower latitudes, as only 2 or 3 minutes of each pass could be heard.

The Unlaunched Oscar

Three Oscar packages have been built and tested, and two of the three have been successfully placed in orbit. The third package was of a different design, having a power output of 250 milliwatts with a continuously running oscillator providing phase coherence between keying pulses. Dimensionally, all three units were interchangeable and all three units successfully completed the environmental testing. The remaining Oscar package was designed, built and tested by Chuck Smallhouse, WA6MGZ, and Orv Dalton, K6VEY. The value of their contribution to the Oscar program was certainly not lessened by the fact that their Oscar satellite was not launched into space.

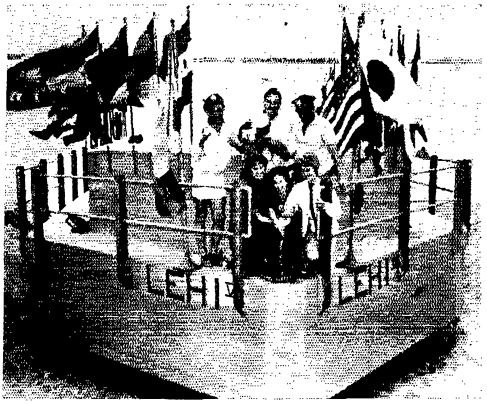
Oscar II Orbital Predictions

Orbital predictions for the Oscar II program were under the management of Ralph Wells, K6QMJ. Predictions were generated showing progressive equatorial crossing times and corresponding longitudes as well as acquisition times and azimuth for various cities of the world. During the exercise, "spot" predictions for the cities were modified to provide equatorial crossing time, longitude and city name were provided for each orbit, along with the time in minutes that it took Oscar to travel from the equator to the city named. This information proved sufficient for most observers, and saved considerable computation time. The operators at W6EE

(*Continued on page 148*)

[4] "Space-Age Antenna Ideas," Kunze, June, 1962, *QST*, p. 11.

Strays



The raft Lehi V has gotten underway for a five- or six-year "drift" around the world—studying ocean currents and marine life. The 40 × 20 foot craft, weighing some 30 tons, has many of the comforts of home aboard, including electric power and a ham station. ARRL's Southwestern Division Director W6MLZ was aboard for the first leg of the cruise, underway on February 27 from San Diego to Ensenada, Mexico.

WAMRAC — the World Association of Methodist Radio Amateurs and Clubs — is having its first Activity Weekend on May 25–26. For complete information on this activity and membership in WAMRAC, write to the Rev. Arthur W. Shepherd, G3NGF, WAMRAC Hq., 121 Main St., Asfordby, Melton Mowbray, Leicester, England. The WAMRAC is devoted to world-wide friendships among Methodist radio amateurs.

FEEDBACK

Our apologies, OMs. That's W6PQH on the cover of February *QST*, not W6TQH. (Tnx, WA6EPX.)

—···—

Okay, Mr. Kennedy, we hams are fit, too. (Well, some of us, anyway.) Among those who have completed 50-mile hikes are KØUWZ and W7DFJ.

—···—

In ARRL's Southwestern Division a committee is working on the possibility of there being an amateur radio float in next year's Annual Pasadena Rose Parade. Because this parade is attended by more than a million people, and televised to many millions more by TV, here is a great chance for favorable publicity for ham radio. But it will cost money (some $5000), and your donation is solicited. Please send contributions to Amateur Radio Rose Parade Committee, Box R, San Gabriel, Calif. Please send check or money order, or cash by registered mail. Be sure to include your name and address. If the project falls through, your money will be returned. But the committee needs to hear from you *now*, so that it will know whether to go ahead with the project. Not next month — *now!* Committee chairman is Kay Koch, K6HIT.

—···—

WØPB holds the distinction of having operated from the lowest (Death Valley, Calif.) and the highest (Mt. Whitney, Calif.) points in the "lower 48" states.

—···—

Extra space for the Correspondence From Members section this month crowds out our usual Building Fund page. Be back next issue.

—···—

Keep a listen for KØVRF/MM and K9QBC/-MM, who are aboard a couple of Navy ships on a cruise to ports in Africa and the Mediterranean. They'll be on the air around 14.3-Mc. sideband every chance they get between now and May 26. Special QSLs will be sent.

—···—

WØFQY, president of Mosley Electronics, includes magic among his many talents, and he has discovered that many other hams have a similar interest. He'd like to hear from all hams who are amateur or professional magicians.

—···—

W6BG reminds us (and referring to an item in December "Correspondence" which related to unorthodox abbreviations on the c.w. bands) that a good standard guide which is available is the Phillips Code. This is a standard of abbreviations which has been used since 1879 and is known to most telegraphers.

—···—

The complete two-band v.h.f. station which was described in the July, August, September and October, 1961, issues of *QST* has proven so popular that back copies of those issues are no longer available. We have, however, reprinted the entire series of four articles in a 24-page pamphlet which is now available for 50¢, postpaid. Included with the reprint will be the complete set of templates to aid you in the mechanical construction of the units.

OUR COVER

Two hundred articles inside the magazine, but this is the first time he's ever appeared on the outside! (On the cover, that is. He's talked with thousands of you fellows at hamfests and conventions.) Meet Lew McCoy, W1ICP, *QST* Technical Assistant, at work in the ARRL lab on a gadget which he hopes to describe in a future issue of *QST*.

Just One More Guidebook, Please!

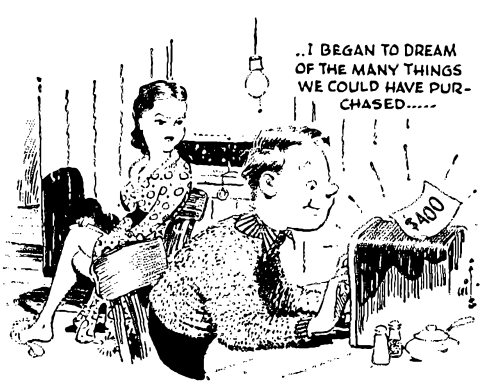
BY SONJA KENNEDY *

It is unheard of to be without a detailed manual for the construction, use and maintenance of any of the gadgets so necessary to smooth operation in the Ham Shack. So, why not offer a guide book for fiancés and wives of hams? A bit of forewarning would be *such* a comfort!

My introduction to ham operations did not seem too frightening, as Dave had just been discharged from the army and was slowly getting a few pieces of equipment lined up for "getting on the air." At least, I was led to believe there would be a few! Little did I know there were stacks of schematic drawings of the dozens of contraptions to come. After a trip or two as a tourist to ham gear shops, I began to view the hobby with a bit of alarm, especially since the boxes of so-called odds and ends were arriving at a wild clip. Had I been forewarned, I might have understood that four years off the air and working for Uncle Sam contributed nothing to the mellowing process in Dave's life as a ham; instead, the return to civilian life intensified the yen for chatting with the thousands of available buddies all over the world. A fine idea, but in the *dining room!* The room was large but, unfortunately, far from soundproof. This would be corrected when we moved to roomier quarters, I hoped.

I must admit I was impressed when notified that the beloved HRO was expected momentarily and must be paid for on delivery and I must please be on the premises to receive the cherished object, immediately. There must be no return trips for the delivery man as this might cause unnecessary damage to the gadget. It arrived, was duly paid for, and stowed in the dining room. Even though the cost depressed me, I could not help sharing Dave's elation as he was examining each marvelous feature of his new receiver. After this brief excitement wore off, I began to dream of the many things we could have purchased with the four hundred dollars that were sitting on the table in the dining room, making all sorts of shrill noises, not in the least intelligible to me. I know now, that first a ham gadget and then a home gadget is apt to be the pattern of things, or perhaps a year of ham gadgets and then a year of home gadgets. A rather slow process, at times, but over the years the balance has worked out well.

* 3455 Markay Court, Cincinnati 11, Ohio



After four months of the ham rig in the dining room, we were transferred to Indianapolis and Dave found a marvelous ham site with a fairly miserable house as an extra. A whole acre of flat, flat ground with only a few distant utility poles to obstruct the view, mighty barren, but perfect for the five 50-foot telephone poles which were soon delivered and planted in strategic spots around the acre. Also, thank goodness, a room for the rig, cold in winter and warm in summer, but at least all by itself. There was a mad scrambling to get the pole holes dug in time for the character who was to come with a winch truck to help in the final setting. No rest for anyone until all poles were set and guyed against the prairie winds.

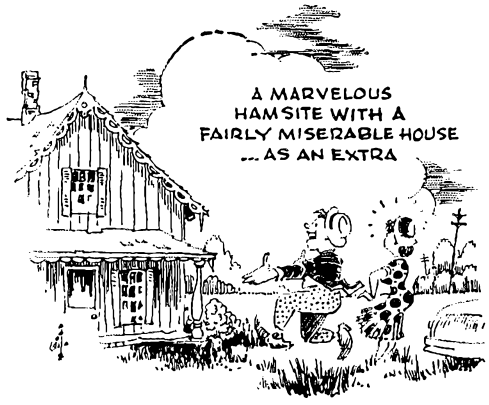
As fall approached and as the wires were stretched from one pole to another and back again, I began to hear rumblings of a "Sweepstakes Contest." This proved to be an all-new phase of our lives. A wild bit of testing and tuning seemed to be the first step in "Operation Sweepstakes", then a detailed preparation of pages for records of contacts to be made during the contest. At this point I discovered that in the Sweepstakes each operator is concerned with contacting as many other operators in as many different call areas as possible, within the allotted time. On the surface, this may sound sensible. Well, it isn't. Forty-eight hours of almost continual operating created a zombie-like creature from the mild-mannered man I married. The first evening of the first contest, I offered to keep the log as Dave rattled off contacts. After a few hours of this frenzied occupation I could see I was causing more trouble than I was worth; Dave felt obliged to check all the notations made by such a greenhorn secretary. Also, I was exhausted! The Sweepstakes contest has helped me realize it is much better to just arrange flexible and frequent meal hours in order that the head operator will at least have the opportunity to consume enough food to maintain a subsistence level. After all, in forty-eight hours, one is not apt to sink too far into a state of malnutrition! (Here, after a bit of editing, I've been asked to mention that Dave is no longer an active Sweepstakes man!)

At first the long hours Dave spent in the chummy confines of the ham shack made me wonder if already the happy glow of our life together had worn off. Now, I'm sure this was not

the case; instead the "ham bug" was reinfecting Dave with a more intense determination for working all the DX available. As the QSL cards began to arrive from all sorts of far off places, my interest was genuinely aroused. Until this time, the noises and general nuisance value of the contraption seemed to be all that had claimed my attention. Even today, after more than three-hundred countries verified, I still am excited when a new card makes the scene. The QSL cards are priceless (to a ham) because they are most always impossible to replace. At first it was a jolt when I realized that when we were transferred, the movers were entrusted with all of our belongings, except the QSL cards and our sterling! Now, we have become so callous as to entrust them with *everything*, except the cards. After all, the sterling may be replaced! Often, I have wondered about the order of removal of valuables from a burning home inhabited by a ham. I surely hope the wife and children would at least be carried out *with* the QSL cards!

Dave was enjoying the combination of antennas provided by the five telephone poles, but then we were transferred to Cleveland, a smaller lot and much nicer house. Sure enough, the antenna designer came up with a great solution! A lovely windmill tower proved to be a tremendous improvement over the scattered poles. It seems I do recall a temporary pole that cracked in two as it was being raised with the help of a nervous winch-truck operator and assorted neighbors. In the spring, when the tower and antenna were in solid operating condition, a slight congestion in the selsyn motor area was detected! A pair of lazy robins had selected that nice cozy spot for a nest. They really had a good thing going, as the sun warmed the metal covering and helped to hatch their eggs, so both Mom and Dad Robin could roam around quite extensively. Dave agreed to permit the birds to raise their young and then planned to remove the nest. A trip out of town delayed the evacuation just long enough for a pair of starlings to move in and get quite settled. The presence of these eggs did nothing to Dave's sense of wildlife preservation, so against the screaming protest of our pre-schooler, the eggs were destroyed and the motor installation made bird-proof!

Aside from the complaints from our neighbors who had become new TV set owners, the ham business was quite calm under the tower. High-pass filters attached to the neighboring TV sets seemed to cool off the complainers. On occasion, though, I was forced to sympathize with Dave because the objectors were unreasonable. Sympathizing with both sides was nerve-wracking, but necessary at times; especially when complaints were raised and Dave happened to be out of town or the receiver had been laid low by a mouse. Yes, indeed, a mouse did crawl in amongst the red-hot wires and managed to get itself fried to a rather vital part of the receiver, which caused an awful mess and ten days of total idleness! Take it from me, the inactivity is much worse than the long hours of operating.



We're happy to be in Cincinnati now, as we have a better antenna location and a roomier house, in that order. While we were renting here for ten months, Dave spent many hours shielding and rebuilding the various gadgets so they would be ready to roar when moving day arrived, or at least shortly thereafter! It certainly was no surprise to me when an additional twelve feet of tower was added in our new location. Now, I understand at least three states are visible from the top on a clear day. That is just fine and I shall take Dave's word for it. We have been reminded by an occasional neighbor that this yard contraption is not an ornament, which is true, but it is almost transparent if you look at it that way. On our present ridge, the antenna engineer seems to have been plagued by more "Act of God" types of damage than ever before. Sleet, wind, heavy snow and ice have managed to take their toll; however with a bit of patience and sunshine, repairs are made with a minimum of mumbling and moaning.

When Dave is away I'm in charge of keeping the antenna aimed in the proper direction; into the wind, I believe. This very minor accomplishment is the extent of my operating ability in the ham shack. Perhaps it would be helpful if I were more interested in becoming a steeplejack, because I could climb up the tower and chase the squirrels from the premises, as I notice they have found another way to build their nest up there. Last fall Dave squirrel-proofed it, he thought, but evidentally this breed of squirrel enjoys chewing wire mesh. On second thought, even if I were adept at climbing the tower, I'm sure I'd be no match for a wire-chewing squirrel!

So, the ham rig may take lots of time; may be a sizeable and continuing investment; may be noisy; may make you feel as if you've lost your charm; may interfere with TV and even a stereo loudspeaker; and of course, may result in cold meals on occasion — these are quite minor in the long run. After seventeen years of being WSBRA's XYL, I'm most thankful that Providence prevented me from writing the article I had planned sixteen years ago. I should feel most ashamed today, if I had. Now, I know the symptoms of

(*Continued on page 150*)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

WHEW!

Spring, the season of the poets, *finally* got here. After the roughest winter in the memory of most of us, we feel especially susceptible to the therapeutic blandishments of verse. W7RGL's piece sort of set the mood last month. Here's another with the proper spirit of wanderlust, a variation on a theme by the late John T. McCutcheon, famed Chicago *Tribune* cartoonist, written nearly fifty years ago. John called it *The Rhyme of the Restless Rover*, but if he had been a ham he surely would have titled it

DX!

As I sit in my shack in the eerie gloom
  Of a shivery, wintry night
I think of the places I'd like to work,
  If only the skip were right.
It might take more than a couple of weeks
  For such an extensive tour
'Cause some of the places are far away
  And conditions are awfully poor.
I'll have to be at it by early dawn;
  I'll sleep with the filaments on.
But first I'd better just lean back . . .
  And . . . and . . . (yawn) . . .

* * *

Ah, I go aboard that clipper ship
  Engaged in the China trade,
And we clear the bar by the morning star,
  As soon as the anchor's weighed.
I tell the skipper the course to set;
  He pipes all hands aloft.
And away we go for Borneo,
  Lunching at Tranby Croft.
Perhaps we'll dock at the Inchcape Rock —
  Perhaps at the Farallones —
We raise Luzon in the rosy dawn
  While the lazy trade wind drones.
I dance to the tune of the rigadoon,
  And as the canvas fills,
We eat our tiffin at Annandale
  In the shade of the Simla Hills.

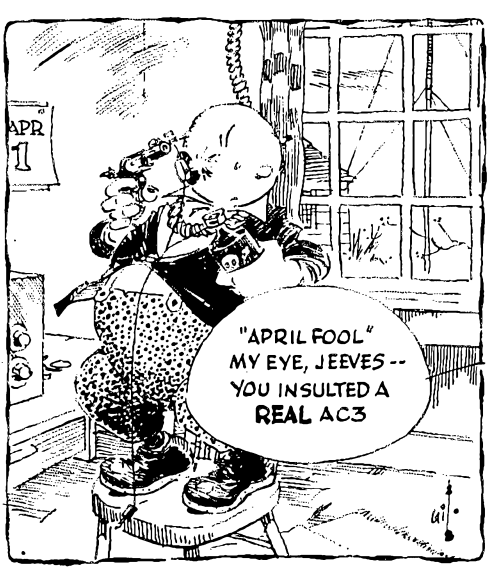
The Persian Gardens at Ispahan,
  The Reef of Norman's Woe,
Sierra Leone, and San Antone
  Are places where I go.
I steer a canoe in the Great Karroo,
  And rollick in Bantry Bay;
By the golden moon, from old Rangoon,
  I journey to Mandalay.
And Malabar Hill is not too far
  If you go by the Andaman Isles;
I sniff the breeze in the Celebes
  While the Indian Ocean smiles.
Van Diemen's Land and Samarkand,
  St. Albans and Singapore —
You easily reach on Rockaway Beach
  From Bingan to Bangalore.
For it's always fair off Finisterre,
  On the way to the Barbados;
And it's not too far to Kandahar,
  If a steady monsoon blows.
Through creamy seas and sparkling skies
  I follow the Spanish Main;
I touch Stamboul and Stanley Pool
  A-glimmering in the rain.
It's never too late to pull your freight
  For Rio and Argentine;
With a favoring breeze off the Hebrides
  I dock at the Engadine.

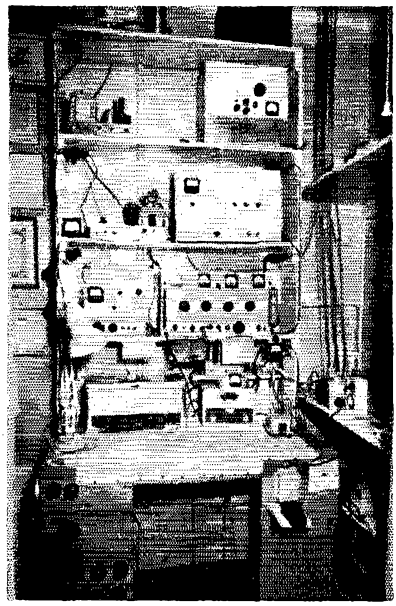
The Barbary Coast I like the most.
  But the Ivory Coast is fine;
I shed my cares in the Aberdares
  And dine on the Brandywine.
We heave the lead at Diamond Head
  And, since the holding's good,
We visit shore to "look them o'er,"
  As all good sailors should.
We drop the hook in the Zuyder Zee,
  We touch at the Cameroons,
We drink a toast on the Congo coast
  To the Inniskillen dragoons.
Mashonaland and Yucatan,
  Kashmir and the Hindu Kush,
Are places we gladly greet
  To escape the tourist rush.
The Friendly Isles and Tonga land,
  Baghdad and the River Plate,
Cockburn Land and the Rio Grande,
  Gaboon and the Golden Gate.
The Orkney Isles and Lockerbie Street,
  Peshawar and Mozambique
While far Cathay and the Hudson Bay
  I view from the mizzen peak.

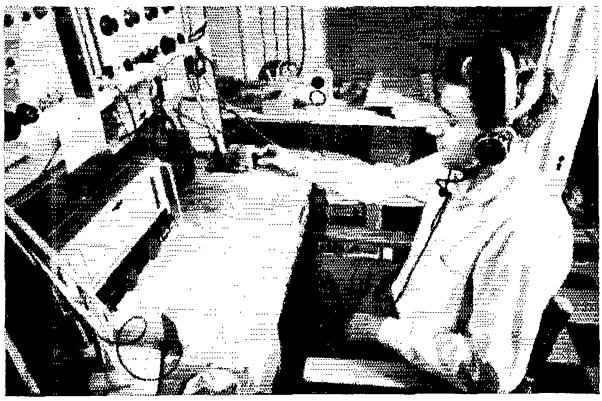
Grundelwald and Brandenburg,
  Savanna and Ootacamund,
Connemara and London town,
  Bombay and the Shanghai Bund,
Zanzibar and the Chilkoot Pass,
  Glengarry and Broken Hill,
The Ballyshannon and County Clare,
  Calgary and Bougainville,
I stop in Lapland — it looks to me
  Like a friendly sort of place;
I study the moon with Lorna Doone —
  Dining at Chevy Chase,
Majorca, Malacca, and Malvern Hill,
  Manila and Fuji San,
County Tyrone and the Arctic Zone,
  Carnarvon and Turkestan,
The Isle of Pines and the Dardanelles,
  Kowloon and the Caspian Sea,
Cawnpore, Krakow, and the Khyber Pass,
  Crimea and Kimberley,
We follow the tide on the Hongkong side —
  Go out on Bubbling Well Road;
I go chop-chop to a curio shop
  That I know in the Queen's High Road.

I look at the glass in Limon Pass,
  And, as the weather is fine,
We steer for Delhi and Bonnie Dundee
  By the way of the River Rhine.
Delagoa, Samoa and Shenandoah
  Are names that please my ear;
Victoria Nyanza strikes my fancy,
  And so does Monastir.
Ping Yang, Hankow and Hyderabad,
  Lucknow and the fair Touraine;
The Caribbean and far Kashgar,
  Are places to visit again.

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







MP4BBE's Bahrein station is heavy on homebrew. John uses a 6AG7-5763-807 sixty-watter, Heathkit VFO, Eddystone 888A receiver, dipoles for several bands, and a 14-Mc. ground-plane. MP4BBE is found mostly on c.w., 3.5 through 28 Mc., and is nearing the 200-countries-confirmed mark in ARRL's DX Century Club.
(Photos via W8KX)

Wind River, the Tana, Yangtse Kiang
And the plains of Abraham;
Siberia, India, Amazon, Oude,
Benares and Bethlehem.
Antilles, Azores, Loch Lomond, and Rome,
Bizerte and Trincomalee;
The River Rhone and the frigid zone
Are spots that appeal to me.
I finish the cruise at Newport News
And wish no more to roam.
I'll settle down for a couple of weeks
Contentedly at home.
Now, such a trip, I honestly think,
Does benefit any man.
He puts more force in his work, of course,
And gains a *beautiful* tan. . . .

* * *

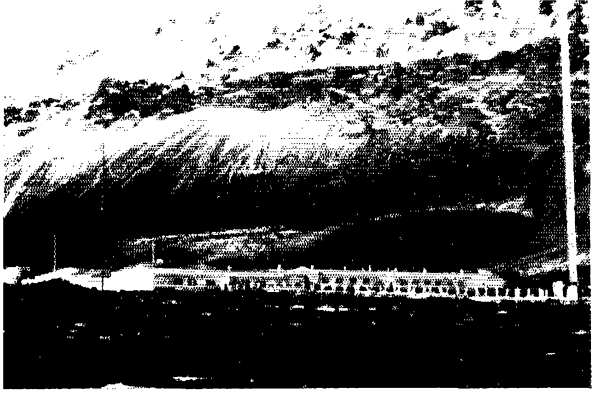
"Breakfast, dear — get up for work!"

What:

That itinerary sounds almost like one of W4BPD's DX-peditions, doesn't it? And if you want to while away a period of punk conditions on a shivery spring evening, try to associate call-sign prefixes with the places named. It won't be easy, because some of the spots have been renamed or almost forgotten after half a century. . . . We agreed to take a close look at 20-meter DX this month, thanks to our fine team of spontaneous "How's" correspondents. In the text to follow, the figures in parentheses represent the number of kilocycles above the lower band-limit; the numerals outside parentheses indicate GMT whole hours. E.g., "9N1AA (10) 16-18" means that 9N1AA was reported active on 14,010 kc. at 1600-1800 GMT. Let's give it a whirl, first looking at

20 phone where **W**3s GQF WZL, **K**s 2TDI 2UYG 6TZX 7RVI 7TMJ ØAXU ØGVA ØJPL, **WA**s 2RJZ 6ORS, **KP4**AXU and club periodicals report action by **CE**s 8AG (285) 4, ØZI/mm (333) 3, **CN8**FK (108) 15, **CP**s 1CS* (202) 21, 5EA (289) 3-4, 5EQ (341) 13-14, **CR**s **6**CA* 18, **6**CY (198) 17, **7**CI (278) 20, **EA8**DL* (182) 19, **EL**s 2E (345) 20, 2C 5C* 14-15, 6E (245) 20-21, **EP2**s AA (290) 12, AC (268) 13, AM 12, **ET3**s JK (278) 20, LM (105) 16, USN (315) 17, **FG7**s XS (122) 22, XT (115) 19, **FM7**WG, **FO8**AQ (248) 7, **GC3**LXK (313) 3 on Guernsey, **GD3**ESV (310), **HH9**DL (340) 23-0, **HI8**s MV XAG (326) 13-14, XHS, **HL9**KH (305) 0, **HP**s 1AP 3DA (321) 12, **HV1**CN (280) 15, K6CQV/**KS6** (262) 7, KA2OV (300), **KB6**s BZ (338) 0, CA (297) 7, **KC**s 4AAC (333) 3 of Wilkes base, 4USB (293) 7, 4USH (305) 4, 4USS (304) 20, 4USX (280) 5, **6**BK (279) 10, **6**BO (324) 10, **KG**s 4AA 4BJ (310) 13, 4BQ (270) 0, **6**AKR (330) 12, **6**AKS (340), **6**ALD (310) 8, KH6PD/**KG6** (298) 20 of Marcus isle, **KJ6**BV (295) 1, **KM6**s BI (299) 20, CE (300), CI (310), **KR6**s BD (280) 10, GM (344) 9-10, MB (120) 2-3, KV4CF (325) 12, **KX6**s BQ (265) 7, DC (330), NF (260) 7, **LA**s 5FI/p (349) 13 of Spitzbergen, 9RG/p 21, **LU**1XH (340), **M1AB*** (260) 11, **MP4BBW** (110, 275) 14, **ON5**AP (335) 14, **OX3**s AI (270) 22, KM* (183) 15, **PJ2**AA (342) 21-22, **PZ1**s AX (335) 23, CQ, **SL6**BH (310) 15, **SP7HX*** (190) 14, SV1AE (275) 14, **TF2**s WGU 11, WHB 12, WHP (298) 20, **TT8AL*** (120) 20, **TU2**s AE* 15, 2AK (280) 19, UAs 1CK (300) 14, 1KBW (298) 13, 1MU 1ZF* (192) 20-21, **2**AW (295) 14, 6FD (343) 14, ØEK (278) 7-8, ØVQ 9, **UD6**s BR (310) 14, KAR (316) 11, FA* 9, **UF6**FB (270) 9, **UG6**AW (280) 13, **UI8**s AD (330) 11, AG (320) 9, **UL7**KAQ (320) 10, **UN1**AB (310) 13, **UP2**OK (319) 15, **VK**s **9**AT **9**ZS (306) 17, ØJM* (168) 16 of Antarctica, **VP**s 2AF* (148) 20, 2LS (344) 23, 2SH (280) 21, 2SY* (166) 14, **4**TI (290) 12, **6**WL **7**NS (290) 12-13, 7NT 19, **VQ**s 1GDW (291) 19, 1IZ (172) 19, **2**AB (290) 19, 2AF (290) 19-20, 2EZ* (195) 19, 2RB* (176) 20-21, 2WR (108) 20, 4ERR (285) 19, 8BI (117) 19-20, **VR**s 2BZ (218) 8, 3R (333) 6, **6**AC (274) 6, **VS**s **6**EO (280) 12, **9**ART (300) 10, 9ASS 15, 9MB (275) 17, XEs 1A (305) 20, 1EH 1VE (305) 20, 2DO (340), 2JZ, YN1AW (125) 14, YO3ZA (310) 13, **ZD**s **6**RM (313) 17, 8DW (310) 20, **ZE1**JE (310) 16-17, **ZK1**BS (280) 5-6, **ZL1**ABZ (305) 4-13 of the Kermadecs, **ZP5**s MS (301) 1, OG (315) 2, **ZS**s **2**MI* (157) 16 of Marion isle, 3E (297) 19, 3HI (125) 19, 3VP* (179) 21, 7R (300) 19, **7**U* (197) 19, 3A2CL (325) 15, 4U1ITU (306) 14 of Switzerland, **4X4**IX (294) 14-15, 5A1TH (196) 16, **5N2**s EBL* (195) 20, HJA 15, **5U7**AH (320) 11, **5X5IU*** (157) 20, **6W8CR*** (200) 19-20, **9G**1s EC* (193) 21, EO (120) 20, GN (309) 22, **9K2**s AM (305) 16, AY* 14, **9L1**RO (307) 12, **9M2CR** (310) 15, **9Q5**AF (120) 20, **9U5**s DR (317) 20 and JH* (190) 19, the asterisks denoting outnumbered non-s.s.b. entries.

20 c.w. should be just about as peppy right now as it will ever be this year — and for some years to come. So you'd better join **W**s 1GDQ 3GQF 3WZL 5WW 6RCV 7DJU 7POU 8YGR, **K**s 1JFF 1QYJ 1RHZ 2UYG 3VWH 4MYO 6MQG 6TZX 7GVM/VO1 7RVI 8NMG 8UZK 9CZV 9GSD 9DKU ØAXU ØGVA ØJPL, **WA**s 2HLH 2PJL 2PZD 2RJZ 2RQZ 2RUB 2VFU 4ARE 4DAA 5EEM 6DJH 6IVM 6ORS 6VAT, **WB2**s ALB CAV, **CE2**CR, **DL9**LI, **I1ER** and **ZS2**U in hot pursuit of such DX desirables as **AP5**JA 10, **BV**1s USA 11, USB (57) 12, **CE9**AX 10, **CN**s 2AQ 8FE (40) 20, **CO**s 2AP (12) 15, 6XZ 15, 7AI, **CP5**EZ, **CT**s 2AI 2BO (25) 15, 3AB 17, 3AU 3AX, **CR**s 4AG (65) 19, 4AH **6**CA **6**CH 15, 6EI (63) 20, **6**JS 17, **7**CI (30) 23, 7IZ (52) 20, 9AII (60) 12, **DU**s 1OR 11, 1RTI 7SV 13, **EA0**AC 8, **EL**s 2PN (40) 17-0, 2S 3AF, **ET3**s JK PP (74) 20, RN (44) 18, USA 11, **FB8**s XX (43) 15, ZZ (42) 14-15, **FG7**s XC (35) 15-20, XE XF XG 17, XJ 20, **FK8**s AS (60) 19, AT 16, **FO8**AA (14) 1-2, **FY7**s YE (11) 21, YF (5) 23, YI (45) 22, **GB3**HAR of England, **GC2**FMV (2) 16 of Jersey, **GD3**UB (28) 17, **HA**s 3KGC (72) 14, 6NC (45) 16, **HH2**CE, **HI8**s LC (77)16, UMN XAG, **HK0**AI (18) 23 of San Andres, **HI**s 5X 9KH 8, 9KN (32) 0, 9KP 9TF 7, **HM5**BF (39) 8, **HP1**IE 13, **HR**s 1KS 2BS 2FG (50) 2, 8CAA, **IS1**MIM (42) 16, plenty of JAs in all call areas but the 4th and 9th, Ks 2QGC/**KG6** (16) 1, KØDNM/**KJ6** (90) 0-1, KA2s KS NY (40) 20, **KC6**BO (22) 11, **KG**s 1FR 15-16, 4AM (40) 22, 4AN 1-2, 4BJ **6**AAY 8, **KM6**s BI CE (31) 20, **KR6**LJ 17, KV4s AA (82) 14-21, CI 11-19, CT, **KX6AJ** 8, **LA**s 7RF/mm (14) 22, 9RG/p (28) 20, **LJ3**G 16-17 of Norway, far-south **LU**s **2ZX 8ZN**, LX1AS (45) 16, numerous LZs, **MP4BDX** (58) 15, **OD5**AX 7, **OX3**s AI AY 17, UD WQ, **OY**s 2H (32) 10-14, 7ML (20) 15, **PJ**s 2MIE 17, 2MS (64) 14, 3AN, **PX1**BR (68) 15-16, **SL8**AY (39) 21 of Sweden, SM5CGK/**9Q5**, **ST2**AR (33) 20-21,



LA8SE/p shipped these striking Jan Mayen photos to W1NTH who generously relayed them to Jeeves & Co. for your inspection. From left to right are the base, a rugged stretch of J.M. coastline, "Beerenberg" mountain from LA8SE/p's shack window, and the LA8SE/p installation.

SVs 1AB ØWC ØWZ (70) 15-16, TA2BK 13-14, TFs 2WFH 2WGT 2WHR 5TP 14-15, TG9AD (77) 21, TN8AF (18) 15-20, TT8s AJ (55-75) 19-21, AL 9, TU2AP (42) 21, UAs 2KAA (29) 14, 2KFL ØEK ØKFG ØKFH ØKFR ØKQD ØKSS ØLA (55) 0, ØLT, UB5KED, UC2KAA, UD6BE (54) 13, UF6s FN KPA (60) 13-14, UG6AW (75) 14, UH8s BI KAA, UI8LB, UL7s CD (62) 10, KBK (50) 10, KKD (58) 10, UM8KAA (10) 11, UN1KAJ, UO5PK (73) 14, UP2CP, UQ2s AR CC GA, UR2s KAS KNP, UT5KDB, UW0s IF LJ (33) 20, IN (30) 20, VEs 8JH 22, 8JJ 8RG ØNU ØNV 13, VK9LA (79) 14, VPs 2AR 2CR (38) 20, 2LS 2MV (5-10) 21, 2MZ (9) 18, 5BL 5GT 5XG 6LJ 6PJ (30) 21, 7NT 12, 8GQ 20, 8GR (63) 1, 8GV (12) 0, 8HD (16) 5, VQs 1GDW (45) 18, 1IZ (55) 18, 2BK (41) 18, 2EW 2JM (64) 18, 2JN (31) 18, 4DW (16) 20, 4BZ 4HE 11-12, 8AI (7) 17, 8BI (35) 19, 8BZ 17, 9HB 19, VRs 2EK 9, 3E 3O 6TC (167) 5, VSs 1LL 1LP 11, 4RS 14, 9AAA (10) 19-20, 9AJA (57) 19, 9ARC 9MB 17, VU2VDZ (61) 14, XZ2KN (55) 13-14, YKs 1AK 15, 2SK 19, YS1O, ZA1KC (68) 15-16, ZB1CR (53) 16, ZDs 6OL 18, 8JP, ZFs 3JJ 3JO 5JF (41) 18, 5JZ 8JJ 8JW, ZL1ABZ (40) 7, ZM6AF (60) 20, ZPs 5LS 9AY, ZSs 3EW 18, 3X (22) 21, 7M (8) 19, 7R (65) 19, 9G, 3V8CA 14-15, 4S7s EC WP 17, 4U1ITU (20) 16, 4X4s BG (79) 14, BS (44) 10, 5A1TW, 5H3s HV (21) 20, HZ, 5R8s AB BC 16-17, BX 19, CJ (76) 13, 5U7AC (50) 20, 5X5s IG (72) 20, IU (20) 20, 6O1s MT 13, ND, 6W8s DD (30) 22, DF, 9G1s DT DV (25) 16, DZ (67) 21, 9L1GM (69) 16, 9M2FT 15, 9N1AA (10) 18, 9Q5s ABU BZ (28) 21, EI (30) 16, SL HL (34) 19, 9U5s DS (53) 21, JH (75) 20 and ZZ/mm.

160 c.w. ought to be accounted for this month before spring static hems it in. The band made a fine comeback in late January after a month or two of dormancy. Ws 1BB 3GQF 3WZL 8CAG 8IHSW and WA6UZA mention *the 1.8-Mc. availability of* DJ2KS, DL1FF, EI9J, *dozens of* Gs, GIs 6TK 3OYG, GMs 2BUD 3KLA 3PBA, GW3JI, HB9CM, HC1DC, HK7ZT, HR3HH, KH6EOF, LU3EX, OH3NY, OKs 1AFC 2AGE, PA0PN, PZ1AR, UB5WF, UO5AA, VOs 1DX 3R, VPs 3AD 5XG 7NY 8GQ, VR3O, W4WQQ/VP9, XEs 1OK 2OK, ZE8JJ, ZL3s OX RB and 5A3CJ. Good to see 160 pulling more than its share of the DX load. We'll certainly need its help in the mediocre propagational years ahead.

* * *

We acknowledge with thanks the reports of "How's" operatives concerning DX doings on the following bands:

15 c.w. — Ws 1GDQ 6RCV 8YGR, Ks 1JFF 2UYG 3NWD 4MYO 4ZNJ 9CZV ØGVA, WAs 6IVM 9AUM, KN1VWL, WN9EYY and VE3FEV.

15 phone — Ks 4ZNJ 7TMJ 9CZV 9DQO ØGVA ØJPL, WA9AUM, WB2ALB and PY7EC.

40 c.w. — Ws 1GDQ 6RCV 7DJU 8YGR, Ks 1JFF 4ZNJ 6TZX 9CZV ØGVA ØJPL ØVSH, WAs 1HLH 5EEM 6IVM 6VAT 9AUM 9EED and DL9LI.

40 phone — W1APA, Ks 4ZNJ 6TZX ØAXU ØGVA ØJPL and WA9AUM.

80 c.w. — Ws 1SWX 3GQF 3WZL 7DJU, KØs JPL VSH and WA6IVM.

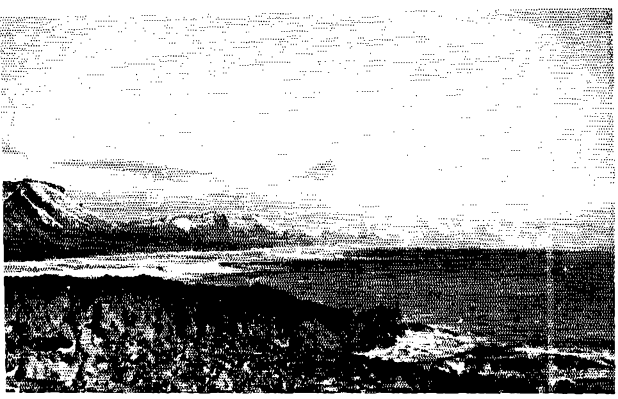
75 phone — KØAXU.

Space and other factors permitting, we'll take up the subject of those slots next month. Good fishin', gang!

Where:

Asia — Things are looking up at the FEARL QSL Bureau, KA2EB proprietor. He observes, "From all indications our members are doing a good job in forwarding QSLs. There were plenty of complaints received about poor QSLing a few years back. Every other station I worked would chew *me* out about some other KA not sending cards. Things have changed. Very favorable reports are coming in these days from oldtimers and newcomers alike. FEARL certifications are going out and arriving at destinations in good shape, too. I'm sure our DX friends appreciate the efforts of those responsible." . . . . . VS9AAA cleared a fat batch of QSLs Statesward and expects another thousand blanks from his U.K. printer shortly . . . . . W6ZY affirms, "I'm QSL manager for HL5X (W2AYN) and request self-addressed stamped envelopes, or self-addressed envelopes with International Reply Coupons, from applicants." . . . . . K7GVM/VO1, whose Placentia mail address appears in the listings to follow, signed KR6CG in 1958-'59 . . . . . Ex-4X4NJ retrieved his K7ADD call and writes from Las Vegas, "All those deserving QSLs for my Israel activity will receive cards but it may take several months for me to complete the job. QSLs sent to my Ramat-Gan address may have gone astray. In any case I will be glad to answer all valid requests for confirmations." . . . . . "S.a.s.e. are much appreciated for my direct replies," declares HL9TF (K2GMF) . . . . . West Gulf DX Club *DX Bulletin* dispatches from the QSL front: YA1AW wants no QSLs mailed to him in Afghanistan but assures us he will take care of things thoroughly when he gets back home. . . . G8KS's address is okay for GC8KS QSLs but make sure you use only Greenwich Mean Time reference and include s.a.e. with IRC. . . . VS9MB ops Bryan, Colin, Dave and Jim each keeps his own Maldives log, so you'll be wise to inscribe the appropriate operator's name on your QSL to that station.

Africa — "ZD8JP wants to do his own QSLing, so he won't be represented by a QSL manager Stateside or elsewhere," remarks W5ZWT. S.a.s.e., of course . . . . . W1JYH tells W1WPO of the ARRL DXCC Desk that Gerry Coetzee, Croydon, Bell Road, Kenilworth, Capetown, S. Afr., now does QSL chores for Marion's ZS2MI . . . . . Regarding the EL6E quotation on page 66, February *QST*, OM G. E. Nicholson ("Philip") protests from Edmonton, Alta.: "I submit herewith photoduplicates of the following documents: (1) The letter of authorization, signed by Assistant Commissioner (now Commissioner) of Communications Samuel Butler, under which I operated amateur radio station EL6E in the period between January 7, 1961, and November 3, 1962. (2) As a character reference, a letter of recommendation from the Order of the Holy Cross with reference to my employment at the Holy Cross Mission during this period. I am holder of Canadian Certificate of Proficiency in Radio Second Class (Commercial) No. 1344. At no time have I knowingly operated EL6E outside of the requirements of the Liberian or international laws governing such operations, nor of the solemn declarations made by me at the time my commercial license was issued; nor have I ever received any official notification of infringement of such regulations on my operations in the Amateur or Commercial Services. My application for a VE6 amateur call sign has received favorable attention from the local Department of Transport office, and letters are expected to be issued early in April. Before I left the Holy Cross Mission on December 10, 1962, I completed filling out 318 QSL cards (some of them duplicates of acknowledgments already mailed from the mission) covering all cards received by me either directly or through VE4OX. These cards will be mailed to the bureaus as soon as my personal effects catch up with me. The name 'Philip', by which I am known to the many amateurs whom I have worked from EL6E, is the name I used as a Brother Companion of the Order of the Holy Cross." Well, it's our policy to avoid expending our limited *QST* space as a forum for the clash of personalities but it seems only fair to record Mr. Nicholson's rebuttal. The real point is, EL6E QSOs *are* being confirmed . . . . . K9EAB relays word from 5T5AD: "I've received nearly 2000 QSLs from U.S. amateurs without accompanying IRCs. I will reply to any requests for cards provided I receive self-addressed envelopes with IRCs or sufficient French postage." How about the bureau, OM? . . . . . "Much of my



mail goes astray if my *Call Book* address (c/o Pelican Pt. Lighthouse, Walvis Bay) is used," warns ZS3EW. "All correspondence therefore should be sent via the QTH in the roster to follow." . . . . . W2ELW informs, "I have all ZD6IIK logs from September 29, 1961, to date but I handle only W/K/VE QSLs for that station. Cards from other parts of the world should go direct to ZD6HK." . . . . . K2PFC, QSL aide for 5A3BC, stresses the necessity of s.a.s.e. with each QSL. "Bing has left Libya and all cards have been answered to date." . . . . . WØMLY of recent Africa DXpeditionary note handles his own QSL matters except for TR8 which is managed by KV4AA. This item comes through WGDXC who also has it that K2MGE may be of assistance in confirming FF8AK contacts . . . . . VERON's *DXpress* records that 9G1AQ has been inactive for three years despite recent radiational evidence to the contrary.

Oceania — K9YRA testifies, "G5VT writes to say that he cannot be QSL manager for K3GAD/KJ6 for European QSOs or otherwise inasmuch as he has received no logs from Tom. I sent several QSLs to the K3GAD home address but all went unanswered. However, since K3GAD/KJ6 logs are available at KJ6BZ, I used the address suggested in January's 'How's' and received a confirmation signed by K7SFA of that station." . . . . . W8WFB tells W1ECH he can assist with VR2EH QSL petitions but has no similar arrangements with other VR2s . . . . . VERON understands that FK8AZ now has his QSL backlog cut 'way down to eighty or so.

Europe — GD6UW's G3PIT asserts, "We QSL 100 per cent, of course, although our cards for 1961's DXpedition were delayed nine months due to trouble with the printers." . . . . . G5GH directs that QSLs for this month's Isle of Man DXcursion by himself, Gs 2BUL and 3FTQ be shipped to the home addresses of the gentlemen concerned. Direct reply requires an IRC and s.a.e. . . . . Hungary QSL chief HA5BU, according to W1ECH, mentions the possibility of HG calls appearing on 28 Mc. soon. The prefix heretofore has been used only on v.h.f. bands . . . . . UA2AW is troubled by an incorrect version of his mailing address now going around. Vlad tells W5PQA the proper QTH is as in the listings to follow.

South America — "Please mention in your column that I am now QSL manager for HK1QQ with logs on hand from January, 1962," communicates W4DQS. "I also have logs for the Malpelo DXpedition of 1961 (HKØTU) and I will be pleased to answer all QSL requests. GMT *must* be used, and s.a.s.e. will be appreciated." Dale also can help you along in HKØAB and KS4BF confirmatory matters. By the way, WA9EED and others were instructed in February by HK1QQ to QSL via K4LDR. Perhaps this holds only for a limited period of operation.

Hereabouts — "QSLers of the Month" this month are CR7IZ, DJ5KN, F2IU, HK3RQ, HL9KH, HP1IE, KB6BZ, KC6BD, KG4AM, KP4s DJ TIN, OH1VX, ST2AR, VP3RW, VQ4DW, ZD6HK and 5H3HZ, plus QSL aides Ws 2CTN 2ELW and W9VZP. Their prompt QSL response moved Ws 8NXF 9PIO, Ks 3NWD 4MYO 6TZX 8SQK, WAs 2NFY 2RJZ and 6VAT to nominate them for this salute. Any DX stations in *your* log worthy of such commendation? . . . . . Ks 4MYO 9CZV and ØGVA offer their services as QSL managers for deserving DX stations . . . . . Help! W8CAG needs clews toward QSLs from DJ1ZG/M1, ET2US, VQ2W, XW8AB and 5T5AB; K2BG will settle for the goods on XW8AA; and WA2NFY wants the word on HKØZU and VP9EX . . . . . Coast Guardsman K7GVM/VO1 comments, "I have QSLd 100 per cent and will continue to do so as long as funds hold out. Our problem up here is keeping a sufficient number of QSLs on hand. Parcel post transit time to the printer and back is six weeks to two months." . . . . . Lament from WA4AYX: "Although TG6PB accepted my offer over eight months ago to handle his QSLs he has failed to send cards or logs. By the way, SM5TA and JA8ADQ report difficulty securing QSLs from W/Ks. Tell the gang I have some HI8JES QSLs on hand, also some VP2SM logs." . . . . . Inquiry by OT W3NT/K2LBB: "Are there any hams now active beside myself who possess QSLs from WFA of the first Byrd Antarctic Expedition, 1928–'29? I worked him as W2NT and I understand that only 500 cards were issued." . . . . . W6KUT disclaims FM7 QSL responsibilities . . . . . W2ZMT says he does *not* handle VP2MZ QSLs, despite rumors to the contrary . . . . . W6KG of NCDXC, whose ex-calls would fill a "How's" paragraph, has QSOd some 100,000 stations and has 50,000 meticulously filed QSLs to show for it. Lloyd can conveniently grab any or all of these cards from his operating position . . . . . Now we present the monthly "How's" rundown of specific postal suggestions that turned up in Jeevesie's mailbag. We emphasize, of course, that none of the following data is necessarily "official", complete or accurate:

AP5DC, J. Geil, c/o Technical Training Centre, Mizpur Rd., Dacca 7, E. Pakistan
CN8FE (via K6VJO)
CN8JF, L. Canfield, P.O. Box 746, APO 117, New York, N.Y.
CO2JL, J. Martinez, P.O. Box 6996, Havana, Cuba
CR5AE, c/o J. Garcia, rue Serpa Pinto 130, Santarem, Portugal
CR6EI (via LARA)
CT2AI, F. da Silva, Box 29, Ponta Delgada, Azores
ex-EP2BK (to VS1LP)
F7OAC, Sig. Support Co., USAMSRC, APO 58, New York N.Y.
FG7XC (via W3GJY)
FO8AQ (via WA6s FJE or NDO)
FR7ZC (via W4ECI)
FW8DW (via W8EWS)
GC8KS (to G8KS)
GD6UW (to G6UW or via RSGB)
HI3PC, M. Cordero, Box 282, Santiago, D.R.
HI8NOG, Box 1157, Santo Domingo, D.R.
HK1QQ (via W4DQS)
HK7AHM, Aptdo. Aereo 222, Bucaramanga, Colombia
HL9KN, APO 358, San Francisco, Calif. (or via K7KID)
HL9TF, T. Lopez (K2GMF), 74th Ord. Bn., APO 970, San Francisco, Calif.
HM4AQ (via W8BF)
K3GAD/KJ6 (via KJ6BZ)
K7GVM/VO1, J. Huffman, USCG Radio Stn., Box 49, Navy 103, FPO, New York, N.Y.
KØDNM/KJ6, S. Merchant, Bendix Radio Div., PMR Box 141, APO 105, San Francisco, Calif.
ex-KA2YA-KG6ICD (to W8BPT/am)
KC4UST, USS *Edisto* (AGB-2), FPO, New York, N.Y.
KZ5BO (to W8BPT/am)
KZ5s FP GI (via KZ5PP)
LA5FI/p (via LA5AD)
LA7RF/mm (via NRRL)
LX3QX (to ON4QX)
OA8NP, P.O. Box 216, Iquitos, Peru
OX3UD (via W2CTN)
PY7VKN, P.O. Box 975, Fortaleza, Brazil
UA2AW, Postbox 7, Kaliningrad obl., U.S.S.R.
UP2OK, P.O. Box 310, Kolnas, Lithuanian S.S.R., U.S.S.R.
VE2ALV/VO2 (via GM3LYS)
VK9LA, L. Allen, Box 5, Cocos, Indian Ocean
ex-VP1AA, D. Hunter, 1906 W. Hanna, Tampa 4, Fla.
VP2SH, Box 142, St. Vincent, W.I.
VP2SYL (via K2MRB)
VP7CS (via W2CTN)
ex-VP8HE (to GM3JDX)
VQ1GDW, Box 84, Zanzibar (or via RSGB)
VQ1IZ, Box 1283, Zanzibar
VS1LP, R. Snyder (WØGTA), Mt. Elizabeth Flats, 55 E. Nutmeg Rd., Singapore 9
VS6EQ (via HKARTS)
W5HCZ/VO2 (via VO2UA)
W8BPT/am, R. Nelson, P.O. Box 364, Howard AFB, C.Z.
W9JJF/KG6 (to W9JJF)
W9WNV/KG6 (via W9VZP)
YA1AW (see preceding text)
YK2SK, Box 125, Beirut, Lebanon
YV4BH, F. Marin, Box 18, Maracay, Venezuela
ZD6IIK (see preceding text)

ZD8JP, left, and visitor W5ZWT occasionally team up for 14-Mc. s.s.b. operation on Ascension island. W5ZWT, who supplied this snapshot, frequently operates on 14,335 kc. during his flights over the Atlantic using a KWM-2, 30L-1 and unipole.

ZD8DW (to W5SWX)
ZS3EW, B. Connolly, P.O. Box 131, Swakopmund, S.W. Afr.
ex-4X4NJ, R. Kline, K7ADD, 521 Sweeney Av., Las Vegas, Nev.
5A4CW, R. Wynhoff (K5HUT), P.O. Box 280, Benghazi, Libya
6O1ND (via W4TUA)
9L1GM (via W3BYX)
9U5JH (via W4YWX)

Contributors of the preceding QTH catalog are **Ws** 1APA 1ECH 1JYH 1SEO 1WPO 5PQA 8KX 8YGR 9NN, **Ks** 2MRB 6CYG 6TZX 9EAB 9YRA ØGVA ØJPL ØVSH, **WAs** 2HLH 2NFY 6VAT, **DL9LI**, **G3PIT**, D. Houghton, American SWL Club *SWL* 6204 E. 109th Ter., Kansas City, Mo.), DARC *D X-MB* (DLs 3RK 9PF), Far East Auxiliary Radio League *News* (KA2EB), Florida DX Club *D X Report* (W4CKB), Japan DX Radio Club *Bulletin* (JA1DM), Kanawha (W. Va.) Radio Club *Splatter* (K8BIT), Long Island DX Association *D X Bulletin* (W2MES), Northern California DX Club *D Xer* (WA6TGY), VERON *D Xpress* (PAØs FX LOU VDV WWP), and West Gulf DX Club *D X Bulletin* (K5ADQ). DX clubs may well be outnumbered by the organizations of other facets of amateur radio but their publications, a few of which we inspect regularly, are unsurpassed in sheer vitality. Well done, editors!

Whence:

Europe — ARRL's annual DXtravaganza is over but it's still DX contest time. PZK (Poland) urges your indulgence in its *International* SP DX Contest to be held (c.w.) from 2000 GMT, April 6th, to 2000 the 7th, and (phone) April 20th–21st, same times, on 80 through 10 meters. Non-SPs will strive to catch as many SPs as possible, a given station to be worked but once per band. The standard RST- or RS001, RS002, etc., serial exchange will prevail. You rate one point per SP contact, the sum of these to be multiplied by the number of Polish call areas collected per band (SP1 SP2 SP3, etc., a possible maximum of 45) for final score. June 30, 1963, is the deadline for submitting log entries to PZK, P.O. Box 320, Warsaw, to be eligible for possible certificates of meritorious performance to be distributed to high scorers. . . . . REF (France) invites your participation in its annual DX contest slated for (c.w.) 1400 GMT, March 30th, to 2100, March 31st, and (phone) April 20th–21st, same times. Non-F stations will go after as many Fs as possible, and vice versa. The usual exchange of RS or RST plus test QSO number — 579001, 469002, etc. — will occur, with French lads adding a code number to indicate their province or country per DPF and DUF certification entities. A French station may also indicate with its call the number of its department (state) for the convenience of DDFM certification hunters. Each successful QSO earns 3 points, this total to be multiplied for final score by the sum of different French provinces and countries accumulated per band. Log entries go to REF, B.P. 42-01, Paris, R.P., France, and no mailing deadline is indicated in F8TM's announcement. . . . . W1UED and K3CUI remind us that this year's Russian DX Contest comes off on the 4th and 5th of next month. We'll schedule a rules condensation for May *QST*. . . . . Wls LLF and WPO are told that Gs 3IFB and 8KS will fire up from Jersey around April 13th–15th as GC8KS on 14,010- and 21,020-kc. c.w., 14,110- and 21,432-kc. single-sideband. They'll be listening 10 kc. up from those c.w. spots, 10 kc. down on phone . . . . . Cambridge University Wireless Society will be concluding their annual multiband GD6UW outburst about now if their timetable runs smoothly. Last year 400 of their 1000 contacts went to W/Ks. . . . . From the 5th to 15th of this month Gs 2BUL 3FTQ and 5GH will put the Isle of Man on DX bands including 160 meters, mostly c.w. The call is unspecified but they may use their own suffixes . . . . . *DJØHZ (K3KMO) hopes to hitch some QRO to* his 40-watter and is angling for early DXpeditionary work among rarer European principalities. . . . . DL9LI reports consistent 14,045-kc. signals from the 50-watter and G5RV-styled antenna of HA6NC at Salgotarjan, while UA2KAA's 100 watts is quite workable around 7015 kc. at 1100–1200 GMT. . . . . SP3AEI desires to correspond with a U.S. ham similarly inclined, *Call Book* address okay . . . . . W8IVK describes a pleasant summer visit with the Austrian Amateur Radio Association, OE1XA, where a hospitable open house is held every Thursday evening. OE1XA has antenna problems but does all right with its German war-surplus receiver and homebrew 200-watter on c.w. and straight a.m. . . . . Club organs aforementioned provide more Continental comments: UA3CR is said to be preparing a Mongolia s.s.b. transpiration for May or June. . . . PAØAA, the Dutch W1AW, transmits DX news on 14,100 kc. at 1915 GMT, Fridays. . . . OY7ML *encountered* trap troubles with his new beam but anticipates a productive DX summer nonetheless. . . . How does a Russian qualify for amateur status? Well, among other things, if he's over 14 and can handle c.w. at 12 w.p.m. he can pass another exam and build a transmitter to earn 10 watts c.w. input on 80, 40 and 10 meters. More experience, an 18-w.p.m. code speed and some stiffer exams finally merit him other modes and higher power. Amateur radio in the U.S.S.R. obviously is more a military than civil province.

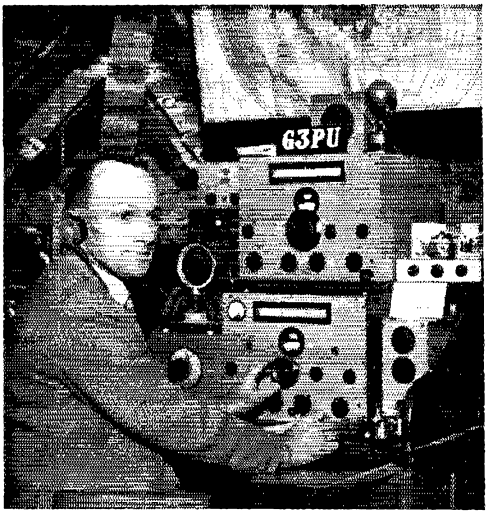
Asia — "AC3PT scheduled a trip to Calcutta in mid-February to see that the transmitter being built for him is completed," advises W3LE. "The Prince has decided to wait a while before getting the kilowatt rig I located for him. He is to use a low-power transmitter until such time as he decides to obtain the kw. Prince Namgyal indicated that he expects to be on starting sometime in March or April. I have my doubts that he will be doing much operating for some time, however, as he was to marry a Miss Hope Cook in March." . . . . More from W3LE: "Ex-JTIs AA and YL now are back on the air from their home QTH as OK1s KW and YL with a Viceroy kw. Mila reports very strong signals from the U.S. on 20 meters." . . . . "I'm now on 20 c.w. and a.m. as HL9TF," *reports* K2GMF. "I have a 51-J and 4-400A hooked to a 14-Mc. ground-plane. A 7-Mc. ground-plane is in the works. My usual operating period is 2300–0100 GMT." . . . . "I was in Israel about two years," pens ex-4X4NJ, now back at K7ADD. "One of the most enjoyable DXperiences of my stay there was 4X5DS operation. I also entered a few contests, among them the 2nd All-Asia DX Test in which I placed first for Asia." . . . . WA6UZA commends JAØSU for passing the 100-country mark on 28 watts, using mostly 15-meter phone and c.w. An on-the-nose quad was no hindrance. . . . . "Ex-5A3BC goes to Pakistan around this time with hopes for early AP hamming authorization," remarks K2ZRO . . . . . Asian items via aforementioned club sources: ITIs TAI and ZGY still threaten a JY filing with Jordan visas good into May. . . . HL9KH (W9WNV) is mulling springtime DXpeditionary sojourns to such spots as Sikkim, and so forth. . . . YA1AW of Kabul likes 14,266 and 14,310 kc. around 1200–1400 GMT, one sideband only. Howard also tries 14,134 kc. for his own DX now and then. . . . HS3PD is unfortunately out of bounds for FCC-licensed amateurs but his appearance may be a good omen.

Africa — K2UYG keeps a close ear on African emanations, and *comments*: "TT8AJ now is active daily from his new Ft. Lamy location, usually sticking to c.w. between 14,055 and 14,175 kc. around 1900–2100 GMT. TT8AL also uses c.w. while TT8s AA and AC favor 21-Mc. a.m. . . . TL8AC encountered receiver trouble on his return to the C.A.R. so his 14- and 21-Mc. work will be held up until he solves this problem. . . . Ex-TT8AG operates FB8ZZ on 14,040 kc. between 1600 and 1800 GMT. FB8XX also shows up on frequency regularly." . . . . K2ZRO has it that 5A1TK, reachable through the Libyan bureau, takes over management of the 5A Award upon 5A3BC's departure. . . . . 5T5AD tells K9EAB he's interested in closed-circuit TV gear and philately. . . . . W9PIO learns that 5H3HZ, who favors 14-Mc. c.w. work, spends off-the-air hours as a police radio engineer. "Chas. says the QRM is still very heavy and wishes the high-power boys would cease calling him during QSOs." . . . . Former EL6E declares, "The continued assistance of W/K/VE hams in maintaining the excellent services which have been rendered to EL6E in the past will be deeply appreciated by the Order of the Holy Cross and myself. It would be impossible to express adequately our gratitude for all the help provided in keeping the mission staff in touch with their families and friends back home." . . . . The collective DX clubs press supplies additional African tidbits: VQ9HB may try Agalega for DX size this month or next. . . . Ex-ZD7SA works for Cable & Wireless in England and has no plans for early

return to St. Helena. . . . 5T5AD should have his new 20A, 2B and TH-4 beam going by this time. . . . W4BPD had 'em in the aisles in February as FR7ZC/j with output on Juan de Nova, now a new DXCC item. Gus seems well on his way toward that exclusive HAI award — Hit All Islands. . . . 9L1GM does brisk 14,050-kc. c.w. business around 1600 GMT. . . . ZS6s BS and PC may be able to steer you toward Marion's ZS2MI.

Oceania — "JA1EEB/KG6I will be on Marcus island till mid-June," says WA6IVM . . . . Erratic conditions bring tricky long-path propagation back to 20 meters and you've got to keep one hand on the rotator switch to catch the right bounce. K2UYG finds ZM6AF rolling through backwards on 14,060 kc. during eastern afternoons . . . . From K6TZX: "KX6AJ says he is about to become the only KX6 on c.w. with the departure of KX6BC. KX6AJ, himself, is scheduled to leave Kwajalein next month." . . . . W7DJU rushed a 50A1 ballast tube to CR8AC to keep his short-wave portable perking . . . . KH6IJ is too much of a ham's ham to be QRT for very long, although it's touch and go right now. Katashi was too QRL with academic matters to accept W2EQS's invitation to participate in January's 160-meter DX doings. Worse than that, KH6IJ has moved into the city where prospects of serious lower-frequency DX activity are remote . . . . W3AFM relays ZL4GA's protest about W/Ks ganging up on his directional DX CQs. "You see, the African region is open for ZLs only for a short time each year via the South Pole." ZL4GA/4 recently stirred up a short-lived storm from Riverton Rocks on 20 . . . . VK3KB discusses rare Willis isle: "Our callbook shows VK4s HG and WV listed on Willis and they are presumably working there. VK5AB also is listed for that QTH as VK4WE, possibly for future DXpeditionary work. There are several factors operating against radio visitations, however, including scarce transportation and a poor anchorage." . . . . Multitudinous Pacific dispatches via the club journals: VS1LP (W6GTA) feels there's hope for legitimate Indonesia hamming in the not too far distant future. The country's national-emergency status may be lifted this summer. VS1LP finds 40 hot to the States at 1300-1600 GMT. . . . GM3OEV leaves for assignment in Singapore and possible operational stops in VS4 VS5 and ZC5 territory. . . . ZL1ABZ of the Kermadecs, lately workable on 14,040 and 14,293 kc., 0300-0500 GMT, must mount an 80-foot tower each time he wants to change beam direction. . . . Marcus island's KH6PD/KG6 is cooking up a Japan-oriented rhombic with a back lobe on the States which should augment the 14-Mc. beam supplied by K7UDV/KG6. Ray is available week days on 14,295-kc. s.s.b. at 2000 GMT. . . . W9JJF has a 500-watt outfit and twirler along on his Pacific swing that may reach from Saipan past Timor, c.w. and sideband on 80 through 15 meters. . . . VK9DR, Christmas, has 150 watts and a 200-foot tower on tap. He formerly signed VKs 2DR and 4DU. . . . Flyboy ZS6IM occasionally tries his DX luck as VK9ZS on Cocos. . . . Papua's VK9AT joins the sideband set. . . . Ex-ZD8RN, KØWII and WA6DLZ recently teamed talents as radiops aboard different ships on the high seas to save the life of a critically ill seaman aboard WA6DLZ's berth, the *Horizon*. . . . CR8AC tantalizes the gang on 7-Mc. code of late. . . . Forty is also the haunt of KC6BO who sports a kilowatt and 250-ft.-high rotary on Koror, 7295-kc. sideband. Those extremely high ham antennas in the Pacific often are ensconced atop the towers of special scatter-propagation arrays, installation of which has been going on for several years now. . . . Consult VK4SS

VP2SY concentrates on 15- and 20-meter phone from St. Vincent, ofttimes assisted by the XYL, VP2SYL. This photo was forwarded by Washington's QSL manager, K2MRB.



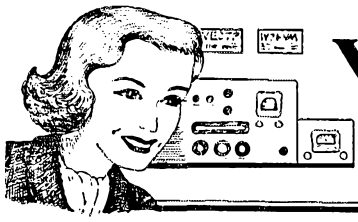
G3PU's perennial 160-meter DX performances are accurately termed persistent, reliable and successful by W1BB, source of this photo. Britain's conservative 10-watt power limit on 160 meters fails to daunt the G gang. Ern's 8.5 watts—an 807 at 275 plate volts—has tagged a 1.8-Mc. WAC and 41 countries. A half-wave skywire 70 feet high gives G3PU's QRP the necessary push. Among those CR-100 receivers and associated gear is a first-prize trophy won in a 1930 listening test.

for full specs on the Down Under certification, a diploma attained through working fifty VKs in five call areas on three bands. . . . 9M2MC heads for ZC5 and possible DX pile-ups this month. . . . K2QGC/KG6 describes all-out attempts by various OMs to fire up on Rota and/or Saipan but the red tape is long, thick and tough. . . . G3OEF wants to return to VS4RM after his U.K. stay. . . . WG6ALS is a rare Novice on 21,202 kc. almost daily with a 6AG7-6146 rig, SX-100 and TH-4 spinner. Neighbor KG6s AIG AJB and AJI were hard hit by Typhoon Karen in late '62, the latter losing his entire dwelling in the blow . . . KC6BK's KWM-1 and TA-33 have collected 132 countries in six months and he's just a state or two shy of WAS. . . . VR6TC, transmitting 14,067-kc. c.w. Tuesdays at 0500 GMT, listens around 14,095 kc. for answers.

South America — W8BPT/am (KZ5BO) discusses his aeromobile DX operations in South American and Caribbean areas: "I've been operating for about three months, making many contacts into Europe on 20-meter a.m. when south of Lima, Peru. We fly mail and supplies to embassies and missions in countries down that way, trips averaging four days but sometimes as long as nine. I manage to work the ham bands from 30 to 40 hours each flight, and the equipment varies with the type of plane used. I'm usually on phone, but when conditions go bad I switch to c.w. We're fortunate in that the Caribbean Air Command, my employer, recognizes the value of amateur radio." Bob expects to remain down that way another three years . . . . PY7EC gets DXcellent 21-Mc. results with an 11-foot vertical top-loaded by the ribs of a parasol abandoned by PY7AMK's daughter. PYs 1AQ and 5GA also enjoy the experiment . . . . Ex-VP1AA theorizes convincingly that Utilla island in the Bay group off Honduras, and not Juan Fernandez island, was the scene of the adventure immortalized by Defoe's *Robinson Crusoe*. Students of the story might contact Dwight for an exchange of ideas on the subject (QTH in "Where") . . . . HC4CD came north in December to visit enjoyably with his QSL manager, K4ZZP, as well as with W4TCY, W6RTR, K6CT, WA6s EML KBI and JRD . . . . WGDXC hears from PY4TK that the Trindade PYØNG effort will take place this summer . . . . NCDXC mentions the 14,080-kc. activity of VP8GB on Adelaide island around 0100 GMT.

Hereabouts — K2MRB figures there are about ten VP2s on the air nowadays, VP2s SH SM and SY the most active. Neil shipped a 6AU6 to VP2SY to keep his v.f.o. functional. WA4AYX finds VP2SM shopping for a new exhaler . . . . K7GVM/VO1d iscourses on Newfoundland DX doings: "Good 14-Mc. openings to West Africa, Europe and South America early this year. My Stateside

(Continued on page 100)



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

BE PREPARED!

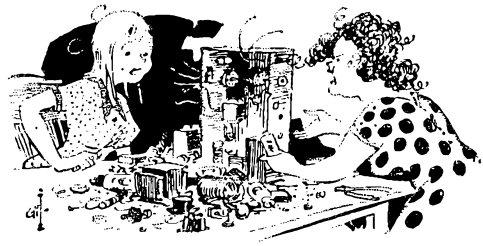
"How do you get to become one? How many hours a week do you spend at it? Isn't it rather unusual for a girl to be doing this? Tell me about some of your more interesting experiences."

Perhaps you have been interrogated by the press with questions like these. A good many of us have. If a session with the press (or representatives of the radio or TV media) results in spreading good publicity about amateur radio, the effort is worthwhile. In fact, we've often suggested on these pages that YLs can do much to help promote good will for our hobby.

How you answer more personalized questions such as "How did you become one?" and "How much time do you spend at it?" etc., is, of course, up to you. Here in your column in *QST* we try to furnish information regularly that should help you to answer questions of a more general nature — "Have you any well-known or notable ones among you? What are some of the things that they have done? How many of you are there in the world?"

In the January issue each year we try to summarize the previous year of YL activity. Such a resume should help give you a start on furnishing general information about the YLs of amateur radio. Additional information you can dig for by rechecking past issues.

A point we're trying to make (at the risk of seeming immodest) is that you can be poised and knowing if you are approached by the press if you keep your copies of *QST* handy for quick reference. You'll be able to drop names and facts and statistics that should be to the satisfaction of the interrogator. Be a self-appointed ambassadress for amateur radio. The information printed here each month is for you, and if you take it upon yourself to use the information to help promote good-will for our hobby, we'll be very happy indeed!



"BE CALM, MABEL....WE'LL LICK THIS THING YET"

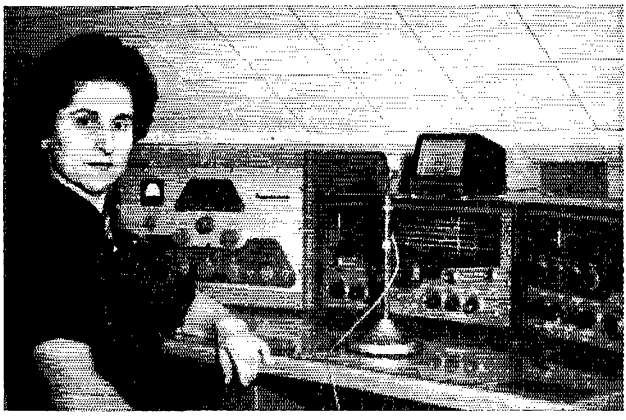
A New High

The Winter 1962–63 issue of the *Radio Amateur Call Book* lists almost 13,000 new licensees over the Fall '62 issue, bringing the number of U. S. amateurs to a total of over 252,000.

Some 123,000 hams are listed in the Winter 1962–63 Foreign edition of the *Call Book*, up 3,000 from the previous listing. (The foregoing information was gleaned from *Radiogram*, Feb. 1963, published by the Scott Radio Supply, Inc., California.)

We arrive at our deduction in a rather unscientific way, in fact more by the seat of feminine intuition, but our new, revised estimate on the number of YLs in the world is around the 10,000 mark, a new high for us. Actually, we have no real way of counting YL noses. Do we have a volunteer for the job? (Male applicants also duly considered.) One could devote all of one's waking hours to solving the

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



Marge Farinet, K8ITF, of Dayton, Ohio, is already busy planning favors and decorations for the Fourth YLRL International Convention to be held near Columbus, Ohio June 19–21, 1964. Marge was president last year of the near 200 strong Buckeye Belles YL Club, which is sponsoring the convention. It's not too early to make plans now to attend the big event, suggests K8ITF, because the convention coincides with the 25th anniversary of the YLRL and it is hoped that just as many YLRLers as possible will converge for the celebration.

At the ARRL Southeastern Division Convention

Miami, Jan. 19-20, 1963

Evalyn Shea (right), K4UIZ, accepts the Field Day trophy for the Orlando Radio Club, of which Ev is president, after the club scored highest in the state for the third year. The trophy is awarded by *Florida Skip*.

V. Mayree Tallman (left), K4ICA, originator of the FINS (Florida International Sidebanders) continued as NCS of the popular net which meets Thursday at 1800 GMT on 14,277 kc.

ARRL President Herbert Hoover, jr., W6ZH is flanked by the President of the Floridoras, Florence Bogardus, W4HRC, (left) and fourth YLRL District Chairman, Marge Campbell, K4RNS (right).

Guest of honor at the Floridora YL meeting, Mary Dosland W5DEW/KØWKS poses with very active Florida YL Marge Campbell, K4RNS. Mrs. Dosland (on right) is the YF of WØTSN, former president of the ARRL.

conundrum, but, of course, the undertaking would have to be repeated every few months!

17th Annual AWTAR

The 1963 All Woman Transcontinental Air Race, popularly known as the "Powder Puff Derby," sponsored by the Ninety-Nines, Inc., will start at Bakersfield, California on July 13 and will terminate July 17 at Atlantic City, New Jersey. This year's race course of 2459 statute miles will cover a route via the following stop-over cities:

Las Vegas, Nevada; Page, Arizona; Farmington, New Mexico; La Junta, Colorado; Great Bend, Kansas; Kansas City, Kansas; Springfield, Illinois; Dayton, Ohio; Cumberland, Maryland.

Carolyn Currens, W3GTC, will supervise the AWTAR amateur radio net for the sixth consecutive year. Carolyn would appreciate offers of assistance from amateurs who live in cities along the flight route. Contact W3GTC, P.O. Box 523, Norristown, Pennsylvania, if you would like to assist in this interesting and exciting operation.

Coming Events

Annual California YL Get-Together — April 5-6 at the Miramar Hotel, Santa Monica. Los Angeles YLRC is hostess club. Registration Friday evening. Luncheon Saturday; YL-OM Dinner Sat. evening. Send $2.00 registration to G. Lukenbill, K6JCL, 11152 Bettes Place, Garden Grove, Calif.

Third YL VHF Contest — April 10-11, sponsored by the YLRL. All licensed YL operators are invited to participate in this operation on 50 Mc. and up, phone and c.w. See complete rules in last month's column.

Orlando Hamfest — April 19-21, Cherry Plaza Hotel Orlando, Fla. Meeting of the Floridoras on April 20, with many other interesting events scheduled for the weekend.

Dayton Hamvention — April 26-27 at the Dayton Biltmore

Wedding cakes follow a fairly standard design until a couple of hams get together. We think you'll admit that two calls with hearts and flowers is slightly different. Marsha McCoy, W1HAQ, accompanied her dad, W1ICP, to the New London, Conn., Hamfest last fall and there met Bob DeBragga, W1YNP. Bob is a high-speed code champ and DX operator and we guess Marsha must have been impressed with all that fast code (?).
One month later they eloped.

Hotel, Dayton, Ohio, sponsored by the Dayton ARC. There will be a separate day-long program for YLs and YFs.

ARRL New England Division Convention — Swampscott, Mass. April 27–28 at the New Ocean House. Eunice Gordon, W1UKR, and Jean Peacor, K1IJV, are co-chairmen of the WRONE meeting. All New England YLs cordially invited to attend.

13th Midwest YL Convention — June 22 and 23 at Falls Hotel, Newberry, Michigan. W8HAV, Zelma, and W8JXJ, Vi, co-chairmen. Many interesting events planned.

AWTAR — July 13–17. See item.

—•••—

The late Gordon "Pop" Woodruff, W4AKF, of Orlando, Florida, who passed away Jan. 1, 1963, will be truly missed by the many ladies he had long flattered. Pop had changed the nomenclature of "XYL" to "BL" — "Beautiful Lady" — throughout his state. (Via K4UIZ and W4BKC)

—•••—

Anyone interested in jetting from Boston to London to attend the Golden Jubilee of the Radio Society of Great Britain, June 30–July 5, should contact Gladys, W1VPF, and Harold, W1EES, Chase, 74 Sylvan St., Danvers, Mass. Plans call for leaving Boston June 20 and returning July 11, at a saving of over $200 on regular flight fare.

—•••—

Currently serving as officers of the Portland Roses YL Club are l. to r. Ruth Donnelly, K7ADI, Secy.; Phyllis Bowers, W7ZMN, Pres.; Dorthie Mallison, W7REU, V.P.; Beth Taylor, W7NJS, Publicity. An award is issued by the Portland Roses for confirmed contact with 8 members. Send list to custodian W7RVM.

Strays

A testimonial dinner will be held on April 20 for retiring Central Division Director Jack Doyle, W9GPI, sponsored by the Milwaukee Amateur Radio Club. Advance registrations by April 16 are required, so please get in touch immediately with Anton J. Kuntz, K9CJP, 2370 West Marne Ave., Milwaukee 9, Wisconsin.

—•••—

Ham and Nags

Officials of the Jefferson Downs race track, ever on the alert for persons using concealed portable transmitters to relay advance race tips, had their suspicions aroused when they heard code signals amid background noises in the judges' booth at the finish line. Asked to investigate, an engineer from the FCC New Orleans office found that it was caused by the track photographer, who pictures the finish of each race from a location just above the judges' booth. That employee was spending his spare time between races listening to practice code tapes, played on a tape recorder, in order to increase his code speed in preparing for an FCC amateur operator examination. The case was closed with the suggestion that he listen with earphones *instead* of using the loudspeaker. (*Taken from an FCC general information bulletin.*)

—•••—

W3EOZ, of B&W, reminds us that some hams are only fooling themselves when they hang onto their new equipment warrantee cards for several months after purchasing the equipment. What these fellows hope to do is to extend the warrantee period of the equipment by not returning the card, but what really does happen is that they deprive themselves of the benefit of being on the manufacturer's mailing list for the latest service bulletins pertaining to the particular piece of gear.

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

Criteria for Design

IT WOULD seem axiomatic that building a new v.h.f. converter consists of copying someone else's design and making the changes necessary to fit the available components. Naturally, a new converter is presumed in advance to work better than the old one. Unfortunately, the results are not always consistent with the presumptions. In view of the fact that practically all of the serious listening on the v.h.f. and u.h.f. bands is done with some form of converter, it seems amazing that so little effort is spent on determining what the requirements for the converter should be before the construction program is undertaken.

The first consideration in the design of the converter is the choice of the i.f. frequency. By i.f. frequency we mean the frequency range which the tunable portion of the receiving system will cover. Obviously the choice of this frequency is to a great extent determined by the type of receiver used as an i.f. amplifier. Consideration should be given to the amount of bandspread available, the band coverage available, and the stability and front-end selectivity of the particular receiver. Some of the older type receivers have insufficient stability in the 28 to 30 Mc. range to provide adequate tuning for weak c.w. or sideband type reception. Naturally, in this case the choice would most likely be one of the lower frequency segments such as the 7 to 11 Mc. or 14 to 18 Mc. range. Unfortunately, the choice of lower frequencies, while giving considerable improvement in stability, is very likely to lead to problems with i.f. feedthrough. This is a result of the strong signals received on the lower frequencies during the normal operating hours for the average v.h.f.er.

Before making your choice, the receiver in question should be operated with a dummy termination on the antenna terminals and tuned over the proposed frequency range during the evening to determine whether the receiver thus operated receives signals in the range to an objectionable degree. In general it is safe to say that all receivers operate with more stability and more front end selectivity in the frequencies below 15 Mc. Usually also in these ranges you obtain more kc. per revolution of the tuning dial than you do on the higher frequency ranges. This results in easier tuning of weak sideband and c.w. signals.

The choice of i.f. frequency is one which you must make and is probably one of the more important decisions in the design of your proposed converter. No amount of design work in the converter can improve the stability of your i.f. receiver. As an example, if you happen to own an NC240D receiver a good choice of i.f. would be the 7 to 11 Mc. range. On this particular receiver the stability in this range is excellent and you have the additional option of tuning the 7 to 7.3 Mc. band with bandspread tuning and the 7 to 11 Mc. portion with general coverage tuning. If, on the other hand, you are blessed with a 75A-1, 2, or 3, a better choice might be the 26 to 30 Mc. range as these ranges provide overlapping coverage of a 4-Mc. segment of the band. Unfortunately, the front end selectivity on these bands leaves something to be desired and if you are troubled with high signal levels in your area

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

From left to right: K3EH W2ADA, WA2CVF, K2PXP, K2ZBX and K3EOF. Occasion was the East Coast V.H.F. S.S.B. Association dinner held to celebrate affiliation with the ARRL

DX for this season on 50 Mc. VP7CX, Harold Lund, at operating position at San Salvador.

a better choice would be the 14 to 15 Mc. range with the option of changing the converter crystal to give complete coverage of the various bands.

Having made your choice of an i.f. frequency, the next consideration is what band or bands must the converter operate on. The particular band chosen determines to a considerable extent how much effort must be made to provide a noise figure which is commensurate with the conditions encountered. Unfortunately, the higher in frequency we operate the better the noise figure must be to take advantage of the conditions. If you scan the antenna aperture *versus* frequency chart in last month's column, you can see that a converter for use in the 50-Mc. or 144-Mc. range can be quite adequately designed using available tubes and conventional circuits. For instance, a 50-Mc. converter will probably hear all that can be heard if it operates in the vicinity of 4- or 5-db. noise figure. Of course, on this band it is quite simple to achieve a 3-db. noise figure and it would be foolish to design for anything worse than that which is easily obtained. On 144 Mc. a 3-db. noise figure would about match the antenna temperature, and, of course, it would be desirable to get as much improvement over this 3 db. as is possible with available tubes.

It is not, however, worth any considerable effort to achieve, for instance, a 1½-db. noise figure on 144 Mc., as the number of times when this improved noise figure would actually buy you anything would be very small. On 220 Mc. there is some improvement in temperature and a 2-db. noise figure would be very desirable. There are, however, few if any tubes available which will give you this good a noise figure at this frequency. In general the ubiquitous 417A will be doing well to give you a 4-db. noise figure at this frequency. The 416B might possibly squeeze you down to 3 db. but you would be hard pressed to get it and still would not be taking full advantage of the available signal at your antenna. Nevertheless, unless you are interested in extremely weak signal work the performance of a 4-db. converter on 220 Mc. is satisfactory for 99% of the available contacts.

It is interesting to note, however, that 220 Mc. is the band where a parametric amplifier is the only presently available method of obtaining a noise figure commensurate with the antenna temperature. On 420 Mc. the antenna temperature is down to about the minimum that you can expect on any of the v.h.f.-u.h.f. bands — approximately equivalent to 1.3-db. noise figure in your receiver. That is to say, if you have no feedline loss and a 1.3-db. noise figure receiver you will be deteriorating the signal at the antenna by 3 db. Naturally this is the band where tubes really start to fail in performance. The 417A is practically useless on this band. The 416B type tube can, if in a properly designed circuit and operating at full ratings, give a noise figure of between 4 and 5 db. In general the 416B when operated in this manner has a relatively short life, however, and it is somewhat disconcerting to have your pride and joy turn up with a 10-db. noise figure after two months of operation. The newer RCA nuvistors such as the 8058 are capable of producing a noise figure between 6 and 7 db.

Crystal mixers preceded by adequately high *Q* cavities can perform in the order of 5½ to 6 db. The emphasis on low noise when using crystal mixers is in the following preamplifier which must be designed to have extremely low noise. A good example would be a crystal mixer such as a MA-1N21F followed by a pair of cascaded 417A's. Converters using this technique have been constructed giving noise figures as low as 5.5 db. At 1296 approximately equivalent performance can be obtained using crystal mixers and no practical improvement can be obtained using tubes available today.

It should be obvious therefore that optimum performance on 220, 420 and 1296 can only be obtained through the use of parametric techniques. However, the design of a converter does not necessarily require the use of parametric techniques in itself. In order for a parametric amplifier to be properly operated it must work into a converter of good design. It is then sensible to design the best converter you can for the band in question and if better performance is desired progress to a preamplifier. In any event it can be seen that as far as noise figure is concerned you cannot design your converter too well for any of the present bands. With the possible exception of six meters each band requires a slightly better noise figure than is readily obtainable. It should be borne in mind that if you have designed your converter using available tubes and have done a reasonably good job, the addition of further preamplification in front of your converter can gain you nothing in terms of noise figure.

Gain considerations. The design of your converter should include some thought on the amount of over-all converter gain required by your system. Any good receiving system is designed so that the noise at the output is generated in the first stage. This means that if your converter is feeding a very poor receiver it will require more gain than if it is feeding a very good receiver. The r.f. amplifier stages of the converter must

have sufficient gain to override the mixer noise of the converter. In general if this is accomplished the over-all gain will be sufficient to override the noise of any following receiver. On 50 Mc. this amount of gain can be obtained from one stage of amplification. Any more stages than one are only contributing to the over-all noise of the system and adding nothing to the noise figure of the system. On 144 Mc. it is very difficult to obtain sufficient gain from a single stage to override completely the mixer noise, and it is customary on this frequency and higher to employ two stages of r.f. amplification before the mixer.

Naturally the amount of amplification ahead of the mixer is determined to a considerable extent by the type of mixer employed. A good triode type mixer, for instance, develops less noise in its output and therefore requires less r.f. preamplification. However, the output from such a low-noise mixer is generally lower and it is possible that additional amplification will be required to override the following receiver noise. In general it is safe to say that if additional gain is required it is more desirable to use it on the antenna side of the mixer rather than the receiver side. This, however, is not always true, as for instance in the case of a crystal mixer with no r.f. preamplification; all of the gain is placed between the mixer and the following receiver. If the following receiver is subject to considerable i.f. feedthrough it may be necessary to increase the converter gain to override the interfering signals. Such a design is a compromise and should not be employed except as a last resort. It is much more desirable to make an effort to shield the i.f. receiver and filter the various leads coming and going from the receiver to prevent the i.f. pick-up initially, than it is to attempt to override it by designing too much gain into the converter. Any gain more than the absolute amount required will increase your tendency to overload on strong signals. Almost every case of overloaded converters is a result of too much converter gain for the following receiver.

If one is to take advantage of the latest techniques in converter design, the obvious solution to the converter problem is to design the best possible 1296-Mc. converter. If this converter is well done it should achieve a noise figure of approximately 2 db. and should operate well over a 4-Mc. range. The design of the lower frequency band converters now is a simple matter of up-converting to the 1296 Mc. converter. As an up-converter can be designed to be unconditionally stable, and as the up-conversion process provides gain, a low noise converter for all the v.h.f. bands can be designed with the 1296 converter as the i.f. So far we have managed to get a 1-db. noise figure on the 50 Mc. and a 1½-db. noise figure on 144 Mc. We have not worked on the 220 or 420 Mc. converters to date. First step — a good 1296-Mc. converter.

144 Mc. and Up

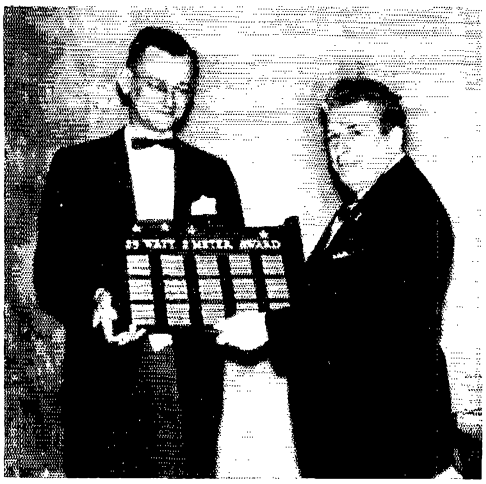
Although activity on 220 Mc., 420 Mc., and up has grown during the past year, seems like the past few months have

Presentation of cup to 50-Mc. winner, VE3DUU (on right) by VE3ATB (on left).

added a number of new stations throughout the country to this ever-growing group. (Perhaps bad weather helped keep 'em indoors.) Among the group is Dick, W6IEY, who sez he finally got going on 432 gear; has completed the TDZ tripler unit and constructed and installed 15 elements for the band. Has repaired and added four elements (total of 13) to the 220 Mc. yagi, and is once again working on the four foot dish for 1296 Mc. In Milton, Pennsylvania W3SDZ sez that things are running well ahead of schedule at his QTH and he expects to have gear for 1296 Mc. finished by early summer. At the present time Vic has his paramp for 1296 almost completed, and is working on a parabolic dish and polar mount, and on a frequency control system for stable receiving and transmitting on that band. Activity in his area is "nil on 432 and 1296 as everybody claims to be building" sez Vic. Out New Jersey way K2DZM has spent a great deal of time building s.s.b. equipment for the v.h.f. bands. He has been running s.s.b. on 50 Mc. for about five years and on 220 for about two years, 100 watts on both bands. He recently completed two s.s.b. transmitters, 432 and 220, part of a 4 band (50-144-220-432), band switching transmitter, each unit capable of 400 watts PEP. On August 15 of last year Mike made his first s.s.b. contact on 432 Mc. and climaxed his efforts on that band on February 5, 1963 when he had his first 2 way s.s.b. contact with W3HFY in Pennsylvania. Nightly skeds have been kept on 220.1 Mc. for the past few months with W3UJG (2100 EST) with good results over a 175-mile path; and a few times there's been a 4-way s.s.b. QSO which included W3UJG (Maryland), W3HFY (Pennsylvania), K2PCG and K2DZM (New Jersey). W8PT in Benton Harbor, Michigan has his rig for 432 Mc. almost completed, a 4X150A driving 4CX250B, 450 watts. Jack is still holding skeds with W9REM on 220 Mc. and with W9BTI and K9UIF on 432.

For the past two months W8PT and K4IXC in Melbourne, Florida have been running daily checks on 144 Mc. W8PT sez "We never fail to hear each other, meteor shower or not. We have worked many times and could work each other several times a week if we took the time. Schedules are at 1110Z-1120Z daily except Sunday; 1300-1330 Z on Sundays and 2230-2240 EST on Tuesdays and Thursdays. Frequency at K4IXC is 144.090, at W8PT it is 144.085."

K2QGF sez that although he did work WA2FNN on 1215 Mc. on December 16 and 19, it does get kind of lonely. He'd appreciate skeds with anyone else in a 50 mile radius of his QTH, Edison, New Jersey. Bob is working on a 700-watt rig for 144 Mc. and also constructing a new antenna system. According to him the old system was "reduced to an aluminum pretzel on December 30." WØMOX will soon be running 800-watts output on 432 Mc., and K9AAJ is now running 450-watts input on this band. Lee (K9AAJ) reports that he is usingthis old single 4X250 rig and made the



Presentation of plaque to 144-Mc. winner, VE3EZC (on right) by VE3DXR (on left).

modification to the output line and plate line which W1HDQ described in January *QST*. Seems very stable and doesn't require retuning every time you put it on the air, sez Lee. In November, Lee worked K4IXC for state number 32 on 144 Mc. and on January 30 — "I had just about given up on aurora when last night (January 30) we got a fair opening in this part of the country. I about fell out of my chair when WØYSJ (144.205) came back to my CQ. NorthDakota is a new state for me and makes a total of 33 on two meters. With the exception of Maine, I think North Dakota must be the hardest state to work on two meters. By the way, do you know of any stations in Maine with some fairly high power on two?" (Well, fellahs?) Within a 100-mile radius of Quincy, Illinois (Lee's QTH) there are approximately 15 active s.s.b. stations on two meters, at least two of them located in Cedar Rapids, Iowa.

Reports from the state of Washington say that K7UIL and K7BNQ are working on a 420 Mc. TV station; and in Locust, New Jersey WB2DXG and WN2DDB are accumulating parts for a TV rig and would like to know if there are any stations within range, and on what frequencies they are transmitting their audio and video. Any advice or information would be appreciated by this brother-sister team and should be sent to 138 Locust Point Rd., Locust, New Jersey.

A letter received from W8EKJ in Oberlin, Ohio reports 220 Mc. activity on the increase during the past year in the Northern Ohio area. He lists thirteen stations being very active with seven of these being in the Cleveland area and the others in the Akron, Canton, Youngstown area. Skeds are held regularly every Monday, Wednesday and Friday at 1900 EST and frequencies ranging from 220.040 to 220.320. At Bob's QTH (W8EKJ) he is running 300 watts to a 4CX250B and the receiver front end is a straight thru paramp using a crystal-controlled pump at 3900 Mc. and an MAHU diode. K3ADS reports that "everything has deteriorated as per usual in January," but in spite of this Larry did have a successful RTTY QSO with W3FEY on 220 Mc. Another one building for 432 Mc. is WA6ROJ who is presently working on a 4X250B amplifier and has four 13-element beams for 432 ready to go up as soon as the new tower arrives; and Paul, W4HHK sez that "parts are being scrounged for construction of a kw. final amplifier for 432 Mc." Word has reached us that K8IRR in Columbus, Ohio is gathering parts for a single 4X150 rig for two meters and for a single 4CX250 rig for 432 Mc.; and that W8TTY should have a kilowatt on 432 by the time this is in print. W8BAX and K8HRR have started working on gear for 2400 Mc. using a 446A local oscillator into an APX-6 i.f. strip through a 1N21E crystal mixer for a receiver and a 2C43 modulated oscillator for a transmitter. In Philadelphia, Pennsylvania K3ADS is wondering if anyone in that area has an APX-6 converted for the low end of 1215. Larry would like to run checks with someone on the Philadelphia area but he can transmit and receive only on the low end.

K9UIF in Hobart, Indiana reports aurora on 144 Mc. on January 12 and 30. On the 12th the only signal heard was W8KAY in Akron, Ohio, but on the 30th Walt worked W8FW in Ohio; K2DUR, New York; W2WCF, New Jersey; and heard W1RJA in Connecticut. Walt maintains nightly skeds at 2150 CST with W8BKI (144.257) in Charleston, West Virginia with good results every night, and follows this one with a sked at 2200 CST with W8KAY (144.300) in Akron, Ohio, also with good results. K3OBU in Delaware comments that on January 5 and 6, during the VHF Contest he worked W4VCC, W1GB 1 and K1SDC on 144 Mc.; also heard W4UBY, W4LTU and a Western New York station. Out in Ironwood, Michigan K8IFL also reports the same good conditions for him during the "Sweepstakes," when he worked W9DLY with solid signals both ways; W9LEE was stronger than usual and reported that Bob's signals were being heard by WØYPT in Iowa; and WØBBN who was not as strong as usual.

WØDQY has been working scatter on 145 Mc. and invites c.w. skeds. In the St. Louis, Missouri area two meters is being used from one end to the other with signals heard locally all the way to the upper end according to WØRVA. Dave, KØRWC sez that in the Pittsburg, Kansas area "144 is coming on like gangbusters! Likely the best January especially during the VHF Contest with 5's, 6's, 9's and Ø's coming through — Plenty of activity." He would like to set up satellite scatter skeds with someone on 144 Mc. The boy who has been giving out Florida contacts on two meters during the meteor showers the past few months, K4IXC also sends his comments: "Have been having lots of success with meteor skeds but still need all New England States and W3. If you know of anyone needing Florida on two meters, pass the word along that I am interested in skeds. Rig here is 1 kw. to 4X250B's, 30-foot yagi at 100 feet, 417A converter mounted at antenna, 75A-1 will Q multiplier and audio filters. Frequency — 144089.5 c.w. At present am running a daily sked with W8PT 0610–0620 EST, and have had several complete contacts lately even without benefit of showers." K4RNG in Miami reports that Saturday and Sunday are very active days on 144 Mc. in that area with s.s.b. increasing by leaps and bounds; and W4RQP also mentions the increase of s.s.b. on two in Leisure City, Florida. W9JOT sez that he hears there are about twenty hams in Chicago area on two-meter s.s.b. and that he is waiting for his s.s.b. gear for that band to arrive; and W4LOJ in Tennessee now has a.f.s.k. teletype in operation on both 144 and 50 Mc. K3CZI is also on 145.05, 1000 watts p.e.p. input. In New Orleans, Louisiana, W5JGV complains about the lack of activity on 220 Mc. locally. Ralph sez he's done a lot of listening and heard a few weak 8 and 9 stations last summer. He's building a 200-watt rig for 144 and 220 Mc. and hopes to be on the air with it very soon.

Clubs and Nets

The Butler County VHF Association in Hamilton, Ohio is a group of amateur radio operators whose interests lie in the v.h.f. bands. The club operates station W8CCI on 50, 144 and 220 Mc. Transmitters run 700 watts on 50 Mc.; 100 watts on 144 Mc.; and 25 watts on 220 Mc., with antennas at 118, 65 and 120 feet respectively. All equipment except the receivers was built by the club members. In 1962 the station worked thirty-eight states, Mexico, Puerto Rico, Cuba, Nova Scotia and several other call areas in Canada. On two occasions during contests more than 400 stations were contacted during the contest period. Thirteen members have mobile equipment in their cars and seven members are currently active on six-meter s.s.b.

The Mountaineer Amateur Radio Association will sponsor the VHF Centennial Cup Award at the West Virginia State Convention on July 6 and 7, 1963. The Association is sponsoring a contest which runs from January 1, 1963 to June 10th, 1963. All contacts must be made on frequencies above 30 Mc. and must be from the same location. No power limitations and contacts may be mixed, using any mode available to the amateur. Each station may be worked once on each band; cross band QSO's not permitted. Score two points for each completed QSO. Multiply final score by number of West Virginia counties worked. Send logs, no later than June 25 to William Huff, 344 Kenmore St., Morgantown, West Virginia.

The Michigan Six Meter Club is also sponsoring their annual contest, on 50 to 54 Mc., all modes. Local participants will win prizes donated by manufacturers and supply

houses, out of state amateurs will be eligible for a contest certificate. For further information contact W8MEH, Reginald Bull, in Detroit, Michigan.

The Confederate States Rebel Net continues to grow and 40 to 45 Rebels report in each Friday night at 2000 hours on 50.4 Mc. Starting in February the net will also function on 144 Mc. The Confederate States Amateur Radio Club has announced that the Rebel Hamfest will be conducted on June 2, 1963.

The East Coast VHF SSB Society maintains a net on Sunday mornings at 1100 to 1200 on six meters on single sideband on a frequency of 50.108 Mc. About 25 to 30 sideband stations check in on an average net operation although the net has logged more on occasion. The northernmost state to check in has been Maine (WA2WLZ/1; Virginia has been the southernmost station to check in on groundwave; and Florida has checked in during a skip session. WA2CVF is net control. The 1st, 2nd, 3rd and 4th call areas are regular check-ins and the net welcomes all those who wish to participate.)

The "Oakville Do" is a non-club group, who meet the Saturday evening following each ARRL VHF contest at Oakville, Ontario, Canada. VHF hams come from as much as three hundred miles away to attend the "Do." Jack Russell, VE3DXR along with Dick Lester, VE3HW and a couple of other v.h.f. enthusiasts, now silent keys, were the originators of the "Oakville Do," and the cup and plaque were donated by Marty Rosenthal, VE3MR. Along with the plaque goes a small cup that the winner of each contest keeps. Winner of the trophies are the persons present at the "Do" with the highest score on low power, 25 watts input or less, on 144 Mc. and 50 Mc.

50 MC.

As a great number of the v.h.f. fraternity know, VP7CX was "in" again during the evening of February 10, and coming through like a-house-a-fire. We received word from Harold that during that evening he worked about eighty stations on 50 Mc. in W1, 2, 3, 4 and 5 lands. Sez he must have worked every station on the band from Massachusetts, even working K1OHM/mobile in South Carolina; (You should have been at this end that night, Harold, you didn't work even a small fraction of the stations in this area calling you) and finished up the evening by working W5SFW as the band went out at 0151 GMT. Since November 30, 1962 Harold has worked 27 states with best DX being K7ALE at Tucson, Arizona, KP4 and YV. He has received permission to operate 144 Mc. and hopes to be on that band very shortly. For those of you who need it for QSL purposes, cards should be sent in care of W9ZDI, and s.a.s.e. would be appreciated.

During the last convention in Miami, Florida, on January 19 WA5CWS met Harold, VP7CX, who gave him the photo you'll find somewhere in this column. Hal told him that he had worked over 400 stations on 50 Mc. (at that time) and I'm sure that it's well over 500 now.

Along the same lines as the above we hear from Chuck Ryan, W6LRU; "One of my six-meter DX contacts on April 2, 1960 was Mike, LU3DCA, whom I asked to come and visit me some time. Lo and behold, on the 3rd of February he did! All the way from Buenos Aires by plane, his XYL and himself came. Dorothy, my XYL, and myself had a very pleasant visit with Mike and I still can't get over the surprise of his visit to this country." Don't read this column too well, do you, Chuck?

Correction received from K1WTK states that his report concerning a YV station, mentioned that a station in 1 land had heard the YV although he did not hear it himself. And — K4RNG reminds us that in his report of activity for June 1962 he said: "June 29, 1962: 0940 YV5AGM, Carlos in Caracas, Venezuela was working a CO2 in Cuba in Espanol. Broke in with 'Por favor comprendido' and he said standby. Worked him at 0940 and again at 1153. He had a field day, but no QSL card received." Les has also heard YV4's in Maracay and YV1's in Maracaibo but has not worked them.

W3SDZ reports only short, spotty sporadic *E* but he has been having good results with scatter skeds on 50 Mc. At 2000 EST nightly Vic calls CQ West on 50.113 and usually K8TUH comes back along with W3UEJ. Then the beam is swung on New England and contact is made with K1PRE north of Boston, a path of over 300 miles. Other stations worked on these skeds have been K1NTC in Maine, W1BSY and K2MUB.

We hear from Nan, K4NGD, that on February 10, VP7CX was also getting into Alabama (plus a few other places) and that strong stations in Miami and Fort Lauderdale, Florida were coming through. WA4BXU was heard working into Texas. Nan reports that K4TIY now has a new 8-element beam and that many of the six-meter boys in the area are working on equipment. New receivers are being talked about and the old ones are being checked into and peaked up. W4WGI tells of a poor opening on January 28 when the band was open to Texas and Oklahoma but with weak and watery signals running from S2–S9 with rapid QSB. Lasted about two hours. In Panama City, Florida WA4FIJ noted only one band opening during January and that on the 31st when it opened into Texas and Oklahoma for thirty-five minutes. Stations worked were WA5BRQ and WA5EAO. W5SFW was heard but not worked. Over in Miami, Florida, Les, K4RNG sez that January was a "dead" band for six meters. He then goes on to report good ground wave on January 6, 15, 25 and 27; and openings on January 8, 11, 12, 27, 28, 29 and 31. (Wonder what a good month is like for Les!) During three of these openings Puerto Rico was coming through, and twice California came through; other than that the only places heard were New Jersey, Kansas, Missouri, Texas, Oklahoma, New Mexico, Arizona, Indiana and Illinois. Two stations in Louisville, Kentucky are interested in c.w. skeds. W4GSH and WA4CQG are both willing and waiting to give a Kentucky contact on c.w. to any who want it. At Fort Bragg, North Carolina K4WOD observed no openings during January. Stan sez that until more locals get on six meters, those now on in that area are monitoring 50.55 Mc. and working on an informal basis on that frequency nightly between 1900 and 2000. W4OAB in Charlotte, North Carolina notes that s.s.b. interest on six and two meters is high, and that the program at the last Carolina VHF Society meeting was on s.s.b. Cliff sez that ground wave conditions were poor during January and that skip came through only on January 28 from 0 land and that was poor too. In Memphis, Tennessee WA4IRX sez that ground wave was normal to below normal and no skip heard or worked during January. Only opening observed by K4KYL in Knoxville was on the 29th when Texas was heard. Down Virginia way WA4AYP and K4IMF agree that ground wave conditions for the month were very good, very often, but W4GVQ sez that groundwave propagation was mediocre and no breakthrough conditions were noted. Roger, K4IMF noted an opening to Alabama on January 31 and on February 1 another one to Delaware and Florida.

On the West Coast WA6YIT, WA6LGE and W6IEY all report the opening of January 29. Milt, WA6YIT sez that he copied several 5's but had no contacts on that date; however on February 1 the band opened again and he worked W5EXN, WA5EFB and KØFTG. "Best opening observed since this station went into operation August 18, 1962." Bill, WA6LGE, sez he found the six-meter band jumping with activity on January 29. First couple of stations heard were from 4 land, with W4ACT on s.s.b. being the strongest. Later the band shifted to 5 land and K5QKV and K5EBZ were contacted; next 7's came in and QSO's were held with K7CIN and K7QXA in Phoenix, Arizona. Although Dick, W6IEY did not catch the opening of the 29th himself, he sends word that WA6ZGT reported hearing Washington, Oregon and Mexico. On January 31 K8SYC/6 reports an opening into Texas and on February 2 Texas and Oklahoma were heard. In Portland, Oregon W7ADR observed the opening of February 1 into California and sez it was preceded by a pronounced weather change. K8WVZ in Napoleon, Ohio (mistakenly mentioned as K8WUZ in February column) reports that s.s.b. popularity is growing and that more operators are using scopes to monitor incoming and outgoing signals. Mike sez that during January ground-wave was slightly better than usual only on the first of the month and that no other "special" cond tions were observed. In Newton, Iowa, WØDRE comments that 50 Mc., has been dead skipwise except for a few skip stations heard during the contest the first part of January. Ohio, Wisconsin, Iowa, Missouri, Kansas and Nebraska were heard although not all worked. On January 31 John heard W9SDU on aurora. QST

Correspondence From Members-

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

Incentive Licensing — Restricted Voice Bands?

[EDITOR'S NOTE: An attempt to cover the many points in more than 1200 comments received at copy time has required, in most instances, the excerpting of a single paragraph or a few sentences from much longer letters, often several pages in length. All comments are being forwarded to the respective division directors.]

¶ Congratulations on your February editorial — as fine as has ever been published in *QST*. . . . — *W6QV*.

¶ I think it is absolutely outrageous . . . — *WA6MXJ*.

¶ Your editorial hits the nail on the head . . . — *WA4FIU*.

¶ I was amazed and bitterly disappointed . . . — *K4VGW*.

¶ Congratulations to the ARRL . . . — *K1WJC/W9MGS*.

¶ . . . to hell with the ARRL . . . — *W4BGA*.

¶ Definitely thought-provoking . . . — *W6COK*.

¶ Why don't you leave things as they are, instead of always stirring up changes. — *K1REC*.

¶ A return to the so-called incentive system of ten years ago that you so heartily plug would return us to the world's greatest form of "Snobdom," not "Hamdom." — *K6BAQ*.

¶ . . . This proposal is fostered by a group that would like to have the ham bands for their own personal use. If we follow their proposal to the ultimate, we would find that only they and a few of their friends would be able to operate. Their friends would operate only with the consent of this group. They speak of improving operating standards — and I have heard this discussed at length when they sat down on my 50 watts with their kilowatts — but they mean for the others to improve their standards, not them . . . — *K5DBU*.

¶ Properly, your plan should be called selective licensing, or "Frequencies for Eggheads." — *WA4AVP*.

¶ Restricted phone bands will be a new challenge for all of us. That in itself, will spark a giant technical re-awakening among our fold. Why? Human beings are victims of egos and status symbols. Back in the Class A license days, those who worked and strived for their extra privileges were able to get on the air and join others like themselves to discuss and advance their ideas. They were in a sort of select club or fraternity, *but not one with closed membership*. This group of elite was opened to all who merely were willing to join it by working for it. One had his ego satisfied and a new status attained. Of course, this status attainment in itself would not be a worthwhile reason to create this group. The real value was in the fact the group had reached a higher technological plane, with the result that operations on those restricted bands were more efficient, less splatter was observed, and cleaner signals in general were developed . . . — *K9WVW/W9JTN*.

¶ If you are supposed to be representing me, will you please send me the name of the opposition organization. If they don't have one, I would like to be a charter member in the one that will result from your editorial. — *WA2JDW*.

¶ I am renewing just to read the ads. Your editorial is ridiculous. — *WA4HVL*.

¶ I have bought my last copy of *QST*. All of a sudden I like *73* and *VHF Horizons*. Thanks for nothing. — *K8OBW*.

¶ . . . Here is my membership expiration notice. Put it in your trash can — I don't want it in mine. — *W4YBA*.

¶ . . . All the League did was put forth a proposal and ask for opinions. It was plainly stated that if the majority of members should oppose it, the matter would be dropped. These fellows threatening withdrawal from membership have been acting like babies on the band. It seems the League can't even ask for opinions without some hotheads taking a fit. — *K3JML*.

¶ Your support of a proposal to return to such a system will evoke loud protests from a small minority, and some will probably go so far as to resign from the League, but all who are concerned about the long-range effect on amateur radio will give you their whole-hearted support. — *W8UMK*.

¶ You say a majority of hams favor restricted voice bands. This I believe is an untruth. . . — *K3EEP*.

¶ . . . Just who did you poll to arrive at the rather irrational conclusion that a majority of amateurs favor being thrown off the phone bands? — *K8DGK*.
[We said a majority of hams favor the *principle* of incentive licensing, a statement again supported by our current correspondence. A majority does not necessarily endorse the concept of restricted voice bands, which is but one method of accomplishing the principle; the purpose of the editorial was to stimulate membership comment as concerns that method. — EDITOR.]

¶ . . . You say most amateurs want to return to the incentive system. If my calculations are correct, there is no way to figure forty per cent of any group as being a majority. . . . — *K5EFY*.

¶ Your article states that a majority of amateurs favors the principle proposed and you know this is a real falsehood. You only need to go back when the other system was in effect and you will find that by your own article only 40 per cent of the amateurs progressed to the higher grade license. . . . — *K3KBG*.
[Heaven help us when we reach the point where amateurs' opinions depend entirely on the class of license they hold! — EDITOR.]

¶ You state as an "inescapable" conclusion that most amateurs want a return to the incentive system of licensing. This may be true, but what they have in mind is additional frequencies and/or privileges, obviously impossible under the present scarcity of spectrum space. I do not believe that these amateurs would want to see anything taken away from their fellows in order to attain this end . . . — *W3EQZ*.

¶ Your conclusion that most holders of General Class license are prepared to relinquish operating privileges on some of the frequencies currently allotted them, so that an incentive system of licensing may be established is, in my opinion, an erroneous one . . . — *K4ATG*.

¶ I'm a General — waiting for the incentive . . . — *K2KAM*.

¶ I hold only a Conditional license, but this is entirely my choosing and election. The reestablishment of incentive licensing will make me "hump" in order that I retain the same operating privileges I now enjoy — but I need to unless I want to stagnate . . . — *W5CUI.*

¶ . . . As a General Class licensee, I would not mind the temporary loss of phone privileges while I worked for a Class A license. It would be my feeling that a great many hams would welcome a higher level of attainment which carried greater privileges with it, and indirectly, a bit more prestige among fellow hams. — *W4IZI.*

¶. . . I am a Conditional Licensee and if I want to work the restricted bands I will gladly go up for an Extra Class license. If I fail then I should not be on 75 or 20 meters. — *K5CFT.*

¶ I've had a Conditional license for eight years, but I am fully in favor of the ideas put forth in the editorial. — *W4DXF.*

¶ . . . My own ticket is only a General (why get anything more?), but if there were any privileges, no matter how small, connected with a higher class license it would be worth my time to go to get one . . . — *W8SGH.*

¶ . . . If a new decision comes, it may be more drastic than a re-instatement of the 1932 ruling. It may force me and the rest of the old Class A gang right back into the examination room. If so, I still vote a definite YES, and I'll struggle again to make the grade. To those who disagree, may I ask if you would like to have the Citizens Banders join us, or just where would you draw the line? — *W1PID.*

¶ Although I am not *yet* a licensed radio amateur I can see that the only practical solution to "cleaning house" is a return to the incentive system. — *Michael W. Waite, Brighton, Mich.*

¶ . . . As a General Class licensee, the only thing that keeps me away from the Extra Class license is the lack of incentive — or "why bother with breaking your head for 20 w.p.m. when it gains you nothing at all?" Should the return of restricted voice bands cause me to lose these privileges, I will be only too glad to present myself to the FCC to take any further exams to qualify. — *K2SKK.*

¶ The holder of an advanced ticket should be rewarded with special bands. I'm only a General, too! — *W4TZY.*

¶ Even though I am recently-licensed General operator, I say, Let's restrict them. . . . Count me as one willing to study for advanced privileges. — *K7STR.*

¶ I am a General Class amateur that is for incentive — just as it was when I went on the air back in 1952 — nobody moaned then. If a ham wants all the privileges let him be willing to *work* for them — *W1WJO.*

¶ I am new to amateur radio (3 years) but I feel that more stringent licensing requirements could only help us attain our basic aims and goals, therefore I am in complete agreement with you. — *WA2LPH.*

¶ Although not licensed at present, I am hard at work trying to increase my code speed so that I can get my General Class license. I think that the incentive system would be the best thing that could happen to ham radio. I also think that the theory part of the exams should be made stiffer — much stiffer. — *Gary F. Thompson, Roy Utah.*

¶ . . . I'll get out the theory books, and the key, and pass the Extra Class, or whatever else is required. Amateur radio has been ruined by commercial interests; and by those who memorize the *License Manual*, and never progress beyond that point. I like to think the hobby was given to an early group of inquisitive radio amateurs so that they might more fully develop the art of wireless communication. Something in recent years has happened to amateur radio and I don't think it is all good! — *K9KHG.*

¶ . . . I realize that in order to institute a program of this nature that the frequency spectrum to be used would have to come from that spectrum already in use by the general mass of amateurs and that some operating privileges would have to be given up by a lot of persons who might not desire this, but I believe it to be in the best interest of amateur radio as a whole (and I'd lose mine right along with the rest of them) . . . — *K5YYI.*

¶ This will put a lot of us to studying, but will do more good than harm. The incentive system will give everyone something to work for, not just plug-in and hook-up. Being close to a FCC testing point is not influencing my feelings. My round trip would be close to 500 miles. I obtained my General license that way and would go again if necessary. — *KØLMU.*

¶ . . . I am a General class amateur and I see where my hamming could be hindered slightly by such a move, but by golly it would be worth it to get the standards back where they belong. — *KØJPJ.*

¶ My vote is 100% for restricted band segments — on the best bands even. I do not hold an Advanced Class license, but definitely can be included in that group of hams who, given the proper incentive, would give the exam a try, or as many tries as it might take. I also would not begrudge those who succeeded were I unable to obtain a higher-than-General Class ticket. — *W7VJT.*

¶ . . . It may cost me, but I am for it. — *W5WLC.*

¶ . . . It is generally accepted that if something is difficult to obtain, it means a lot more. So it is with an Advanced Class ticket; although I am still a General, I feel if there were incentive toward an Extra Class license, I would be more inclined to work for it. Certainly, improvement in each individual operator would result in improvement of the whole fraternity. . . . — *W4RGV.*

¶ . . . What has surprised me is that most General Class hams licensed since Docket 10173, after they have gained experience through actual operating and by construction of equipment, quickly assert that there should be operating privileges as an inducement to self-improvement. These newer hams are just like the old timers; they believe that privileges should be earned; and if you can't earn them, you shouldn't have them. . . . No one would be hurt if a reasonable grace period were allowed before restrictions were again placed upon certain phone bands. Every General and Conditional Class amateur would have ample time to improve himself and obtain the higher class of license before the effective date of the restrictions. So long as every amateur is given a fair opportunity and a reasonable time to qualify for such phone privileges as might be re-established, then every amateur would be given equal treatment. None of us has any vested right to any frequency. . . . — *W8MGQ.*

¶ . . . Concerning the stark fact that if incentive licensing is again instituted, privileges will be withdrawn from persons who now have them under the basic license, so that officialdom is reluctant to do this, I have this to say. I was one of those who had a Class A license. I made an effort to gain those privileges, yet in 1952 officialdom took them away from me and 40 per cent of all amateurs. I see no difference in the present situation. I do not want those privileges back without an examination, but I want them back. They were worthwhile and they were a goal. . . . — *W1LGP.*

¶ . . . Most of us have good intentions of learning more code and theory, but without a real incentive, never seem to get around to it. After all, it's the effort required to become a licensed amateur that has given respect and prestige to our amateur organization. All one has to do is read some of the criticism being launched at the Citizen-banders by the FCC these days, or listen in on their frequencies to realize what mediocrity has done for this group. . . . — *WA2SED.*

¶ . . . Suppose, unknown to you, each and every General was presently studying for his Extra Class. And suppose you enacted your proposed changes and by some miracle they could all be examined and get their Extra class overnight. Do you suppose the band conditions would change? I doubt it. That piece of paper will not make a good operator. — *W2KWB.*

¶ As a high school teacher of electronics, it is quite obvious to me that a large percentage of the capable students entering amateur radio are not motivated to improve their skills after securing their General class license. — *W6WNR.*

¶ . . . You can lead a man to theory but you cannot make him think. Those amateurs with an earnest desire for more technical ability will acquire it by themselves, with the aid of ARRL and more technical articles catering to the majority of amateurs in *QST*. . . . — *WA6MAX.*

¶ . . . What you are really trying to accomplish is the downgrading of the present General Class license and take away privileges now held by Generals which were earned the "hard way" in passing an examination that is tougher than the old Class A ever was. You are also trying to set up a "caste system" among amateurs which in its very concept is undemocratic and, more to the point, unrealistic since it would create more barriers to progress than it would offer in the way of incentive. . . — *W4VGT.*

¶ . . . Advanced technical proficiency is more a matter of "desire" than license. It is just as easy to memorize the Class A test as the Class B. I have done both. . . . — *WØRQS.*

¶ . . . I want to learn all I can about radio and I do so at every opportunity, but I certainly would be opposed to having my operating privileges restricted without good reason. I believe that anyone who can pass a General examination can surely tune a transmitter properly and would know enough to get off the air if experiencing difficulty that might cause spurious sidebands or other interference. . . . — *WA4DPE.*

¶ . . . Those in our government who would like to have as large a cross-section of our citizenry as possible to call upon in event of need, evidently feel that it is better to have many people with some knowledge than a few persons with much knowledge of radio, or they would not have created the Novice and Technician grades of license. Your proposal could sure throw a monkey wrench in these gears by making the requirements for desirable operating privileges so high that few would care to enter amateur radio as a hobby. . . . — *KØMRH.*

¶ . . . You are still pursuing the outmoded policy of special privileges for the special few. The five bucks I pay ARRL each year is just as good as the five bucks that the professional electronic engineer who holds a ham license pays you and I expect you to give me the same representation that you give him. . . . — *WA6TYR.*

¶ . . . This nation has been paying homage to mediocrity and has spawned a "something-for-nothing" philosophy. . . . I do not like to see my hobby placed in such a category. Improvement should be the catalyst of the hobby. . . — *W8EGR.*

¶ . . . What does a higher grade of license represent? It's the ability to grasp the technicalities of the art in sufficient depth to ensure a passing grade on an examination, nothing more. What is accomplished hence depends on the individual. Industry has many brilliant theoreticians who are inept at putting their theory into practicality. . . . — *W2NVD.*

¶ . . . Too many unthinking amateurs, I fear, are eager to milk all possible benefit from the hobby, but are reluctant to support it in return for the many benefits they receive. . . . All amateurs must do their part to continually insure that our hobby remains in the best public interest, convenience and necessity. In order to achieve this encompassing goal, it may be necessary to subordinate personal desires for the over-all good, in a democratic manner. Such an exercise now lies before us. In the best interest of this hobby, it is mandatory that some form of incentive license be forthcoming. . . . — *W6SAI.*

¶ . . . A tougher license exam certainly would not prevent people from getting their license if they really wanted it. It would, in many cases, give the ham a broader technical background — and would put new prestige into being a licensed radio amateur. — *K3SVC.*

¶ I worked and studied long and hard for my General ticket. If you can get more space for our bands I will study more to increase my theory and code speed to be able to use this extra space granted to an Advanced license. If on the other hand you are trying to take a portion of the bands away from me, I say *no*. . . — *WAØATN.*

¶ . . . Incentive-licensing? Yes! But not by working the hardship of excluding present General Class licensees from present phone bands. Many of the most considerate and best operators on 20- and 75-meter phone today are General Class. Many of these persons are very careful not to overmodulate. Is it fair to close the 20- and 75-meter phone doors to these good operators after they have occupied (and well) these bands these many years? I can't believe that ARRL would really propose such a plan. . . . — *K9UQX.*

¶ I would request that when you comment on the inconveniences which may accrue to the General or Conditional Class licensee by restricting their privileges until they aspire and qualify to achieve better standing, that you recognize in the same breath the dismay and mortification of those amateurs who had their privileges equated with those unproven, untested and unqualified persons. . . . — *W7ZOZ.*

¶ . . . There was a time (a decade ago) when the mention of one's being a ham opened many doors in the electronics industry. It meant to those in management that the applicant was seriously interested in things technical and had the ambition and facilities at home to further his technical level. As the years went by and a large percentage of the applicants were new hams with "easy to get" licenses, management realized that not all hams had this driving urge to increase their technical level. The result was an upgraded "minimum technical requirement" necessary for the job in question . . . namely, the commercial Radiotelephone Operator License, 1st Class. What a blow to the prestige of ham radio in general! — *K2DDK.*

¶ . . . Unless the desire of the majority of hams is to limit ham radio to highly qualified technicians, it is taking too narrow a view to insist on this qualification for a license. Such an insistence is not going to make a technician out of a man who has no interest in it whatsoever. Nor does the writer feel that such an interest is at all vital to his participating, and participating for the good of the fraternity, in ham radio activities as a fully licensed amateur. Nor can I see where learning a bunch of new diagrams or new theory, beyond the point of knowing how to run a rig properly and what in general makes it work, is going to do anything more than force out of ham radio a lot of people who, by and large, are doing some other phase of the hobby a lot of good. . . . — *WA6FPB.*

¶ . . . The amateur radio bands are as much a public domain as are the national parks and the lakes, rivers and streams of the country. Should some of the pleasures of these birthrights be set aside for the exclusive enjoyment of, let us say, geologists or hydraulic engineers? . . . — *K1RFY.*

¶ The intent of such a system is either to eliminate people from participation in the hobby or to make pseudo-professionals out of "amateur radio operators". If your intent is the former, then there are much more effective, decisive ways in which this may be accomplished. If your purpose is to make this a hobby restricted to the professional why not go all the way. Require a degree in electronics, forty words per minute with the code, and a five-thousand dollar commercial built station as a minimum. . . . — *K6QXK.*

¶ Many of us, who enjoy ham radio from the inside as hobbyists and who view it externally from positions in commercial or government electronics, have recognized for some time the fact that, to survive, ham radio will have

to justify itself exclusively and convincingly on technical merit. As a pool of radio operators, we are rapidly being obsolcted by mechanization. As a commercial market, we can be more than replaced by an expanding citizen's service. As an emergency communications facility, our usefulness and necessity diminishes as commercial, government, and even citizen's services expand. But as a *potential* source of trained and experienced electronic technicians, ham radio is unrivaled in value. — *K6CTV*.

¶ . . . Amateur radio exists because of the service it renders, and not because it is an engineering school. If you want more room for the old timers, and engineers on the band, then please cut the power to a couple hundred watts like the rest of the world nearly does. — *K9ZNK*.

¶ . . . I see nothing unreasonable in requiring a man who wants to use thirty, or more, times the bandwidth of a c.w. station, to have to meet special requirements. — *W4AU*.

¶ . . . I'm one of those old-fashioned fellows expecting something for something and nothing for nothing. Although I do not possess an Extra Class license, I'm for it 100%. — *W9FCV*.

¶ . . . In my opinion amateur radio as a field for young people to learn and advance in the modern electronics world is now nearly useless for there is neither much difficulty in getting a license nor any place to go after getting one. The amateur radio license has lost its validity as a recommendation for hiring technicians since the chances of getting someone qualified to adjust anything, much less build something, are very slim. . . . — *W6UGL*.

¶ . . . We have a bad habit in our country of making things easier and easier for everyone, with a general lessening of quality all along the line. For some reason or other we want everybody to be of the same ability, even if it means widespread mediocrity. . . . — *W2OO*.

¶ . . . This country today seems to be going jabber-happy on the air. The FCC has finally had a bellyfull of the farce on the citizen's band and is doing something about it. They are beginning to do the same thing on the marine bands. If the phone bands are to be a collection of jabberers and their last stronghold on the air, at least let them be technically-informed jabberers! — *W4TJU*.

¶ There seems to be a popular misconception that the only true hams are those who build their own equipment. To h - - - with that idea. I feel just as proud with store-bought gear. Sure, I get a blast building gear on my own, but I worked long and hard to buy my HT-37 and SX-100. Now if someone comes up with the bright idea that I can't operate my rig on, say, 75 and 20 phone, someone's going to have a fight on their hands. — *KØSRL*.

¶ . . . Recently I stood alongside a lad of about fifteen who was with his father in purchasing a transmitter at Allied Radio. From their conversation with the salesman it was very clear that he had just received his ticket. He told the salesman, "we don't care what the cost is but we want the one that will send out the strongest signal." — *W9IHM*.

¶ . . . The manufacturers perhaps have helped in bringing on the "plug-in appliance operator" but at the same time they have helped to improve the class of signal on the air today providing it is operated as it should be. . . . — *KØRTL*.

¶ As for too many of todays amateurs being plug-in appliance operators, I can only say, can you imagine what our ham bands would be like today if the majority of the equipment was "home-brew", not even mentioning the TVI and BCI problems? — *K3GBA*.

¶ . . . There are many good reasons for using manufactured gear, but there can be no excuse, in amateur radio, for not even knowing what's behind all those expensive panels — *W2LYH*.

[Precisely what the editorial meant to convey. — EDITOR.]

¶ You call us plug-in-appliance operators. What do you use in W1AW — all home-brew equipment? — *K4AJ*.

[About 50–50. — EDITOR.]

¶ . . . It is nothing more than a restriction to those unable to qualify for reasons either mental or physical. Even a first-year psychology student learns that you don't take something away from an individual to create an incentive. . . — *WA6KDK*.

¶ Just finished a course in political economics and learned that progress results from a situation of incentives and that progress is usually absent where these incentives do not exist. . . . — *WØGPH*.

¶ . . . I know that I could study (or should I say memorize) the necessary material to obtain an Advanced Class license. Thus, in itself, would in no way change the way I presently operate. I would still be a "plug-in-appliance" operator and I doubt sincerely that the mere fact I held an Advanced Class license would in any way benefit either myself or ham radio in general. . . . — *W6VWL*.

¶ . . . The idea that only the Advanced class of license would provide special privileges is not true. This same line of thought could be applied to the General class of license by holders of the Novice and Technician class who may think that the General class provides special privileges. — *W2DOE*.

¶ . . . It is argued that certain amateurs want incentive and to be prodded to improve their technical ability. One of the bases of amateur radio is its man-power reserve in time of national emergency. There are thousands of us who have fulfilled that purpose in past wars. Why because some eager beaver wants to be prodded to improve his technical knowledge we should all be forced to take tests and conform to his mold when we are not so interested escapes me. Why can't the League issue a fancy technical certificate with gold stars around the outside and intersperse it at intervals with happy industrious beavers. — *W5EW*.

¶ . . . It took me 3 trips before an FCC examiner to get my General ticket. What you are trying to do is to eliminate the person with average intelligence, but what I think you forgot is that the ham is average, he comes from all walks of life postman, plumber, mechanics — not all of us are electronic technicians. . . . — *WA2LRV*.

¶ . . . The hobby of amateur radio has always been considered a democratic one. Regardless of a man's race, color, and creed, regardless of his religion or his political views, it is the only hobby I know of in which merely by talking to another without ever knowing what he looks like or his particular affiliations, you consider him a friend. Now, you want to take this away from us and dictate to us telling us just what areas of radio we can use because some have an additional ability to learn and because of this added ability they are far better than any one else. . . . — *WAØDKI*.

¶ Incentive licensing is a blow to the socialistic idea of everyone being equal regardless of one's ability or knowledge. I trust ARRL will back this idea wholeheartedly. — *W4VHY*.

¶ . . . Before the FCC action of 1952, there was 60% mediocrity. What makes you think there will ever be anything less? I don't see how an incentive system would defeat this nemesis. If the entire ham population advanced to a higher class license, then all hamdom would again be mediocre. What then, a super class license? . . . — *W3IND*.

¶ You opened up a hornet's nest which will do all of us good to discuss. . . . My suggestion is that as far as phone is concerned, we be given five years to get the good out of any a.m. equipment we have and after that everyone go s.s.b. That's the way we outlawed spark; that's the way the commercials are to go in the near future, so why not the ham? Also we need some stiff regulations as to suppression, distortion products, etc. That could come later when we see how things go. A basic rule of our regulations is that equipment and operation shall be consistent with "the state of the art". It's high time we all realize just how far we have progressed in the state of the art. — *W9HLF*.

¶ . . . Why not have a clean sweep and recall all amateurs back for a re-examination and in that way it would be fair to all concerned. — *K1SYZ*.

(Continued on page 140)

Operating News

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

ARRL Activities Calendar.....81
Brass Pounders League.....84
CD Parties Results.....79
Code Proficiency Program.....85
DX Century Club Awards.....83
DXCC Notes.....82
Election Notice & Results.....84
RACES News.....81
Traffic Topix.....82
With the AREC.....80
W1AW Operating Schedule.....85

Ever Try Traffic? "Every month your SCM has a wistful appeal for QNI in the Section Traffic Net. Most of us steer clear of that rhythmic nightly call-up because of some largely mythical reasons. (a) We're afraid of those "speed-demons" (b) Traffic is dry-as-dust or not fun (c) It's a "foreign language." Those who think this apparently are *not* on to the fact that the latch string is *always* out on the good traffic nets. Operators *gladly* match their speed to yours. You get the feeling of belonging. Traffic begets fun and fraternalism. Your Section Net needs you. You set the speed limit and netters will match it. If you want to break the sound-barrier you'll find some to assist; if you are in a slow mood they will laze along with you.

"Sure it's at first a 'foreign language.' The way to learn it is to work it. You can memorize QN's "WA", "BN", UP7, DWN 5, til you are blue but it won't help til you do it. That preamble is the same thing you have sent hundreds of times on SS. Traffic has more fringe-benefits than a union contract. There are the Net Certificates: the toughest of all the 'wall paper' to earn — BPL; and the only piece of jewelry found anywhere, the Traffic Medallion. There is only one drawback. Once you have bucked QRM, QRN, Aurora, Foreign Commercial garbage and earned your net or ORS certificate you are hooked and the rest of the hobby seems tasteless." — *Louise Morcau, WB6BBO (QRZ, Ramona Radio Club)*

Signal Quality and Band Conditions Can be Improved by Personal Effort. If we could see ourselves as others see us, very likely there would be some upgrading of transmitter adjustments in a hurry. Paul Montgomery, W8HZB, comments on "how it used to be." Where a gain control is ridden too hard, or the need for other kinds of adjustment "shows through" on signals worked, we each collectively can do more than a corps of monitoring stations to make our bands better, just by frank operator-to-operator talk. From W8HZB, "I remember back some years ago when there would be three stations in a round table. If one operator had a bad signal, the others contacting him would advise him what to do from time to time until finally before the QSO was done steps were outlined or adjustment completed so the signal was perfectly cleaned up. A little more of that kind of spirit *we could use today* . . ."

The operator-to-operator approach should include assistance by us older hams to both Novice

Two halves of a winning traffic team, KC4USH at Cape Hallett, Antarctica and Betty Gillies, W6QPI at Rancho Santa Fe near San Diego, California. Don heartily commends W6QPI for her devoted and sincere assistance for present and past years furnishing communications channels for KC4 stations. Meanwhile, KC4USH continues to use 14,300 as a calling frequency and looks for east and midwest QSOs.

and Technician operators. In an *exchange* of information both parties can learn. Those in the game longer can always relate interesting experiences, and include friendly background and many helpful operating tips. Remember, newcomers are often starting from scratch. The history of amatuer accomplishments and public service responsibility can be interesting and one can be surprised to learn things (perhaps even beyond amateur radio!) in return. It is a fraternal obligation to assist the newer operator. Another field sadly neglected is that of making all signal reports *honest*. Have a care to follow the signal reporting definitions carefully. Post ARRL's Operating Aid No. 3 by the receiver. The true ham wants a true and honest signal report. It is a disservice to him and Amateur Radio *not* to use the signal reporting scales honestly and accurately at all times.

Clubs Commended for TVI-Committee Work. FCC's annual report for fiscal '62 showed an increase in the number of TV Interference Committees for the whole country to a total of 640. Several ARRL-affiliated clubs have earned special commendation in the last year or two for their outstanding efforts in assisting fellow amateurs, FCC and the public by constructive and effective TVI Committee work.

Among these, the *Bloomington Amateur Radio Club* (Indiana) accomplished especially outstanding work. We're pleased to reproduce below the text from FCC's letter — and hope many other active club groups can earn such a commendation.

FEDERAL COMMUNICATIONS COMMISSION
"Bloomington Amateur Radio Club,
Box 73, Bloomington, Indiana.

"The activities of your Committee in solving interference problems are sincerely appreciated. The report indicates that your committee handles a wide range of interference complaints. Your community is indeed fortunate in having a group of technically trained persons contributing their time and talents in solving interference problems. . . . May you have continued success in your investigations. . . . Please extend my best wishes to all the members of your Committee for their worthwhile service in our mutual battle against interference."

— *Geo. S. Turner*, Chief,
Field Eng'g. and Monitoring Division.

Besides handling amateur problems successfully in line with usual committee practice, the BARC's annual report of its TVI-group shows that it turned up several non-amateur difficulties. Examples of these were TV equipments (several) being operated from one antenna without matching provisions, heating-pads, power line noise and the cases of RFI (Radio Frequency Interference) noted in Stereo and B, C equipment that needed attention by local service men.

To assist amateur radio clubs in TVI committee formation and operation ARRL continues to make available its prepared information and detailed recommendations based on experience in dealing with this subject. All TVI committees known to us have our *Suggestion Kit for TVI Committee Operation for Interference Elimination*. Any local amateur society organizing a community group for such problems and not now having our data, is invited to request same of the ARRL Communications Department. The kit has quite a few pieces of information. It's sent free of charge, so one to a club, please.

— *F. E. H.*

RESULTS, JANUARY CD PARTIES

For the first time in a number of years, a new multiplier was available to the CD gang during the January CD Parties. Effective mid-December, Delaware became a separate section and as usual the savvy CD appointees picked up a new multiplier the easy way. To add spice to the game of "worked all sections," Yukon-N.W.T. will continue to count as a separate multiplier in ARRL activities so it's going to continue to be just as tough as ever to make "the clean sweep." ORS/OBS/OO K4ZYI almost duplicated his performance for the October c.w. affair but managed this time to top the code roster with 213,730 points. Wayne reports that he worked frantically on the receiver for 5 hours before the party started, replaced 5 antenna coils and 2 i.f. transformers; getting it perking 10 minutes before zero hour! *He* says he was a nervous wreck by then, score proving otherwise! The fourth call area took top four places with K4HSB using the theory which works for him; *i.e.*, get all the sections as soon as possible and then spend the rest of your time on 40 and 80 getting points. OT W4YE placed 3rd averaging about 30 QSOs an hour throughout his operating period, coming up with 3rd high c.w. score of 186,450. Fourth placer K4TEA claims that if you win the Georgia section you win over-all; word must have gotten around cause 3 out of the top 4 were ORS/Ga.! WA6HRS reports that VE8RG called him during the early hours of the party asking how to get in; watch out for Yukon-N.W.T. in parties ahead! CD faithful K4BAI multi-opd, assisted by OO K4ADU, and added up 537 in 66 sections for 179K.

K5MDX reappeared on the phone CD scene topping the list with 125 two-ways and an excellent section total of 46. Dave got replies to CQ CD from TF2WHF and VP1AB and hopes to do as well in the DX Competition! Hdq. Ass't. Sec'y. W1ECH talked up a storm from W1AW with 119 contacts in 38 sections. Gary says it was nice to get *both* No. and So. Carolina but where were the W6 and W7 stations? E. Mass. regular W1NJL says it took 12 hours to raise 88 in 35 on 75/40/20 phone and just one and a half hours for 88 in 37 on 80 c.w. *Oh what a difference!*

The following are the high *claimed* scores, number of QSOs and sections. Final results will appear in the *April CD Bulletin*. — *W1YYM*

C.W.		PHONE	
K4ZYI	213,730-634-67	K5MDX	28,750-125-46
K4HSB	195,960-561-69	W1AW[6]	23,940-119-38
W4YE	186,450-558-66	K2QDT	23,000-135-32
K4TEA	185,250-566-65	W1NJL	16,450- 88-35
W5CME	173,120-534-64	WA2NCE	16,100- 87-35
K5OCX	171,360-538-63	K8RMK	13,330- 81-31
K8RMK	153,730-483-63	K9MAN	12,865- 83-31
W1AW[2]	153,400-465-65	K4TEA	11,455- 75-29
K8MTI	151,140-451-66	W4LK	10,875- 75-29
W9LNQ	146,620-453-64	W9QQG	8700- 55-29
K7CTI	145,530-458-63	W0EEE[7]	8700- 58-30
WA6GFY[2a]	143,840-464-62	W1PYM	8580- 61-26
W9YYG	132,370-422-62	W9ACU	8000- 57-25
WA6HRS	131,130-418-62	K8DDB	6500- 52-25
W4DVT	124,745-402-61	W1GKJ	6270- 52-22
WA4JFY	123,480-389-63	W4JUJ	6120- 44-24
K9DHN	122,720-411-59	W2ZVW	6110- 40-26
W8VPC	121,220-411-58	W9SZR	5865- 42-23
WA2WLN	120,475-375-61	W3NOH	5520- 46-24
W0ETT	115,010-367-62	W2BEI	5100- 35-17
W4JJ[3]	114,080-365-62	K4JQO	5070- 39-26
W6NKR	110,250-343-63	K5TYW	5060- 37-23
K1WJD	108,190-342-62		
K4ITV	107,055-347-61		
W6WX	106,640-337-62		
K4LPW	105,530-339-61		
W2GKZ	105,210-327-63		
W4KFC	104,100-340-60		
W6BES	103,700-333-61		
K6SXX/4	103,240-351-58		
W7RGL	102,175-328-61		
WA2NCE	100,040-323-61		
K4BAI[4]	179,520-537-66		
W0TUF[5]	105,610-358-59		

[1] K4DRO, opr.; [2] W1WPR, opr.; [2a] W6CUF, W7WJB, oprs. [3] K4VFY, opr.; [4] K4s ADU BAI, oprs.; [5] KØs IVQ QWY, oprs.; [6] W1ECH, opr. [7] KØLGZ, opr.

A special breed of amateur is making himself heard more and more. This is the amateur who grows increasingly impatient and disgusted with the trends he meets, with the lowering of standards, the rise of the ignorance factor and selfishness among the newer, less experienced, less qualified amateurs now populating our bands in increasing numbers. This is the amateur who deplores the low inclination on the part of his brother amateurs to take the responsibility for meeting the Basis and Purpose of the amateur service as described in Part 12.0 of our regulations. This is the amateur who spends untold amounts of energy, time and money (his own) to further the cause only to be met with indifference and apathy on the part of clubs and organizations who find more "fun" in participating in and sponsoring and encouraging activities of a far less altruistic nature. This is the amateur who harangues and harrasses and importunes until he gets the job done, even though at the expense of ulcers. This is the "angry amateur."

He gives us a lot of trouble. He causes us to write lengthy letters, disagrees with many of the things we say and do, writes wrathful articles which too often are not printed, calls us on the telephone, and in general makes a blamed nuisance of himself. We wish he would let us alone. But without him, we don't know how long amateur radio would last as a public service.

Of course there is anger from the other side of the fence, too — anger that the lowered standards are not lower, that licenses and awards and high scores are not easier to get than they are, that SCM appointments require some degree of effort and achievement as a prerequisite, and that the radio amateur is unjustly expected to perform certain duties in addition to his magnanimity in occupying the amateur bands which, as everybody knows, would be completely useless for any other purpose. The ARRL award which requires the least effort is by far the most popular. If we had an award that read: "This certifies that Joe Blow, a radio amateur, has done absolutely nothing in amateur radio for the period required by the rules", we are sure it would be still more popular. Perhaps we should have one — a "nothing" award.

Yes, this type of anger is easy to assuage. It's the righteous fury of the "angry amateur" that is hard to alleviate, because *this requires some* action, some progress, some show of energy and enthusiasm and, above all, of altruism. And there is no anger that is more bitter, more invective, more denunciatory, than the frustrated ire of the amateur who sees our hobby gradually losing its stature through apathy and selfishness among its participants, through the failure of a majority of these participants to take enough time out from their "fun" to render the public service that Section 12.0 requires of us. May his voice be heard above the uproar of protests against high standards. May it be heard in the *right* places, by the *right people equipped* and willing to *do* something about it. — *WINJM.*

— • • • —

Thirteen locations on the Sacramento River and its tributaries and the mountain-top repeater were manned on July 28–29 as amateur radio provided communications for the annual Stockton-Colusa-and-return boat races. In addition, WGOVR operated portable from one of the "sweep boats" which trailed the racers and WA6MMO operated K6HB at the Yolo County sheriff's office. All river stations used low power portable equipment which was retransmitted by the Mt. Vaca repeater on another frequency, providing all river locations with direct communication with all other locations. Traffic included *race progress, safety* information, Coast Guard Auxiliary traffic and timing checks. The operation was so successful that it will probably be an annual affair. — *W6GDO.*

— • • • —

On Aug. 18-19, 26 amateurs of the Calhoun County (Mich.) AREC showed up to assist with communications at the Kellogg Air Field Air Show in Battle Creek. W8RQG and K8AXV acted as control stations and mobile units were located at seven different points on the field, including first aid stations, ambulances, fire trucks, civilian aircraft registration points, etc. — *K8AEM, EC Calhoun County, Mich.*

— • • • —

On Jan. 12, during some bad weather in Nebraska, KØHYP and WAØAES were able to be of assistance when normal communications were wiped out by the storm. WAØAES sent messages to broadcast stations in Ogallala and North Platte asking them to announce the closing of certain public schools, and a message via KØHYP advising that a benefit in Alliance was cancelled. — *WØRJA.*

— • • • —

On Jan. 12, WA4HFE assisted in locating a man in Memphis, Tenn., to advise him of a death in his family. A directional call for Memphis brought the aid of W4WGI and WA4FOH, both in Alabama, and eventually K4BSI and K4VAJ in Memphis joined the happy throng. Through their efforts and those of W4LHE and W4BSK the missing man was located. — *W4NML, SEC Alabama.*

— • • • —

On Jan. 13, K4RSB, EC for Madison County, Ala., was asked to render aid in providing communications for roadblocks which had been established by the highway patrol because of icy road conditions. Amateur mobiles W4YFN, *K4s* RSB IKR and VDY reported to the Huntsville station of the highway patrol and were deployed to the four manned roadblocks. A net was established on ten meters with K4SWU as NCS. Communication was maintained for about four hours, at which time the units were released. — *W4NML, SEC Alabama.*

— • • • —

On Jan. 19 KØJGI at Ottumwa, Iowa, heard a call for assistance from K9UIM to the effect that his car had stalled in below zero weather, apparently with a frozen gas line. KØJGI called the number he was given and help was dispatched. — *KØJGI.*

— • • • —

On Jan. 24 an Air Force bomber crashed into the side of a mountain in the Greenville, Maine, area, in sub-zero weather. Piscataquis County EC W1OTR went into action setting up communications from the scene and maintaining it until the Air Force could establish its own. W1OTR was among the first to reach the scene of the crash, at which

Above is a Communications Planning Committee meeting at the new club station of the San Antonio Radio Club, W5SC. Standing, l. to r., K5VCR (Club Pres.), K5HZR (EC), a red cross official. Seated, l. to r., KBUWS, K5IEG, W5EJT, W5VPQ and W5IRQ. K5PKX, assistant EC, took the picture.

two of the nine crew members were rescued. Communications were conducted for the state police and rescue teams from Dow Air Force Base. Civil defense was called out the following day. Amateurs participating included *K1s* ASP HTJ OJN OPN RGK VAV, *W1s* LRZ VXU and CMO. — *W1GRG, SEC Maine.*

—•••—

In the evening of Jan. 31, Palo Alto, Calif., EC K6BBF was notified by the fire department to alert the Southern Peninsula Emergency Communications Service Net for action in connection with flood conditions. The headquarters station at city hall (K6BBF, we suppose) was activated and four members responded. W6IBW and K6KEV worked as mobiles, W6ASH as alternate control and K6IQY on stand by. Long experience as an operating net with plenty of practice enabled these operators to do an impressive job. — *K6BBF, EC Palo Alto, Calif.*

—•••—

Arizona SEC K7NIY advises that in conference with the state highway department, *he* found them willing to install signs at the borders on every main highway and also at county lines, giving county and state emergency frequencies. This may seem unusually cooperative, and maybe it is — but have you *asked* your state highway department if they would do it?

—•••—

Well, we set another all-time record in December SEC reports. Forty-four (count 'em, 44!) SECs reported representing 17,554 AREC members, to wind up 1962 with a bang. Nice going, fellows. No new sections reported, but the above figures are *higher* than *any previous month* in AREC history, and compare with respective figures of 30 and 13,884 for *Dec. of 1961.* Sections reporting for December: Ont., S. Tex., E. Mass., S. N. J., NYC-LI, W. Mass., S.J.V., Nevada, Mich., Alberta, Wash., Mont., W. Fla., Ill., Ga., E. Bay, Ind., Maine, Ala., Ohio, Utah, Colo., S. C., Ore., N. C., E. Fla., New Mex., W. Pa., Kans., N. Tex., Los A., Tenn., Ariz., Mo., Iowa, W. Va., S.C.V., R. I., N. N. J., E. Pa., S. Dak., Sac. V., Minn. Incidentally, six sections reported membership in four figures, namely S. Tex., NYC-LI, Mich., Ind., Ohio and E. Fla.

The 1962 chart shows that during the year we received 420 SEC reports in 54 sections, as compared with 337 and 47 in 1961, making 1962 a record year as well as December a record month. The following sections show a 100% reporting record for the year: (no. consecutive 100% years in parentheses): E. Mass., Mich. (4), Alberta, Wash. (3), Ind. (4), NYC-LI (9), Utah, Ore. (3), N. Texas, Los A., S. Texas (4), E. Fla. (11), Nevada (2), Ohio, E. Pa. (3), S. Dak. (3). We doff our hats to these 16 SECs and the section AREC groups that make such a record possible.

RACES News

A lot of ROs are asking a lot of questions these days, especially about the frequency allocations plan which went into effect on Jan. 1, 1963, with the requirement for all plans to conform to making provisions to replace all a.m. with s.s.b. on the 75, 40 and 20 meter RACES phone segments. One OCD regional communications officer, W4FR, who hangs his hat at Region 3 headquarters in Thomasville, Ga., advises that he will be available on the air to answer any questions about RACES plans and necessary modifications thereof from anyone in his region. *Look for him on Monday thru Friday at 1400* GMT on 7251.5. Contacts on c.w. will shift to 7098 kc. *after initial contact on 7251.5. No formal traffic will be* handled. Region 3 encompasses the states of Alabama, Georgia, Florida, Mississippi, North Carolina, South Carolina, Tennessee and the Canal Zone. Any contacts made will be for chit-chat only; *no government business will be handled.*

—•••—

The Monroe County, N. Y., RACES organization recently received a commendation from the New York State Civil Defense Commission for "Consistent Progress During the Year 1962." RO W2CTA is justly proud of this citation and of the RACES progress on which it was based. The folder reporting on their 1962 activities shows exercises by the East Rochester Net on May 19, by the Ten Meter Mobile Net on May 27, by the Two Meter Net participating

The Niagara Radio Club of Niagara Falls, N. Y. installed this demonstration RACES station at the Hobbyrama on Nov. 3 and 4. It attracted a great deal of attention, according to Chief Perpetrator W2OVP.

in a regatta on Lake Ontario on July 12, 13 and 14, and a county-wide exercise involving seven nets on Nov. 28, with *a number of sub-exercises being carried on simultaneously.* The report shows how consistent RACES progress is made, including mobile surveys and results thereof, new magnetic maps at the control center, plans for additional and better equipment, liaison with state command nets and facilities for same, and internal administration. Congrats to the Monroe County RACES gang for a good job!

A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

Apr. 1: CP Qualifying Run — W6OWP
Apr. 13–15: C D Party (c.w.)
Apr. 20: CP Qualifying Run — W1AW
Apr. 20–22: CD Party (phone)
May 3: CP Qualifying Run — W6OWP
May 21: CP Qualifying Run — W1AW
June 6: CP Qualifying Run — W6OWP
June 8–9: V.H.F. QSO Party
June 19: CP Qualifying Run — W1AW
June 22–23: Field Day

OTHER ACTIVITIES

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

Mar. 30: REF DX Contest (c.w.) (p. 64, this issue).

Mar. 30–Apr. 1: West Virginia Centennial QSO Party, State Radio Council (p. 128, last issue).

Apr. 1–30: Goose Bay QSO Party, Goose Bay ARC (p. 136, this issue).

Apr. 6–7: Ohio QSO Party, Ohio Council of Amateur Radio Clubs (p. 102, this issue).

Apr. 6–7, 20–21: International SP DX Contest, PZK (p. 64, this issue).

Apr. 10–11: Third YL VHF Contest, WRONE (p. 72, last month).

Apr. 20: REF DX Contest (phone) (p. 64, this issue).

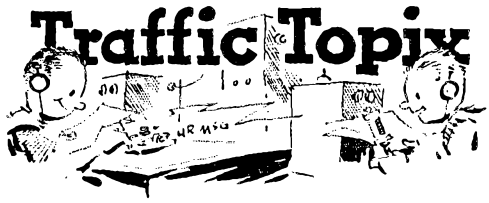
Apr. 20–22: Vermont QSO Party, Central Vermont ARC (p. 114, this issue).

May 3–5: West Virginia QSO Party, State Radio Council (next issue).

May 4–5: International Telegraphic Contest, USSR Federation of Radio Sport (next issue).

May 11–13: Georgia QSO Party, Columbus Amateur Radio Club (next issue).

Traffic Topix



The more people tell us that they read this column, and the more comments we get about it, the more self-conscious we become and the harder it gets to write the darned thing. What to talk about this month?

It is surprising how much food for thought can be obtained, regardless of what amateur radio operating subject interests you, by just listening. Browsing around with your receiver during the shank of the traffic evening, one thing you can really notice is that, generally speaking, the great masses of casual amateurs are neither impressed by nor interested in those of us who are giving our all for the benefit of public service by handling traffic. They seem not at all reluctant to fire up with a CQ on a net frequency, not at all perturbed by the fact that no one answers them because of the QRM from the net and so, after listening for five seconds, they start all over again. Should the NCS call and ask them to QSY, they are apt to claim that they have as much right there as does the net.

And you know something? They are absolutely right. Perhaps we are inclined to diffidence, but it always embarrasses us to have an NCS call an interfering station and ask him to move off "the net frequency." We are very much impressed with what we are doing, but our brother who just wants to chew the rag couldn't care less. Considering the equal rights in the matter, how would *we* react if *he* were to call *us* and ask us to move the net elsewhere so he could continue his ragchew without QRM from the net?

This is all wrong, fellows and gals. QRM, on phone or c.w., is something that we are just going to have to learn to live with. *You* think handling traffic is more important than chewing the rag, and so do I, but the ragchewer doesn't think so, and neither do the FCC regs. If they did, FCC would assign our nets spot frequencies and relegate ragchewers or pursuers of other amateur activities to different segments. A good idea? Maybe, but don't hold your breath.

Meanwhile, let's knock it off, shall we? If someone causes your net some QRM, well, that's the way the chips fall in this game of ours. If the guy is impressed, he'll move off without being told. If he's not impressed, he won't move even if you ask him, except perhaps grudgingly, and then only to land on top of another net 10 kc. up or down. If he's a stinker (there are some, but not as many as you think), he'll take perverted satisfaction from the fact that he is having an effect, and deliberately transmit longer to heighten the effect (but you can't prove it). The best thing to do, everything considered, is just to ignore the QRM, move out from under it, work through it, or anything else rather than try to order interfering stations off the air. *W1NJM.*

Net reports (January):

Net	*Sessions*	*Check-ins*	*Traffic*
Fourth Region Day	31	156	158
20 Meter S.S.B.	21	485	1544
7290	44	1654	1073
Early Bird	30	—	130
North American S.S.B.	—	334	196
Northeast Area Barnyard	—	939	10
Eastern Region Traffic	26	49	60
All Service	4	22	53
75 Meter Interstate SSB	31	1163	607

Our January record was still a long way from smashing, but it appears we did beat January of last year, and this is encouraging. Section nets are urged to use form CD-125 for reporting; be sure to indicate the region net with which you maintain liaison.

WA2GQZ reports that 2RN is holding a "Traffic Clinic" on 3670 kc. at 2100 GMT Sunday; procedures are practised and discussion held. WA2HGB is manager. W3UE is trying to hang on as 3RN manager. RN5 is really coming to life under its new manager, K4AKP. K6LKD is the new manager of RN6; this was K6KCB's last report. RN7 showed improvement, despite generally poor conditions. W8CHT commends the following 8RN operators: *K8s* SQK ONQ KMQ, *NJW*, *W8s* BZX DAE EU PMJ. WØBYV is having his troubles on TEN. 11 sessions not reported and bad conditions washing out some of the later sessions; South Dakota stations are handling more than their share of the load. W2EZB indicates that EAN NCSs are receiving fine support from CAN stations who QNI for the specific purpose of helping the NCS when he can't hear local regional representatives. EAN is not staffed to reciprocate but CAN makes out pretty well with an RN5 man doing duty as assistant NCS. W9DYG indicates the following have received CAN certificates in 1962: *W1s* EMG NJM, W2EZB, W3EML, *W4s* DLA SEZ, W5TYW, *W8s* CHT UPH, K9DHN, W9ESP. Fred suggests a *big* NTS get-together at centrally-located Cleveland National Convention next October. WA6ROF says the PAN gang is doing the best they can with what they've got.

Transcontinental Corps. TCC-Eastern report is slightly abbreviated this month as W3EML struggles to get started on a job which is bigger than he thought. K4AKP is not too proud of all the "unsuccessfuls" in his report. W7DZX makes almost the same comment. Well, we can't win 'em all.

January reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	51	39.5	1000	462
Central	93	81.7	1884	922
Pacific	119	81.5	1443	724
Summary	263	66.3	4327	2108

The TCC roster: Eastern Area (W3EML, Dir.) — K1TSD, *W1s* SMU EMG NJM, W2MTA, *W3s* EML IVC FAF, W4DLA, *W8s* CHT UPH ELW BZX. Central Area (K4AKP, Dir.) K1AKP, *W9s* ZYK JOZ DYG CXY VAY, K9DHN, WØSCA. Pacific Area (W7DZX, Dir.) — *K6s* KCB LKD GID, *W6s* EOT HC, WA6ROF K7NWP, W7DZX, KØEDK, *WØs* WME WHE KQD, VE7AGF.

January reports:

Net	*No. sessions*	*Traffic*	*Rate*	*Average*	*Representation* (%)
1RN	61	606	.330	9.9	69.3
2RN	59	684	.576	11.6	98.6
3RN	62	569	.349	9.1	99.5
4RN	57	543	.312	9.7	95.4
RN5	62	912	.416	14.7	90.7
RN6	21	161	.230	7.7	55.2[1]
RN7	62	428	.213	7.9	71.0
8RN	62	362	.228	5.8	85.5
9RN	54	873	.656	16.1	75.4
TEN	75	584	.345	7.8	65.8
ECN	28	80	.132	2.9	69.0[1]
EAN	31	1726	.942	55.6	94.2
CAN	31	1277	.742	41.1	98.9
PAN	31	910	.564	29.4	94.5
Sections[2]	1086	4769	—	4.4	
TCC Eastern	51[3]	462			
TCC Central	93[3]	922			
TCC Pacific	119[3]	724			
Summary	1782	16592	EAN	8.1	3RN
Record	1974	25982	1.039	12.5	100.0

[1] Representation percentage based on one session per day. Others are based on two or more sessions per day.

[2] Section nets reporting (39): TEX (Texas); CEM (Idaho); BCEN (B.C.); GBN (Ont.); WSN (Wash.); RISPN (R.I.); MSPN & MSN (Minn.); AENP, AENR, AENS, AENB, AEND, AENH, AENM, AENO, AENP Morn & AENT (Ala.); W. Fla. Phone; VN & VSN (Va.); MIDD (Md.-Del.-D.C.); SCN (S.C.); KYN (Ky.); Wolverine (Mich.); BN (Ohio); ILN (Ill.); Tenn. SSB, TN & E. Tenn. Phone; GSPN (N.H.); TLCN (Iowa); EPA (Pa.); SCN (Calif.) POI (Hawaii); CPN (Conn.); NCN NCSN (NCC.); BUN (Utah).

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

DXCC Notes

Announcement is hereby made of the addition to the ARRL Countries List of *Juan de Nova*. This listing will encompass the islands of Juan de Nova, Bassas da India and Europa. These three islands are French territory under the administration of the Overseas Department of Reunion. Located in the Mozambique Channel, they are separated from Reunion by the Republic of Malagasy. Prior to the independence of Madagascar (June 25, 1960), these islands were under the administration of Madagascar.

DXCC credit claims for contacts with Juan de Nova may be made starting June 1, 1963. Such confirmations must be for contacts made June 25, 1960 or later. Confirmations for Juan de Nova credit received before June 1, 1963 will be returned without credit.

—•••—

Announcement is hereby made (effective March 1, 1963) of the deletion of all DXCC credits for VQ9A/8C (Chagos Islands) previously made. Confirmations for contacts with VQ9A/8C presented March 1, 1963 and after have been, and will be refused credit.

Rule 7 of the DXCC Rules states "In cases of countries where amateurs are licensed in the normal manner, credit may be claimed only for stations using regular government-assigned call letters." Upon request, specific allegations that have been made pertaining to the lack of proper licensing for operation of VQ9A/8C from Chagos Islands have been investigated and found to be substantiated. There does not, however, appear to have been malicious intent to deliberately contravene existing laws concerned with normal amateur licensing by the Mauritius Government authorities.

While it is with regret that this rejection for DXCC credit of the VQ9A/8C operation must be made, we strongly urge those interested in DXpedition-type operation to be sure that the legal requirements for their operation have been met.

DX CENTURY CLUB AWARDS

Honor Roll

The DXCC Honor Roll consists of the top ten numerical totals in the DXCC. Position in the Honor Roll is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date of receipt. All totals shown represent submissions received from January 1, thru January 31, 1963.

W1FH.....312/327	W9NDA....309/322	W6EBG....307/321	W1CLX....306/318	W0DU.....304/316
W6CUQ....311/325	W3KT.....308/321	W8BF.....307/319	W7PHO....306/317	CX2CO....304/317
W2AGW....311/324	W8JIN....308/322	W8UAS....307/319	W2HMJ....305/317	W0AIW....304/316
W1GKK....311/325	W8BKP....308/320	W9YFV....307/320	W5MMK....305/317	G3AAM....303/316
PY2CK....311/324	W6AM.....308/322	W8DMD....307/319	W6GPB....305/317	W9LNM....303/317
W4DQH....310/323	LU6DJX...308/321	CE3AG....307/320	VE7ZM....305/318	W3LMA....303/315
W3GHD....310/323	W5ASG....308/321	G2PL.....307/319	W1ME.....304/317	W2LPE....303/316
W8KIA....310/323	4X4DK....308/319	HB9J.....306/320	W8KML....304/316	W4TM.....303/316
W9RBI....309/323	G4CP.....308/321	W0QVZ....306/317	W1BIH....304/317	W8DAW....303/316
KV4AA....309/323	W2HUQ....307/320	W7GUV....306/319	K2GFO....304/317	W1JYH....303/316
W8BRA....309/322	W5ADZ....307/319	W2BXA....306/319	W9HUZ....304/316	W6YY.....303/316
		W3JNN....306/319		

Radiotelephone

W3RIS.....312/326	W8GZ.....308/320	4X4DK.....306/317	W4DQH....304/315	W8KML....302/314
PY2CK.....311/324	W1FH.....307/319	VQ4ERR....305/318	W7PHO....304/315	W6YY.....302/315
W9RBI.....309/321	W8BF.....306/318	W8PQQ....304/315	CX2CO....304/317	W6AM.....301/314

New Members

W3EKN....196	W5AI.....110	JA2A1R....106	DL9NF.....103	W8ILC.....101	K4LDR.....100
W8TPS.....154	PA0LV.....110	W1UBA.....104	K1REY.....102	DJ2JE.....101	K5QHZ.....100
W4AXE.....117	YV1EL.....109	WA2NGQ....104	K0TFP.....102	K1MTH.....100	W7KMU.....100
DJ5IM.....116	K0QJG.....107	HB9BJ.....104	F2DG.....102	WA2NWW....100	VE3MJZ....100
DJ5DA.....111	SL2ZA.....107	VE2JD.....103	W1BGU.....101	WA2JBV....100	G2CKK.....100
OH2AA.....111	K3IWV.....106	VE3GDX....103	WA6OZL....101	K3JNP.....100	

Radiotelephone

WA2TAG...137	YV5BBU...112	W8MNQ....103	DJ6QB.....103	T12WD.....102	W4FZO.....100
W3BSC.....112	K3NNW....110	W8CAU7 CN8.....103	KX6AE.....103	YV1EE.....101	VE4OX.....100

Endorsements

W9KOK....312	W2LSX.....260	W8TTN....217	EA1GZ.....189	DJ2EO.....152	K9YOE.....130
W2LV.....311	W5WW.....260	W1RLQ....212	W3FSF.....185	W3SW.....150	K9ZQW.....130
W2UVE....302	W9HB.....252	W4IUO....212	DL7BK.....185	W7YAQ.....150	F9OQ.....130
I1AMU.....301	VE2BV.....252	W3HDZ....211	YU3OV.....184	KV4CI.....150	K0WKE....127
W0SYK....301	W9GRF....250	W4OOP....210	K4HYL.....181	W8CJ.....149	W9OW.....125
W4LVY....300	W1TSL.....246	VE4OX....210	W4RVW....180	DL4MG.....148	W9GMS....124
W6KEV....300	W3LPF.....241	W2QQ.....206	JA5FQ.....176	K2LBB.....147	G3KRC.....123
W2CYS....294	W4PAA.....241	SP4JF.....204	W1EFQ.....175	W1BFW....145	K2JUA.....122
WA2IZS....291	W0BPA.....241	PA0VO.....203	DL1PM.....171	K8WOT....144	W9JFW....120
W4ECI.....290	W2RGV.....240	W9UXS....202	W7IYW.....170	SV0WZ.....143	K6ALH....120
K5BGB....290	W4HUE.....240	K4TKM....201	W4SNU.....170	WA2HUV....142	WA6HRS...120
W6OSU....290	W8IBX.....240	W6PHF....201	K8YBU.....169	W2KHT....142	W9CRE....120
W0MLY....290	VE1WL.....240	W9YT.....201	K2ZYR.....168	F9TE.....141	W9LGH....120
DL1IN.....284	G3HDA.....234	W4EJN....200	VQ8AD.....168	W2MZV....140	K9OPF.....120
DL7AA.....283	WA6AMZ....232	K6IEC.....200	W4SXE.....161	K2YMO....140	W1IRW....112
W1GYE....282	W2PDB....230	VE7EH....200	VE3NK.....161	W8OQV....140	K1LWI....112
W6DQH....280	W4MS.....230	K4QBP....199	OH2VZ.....161	W8CJN....138	WA6BBJ...112
PA0LOU....273	W4RBZ.....229	W1QV.....194	OZ4H.....161	WA2IEK....137	W4MLE....111
PY1GJ.....271	W9RCJ.....227	W8HEV.....194	W2UA.....160	W1SIK.....136	K9ASF.....111
W2ICO.....270	W2MES.....221	K4BVD....192	W8RMF/5...158	W6OMR....134	K1JHX.....110
W6YK.....270	K4EDF.....221	OA4FM....192	SM5MC.....156	W4SHW....132	K3MNJ....110
W0BSK....270	W2ZVS.....220	W8QNW....191	W0FDL.....155	K17BZO....133	K4BYN....110
VE2YU....270	K4AJ.....220	W4QVJ....190	K9WTS.....154	K0JPL.....133	K0TYO....110
W4DQS....265	W4LZW....220	W6VVR....190	K3HQJ.....152	W4HOS.....131	JA2AB.....110
W0BQM....262	G2IO.....220				VQ2EW.....110

Radiotelephone

W3JNN.....312	W9HB.....234	VE2YU.....211	W4HUE....170	K5YYI.....141	W8TOZ.....129
W9NDA....300	W4PAA.....232	VE1WL.....210	W4BXG....160	K2OEA.....140	K0WKE....124
OZ7FG.....280	W2RGV.....231	DL3RK.....210	W1HR.....155	W6YK.....140	EP3RO.....124
DL1IN.....271	W8BGU.....230	W8IJZ.....190	W4LVV.....152	W8TTN....140	W9LAA....122
W2UTE....270	W2TVR.....222	W2SNI.....182	YV2CJ.....149	W2ODO....139	YU3OV....120
Z81DG.....252	K9LUT.....221	W4PJG....181	W7CALO....147	SM5MC....138	DJ2UU....116
W0SYK....251	K4AJ.....220	K4HYL.....180	W2NQR....145	W0YYS....136	VE3CBY....114
K2MGE....248	W0BQM....217	K4STY.....179	YV3DV.....145	W6UBG....133	W1QCO....110
K9KYF....236	W4MS.....212	W4RBZ.....178	W4IUO.....143	F8WE.....133	G3HDA....110

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	Apr. 10, 1963	Miss Harriet Proctor	Aug. 10, 1962
Idaho	Apr. 10, 1963	Mrs. Helen M. Maillet	Apr. 10, 1963
Oregon	Apr. 10, 1963	Everett H. France	June 10, 1963
Nebraska	Apr. 10, 1963	Charles E. McNeel	June 10, 1963
Iowa	Apr. 10, 1963	Dennis Burke	June 16, 1963
South Dakota	Apr. 10, 1963	J. W. Sikorski	July 3, 1963
North Carolina	Apr. 10, 1963	N. J. Boruch	Resigned
Hawaii	May 10, 1963	John A. Montague	July 14, 1963
New York City & Long Island	May 10, 1963	George V. Cooke, jr.	July 31, 1963
Canal Zone	May 10, 1963	Thomas B. DeMeis	Oct. 1, 1962
Maine	May 10, 1963	Albert C. Hodson	Resigned
Oklahoma	June 10, 1963	Adrian V. Rea	Aug. 9, 1963
Kentucky	June 10, 1963	Elmer G. Leachman	Aug. 10, 1963
West Indies	June 10, 1963	William Werner	Aug. 10, 1963
Western Massachusetts	June 10, 1963	Percy C. Noble	Aug. 11, 1963
San Francisco	June 10, 1963	Wilbur E. Bachman	Aug. 14, 1963
Southern New Jersey	June 10, 1963	Herbert C. Brooks	Aug. 26, 1963
West Virginia	July 10, 1963	Donald B. Morris	Sept. 18, 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.

Minnesota	Mrs. Helen Mejdrich, WØOPX	Feb. 23, 1963
British Columbia	H. E. Savage, VE7FB	Apr. 10, 1963

In the Connecticut Section of the New England Division, Mr. Robert J. O'Neil, W1FHP, and Mr. Fred Tamm, K1GGG, were nominated. Mr. O'Neil received 301 votes and Mr. Tamm received 223 votes. Mr. O'Neil's term of office began Feb. 6, 1963.

In the Eastern Florida Section of the Southeastern Division, Mr. George E. Cushing, W4QVJ, and Mr. Guernsey Curran, W4GJI, were nominated. Mr. Cushing received 533 votes and Mr. Curran received 338 votes. Mr. Cushing's term of office began Feb. 27, 1963.

In the Missouri Section of the Midwest Division, Mr. Alfred E. Schwaneke, WØTPK, and Mr. Paul L. Haefner, KØJPL, were nominated. Mr. Schwaneke received 290 votes and Mr. Haefner received 258 votes. Mr. Schwaneke's term of office began Mar. 1, 1963.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for January Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
K6BPI	51	1616	1470	146	3283
W3CUL	235	1464	1101	356	3156
W9IDA	13	1331	1300	0	2644
W9JOZ	12	1305	1299	5	2621
W6YDK	1684	265	198	66	2213
WØLGG	314	904	825	42	2085
W9MM	15	894	740	154	1803
WA4BMC	142	766	756	36	1700
W3EML	27	667	606	19	1319
K4MRM/9	1	635	615	20	1271
WØSCA	28	563	550	1	1140
WA2GFT	33	551	495	44	1123
K4AKP	16	553	443	107	1119
W1PEX	29	532	505	25	1091
K6EPT	105	445	310	135	995
K7KBN	227	350	327	23	927
K5QXV	14	507	372	21	914
W7BA	6	452	407	43	908
W3IVS	16	448	369	57	890
W3VR	76	376	359	11	822
K9KZB	38	345	321	24	728
W2MTA	18	355	340	13	726
K1TSD	32	347	323	20	722
WØZWL	0	525	3	194	722
W1TXL	105	311	251	37	704
W6RSY	33	320	235	82	670
WA4IJH	22	322	307	13	664
K2UBG	18	336	283	18	655
W7GUH	103	271	200	71	645
K8YUZ	14	300	287	13	614
W7DZX	6	323	275	8	612
K1HCS	70	260	226	32	588
W9NZZ	149	219	0	217	585
W9DYG	60	282	213	25	580
WA9AJF	65	251	154	96	566
W6GYH	63	255	239	6	563
K4HSB	93	117	334	5	549
W4TUB	7	272	258	5	542
K4PNY	101	220	100	120	541
K4MCL	19	267	168	78	532
K5TEY	7	272	246	2	527
K7NWP	14	240	217	44	515
WA4ELB	16	11	220	263	510
W2EW	70	213	73	150	506
K2UCY	18	244	218	26	506

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W7FKK	100	201	102	99	502
W2EZB	8	235	237	21	501
K6MDD	10	240	150	100	500
Late Reports:					
W9FSP (Dec.)	118	1003	957	40	2118
K4AKP (Nov.)	16	497	414	82	1009

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W6IAB	306	1562	1490	75	3433
K9NBH	3181	8	0	0	3189
W4PFC	36	1123	1074	49	2282
KR6GF	546	161	36	125	868
K8FDV	10	362	360	2	734
K6AIR	125	0	360	20	505
Late Reports:					
K6AIR (Dec.)	0	300	0	300	600

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

K6GZ 262	WA2GAB 120	WA6YLZ 106
W4MIN 247	WA2RUE 120	W9BUQ 105
W8EOI 171	K3QOO 120	WA2CGF 103
WA2JSG 161	W4NTR 117	WN4IXI 101
W7APS 157	K4VFY 117	K4YUD 101
W9USR 136	K8GOU 113	Late Reports:
K4SJH 133	K4AHU 108	WA6YLZ (Dec.) 111
WA2QJU 132	K9GMZ 108	K4YDL (Dec.) 101
W8DAE 121	W3MFB 107	

More-Than-One-Operator Stations

K6FCT 300	KR6MD 194	Late Report:
WA4FYV 288	KR6MB 131	K6FCT (Dec.) 100

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W1DWA, WA2UZH, K6LKD, W9FSP, KØYRQ.

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.

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, Hawaii −10, Central Alaska −10.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Apr. 20 at 0230 GMT. Identical tests will be sent simultaneously by transmitters on 1805, 3555, 7080, 14,100, 21,075, 28,080, 50,700 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Apr. 4 at 0500 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, 0230 GMT Apr. 20 becomes 2130 EST Apr. 19.

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 0230 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. 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 Feb. *QST*

Apr. 1: *It Seems to Us*, p. 9
Apr. 4: *An Interlaced Quad* . . . . p. 11
Apr. 10: *Measuring Inductance* . . . . p. 16
Apr. 13: *High-Quality Speech Compressor*, p. 19
Apr. 16: *Pulse: A Practical Technique* . . . . p. 23
Apr. 19: *The RCC 230-L Amplifier*, p. 29
Apr. 22: *The Oscar III* . . . . p. 42

W1AW SCHEDULES

(April 1963)

Operating-Visiting Hours

Monday through Friday: 3 P.M.–3 A.M. EST.
Saturday: 7 P.M.–2:30 A.M. EST.
Sunday: 3 P.M.–10:30 P.M. EST.

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. The station will be closed April 12, Good Friday.

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.

Official Bulletins

Bulletins containing latest informaion 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, 0100; Tuesday through Sunday, 0500.
Voice: Monday through Saturday, 0200; Tuesday through Sunday, 0430.
Caution: Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

W1AW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from *any* amateur station in accordance with the following schedule:

GMT	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0030–0100	.....	.....	7255*	.....	7080	.....	7255*
0120–0200[1]	.....	.....	7080	3555	7080[2]	3555[2]	7080
0210–0230[1]	.....	.....	3945	50.7 Mc.	145.8 Mc.	3945	3945
0330–0430	.....	.....	3555	3945	7080	1820	3555
0440–0500[1]	.....	.....	3945	14,280	3945	14,280	3945
0520–0600[1]	.....	.....	3555[2]	7255*	3555	7080[2]	3945
0600–0700	.....	.....	14,280	14,100	3555	14,100	.....
0700–0800	.....	.....	7255	3945	7080	3945	7255*
2000–2100	.....	.....	14,280	21/28 Mc.[3]	14,100	.....	.....
2100–2200	.....	14,280	21/28 Mc.[3]	14,100	21/28 Mc.[3]	21,330*	.....
2200–2300	.....	14,100	14,280	21,075[2]	14,280	14,100	.....

[1] General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0200 and 0430 on phone and at 0100 and 0500 on c.w. Starting time is approximate.
[2] W1AW will first listen for Novices before checking the rest of the band for other contacts.
[3] Operation will be conducted on either 21,075, 21,330, 28,080 or 29,000 kc.
* Operation may be on *s.s.b.* as announced at the beginning of the period.

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activitiesfor the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: W3DUI. RM: W3EML. PAM: K3BHU. V.H.F. PAM: W3SAO. W3QDW has been appointed EC for Lackawanna County. Other appointments: K3KTH as ORS; K3RGP, K3SUH and K3SHY as OESs. A 6-meter OBS appointment goes to W3BKF in Bradford County. K3HTZ, K3SLP, K3MVO and W3LC have been racking the DX on 80-meter c.w. New Gear Dept.: To W3EML a pair of 813s in the final. W3MFW erected a 40-meter beam; K3TLX is sporting a Viking I; to W3PCX a Heathkit "Shawnee;" to K3UMJ a new TA-33 antenna; K3ORG got a Drake 2-B; K3SPI got an HT-37. K3CKA again is active on 6 meters. K3QNC has a new bug. KN3VOT is a new Novice in Paxinos. K3SHY, an NCS for the Cen-Pen-6 Net, is looking for outlet stations in the Scranton-Wilkes Barre area. (What net isn't?) W3BUR held regular skeds with W4VWL in Florida while his XYL was visiting there. The Lancaster Transmitting Society started code and theory classes Jan. 29. K3NBU had his kw. working in the DX Test. K3SEH is planning a 300-watter tor 2 meters in the next V.H.F. Contest. W3HNR is now at Ft. Meade, Md., and expects to QNI the PFN from there. Easton, Pa., has come alive on "six" with K3LPB, K3TFX, K3OZU, WA2ADJ, K3QER, K3UXC and K3IUB active. K3RZM has started a "Trouble Shooters Annonymous Club." For details contact him. K3MLI is s.s.b. on 2 meters. W3SDZ runs a full gallon s.s.b. on 6 meters and holds regular skeds with W8s and W1land. K3DSM is at the Valparaiso Technical Institute in Indiana. The annual auction of the Hilltop Transmitting society will be held Apr. 7 at the club house, Red Lion. Rodger Phelps, the amateur's friend and Engineer in Charge of the Philadelphia Office of the FCC, has retired and is replaced by Mr. Ken Roberts. Officers of the General ARC are K3NYG, pres.; K3PSW, vice-pres.; W3UET, secy. The EPA C.W. Net had a QNI of 448 with a traffic total of 443, almost one QTC apiece. Time's "affiittin' ", how are things shaping up for Field Day? Traffic: W3CUL 3156, W3EML 1319, W3IVS 890, W3VR 822, K3MQE 482, K3JSX 366, K3MVO 187, K3CAH 158, W3FAF 124, W3ZRQ 87, W3RV 77, K3KTH 66, K3SHY 65, K3OWE 63, W3AXA 48, K3HNP 37, W3BUR 30, W3MFW 28, W3NNL 25, K3TLX 21, W3LC 19, W3ADE 18, K3NLW 14, K3SLP 14, W3BFF 13, W3BKF 11, W3JKX 9, K3ANU 6, K3HTZ 6, K3MDG 6, W3OY 6, W3EEN 5, K3NBU 5, K3KHV 4, W3DUI 3, W3ELI 3, K3AKN 2, W3FEY 2, W3HNK 2, K3SEH 2, W3BNR 1.

MARYLAND-DISTRICT OF COLUMBIA—SCM, Andrew H. Abraham, W3JZY—SEC: W3CVE. RM: K3JYZ and W3TN for MDD traffic net meeting on 3649 kc. daily at 0000Z. RM: W3ZNW for MDDS (slow) Net meeting on 28.100 kc. daily at 0130Z. PAM: W3EQK. The MEPN meets on 3820 kc. Mon.-Wed.-Fri. at 2300Z and Sat. and Sun. at 1800Z. W3ATQ is a new ORS and is on the MDD Net. W3BKE worked 96 stations in the 160-meter contest. W3CDQ has been ill with the flu. K3DNO is trying to get on 6 meters with s.s.b. W3ECP was in Georgia during part of January. W4EXM/3 has his new call, EP2AM. Art will be using his Collins S/Line equipment while in Teheran, Iran. W3EOV, K3HFV, K3RGA and W3IXQ were blood donors to K3DGK when he was in the Suburban Hospital. K3GJW is busy building some new equipment. W3HCE is working mobile with a Shawnee on 6 meters. K3HPG and W3LII took part in the 160-meter contest. W3HQE was active in the DX Contest. W3IVC has a new HQ-180. K3JYZ will be traveling for a couple of weeks. K3LLR is working in the traffic nets and also looking for DX. W3MCG has increased power. Karl will be looking for DX in the contests. K3NCM is busy handling traffic on the phone nets. K3NKX is selling all his mobile equipment. W3NO is active on phone. W3OHI is working 20 meters with his dipole in the attic of the house. K3QFG is busy with home work and is getting things all set for the Science Fair. K3QDD is a new ORS on the MDD. Rick is NCS on Sun. nights. K3PRN burned out the power transformer in his Viking Challenger. W6QEG/K3QOO made the BPL. K3RGG is using a 32-V-2 transmitter to check in the MEPN. K4SRA/3 is busy as the EC for St. Marys County getting the nets going for emergency work. W3TN is taking over the duties as RM for MDD in the absence of K3JYZ. Dave is doing a splendid job. W3JHR is NCS on the Maryland and D.C. Navy MARS Net. W3ZAQ reports band conditions are very poor. W3ZNW has completed his current antenna projects. W3YKQ is the new EC for Howard County and will be checking into the MDD Net for traffic; he also uses a twelve-element "J" beam on 6 meters. W3RID is the Howard University club station that has been activated by K3QMF. Traffic: K3QFG 273, W3RID 227, W3IVC 223, W3TN 173, W6QEG/K3QOO 146, W3MCG 80, K3WBJ 75, W3HQE 52, W3BKE 47, K3JYZ 38, W3PQ 31, W3NO 29, W3ECP 25, K3NCM 25, K3QDD 24, K4SRA/3 11, W3EOV 9, K3LLR 9, W3ATQ 4, W3OHI 2, W3ZNW 1.

DELAWARE—SCM, M. F. Nelson, K3GKF—PAM: K3LEC. RM: W3EEB. New appointments: EC (Sussex County), K3KAJ and K3PZL. Reappointments: EC (Kent), W3JFR; OO, W3DRD New Generals: New Castle County, K3SXA; Kent County, K3RUH and W3RUJ. New First State ARC officers: W3URR, pres.; K3CRC, secy.-treas.; K3GHC, publicity; W3KET, activities; W3CMR, trustee. K3BBR had dad K2DU as a holiday visitor. W3EKO is getting ready to go on 432 Mc. Dover High School Club station K3LTO now is on 7 Mc. K3MPZ and K3AZH furnished mobile communication for a Wilmington relay race. Traffic: K3AZH 201, W3EEB 159, W3JFR 142, W3EKO 140, K3AXW 137, W3IYE 100, K3EWK 95, K3SRG 90, W3HZW 78, K3SMN 76, K3OWS 57, W3CFA 35, K3CNI 35, K3KAJ 34, W3HIC 32, K3GKF 31, K3OBU 25, K7ETU/3 23, W3BYJ 21, W3PZL 21, W3OPF 11, W3OZM 7.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. PAM: W2ZI. RM: WA2VAT. The NJN report from Net Mgr. W2QNL shows 31 sessions, QNI 506, traffic 356. WA2WLN, W2RG, WA2BLV, WA2VAT and W2ZVW are NCSs. WA6IMU is visiting WA2NXV in Gloucester. K2RXB, Margats, has just returned from a Caribbean cruise. With regret we report the passing of W2ANS, Cinnaminson Twp. The Levittown (N.J.) Radio Club and the Medford Wireless Assn. have applied for affiliation with the League. The Burlington County Radio Club now meets the 2nd Mon. Officers are W2WUP, pres.; W2ZNF, vice-pres.; K2HJY, treas.; K2BG, secy. About 75 hams and guests attended the Gloucester Co. ARC birthday party. WA2NRD was chairman. K2JKA expects to QRO in 6 meters. K2HBY is SJRA's DX Contest Chairman. Storm damage to antennas was reported by WA2KOK, W2OSD, W2BLV and WA2BLV. K3HNP and K2YIP recently received the CHC certificate. Contact WA2EIY for SJRA's certificate. There was no report this month on N.J. Phone and Traffic Net activities because Net Mgr. W2ZI was in the hospital. W2LY is Camden County Radio Officer. SJRA's code and theory class meets each Fri. night at the Cherry Hill High School. Classes are under the direction of K2BZK, WA2GQZ, Red Bank, is editor of a new bulletin *Traffic Lines*, an outstanding paper combining the news of NJN, NLI, NYS, 2RN and EAN. The Southern Counties ARA meets the 1st Fri. of each month in Northfield. WA2QOG, WA2OZQ, K2HBA and K2CIR visited the Apple Pie Hill Radio Club. WA2AWD built a transmitter for the Oakcrest High amateur class. K2YYB is the instructor. Again we solicit reports from clubs in addition to those included in this report. Traffic: WA2VAT 207, WA2WLN 207, WA2BLV 168, W2RG 129, W2ZVW 93, W2BZJ 90, WA2NXV 71, W2TLO 58, K2RXB 56, WA2KAP 13, W2BEI 8, K2JJC 7.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2ICZ. RMs: W2RUF, W2EZB and W2FEB. PAM: W2PVI. NYS C.W. meets on 3670 kc. at 1900. ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3610.5 and 3993 kc. at 0900 Sun. and 7102.5 kc. at 1930 Wed., TCPN 2nd call area on 3970 kc. at 1900, 1PN on 3980 kc. at 1600, 2RN on 3960 kc. at 0045 and 2345 GMT. A BPL certificate goes to W2EZB. W2ICZ replaces W2LXE as SEC. W2LXE did a fine

(Continued on page 94)

TOWER OF BABEL
OR
HIGHER SCORES IN CONTESTS

EVERY radio amateur who entered the ARRL Sweepstakes in November, 1962, and the DX International Competition in February, 1963, did so because of the compelling interest. Here was the challenge emphasizing the need for good equipment, topflight operating ability, quick thinking and a large piece of stick-to-itness.

NOT entering, but observing A.M. and S.S.B. with two receivers, about 26 stations were logged consistently. These stations certainly could have scored considerably more points had it not been for the numerous repeats required because of their non-standard phonetics — phonetics of their own "manufacture," not readily understood by the receiving operators.

THIS consumed valuable time which could have been devoted to additional contacts. For their consistent and conscientious efforts to insure correctness of their calls — an orchid and admiration! Certainly one can feel proud to be a radio amateur.

OF COURSE, all of us have heard many hundreds of tricky, manufactured phonetics and they have enlivened the fun. However, in any contest challenging the maximum effort of any radio amateur, standard practice would eliminate or reduce time wasted or lost in making repeats.

ACTUALLY, an easy and good way to "train" for any contest is to use ARRL or Military phonetics in daily contacts. In a short time this will become a good habit that will pay plus dividends in more contacts and higher scores. It is considered good operating practice to use one or the other but don't mix them.

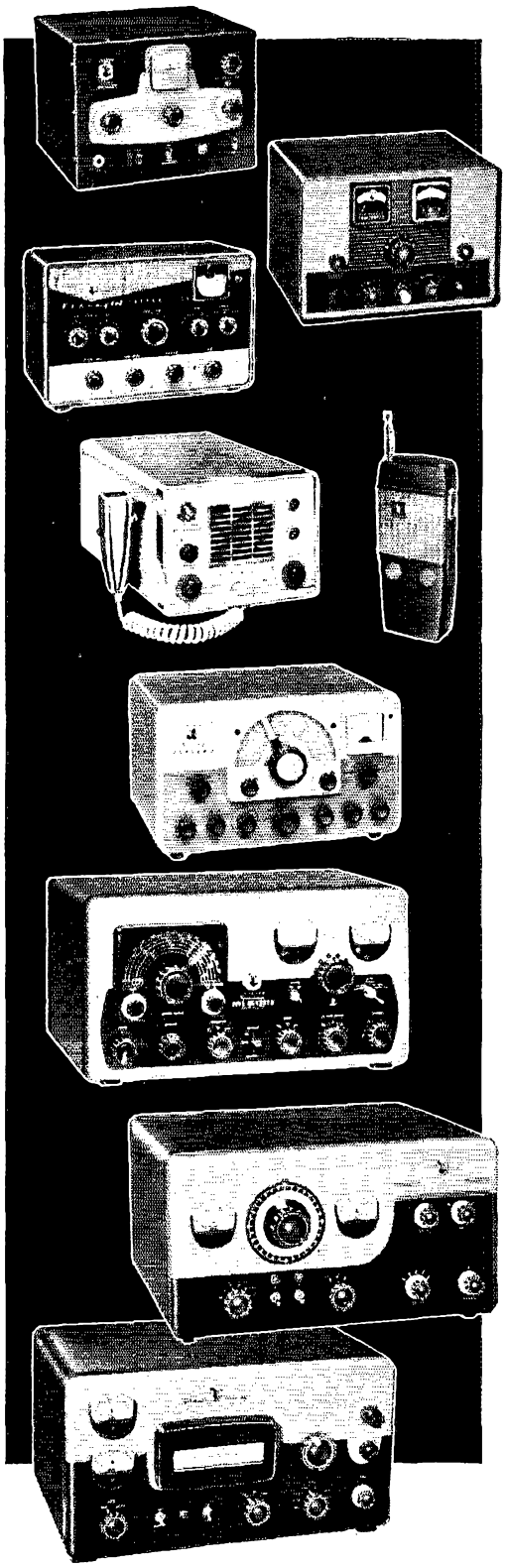
ARRL PHONETICS

A	ADAM	N	NANCY
B	BAKER	O	OTTO
C	CHARLIE	P	PETER
D	DAVID	Q	QUEEN
E	EDWARD	R	ROBERT
F	FRANK	S	SUSAN
G	GEORGE	T	THOMAS
H	HENRY	U	UNION
I	IDA	V	VICTOR
J	JOHN	W	WILLIAM
K	KING	X	XRAY
L	LEWIS	Y	YOUNG
M	MARY	Z	ZEBRA

MILITARY PHONETICS

A	ALPHA	N	NOVEMBER
B	BRAVO	O	OSCAR
C	CHARLIE	P	PAPA
D	DELTA	Q	QUEBEC
E	ECHO	R	ROMEO
F	FOXTROT	S	SIERRA
G	GOLF	T	TANGO
H	HOTEL	U	UNIFORM
I	INDIA	V	VICTOR
J	JULIET	W	WHISKEY
K	KILO	X	XRAY
L	LIMA	Y	YANKEE
M	MIKE	Z	ZULU

FRED H. SCHNELL, W4CF



Viking®

ADVENTURER—Self-contained . . . 50 watts CW input . . . rugged 807 transmitting tube . . . instant bandswitching 80 through 10 meters. Crystal or external VFO control—wide range pi-network output—timed sequence keying. With tubes, less crystals.
Cat. No. 240-181-1 Kit ..... **Net $69.95**

CHALLENGER—70 watts phone input 80 through 6; 120 watts CW input 80 through 10 . . . 85 watts CW on 6 meters. Two 6DQ6A final amplifier tubes. Crystal or external VFO control—TVI suppressed—wide range pi-network output. With tubes, less crystals.
Cat. No. 240-182-1 Kit ..... **Net $124.75**
Cat. No. 240-182-2 Wired, tested ..... **Net $169.75**

6N2—Rated 150 watts CW and 100 watts phone—instant bandswitching coverage 6 and 2 meters. Fully TVI suppressed—use with "Viking I, II", "Ranger I, II", "Valiant" or similar power supply/modulators. Operates by crystal control or external VFO with 8-9 mc. output. With tubes, less crystals.
Cat No. 240-201-1 Kit ..... **Net $149.50**
Cat. No. 240-201-2 Wired, tested ..... **Net $194.50**

10 METER "MESSENGER"—A compact, superbly-engineered transceiver. Ideal for fixed location or mobile operation. Completely crystal controlled, the 10-Meter "Messenger" contains 10 tubes (including rectifier). Instant selection of five frequencies in the range of 29.4 to 29.7 mcs., within a 300 kc. segment of the 10-meter band. Superheterodyne receiver has excellent sensitivity and selectivity. ANL, AVC—positive action "squelch" . . . wide range pi-L network output . . . push-to-talk ceramic microphone! Transmitter section uses a 7054 crystal oscillator coupled to a high gain 7061 final amplifier—delivers a clean, crisp, well modulated signal! Unit is light weight, easy to install. With power cords, tubes, microphone and 29,640 kc. crystals for National Calling and Emergency Frequency.
Cat. No. 242-201 115V AC only ..... **Net $129.75**
Cat. No. 242-202 115V AC/6V DC ..... **Net $139.75**
Cat. No. 242-203 115V AC/12V DC ..... **Net $139.75**

10 METER "PERSONAL MESSENGER"—Two models: 100 milliwatts for short range; 1 watt for extended range—11 transistors and 4 diodes—super-heterodyne receiver with tuned RF amplifier gives excellent sensitivity, two stage transmitter punches signal home. "Quiet" control silences receiver on standby. With battery compartment for penlight cells (less cells). Rechargeable cadmium battery and other accessories available.
Cat. No. 242-103 10 Meter "Personal Messenger", 100 milliwatt, with 29.640 crystal, 8 penlight cell battery case . . . Net $109.50
Cat. No. 242-104 10 Meter "Personal Messenger", 1 watt, with 29.640 crystal, 8 penlight cell battery case ..... **Net $129.50**
Cat. No. 251-806 Leather carrying case and strap . . . . Net $8.50
Cat. No. 250-804 Rechargeable nickel cadmium battery. Plugs into 115 V AC outlet to recharge . . . . . Net $19.95

RANGER II—Now—a new version of the popular 75 watt CW or 65 watt AM "Ranger". The "Ranger II" transmitter also serves as an RF/audio exciter for high power equipment. Completely self-contained instant bandswitching 160 through 6 meters! Operates by built-in VFO or crystal control. High gain audio-timed sequence keying, TVI suppressed. Pi-network antenna load matching from 50 to 500 ohms. With tubes, less crystals.
Cat. No. 240-162-1 Kit ..... **Net $249.50**
Cat. No. 240-162-2 Wired, tested ..... **Net $359.50**

FIVE HUNDRED—Full 600 watts CW—500 watts phone and SSB (P.E.P. with auxiliary SSB exciter). Compact RF unit designed for desk-top operation. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 through 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.
Cat. No. 240-500-2 Wired, tested ..... **Net $1050.00**

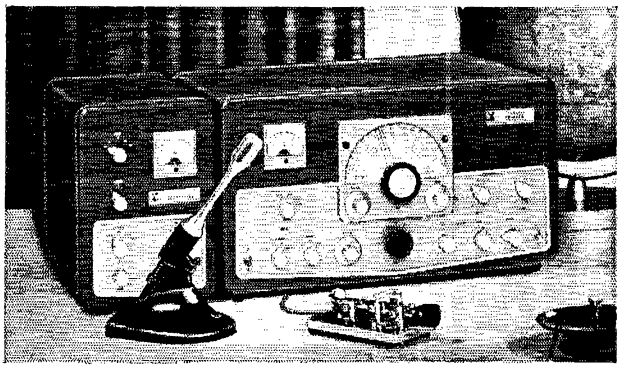
"6N2 THUNDERBOLT"—1200 watts (twice average DC) input SSB and DSB, Class AB1; 1000 watts CW, Class C; and 700 watts input AM linear. Continuous bandswitched coverage on 6 and 2 meters. TVI suppressed. Drive requirements: approx. 5 watts Class AB1 linear, 6 watts Class C CW. With tubes and built-in power supply.
Cat. No. 240-362-2 Wired ..... **Net $549.50**

"THUNDERBOLT"—The hottest linear amplifier on the market—2000 watts P.E.P. (twice average DC) input SSB; 1000 watts CW; 800 watts AM linear. Continuous coverage 3.5 to 30 mcs—instant bandswitching. Drive requirements: approx. 10 watts Class AB2 linear, 20 watts Class C continuous wave. With tubes and built-in power supply.
Cat. No. 240-353-2 Wired, tested ..... **Net $659.00**

New Catalog

The E. F. Johnson Co. also manufactures other transmitters and accessories . . . all described in our newest amateur catalog. Write for your copy today!

1st Choice Among Nation's Amateurs!



Matched Pair

Outstanding performance on SSB, AM and CW with absolutely no compromise on any mode!

"SSB ADAPTER"—The new filter-type SSB generator—with bandswitching 80 through 10 meters . . . more than 50 db sideband suppression . . . more than 45 db carrier suppression! When used with the Viking "Valiant" or "Valiant II" it places 275 watts P.E.P. at your command. Two compact units and interconnecting cables . . . RF unit is only 8" wide—may be placed on your operating desk. Power supply unit may be placed in any convenient location. Features built-in multiplier requiring VFO input only—band-pass interstage couplers require no tuning—design and front panel make operating practically foolproof. Superb audio fidelity and balanced audio response; excellent sideband, spurious and carrier suppression. Other features: positive VOX and anti-trip circuits with built-in anti-trip matching transformer and adjustable VOX time delay. With remote power supply, tubes and crystal filter, less microphone.

Cat. No. 240-305-2—Wired, tested.....Net $369.50

INVADER—More exclusive features than any other Transmitter/Exciter on the market today! Specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db sideband suppression—more than 55 db carrier suppression! Instant bandswitching 80 through 10 meters—no extra crystals to buy—no realigning necessary. Delivers a solid 200 watts CW input; 200 watts P.E.P. SSB input; 90 watts input on AM! (25-30 watts output—upper sideband and carrier). Built-in VFO—exclusive RF controlled audio AGC and ALC (limiter type) provide greater average speech VOX and anti-trip circuits. Fully TVI suppressed. Self-contained heavy-duty power supply. With tubes and crystals.

Cat. No. 240-302-2 Wired, tested.....Net $619.50

INVADER 2000—Here are all of the fine features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply. Rated at a solid 2000 watts P.E.P. (twice average DC) SSB, 1000 watts CW, and 800 watts AM! (250 to 300 watts output—upper sideband and carrier.) Wide range output circuit (40 to 600 ohms adjustable). Final amplifier provides exceptionally uniform "Q". Exclusive "push-pull" cooling system. Heavy-duty multi-section power supply. With power supply, tubes and crystals.

Cat. No. 240-304-2 Wired, tested.....Net $1229.00

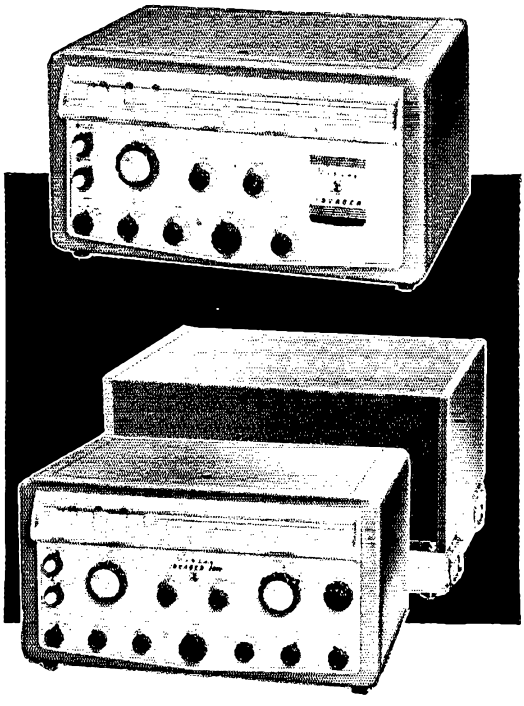
HIGH POWER CONVERSION—Take the features and performance of your "Invader" . . . add the power and flexibility of this unique Viking "Hi-Power Conversion" system . . . and you're "on the air" with the "Invader 2000". Wired, tested, includes everything you need—no soldering necessary—complete conversion in one evening.

Cat. No. 240-303-2.....Net $619.50

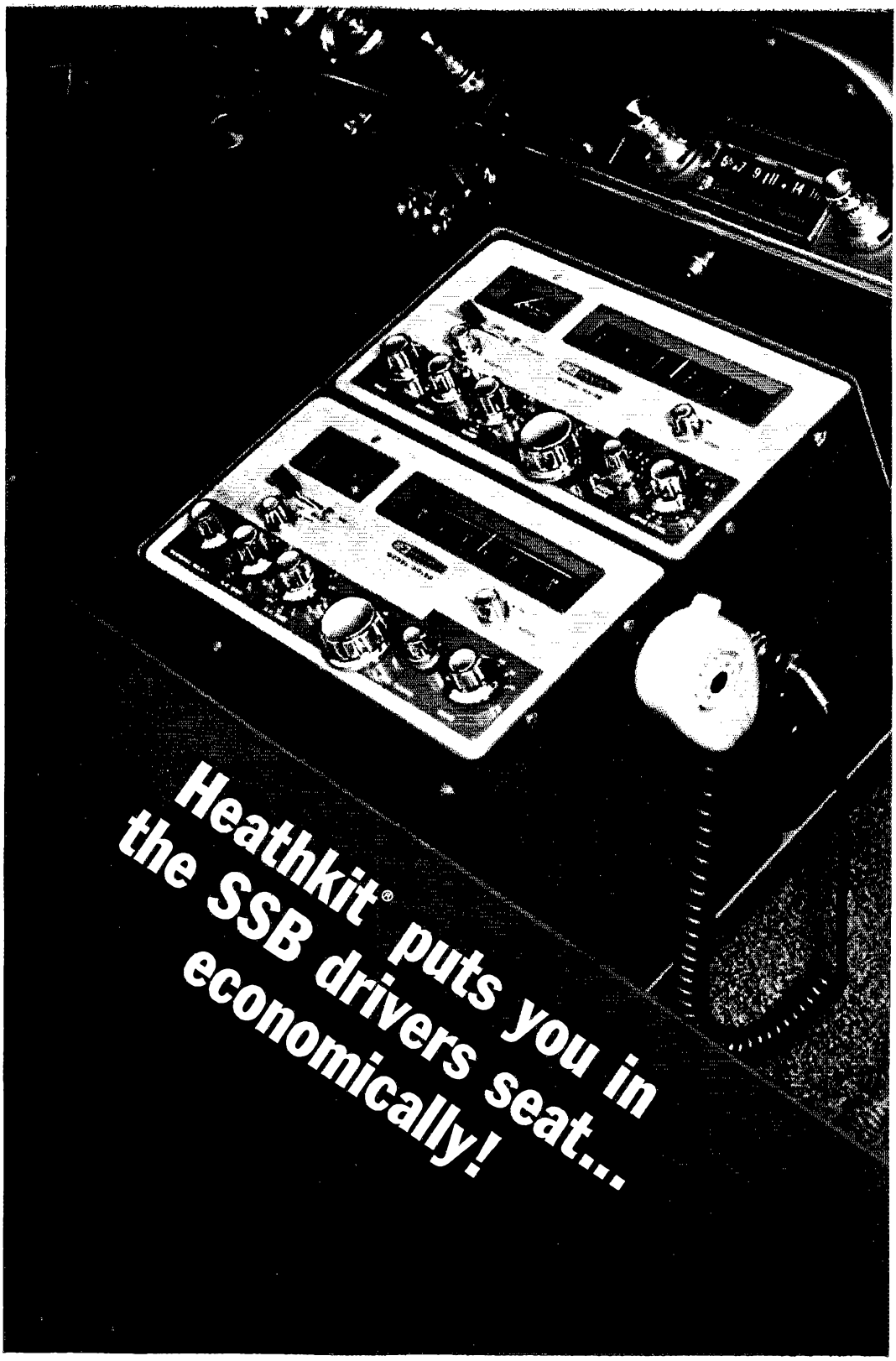
"VALIANT II"—Outstanding flexibility and performance—bandswitching 160 through 10 meters—delivers 275 watts input CW or SSB (with auxiliary SSB exciter or Viking SSB adapter) and 200 watts AM! Low level audio clipping—differentially temperature compensated VFO provides stability necessary for SSB operation! High efficiency pi-network tank circuit—final tank coil silver-plated. Other features: TVI suppression; time sequence (grid block) keying; high gain push-to-talk audio built-in low pass audio filter; self-contained power supply; and single control mode switching. As an exciter drives any popular kilowatt level tubes and provides quality speech driver system for high power modulators. Provision for plug-in SSB operation with no internal modification. With tubes, less crystals.

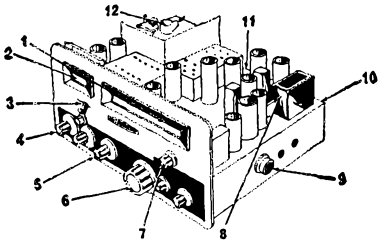
Cat. No. 240-105-1—Kit.....Net $375.00

Cat. No. 240-105-2—Wired, tested.....Net $495.00



E. F. JOHNSON COMPANY
WASECA, MINNESOTA, U.S.A.


Heathkit® puts you in
the SSB drivers seat...
economically!



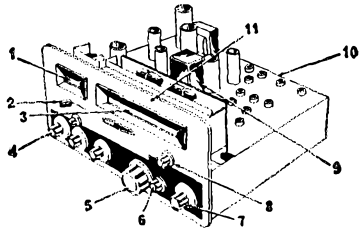
HEATHKIT HX-20 SSB MOBILE TRANSMITTER... A SENSATIONAL VALUE AT ONLY $199.95

1. Easy-to-read, edge-lighted, slide-rule dial **2.** Relative power output indicator for ease of tuning **3.** Spot function for zero-beat or talk-on frequency setting **4.** Fixed 50 ohm loading for easy tuneup **5.** Bandswitching 80 through 10 meters—all crystals furnished **6.** Full gear drive vernier VFO tuning **7.** Mode switch for LSB, USB or CW **8.** Hermetically sealed crystal bandpass filter **9.** VOX or push-to-talk operation **10.** External linear amplifier cutoff bias **11.** Built-in antenna relay plus external antenna relay control **12.** 6146 for 90 watts P.E.P. input. Automatic level control for maximum talk power, low distortion Crystal control, dual conversion, heterodyne circuitry. Frequency stability 100 cps overall, after warm-up. 50 db carrier suppression, 55 db unwanted sideband suppression.

SSB Portable, fixed station or mobile

less than $395.00 with power

All the features you want and need for top mobile performance. Handsomely styled with die-cast panel, chrome-plated knobs. Units require only 1 cubic foot of space for easy installation in auto. Rack mounting allows easy removal for fixed or portable use. Operates with Heathkit HP-10 or HP-20 power supplies. Here's quality, economy and versatility that can't be beat anywhere!



HEATHKIT HR-20 SSB MOBILE RECEIVER... MANY EXTRAS FOR TOP PERFORMANCE $134.50

1. Built-in calibrated "S" meter **2.** Fast or slow AVC selection **3.** Rotating slide rule dial **4.** Crystal controlled BFO for selectable sideband reception **5.** 30-1 gear drive vernier tuning **6.** Antenna tuning control, 1 uv sensitivity on all bands **7.** Full coverage 80 through 10 meters **8.** Series noise limiter for AM reception **9.** Crystal bandpass I.F. filter **10.** Additional 500 ohm output for anti-trip circuit or headset **11.** Die-cast control panel & knobs. Product detector for SSB & CW, diode detector for AM. Fully compatible for use with HX-20. Excellent mechanical and electrical stability.

FREE CATALOG!

Send in today for your free 100-page catalog. Over 250 kits in this most complete catalog of kits. Every piece is top quality . . . save up to 50%

HEATHKIT by Daystrom

HEATH COMPANY
Benton Harbor 9, Michigan

Please send my FREE 100 page 1962 Heathkit Catalog

Name_____

Address_____

City_____ State_____

GOTHAM VERTICALS DELIVER THE CONTACTS

THE ULTIMATE PROOF OF THE FINE PERFORMANCE OF THE GOTHAM VERTICAL ANTENNAS IS IN THE ACTUAL FIELD RESULTS, BY HAMS ALL OVER THE WORLD.

PROVEN! PROVEN! BY THESE EXCERPTS FROM UNSOLICITED TESTIMONIALS:

CASE HISTORY #71
"I am very delighted with the first V80 and want another for a different location." A. C., California.

CASE HISTORY #159
"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them, too. Will you please send me four more." W. A., Alaska.

CASE HISTORY #248
"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

CASE HISTORY #111
"The V160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when bought it." D. S., New Jersey.

CASE HISTORY #250
"I have one of your vertical antennas and have been having fine results on 10, 15, and 20 meters." N. S. P., Missouri.

CASE HISTORY #613
"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success — i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

CASE HISTORY #483
"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some of the lower bands." J. A., New Mexico.

CASE HISTORY #123
"I am full of praise for your vertical. In the recent field day, we went up to the mountains near here and QSO'd a KA2, KZ5, and an XE at 2100 PDST on 15 meters. We got a 59 plus from the KA and KZ and 58 from the XE." D. P., Nevada.

CASE HISTORY #398
"Some months ago I purchased one of your V80 vertical antennas. I have had wonderful results with this antenna, and I think it was of far greater value than the small amount I paid for it." R. C., Utah.

CASE HISTORY #766
"The Gotham vertical takes almost no room. I don't see how I could have used any other type very well. Sure do appreciate the fine record this antenna has made so far." H. C., Haiti.

CASE HISTORY #146
"I have had very good luck with mine (my V80) feeding it with a Johnson Adventurer; works fine on all bands." B. I., Nebraska.

CASE HISTORY #555
"Being an owner of your V80 vertical I would like to let you know of the excellent results I am getting with it, both working the DX and the local stations on the lower bands. It certainly is an excellent antenna system." F. H. Jr., New York.

CASE HISTORY #84
"A few months ago I purchased your V40 vertical and have achieved outstanding results on the air." K. G. B., North Carolina.

CASE HISTORY #407
"I recently purchased a Gotham V80 vertical antenna and I am very pleased with the results. Up until now my home brew antenna has had a very high SWR, but with the V80 the SWR is 1:1." J. D. R., Virginia.

CASE HISTORY #414
"Just a quick note to tell you how pleased I am with my 2 day old V80. My old SX-28 just seems to be re-born. An excellent receiving antenna as well as a fine transmitting antenna." D. J., Utah.

FREE

Catalog of all Gotham antennas, including 47 different beams covering 2 meters through 20 meters, free on postcard request.

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 VERTICAL ANTENNA IS THE BEST ALL-BAND ANTENNA

- 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.

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

THE V40 IS ALSO MADE FOR CITIZENS BAND OPERATION, WITH SPECIAL INSTRUCTIONS. DESIGNATE CB-11 ANTENNA. PRICE SAME AS THE V40

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

Address.....

City.....Zone.....State.....

Station Activities

(*Continued from page 86*)

job and we regret that the pressure of business forced him to resign. W2ICZ lives at 76 Chardon Dr., Buffalo 25. Any correspondence regarding the AREC should clear through him if your local EC doesn't respond within a reasonable length of time. Appointments: WA2LKW as ORS, W2VJB as OBS (trustee W2WUX, Utica ARC), WA2VZA as OES, WA2NZO as OES. Endorsements; W2RQF as OO, K2EQB as OO, K2UOQ as OES. Congratulations to the Southwestern N.Y. V.H.F. Assn. on becoming an ARRL affiliated club. WA2CYM is pres. K2TKD announces the formation of the Fredonia Am. Rad. Technical Soc. Correction: K2PKL, not W2RHQ, was chairman of the 1962 V.H.F. roundup as reported in Dec. *QST*. W2RHQ will be chairman of this year's affair. The Tioga ARA elected W2EEQ, pres.; WA2-TDG, vice-pres.; and Mary Jones, secy. W2VDX and W2EWO have a new harmonic, a girl. The Erie County Phone Traffic & Emerg. Net elected K2QDT, mgr.; WA2CJJ, asst. mgr.; and K2AUW secy.-treas. WA2TGC has built a heath 6-meter s.s.b. transmitter. The Western New York Hamfest is scheduled for May 11, Doud Post, Rochester and is sponsored by the RARA with W2ICE as chairman. W1DF is scheduled to speak. Reserve the date now! W2OE reports that W.N.Y. contacts are easy from W6-Land. He'll be back May 1. K2IQH is now on 6 meters. After a long absence the RAWNY is back in business with a fine monthly bulletin edited by W2KLF. K2GUG, W2EUP, WB2EUT, K2VOX and WA2EGW plan to go wide-band f.m. on 146.94 Mc. using surplus commercial gear. K2HUK is Radio Officer for Erie County. Traffic: (Jan.) W2EZB 501, W2FEB 335, W2OE 314, WA2IYB 227, WA2KQG 219, WA2LKW 219, K2QDT 198, W2RUF 139, WA2HSB 72, W2QHH 64, K2-OFU 52, WA2KZQ 50, W2FCG 40, K2AFE 25, W2RQF 25, K2JBX 24, K2BBJ 21, WA2ANE 20, K2RHY 18, K2-ULY 17, K2IMI 16, WA2RLV 14, WA2WEE 14, K2MPK 10, K2MQA 8, WA2ENV 7, K2HOH 5, W2PVI 5, WA2-GLA 4, K2PBU 4. (Dec.) WA2RLV 12, K2DNN 5.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: W3LIV. RMs: W3KUN and W3NUG. The WPA Traffic Net meets Mon. through Fri. at 2400 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets at 2330 GMT on 3585 kc. Mon. through Fri. It is with deep regret we record the death of W3-KSJ, of Clairton. W3SMV is on 160 meters. W3IOB and K3OGK are building s.s.b. rigs. The Western Penna. Mobileers report via *The Whip*: Operation "Pumpkin" was a complete success; K3KUZ has a new Cheyenne rig; W3PDR now has a tenner. The Breezeshooters' Hamfest will be held at Wildwood Grove Sun., May 26. K3ODD has a new HQ-170A. K3VGO is the new pres. and K3PJX is secy.-treas. of the Crawford County Radio Amateur Assn. At the recent Amateur Transmitters' Assn. meeting, W3VPK and K3GQA presented the evening's program at the Buhl Planetarium. K3SJL now has his General Class license. The South Community YMCA (K3HUO) ARC now is completely reorganized and planning v.h.f. work very soon. The Coke Center RC reports: W3RUK is moving to W6-Land; K3LQK has a new Apache; K3NGY has a new HQ-129X; K3-JDZ is putting a kw. together. The Skyview Radio Society in Upper Burell Twp. elected W3HQW, pres.; W3-BWW, vice-pres.; K3KSY, secy.; W3GDS, treas. The club net meets on 29.360 Mc. Thurs. at 8 P.M. K3CXA was guest speaker at the recent Nittany ARC meeting. Up Erie way: K3UTL has his Apache working; W3YWL is working 160 meters; K3OFA is leaving for the Air Force; the Radio Assn. of Erie's Annual "Hamquet" will be held at Cesare Battisti Club Apr. 27. The Foothills RC is editing the *W3LWW Newsletter*. New officers of the Bedford County ARC are K3KYT, pres.; K3-MKX, vice-pres.; K3MIU, secy.; K3NQT, treas. The Horseshoe RC reports via *Hamateur News*: K3VYF is getting a Knight T-150; K3BDI recently got married; K3AYU and W3ISZ are building TV cameras; K3SIQ lost his cubicle quad in a storm. W3JWZ is in France studying at the Université de Paris for an MA in French. The section traffic nets still need several outlets in the Pittsburgh area. Traffic: W3MFB 360, K3OOU 269, W3KUN 146, W3JHG 65, W3UHN 64, W3IYI 52, K3EDO 43, W3KWO 40, W3OEO 33, K3DKE 30, W3SMV 25, K3HID 11, K3SMB 9, W3KNQ 6, K3PYS 6, K3JCZ 4, K3COT 3, K3PJX 2.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, W9GME. SEC: W9RYU. RM: W9USR. PAM: W9VWJ. EC of Cook County: W9-HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. This section extends congratulations to our new Central Division Director, Phil Haller, W9HPG. He succeeded W9GPI, who resigned because of serious illness in his family. The gang will miss Jack Doyle, who has been a devoted Director and who travelled extensively to all parts of the division regardless of his sacrifice of time and personal finances. K9ODE (of the Templeton Case fame), W1ICP, K2FF and your SCM were on hand for the dedication of the VAR Hospital radio station and the Amateur Radio Night Open House at the Museum of Science and Industry Mar. 11. W9HPG is sporting a new HT-37. QSL Bureau Manager W9MSG spoke before the Rockford Amateur Radio Assn. WA9-DEW is the new acting manager of the Chicago Area Emergency Net. W9OKI and W9OIJ received Worked all Illinois Counties certificates. W9SKR is now working with a Loudenboomer. WA9CWZ is looking for 6-meter signals with a new Telco 201 converter. A new Novice XYL is WN9GGI. Major Kent, W7CZL, spoke on Military Communications in the Korean Theatre at the North Shore Amateur Radio Club. W9NWK was elected manager of the Interstate Sideband Net and W9IDA was elected asst. net manager. New calls in the Mt. Vernon area are WA9AWU and K9MGN. WA9AWP received 2nd-class phone and 2nd-class telegraph commercial licenses. W9PBY was injured and burned when he came in contact with 2500 volts but is recuperating satisfactorily. The Veteran's Administration Research Hospital Club has been declared an ARRL affiliate. W9IMN, W9GFF, W9JUV/K9OSO, W9KCR, K9QIZ and K9UCG participated in the recent FMT. New appointees include W9DGL and K9YMO as OBSs. K9YMO as OO and WA9DXM as OES. The new officers of the Chicago Area Radio Club Council are W9KQE, W9MSG, K9TRP and W9FYU. If anyone is interested in advancing in code and theory, please contact your nearest radio club for information. The Central Illinois Radio Club (Bloomington) cooperated with the March of Dimes Collection with 6-meter mobiles. New officers of Shawnee Amateur Radio Assn. are W9PLT, K9RXG and K9ZGP. K9FJM, WA9CMY, WA9BXB, K9FZB and WA9AWS are the officers of the Worth Township Amateur Radio Club. W9-BKT is now RTTY on 2 meters a.f.s.k. W9EU, W9NIU, W9PBY and W9TV received proficiency awards from MARS. The Chicago Area Emergency Net traffic count was as follows: Nov. 51, Dec. 61 and Jan. 41. The North Central Phone Net had a count of 293 messages for January. The ILN's traffic for Nov. was 228, Dec. 238 and Jan. 140. The January traffic count of the Interstate Sideband Net was 607. Recipients of the BPL award for January traffic were K9NBH, W9IDA, K4MRM/9, K9-KZB, WA9AJF, K9GMZ and W9USR. Traffic: (Jan.) K9NBH 3189, W9IDA 2644, K4MRM/9 1271, K9KZB 728, WA9AJF 566, W9EET 286, K9GMZ 238, W9USR 173, W9-AKU 126, K9ZQT 82, K9BTE 74, K9CYZ 37, W9JXV 34, W9MAK 33, K9UOV 27, K9ISP 20, K9CSD 18, K9LRN 16, K9OCU 13, W9PRN 13, K9LXG 12, W9NWK 12, K9DRS 11, WA9FOT 6, K9KCX 6, W9LNQ 6, W9SKR 5, K9RAS 4, K9UCG 4, W9OKI 2. (Dec.) W9USR 223, W9EET 222, W9FGY 96, WN9BCH 48, K9UOV 33, W9-VEY 22, K9AXS 20, W9BQC 14, K9ISP 10, K9VUL 3, W9BKT 2. (Nov.) K9UOV 47.

INDIANA—SCM, Donald L. Holt, W9FWH—Asst. SCM: Clifford M. Singer, W9SWD. SEC: W9SNQ. PAMs: K9KTL, K9CRS, K9GLL. RMs: W9TT, K9-DHN. Net skeds (all times in GMT): IFN, 1300 daily except Sun. at 1330 and 2300 M-F on 3910 kc. ISN (s.s.b.), 0030 daily on 3920 kc. IN (training), 0000 M-W-F on 3745 kc.; QIN, daily at 0030 and RFN, at 1300 Sun. on 3656 kc. New appointments: K9KTL as OO, W9RDJ as OBS and K9DHN as RM for QIN. New officers of the Tri-State College ARC are K3RQY/9, pres.; WA9DAB, vice-pres.; WA2VCM/9, secy.-treas.; K9OPO, stn. mgr. New officers of the Kokomo ARC are K9MJN, pres.; K9BJN, vice-pres.; K9SXM, secy.; W9-DKR, treas.; W9BYC, director. New officers of the Michiana ARC are K8HPO, pres.; W9CC, vice-pres.; WA9BHK, treas.; K9AJC, secy.; W9SIQ, comptroller; K9BCQ, corr-secy.; W8QBE, director. A new Tech. Class licensee in Kendallville is WA9GCA. QIN Honor Roll: W9TT, K9KTL, K9DHN, K9SGZ, WA9ELY and WA9BFB. Those making BPL: W9JOZ, W9MM, W9NZZ and W9BUQ. *Amateur radio exists as a hobby because of the service it renders.* Jan. net reports: IFN 301, ISB 3865, QIN 190, RFN 140, Hoosier V.H.F. 149, 9RN 873. Indiana represented 98 percent. Traffic: (Jan.) W9JOZ 2621, W9MM 1803, W9NZZ 585, W9ZYK 481, K9ZLB 418, K9IVG 327, W9TT 291, K9INF 280, W9BUQ 262, K9-DHN 209, W9VAY 191, K9KTL 173, W9QLW 142, K9-SGZ 119, K9RWQ 113, W9FWH 56, W9RTH 52, W9RDG 46, W9SNQ 46, WA9BFB 45, W9EJW 42, K9QJR 41, K9-CRS 40, K9ILK 39, W9PMT 39, W9IOK 34, W9CC 33, K9OXA 32, W9DGA 29, K9HYV 28, W9QYQ 27, K9-MWC 25, K9FZX 22, WA9ELY 21, K9AUI 19, W9DZC 19, K9ARW 15, K9BTZ 14, W9GFO 12, W9QWI 12, K9-BSL 11, W9AB 9, WA9BBJ 9, W9EGV 9, K9CIF 8, W9-HUF 8, W9JBQ 8, W9RE/9 8, W9CLY 7, W9ETJ 7, K9OFG 7, W9BOP 5, W9YYX 5, WA9FTO 4, W9JSV 4, K9WET 4, K9LVK 3, K9QVZ 3, K9MAN 2. (Dec.) K9-ARW 64, K9WET 33, K9YZC 20, W9AB 3.

(*Continued on page 96*)

"I have had many unsolicited compliments..."

. . . writes J. O. Baumgardner, W8BF, of his Electro-Voice Model 729 Ceramic Cardioid Microphone.

W8BF, consistently among the top-rated hams throughout the world, has a DX Century Club certificate almost covered by endorsement stamps that put his score at a hefty 299. Working successful DX phone requires a top-notch signal, and "Orrie" tells us that a good microphone is vital for good scores. *"Because of my many years of working DX on fone, I know that it is important to have audio quality that will penetrate heavy QRM and, at the same time, be smooth and pleasant to listen to."* W8BF goes on to say that, *"After running many tests with both local and DX stations, I am sure the Electro-Voice Cardioid Model 729 fills the bill very well. I have had many unsolicited compliments since using the 729."*

"Orrie" concludes by saying he, *"recommends this mike to those amateurs using VOX operation, due to its low background pickup. All in all, I think it is a very fine mike for amateur use."* W8BF is just one of many hams all over the world who are switching to Electro-Voice cardioid microphones for higher modulation, less interfering room noise and more positive VOX operation. The result is more and better contacts, even in the face of heavy QRM. The 729, with its high quality is modestly priced to fit every ham's pocketbook. We suggest that you follow W8BF's lead and try an Electro-Voice Model 729 Ceramic Cardioid on your rig today.

TECHNICALLY SPEAKING: Model 729 Ceramic Cardioid uses sound entrances to both sides of diaphragm to provide uniform cardioid pickup pattern at all speech frequencies. Cardioid pattern reduces random noise pickup by 67% over non-directional types, permits greater working distance. Placing monitor speaker at rear of 729 allows higher listening levels without triggering VOX circuits. Smooth response from 60 to 8,000 cps is free from peaks for natural voice reproduction. Peak-free response also means maximum modulation levels. Rugged ceramic element is unaffected by heat, humidity or rough handling . . . ideal for mobile or fixed station operation. Slip-in stand mount, table stand provided. Available with relay-control switch.

Model 729 ..... Amateur Net Price: $14.70
Model 729SR (with relay-control switch)
..... Amateur Net Price: $15.90

Electro-Voice®

Commercial Products Division
ELECTRO-VOICE, INC.
Dept. 432Q, Buchanan, Michigan

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC: SEC: W9BCC. PAMs: W9SAA, W9NGT and W9NRP. RM: W9VHP. Nets: WIN on 3535 kc. daily at 0045 GMT (new time), WSBN on 3985 kc. daily at 2315 GMT, BEN on 3950 kc. at 2400 GMT daily. New appointees: W9JOT and K9YGR as OESs, WA9UEA as Winnebago County EC, K9IMR as OPS. Renewed appointments: W9FXA and W9KQB as ORSs; W9NRP, W9DCK and W9GXD as ECs; W9GFL as OO; K9GDF as OPS; W9BCC as SEC. W9VSO was promoted to OO Class 1. Net traffic reports: WSBN, 309 offered and 625 cleared; BEN 284 and 166; WIN, 170 and 87. W9ONI reports there are 14 RACES members in Douglas County. W9-FBC reports WN9FMQ, WA9ACI, W9ELA and K9ELF are active on 2 meters in his area. W9EKZ has a new HB converter on 6 meters. FMT results: W9AIW 16.5 p.p.m. and K9GDF 54.2. Don't forget the Southern Wisconsin QSO Party Hamfest sponsored by the Racine Megacycle Club in Racine. For information write to Phil Neumiller, W9HAG, 1110 Summerset Drive, Racine, Wis. WA9GJH is the new call of the Nicolet High School in Milwaukee. K9CJP is busy handling traffic on the s.s.b. nets. W9RQM still is chasing DX. W9YT used a 160-meter balloon-held vertical and lost it when the wire broke. W9IDYG made the BPL. Traffic: (Jan.) W9IDYG 580, W9SAA 342, W9CXY 246, K9IMR 166, W9VHP 62, K9GSC 60, K9BLN 46, W9HPC 26, W9AOW 24, W9NRP 24, W9WVM 21, K9GDF 16, W9KQB 14, W9OTL 14, W9-LFK 12, W9CBE 10, W9MWQ 9, K9CUT 7, W9WJH 7, K9FPM 6, W9UEB 6, WA9AOI 5, W9ONI 4, W9RQM 4, W9FSP 3, W9SOA 2, W9VIK 1. (Dec.) W9FSP 2118, W9-NHE 84, K9CUT 15, W9ITW 8, K9BOJ 3.

DAKOTA DIVISION

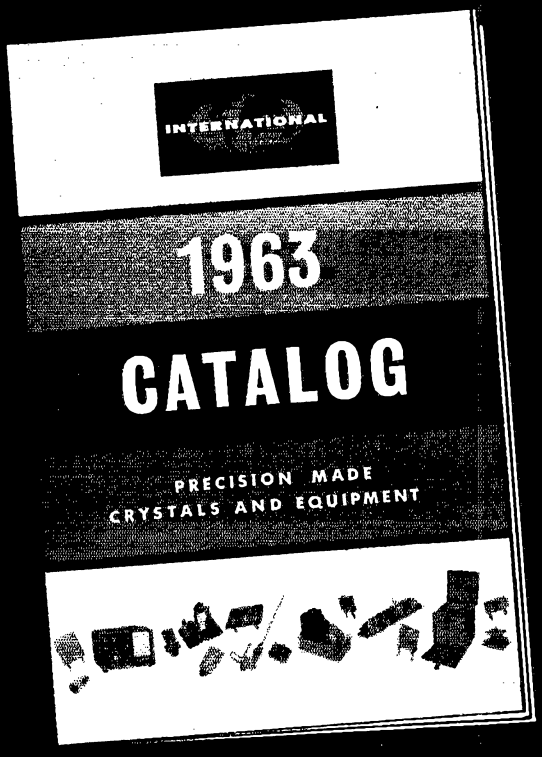
NORTH DAKOTA—SCM, Harold A. Wengel, WØ-HVA—SEC: WØCAQ. PAM: KØTYY. KØQWY has asked to have his appointment as RM cancelled because he is unable to do a good job on account of his school work. The North Dakota 75-Meter Phone Net reports: For December 25 sessions with 498 check-ins, 55 formal messages handled and 46 intormal with 9 relays. For January 21 sessions with 486 check-ins, 27 formal messages handled and 56 informal with 11 relays. The MARA held its second annual banquet Jan. 5, which was attended by about 25 hams and their guests. The MARA is co-sponsoring a series of four IGY films with the Minot Teachers College Beta Gamma Phi Science Club. The first film was shown Jan. 28. Three new appointments were made in January; one OES, one OO and one OPS. Traffic: (Jan.) KØITP 100, WØYCL 24, KØFOP 14, WAØAYL 13, KØFRP 10, WØCAQ 6, WØ-DNJ 4, KØGGL 4, WØBHF 2, WØBHT 1. (Dec.) KØ-ITP 169, WØYCL 66, KØFOP 4.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: WØSCT. Ex-WØADJ is now K7VRW, Missoula, Mont. New Calls: WNØEUW, Scotland; WNØESJ and WNØETM, Scotland, WAØCXA and OM, WNØCXB, have purchased an HT-37. The Sioux Falls ARC and the Radio Researchers Club, Brookings, conducted auctions during January. KØWJT reports he received a Ford Falcon as a combination Christmas and graduation gift. Traffic: WØZWL 722, WØSCT 378, WØDVB 137, WAØAOY 132, KØAIE 57, KØVYY 33, WØOFP 30, KØCXL 19, KØZBJ 18, KØTFJ 16, KØGSY 15, KØ-TXW 14, KØBSW 8, WØDIY 8, KØHQD 7, KØJGM 6, WØIGG 4, WØQDU 4, KØTNM 4, WØYVF 4, KØZTV 4, WAØCKH 2, WØCMJ 2.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles Marsh, WØALW. SEC: KØKKQ. RMs: KØUXQ and KØIZD. PAMs: WØGCR, KØEPT and for MSSB WØHEN. To Helen, WØOPX, most sincere and hearty congratulations with best wishes and good luck as our new Section Communications Manager! This is my 48th and last appearance as your SCM. I wish to thank each of you with all my heart for your splendid cooperation the past four years. Yes, a big thanks to all the past and the present League Officials, Our Division Director, Asst. SCMs, the SECs, PAMs, RMs, OOs, OBSs, OESs, OPSs and ORSs, all the AREC members, net members and NCSs, DXers, Novices, rag-chewers and contest operators, all who have served eloquently and devotedly to improve our section as a whole. It was you, your organized clubs and groups who made it possible for me to carry on my duties as SCM. I have great pride and admiration for all of you. May you continue to support equally generously our new SCM and the League in the future. Thank you and it has been a pleasure and an experience to have served you as Section Communications Manager! Your news items have been and will be directed to WØOPX. You do likewise. 73. Traffic: (Jan.) WAØBYO 145, WØKJZ 113, KØGCJ 91, WØHEN 86, WØATO 81, KØTHD 79, WØOPX 71, WØ-RTQ 69, WØTHY 60, WØWMA 52, KØQBI 50, KØGKU 40, WØGCR 37, KØZKK 34, WØUMX 31, WØVXO 27, WØYC 25, WØKLG 24, KØICG 21, WAØABU 19, KØ-VPJ 16, KØIJU 12, WAØARA 7, KØFLT 6, WØBUO 5,

(Continued on page 98)

FREE 1963 INTERNATIONAL CATALOG



. . . your buying guide for precision radio crystals and quality electronic equipment . . .

- Transmitters
- Amateur Crystals
- Citizens Band Crystals
- Citizens Band Transceivers
- Converters
- Transistor Subassemblies
- Converters
- Power Supplies
- Antennas
- Oscillators

AMATEURS • EXPERIMENTERS • CITIZENS LICENSEES

Mail coupon today for your FREE copy of International's 1963 catalog.

INTERNATIONAL CRYSTAL MFG. CO., INC.

18 NORTH LEE • OKLAHOMA CITY, OKLAHOMA

International Crystal Mfg. Co., Inc. QST
18 North Lee, Oklahoma City, Okla.
Rush FREE 1963 Catalog.

Name_____
Please Print

Address_____

City_____ Zone____ State_____

WAØCAI 5, KØLWK 4, WAØACI 3, KØCNI 2, WØURQ 1. (Dec.) WØYC 39.

DELTA DIVISION

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO — K5VJT and K5PGV had their OPS and ORS appointments renewed for another year. The Calcasieu ARC is planning a fish fry and get-together at Lake Charles on May 5. The Catahoula ARC Hamfest will be held in August. W5EBK is a proud papa again. K5QXV made the BPL again. W5AJY is helping Bolton High School in Alexandria as adult sponsor to reorganizing the club. K5CDC is sporting a new HT-41 and ordered a 75-meter Swan. K5KTV must be awfully busy with that new gear at the Hospital. W5VSU has been busy giving tests to new hams. K5QNK has been chasing DX and soon will have 4 811As for his HT-37. K5ELM is now s.s.b. with a 20A and a linear. K5TNS is enjoying his new HT-37 after a 12-month layoff. New officers of the Jefferson ARC are W5JKH, pres.; W5EBK, vice-pres.; WA5BAN, secy.; K5HEK, treas.; W5MXQ, K5AGJ and K5IXD, members of the board. K5FQN has been doing a bang-up job handling the Delta 75 net on 3905 kc, Sun. mornings. W5HHA is on phone. W5CEZ finished his modulator and power supply for his 6N2 so he is back on 6 meters. Congrats to W5CME, who won the RTTY contest in the U.S.A. Congrats, also to K5UYL on his 35-w.p.m. Certificate. W5JGJV had power supply trouble that kept him off the air but got his 144 and 220 Mc. rigs working A-3. K5KQG is active on the Delta S.S.B. Net. K5TJG is trying his hand at frequency measuring. Caravan Club officers for 1963 are W5KQS, caravan master; W5JHV, asst.; K5WWR, secy.; K5MKE, treas.; K5KDQ, Program Director; WA5BQB, asst.; W5PJS, News Reporter, Traffic: K5QXV 914, W5CEZ 261, W5MXQ 86, K5CEC 40, W5AJY 30, K5CZV 20, K5TJG 15, K5KQG 9, W5EA 8, K5KTV 7, K5VJT 7, K5FYI 6, W5CME 4, W5HHA 4, K5FQN 2, K5MOJ 2.

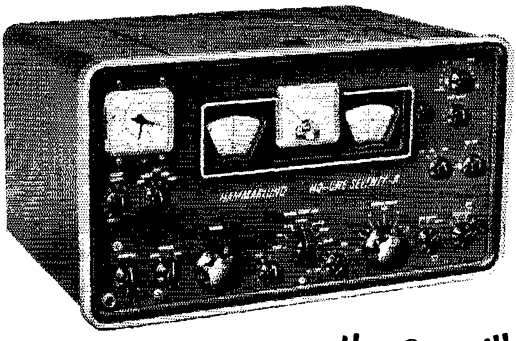
MISSISSIPPI—SCM, S. H. Hairston, W5EMM—SEC: K5SQS. The Tombigbee ARC, WA5DGO, pres.; and Corinth hold weekly c.w. theory classes. W5AWP, K5GAD and K5WSY/5 worked fixed/mobile to collect donations for teens against polio. Jan. CD Party: W4CJD/5 scored 108 QSOs in 53 sections, total 28,620; K5MDX had 125 QSOs in 46 sections, total 28,750. Congrats to WA5BNH on his 75-meter s.s.b. DX. W5MUG and I enjoyed presenting the new charter to the Keesler ARC, which is booming. W5CUU is going great guns on RTTY. WA5BHZ is operating c.w. from Carthage. New amateurs: WA5EKV, K4WGX/5, WN5BHV, WN5FEL and WN5EZS. The Natchez Club now owns 23 GE complete mobile rigs monitoring the frequency in case of emergency. RM W5JDF says to check in on the new Miss. C.W. Net 3760 kc. 6:45 P.M. CST M-F, 1:45 P.M. CST Sun. New appointment K5KSK as OPS and ORS. Mississippi Net traffic: 39. Traffic: W5JDF 146, W5MUG 57, K5SQS 44, K5YTA 27, W4CJD/5 24, K5KSK 23, K5IHQ 16, K5GVV 13, W5WZ 13, W5CKY 9, WA5BNH 8, K5DGL 8, K5PPI 8, K5QXH 7, K5VVM 5, W5AMZ 4, K5WSY 4.

TENNESSEE—SCM, David C. Goggio, W4OGG—SEC: W4WBK. RMs: W4OQG and K4AKP. PAMs: W4LLJ and K4WWQ. New appointments: W4PHW as OBS; W4CVG as OPS; W4LOJ, K4SHY and WA4IRX as OESs. Officers of the newly-affiliated Radio Amateur Transmitting Society of Nashville are W4WHN, pres.; WA4CBK, vice-pres.; K4LGW, secy.; K4OKW, treas. New officers of the reorganized Nashville Amateur Radio Club are K4MVF, pres.; K4UES, vice-pres.; W4KAT, secy.; K4IAW, treas. Net reports for Jan., 1963:

	Net	*Freq*	*Time*	*Days*	*Sessions*	*QTC*	*QNI*	*Average*
TN		3635	1900C	M-S	27	91	220	8
TSSN		3980	1830C	M-S	27	106	813	30
ETPN		3980	0640E	M-F	26	17	459	18

K4AKP reports a fine increase in RN5 traffic and representation for December with Tennessee ranking first. Bristol EC K4ILW reports new club officers are W4UJH, pres.; K4ITV, vice-pres. The Bristol Club meets the 1st and 3rd Fri. of the month. Amateur radio in Tennessee suffered a great loss with the passing of W4PL. Ben was dean of all traffic men in the U.S. and was near the top of the all-time traffic handlers. New officers of the RAC of Knoxville are K4QHB, pres.; K4DXV, vice-pres.; K4VZI, secy.-treas. Congratulations to the Maury ARC on obtaining ARRL affiliation, reported by W4GGM, secretary. New officers of the Mid-South V.H.F. Assn. are W4YEL, pres.; W4SLC, vice-pres.; W4ZNV secy.; and WA4IRX, treas. New officers of the Crossville ARC are W4WBY, pres.; K4VMO, vice-pres.; WA4IUZ, secy.-treas. Net Mgr. WA4BDW invites any Novice interested in learning net procedure to check in the Alabama Novice Net which meets daily except Sun. at 4 P.M. CST on 3725 kc. LO Party freqs. suggested by Delta Director: 3925 kc., 5 P.M. Sat.; 3810 kc. 9 A.M.

(*Continued on page 100*)

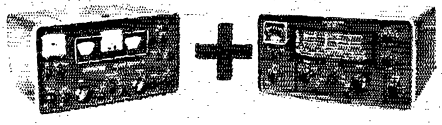


RED HOT and ready!

the Scintillating Single Sideband SPECIALIST

HAMMARLUND'S NEW HQ-170A

TRY THIS COMBO



Take one Hammarlund HQ-170A

Hammarlund's "Fabulous '50"—the new, compact, crystal lattice filter-type SSB transmitter.

= THE BEST AMATEUR RADIO STATION MONEY CAN BUY!

Fill-in the attached coupon and let us send you complete technical data on this revolutionary new equipment.

We did more than add a letter to the famous HQ-170: we added

- ★ Significantly improved electrical and mechanical stability.
- ★ Silicon rectifiers—for cool, high efficiency operation.
- ★ 144 to 148 mc dial scale for 2 meter converter use.
- ★ Accessory power supply socket for converters, etc.
- ★ Separate system socket for convenient transmitter/receiver control.
- ★ "Flip-open" top for greater convenience.

It wasn't easy. We set out to improve the receiver recently voted FIRST IN ITS CLASS. The one and only amateur band receiver that offers so much for SSB and AM/MCW. Full coverage of 8, 10, 15, 20, 40, 80, and 160 meter bands—plus 2 meter calibration for converter use. Triple conversion with fixed IF frequencies provide optimum spurious response rejection.

HAMMARLUND Manufacturing Company —Dept. Q-4
A Giannini Scientific Company
53 West 23rd Street, N. Y. 10, N. Y.

Please send me brochures on:

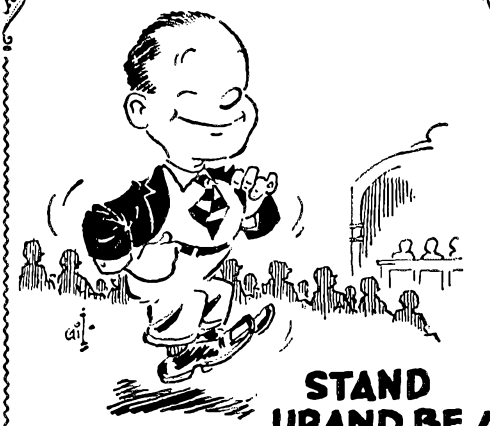
☐ HX-50 $449.50 ☐ HQ-170A $369.00*
(*24 hour clock-timer $10 optional)

NAME_____

ADDRESS_____

_____

CONTROL RADIO EQUIPMENT
COMMERCIAL COMMUNICATIONS EQUIPMENT
INTERCOM 2-WAY RADIO
VARIABLE AIR CAPACITORS
SUPERVISORY REMOTE CONTROL SYSTEMS



STAND UP AND BE COUNTED!

CONGRESS is certainly in the news these days—haggles, wrangles, debates, and good honest work, too—with its efforts to provide for the general good of the country.

OUR own "congress," the Board of Directors, will be meeting next month, too. With much less fanfare and considerably greater efficiency, they, too, will try to accomplish what needs to be done for the League and all amateurs.

YOUR Director will be there, representing the amateurs of your division. Naturally, the wishes of his constituents will be important to him in making decisions on amateur affairs.

AND say—if you've been putting off applying for membership, do it now. Stand up and be counted as a "citizen" of our democracy-within-a-democracy. Dues, including QST subscription, are **$5** in the U. S. and possessions, **$5.25** in Canada, and **$6** elsewhere.

THE AMERICAN RADIO RELAY LEAGUE
WEST HARTFORD 7, CONNECTICUT

Sun. and 7120 kc. 1 P.M. Sun. The SEC, PAMs and ECs are invited to meet W5MUG. Charter members of the Certificate Hunters Club in the state are K4JIG, K4RIN and W4YMG. Anyone wanting information write K4JIG, 761 University, Memphis. Bill also is custodian for the Worked All Tennessee Counties Award. Frye ARC announces the Chattanooga CHOO CHEW Party will be held Aug. 4 through Aug. 10. All ECs: The second state S.E.T. will be held Mar. 15-30. The MARA announces a homebrew contest, hamfest chairman K4EQK and K4QWV winner of the transmitter hunt trophy the second year in a row. Since there was little response to the SCM's proposed amateur award and QSO Party, these activites will not be held this year. Traffic: (Jan.) K4AKP 1119, W4ZJY 335, WA4AVX 239, W4OGG 168, K4WWQ 105, W4PQP 102, W4KAT 65, W4OQG 59, W4MXF 57, K4AQA 51, K4JXG 38, W4RMJ 31, W4TZG 28, K4OUK 25, W4ODR 24, W7WST/4 19, WA4BUP 14, K4LPW 14, W4LLJ 13, W4CVG 12, WA4AIS 11, W4PHW 10, WA4CRH 8, W4HPN 8, W4WUG 8, K4EJQ 7, K4LTA 7, WA4GAX 6, WA4MCC 6, W4WRK 6, K4CPC 5, W4FLW 5, W4DTI 4, W4CZE 2, K4IBZ 2, K4NRV 2, K4PYH 2, K4ZUO 2, K4WUH 1. (Dec.) K4EJQ 38. (Nov.) K4AKP 1009.

GREAT LAKES DIVISION

KENTUCKY—SCM, Elmer G. Leachman, W4BEW—SEC: W4TFK. PAMs: W4SZB, K4ECJ, V.H.F, PAM: K4LOA. RM: W4CDA. Asst. RM: K4NYO. Welcome to the Capitol Amateur Radio Society, just organized in Frankfort with K4HOE, pres.; K4MMB, vice-pres.; K4HGX, secy.; W4TFK, treas. Recently appointed ECs, W4NDY at Winchester and K4QHZ at Morehead, have organized local 10-meter emergency nets. Kentucky now has six nets going regularly—KYN on c.w. daily (3600), Early Morning Phone Net (3960), Morning Phone Net (3960), Evening Phone Net (3960), Maysville Traffic Net (c.w.) and the Korn-Krackers (morning daily, 3932) with call-ins approaching 100 stations. KYN held 39 sessions in January with a traffic count of 215. For the same period MKPN and EMKPN held 57 sessions with 846 check-ins. K4LOA, of 6-meter fame, wants more c.w. stations and skeds with all parts of Kentucky. W4USE was in a Fall-Out Shelter experiment in Louisville in which 13 operators were used. K4HSB made DXCC, 109 countries, and comes up with BPL, his 3rd in a row. WA4ELB also made BPL. W4NDY, our Winchester EC is recovering nicely after a serious auto accident. ECs, please report to your SEC, as requested in a recent bulletin. A Novice net is in the making. Please contact W4TRO, W4CDA, W4BAZ or W4BEW. Traffic: K4HSB 549, WA4ELB 510, K4WJI 345, K4KWQ 214, K4QIO 102, W4CDA 97, K4HOE 48, W4SZB 42, W4YYI 37, WA4APU 35, K4NIO 31, WA4GCL 30, W4REW 23, K4VDO 16, K4LOA 15, W4USE 15, W4KJP 14, WA4GFN 13, WA4CQG 9, K4VHJ 8, K4QHZ 3.

MICHIGAN—SCM, Robert P. Thetreau, W8FX—SEC: W8LOX. RMs: W8EGI, W8IXJ, W8FWQ, K8KMQ. PAMs: W8CQU, K8LQA. V.H.F, PAM: W8PT. Appointments: W8CKK, W8DTZ, K8IGQ, W8IUC and K8PVC as ECs. W8SWF as OBS. K8BGZ, WA8BYL, WA8CEJ and K8IFL as OESs. K8EPZ, K8PSV and W8SWF as OPSs. W8HKT, K8IRC, W8IXJ, K8NHC, W8QQO and W8WXO as ORS. The following code classes are under way: W8CAM (QCWA) Mon. through Fri. 7 to 7:30 P.M. 1804.5 kc. Kalamazoo ARC at Portage Hi School. Grand Rapids ARA at Red Cross Bldg. Genesee County (Flint) RC, by W8RTN and W8RUV. Central Michigan (Lansing) ARC at Michigan School for the Blind. Thurs. at 7:30 P.M. music bldg. All clubs are urged to make their "Techs" become General by starting code classes. New officers—Kalamazoo ARC: W8EMD, pres.; K8AJD, vice-pres.; K8CTQ, secy.-treas. Franklin Hi (Livonia) RC: WA8DDI, pres.; WA8CEJ, vice-pres. The Metro Rag Chewers Club Net meets Wed. at 0200 on 50.25 Mc., Saginaw Valley ARA Net Wed. at 0100 on 29610 kc. Central Michigan ARC Net (Lansing) Sun. at 1500 on 29 Mc. Michigan Nite Owl Net Sun. at 0200 on 50.4 Mc., Lansing 2-Meter Net Tue. at 0100 on 145.13 Mc. General Motors ARC has the following nets: 3970 at 1300 Sun.; 7220 at 1300 Sat.; 14,290 at 2100 Wed.; 28,700 at 2030 Fri.; 50.250 at 2230, Mon. The Catalpa ARS Net meets on 28,880 kc. Sun. at 1430. During Dec. and Jan., W8PT had a daily except Sun. sked with K4IXC, Fla., on 144,085 c.w. at 1110Z, which never failed! The Michigan 6-Meter Club is sponsoring the annual 50-54-Mc. contest, April 20-21, all modes. Out-of-state hams are eligible for a contest certificate. BPLers: K8FDV, W8EOI, K8GOU, W8DSW got his 25-w.p.m. sticker. WA8HAU (ex-K8YZP) wants Detroit and Adrian skeds on 160 meters. K8RDE makes DXCC. K8KQV is taking E.E. at Ypsi. W8YY, Mich. Tech., is running a kw. K8NHC is at W.M.U. W8HKT gave a good talk on s.s.b. at the Genesee County RC. The Grand Rapids Convention will be held Apr. 6 at the Pantlind Hotel.

(Continued on page 102)

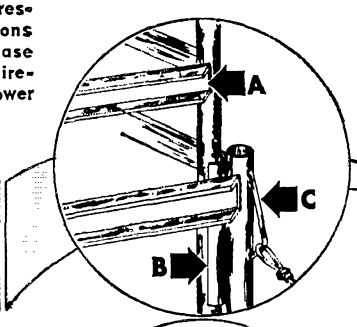
MOSLEY TOWERMASTER

Mosley, *the top name in beam manufacture,* **now has a complete line of quality Built towers designed to fit every need, application and requirement.**

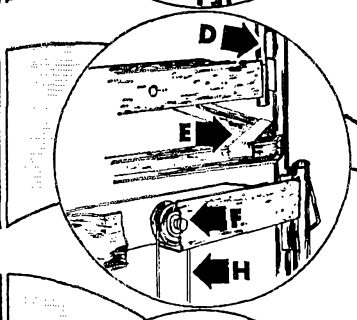
Mosley Towers are designed for 30 pound wind pressure areas in which full engineering calculations and specifications are available with the purchase of a tower to meet and exceed building code requirements in areas requiring special permits for tower installation.

Features

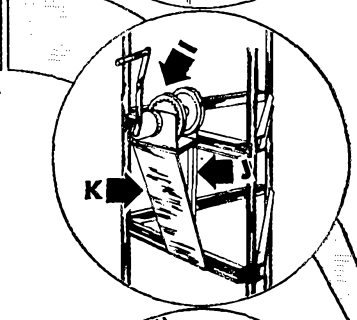
A - Heavy Duty Steel Channel Bracing Members - *Conforms to ASTM standard for structural members.*
B - Low Friction Section Guides.
C - Vertical Guy Attachment Loops.



D - Welded Section Stops.
E - Heavy Duty Safety Clips.
F - Metal Ball Bearing Pulley Sheaves.
G - All Welded Construction (*done by certified personnel under strict inspection and manufacturing controls*).
H - Galvanized Aircraft Type Raising Cables.



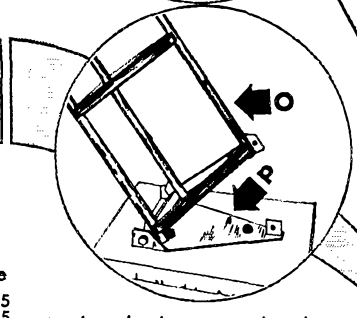
I - Geared Crank-up Winch and Safety Lock.
J - Extra Reinforcing Spreader.
K - Heavy Steel Winch Frame.



features not illustrated

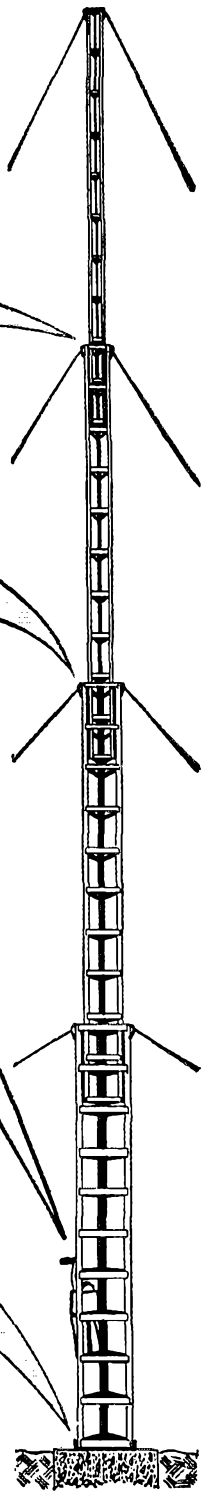
L - Predrilled Rotor Mounting Plate with series 300 will accept CDR type rotor - series 400, 500, 650, 700, 750 will accept either CDR or Prop-Pitch types.
M - 2 inch I. D. Mast Sleeves.
N - Iron Phosphate Rust-proof Undercoating plus a Tough Triple Coat Epoxy Resin Finish - *Galvanized series are also available at only a slightly higher cost.*

O - All Tubular Leg Members of High Strength Mechanical Steel Tubing - *Conforming to the Formed Steel Institute standards.*
P Heavy Duty Steel Hinged Base Plate.



The Mosley "*Towermaster*" design is available in a complete tower package unit which includes all Guy Cables and Cable Clips, Guy Plates, Thimbles, Guy Anchors and Extension Mast.

Mosley No.	Height ft.	Weight lbs.	Price
CTL-40237	37	165	$144.95
CTL-40354	54	275	199.95
CTL-40471	71	395	274.95
CTL-50237	37	210	179.95
CTL-50354	54	320	245.95
CTL-50471	71	460	346.95
CTL-50588	88	620	476.95
CTL-506105	105	890	784.95
CTL-30237	37	145	99.95
CTL-30354	54	220	159.95
CTL-30471	71	290	229.95
CTL-30588	88	390	319.95



Mosley also has a complete line of SELF SUPPORTING TOWERS

MOSLEY Electronics, Inc
4610 North Lindbergh Blvd.
Bridgeton, Missouri

Thirty-one hams of the Central Michigan ARC AREC took care of Ingham County "March of Dimes" communications. W8JYU and W8MZI are Silent Keys. Traffic: (Jan.) K8FDV 734, W8EOI 334, K8GOU 265, W8ELW 168, K8KMQ 135, K8NJW 126, W8DSW 100, K8JJC 93, W8IBB 89, WA8ENO 73, W8FX 52, W8FWQ 46, W8EGI 45, K8HLR 44, K8PYW 44, W8EU 42, K8WQV 38, W8USZ 35, W8BEZ 34, W8HKT 33, K8QLL 33, W8RTN 32, WA8ASV 31, W8QFO 27, W8IXJ 23, WA8HAU 22, K8TFE 18, K8VDA 18, W8SWF 17, K8JED 16, K8TJH 14, WA8ASK 12, W8ZLK 10, W8TBP 9, K8YAY 9, W8AHV 8, K8WWM 8, W8ZHB 8, W8AUD 4, K8GJD 4, K8KQV 4, W8UFS 4, W8DSE 2, W8DVB 2, W8PGW 2, K8YVV 2. (Dec.) K8TIG 84, K8YAY 24, W8EGI 18, W8TBP 11, W8ZLK 6.

ELEVENTH OHIO QSO PARTY

April 6-7, 1963

All Ohio amateurs are invited to take part in a QSO party, sponsored by the Ohio Council of Amateur Radio Clubs.

Rules: 1) The party will begin at 2300 GMT Saturday April 6 and end at 2300 GMT April 7. 2) All types of emission and all bands may be used, but a station may be worked only once regardless of mode. A maximum of ten stations may be worked in a single county. 3) The general call will be "CQ Ohio." 4) *Scoring:* Multiply the number of Ohio stations worked by the number of Ohio counties contacted. Logs should include calls of stations worked, time, date and the county in which the station is located. 5) Suggested frequencies are: 3550, 3740, 3860, 7100 and 7250 kc. On the other bands, take your choice. 6) A cup and four appropriate certificates will be awarded to the highest scoring stations. 7) All contest logs must be postmarked not later than May 6, 1963, and should be sent to the contest manager, Mr. Marvel Sines, W8HUX, 3325 Brock Drive, Toledo 13, Ohio.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM, J. C. Erickson, W8DAE. SEC: W8HNP. RMs: W8BZX, W8DAE, W8VTP and K8ONQ. PAMs: W8VZ, K8BAP and K8UBK. *Attention all Ohio amateurs:* the Eleventh Annual Ohio QSO Party will be held Apr. 6 and 7 and again we have a chance to get the counties we need for the Worked All Ohio Counties certificate, of which only 11 have been issued. Clubs, request your members to get into this contest, particularly those in the counties with only a few stations. K8ITH/8 again is going into a number of rare counties, namely, Monroe on the 5th, Meigs, Gallia and Vinton on the 6th; Highland, Brown, Fayette, Delaware and Morrow on the 7th. He will be on suggested frequencies and on 3575, 7030 and 14,075 kc. Ex-8RJ is a Silent Key. Mark down the dates Apr. 26 and 27 for the Dayton Hamvention. Canton ARC's *Feedline* has a picture of the club's station on the cover page with its new Gonset G-28 transceiver with v.f.o., a Gonset GSB-101 linear and Ham-M rotator; then it states that W8LCA put on a demonstration involving the determination of noise figures in converters; WN8GMX and GMY are new hams in Massillon; WA8ABC was in the hospital following an appendectomy; K8KTM is going s.s.b.; W8HR completed the building of an HBR-16 and W8NAL is going s.s.b. with an HT-37. The Seneca RC saw a film, *Tools that Shaped America*, and heard W8IJL and W8POH speak on shack wiring. Greater Cincinnati ARA's *The Mike and Key* informs us a film was shown, *Important Role that a Quartz Crystal Plays in Present-Day Communication*, and the U. of Cincinnati RA's 1963 officers are W8FNI, trustee; W8SBD, chairman; K8RHZ vice-chairman, K8HGI and K0ECF, secy. W8YX is the club station. Dayton ARA's *R-F Carrier* tells us the club may hold meetings once a month instead of bi-weekly; K8WPF has a new baby boy; W8ENH received his WAS and K8ERD is in the hospital. Toledo's *Ham Shack Gossip* names W8JR and K8KOM as its Hams of the Month; K8YOO and K8YON motored to Florida. W8DQR has a new baby boy and K8AKR was in the hospital following an operation. Findlay RC's *WSFT News* reports its 1963 officers are W8UN, pres.; W8OMN, secy. Springfield ARA saw the Ohio Bell color-sound film on Telstar, held its annual club bowling tournament and K8WQE gave a talk with slides on *Television Interference Suppression on Our Own TV Set*. The Six-Meter Nomads' *The Amateur Extra* tells us its 1963 officers are K8SEV, pres.; K8VIE, sr. vice-pres.; WA8ADD, jr. vice-pres.; K8VIL, secy.; K8VGF, treas. The Lake-Geauga ARC's 1963 officers are W8LAG, pres.; K8CQY, vice-pres.;

(*Continued on page 104*)

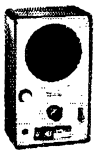
your choice of 2 GREAT EICO® TRANSMITTERS...

designed by Hams... for Hams...

to the highest Ham standards

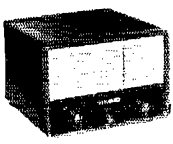
90-WATT CW TRANSMITTER* #720
Kit **$89.95** Wired **$129.95**
*U.S. Pat.
"Top quality"—ELECTRONIC KITS GUIDE
Ideal for veteran or novice. "Clean" 90W CW, 65W AM-phone with EXT plate modulation. 80 through 10 meters.

60-WATT CW TRANSMITTER #723
Kit **$59.95** Wired **$89.95**
"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.

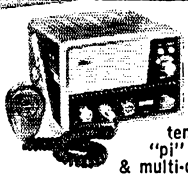


TRANSISTOR CODE PRACTICE OSCILLATOR #706
Complete with battery Select variable tone, flashing light, or both together. Phone jack for private use. Efficient speaker: clean loud signals.
Kit **$8.95** Wired **$12.95**

New!

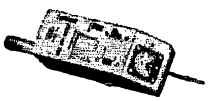


VARIABLE FREQUENCY OSCILLATOR (SELF-POWERED) #722
Approaches crystal stability. 80 through 10 meters.
Kit **$44.95**
Wired **$59.95**



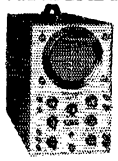
CITIZENS BAND TRANSCEIVERS U.S. Pat.
770 Series
Superhet; pre-aligned xmitter osc; match antennas by variable "pi" network. Single & multi-channel models.
From Kit **$79.95** Wired **$109.95**

HIGH-LEVEL UNIVERSAL MODULATOR-DRIVER #730
Kit **$59.95** Wired **$89.95**
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.

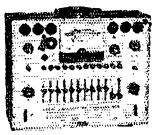


GRID DIP METER #710
Kit **$29.95** Wired **$49.95**
Includes complete set of coils for full band coverage. Continuous coverage 400 kc to 250 mc. 500 ua meter.

PEAK-TO-PEAK VTVM #232 *U.S. Pat.
& exclusive *UNI-PROBE®
Kit **$29.95**
Wired **$49.95**
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 **$28.95**
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.
☐ Send free Catalog & name of neighborhood distributor.
☐ Send free "Short Course for Novice License." ☐ Send 36-page STEREO HI-FI GUIDE: 25c enclosed for postage & handling.

QST-4
Name.....
Address.....
City..... Zone..... State.....
Add 5% in the West.

ENGINEERS: Excellent career opportunities in creative electronics design. Write to the Chief Engineer.

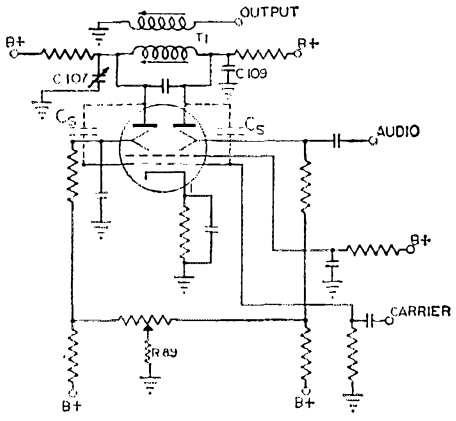
W8OED, secy.-treas. Columbus ARA's *Carascope* says WA8FBM gave pointers on how to handle printed circuit wiring techniques and W4ABD/8 is the new editor of *Carascope*. According to Queen City Emergency Net's *The Listening Post* all its nets are in good working order in case of an emergency. South East ARC's *Ham-Fax* tells us the members heard a talk on generators; WA8CCV is home from his honeymoon in Hawaii; WA8CEU is in the Coast Guard radio school and K8TSI is in Florida on vacation. Parma RC's *P.R.C. Bulletin* informs us the club held Old Timers Night. I want to thank the V.H.F. High Banders for sending me their bulletin. Suggest a name for this bulletin and send it to 795 W. Center St., Marion, Ohio. The club's 1963 officers are K8TFL, pres.; K8QBY, vice-pres.; WA8ALT, secy.; W8RRB, treas. Champaign County ARC's 1963 officers are W8SXQ, pres.; K8YRH, vice-pres.; WA8AWX, secy.-treas.; W8APY, W8HNY and W8JXM, directors. W8THJ is in Florida. Licking County RC's 1963 officers are K8QOQ, pres.; W8MRN, vice-pres.; K8EKI, secy. K8VIO is a new OBS. K8ZES is an OES. K8YUZ and W8DAE made the BPL in January. Traffic: (Jan.) K8YUZ 614, W8DAE 387, K8LGA 373, W8HZX 255, K8UBK 154, W8MGA 150, K8DIU 136, K8SQK 124, K8AGN 104, K8ONQ 77, W8KCN 60, W8ECB 44, K8VWN 42, K8JSQ 37, K8AJT 36, K8TKG 36, WA8ADB 35, K8BAP 31, K8RXD 26, WA8AJD 23, WA8CXY 20, W8IEP 19, W8AL 12, K8LGB 12, WA8BOV 9, K8UID 8, W8HNP 4, K8KLA 4, W8RYP/8 4, WA8BZR 3, K8DIH 3, K8DDB 2, K8BPE 1. (Dec.) K8TKG 57, W8QCU 24.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAM: W2IJG. Section nets: NYS on 3670 kc. nightly at 0000 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc. nightly at 2300 GMT; MHT (Novice) on 3716 kc. Sat. at 1800 GMT; Inter-club on 28,690 kc. Mon. at 0130 GMT; Emergency Coordinators on 146,550 kc. Fri. at 0015 GMT. Appointment: WA2IRK as OES. The Roosevelt H.S. Club, K2RKS, is back on the air after two years of silence. Official Observer K2DEM was real busy while home from Yale during the holidays. K2SJN reports new classes for all amateur licenses are under way at New Rochelle. A new Apache and 15-meter beam are reported by WA2JMB. WA2HGB conducts a traffic clinic (2TC) each Sun. on 3670 kc. at 2100 GMT to improve traffic techniques. New officers of the Albany Club include WA2HFT, pres.; WA2BLC, vice-pres.; K2BUF and K2KZN, secy. and treas. W2AAO and WA2HFT received the Condon Award from the Albany Club for meritorious service. W2FBS, W2ODC and K2IOW were speakers at the Schenectady Club on antennas for limited space. January was "Gimmick Nite" for members of the Albany Club. K2UTC did extremely well in the Nov. FMT. The new officers of the New Rochelle Club are WA2FCR, pres.; WA2JZA, vice-pres.; K2SJN, secy.; WA2JZE, treas. Others are W2RAE, WN2EER, WA2OBZ and WA2NRB. Congrats to WA2VYH on the birth of a son. Appointees are reminded to send in their certificates for endorsement if more than a year has elapsed. Traffic: WA2UZK 211, W2THE 208, W2PKY 96, WA2VYS 90, K2TXP 75, K2SJN 52, WA2HGB 22, WA2LJM 19, W2URP 18, W2GTC 14, K2HNW 8, W2EFU 6, W2WGE 4, WB2BEC 2, K2DEM 2, W2GTB 2, WA2MHY 2.

NEW YORK CITY AND LONG ISLAND—SCM, George V. Cooke, jr., W2OBU—SEC: K2QVN. RM: W2WFL. PAM: K2HCU. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0015Z nightly; NYCLIPN, 3908 kc. at 2230Z nightly; V.H.F. Net, Tue.-Wed.-Thurs. 145.8 Mc. at 0100Z and Fri. through Mon. on 146.25 Mc. at 0000Z; Mike Farad on 7238 kc. at 1700Z; All Service Net at 1800Z Sun. on 7270 kc.; Q5 Net on 3935 kc. at 2100Z daily. WA2GPT, W2MTA, K2UBG, W2EW, WA2JSG, WA2QJU, WA2RUE and WA2GAB are recipients of BPL certificates for traffic handled during January. WA2GPT has a new HT-37 and is getting acquainted with s.s.b. operations. K2UBG worked some traffic on 160 meters and reports difficulty in getting more than a couple of stations to get on the band. W2EW, V.H.F. PAM, reports traffic of a high quality nature and not the so-called "nuisance" type. Let all traffic men and gals in our area try to do the same. This is an amateur radio service and not just a lot of so-called "hams." WA2EXP is a new ORS appointee and is really making himself felt in traffic circles. WA2IUQ is using a new electronic keyer and also earned Twins Award-Class C Nr. 316. Stuyvesant HSRC is commemorating its 40th year, being first licensed as 2CLE in 1923. WA2CGG is expecting a harmonic in May. WA2VKK is on again, having made the grade from Novice to Technician. WA2SIV received WAHJ and WAB

(*Continued on page 106*)



QUITE a bit of material has been published concerning balanced modulators for SSB, and the 7360 sheet beam tube has been the subject of a number of articles on homebrew gear. Most of the information on this tube, however, deals with its use at frequencies of 455 KC and lower, and we think you might be interested in the technique used by National to provide a stable balanced modulator using the 7360 at the NCX-3 IF and filter frequency of 5.2003 Mc.

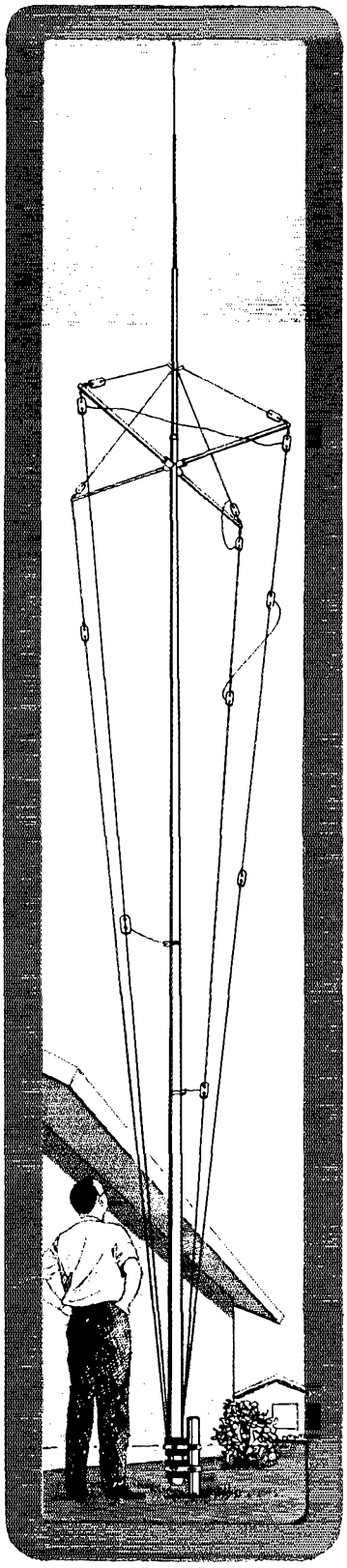
AS you will note from the circuit of the NCX-3 balanced modulator shown above, electron emission from cathode to plates of the 7360 is intensity modulated by the 5.2003 Mc. carrier signal on grid 1. In addition, the audio signal applied to one deflection electrode deflects the carrier modulated electron stream from one plate to the other at an audio rate. By adjusting the DC voltage on the deflection electrodes by means of the NCX-3 front panel Balance Control R87, it is possible to make the carrier modulated electron flow to each plate equal. When this occurs, there will be no output voltage generated across the balanced plate circuit T1 because in-phase voltages developed at opposite ends of a balanced circuit result in a net output voltage of zero. However, when audio is applied to one deflection electrode, the electron beam shifts and one plate will receive more electron current than the other, destroying the balance and generating a modulated RF voltage across the plate circuit. At this point we have a DSB suppressed carrier signal. At the usual low frequencies in which the 7360 is used, a sufficient degree of carrier balance is quite easily achieved. However, as frequency increases, minute stray capacities between grid and plate (as indicated by the dotted capacitors in the circuit diagram) will introduce signal coupling to the balanced plate circuit in addition to that provided by the electron beam. This stray coupling is usually not balanced (unfortunately) and will therefore reduce the effective suppression of the carrier. In the NCX-3 balanced modulator, trimmer C107 and capacitor C109 are incorporated from plates to ground to allow precise equalization of this stray coupling and thereby achieve maximum balance. Without this special equalization many 7360 tubes will only provide 30 db of carrier suppression at 5 Mc. The addition of C107 and C109 allows adjustment of each NCX-3 balanced modulator during factory alignment to provide carrier suppression *before filtering* of 50-60 db. The additional suppression provided by the NCX-3 crystal lattice filter assures overall suppression (even with stray coupling) of at least this order in the final transmitted signal. It's also important to note that the incorporation of these equalizing capacitors assures the NCX-3 owner of ability to duplicate original factory alignment and performance should replacement of the 7360 ever be necessary.

MIKE FERBER, W1GKX

awards. WB2AAM is looking for school traffic nets in the N.Y.C. area on 6 and 40 meters. WA2LJS received his new Navy MARS call, NØRKN. WA2IZV received his justly-earned WAS certificate. WA2JYR was an honors winner in the Westinghouse Talent Search. Project: Optical Ruby LASER. WA2OOY is the new president of the Poly Prep HRC. W2PF maintained a sked with W2KW/KV4 during a Virgin Island vacation with the KV4 station using a KWM-2 with 20-meter dipole in the hotel and worked many new countries. WA2RAQ is happy with his new push-to-talk on the Seneca and a D-104 mike. New officers of the Brooklyn College RC are WA2ZVJ, pres.; WA2MIS, vice-pres.; WN2BFF, treas.; K2IGJ, technical advisor. WA2PZM and WA2VNV are seeking contacts on v.h.f. f.m. Many locals have joined the Eastern N.Y. WBFM Net. WA2GJT started work on 3.3 and 5.6 KMC. c.w. rigs. Prospectives in the Bronx should contact W2HHE of the Bronx RC for code and theory sessions by the club. WA2OEH now is in a new QTH at Belle Harbor. WB2BKS, WA2VGM and K2GZ are leading the way on c.w. on 2 meters. WB2ASR is now on 2 and 6 meters with a Zeus and a 75A-4. There is a move to organize a Suffolk WX Net with W2JFP of the Brookhaven Labs offering to assist. Those interested, please contact Suffolk County C.D. HQ. 31 Oak St., Patchogue, N.Y. or get a message to K2BGP on 29.560 or 145.3 Mc. Despite last ditch efforts it seems certain that the area known as "Radio Row" in New York City will be demolished and become the future home of a World Trade Center. Stores in the area will have about one year more to operate. Where they will go then is purely conjecture. Nineteen new members joined the Five Towns RC at its January meeting. Traffic: (Jan.) WA2GPT 1123, W2MTA 726, K2UBG 655, W2EW 506, K2UAT 351, W2WFL 342, WA2JSG 305, WA2QJU 273, WA2EXP 243, WA2RUE 161, WA2GAB 156, K2KYS 93, K2UFT 86, WA2VLK 79, WN2EAZ 60, W2JGV 59, WA2IUQ 57, WA2RZJ 52, WA2VKK 50, K2SPG 44, K2THY 41, WA2WIH 41, WA2SIV 32, WA2IMH 28, WA2FUL 27, WA2LJS 26, WA2ZXR 25, WA2RMP 19, WA2EFN 14, WA2PUE 12, WA2GFP 10, WA2IZV 10, WA2OOY 10, WA2FRW 9, W2PF 4, WA2RAQ 3, WA2PZD 2, WA2SAZ 2, K2AHS 1. (Dec.) K2UFT 71.

NORTHERN NEW JERSEY—SCM, Daniel H. Earley, WA2APY—SEC: K2ZFI. RM: W2QNL. PAM: K2SLG. V.H.F. PAM: K2VNL. Names, times and frequencies of NNJ NTS nets: NJN, 2400Z 3695 kc. daily; NJPN, 2300Z daily except Sun. (1400Z) on 3900 kc.; NJ 6&2, Mon. Thurs. and Sun. at 0300Z on 51.15 Mc. Tue. and Sat. at 2200Z on 146.70 Mc. Sessions, attendance and traffic for Jan. NJN: 31, 506, 356. NJPN: no report. NJ 6&2: 21, 138, 72. New appointments are WN2CWG, WA2ZRR and WB2CRS as OESs. Renewals: WA2IGQ as EC; WA2SRK and WA2JHQ as ORSs; WA2JHQ as OPS; WA2IGQ as OES. W2QNL, our RM, is all excited over the terrific bulletin put out by WA2GQZ. It includes activities of NJN, NLI, 2RN and EAN and is a beautiful printing job and is well written. WA2APT has been busy with his science project for school, a radio telescope. WA2PBN has been issued WB2EPF to operate from school and expects to have a Clegg Thor VI on 6 meters. W2BVE is working at USA-CA now. K2AGJ says she never tires of 20-meter DX. Flowers to W2NIY for telling the truth, it's too cold in the basement shack to operate. W2NIY also has received the HTH-100 certificate. W2CVW has completed QSL No. 18,000. K2PVH is building a parabolic for receiving Oscar III on 2 meters. K2NKD still is on 80 and 40 meters. K2UKQ has gotten her antenna up again but the problem is solved. She's moving to an apartment in the city. WA2OQP won the Oct. Phone CD Contest. WA2ZKT has a new Heath v.f.o. and finally got the 15-meter dipole up. K2UCY has been made NCS of the NYCLI 2-Meter Net. W2OXL and W2VMX both report sickness. Hope they're feeling better. WA2OVK has problems with weak tubes and bad antennas. WA2KIY reports that W2SYU is back from the Army. W2BBR is using an AF-68. W2GVV is doing fine running the Three Minute Net (Mon. at 2430.) WA2KIY is going to try for CP-20. Received an interesting letter from W2JAE, OO who reports of the shock experienced by some fellows when told that their expensive commercially-built exciters have key clix. W2JAE says he has had three "over $500" type exciters and two of them clixed before modification. The Garden State Amateur Radio Association meets in the Red Cross Building, Route 35, Shrewsbury, N.J. The club has a terrific lineup of activities to spark the club to life and the members are sure that everyone will find something that will interest him. Traffic: K2UCY 506, WA2SRK 367, K2VNL 283, WA2CCF 183, W2QNL 112, K2SBS 94, W2CVW 77, WA2GQZ 72, WA2JTZ 50, WA2ZRR 50, WA2WSB 41, WA2LUD 39, W2FNX 32, W2TFN 28, WA2APV 25, K2PVH 19, K2SLG 19, W2BVE 16, K2EQP 16, K2VNK 15, K2JTU 14, WA2APT 13, W2DRV 13,

(Continued on page 108)



hy-gain
scores another major
BREAKTHROUGH!

The sensational NEW
HY-TOWER JUNIOR
for 80 thru 10 meters

• TRAPLESS CONSTRUCTION • AUTOMATIC BAND SWITCHING
• MOUNTS ON 4 Sq. Ft. of REAL ESTATE • MODESTLY PRICED

It all started the day Hy-Gain startled the industry by announcing the incomparable Hy-Tower – still acknowledged by experts as the epitome in vertical antenna systems. Now, today, for those thousands of Hams who requested it... Hy-Gain offers the new low-cost Hy-Tower Junior.

As its name would imply, the Hy-Tower Junior doesn't completely measure up to the Hy-Tower... probably nothing ever will. However, the Hy-Tower Junior is one sensational all band vertical in its own right. It's trapless – It has Hy-Gain's unique stub decoupling system for automatic band switching – It's lightweight (one man can install) – It's broad band (250 KC band pass on 75M) – It ground mounts on 1⅝" steel pipe – Its SWR is less than 2:1 at resonance on all bands – It's fed with 52 ohm coax – Its overall height is 36½ ft. phone; 38 ft. C.W. – It's modestly priced. All in all, the few Hams who have seen it say: It's the greatest advance in all band antennas since the Hy-Tower. See it today.

HY-TOWER JUNIOR MODEL 18JR $79.95

Electrical Specifications:

Frequency Range ..... 80 thru 10M (160 with Loading Coil Accessory)
Maximum Power 1kw, AM; 2kw PEP
Polarization ..... Vertical
Pattern ..... Omni-Directional
Gain ..... Unity
Impedance ..... 50 ohms nominal
SWR .. Less than 2:1 at resonance
Band Pass .. 10-15-20-40M, below 2:1 SWR; 250kc below 2:1 75/80M
Multi-Band Technique ..... Stub Decoupling
Ground Plane Req. . Copper Plated 6' Ground Rod (not supplied)

Mechanical Specifications:

Max. Wind Survival .. 40 MPH Self Supporting (100 MPH Guyed)
Construction ..... 2" to 7/16" Aluminum 6063 T832 Alloy
Wire Elements ..... 7-24 Copper Clad Steel
Insulators ..... Ceramic and Injection Molded Plastic
Overall Height ..... 36'6" Phone; 38' CW
Net Weight ..... 30 lbs.
Mounting Requirements .... 1½ to 2 inch Steel Pipe – Ground Mount (not supplied)

Available now from your favorite HY-GAIN distributor

hy-gain ANTENNA PRODUCTS
8403 N.E. Highway 6, Lincoln, Nebraska

WA2OVK 11, WA2ZQH 11, K2AGJ 8, W2BVE 7, WA2PPX 7, W2ONL 6, WA2PBN 5, WA2KIY 4, WA2UOO 4, WA2ZKT 4, W2NKD 3, W2ABL 2, W2EWZ 1.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WØNTB—SEC: KØEXN a new appointee is KØIDX as Bremer Co. EC. Please note that you have about ten days to nominate your choice for SCM for the next two years. See Election Notice this issue for instructions. Our Director, WØNWX, reports working Gs and VPs too numerous to mention on 160 meters. WØVXO reports the same. After reading p. 9 of Feb. QST, and p. 10 in March, get busy and let Headquarters know what you are thinking. My opinion for what it is worth is that the present system for licensing should be modified to make a higher class license expected of amateurs after they have benefited from one five-year term. Of course, exceptions should be possible in hardship cases. Tallcorn: QNI 184, QTC 75, sessions 23, new members WØCQL, KØHG, WØMCI. 21 actives. 160-Meter Phone Net: QNI 992, QTC 31, sessions 31. Hamilton County 160-Meter Net: QNI 119, QTC 10, sessions 31. 75-Meter Phone Net: QNI 1202 QTC 102, sessions 26. New officers of the NEIARC are KØPFH, pres.; KØKYR, vice-pres.; KØKVM, treas.; WØANZ, secy.; WØPTL and KØCQH, directors. Fairfield ARC's officers are KØEAK, pres.; WØIWF, vice-pres.; KØIQV, secy.-treas.; KØBRE, act. mgr.; KØTLY and KØJWO, directors. Officers of the Ames Radio Club are WØIII, pres.; WØNFL, vice-pres.; KØUAA, secy.-treas.; WØLSF, act. mgr. Traffic: (Jan.) WØLGG 2085, WØSCA 1140, WØNTB 69, WØLJW 26. WØPZO 22, KØQKD 16, WØQVA 12, WØYDV 12, KØGXP 9, KØKAQ 9, WØUSL 8, KØJMA 5, WAØDQD 4, KØMST 4, WØNWX 4, WØUIZ 4, KØDYS 3, KØQKR 3, KØUAB 3, KØVBM 3. (Dec.) WØPZO 271, KØGXP 28.

KANSAS—SCM, C. Leland Cheney, WØALA—Asst. SCM: Richard G. Caspari, WØYZB. SEC: KØBXF. Asst. SEC: KØEMB. PAMs: KØEFL, WØBOR. RMs: WØQGG, WØPFG. V.H.F. PAMs: WØHAJ, KØVHP. New appointments: WØQGG as RM for 80-meter c.w.; WØZGK as EC for Zone 5. WØSAF has found it necessary to resign as RM because of a change in his work assignment. Our compliments to WØOAQ and WØPFG on their real good OO performance; also to KØRWC and KØGIC, who keep the activity propaganda moving as OESs. For those of you who chase rare contacts, the Flint Hills ARC of Butler County will make an expedition into Chase County, Kan. May 11 and 12 from 1 P.M. Sat. through 1 P.M. Sun. so that that amateurless county may be added to your log. Frequencies will be 3840, 3650 and 14,250 kc. and 144.35 and 144.80 Mc. The call will be WØECD/Ø. Plans are for a section meeting in the southeast corner of the state in April open to all amateurs. Net traffic: KPN, 3920 kc, Mon.-Wed.-Fri. 1245Z; 28 sessions: QNI high 55, low 2, total 389, average 13.99; QTC high 8, low 0, total 84, average 3; NCSs KØRFR, WØEXG, KØGII, KØQKS, KØYTA, KØEFL. QKS, daily 3610 kc, 0030Z; 31 sessions; QNI high 14, low 3, total 293, average 9.4; QTC high 15, low 0, total 149, average 4.8. SCAN, Tue. at 7 P.M. CST; 4 sessions; NCSs KØSMI, KØTFK, WØTSY, WØERT; meets on 7205 kc. SCAN, Mon. at 7 P.M. CST at 7070 kc. HBN, 7280 kc, Mon. through Fri., 1800Z; QNI 201; QTC 356; NCSs KØICB, KØYWT, W5ZEY/Ø, KØHGI. The new manager is KØYWT. Traffic: WØBYV 274, KØYTA 205, KØHGI 147, WØIFR 50, KØEFL 34, WØYZB 24, WØRJF 22, KØTGR 20, WØEXG 15, KØGII 13, KØLHF 8, KØVQC 2, WØPFG 1.

MISSOURI—SCM, Major R. C. Gordon, KØWNZ—SEC: KØWNZ. RMs: WØOUD, KØONK. PAMs: WØBVL, WØLFE (v.h.f.). Net reports: MEN (3885 kc, 0000 GMT, Tue, Thurs, Sat.) 13 sessions, QNI 311, QTC 111; NCSs: WØTPK 5, KØVPH 4, KØONK 2, W5ZEY/Ø and KØJPL 1 each. MON (3580 kc, 0100 GMT Tue-S) 27 sessions, QNI 177, QTC 195, NCSs: WØOUD 11, KØVPH 5, KØFPC und WØQIQ 4 each. MSN (3817 kc, 2200 GMT M-F) 24 sessions, QNI 157, QTC 31; NCSs: KØONK 8, WNØCWV and KØGFA 6 each. MSSB.N (3963 kc, 0000 GMT W & F) 9 sessions, QNI 171, QTC 26; NCSs: WØOMM 6, WØECA 3. PON (MO) (3810 kc, 2100 GMT M-F) 22 sessions, QNI 301, QTC 81; NCSs: WØHVJ 9, KØBWE 6, KØONK 3, WAØAQN 2. WØTXC 1. SMN (3580 kc, 2200 GMT Sun.) 4 sessions, QNI 24, QTC 23; NCSs: WØOUD 3, KØFPC 1. Appointment: WØEWM as OES. Endorsements: WØAYB as OBS, KØONK as ORS. Resignation: KØIHY as EC. Reports from the following are gratefully acknowledged: KØJPL, WØPME (OOs); KØFPC, WØRVA (OESs). Net reports and station traffic reports indicate that traffic is holding up well in spite of the long skip conditions on 40 and 80 meters.

(*Continued on page 110*)

BRAND NEW FROM CLEGG LABS . . . THE

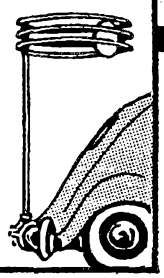
POWER PACKED THOR 6

TRANSCEIVER FOR 6 METERS.

Come on up out of the noise . . . let 'em know you're around! For contests, marginal openings or just overriding the Qrm . . . your new sixty watt, VFO controlled, 100% high level modulated THOR 6 transceiver makes you the "Voice of authority" on six . . . and what's more you'll hear them too! The receiver section with its crystal lattice filter, is selective to the nth degree and so sensitive that even S1 signals are Q5. Sound good? Here's the rest of the story.

MOBILE OPERATION

Now you can run a mobile "power house" using the new Clegg Model 418 transistorized 12V DC power supply / modulator unit to power your THOR 6 transceiver.



TRANSMITTER FEATURES:

- **FULL 60 watts input on phone or CW to 6883 final.**
- **BUILT-IN VFO that automatically tracks the receiver or switches to crystal control for fixed frequency operation.**
- **ALL stages broadbanded for easy QSY.**
- **SPEECH-CLIPPING FOR MAXIMUM talk power.**
- **BUILT-IN PUSH-TO-TALK.**
- **BUILT-IN Keying relay for clean chirpless keying.**

RECEIVER FEATURES:

- **NUVISTORIZED front end for extreme sensitivity at lowest noise level.**
- **CRYSTAL lattice filter for maximum selectivity.**
- **BFO with variable carrier injection for SSB reception.**
- **ULTRA-STABLE tuneable local oscillator that also functions as VFO for transmitter.**
- **EXCELLENT audio characteristics. 2 watts into 3.2 ohm speaker.**
- **Sharp reduction in spurious responses and cross modulation.**
- **Effective noise limiter.**

The THOR 6 is of two unit construction with attractively styled receiver and transmitter rf section mounted in one cabinet for convenient desk top operation. The power supply/modulator section is mounted in a second cabinet for remote location. A ten foot interconnecting cable is provided.

Amateur net price for AC operation $349.95. 12V DC Mod./Pwr. Sup. $100.

COMING IN APRIL - SSB - THE VENUS 6

Clegg LABORATORIES

DIVISION OF TRANSISTOR DEVICES, INC.

RT. 53, MT. TABOR, N. J. • OAkwood 7-6800

See your Distributor or write for information.

The Northwest St. Louis Amateur Radio Club reports its new officers are KØJPL, pres.; KØECK vice-pres.; WØDQA, secy.; WØCED, treas.; KØVSH, act. mgr. Traffic: KØONK 296, KØVPH 217, WOOUD 161, KØYIP 132, KØFPC 100, WØTPK 79, W5ZEY/Ø 76, WØOMM 50, WØKIK 41, KØVBT 41, WØBVL 36, KØWNZ 35, KØVSH 34, WØGBJ 19, WØPXE 17, WØMKJ 13, KØJPL 12, WØGQR 6, KØRDJ 6, WØEOJ 4.

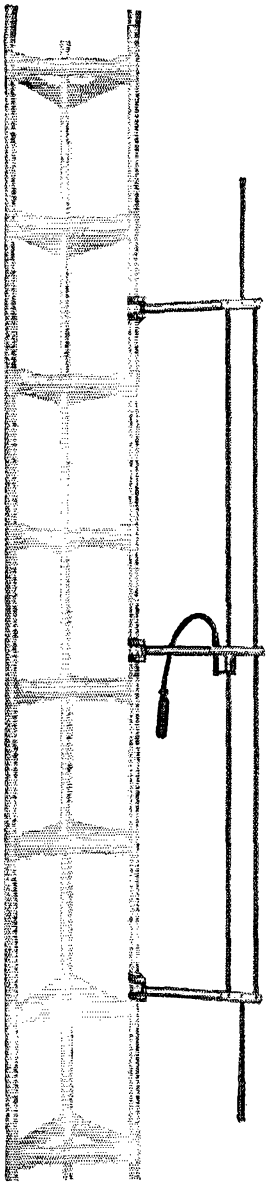
NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTSU. WØOKO reports QNI 155, QTC 48 for the Nebraska section net "CW." Western Nebraska Net WØNIK NC, reports QNI 748, QTC 559 of which 538 WX, 100 per cent reporting KØITP, WØLOD, WØAHB, KØAIE, KØBMQ, WAØRYK, WØZJF, WØNIK, WAØAES, WØDVB and WOOFP. Morning Phone Net, KØDGW NC, reports QNI 556, QTC 59, WAØBES reports the Nebraska Emergency Phone Net. WØEGQ NC, had QNI 903, QTC 46, new members WAØDFS, WØJFN, WØMKP, WØNNL and WØRAM. Nebraska Storm Net, KØJFN NC, reports 31 sessions, QNI 768, QTC 6. New officers of the Oregon Trail Radio Club at Fairbury are WØAGK, pres.; WØDQD, secy. New officers of the Fremont Radio Club are WØAZO, pres.; WØVBR, secy.; KØKQE, activity. New officers of the Holdridge Club are WAØERN, pres.; KØKJL, secy. My term as SCM expires June 10. Please have the men of your choice nominated for election as I will not be a candidate for another term. With deep regret we report the passing to Silent Keys of WØYSK and KØTIU. Traffic: WØGGP 450, WØLOD 104, KØKJP 92, WØOKO 84, WØBYK 56, WAØBID 44, WØNIK 40, WØFTQ 36, WAØAES 30, KØFRU 28, WØNYU 28, WØAHB 27, WØWUV 27, KØCYN 26, W6JCF/Ø 23, WØEGQ 20, WØZJF 20, WAØBES 17, WØRIH 17, WOCCD 14, KØUWK 14, WØVEA 12, KØZFO 12, KØIAL 8, KØMSS 6, KØYZP 6, WØFIG 5, WØIAY 5, KØJFN 5, KØGDW 4, WØVZJ 4, WØHOP 3, KØFSC 2, WØNOW 2, WØSWG 2.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Robert J. O'Neil, W1FHP—SEC: W1EKJ. RM: W1KYQ. PAM: W1YBH. V.H.F. PAM: W1FHP. The CPN held 31 sessions in Jan. with an average attendance of 23 stations. High QNI goes to K1ONZ 31. W1LUH 30, K1AQE 29, W1DAV, K1DGK and K1UQQ 27, W1VQH 25, K1PUG, K1SRF and W1YBH 23. CN meets daily at 1845 on 3640 kc. CVN meets Mon., Wed. and Fri. at 2030 on 145.980 Mc. NCS tunes from 147 Mc. down on each call-up. W1NJM made the BPL in January. A new OES is K1WPQ. Several appointment certificates will expire very soon. A look at yours on the wall will save time in renewal. Note the new SCM's name and address on page 6 of *QST*. Traffic: W1NJM 258, W1AW 166, W1YBH 106, W1EFW 102, K1JAO 100, K1GGG 77, K1QPN 76, K1QPS 74, W1BDI 72, W1CTI 72, W1OBR 65, K1WWI 61, K1LFW 48, W1LUH 45, K1UQQ 44, K1QVX 43, W1FHP 35, W1MPW 35, K1DGK 33, K1WKK 33, W1RFJ 32, K1YIX 30, K1PUG 28, K1SRF 28, K1EIC 22, K1EIR 22, K1AQE 15, K1NTR 15, K1MBA 8, W1BNB 6, W1CHR 6, K1OJZ 6, W1CUH 5.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—W1AOG, our SEC, received EC reports from K1s MBU, ICJ, W1s STX and FON. We now have an Eastern Mass. 10-Meter Net on 28,950 kc. Mon. through Fri. at 2000 (0100 GMT). W1FON is our new PAM for 10 meters. W1VAH is a new OO. W1KQJ Quincy EC. W1UMK is a Silent Key. W1s BGW, AYG, RHN and K1IZM took part in the Nov. FMT. W1FSK spent some time in the hospital but is feeling better. W1SZ now is in Weston. K1OCD has a new baby girl. W1MB is back to work again. KN1ZUY is the son and the father is KN1ZUR. W1MTU is on 160 meters. Heard on 75: W1s ATI, AFD, MMY, QAF, K1JHD. New officers of the Massasoit ARA are W1ULJ, pres.; W1WLZ, vice-pres.; K1HFG, secy.; K1JJJ, treas. W1WLZ spoke on "Telemetry" at this club. K1PZB has DXCC. K1MMC is building an s.s.b. rig. W1ECK is building an all-band exciter. K1JJJ has gone hi-fi. K1NKW is on 20. Ex-W1ZSR is heard on 20-meter s.s.b. from Florida. W1AIR has high stable v.f.o. for 2. W1MV has 300 countries confirmed. K1LEK has a new mobile. W4UDK/1 is in Florida. W1ZQO has a new house. The T-9 Radio Club met at W1TYP's QTH. W1HGT is busy at college. W3JSL/1 will move to Okinawa soon. The Wellesley Club held a meeting. K1YNM is on 6-meter c.w. W1VAH is working on a converter. W1VMD lost his beam in a storm. KN1-ZLG is in Natick. K1VEZ is in Chelmsford. W1NF was off because of a cold shack. W1PMZ spoke at the Middlesex ARC and the club showed an ARRL film. K1SGZ is building a new rig for 6. K1QPD has a new beam on 6. KN1UIF has a vertical antenna on 40. K1MTT is mobile on 6. The Townsend ARC meets the 1st Mon. of

(Continued on page 112)



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

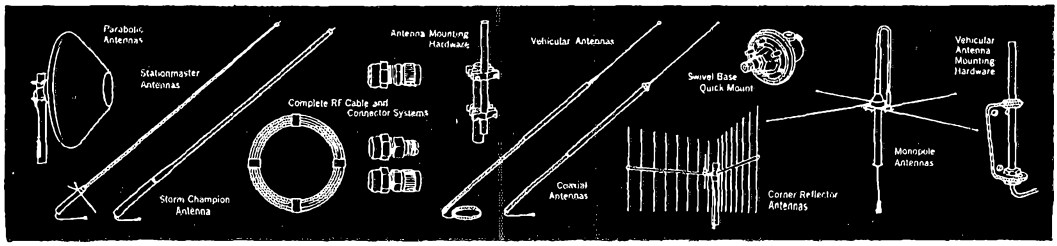
Communication Products Company

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)



each month at SMS. K1PNB is pres. W1AOG is on 40-80 c.w. and 10.K4s BVD and RNH were in the Jan. CD Party at W1MX, writes K3OAE. W1BVP, now LT-JG in the Coast Guard, is in Cleveland. K1CZO is back to work after two months. K1KMV on active duty with the Marines, is home now. W1YNF and K1YNL are on 6. K1QVU heard W1AW on 6. K1VHZ is busy at school. The 6-Meter Crossband Net had 23 sessions, 386 stations, 60 traffic. EM2MIN had 23 sessions, 261 stations, 231 traffic. W1LES now is an NCS for this net. KN1-ZQU is checking in. W1PEX is State Director for Air Force MARS. W1ELP worked his 2700th W1-K1 on 6. W1OFK has an Apache TX-1 for sale. New officers of the Cape Cod & Island ARA are W1AKN, pres.; K1IDA, vice-pres.; W1EYK, secy.-treas.; W1s QLL, OQT, TJW, BCN, K1IDA, directors. K5MVW was guest speaker. W1NN is back on the air on 10. W1BHD and W1HXK doing some flying, also W1HKG. Everett CD is moving into the new City Hall. W1MQO is in the hospital and feeling better. W1LXR is sporting a fire engine red car. W1KCO showed Telestar movies at the Nite Owl Club meeting. K1IRC demonstrated his equipment to students at Browne & Nichols School. K1AXB has a new G50 Gonset. G3NVA visited W1TZ and Ed is now a life member of the RSGB. The Needham Senior H.S. ARC, K1UGO now has a bulletin. W1AOG spoke at the Old Colony Club. W1RK is a Silent Key. Tufts University ARS, W1KN, is now affiliated with ARRL. Bruce Graves is secy.-treas. K1YNM is a Silent Key. K1AIQ is at AFB, Biloxi, Miss. Appointments endorsed: W1TRC Maynard, W1-BHD Everett, W1KWD Weymouth. W1MRQ/CHA Groveland as ECs; W1AWA as PAM for 6; W1AQE as RM for 15; W1s TZ and DFS as OOs; W1s TZ, VMD and BHD as OBSs; W1s BHD, AOG, HGT, K1s KUY and MEM as OESs; W1s PEX, MRQ, BB, AQE and AOG as ORSs; W1s BB, OFK and MRQ as OPSs. W1AQE, on several bands also is on 160 c.w. W1PEX and K1TSD made the BPL. K1YVB is a new OES. Sorry to have to report the death of W1GOU, who was well known on 10 meters. Traffic: (Jan.) W1PEX 1091, K1TSD 722, W1OFK 369, W1ZSS 206, K1ONW 149, W1LES 97, K1PNB 76, W1DOM 56, W1AOG 55, K1-GKA 52, K1WJD 49, W1SIV 45, W1HGN 34, W1MX 15, W1DIY 14, KN1VXB 14, W1BKI 11, K1QVU 10, K1-LCQ 7, K1CMS 6, W1DLY 5, K1MOO 5, K1OCD 4, W1MRQ 3. (Dec.) W1SIV 66, K1OJQ 40, W1MX 26. (Nov.) K1OJQ 26.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: W1BYH/K1APR. RM: K1IJV. PAM: K1RYT. W1ICW (in Springfield for the past 29 years) is now in W4-Land at 408 S. Harding St., Greenville, N.C., and will be on 20-meter s.s.b. soon. W1DWA is back on the air with an Eico 720 after a 3-year absence. K1VPN is a new member of WMN. K1SSH is temporary manager of EASN. W1DPY is building a Heath Marauder, and W1BVR is attempting to build a Heath HX-20 (s.s.b., no less). RM K1IJV reports a total of 18 stations on WMN during the month with those in top attendance being K1IJV, W1DVW, K1SSH, K1LBB, K1VPN and W1XPB. W1OY (EC for Westover AFB) says the layout there is an amateur's dream! Our SEC, W1BYH, is now a married man with a new address of Box 147R, Rindge Rd., Ashburnham. Congrats. OB! K1PYX has had over 400 contacts on 6 meters during the past 18 months (40 watts and a beam). New members of the Berkshire County Amateur Radio Association are K1RYT, K1WZS, W1UUK and KN1ZHJ. W1CPN is building a Seneca and K1UVP is assembling a Ranger. W1UDT and K1DJN had a grueling time during the January Sweepstakes from atop Mt. Greylock. W1TDS is now the proud father of twins. K1PES now has a 600-ohm open line to his "antenny" and says it works much better. (Some of these old-fashioned ideas ain't so bad after all—SCM). Traffic: (Jan.) K1IJV 156, K1SSH 118, W1BVR 85, K1LBB 81, W1ZPB 56, W1DVW 42, K1VPN 21, K1-ZBN 8, KN1YNS 4, K1TTT 3. (Dec.) K1SSH 166.

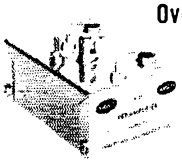
NEW HAMPSHIRE—SCM, Albert F. Haworth, W1YHI—SEC: W1TNO. PAM: K1NXV. RM: K1BCS. GSPN meets Mon. through Fri. at 2400Z and Sun. at 1430Z on 3842 kc. CNEW meets Mon. through Sat. at 1130Z on 3842 kc. NHN (c.w.) meets Mon. through Sat. at 2330Z on 3685 kc. Appointments: K1CXP as EC for Hillsborough County. Endorsements: K1CIG as OES and OBS; W1BYS as OPS; K1NBN as OO class IV; W1SWX/K1DSA as OO class I and II. Attention is called to the expiration dates of all AREC memberships. Endorsements should be made by the SEC on cards. Congratulations to the new Souhegan Amateur Radio Assn., which meets the 1st and 3rd Fri. at Town Hall, Milford with W1PYM, pres.; W1UXS, vice-pres.; K1PSR, secy.-treas. League affiliation of the Monadnock Radio Club, Inc. has been announced. Fifteen members of the Midstate Amateur Radio Assn. joined

(*Continued on page 114*)

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**

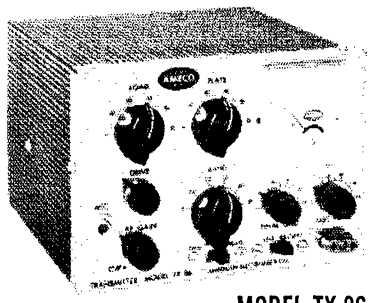
MOBILE CONVERTERS

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

$49.95 wired **$34.95 kit**

NUVISTOR CONVERTERS

For 50, 144 & 220 MC
High Gain, Low Noise

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, CE-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-4

AMECO EQUIPMENT CORP.

Affiliated with American Electronics Co. and Ameco Publishing Corp.

178 HERRICKS RD.
MINEOLA, L.I., N.Y.

the AREC in a body. K1BCS reported over 500 for two months. Congratulations. Press. Traffic: (Jan.) K1BCS 588, K1TMD 286, W1CUE 14, W1EVN 8, W1TFS 2, W1SWX 1. (Dec.) K1TMD 62, K1MOZ 30, W1BYS 2, W1EVN 1.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: W1YNE. RM: W1SMU. PAM: W1TXL. New appointments: K1OZI as OO Class III and IV; K1PLH as EC for Portsmouth. R1SPN report: 31 sessions, 786 QNI, 145 traffic. The NCRC of Newport installed new officers and elected six new members recently. Those installed were W1TXL, pres.; K1PTV, vice-pres.; K1VPK, treas.; K1VQO, rec. secy., W1JFF, rec. secy. W1AWG, 42 years a member of the club, was elected a life member. The ARRL Membership Drive is led by K1VPK. W1UGH gave a lecture with slides on antenna design for rockets to the club. The W1AQ Club of Rumford elected to membership W1FNH and K1VQL. A WRI certificate was issued to K1HMN. AREC membership continues to grow with the latest report showing 121 members, 23 mobile units, 7 emergency units and 7 emergency nets. Contact the SEC or SCM for information on how you may join. K1VSK has been elected pres. of the Hope HS Club of Providence. The club call is K1TJO and the club has a total of 13 licensed operators and 5 who will try for the Novice class. Those directing code classes are K1s PYO, UQM, NGW and VSK. K1VSK received his 25-w.p.m. certificate and has worked 5 continents. East Prov. HSRC officers are K1NKR, pres.; Lee Taylor, secy.; Bob Alosi, treas. K1NJT is building a new 6-meter rig. Traffic: W1TXL 704, K1TPK 72, W1YNE 55, K1OZI 33, K1NJT 32, K1SXY 22, K1GRC 20, K1DZX 1.

VERMONT QSO PARTY

April 20-22, 1963

All amateurs are invited to participate in the Vermont QSO Party, sponsored by the Central Vermont Amateur Radio Club, K1YMZ. Vermonters are urged to work as many out-of-state stations as possible so that those interested can earn credit toward WAS, WANE and W-VT awards.

Rules: 1) Time, the 28-hour period from 2300 GMT April 20 to 0300 GMT April 22. 2) No power restrictions, all bands can be used and contact credit with the same station on different bands will be given. 3) Vermont stations score 1 point per contact and multiply by the number of ARRL sections or foreign countries worked. Outside stations score 3 points per Vermont station and multiply by the number of Vermont countries worked. 4) Certificates will be awarded to the highest scoring station in each ARRL section, plus a trophy to the highest scoring station outside Vermont. A trophy will also be awarded to the top Vermont scorer, with 2nd 3rd and 4th place station receiving a gold-trimmed certificate. A special award to multioperator groups. 5) Suggested frequencies: 3520 3855 7050 7250 14,100 14,250 21,000 21,300 28,100 28,600 50,250 50,360 144-144.5 and 145.8. 6) Vermont stations send number of QSO, report and county. Others send QSO number, report and section. 7) General call to be used "CQ VT" on c.w. and "Calling any Vermont station" on phone. 8) Logs should be postmarked no later than May 20 and sent to the CVARC, c/o Ann L. Chandler W1OAK, RFD #2, Barre, Vermont. 9) the W-VT (Worked Vermont) certificate will be awarded to stations working 13 out of 14 Vt. counties, provided the station has not previously been issued the award. Party logs showing required data will be accepted in lieu of QSLs. Vermont stations are urged to be active and QSL promptly.

VERMONT—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB. PAM: W1HRG. RM: W1KRV. We urge all Vermont amateurs to participate in the Vt. QSO Party being sponsored by the CVARC, K1YMZ, from Apr. 20 to 22. Ann, W1OAK, is in charge of planning. We welcome KN1ZRC, KN1ZRE, KN1ZRD and KN1ZRF in the Plainfield area. K1BGC, of Graniteville, has a new DX-100B. W1YEL, of Island Pond, received an appointive office from ex-Gov. Keyser. K1AEY, of Hardwick reported on her DX work at the Mike and Key January supper. W1HRG, of So. Burlington, has received an OO appointment. K1UCE, of White River Junction, is thinking seriously of s.s.b. the Chatter Club Net meets daily at 8 P.M. EST on 28.6 Mc. Regu-

(Continued on page 116)

SSB COMMUNICATIONS

A COMPLETE 1KW FIXED CHANNEL STATION!

Shown above is the R F Communications Model SB-6F, 125 Watt SSB Transceiver driving the Model RF-101, 1KW Linear Amplifier. The system provides 6 crystal controlled channels over the frequency range of 1.6 to 16Mc for Government, commercial and military applications. Power **output** is a full 1KW, p.e.p., using two 3-400 Z triodes in grounded grid. Kilowatt antenna coupler available.

Contact us for details

R F COMMUNICATIONS, INC.

1680 University Ave. • Rochester 10, New York

AREA CODE 716, CH 4-5830 • CABLE: RFCOM • ROCHESTER, N. Y.

Overseas Distributor Inquiries Invited

lars are W1MMV, W1QMN, W1LYD, W1HDM, K1GBS and K1MPN. The Mike and Key has a club contest based on the most counties worked by June 7. Traffic: K1YID 13, W1EIB 2.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—The FARM Net meets at 1900 MST on 3935 kc. M-F. The Gem State Net meets daily at 2000 MST on 3580 kc. TEN meets Sun. at 0900 MST on 3910 kc. The Boise Valley Net meets Sun. at 1930 MST on 145.44 Mc. New EC appointments went to K7SKS, Mountain Home, and W7SLV, Boise. The '63 Centennial Certificate is awarded for working 10 stations in 5 counties; Idahoans work 22 counties; during the year 1963. Send QSLs with a self-address stamped envelope for return to Mahlon J. England, W7ZLO, P.O. Box 103, Shelley, Idaho. Centennial QSLs are available to Idahoans through Sue Nash, K7SKR, 228 Baker Drive, Mountain Home, for s.a.s.e. The Eagle Rock and Magic Valley Clubs, assisted in Sabin Vaccine distribution. The Pocatello Club's new officers are K7LCW, prexy; K7IMB, veep; K7KVS, secy.; W7CDA, treas. New calls are KN7VMQ and K7VPA, formerly KL7BIS. FARM Net traffic: 32, Gem State Net traffic: 41. Traffic: W7EMT 92, K7KBY 61, K7HLR 21, W7GGV 12, W7MJZ 4, K7OAB 3, K7QIE 3, K7SJM 3.

MONTANA—SCM, Walter R. Marten, W7KUH - SEC: W7UPR, PAM: W7YHS, RM: K7AEZ. Montana Phone Net meets Mon., Wed. and Fri., 3910 kc, 1800M. Code practice, Mon., Wed., Fri., 3825 kc, 1900M by K7CGF. Station activity reports were received from W7UPR, K7CTI, K7VMJ, K7EWZ, W7EWR, W7NPV, K7KJH, W7FIS, K7OGF, W7EWR QSOed K5LWR, ex-W7FDH, at White Sands, N.Mex. K5LWR wants a sked with the gang at Great Falls on 14.050 kc. K7EWZ is back on RN7 and TWN and has 2 new 50-ft. poles. K7VMJ is building a crystal-controlled converter for 40, 20, 15 and 10 meters. K7CTI TVI-proofed the 500-watt 811A rig. KN7VRH is a new call in Bozeman. K7NKS, W7OOY and W7NPV are the proud parents of new baby daughters, W7BUT, W7FLO, K7EVS, K7KOK, W7MPV, W7-NPV, W7VQZ, W7ZAZ, W7ZHA, W7ZPT and W3PHE are all employees of Montronics, Inc., Bozeman. W7UPR is back from a vacation trip to Oregon. New officers of the Hell-Gate Radio Club (Missoula) are K7IMZ, pres.; Bob Williams, vice-pres.; KN7MGL, secy.-treas.; Jean Smith, editor. On 2 meters are K7CVK, K7IMZ and W7NEG all of Missoula. K7PGS repaired the receiver after getting involved with r.f. K7EBE is changing over to s.s.b. K7AEY is home on leave. W7YTJ makes Billings his home now. K7ELW has been in the hospital. W7IWW has rebuilt his receiver. K7BON is on the air with a new s.s.b. rig. Stations getting ready for RTTY are W7MKB, W7MVN and K7LIT. KN7TQM was home for Christmas in Billings from the Blind School in Great Falls. Four people have taken amateur radio exams after receiving on-the-air code practice sent by K7OGF, K7CTI's folks, W7TWH and W7TWG, plan to get back on the air. K7JXL has moved into his fine new home and ham shack. W7FGZ is working DX on s.s.b. mobile. K7IOA holds regular AREC drills on 3910 kc. at 1300 the 1st and 3rd Sun. of the month. Your SCM W7KUH attended meetings at the Montana State College Amateur Radio Club and at Livingston. He also attended the Ham-of-the-Year Banquet of the Yellowstone Radio Club. The Ham-Of-The-Year award was made to W7CPY, of Billings. Traffic: K7EWZ 143, K7EGA 39, K7DCI 30, K7OGF 22, K7DCH 12, K7MEG 5.

OREGON—SCM, Everett H. France, W7AJN - SEC: W7WKP, RM: W7MTW. New appointment: K7MHE as OES. Endorsement: W7ADR as OES. Nets, time GMT: OSN, 3585 kc, 0230 Tue.-Sat.; OAREC, 3585 kc, 0330 Wed.-Thurs.; AREC, 3875 kc, 0300 Tue.-Sat.; AREC V.H.F, 50.550 Mc, 0400 Fri.; OEN, 3840 kc, 0200 and 0300 daily. W7DEM reports using 8 watts to a 2E26 on c.w. and says its lots of fun; also ten are enrolled in the code class of the Southern Radio Club of Grants Pass. K7EZP reports the Washington County Civil Defense Net has been reactivated on 145.35 Mc. with W7UXR as net control and W7NXA as asst. K7EZP, of Forest Grove, Ore., and K7LBD, Yakima, Wash., have made two-way contacts on 2 meters. W7MA, of Reedville, and K7TFV, of Redmond, Ore., claim the record for a 2-meter two-way contact over the Cascades. W7GUH makes BPL again. FB, Bill. K7IWD has received his 2nd-class commercial phone ticket and sends in a report of 17 stations with some form of discrepancy noted during his OO observations. W7FKF, also an OO, sends in a good report. W7ADR, as OES, has installed a home-brew mechanical 3-deck switch for beams to his converters and transmitters. W7ZFH, mgr. of OSN, reports sessions 22, total attendance 170, traffic 47. BRAT awards went to W7AJN, W7BVH and K7IWD. Thanks for the individual reports sent in. Traffic: W7GUH 645,

(Continued on page 118)

MODEL 5CIV84 40 and 80 METER

"DUO-BAND"
"BALUN"-FED INVERTED "V" ANTENNA KIT
INSTALLATION and ASSY. INSTRUCTION SHEET

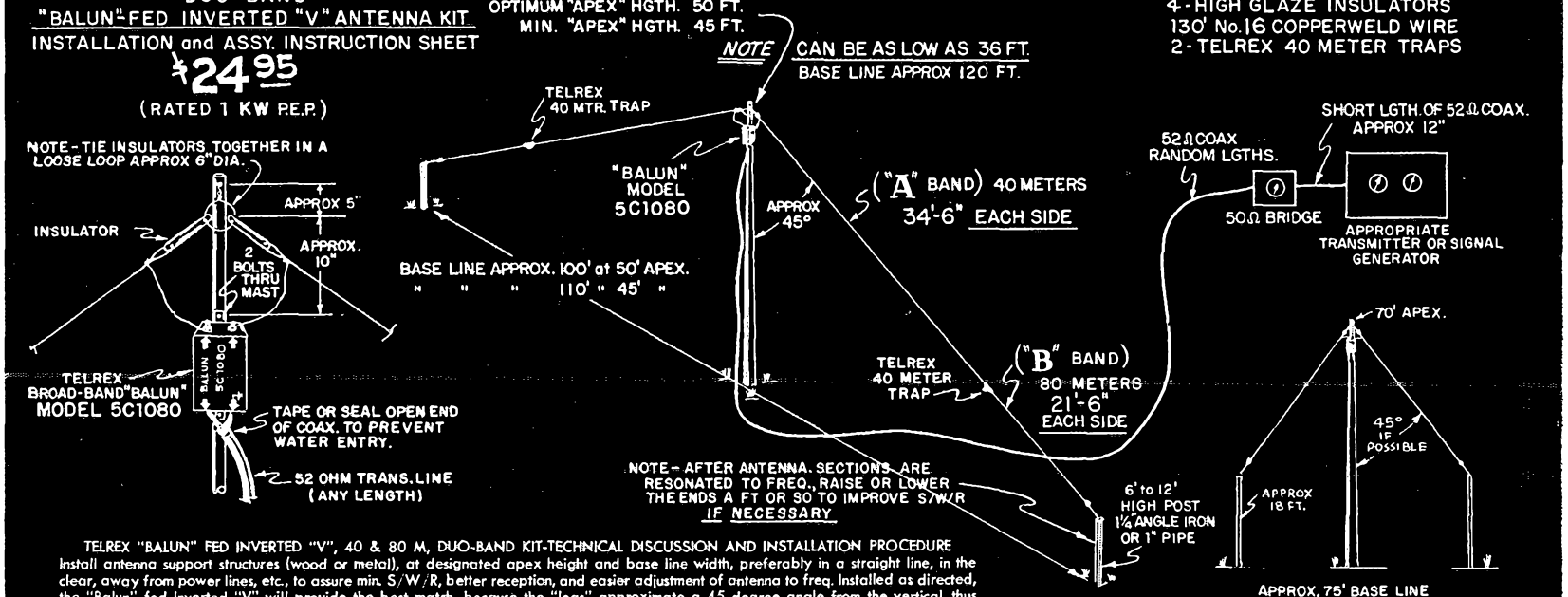
$24.95

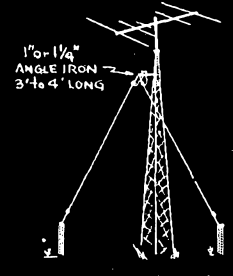
(RATED 1 KW P.E.P.)

MFD. UNDER TELREX PATENT No. 2,576,929

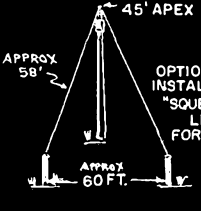
KIT COMPONENTS SUPPLIED

1 - TELREX BROAD-BAND "BALUN"
4 - HIGH GLAZE INSULATORS
130' No. 16 COPPERWELD WIRE
2 - TELREX 40 METER TRAPS





ILLUSTRATING BEST WAY TO EASILY MOUNT INVERTED "V" TO PRESENT EXISTING TOWER



TELREX "BALUN" FED INVERTED "V", 40 & 80 M, DUO-BAND KIT-TECHNICAL DISCUSSION AND INSTALLATION PROCEDURE

Install antenna support structures (wood or metal), at designated apex height and base line width, preferably in a straight line, in the clear, away from power lines, etc., to assure min. S/W/R, better reception, and easier adjustment of antenna to freq. Installed as directed, the "Balun" fed Inverted "V" will provide the best match, because the "legs" approximate a 45 degree angle from the vertical, thus effecting an input imped. of approx 52 ohms, automatically at most sites, without fuss or bother. However, the Telrex "Balun" fed Inverted "V" lends itself to considerable variation from these definite recommendations, although greater difficulty may be experienced to "cut" antenna to freq. and to reduce the S/W/R to a usable minimum.

Performance — Properly installed and resonated to freq., a Telrex "Balun" fed Inverted "V" 40, 80 M, duo-band, is superior to a ground plane or a ¼ wave dipole with a costly radial system, and will provide a S/W/R of under 2/1 for approx 3% freq. bandwidth, (about 250KC on 40M; about 125 KC on 80M). The pattern is primarily Omni-directional with nulls off the ends of approx 6 DB, and the radia- is hi-performance, low-angle, irrespective of ground conductivity!

INSTALLATION PROCEDURE — Cut copperweld wire supplied into designated lengths. Assemble to insulators and "Balun" as illustrated. Connect a 52 ohm coax trans. line (any length), to input side of "Balun", then raise the antenna to its prepared supports for resonant checks. With a S/W/R bridge (and signal gen.) connected as illustrated, locate the resonant freq. of "A" Band (40 meters), it should resonate low in freq., perhaps outside the low end of the 40 meter band. To correct, shorten each "leg" approx 1 ft. or so, then recheck resonant freq. Repeat (shorten or lengthen) if necessary, until antenna resonates to your desired "A" Band (40M) sector. Note! The antenna must be raised to its intended final apex and end post height each and every time resonant freq. and/or S/W/R readings are taken and — Only After "A" Band has been properly resonated to freq., should you proceed to resonate "B" Band (80M) as instructed for "A" Band. Note! When "B" Band has been properly resonated, recheck and correct "A" Band to freq., if necessary. In conclusion — If further info or assist-ance is required, please write Department H and please supply S/W/R readings, a rough sketch, and a stamped addressed envelope so that we can respond quickly and easily.

TELREX EQUIPMENT AVAILABLE THRU THE BETTER AMATEUR DISTRIBUTOR. IF NOT IN STOCK, PLEASE ADVISE. WE WILL BE PLEASED TO SHIP FROM OUR FACTORY.

Telrex LABORATORIES
ASBURY PARK NEW JERSEY U.S.A.

K7IWD 215, W7ZB 86, W7ZFH 57, W7AJN 19, K7QZF 10, W7BVH 7, W7DEM 7, W7MAO 4, K7EZP 2.

WASHINGTON—SCM, Robert B. Thurston, W7PGY —Asst. SCM/SEC: Everett E. Young, W7HMQ. RM: W7AIB. PAM: W7LFA, W7COG and W7HDL are new OOs. W7BA and W7RGL renewed their OBS appointments. Loyd also renewed his OPS and ORS appointments. New officers of the West Seattle Amateur Radio Club are W7EWP, pres.; W7TWU, vice-pres.; W7EJD, secy.; K7JBZ, treas.; W7GUW, steward; and K7EKY, sgt. at arms. K7GCK received his 30-w.p.m. CP award. A new General Class licensee in the Tacoma area is K7RRQ. The Radio Club of Tacoma (W7DK) had a potluck dinner at the club house with 93 in attendance. W7QFR gave a talk on the license plate law for Washington. Two new Novices in the Burlington area, a father-and-son team, are KN7VKX and KN7VDY. K7PIG says he is selling his 6-meter gear and will order a new SX-111. K7INM has a new HQ-145. A new General Class licensee is K7TGN. K7GVM/VO-1 will be located in Newfoundland until June 1964 and is looking for contacts with the Washington, Idaho and Oregon gang on 20-meter c.w. after 2145 GMT. A very active 6-meter net is in full swing in the Wenatchee area using 53.29 Mc. K7BVZ has a new 30L-1 linear and has worked 89 countries so far. K7JRE has his new 100-watt rig completed. A new Novice in the Walla Walla area is KN7VPE. The Walla Walla gang will be operating on 146.760 Mc. soon and this will tie other nearby communities in a common net. W7MNC has the new skyhook up. KN7SNJ is studying hard for his General Class license. K7CWO renewed his OPS appointment. There is an opening for a V.H.F. PAM. If you are interested and can qualify, please contact the SCM. K7PJD is a new OBS in the Seattle area. W7IST is planning on a 100-watt rig for the June V.H.F. Contest. The NSN had 26 sessions with 142 QNIs and 31 QTCs for January. W7HLX joined the ranks of Silent Keys. W7LFA is active on 2-meter f.m. with a ten-element stacked beam. New officers of the Richland Club are K7OFW, pres.; K7KSF, vice-pres.; W7MDA, secy.; KN7THE, treas. The following amateurs participated in the inland empire March of Dimes telethon Jan. 20: K7s CDI, QOM, PVO, OFW, PWM, DED, KSF W7S RXJ and OEB. New calls in the Richland area are KN7VNX, KN7VNW and KN7VNV. W7ZBU works for United in Seattle. New Novices in the Wenatchee area are KN7VWX, KN7VXO and KN7VNE. W7IEU was elected net mgr. of WSN with K7QMF as associate mgr. and K7DED as net recorder. K7UAC operates the MARS station (K7FEA) at Fairchild AFB, Spokane. Traffic: (Jan.) W7BA 908, W7DZX 612, K7JHA 257, W7APS 195, W7GIP 124, W7OEB 80, K7CTP 46, K7QMF 44, K7PIG 35, W7AMC 32, W7BTB 30, W7IEU 20, W7AIB 13, K7IAE 7, K7JRE 7, K1RFX/7 2, W7JEY 2. (Dec.) W7GIP 111, W7KZ 8.

PACIFIC DIVISION

NEVADA—SCM, Leonard M. Norman, W7PBV—SEC: W7JU. K7ICW is being heard in California on 221.5 Mc. W7VIU has a Knight T-150 transmitter under construction and reports some DX on 40 meters. K7GQD is on s.s.b. with a KWS-1 and has his antenna farm undergoing repairs. K7NCP is conducting theory and code classes. A second club station is in the making at the Mercury test site. K7KBN's shore leave has expired and he is en route to radio school in the U.S. Navy. W7HJ has resigned as Boulder City EC because of ill health. Get well, Frank, and thanks for a job well done from both Charley and me. K7DEG and committee are negotiating for QSL cards commemorating Nevada's 100th anniversary in 1964. Nevada amateurs interested in securing cards should send their request to P.O. Box 2534, Reno. We counted 525 amateur stations listed for Nevada in the *Call Book*. Traffic: (Jan.) K7KBN 927, K7GQD 30, W7PBV 6. (Dec.) W7VIU 21.

SANTA CLARA VALLEY—SCM, Jean A. Guelin, W6ZRJ—Asst. SCM, Edward T. Turner, W6NVO. SEC: WA6EIC. RM: K6KCB. PAM: WA6HVN. New appointees are W8OCU/6 as ORS; W6CYL and WA6HVM as OPSs; W6OOY and K6UHZ as OESs. The rains came again and minor flooding and storm damage kept AREC and RACES stations busy on Jan. 31. K6HWR, Gilroy EC, was the only communications into that city for several hours. The San Jose C.D. Net remained in operation with K6RJE as control for over 30 hours and the Red Cross station, W6UW, was a major communications link to Alviso, via WA6HVN/M. The SCCARA is planning a v.h.f. hamfest for this summer. W6RSY and K6GZ report that conditions on 80 meters were very poor. K6DYX sends a fine report on his new RTTY net with several stations up and down the coast and traffic handled. K6GID has a new decoder operating on 2-meter f.m. W6ASH sends an OO report and information on 432-Mc TV. W6AUC is holding regular skeds

(Continued on page 120)

CAMP ALBERT BUTLER INVITES NOVICES & TECHNICIANS OF ALL AGES

TO TRY FOR YOUR

GENERAL CLASS TICKET

THIS SUMMER!

This Co-Ed Amateur Radio Camp, YMCA owned and operated, is designed for just 60 campers. There is no age limit but a Novice or Technician license is desired. Time will be divided between radio classes and the usual camp activities such as swimming, archery, riflery, horseback riding, etc.

Entire Staff consists of licensed hams who are instructors in Electrical Engineering in some of our finest colleges and universities.

Camp opens on **August 3rd** and closes **August 17th.**

Tuition of $150 includes usual camp expenses — notebooks, textbooks, Health and Accident insurance, as well as horseback riding.

C. L. Peters, K4DNJ Q-4
General Secretary
Gilvin Roth Y.M.C.A.
Elkin, North Carolina

Please send me the Booklet and Application Blank for the Camp Albert Butler Radio Session.

NAME.....
Novice or Technician Call.....
ADDRESS.....
CITY.....ZONE....STATE.....

with Hawaii and Alaska using the S/Line. The storm cut power to W6YHM who stayed right on using the generator. K6YKG is active on the new Western MARS Navy Common Net. OPS W6VQK worked several contacts in the CD Party via c.w. but had little luck on phone. W6PLG is back and has picked up his ORS appointment. K6MTX has moved into his new shack. K6DYX gave a lecture to the Monterey Bay Radio Club on 220 Mc. with OES W6SHK assisting. WA6HRS kept his OBS skeds right through the storm but almost lost his antenna systems. The Lockheed Club, OBS WA6GFY, wasn't so lucky, losing the tower, beam and other antennas. K6UHZ is reported as going to 432 Mc. W6ZRJ built a new keyer and can now key via audio tape. Traffic: W6RSY 670, K6GZ 356, K6DYX 113, K6GID 87, W6ASH 69, W6AIT 54, W6YBV 49, W6DEF 47, W6AUC 42, W6YHM 31, W6OII 27, W6ZRJ 18, K6YKG 11, K6VQK 9, W6UW 6, K6EQE 4, W6ZLO 4, W6PLG 2.

EAST BAY—SCM, B. W. Southwell, W6OJW—SEC: WA6MIE. ECs: WA6WRH, K6EDN, K6JPY, K6HTJ, W6WAH, WA6FFF and WA6NFF. A drop of 66 per cent in the total reported traffic handled in the section for 1962 over 1961 shows some traffic is not being reported to the SCM. Whether you are an appointee or not, please report traffic handled to the SCM on the first of each month so we can make 1963 a banner year. W6AKB is eyeing s.s.b. W6JTB is a new call for the Antioch DX Society and was in the 160-meter contest with a vertical 320 feet up supported by a weather balloon. WA6WLE is building an S meter for the receiver and a speech compressor for the DX-40. WA6KJZ worked 5 new countries for a total of 66/50 and needs Africa for WAC. WA6MJP has a 112/88 score and is sweating out cards for DXCC. W6EY is on the MARS and SARO Nets. WA6VAT has a new electronic key, vertical and received his WAS sheepskin from Hq. WA6LGE worked 50 stations in 5 sections in the CD Party and is stalking Alabama for WAS. WB6CGO is a new one in Vacaville. The Franktort Radio Club, Ky. sends thanks to the E.B. gang for Optimist Club traffic-handling in 1962. The Silverado Amateur Radio Society, Inc., of Napa, elected W6NOP, pres.; W6NDR, vice-pres.; WA6OGB, secy.; K6RZR, treas.; WA6BWR, sgt. at arms. WA6WYA and WA6NGH do their German homework over ham radio. W6UKR is another s.s.b. convert. W6UF sold his mobile a.m. gear to go s.s.b./mobile. WA6HKD holds up his end of the traffic nets on 80-meter c.w. New officers of the HARC are W6NYK, pres.; K6QLF, vice-pres.; K6SPP, secy.; WA6MJY, treas.; and WA6LSU, sgt. at arms. WA6FFI has his 250-watt rockcrusher going finally. WN6CVA has a DX-60, an SX-101 and a dipole on 40-meter c.w. WV6ZXT has a new Eico rig and an NC-300 receiver. WN6CTZ is averaging a contact a day. WA6BBJ is working on a homebrew receiver for 432 Mc. WA6NXC made 4140 points in the V.H.F. SS. WA6GUM is portable W2/N.Y. area. WA6VQF, WA6UQQ, WA6ZNJ and WB6CDX are new members of the ORC. K6IMV and his XYL, K6OBB, are back from a trip to the L.A. area. K6JZR passed the Extra Class exam and his XYL, WA6DOO, made General. Diablo Valley College has a course called Electronics-130, which is theory class for Novice, Tech. and General Class licenses. The HARC will sponsor the Greater Bay Area Hamfest for 1963. W7QOH/6 was mobile during the recent flood conditions. WA6VAT made CHC and still needs Africa for WAC. W6ZF had a bout with Asian flu and is readying his G.R. primary frequency standard for the FMT. W7QOH/6 checks into OSN frequently. K6OSO passed the Amateur Extra Class, and the Commercial 2nd class phone and telegraph exams, and now works for RCA. The 144-Mc. repeater, WB6AAE, on Grizzly Peak works FB. WA6MIE is awaiting a new KWM-2. W6OJW got 7 new certificates this month and is nearing the 100 mark. Traffic: WA6RGD 197, WA6MIE 65, W6AKB 50, W7QOH/6 18, WA6ZLZ 8, W6ZF 4.

SAN FRANCISCO—SCM, Wilbur E. Bachman, W6BIP—Congratulations to WA6IVM on winning the award which was sponsored by the JARL in the multi-band section for "W" Land. K6RCK is on the way to recovery after recent surgery. WA6NDZ is busy expanding the size of the hamshack. K6TWJ is the new president of the Golden Bear Net, Inc. K6JFY reports that he is getting back in the swing on the air. K6VXI's transmitter is silent because of needed repair work. WA6OTE notes on his report that he checks into the Mission Trail Net, the Golden Gate 2-Meter Net and the Post Office Net. WA6YYM is a new member of AF MARS in the 2-Meter Net and worked W6NTV 88 miles away on that frequency. The AREC and HAMS held a joint meeting in January. The Disaster Director of the Golden Gate Chapter of the Red Cross was guest speaker. Many AREC members and ECs attended this meeting. BAY-LARC no longer will hold meetings in San Bruno Hall but has plans made for a future luncheon and meetings

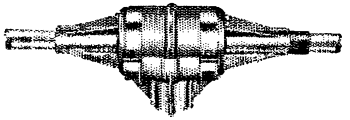
(Continued on page 122)

FIRST and ONLY.. remotely tuned ROTATABLE DIPOLE!

DESIGNED SPECIALLY FOR 40 AND 75 METERS IN LIMITED ANTENNA SPACE

NEW-TRONICS CLIFF-DWELLER™

PAT. PEND.



Housing for motors and gear trains with mounting yoke

Resonance and band switching control

ELECTRICAL FEATURES

- Antenna resonance finger tip controlled from transmitter location in shack.
- VSWR: 1.1 to 1 or less across entire band
- Feed-point variable to compensate for antenna environment
- No traps . . . no baluns . . . no matching devices of any kind
- Feed direct with any length 52 ohm cable
- Power handling capacity — maximum legal limit

The CLIFF-DWELLER is another New-Tronics first. Here's a tuneable dipole ideal for hams who live in apartments or in homes on small lots. The CLIFF DWELLER will give you unbelievable performance even in limited space.

MECHANICAL FEATURES

- Approx. lengths
  - 28′-6″ — 26′ 7.0-7.3 mc
  - 30′-6″ — 26′ 3.5-4.0 mc
  - 31′-4″ — 26′ Two-Bander
- Self supporting, accepts 1¼″ threaded pipe for mounting in standard rotators
- Maximum turning radius approx. 15′-8″
- Sturdy aluminum die cast housing for motors and gear trains which drive end sections of dipole
- Heat treated aircraft type, 1¼″ heavy wall aluminum tubing
- Completely waterproofed resonators and housings

MODEL NO.	FREQ. MC	WEIGHT	NET PRICE
CD 40	7.0-7.3	Under 20 lbs.	$ 92.50
CD 75	3.5-4.0	Under 20 lbs.	99.50
CD 40-75	Two Bander	Under 20 lbs.	129.50

See the CLIFF-DWELLER and other fine NEW-TRONICS products at your distributor or write us for descriptive literature.

NEW-TRONICS CORPORATION

3455 VEGA AVENUE • CLEVELAND 13, OHIO

at the home QTH of the ladies. Tamalpais news: Installation of new officers was held in Jan. with K6BMW pres.; WA6FJY, vice-pres.; K9OVQ/6, secy.; W6KHH, treas. K6OVV was awarded a plaque as "Ham of the Year." WA6BSA is now General Class and his jr. operator is waiting for his Novice call. WA6QFV and WA6QCR are tinkering with 2 meters. K5AGB/6 also has two sons with Novice tickets. W6OPL has a new inverted antenna. WA6ROJ is building a 4X250B amplifier for 432 Mc. and has 4 thirteen-element Yagis ready to install when the tower arrives. K6AIR's gear is now assembled for MARS repeater for Mt. Tamalpais, frequency to be 143.46 and 143.95 Mc. W6AAE and W6HST will operate it at the mountain. K6ANP's XYL Rae presented Len with a jr. operator Feb. 1. Everyone agrees that the baby Anthony looks just like his grandpop, W6GGC. Eureka news: WN6DKC and WB6DGC are new calls. W6JSY is home from the hospital and the plastic valve in his heart seems to be ticking O.K. 2-meter activity still is strong. New officers in the club are W6ZSE, pres.; WA6PTA, vice-pres.; WA6MGG, secy. Following is a list of Emergency Coordinators in the S.F. section: Ft. Bragg WA6VWF, Mill Valley K6OJO, Ukiah W6KVQ, San Rafael WA6AUD and W6OPL, Eureka W6SLX, Fortuna K6EKC, Loleta W6BWV and San Francisco U.H.F. EC WA6MSN. Contact the one nearest you and help him organize a local emergency net. Traffic: (Jan.) K6AIR 505, W6FCT 390, K6TWJ 113, W6PZE 60, W6OPL 36, K6JFY 19, WA6OTE 14, WA6QXV 7, WA6VWF 1. (Dec.) K6AIR 600, K6FCT 415.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Delta Amateur Radio Club held an installation dinner in Stockton Jan. 26, with about 50 in attendance. WA6FBL, pres.; K6GQK, vice-pres.; K6GZN, treas.; and WA6LSA are the new officers. WA6SZS passed the General Class exam. The Modesto Amateur Radio Club holds meetings the 2nd Wed. of each month at 7:30 P.M. at the old City Hall in Modesto. On Jan. 19 the Modesto Yacht Club hosted the following amateurs, who assisted in furnishing communications for last year's boat races: W6GYN, W6HAB, W6SQR, W6SKH, K6IXA, K6ODA, K6RPL and K6DMH. WA6SPE is the new Stanislaus County EC. The SJVN had 569 check-ins, 13 traffic, 15 contacts, 1 phone call and 9 bulletins. The Tulare Amateur Radio Club has a 2-meter net in operation on 145.62 Mc. W6ARE and W6ZKH are monitoring after 6 P.M. every day. WA6OJT is working on a plate modulator for his DX-40. W6NKZ has ordered an SB-33 s.s.b. transceiver. W6FXV is blowing out 6146 in his mobile rig. WA6TZN is on 16-20 meters. WA6VMH is on 20-40 meters. W6TZJ is on 6 meters with ½-watt s.s.b. power. WA6CVX is using an SB-10 with an Apache on 75. W6MVU is heard on 75 and 40 s.s.b. with Heath twins. W6KTW is knocking off the DX on 160-meter c.w. WA6MJL is on 75 with a 20A. W6TKF is on 20 with a pair of 813s s.s.b. WA6BUH is on 75 with an SB-10 and a Ranger. Don't forget the Pacific Division Convention to be held in Fresno, at the Town-Country Motel May 18-19. Traffic: WA6ESH 136, WA6YZA 119, W6ARE 16, W6EFB 15, WA6OJT 12.

ROANOKE DIVISION

NORTH CAROLINA—SCM, N. J. Bonuch, W4CH—SEC: W4MFK. RM: K4CPX. V.H.F. PAM: W4ACY. The SEC has been extremely busy in presenting the new AREC plan for N.C. to individuals as well as to clubs. The V.H.F. Contest was a big success. W4ACY made 124 contacts on 6N2 in 4 sections, while W4BUZ reported more than 105 N.C. 2-meter stations actually participated. K4WOD monitors 50.25 and 50.55 Mc. nightly from 7-8. W4COJ tells us of having an FB v.h.f. meeting in Lexington. WA4JCS installed a 50-Mc. rig in his car. W4OAB observed poor ground conditions throughout January. K4SWN conducted another c.d. practice drill in Davidson Co. with 22 participating. Anyone in the Piedmont area interested in joining an AF MARS net on 143.950 should contact AFA4SWN. WA4FJM, NCN mgr. has been occupied with the *Bulletin* and compiling a new Traffic Routing Guide for the c.w. traffic gang. K4QFV made a nice showing during the CD Party. K4RYJ is secy.-treas. of the Coastal Carolina Emergency Net. Good luck to the newly-organized Pamlico Amateur Radio Club in Washington. K4NJW is pres.; WA4EJE, vice-pres.; WN4LOF secy.-treas. Recent new appointees are WA4ANH as ORS; K4TSM, WA4BIF, WA4EAH as ECs. Traffic: (Jan.) WA2WBA/4 133, K4TPK 125, W4PCN 118, W4LWZ 67, WA4ANH 62, WA4FJM 54, K4YCL 51, W4BAW 32, W4FJQ/4 23, K4QFV 23, W4COJ 17, K4MPE 17, W4EJP/4 12, K4IEX/4 12, WA4JCS 5, WA4DAA 2. (Dec.) K4CPX 77, W4ATC 5.

SOUTH CAROLINA—SCM, Lee F. Worthington, K4HDX—SEC: W4BCZ. RM: W4PED. S.S.B. PAM: K4JOQ. A.M. PAM: K4KCO. Nets: C.W., 1900 and 2200 EST 3795 kc.; S.S.B., 1900 EST 3914 kc.; A.M.,

(*Continued on page 124*)

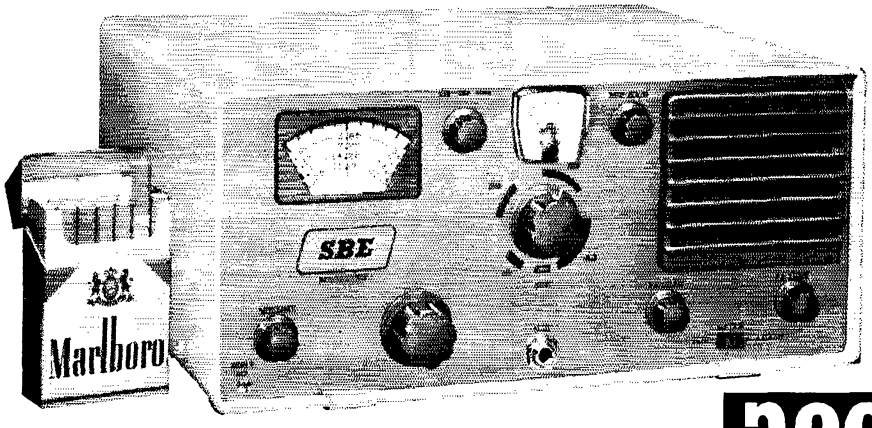
SB 33

"BILATERAL"

Transistorized Circuitry

KEY FEATURE IN THE BIG SB-33 VALUE

Bilateral! Space-age word, key to one of the biggest SSB transceiver values ever! Exclusive SSB Bilateral amplifiers and mixers (pats. appd. for) operate in two directions—avoid needlessly-idle stages in either transmit or receive. This eliminates a boxful of components—simplifies wiring—reduces equipment size—provides savings in cost that reflect in a lower selling price. **There is no compromise!** The compact SB-33 package includes **everything** essential for the brightest state-of-the-art SSB performance—features a **Collins mechanical filter that is used in both transmit and receive!** And add—as further cost-reducing innovations, new SBE overtone techniques for a unit using only three quartz crystals! Advanced solid-state techniques are skillfully applied throughout SB-33 to take full advantage of lower power consumption and superior heat rise properties of transistors and diodes. Equipment is more effective—smaller in size. Stability is inherent, VFO drift extremely low. Both VFO and I-F are gang-tuned on the nose. No critical bandpass circuits.



4-Bands: 80-40-20-15 meters.

Power input: 135 watts P.E.P. maximum (speech waveform).

Receiver sensitivity: Better than 1 uV for 10 db signal/noise ratio.

Sideband selection: Upper or lower sideband selectable by panel switch without change in frequency.

Tube and semiconductor complement:
2—PL-500 beam power tetrodes.
1—12DQ7 driver. 20 transistors.
13 diodes, 1 zener diode.

Power supply: Built in 115VAC supply.

Loudspeaker: Built-in.

Size: 5½"H, 11¾"W, 10¼"D. 15 lbs.

389.50

SB-33 Special inverter, 12V DC/115V AC 59.50

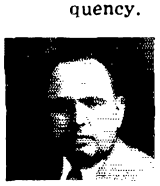
SB-33 Deluxe VOX/Compressor 39.50

SB-33 100 Kc crystal calibrator 27.50

SB-33 Mobile mounting base, locking type 12.50

SB-33 Carrying case, luggage type w/accessory compartment 29.50

SB-33 accessory adaptor for rear of transceiver 1.95



SBE Sideband Engineers Inc. Rancho Santa Fe, Calif.

Faust Gonsett, W6VR, Pres.

1900 EST 3930 kc.; AREC S.S.B., 1830 EST 3914 kc. Wed. New appointments: W4SME as OPS, K4SWF as EC, W4EIF as EC, W4SME as ORS, K4AVU as OO Class I, K4HDX OO as Class I. W4TLC/OES operated from Caesar's Head Mtn. with 2-meter equipment during the V.H.F. SS and is nearing completion of the new 450-Mc. rig. W4VIW, OES and OO is sporting a new "spirairay" beam for 6 and 2 meters. W4PED, RM is looking for contacts with new 6-meter equipment. K4NGT and WA4BRW are on 6 meters with new Clegg 99s. W4HQC is going on v.h.f. with a Clegg Thor VI. With v.h.f. on the up-swing in the state we are looking for more OES appointments. Contact the SCM. ARRL-affiliated clubs are invited to join the State Radio Council by contacting the SCM. The state nets need operators, contact your RM and PAMs. Net traffic: S.S.B. 70, C.W. 58, A.M. 23. Traffic: K4WJR 76, K4LND 55, K4WOI 42, K4VWL 18, WA4CSO 12, W4PED 11, K4YFK 11, K4OCU 8, K4PJW 8, W4NTO 6.

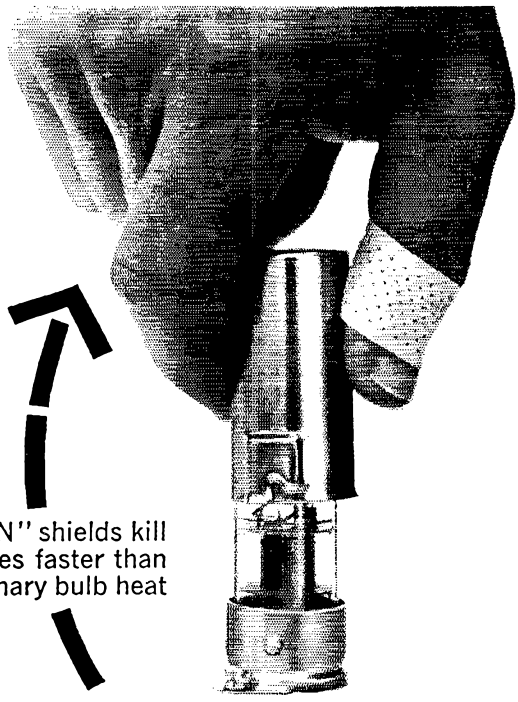
VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM: H. J. Hopkins, W4SHJ. RMs: W4LK, K4ITV, W4IA, W4SHJ, W4QDY. PAM: W4UFX. W4PFC reports another good month of traffic and hopes that it continues. W4DLA is working some 3-5 and 7-Mc. c.w. DX, traffic, revamping the c.w. rig keying and building new station equipment. The Lynchburg 2-meter F.M. Net meets nightly at 2345Z on 146.94 mc. W4NTR reports much inactivity because of equipment failures. W4FOR is sitting tight in regards to a move to a new QTH. WA4JFY is sporting a pair of 811As with 500 watts and knocking off DX like mad. W4PTR has the kw. final on the air now. W4WRG is getting a new v.f.o.-hb job. K4GRZ is the new 4RN representative on Monday nights. WA4GWD is on the Eastern shore working on the station and antennas. W4TE and W4BZE are being frozen out of their shacks! W4LRN had an operation on his wrist. K4YZT is working on an s.s.b. rig. W4JXD helped the Vienna Radio club to get organized. Up Richmond way W4JUJ grabbed two new pieces of wallpaper —USA—CA 500 (600 counties) and WANJ (worked all NJ counties). W4BZE heard and worked his first G on 160 meters. W4KX is as busy with meetings as he is with traffic. K4LTK is on 2-meter mobile f.m. and is looking for contacts on NCF of 146.94 Mc. W4NVX is building a pair of 4-400As. In Roanoke K4JKK is putting up a 350-ft. long wire. OPS W4CVO is country hoppin' with XYL—Peru, Ecuador, Panama, Brazil, and Argentina. Hoping to get to Pakistan and India! The boys report very few phone stations in the CD Party. K4QIX is busy as EC with nine 10- and 6-meter sessions. K4SGQ is going to hep us his speed with a W8FYO key lever. W4PVA has growing pains with the shack. WA4HHP is a new General. Traffic: (Jan.) W4PFC 2282, K4PXY 541, W4DLA 430, W4NTR 244, W4RHA 206, W4DVT 168, W4FOR 106, W4LK 104, K4FSS 90, WA4-JFY 87, K4ITV 70, K4PQL 62, W4PTR 61, K4WVT 41, W4IA 37, W4WRG 33, K4GRZ 31, K4SDS 31, WA4GWD 29, K4MXF 25, W4SHJ 25, W4TE 19, W4LRN 16, K4YZT 14, W4JXD 10, W4PRO 10, W4QDY 10, W4JUJ 9, W4BZE 8, K4BAV 7, W4KK 7, K4LTK 7, W4NVX 7, W4ZAU 7, W4CVO 6, K4JKK 6, K4QIX 6, K4YDL 6, K4SGQ 5, W4OWV 1. (Dec.) K4YDL 131, W4ZM 102, W4OOL 11, K4TZF 10, K4MLD 6, K4SGQ 5, W4PVA 4, K4JYL 3, K4QIX 1. (Nov.) W4OOL 55, K4MLD 3.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM —SEC: W8SSA. RM: K8HID. PAM: K8CFT. C.W. Net: 3570 at 0000. Phone Net: 3890 at 2330 and S.S.B. on 3903 at 0100. Another "ole timer," W8EYV, of Keyser, passed away in January from a heart attack. New officers of the Clarksburg Radio Club are W8CCR, pres.; W8ESQ, vice-pres.; K8LGI, secy.-treas. W8CZT, ex-K4TZV, is recovering at home from a recent illness. K8SKT is very active in AREC work in the Huntington area. Congrats to W8CKX a new ORS, who is giving West Virginia quite a boost on 8RN. W8DFC renewed his ORS appointment and is pushing AREC work in Mercer County. K8ZWM and W8JFP report that prizes are coming in for the State Convention, July 6 and 7 Jackson's Mill. New Generals in the Parkersburg area are K8ZPN and WA8ANT. The BARC had a fine FD score of 938 contacts and 5778 points. The Ruhr Valley Transmitters ARC at Paden City now is affiliated with the League. During the Centennial year, look for West Virginia amateurs around 3570-3890-3903-7050-7205-14,-050-14,300-21,050-21,350-28,050-28,800. Traffic: W8NYH 98, W8CKX 67, K8ZWM 64, W8DUV 58, K8TPF 42, K8UQY 40, K8KST 16, K8ELH 14, W8HZA 11, W8JM 7.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: WØSIN. PAMs: WØCXW, WØIJR and WØGNK. RM: WØFEO. ORSs: KØDCC, KØMIC and KØSLD. Colorado's newly-elected SCM, Don Crumpton, is sporting an HT-32 transmitter. Send reports to Don at 1200

(Continued on page 126)



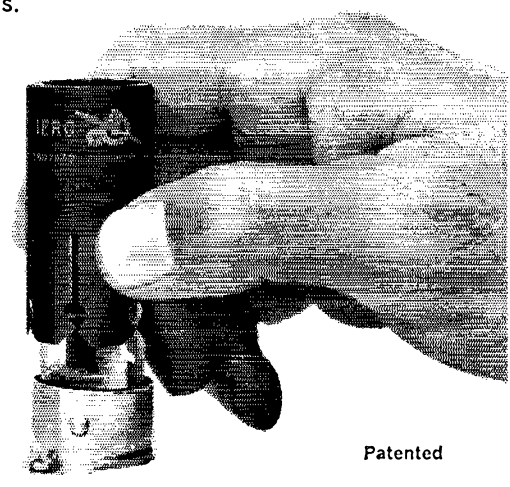
1.
"JAN" shields kill tubes faster than ordinary bulb heat

HERE'S THE WAY TO DOUBLE ELECTRON TUBE LIFE!

This low cost quick change to **IERC TR heat-dissipating tube shields** can extend tube life 2 to 12 times in any equipment.

TR series shields install as quickly as shown into your present equipment, giving failure-free performance proved in new military and industrial equipment using IERC shields.

2.
Heat-dissipating shields extend tube life 2 to 12 times



Patented

For **complimentary** 24-page catalog, prices and sources for TR's, write:

IERC DIVISION

INTERNATIONAL ELECTRONIC RESEARCH CORPORATION
135 West Magnolia Boulevard, Burbank, California • Victoria 9-2481

Alexander Circle, Pueblo, Colo., by the 5th of each month. KØWWJ reports a 21-mile contact on 1¼ meters using a Nuvistor rig. George Fredrick, of the Hewlett-Packard Corp., gave a lecture and demonstration to the Pikes Peak Radio Amateur Assn. Jan. 9. The HP oscilloscope demonstrated is manufactured in Colorado Springs. KØWMD is conducting code classes at the YMCA Youth Center for the PPRAA. Congratulations to KØQGO on his expert handling of the *Colorado Traffic Net News*. Myron is a student at Pueblo College. HNN sessions often were completed in January with the help of out-of-state stations. KØDCW stated that band conditions were rough. WØIA reports a total QN1 of 1052 in January for the Colorado Weather Net. Long skip also plagued CWN. Congratulations to WØBWJ on his reelection as Rocky Mountain Division Director. Traffic: WØKQD 116, KØZSQ 74, KØDCW 72, WØENA 42, KØTTB 15, KØWWJ 10, WØMYB 1.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, W7OCX. SEC: K7BLR. W7QWH was awarded the PICON award for Utah for 1962 for his work in recording *QST* for blind amateurs. K7NWP earned another BPL card for January traffic. Olympus High School Radio Club officers are Larry James, pres.; Steve Olsen, vice-pres.; Ron Flowers, secy.-treas. W7OSV is one of the sponsors of the group. W7OCX, the Division Vice-Director, gave the main address at the annual Ogden ARC installation banquet. WØBWJ, the Director, spoke on incentive licensing. K7RPA has been appointed OO. The Utah ARC in Salt Lake has nearly 100 per cent ARRL membership. Line noises and other interference have become an acute problem in the Kearns area. Traffic: K7NWP 515, W7OCX 58, W7QWH 4, K7RPA 3.

NEW MEXICO—SCM, Carl W. Franz, W5ZHN—SEC: K5QIN, V.H.F. PAM: W5FPB. 10-Meter PAM: W5WZK. Welcome to WN5FQP, WN5FQQ and WN5FRI, new in Albuquerque and Novices and members of the Yale ARC for the handicapped. We are very happy to have you fellows with us. Our thanks to W5PIZ for his contribution of some very useful parts to the Yale ARC. New officers of the Albuquerque ARC are W5KDT, pres.; W5LTR, vice-pres.; K5YTQ, secy.; W5GXR, treas. New officers of the Albuquerque V.H.F. Club are W5LTR, pres.; K5HMN, vice-pres.; W5FPB, secy. W5WZK received a letter of thanks from the Albuquerque Chamber of Commerce for his work with the Tourist Comm. in the past year. The *Denver Post* will print an article on the Albuquerque amateurs who handled many tourist messages. A RACES week end field test will be held shortly for the Albuquerque area. The 1963 N.M. QSO Party was most successful; W5LEF, W5CK and K5UYF went to Taos County and made over 600 contacts over the week end. Traffic: W5UBW 59.

WYOMING—SCM, L. D. Branson, W7AMU—SEC: W7HH. The Pony Express Net meets Sun. at 0830 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.; the Wyoming Emergency Net at 1215 MST every day on 3920 kc.; WØBWJ, Rocky Mountain Division ARRL Director, located in Denver, Colo., visited the Casper Amateur Radio Operators at a meeting held in the radio club house and made a very good speech to a very large group of hams, old and young. W7BXS, Assistant Director, from Casper, also was in attendance and gave an instructive speech. Coffee and cookies were served after the meeting. Traffic: (Jan.) W7DXV 68, W7AMU 59, W7HH 33, W7BHH 19, W7NMW 15, W7AEC 11, W7LKQ 7, W7LVU 6, K7QJW 2, K7QYG 2. (Dec.) W7HH 30.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William S. Crafts, K4KJD—SEC: W4NML. RM: W4USM. PAMs: K4BTO, K4DJR. V.H.F.: K4TNS, K4WHW. New officers of the Decatur Club are W4BFM, pres.; WN4GGG, vice-pres.; WA4GGD, secy.; K4SMF, treas. New officers of the Muscle Shoals Club are WA4GOO, pres.; K4ZBX, vice-pres.; K4RIL, secy.-treas. New officers of the N. Ala. Hamfest Assn. are WA4GNG, pres.; K4WHW, vice-pres.; K4UEC, secy.; W4BFM, treas. Remember the Montgomery Hamfest will be held April 21. See you there. K4WOP is the new manager of AENT. Attention Novices: The Ala. Novice Net (AEND) meets daily except Sun. on 3725 kc. at 1600 CST. Everyone is welcome to call in. K4YUD made BPL again. He also received a 30-w.p.m. CP sticker. Attention U. of Ala. hams: Write U. of Ala. ARC, Box 3007, Univ., Ala., or see K4WWP, Room 10, Wyman Hall, to help get a station going. K4NKT has a new 10-15-20-meter vertical. WA4CWF is a new General in Holt. K4VQJ has a new 6-meter rig. Others new on 6 meters: W4FTT, WA4KMA, W2HDS/4, WA4LVK. The

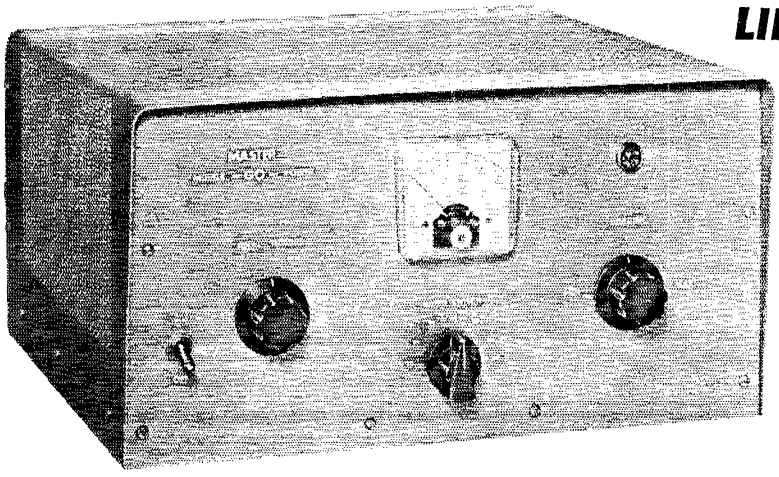
(*Continued on page 128*)

GO MOBILE WITH MASTER MOBILE'S

MASTER

MOBILE "GO" POWER

LINEAR AMPLIFIER



MODEL K-73

$289.50

AMATEUR NET

BUILT ESPECIALLY FOR MOBILE SSB OPERATION

OUTSTANDING FEATURES

- SMALL SIZE: 13½" wide x 6½" high and 12½" deep.
- WEIGHT: 15½ pounds.

2-811A zero bias triodes in grounded grid.

750 Watts PEP.

500 Watt self contained TRANSISTORIZED DC Power Supply employing a bridge of solid state rectifiers for excellent regulation.

Provision for five wire remote control cable for On-Off Switch, Pilot Light, Plate MA or RF Output Meter and Push-to-Talk Antenna Changeover Relay.

Panel meter measures plate current or RF output.

Ideal linear amplifier for any 50-100 Watts SSB exciter, such as KWM-2, SWAN, HALLICRAFTERS, SONAR, etc.

Covers 10, 15, 20, 40 or 80 meter operation with a heavy duty band switch.

Internal antenna relay allows barefoot operation when amplifier is not in use.

Wide range PI-NET output.

Does *not* require additional batteries in *most* automobiles.

PRODUCT OF THE YEAR!

Master Mobile Mounts INC.

"Leading the Antenna Industry Since 1945"

4125 W. JEFFERSON BLVD. LOS ANGELES 16, CALIF.

JOBBERS— WRITE FOR COMPLETE CATALOG & DISCOUNTS

Mobile ARC members collected money for the "March Of Dimes" Telethon Jan. 19-20. Traffic: (Jan.) K4YUD 123, WA4BDW 121, K4AOZ 77, K4BSK 67, K4WOP 67, K4KJD 39, K4WHW 39, W4USM 36, W4FQG 31, K4ZTT 30, K4DJR 25, W4NML 20, W4YER 20, WA4HCW 16, K4HJM 13, K4BRZ 11, K4BTO 10, K4FZQ 8, W4DS 7, K4CTB 6, WA4EEC 6, WA4HGN 6, W4RLG 6, K4NSU 5, WA4EDF 4, K4KDE 4, K4PHH 4, K4WSH 4, K4JDA 3, W4PEX 3, K4RSB 3, K4WWP 3, WA4GNG 2, K4GXS 2, W4MI 2, K4NKT 2, K4WSK 2, K4WSS 2. (Dec.) W4YER 81, K4CFD 75, WA4HCW 25, K4PBY 2, K4KDE 1.

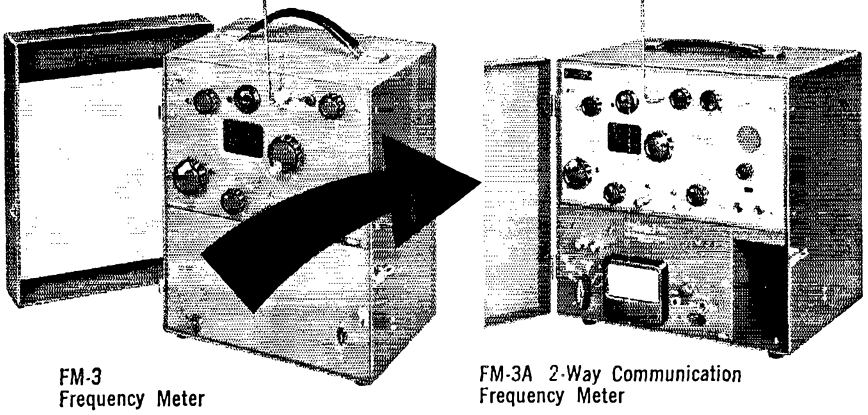
EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: W4IYT. RM: K4KDN. RM RTTY: W4EHU. PAM: 40 W4SDR; 75 K4LCF; S.S.B. W4OGX. W4RMU has resigned as V.H.F. PAM for personal reasons and there now exists a vacancy in this appointment for a good v.h.f.er who does not mind doing some organizational work. Those interested, please contact the SCM for details. The SSB Fast Traffic Net is now operating on 3940 kc. Mon. through Fri. at 1830 EST and Sun. at 1800 EST. Now is your chance to check up on your current ability to handle traffic without waiting for those emergencies that *do* crop up. W4EXM finally has his Iran call, EP2AM, and is operating on s.s.b. An emergency 2-meter link was provided between the Titusville Airport and FAA Orlando Jan. 27. WA4FYV, RACES station Palm Beach County, operated a station at the South Fla. Fair and Exposition at West Palm Beach Jan. 25 to Feb. 2. Congrats to W4GWF and the gang on a fine job. The 2BEN sked has been changed to Mon. nights, same time. This puts the Dade and Broward AREC Nets the same days and time. This gave you ECs an idea? Traffic: (Jan.) WA4BMC 1700, WA4IJH 664, W4TUB 542, W4KIS 460, W4MIN 422, K4SJH 406, WA4FYV 293, K4KDN 264, W4SDR 256, W8LDU/4 234, K4BY 214, WA4GBM 211, K4AHU 168, WN4IXI 158, WA4BGW 157, W4EHW 156, W4TRS 141, W4CIL 128, W4AKB 118, K4LCF 105, K4YSN 101, WA4CJC 70, K4COO 66, WA4LHK 66, K4AKQ 61, W4EAT 59, WA4CNZ 51, WA4FGE 46, W4CWD 41, W4BKC 38, WA4COR 38, K4DBT 38, WN4CSS 36, K4ENW 32, K4VNA 30, K4NXW 29, WN4IXS 28, WA4KGH 26, K4RNG 26, W4ZZZ 26, W4OGX 25, K4JWM 23, WA4ACI 17, K4AX 16, W4BNE 14, K4MGX 14, W4SVB 14, K4FQP 13, W4DFZ 11, K4MTP 11, W4AYD 10, W4QVJ 10, K4ZIF 9, WA4IHH 8, W4NOK 8, K4LJS 5, WA4AZZ 4, W4BBZ 4. (Dec.) W4SDR 240, WA4CJC 147, K4AKQ 72, K4RNG 55, K4AX 45, W4IYT 32, K4ENW 30, K4MZR 17, K4NXW 16, W4QVJ 15, K4JZU 8, W4LMT 7, K4JZX 2, W4LVV 2, WA4CNZ 1. (Nov.) K4MZR 25, K4NXW 7.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: W4BVE West. Fla. was represented at the S.E. Division Convention by your SCM and SEC, along with W4BVE, WA4FIJ, WA4FJF and K4GVV. The Fla. AREC Plan received high praise. Panama City: West Fla. ROs and ECs met to hear W4UHY, State RACES Radio Officer, speak. Plans were firmed up for area, district and county net frequencies under RACES. On two occasions 3-meter mobiles took part in fund-raising campaigns, with good coverage of a 25 square mile area. The coordinator was WA4FIJ. WA4FJF is a new OO. The PCARC has on-the-air code practice at 0200Z Thurs. on 29.0 Mc. Cross City: WN4LGC is active on 80- 40- and 15-meter c.w. Fort Walton: V.h.f. activity is on the upswing with a number of 220-Mc. surplus transceivers on the air. The EARS took part in the V.H.F. Sweepstakes, operating W4SRX on 6 and 2 meters from atop a 100-ft. fire tower. WA4BOZ is working on RTTY gear. W4KWX is mobile on 2 meters. K4CZA has been transferred. K9TXT has 100 watts homebrew on 145 Mc. WA4DYN was appointed OES, Pensacola: K4BZJ keeps 29.560 Mc. hot. K4KIF, W4MS and W4EQR are building new rigs. W4AXP is breaking in a new SX-101. The PARC is remodeling the clubhouse. Traffic: (Jan.) K4VFY 335, K4BDF 23, WA4FIJ 21, W4GAA 15, W4ZGS 2. (Dec.) K4RDF 53.

GEORGIA—SCM, James A. Giglio, W4LG—SEC: W4YE. PAM: W4KR. RM: W4DDY. Stations are invited to check into the Georgia WARN drill on 3550 kc. at 2030 EST the second Sun. of each month. The Amateur Radio Club of Augusta is conducting a code and theory class. Contact W4AAY for schedule data. K4DKY is sporting a new 6-meter transceiver. W4LNG reports good results with a newly-designed automatic noise generator. Converting a tool shed into a ham shack has been the main activity of WA4CZM, temporarily QRT. Welcome to new hams WA4FOA, WA4CEQ, WN4KJL, WN4KOV, WN4KZZ, WN4LBT, WN4LWZ, WA4EJX, WN4MDS, WN4JHE and WN4JTC. Each received help from the code and theory class sponsored by the Atlanta Radio Club and conducted by K4ZYK and WA4ENC. Congratulations to W4RLZ, who qualified at 54.3 w.p.m. on c.w. with W1NJM. Don't forget the League Officials

(*Continued on page 130*)

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

meeting, the 1st Sun. of each month on 3995 kc. following the Georgia Cracker Mobile Net. Lost: One antenna. Anyone with information contact K5ETX/4. W4WKP has joined K4BAI and K4QPL at Mercer. The RMs of Georgia and South Carolina live one mile apart—across the Savannah River. K4TEA has changed to a heavy-duty TA33 beam in preparation for the kw. W4LME has been hospitalized for tests prior to retirement. W4-MLA has his first license, dated May 17, 1923, and first ARRL membership certificate, dated Jan. 24, 1924, on display in his shack. W4ZYU writes from Pakistan. New appointments: K4DLE as OES; W4DOC and K4NQQ as OPSs; K4VHC as ORS; WA4AFP and WA4JCH as ECs. Traffic: K4MCL 532, W4DDY 170, K4WWY 168, W4PIM 68, K4FRM 60, K4YRL 54, W4HYW 53, W4MLA 35, K1KSH/4 33, W4LME 20, W4YE 16, K4BVD 13, K4ZYI 12, W4AAY 10, K4QPL 10, W4BZ 4, K4DKY 2, W4OHA 2.

WEST INDIES—SCM, William Werner, KP4DJ—C.D. Radio Officer: KP4MC. QSL Bureau Manager: KP4-YT, Box 1061, San Juan 5. On Dec. 15 the supposed mountain-barrier to 144-Mc. signals was overcome when KP4AAN in San Juan, on the north coast of P.R., successfully made contact with KP4ES, on the south coast. KP4AAN used a Gonset Communicator driving a Viking 6N2 Thunderbolt feeding a Telrex 20-element beam with a 22-ft. boom on top of an 85-ft. tower located on a hill 485 feet above sea level. His receiver is an RME converter into a Collins 51J4. KP4ES used a Heath Seneca feeding a comparatively small array of two stacked six-element beams. His receiver is an Ameco converter into a Collins 51J4. On Dec. 16 KP4CK, in San Juan, with the help of son KP4AMG, raised his antenna consisting of two stacked eight-element beams on 16-ft booms to the top of a 65-foot tower fed by a Polycom 6-2/Viking 6N2 Thunderbolt combination and also contacted KP4ES. KP4CK receives with an Ameco converter into either a 75A4 or Drake 2B or the Polycom receiver section. W4RUX/KP4CGB received Navy MARS appointment and was assigned to call NØ-RSY. If interested in Navy MARS, contact Wess, KP4-CGB/NØRSY, at Box 2029, San Juan. KP4CGB, NCS of AEWN, reports the net had a very successful season. KP4BEA worked 200 countries with his HT-37 during 1962. KP4AOO took down the tower for repairs and is using a vertical. W4CG is stationed in KP4-Land with the FAA at International Airport. KP4BHR and his XYL KP4BIE got their first harmonic on Christmas Day. OPS KP4BAU has been transferred from Ramey AFB to Griffis AFB, Rome, N.Y. KP4AWZ is transferring from Roosevelt Roads to Naval Comms Station, Washington, D.C. KP4ABA tied the end-fed Zepp to a Viking I through the antenna coupler and r.f. ammeter. KP4PZ has a 40-meter vertical folded dipole 60 feet high. KP4CH put up inverted "Vee" antennas for 80, 40 and 20 meters and gets reports of 3 S units more when using a 40-meter dipole on 15 meters. KP4SV uses a HyGain dual-doublet on 80 and 40 meters. An s.s.b. ragchewers round table is held every night at 9 on 3810 kc. with KP4CK, KP4CO, KP4DP, KP4ES, KP4RD and KP4SV. KP4AXU, at Ramey uses a Ladder Line to feed 40- and 80-meter antennas. Old Timers on 40 meters Sun. morning are KP4AY, KP4BQ, KP4BY, KP4CC, KP4CH, KP4CO, KP4DJ, KP4ES and KV4BA at St. Thomas. KP4GN, Guayama, transmits RTTY. KP4BCA, NCS of the AREC Net on 21,370 kc. Mon. at 2330 GMT, reported the net resumed Jan. 7 with KP4AYP, KP4AXO, KP4ASL, KP4BBN, KP4BDO and KP4SV checking in. KP4AFL, at Mayaguez, has all Heath equipment. DX-100, SB-10, HO-10, HA-10. KP4SV bought a Collins S/Line station so sold the 100V to KP4AWZ, who sold his 20A to KP4ASK, who bought a p.p. 813 linear from KP4APY, who is on a.m. KP4AWH has a new Swan 75-meter transceiver. KP4DV's son KP4BJU has registered in the AREC. During four months as a Novice he worked 40 states and 18 countries using a Viking Adventurer, a dipole antenna and an HQ-170 receiver. KP4BJD and KP4BHY publish a magazine called *QPT*. KP4CH has a new Hallicrafters HA-5 v.f.o. KP4AZ is working VK/ZL around 7002 kc. midmorning and late afternoon before dark, using a base-loaded grounded vertical antenna. KP4ACF, president of the PRARC during 1961-1962 died in Biloxi, Miss. after a short illness. Another Silent Key is KP4AU, who died Jan. 12 at Sabana Grande. KP4AWH worked 47 countries on 75-meter phone. KP4AWH raised the center of an inverted "Vee" to 50 feet. KP4BHY sent for an AREC registration form. KP4BJD's photograph appears in the Jan. 1963 issue of *Popular Electronics*. KP4WT reports into five different nets: The Antilles Weather Net, Civil Defense Net, Civil Air Patrol, AREC Net and MARS. KP4TL's photograph appears on page 73 of Feb. *QST*. Traffic: (Jan) KP4WT 128, KP4BJD 15, KP4AFL 4. (Dec.) KP4WT 98, KP4BAU 34, KP4AFL 4. (Nov.) KP4WT 86, KP4BAU 40, KP4BCA 2, KP4BJD 2.

(*Continued on page 132*)

1963 EDITION

The RADIO AMATEUR'S HANDBOOK

By A.R.R.L.

AN INVALUABLE reference work and text for everyone—hams, engineers, lab men, technicians, experimenters, students, purchasing agents.

Distributors throughout the Nation have the 1963 Edition in stock. Better get your copy of this complete Handbook now. The demand is tremendous!

In the pages of this latest edition will be found, in addition to accumulated knowledge since the first Handbook was issued in 1926, up-to-date information invaluable to ham and engineer alike. Every field of ham radio is covered: transmitting, both c.w. and 'phone; single-sideband and a.m.; receiving; propagation; antennas; construction; theory; charts; diagrams; circuits; transistors; miscellaneous data; procedures; station operation, etc.

The 1963 Edition contains

- **Sections on Theory; Electrical Laws and Circuits, Vacuum Tube Principles, Semiconductor Devices, High Frequency Communication, Antennas, Transmission Lines, Modulation V.H.F. and U.H.F.**
- **Sections which include How-to-build-it articles dealing with Receivers, Transmitters, Power Supplies, Radiotelephony, V.H.F., U.H.F., Antennas, Mobile Equipment, radioteletype, transistorized equipment, etc.**
- **A separate section on test and measuring equipment**
- **34 pages of data on vacuum tubes and semiconductors, a great time-saver to both engineer and amateur. One of the most complete compilations of its kind available anywhere.**
- **Many valuable catalog pages listing manufacturers' and distributors' products and services . . . a useful supplement to the editorial section**
- **Plus thorough treatment of such subjects as assembling and operating a station, BCI and TVI, construction practices, etc. — *and fully indexed and completely illustrated throughout. You can locate in a jiffy what you want.***

$3.50 U.S.A. Proper **$4.00** U.S. Possessions and Canada. Elsewhere, **$5.00.** Clothbound Edition, **$6.00** U.S.A., Possessions and Canada, **$6.50** Elsewhere. All prices postpaid.

The AMERICAN RADIO RELAY LEAGUE, INC.

West Hartford 7, Conn. • *U.S.A.*

SOUTHWESTERN DIVISION

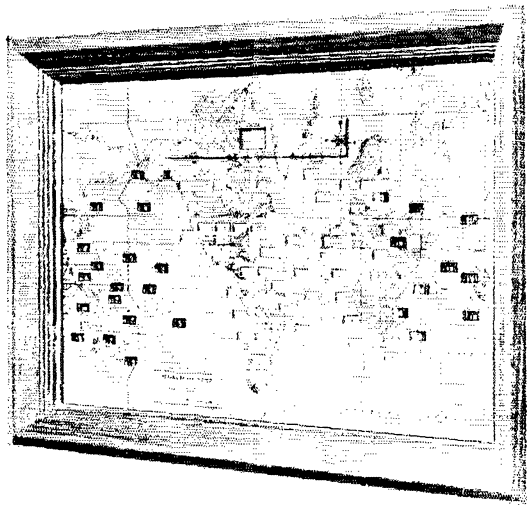
LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—Asst. SCM: Lyle G. Farrell, W6KGC. SEC: K6YCX. RM: W6BHG. PAMs: W6ORS, K6PZM. The following stations earned BPL in January: K6EPT, W6GYH, K6MDD and WA6YLZ. Congrats, fellows! New officers of the San Fernando Valley Radio Club are WA6IZO, pres.; K6RVA, vice-pres.; WA6RMT, secy.; WA6PPY, treas. WA6YLZ is running a Gonset III on 2 meters. WA6SNK reports that his mother is doing fine with the call WN6BNP. WA6HUO is helping patients at the VA Hospital with the AREC group. W6AM and a large group from the section attended the joint DX conclave at Paso Robles. WA6USU grabbed his first JA! K6COP completed his senior project at Cal-Poly on Intrared Communications. New officers of the Southeast Radio Club are K6DPG, pres.; K6KCU, vice-pres.; K6LOP, secy.; K6URT, treas. WA6YIT reports some fine openings on 6 meters to Texas and Colorado. The Tri-County Amateur Radio Assn. meets the 2nd Mon. of each month at the Naval Reserve Training Center in Pomona. K6HIT reports that donations for the Rose Parade Amateur Radio Float should be sent to: Amateur Radio Rose Parade Committee, Box R, San Gabriel, Calif. K6CSR is back to work and on the air after a heart attack. WA6DWP spent his vacation in the Monterey-Carmel area. WA6DJB received his A-1 Operator Club certificate. Congrats Dick! K6CDW is in a new QTH in Canoga Park. New officers of the South Bay Wireless Society are WA6LAM, pres.; WA6BNI, vice-pres.; K6HIT, secy.-treas. WA6UHM received his CP-30. Congrats, Bob! K6KUC has his new all-band vertical tower up. Support your section nets. On c.w., SCN meeting daily at 0300 GMT on 3600 kc.; on phone, SoCal 6 meeting daily at 0300 GMT on 50.4 Mc. Traffic: (Jan.) K6EPT 995, W6GYH 563, K6MDD 500, W6WPF 224, WA6WTK 219, WA6YLZ 212, W6QAE 152, WA6TWS 135, WB6BBO 103, WA6DJB 100, K6ZDL 95, W6BHG 90, K6HIT 81, WA6TYV 29, WA6SNK 25, WA6CXB 19, WA6KAW 17, W6CK 8, W6ORS 6, WA6USU 5, WA6CKR 4, W6USY 4, W6LVQ 2, WA6ORS 2, W6SRE 2, W6VOZ 2. (Dec.) WA6YLZ 220, K6UMV 91, K6YVN 63, K6SIX 59, W6NKR 9, WA6CKR 6, WA6SLF 4.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—Asst. SCM/SEC: 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; the Arizona Interstate Net, C.W., Mon. through Fri. at 1900 MST on 3555 kc. The Maricopa County AREC Net will meet each Thurs. night at 0200 GMT (7 P.M. MST) on 28,620 kc. Congratulations to W7FKK, who has made the BPL for two months running. Traffic: W7FKK 502, W7AMM 245, WØWHE/7 114, K7CET 7.

SAN DIEGO—SCM, Don Stansifer, W6LRU—Although 1963 is well under way, reports of elections in the section highlight news this month. Officers of clubs in the section follow: The San Diego VHF Club—WA6OSB, pres.; WA6LAG, vice-pres.; and WA6SKT, secy. The Anaheim Amateur Radio Association—K6JBG, pres.; WA6IYX, vice-pres.; WA6NFI, secy.; WA6YKT, treas. and W6GZK, act. mgr. The American Radio Club of El Cajon—WA6ZMZ, pres.; WA6YSQ, secy.; and WV6ZAC, treas. The North Shores Club—K6QPZ, pres.; WA6UET, vice-pres.; K6VTO, secy.; and W6SK, treas. National City Amateur Radio Club—K6TFT, pres.; WA6BDW, vice-pres.; WA6TAD, secy.-treas. The South Bay Amateur Radio Society—K6UMC, pres.; WA6COI, vice-pres.; WA6GBF, treas.; WA6HXB, secy. WA6ZID reports a new club at the Westminster High School in Orange County. WA4HKO, ex-operator at KH6AJF, is now at W6IAB. W6PAN spoke to the North Shores Club in February on "Satellite Tracking." W6IES has a new 6-meter s.s.b. exciter and final. About 20 stations now operate f.m. on 146.840 Mc. in San Diego. Local FCC Engineer John Crews spoke to the American Radio Club in El Cajon in February. The shack at K6IME, a new QRS in Tustin, is 27 by 45 inches, including space for him. The new NCS for the 2-meter AREC net at 1900 Tue. on 145.5 Mc. is K6TFT. Your SCM visited the Orange County Club in Santa Ana in February. Field Day was the topic at the Newport Club in February. The San Diego V.H.F. Club offers a certificate for working 10 members from the county, 7 out of the county, or 5 from out of state. Traffic: W6IAB 3433, K6BPI 3283, W6YDK 2213, W6EOT 372, K6LKD 177, WA6CCD 167, WA6ROF 87, K6IME 80, WA6UUO 29, K6GJM 10, K6TFT 10, WA6ZID 7.

SANTA BARBARA—SCM, William C. Shelton, K6AAK—The Lompoc Club has a nice newsy letter on a monthly basis and has a new meeting place promised in

(Continued on page 134)



If it's 10 O'Clock in your shack

WHAT TIME IS IT IN ZANZIBAR?

With a World of Time electric wall clock, you'll know the answer is 6:00 O'Clock — same as for Moscow. Set the World of Time clock for the correct hour in your zone (with daylight saving time adjustment) and you know the correct Standard Time in 70 different cities and in every time zone. See at a glance the location of your contact, his time zone, and the present hour there . . . whether he is on the hourly, half-hourly, or even the 20-minute system, as in Monrovia! Height 15", width 19", depth 4¾". Amateur Net $49.95

OTHER HARVEY VALUES OF THE MONTH

Toroid Low Pass Filter — Handles up to 25 to 30 watts of audio; needs no maintenance; is better than a speech clipper. Contains five toroidal coils in an L/C network . . . pass band 300 to 2,500 cps ± 3 db . . . extremely sharp cutoff at 3,200 cycles . . . impedance 500-ohm in and out . . . weighs 3.6 lb. . . . dimensions, 3⅜x3⅜" x 5". Use in single side band applications, in 500-ohm line from speech driver to modulator, in 500-ohm receiver output, and as a telephone line filter for broadcast stations. Amateur Net $9.95.

Rotron Whisper Fan— The fan that moves 60 cu. ft. of air per minute . . . while running so silently you have to look to see if it's running! Removes heat to save your rig, yet uses only 7 watts. Measures 4½" square by 1½" deep. Has run for years in computers and other commercial equipment without attention—lifetime lubricated. Amateur Net $14.85

Extra-Sensitive Head Phones by Superex— 600-ohm impedance; extra-high sensitivity for weak signals and hard-to-read stations . . . reproduction is crisp, free of distortion . . . unequalled wearing comfort over long use. Amateur Headphone Model AP-S. Amateur Net $24.95

Include postage with your order . . . any overages will be refunded.

Uni-card

HARVEY RADIO CO., INC.

103 West 43rd Street, New York 36, N. Y. 1 Block from Times Square / **JUdson 2-1500**

Visit our new subsidiary, FEDERAL ELECTRONICS, INC., Vestal, N.Y. for all your industrial needs.

the new recreation hall. Newly-elected officers are W6-JFP, pres.; WA6WCD, vice-pres.; WA6JAB, treas.; and WA6JZW, secy. WA6JON reports on the VAFB Lockheed Employees Amateur Radio Club activities, such as the support of launching the Oscars. The club has a membership of 50. W6YCF was visited by W6MLZ and W6-GTE. The DX Club convention held at Paso Robles was well attended. K6TOE is the new secy. of the Estero Radio Club at Morro Bay. WA6RNY is a new club station at Hancock College. The Oxnard Club paper, the *Keyer*, reports the activities of Ventura County. Nets: OEN, 3930 Tue., Thurs. 2000, Sun. 0830. OVHFN, 145.2 Mon. 2100. SBCCN. 145.0 daily 1830. Traffic: K6-AAK 12, W6YCF 3.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Hurbin, W5BNG—Asst. SCM: E. C. Pool, W5NFO. SEC: K5AEX. RM: W5LR. The editorial on page 9 of Feb. '63 *QST* has stirred up much comment from the many readers of the magazine. My suggestion is that you put your comments in writing and send them to the Editor or to your Director. The only way the League can know what you want is by your letters and not your comments on the air. Congratulations to the Boomtown ARC, Burkburnett, Tex., the Texas Instrument ARC, Dallas, Tex., and the Red River ARC on the affiliation of your clubs. Please keep me informed of your activities. The Red River ARC took part in the March of Dimes Telethon and collected more than 50 per cent of the total collections. WA5AOE is teaching theory, K5RCB is teaching code and WA5CMC is instructing in operating procedures and FCC regulations in the class for Novices being conducted by the Red River ARC. W5-BNG became eligible for the Grand-pappy Club Feb. 2. Oh, yeah, it was a boy. LU3DCA and his XYL visited K5TKR and K5ZBM in January. Please let me have your traffic reports and news by the 4th of the month so I will have time to include them in my report. Thanks to the transplanted Texan in South Carolina for your card. It let me know that my efforts to give you the news from this section were not wasted. Why didn't you identity? Some of your friends here might like to know about you. Traffic: K5ILL 300, W5BKH 206, W5LR 82, K5KNX 75.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—New officers of Bartlesville Radio Club are K5WVS, pres.; W5JMF, vice-pres.; K5HLA, secy.-treas. The 2-meter group in Bartlesville is growing and includes K5HLA, K5CKP, K5UZL, K5DJB, K5JTG, K5AUX, K5USY, W5YLH, WA5ASX and K5WMX. New officers of the Aeronautical Center Amateur Radio Club are W5RRN, pres.; W5HXT, vice-pres.; W5EHC, secy.; K5QWZ, assistant to the president for associate members. WA5-BXW, of Oklahoma City, has his General Class license at age 12. K5QAK is now an XYL. WA5CHD and WA5EQP are new Generals at Enid. The Oklahoma City Amateur Club sponsored a "Bean Supper" Jan. 11. W5JJR, Tulsa County EC, announces that 29.6 Mc. will be an emergency mobile frequency in Tulsa. New officers of the Oklahoma City V.H.F. Club are W5PPE, pres.; K5RRQ, vice-pres.; K5VRL, secy.; K5LRE, treas. An old-timer, W5JP, has joined the ranks of Silent Keys. Harve will be missed by his many friends. The Enid Club just finished with a code class. Rumors have it that W5EJK got the hi-fi bug. K5ZEP is home from the hospital. K5CAT is not satisfied with putting signals in the air—he got in the air with a new plane. A5DGD likes the good old summertime—water doesn't freeze. W5GIQ has a new 60-ft. tower for 2 meters. Let us have your news, fellows. Traffic: (Jan.) K5TEY 527, K5IBZ 286, W5PPE 241, K5VNJ 145, K5AUX 109, W5DRZ 95, W5QMJ 77, W5CCK 31, W5PML 29, W5JMQ 26, K5DLP 25, K5OCX 15, W5PNG 10, K5ZCJ 10, K5CBG 8, K5JOA 7, W5EHC 4. (Dec.) W5VCJ 34, W5FKL 2.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. E. W. Street, VE1EK, and H. C. Hillyard, VO1CZ. K7GVM/VO1 reports that the Argentia club is now active with W5CPD, pres.; K1QVI, vice-pres.; WA4HYC, secy.-treas. The club has reactivated the "COD-FISH" award with the following stations, all operating /VO1, available for points: K1QVI, W1UHK, K2EEA, K3CNU, W3SSL, K4DJC, W4EHQ, WA4NYU, WA4KJR, W5CPD, WA5EWB, K7GVM, WA8DKZ, K9-HXT and WAØAMP. VE3ERM/1 reports the UNB Club station is active with a DX-40 Mohawk, Hi-Gain Tribander combination. VE1OC reports formation of a 10-meter net for local activities in the Halifax area. The net meets at 10 A.M. Sun. on 28.3 Mc. with the following VEIs reporting in regularly: AAY, AI, AIH, AIP, AJF, BC, CT, DX, OC, PO, YE, WX, ZP, NU and XP. Aaron also reports a 6-meter net active Sun. at 10 A.M. on 50.15 Mc. All stations are invited to participate.

(*Continued on page 136*)

"CALL ME for Personal Service"

Bob Henry
WØARA
Butler, Mo.
ORchard 9-3127

ON

"CALL ME for Personal Service"

Ted Henry
W6UOU
Los Angeles
GRanite 7-6701

OPEN NOW
THE 3rd
HENRY RADIO STORE
931 N. Euclid Ave.,
Anaheim, Calif.

WORLD'S BEST TERMS

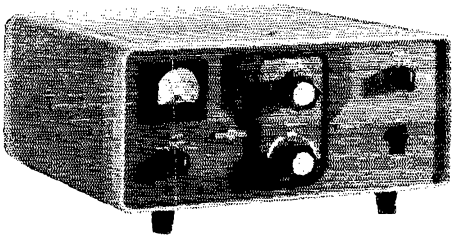
Because we finance our own terms . . .

- Only 6% a year finance cost
- 20 months or longer to pay
- Only 10% down (or your trade-in as down payment)
- No finance charges if paid within 90 days
- Reduced charges if paid off ahead of time
- You get more flexibility of financing in the future (such as re-financing) because we handle our own financing

A-1 Reconditioned Apparatus

Nearly all makes and models. Big savings! Ten day trial—90 day warranty. 90 day full trade back on new apparatus. Write for bulletin.

Collins



62S-1 VHF Adapter	$ 895.00
75S-3 Receiver	680.00
30L-1 Linear Amplifier	520.00
KWM-2 Transceiver	1150.00
32S-3 Transmitter	750.00
516F-2 AC Power Supply	115.00
MP1 12V DC Power Supply	198.00
75S-1 Receiver	520.00
30S-1 Linear Amplifier	1556.00

Write, phone or visit either store today!

Inquiries and orders from military men and others outside USA wanted

Butler 1, Missouri
ORchard 9-3127

Henry Radio Stores

11240 West Olympic Blvd.
Los Angeles 64 Ph. GRanite 7-6701

BIG TRADE-INS

"World's Largest Distributors of Short Wave Receivers"

Signal reports on stations heard are welcomed from those unable to call in. VE1EK and VE1ZZ are active on 1.8 Mc. A new call is VE1AKZ. VE1WB and XYL Gertie are pleased to announce that their newly-arrived 3rd jr. operator is making local contacts on the audio frequencies. Traffic: VO1OM 15.

GOOSE BAY QSO PARTY

April 1-30, 1963

All amateurs are invited by the Goose Bay Amateur Radio Club to participate in the annual Goose Bay QSO Party which commences at 0001 GMT April 1st and ends at 2359 GMT April 30, 1963. Any amateur in Canada or the United States submitting a list showing he has worked four members of the club during the party will receive a WAG (Worked All Goose) Award. All others submitting a list showing they have worked three members will also receive a WAG Award. The following stations will be active on 80-40-20-15 and 10 meters during the month: VO2s AH BA NA RN UA, VO2DP/VE2, VO1FG/VO2, VE1MW/VO2, K5DYR/VO2, K5HOJ/VO2, W5HCZ/VO2, K7TIH/VO2, W8UPV/VO2 and KØSZE/VO2. Please submit your list to the Awards Manager, Mr. Jack Willis, VO2NA, P. O. Box 255, Goose Bay, Labrador, Canada. No QSLs are required but the GBARC member must have received *your* card. Your QSL may be sent along with your application to VO2NA.

ONTARIO—SCM, Richard W. Roberts, VE3NG—SEC: VE3AML. PAMs: VE3CFR 75 and VE3DUU 2 meters. Ont.-Que. Net Manager: VE3CYR. We regret to announce two Silent Keys during January, VE3FR and VE3BKN, both of Toronto. C.w. operators are required for the Ont.-Que. Net. Check with VE3CYR. The Ontario DX Assn. is now ARRL affiliated. VE3MJ was a visitor to the Bahamas. VE3DJA, ex-DL2BU, has returned to Centralia. VE3DEU is portable at Sturgeon Falls. We welcome a new club in Brampton, the Peel Radio Club. Officers are VE3MM, VE3DTY, VE3-3DSN, VE3EWN, VE3AUB and VE3EQ. VE3CIL is OBS on 2 meters. The Lakehead ARC held a successful dinner. Officers are VE3EEG, pres.; VE3EEF, secy. VE3BTQ, ex-VE3ER-AGP-VE7QH-VE8AS, has returned after a long absence and now resides in Barrie. VE3EIG rates high in the ARRL FMTs. Our VE3 Official Observers report frequent violations of our Radio Act as pertaining to amateur communications. I suggest that we *all* take a second look at our operating habits and act accordingly. The OOs have been instructed to double their efforts and mail a card to the offenders. The v.h.f. group in Southern Ontario held a meeting at Oakville. The 2-meter SS Trophy was won by VE3EZC and the 6 by VE3DUU. VE3TX was guest speaker at the North Bay ARC. VE3AHH is on s.s.b. with his home-brew gear. Ex-H18DGC is now VE3FKC and resides in Sarnia. Welcome to VE3TW, EC for 2 meters and VE3BTI, EC for 75 meters in the St. Kitts area. VE3RX spoke to the Niagara Club about the future of the Radio Society of Ontario. VE3AQL runs a fine AREC net Sun. on 29 Mcs at 10 A.M. VE3AQM is on 2 meters. VE3CYV is now Class AA. VE3KF is home from the hospital. VE3ETM sparks the AREC gang in Windsor. VE3EZI and VE3EZC have a new shack. Traffic: VE3CYR 191, VE3CFR 127, VE3GP 108, VE3GI 89, VE3DPO 86, VE3NG 71, VE3EHL 53, VE3-BAQ 46, VE3DRF 41, VE3DWN 38, VE3BUR 34, VE3-AML 33. VE3EAM 30, VE3ETM 27, VE3EYC 26, VE3DU 21, VE3CIL 18, VE3BLZ 17, VE3DUU 17, VE3-DMU 16, VE3CFI 12, VE3DH 10, VE3ELQ 10, VE3EAU 6, VE3RN 6, VE3OT 3.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Asst. SCM: Jean P. Achim, VE2ATL. VE2IE and VE2CP have retired and joined the "Professional Loafers." The P.L. Net, on 3790 kc., is heard frequently during the day. VE2AEW, South Shore EC, will relinquish this office when he leaves for Collingwood, Ont., in April. The MECC Net is active Sun. on 3755 kc. at 1100. VE2AEV, at Chibougamau, had a bad fire in his house. South Shore Club elections: VE2NY, pres.; VE2EP, vice-pres.; VE2GD, secy.-treas.; VE2AEM, VE2AJI and VE2SC, dir. A ladies auxiliary has been inaugurated. VE2BOV is a newcomer at Trois-Rivieres. In that city VE2AGI and VE2AJD instructed 12 potential hams in technical and operating procedures. VE2AYH, VE2BOW and VE2AWY graduated from the MARC

(*Continued on page 138*)

Here's your chance to STEP UP to greater operating pleasure with a better receiver AT A PROFIT!!

That's right. I will allow you a lot more for your present receiver than it is worth — in most cases even **more than you paid for it!**
But, you will have to act quickly. Our supply of these brand new, latest improved production, Hallicrafters receivers is limited. Each one is in its factory-sealed carton, and includes full Warranty. Don't miss this buy of a lifetime! Send your order today. 73, *Bil Harrison*, W2AVA

Here's How

1. Look at the mouth-watering **guaranteed** allowance for your old receiver.
2. Rush the low, low balance to us. (Or, a $10 deposit can reserve your new receiver for you.)
3. Send or bring in your old set.
4. We can immediately ship or give you your brand new, exciting performance, world-famous Hallicrafters receiver.

Act Now!

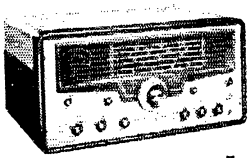
ENJOY THESE OUTSTANDING FEATURES!

Both the SX-111 and the SX-101A bring you:

- Full width, direct calibration of 80, 40, 20, 15 and 10 meter bands, plus 10 Mc for WWV.
- Selectable selectivity, 500 cycles to 5 Kc.
- Tee-Notch filter, lets you suppress heterodyne QRM, sharpens selectivity.
- Crystal controlled upper – lower sideband selection.
- Separate product detector for SSB/CW.
- Dual conversion, with crystal controlled second oscillator.
- Improved noise limiter.
- Lab type precision 100 Kc crystal calibrator.

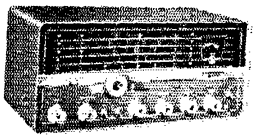
With Harrison's long trades, either receiver is a good investment in top performance and value!

hallicrafters



SX-101A

70 pounds of solid stability! Cold rolled .089 steel chassis — heaviest in the industry. • Better than 1 microvolt sensitivity on all bands. • Amplified S-meter • Fast-slow AVC. • 30.5-34.5 band (for UHF converters) with full direct dial calibration for 6 and 2. • 13 tubes plus rectifier and regulator. Plus many more features that make this SX-101A the new standard of comparison. **$445.00**



SX-111

Sensitivity of 1 microvolt on all bands • 12 tubes plus rectifier and regulator • The nearest thing to SX-101A performance, for a lot less money! **$279.50**

LOOK AT THESE GUARANTEED ALLOWANCES*
Toward a new SX-101A, I will give you for your:

Collins		SX 101	$285.	HQ 170	$327.
75A3	$355.	Mark III	305.	HQ 180	360.
75A4	440.	SX 110	225.	**National**	
75S1	425.	SX 111	278.	HRO 5	$210.
Drake		SX 140	205.	HRO 7	232.
2A	$285.	**Hammarlund**		HRO 50	270.
Hallicrafters		HQ 110	$270.	HRO 60	355.
SX 28	$208.	HQ 129	215.	NC 183	250.
SX 43	201.	HQ 140	260.	NC 183D	285.
SX 71	225.	HQ 145	285.	NC 270	270.
SX 96	250.	HQ 150	270.	NC 300	285.
SX 100	278.	HQ 160	300.	NC 303	355.

LOOK AT THESE GUARANTEED ALLOWANCES*
Toward a new SX-111, I will give you for your:

Collins		**Hallicrafters**		**National**	
75A1	$220.	S 40	$115.	NC 88	$130.
75A2	255.	S 53A	122.	NC 98	145.
Drake		S 76	145.	NC 109	155.
1A	$205.	S 85	136.	NC 125	140.
Hammarlund		S 107	130.	NC 173	155.
HQ100	$170.	S 108	143.	NC 188	135.
		SX 24	115.		
		SX 25	120.		
		SX 99	150.		

Do you want to CHARGE the balance, or SPREAD IT OVER MANY MONTHS?

When reserving your new receiver, tell me what you would like to do. I'll be happy to send you the credit form and give you a deal that will delight you!

HARRISON

"HAM HEADQUARTERS U.S.A."
225 GREENWICH STREET
NEW YORK 7, N. Y.
BArclay 7-7922
(LONG ISLAND: 144-22 HILLSIDE AVE., JAMAICA—RE 9-4102)

*Allowance for original factory wired equipment, delivered here in good operating condition.

FOR OTHERS, REGARDLESS OF MAKE, MODEL AND CONDITION, I WILL STILL ALLOW YOU MORE THAN IT IS WORTH. Bring it in, or write me a full description.

training program. The original VE2AWY, at Bedford, now signs VE2II. VE2AQV received an Advanced class certificate and also is active as an OO. News from the Asst. SCM: VE2NV tries for DX on the low end of 80 meters. VE2SH sports a KWS-2 and VE2BHN has a new Drake receiver. VE2BJV is operational on emergency power. VE2PY plans to reactivate FP8BG this summer. Salutations à tous les amateurs de la région de l'Abitibi, nous apprécierions des rapports sur vos activités. VE2BEZ est de retour dans l'air avec un Ranger et un SX-71. VE2AJV opère maintenant un 20A et un Courrier. VE2AWR travaille avec la compagnie de téléphone Bell. VE2JC se paye le luxe d'un Communicator I sur 2 M. 58 personnes on participé a la danse du Club des Jeunes Radioamaters (anciennement le C.J.O.) Traffic: VE2DR 78, VE2EC 59, VE2CP 33, VE2BB 23, VE2ALE 21, VE2ABV 18, VE2AKK 15, VE2AQV 13, VE2AUU 12, VE2AGQ 10, VE2BG 10, VE2AUH 7, VE2UN 7, VE2AJD 4, VE2BAC 3, VE2BDS 1, VE2BLR 1.

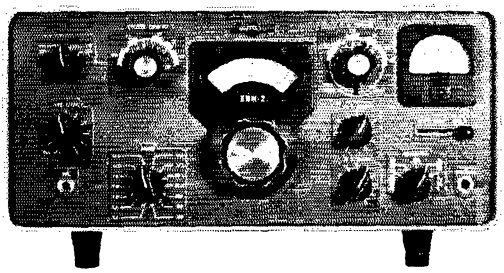
ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FS. PAM: VE6PV. RM: VE6AEN. ECs: VE6FK, VE6SS, VE6ABS. OPSs: VE6CA, VE6PV, VE6HM, VE6SS, VE6BA. OOs: VE6HM, VE6NX, VE6PL. OBS: VE6HM. ORS: VE6BR. OESs: VE6DB, VE6HO. Our PAM reports that for the time being the Alberta Phone Net will meet at 1800 MST to try to beat the blackouts. Our SEC reports that all EC groups are doing very well. Our RM reports things are very slow. Our OBS reports bulletin coverage is not good because of blackouts. Our OESs reports things slow this month. VE8-Land reports some activity on 6 meters but nothing spectacular. There was good coverage on 20 meters from CN8, CR6, CR7, VQ2, 9Q5, ZS1 to 7 except 3. New officers of the Calgary Club are VE6AAT, pres.; VE6ADL, vice-pres.; VE6AGF, secy.; VE6AAL, treas.; VE6TK, activities; VE6PL, publicity. VE6PZ reports that the Red Deer Club is doing a lot of experimenting. VE6CA has had a lot of back trouble this winter. VE6AEK is trying out a 300-ft. vertical. APN welcomes four new members to the net, VE6AAT, VE6AHA, VE6AEK and VE6HS. Don't forget the International Glacier-Waterton Hamfest at Waterton July 20 and 21. Traffic: VE6HM 142, VE8WW 27, VE6CA 10, VE6TG 9, VE6PL 8, VE6SS 8, VE6UH 4, VE6VE 4, VE6FK 3, VE6NF 3, VE6ADZ 2, VE6FS 2, VE6AAX 1, VE8CW 1, VE8PK 1.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—The Merchant Marine Cadet Association has formed a club with the call VE7BLN. Members are VE7TN, VE7MV, VE7NK and VE7IR. For information write P.O. Box 2796 c/o VE7IR. The Nanaimo Club reports that VE7JI is back in the hospital. VE7LP is in the real estate business and the club is building 6-meter fixed and mobile units. Chilliwack reports six new members with calls from their code and theory classes. New officers are VE7BEN, pres.; VE7EX, vice-pres.; and VE7BLA, secy. Penticton reports that most members are building mobile equipment for 51 Mc. The Cowichan Club tells us that VE7APR is lighthouse tender at Sointula now. VE7AKP is putting a rig on 420 Mc. The Vancouver Amateur Radio Club is building rigs for 20-40-80 meters for FD has started a net on 7.2 Mc. at 0400 GMT Mon. through Fri. to bring the members code speed up for FD. Kimberly reported that five below is keeping the members away from the meetings but they are planning to use 6 meters this coming FD. VE7BBB still is receiving certificates. I saw the album of her certificates and think that it would be hard to dream up some new certificate for which to work. Another brand-new club is the Surrey Amateur Radio Club with members VE7AOA, VE7AQN, VE7YM and VE7ABS. Let's hear from more clubs, please. Traffic: VE7AGF 184, VE7AC 20, VE7BBB 9, VE7AAF 8, VE7AMW 5, VE7DH 4, VE7AOY 2.

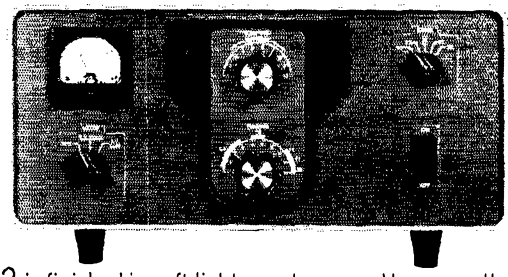
MANITOBA—SCM, M. S. Watson, VE4JY—The ARLM officers for 1963 are VE4JY, hon. pres.; VE4TT, pres.; VE4ZX, vice-pres.; VE4RS, secy.; VE4GA, treas. VE4DX continues as editor of the ARLM *Satellite*. The new executives for the Brandon Club are VE4DG, pres.; VE4DQ, vice-pres.; VE4CM, secy.; VE4KN, treas. The WARA held a round table discussion at a recent meeting preceded by a talk on receivers by VE4KF. A movement is on foot to form an independent board of amateurs consisting of representatives from all radio clubs in Manitoba to present a united front in matters pertaining to amateur radio. VE4FO, the new EC, is active in organizing a strong AREC and a meeting has been called for the purpose. VE4OZ, the Bird ARC at mile 349 HBC railway being the 56th parallel, is on the air looking for contacts. Two other active stations in the North are VE4SD at Cranberry Portage and VE4SW at Oxford House, both putting out FB signals. The Manitoba Phone Net now meets at

(Continued on page 140)

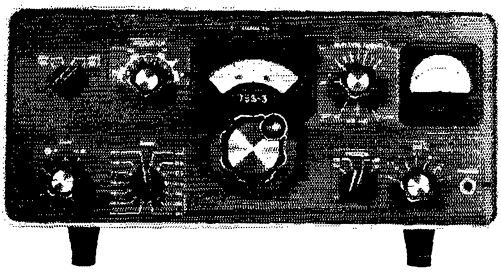
Either your ham equipment



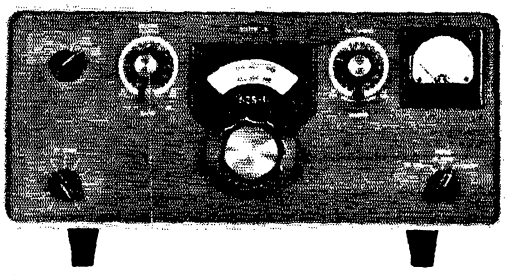
1 is designed around the latest systems concept



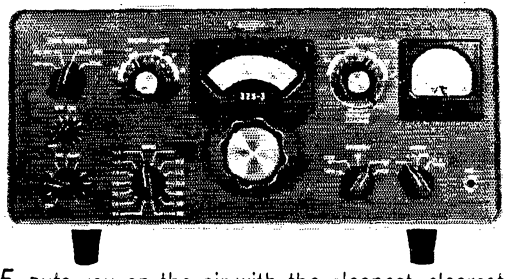
2 is finished in soft light-gray tones and has smooth, stylish lines



3 gives you swift, sure precise tuning on each unit



4 has station flexibility to let you operate as a transceiver or on separate frequency control, on HF or VHF



5 puts you on the air with the cleanest, clearest signal on the amateur bands

either that — or you're not using the Collins S/Line

See for yourself how much more pleasure the Collins S/Line can add to your ham operations, how much more beauty and style it adds to your ham shack. Come in for a demonstration soon.

ELECTRONIC WHOLESALERS INC.

9390 N.W. 27th AVE., MIAMI 47, FLA. *Phone OXford 6-1620*

2345 SHERMAN AVE., N.W., WASHINGTON 1, D.C. *Phone HUdson 3-5200*

1301 HIBISCUS BLVD., MELBOURNE, FLA. *Phone PArkway 3-1441*

938 BURKE ST., WINSTON-SALEM, N. C. *Phone PArk 5-8711*

2310 BOB WALLACE AVE., S.W., HUNTSVILLE, ALA. *Phone 534-2461*

1845 and 0100 GMT on 3760 kc. daily. Traffic: VE4KN 7, VE4UM 6, VE4EG 4, VE4JA 3, VE4KL 3, VE4AN 2, VE4QD 2, VE4SE 2.

SASKATCHEWAN—SCM, Jack Robinson, VE5BI.—Keith and June Baker, now VO2XX and VO2YY, send greetings from Labrador to the Saskatchewan gang and hope to be back on the air this spring. One consolation is there is no TVI in Labrador. VE5NZ is now on phone. VE5KZ, our sightless operator, is now recuperating from a broken ankle. VE5VD is a new ham in Regina. VE5QSO, the SARL station, is now on the air from Regina. The Saskatoon Club is sponsoring a Saskatoon certificate. Details later. During January the SARL held a c.w. and phone contest with about 120 stations taking part. Scoring was 2 points per exchange of number, sig. report and QTH with power multiplier. It is hoped to make this contest an annual event. It is time to start thinking of the hamfest at Moose Jaw this coming July and get that mobile rig in good shape. Traffic: VE5HP 129, VE5LM 28, VE5NX 10, VE5EO 6, VE5JU 5, VE5CM 4, VE5SF 4.

Correspondence from Members

(Continued from page 77)

¶ . . . In my opinion the greatest evil is permitting one amateur to give another an examination and until this is eliminated restricting the voice bands would have very little effect. — *W5YWD.*

¶ . . . Amateur radio can be upgraded by raising the standards for those who seek to obtain a General ticket for the first time. This is the method that professions such as law and accounting use to raise their standards for the benefit of the public. This method would provide an orderly and positive method for reaching your objective. — *WA2JXG.*

¶ . . . One rather obvious way to attain the goal is to make the FCC exam much stiffer, comparable to the commercial license exams. It would be desirable also to keep the exams up to date with current technology such as solid state devices, s.s.b., TV, etc. Another suggestion might be to limit all *future* Class B and C licensees to lower power, phone on certain bands or limited to certain modes. . . . — *W8HPL.*

¶ . . . No restricted voice bands; a 250-watt power limit; a voluntary clean-up campaign; use of ten meters for 5-kc. slow-spot-scan A-5; a more-detailed General exam that cannot be easily memorized. — *W4WZZ.*

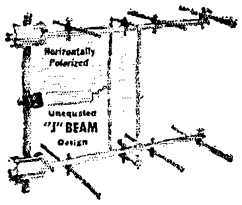
¶ . . . At a certain date make the General exam much more difficult. In a very few years (when the sun spot cycle improves) the ranks of amateurs will be markedly depleted. This depletion can be controlled by the difficulty of the exam ranging all the way from requiring the knowledge commensurate with a degree in electrical engineering to the present level of a knowledge possible for the brighter 12-year-old to acquire. During the bottom of the sun spot cycle leave us poor lids alone, but in the meantime push my suggestion in the preceding paragraph so that when propagation becomes good again the bands will be populated by a superior breed of ham. — *K4SUJ.*

¶ . . . You speak of mediocrity. Frankly, what little mediocrity I have encountered stemmed more from the editorial pages of *QST* than from the ham bands. I am in complete agreement that our operating standards should be kept high but I think it can be achieved by educating hams thru such publications as *QST*, not by penalizing General and Conditional Class licensees. . . . — *K5SBN.*

¶ . . . What we need is a "peace corps" type approach to the problem, more educational programs, continued stressing of malpractices by *QST* and more self-policing by the rank and file. Sending those not well versed in the subject off to Siberia is not the final solution to the problem. — *W2DDR.*

¶ . . . Will changing the rules alone clear the situation? I have my doubts. Twelve years experience in police work proved to me that you don't have to arrest many offenders to keep law and order, but you do have to make an example of a few, and others soon learn that violations will bring punishment. . . . — *K4IZT.*

(Continued on page 142)



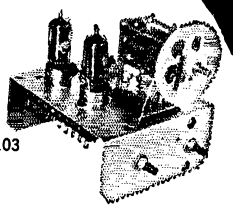
UNEQUALLED "J" BEAM 144 MC ANTENNA BY GAIN, INC.

- Your choice — horizontal or vertical polarization
- Add-on modular design for increasing gain
- Perfect impedance match — no tuning required
- 50 ohm model includes efficient waterproof balun
- Priced from **$18.95** up

WRITE FOR DETAILS

AMERICAN GELOSO V.F.O.'s

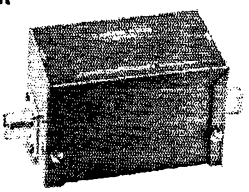
Wired, tested, calibrated, ready for use.
Mod. 4/104 for driving one 807 or 6146 final in AM or CW under Class "C" conditions.
Mod. 4/102 for driving two 807's or 6146's final. Has 5 bands. Supplied with Mod. 1640 dial ass'y.
Mod. 4/103 for 144-148 mc bands. Combines VFO primary freq. of 18 mc with xtal fundamental freq. of 12 mc. Supplied with Mod. 1647 dial ass'y.
Mod. 4/104, 4/102 or 4/103 less tubes and xtal, each **$29.95**



SUPEREX HAM HEADPHONES

Full comfort even after many enjoyable hours of continuous use. Superb comfort even for eyeglass wearers. Crisp, distortionless reproduction and high sensitivity allows you to single out that weak signal and hard to reach station. 600 ohms impedance, completely adjustable head harness. **$24.95**

GAVIN, 2 METER, TUNABLE BAND PASS FILTER

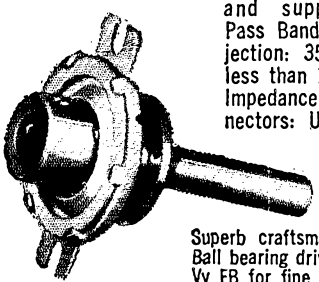


Model BP-144 is a narrow band pass filter designed to attenuate spurious emissions generated in 2 meter xmtrs. Four tunable stages for optimum match and suppression. Pass Band: 2 mc. Center Freq: 144-148 mc. Rejection: 35 db, 5 mc from center. Insert Loss: less than 1 db. Power Rating: 190 w. plate input. Impedance: 52 ohms. Size: 4"x2¼"x2¼". Connectors: UHF coax.

BP-144 **$11.85**

BULLSEYE BUYS AT ARROW

hand-picked for hams by hams...



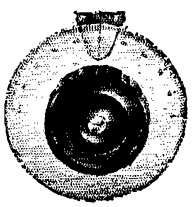
Shown approx. actual size.

PRECISION PLANETARY-VERNIER for exceptionally fine tuning

Superb craftsmanship by Jackson Bros. of England. Ball bearing drive, ¼" dia. Shaft 1⅛" long, 6:1 ratio. Vy FB for fine tuning. Easily adaptable to any shaft. Comparable value $5.95. **Amateur net $1.50 ea. 10 for $13.50**

PRECISION BALL DRIVE DIAL

Another superb product of Jackson Bros. of England. 4" dia. dial with 6:1 ball drive ratio. Fits standard ¼" shaft. For that velvet touch... **Amateur net $3.95**



VERSATILE MINIATURE TRANSFORMER

Same as used in W2EWL SSB Rig—March, 1956 QST. Three sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22000 ohms. (By using center-taps the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. New and fully shielded.

Amateur net $1.39.
3 for $3.49.
10 for $10.75

MAIL ORDERS PROMPTLY PROCESSED. SAME-DAY SHIPMENT FROM STOCK.

SEND FOR FREE CATALOG

Trade-Ins welcomed.

TO SAVE C.O.D. CHARGES, PLEASE INCLUDE SUFFICIENT POSTAGE WITH YOUR ORDER. ANY EXTRA MONEY WILL BE RETURNED.

ALL PRICES F.O.B. N.Y.C.
Arrow's Export Dept. Ships To All Parts Of The World.
Prices Subject To Change Without Notice.

ARROW ELECTRONICS, INC.

900 Broad Hollow Rd., Farmingdale, N. Y.
516—MYrtle 4-6822

65 Cortlandt St., N.Y. 7, N.Y. • 212 — Digby 9-4730
525 Jericho Tpke., Mineola, N.Y. • 516 — Pioneer 6-8686
225 Main St., Norwalk, Conn. • 203 — Victor 7-5889

¶ . . . The Conditional license is the biggest mistake FCC has made. It is my opinion if this practice were immediately abolished we should begin to see the results within five to ten years. It is much too easy for anyone living 75 miles from an examining point to obtain a ticket and this practice has been badly abused. . . . — *W5BIN.*

¶ . . . Increase our official observers ten-fold; have them send out citations not only for illegal signals, but also for poor operating procedures; after a station has received 3 citations for the same violation, he should submit himself to a 6-month suspension of his ticket; require a station to have General or Conditional class ticket for at least five years before he is permitted to operate phone; last and most important of all, reduce power limit. — *K5KQG.*

¶ . . . Having the government print up the necessary tests and processing them, etc., would only give another valid reason for imposing a fee or "tax" on amateur licenses. . . . — *K1YYC.*

¶ . . . If the ARRL could devise an examination based on common courtesy and *operating* ability, I think the League would be getting it closer to the point. Any careful listening to the bands will show numerous examples of a total lack of courtesy and consideration for fellow amateurs. . . . — *K1OCS.*

¶ . . . The whole thing could be solved, over a longer period of time, by simply making the Conditional and General Class license examination much more difficult technically. Have you ever seen a copy of an English exam for a ham ticket? I take the *RSGB Bulletin*, and I recall one question which said, in effect, "Draw a schematic of a complete radiotelephone transmitter, justifying your choice of modulation method used". I wonder how many would have passed that one over here? — *K1CLD.*

¶ . . . If there is just no other way out of the dilemma, and some class has to lose privileges, then I think such loss of privileges should be limited to those who hold licenses by way of the so-called "mail exams". I am unalterably opposed to anyone, who has taken the examination directly from the F.C.C., losing any current privileges — *WØLOW.*

¶ . . . If the League insists on *restricted* licensing, then may I urge a withdrawal of all licenses above the General class. In all fairness to the late comers to amateur radio, I believe we should all be placed on equal status. I'm sure the Class A boys won't object to taking the exams again since in this way they can prove once and for all their technical knowledge, plus the special skill one gains merely by being old — Hi! — *K1NFY.*

¶ . . . Announce that from a certain date, all Novices joining the ham fraternity will be required to pass Class A examinations before being permitted to use voice bands. These amateurs would be assigned an odd call such as KQ3HGX. The advantages are numerous to such a plan. The Novice does not have any investment in time or equipment and if he does have the time he can earn the Class A ticket. If he is told what he has to face before buying or building equipment he may want to take up another hobby such as flute playing or bridge. Those already "in" would not be forced out or off the bands that they have cultivated and just by time and time alone would the QRM from stateside be reduced. — *K3HGX.*

¶ . . . The policy of an almost automatic renewal of amateur license causes a gradual degeneration on the bands. Requiring each applicant to have appeared for strict FCC examination within 12 months preceding license renewal date would cure a lot of ills. A person who fails an examination should wait 6 months prior to being eligible for re-examination. This imposed delay will relieve the examiner load and encourage individuals to be ready in all respects before they appear for exam. . . . — *W5BMH.*

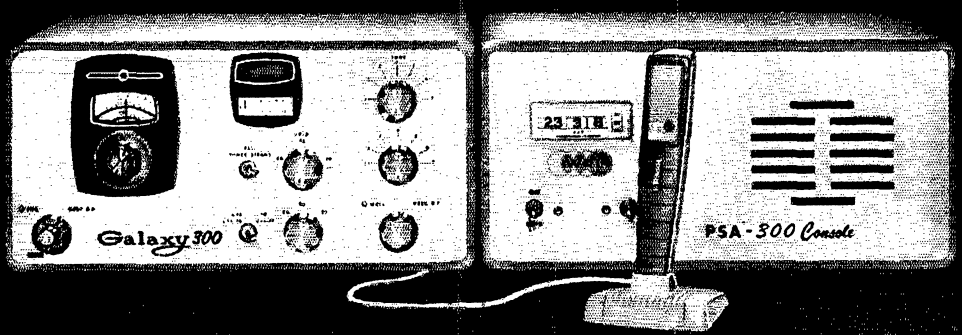
¶ . . . Any new Class A examination should be a stiff one; anything less would have no meaning and would serve no useful purpose. We must have improvement if we are to survive and I feel that everyone should requalify for the ultimate privileges. It can be argued that this would eliminate many of those now enjoying these privileges, but it

(Continued on page 144)

the greatest thing that's happened to amateur radio in years!

Galaxy 300 watt

SSB/AM TRANSCEIVER 80-40-20 METERS
Selectable upper or lower side bands



Exclusive from WRL *only!*

A 300 WATT SSB/AM TRANSCEIVER WITH LUXURY FEATURES FOR LESS THAN ONE DOLLAR A WATT.

$299.95 WIRED (the price of a single receiver or transmitter.)

This is the Galaxy 300. It's quite a single side band-AM transceiver. It may very well change your ideas about more expensive transceivers. It's a full featured SSB/AM transceiver with 300 watts of power—priced like a single receiver or xmitter—less than one-fourth the price of conventional SSB transceivers. How can it be priced so low?—Engineering know-how and selling to you direct from our factory—an aggressive business step on our part. Here is what makes the Galaxy so good: Input, 300 Watts PEP on SSB, 175 AM—Selectable Sideband—Automatic Load Control—Separate RF & Gain Controls—9.1 MC Crystal Filter—Stable Linear VFO—1 UV Sensitivity for 10 db S/N—Smooth Dual Vernier Tuning: ratio 72:1 or 12:1—P.T.T. & Vox Operation (Vox optional $24.95)—Mobile or Fixed Station—Full Year Parts Warranty. All this for $299.95 f.o.b. WRL. Relieve that "expense tension" at your home and order a Galaxy now. **You must be satisfied—or money back!**

MATCHING POWER SUPPLY "PSA-300 Console"

Best choice for your AC Supply. Styled to match the Galaxy 300. Designed for "Full Power" operation. Completely wired with speaker. "Numerchron" clock optional.

66NA037	Less Clock	$79.95
66NA038	With Clock	$99.95

Mobile Supply "G 300 DC" designed for "Full Power" operation.

66NA041	12VDC Transistorized	$119.95
66NA042	Mobile Mtg. Bracket	$ 14.95

WORLD RADIO LABORATORIES
3415 West Broadway • Council Bluffs, Iowa
• Phone: 328-1851

WRL WORLD RADIO LABORATORIES
3415 West Broadway, Council Bluffs, Iowa

- ☐ Rush Detailed "Galaxy 300" Brochure.
- ☐ Send "Charg-A-Plan" Credit Application.
- ☐ Quote "Trade-ins" on Attached Letter.

NAME_____

ADDRESS_____

CITY & STATE_____

stands to reason that those not entitled to them should not enjoy them anyway. — *W4BRB.*

¶ . . . I note that you explicitly stated that this proposed new exam should contain up-to-date theory; yet many of the holders of the old Advanced Class ticket are assuming that they would be able to hold onto full privileges without having to take any new exam. If this should be the case, I would be strongly opposed to it. I fail to see where these fellows can claim that, on the basis of an exam taken in the 30s or 40s, they have an adequate knowledge of such subjects as s.s.b., RTTY, transistors or television. I say bring the exam right up to date and make everyone except extra class holders take it if they want to take advantage of any extra privileges. . . . — *W9SZR.*

¶ . . . Although we worked hard for our Class A ticket let us not make incentive licensing retroactive. Wipe the slate clean! We'll start from scratch and all amateurs will reap the benefits of: improved technical proficiency, signal quality and band conditions! — *W9CPD/K9LKA.*

¶ . . . Having the Novice license valid for only one year is very sound. Perhaps the Technician license should be good for only one five-year term. This would force those with a deep interest in amateur radio to move up the ladder of operating skill and technical knowledge. I also feel that some of the phone bands that are now used by General and Conditional license holders should be for the Amateur Extra Class only. — *K1APA.*

¶ . . . If I too have failed to keep myself properly updated in technique and knowledge so that I am honestly unable to qualify for the advanced license, you would see a new record in getting the upgraded license. We were all beginners at one time and I certainly have no bones to pick with a fellow ham just because he is new and has not had the time to gain the experience I have, but do detest the drug store hams that, after holding a license for several years, continue to give frequency checks with S-38 class receivers, report my modulation at 102.3% with nothing more than this same quality receiver, and in the class of ham that is actually writing published articles in some so-called magazines that are so full of technical errors that a 10-year-old kid studying for a Novice license can spot them. — *WØJJK.*

¶ . . . Give all present holders of General Class licenses one year to get an Advanced license or boot them off the 75-, 20- and 15-meter phone bands. Maybe the broadcast QRM on 40 or a dead 10-meter phone band will provide an incentive to move ahead. This should present no hardship to General Class hams as most of them are of the plug-in variety anyhow, and can readily turn their store-boughten bandswitches off the 75–20–15 meter phone bands. Make the new Advanced test comprehensive enough to eliminate the "License Manual Memorizers" and restore the previously-deleted phone privileges. For the Extra Class License holders provide exclusive 20-kc. segments in the 40- and 20-meter c.w. bands. . . . — *W2UKE.*

¶ I am still puzzled as to why FCC ever dropped this system in 1952. It seems to me to be akin to FAA letting (us) private pilots fly the big jet planes without regard to necessary qualifications! To make it fair to all concerned, every amateur should have to re-qualify for the senior licenses. That way we'd all be starting anew, as it were. . . . — *W2MQB.*

¶ . . . If you think a special privilege is warranted, then find some room in the c.w.-only portion of the band. . . . — *K6ZFN.*

¶ . . . Limit legal maximum power to 250 watts input. This will award the sought-after QSOs to the technically-adept and operationally proficient ham, thus giving real incentive to technical improvement. . . . — *WA5CSG.*

¶ . . . I suggest no more Conditional exams; tougher Novice, Technician, and General license exams; require each Conditional and General license holder to pass the new exam upon the expiration of his present ticket. — *WA5CAO.*

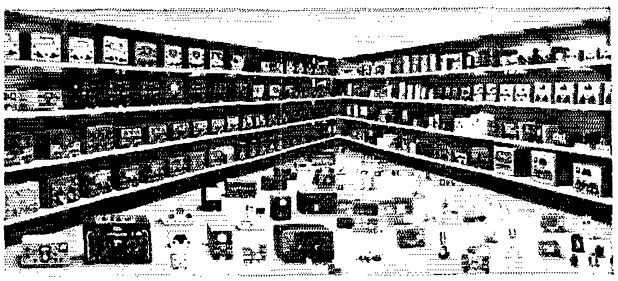
¶ . . . Amateur radio needs a shot-in-the-arm. Limiting the 15–20–40–80-meter voice bands to the serious amateur could do the trick. An incentive goal, such as voice operation in these bands, tied to the Extra Class license, would do much to enlarge our knowledge of the art. If this were

(*Continued on page 146*)

LIKE-NEW HAM EQUIPMENT

AT MONEY-SAVING PRICES!

- Trade Your Present Gear On A Like-new Receiver or Transmitter
- Two-Week Trial
- 90-Day Guarantee



Are you interested in buying a current model of a transmitter, receiver, or other ham equipment in excellent condition — at SENSATIONAL MONEY-SAVING PRICES?

Do you insist on LIKE-NEW EQUIPMENT that's *attractive* in appearance and *dependable in* performance?

TRIGGER specializes in such gear. Receivers, transmitters, etc., are completely realigned and calibrated by service technicians trained in rigid quality control methods. Tubes, capacitors, and other components that can contribute to unsatisfactory performance are replaced — insuring optimum, trouble-free performance. If you live anywhere near the CHICAGO area, drop in for a "look-see" and EYE-BALL QSO.

Inventory consists of one of the most complete stocks in America. Listed below are but a few of the hundreds of items currently available. CALL, WRITE, OR PHONE TODAY!

another important TRIGGER service: WE BUY USED HAM GEAR FOR CA$H!!

PROMPT SERVICE PROMPT CASH!

SPECIALS OF THE MONTH

LIMITED QUANTITY!

Ranger.....$129.50
SX101A.....$189.50; HQ-140X.....$ 99.50
SPECIAL: 6146 Tubes $3.29 ea. fully guaranteed (limit: 6 per customer.)

KWM-2	$875.00	GSB-101	199.50
KWM-1 & AC Supp	495.00	Super 6 Conv.	19.50
75S-1	349.50	HRO-60	289.50
32S-1	479.50	PHASEMASTER II, BANDHOPPER	149.50
S/Line supply	79.50	VFO	79.50
30S-1	895.00	HEATH SENECA	139.50
75A-4	495.00	HQ110-C	144.50
75A-3	367.50	DRAKE 1A	149.50
HT-32	367.50	R-100 & S-MTR.	77.50
HT-37	349.50	R-55	44.50
COMM. II, 6 mtr.	89.50	DB-23	29.50

(above prices F.O.B.)

(A small deposit will hold the unit of your choice on Lay-Away)

Weekdays . . . . . 1-9 P.M.
Saturday . . . . . 9-6 P.M.

Or By Appointment After Hours
Phones PR 1-8616
Chicago TU 9-6429
Business phones with QTH Extensions

TRIGGER Attn: W91VJ
7361 North Avenue Amount Enclosed _____
River Forest, Illinois
(suburban Chicago)

RUSH THE FOLLOWING: _____

* _____

_____

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

●ORDER BLANK TO: (1) trade ur present gear, (2) order above units, (3) sell ur gear for cash
(ABC1234)

• •

TRIGGER Electronics
7361 NORTH AVENUE, RIVER FOREST, ILLINOIS

adopted, the Extra class should be brought up to a level commensurate with the present state of knowledge in the field. Personally, I doubt if I could pass such a test immediately. On the other hand, I studied and passed the old Class A many years ago, and I can do the same with any other requirement that is developed as long as the necessary incentive is there. . . . — *W4VMO.*

¶ I vote yes! To minimize inconvenience to Conditional and General licensees, I suggest that the effective date of any change in regulations be delayed one year from adoption to permit license upgrading by those who wish to do so. — *K6CYG.*

¶ . . . I feel that non-renewal of a Technician license, renewal of a Conditional license on condition of inability to travel to examination point only (especial hardship instances), and written and witness certification of all other renewals would be sufficient at this time. Written test and certification by qualified volunteer examiner similar to the present Conditional license, for all renewals. — *WØVEA.*

¶ . . . We must get FCC to increase the scope of all examinations. Here we are in the age of transistors, s.s.b. and amateur T.V. but the General doesn't have to answer a question on these modes, or new principles. What you have been trying to do in the last few months in *QST* has been a fine effort towards trying to explain splatter, bad procedures, TVI, etc. But shouldn't the amateur learn this before he's on the air, not after? . . . — *K8VIR.*

¶ . . . Eliminate the Novice Class license and add the present Novice frequencies to those of the Technician. Require that all examinations (except Class C) be taken before an FCC officer. When present Technician licenses that were taken by mail come up for renewal, they must be reexamined before an FCC officer. Since travel is now easy for almost everyone allow only those persons who are physically unable to travel to take the Class C exam. Reexamine all old Class C licenses at renewal time. . . . — *W4UVU/-W4RWG.*

¶ . . . Do it up right: how about a mandatory period of c.w. operation only? Maybe even restricted to 250 watts power? Dare say some people would be surprised at the fun they could get out of hamming that way. And the new ham would have a much deeper appreciation of the skill and art of communication. Compare this with the chaos generated today by the "easy-license" ham, his newly-arrived equipment just plugged in, pompously holding forth on the merits of this mode *vs.* that mode. I agree 100% with your editorial. It may mean loss of phone privileges for me, but then again, considering conditions as they are today, what have I to lose? Best wishes to the League in its fight for the revival and survival of REAL amateur radio.— *K4EJG.*

It's the Cats-Net

(Continued from page 56)

"Net Control from W6CIS. Hey, what about my Menlo traffic?"

"W6CIS — sorry, OM, CATS Net doesn't handle third-party traffic."

"Well, you're listed right here . . . CATS Net, it says here . . ."

"Well ya see, OM, we had an emergency — errr — executive commit — ahhhh vote — there must be some mistake OM.

"Well, right here it says 'CATS Net — Communications And Traffic Society Net' meets every . . ."

"W6CIS, this is Net Control. Well, it's the CATS Net all right, but I guess you have an old list or somethin' like that. CATS stands for Chatter And Talking Society. See ya again sometime, eh? Now, anyone else want to check into CATS Net?" QST

Oscar II

(Continued from page 56)

gradually became quite proficient at conjuring up spot predictions for "check-in" observers, using a modified globe that was employed for general predictions.[5] Don Peterson, WA6GQE, was the chief operator and held W6EE on an around-the-clock basis for three days on 20, 40 and 80 meters with relays of volunteer operators. After that, the W6EE operation was cut back to 16 hours per day until after Oscar II was consumed in flames on the night of June 20, 1962. As a back-up for Oscar II flight, a selected group of Oscar I observers were chosen to provie a simplified report directly to W6EE on every audible orbit. This data was immediately processed and used to validate and update the orbital predictions given for the following two days. In order to minimize errors, a systematic checking procedure was instituted and all original prediction messages were punched on RTTY tapes. This master tape was later translated into a taped voice message for transmission on sideband. Multiple copies of the master tape were made at W6EE for transmission on the air, and a copy was sent to W6ASH or K6JTC for relay to W1AW.

For the first 200 orbits, K6QMJ generated the predictions and cut the master tape at his home. The tapes were routinely picked up, checked and used at W6EE. At about orbit 200, the satellite orbital period was decaying so rapidly that it was no longer possible to keep Ralph adequately supplied with up-to-the-minute data and the prediction operation was moved to Oscar Hq. using the latest reception report data. It was during the final one hundred orbits of Oscar II that data supplied by volunteer tracking groups scattered across the United States became extremely valuable. It was possible to use "hot" data from afternoon orbits over the east coast and mid-west to up-grade last minute predictions.

Looking Forward to Oscar III

"The Past is Prologue." Oscars I and II have proven that radio amateurs can track a space satellite, can extract data from it, and draw usable conclusions from the data. As amateur radio is a hobby of *communication*, it is only natural that the next step forward be the launch of communications satellite, especially designed for two-way amateur communication.[6] Construction of such a device is now well underway. The operator training achieved from the flights of the first two radio amateur satellites may now be put to a practical test. Armed with orbital data, the Oscar participant will *know* when Oscar III is within range, and he will have the equipment and the know-how to put this revolutionary device to work. Amateur radio stands on the threshold of a new era in v.h.f. communications and untold wonders await the amateur

(Continued on page 150)

[5] "Keeping Track of Oscar," Burhans and Rankins, May, 1962, *QST*, p. 15.

[6] "The Oscar III VHF Repeater Satellite," Orr, Feb. 1963 *QST*, p. 42.

$5.00 Says You're Wrong...

IF YOU'RE READY to move up to Collins . . . quite frankly you're going to invest a good amount of money. OK . . . you want to save as much as you can and Walter Ashe will help you do it. Our big volume of ham equipment sales . . . our urgent need for good clean trade ins . . assure your getting FAR MORE in trade! Make us prove it! Rush the coupon telling me what new equipment you want and what you want to trade.* I'll send you back a quote that will knock you off your chair . . . PLUS a gift certificate worth $5 on any new equipment you buy that's worth $100 or more! Are you listening?

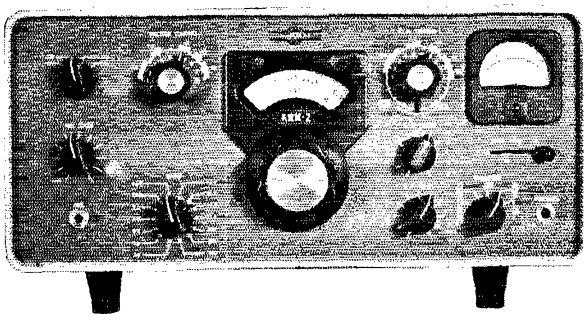
Walter Ashe

WALTER ASHE IS COLLINS HEADQUARTERS

Collins KWM-2

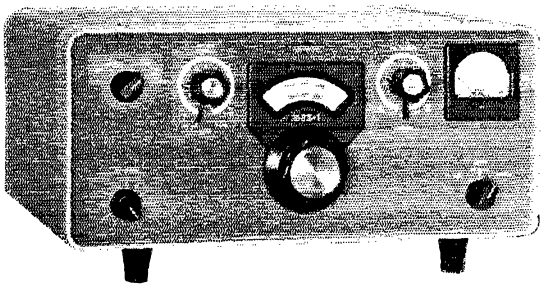
Still the KING in SSB transceivers. Don't be misled. Here is the *complete* coverage upper and lower sideband unit. Others may come and others may go, but the KWM-2 and old man river just keep right on rolling along. Please hurry and get yours before the Joneses next door show up with one of the lesser units now on the market. Maybe you can help change their minds and become a Collins twosome.

Amateur net **$1150.00**



COLLINS KWM-2 ACCESSORIES

516F-2 A.C. Power supply	$115.00
351D-2 Mobile mounting tray	$120.00
MP-1 12 VDC Power supply	$150.00
PM-2 110/220 VAC Portable power supply	$150.00
CC-2 Carrying case for KWM-2 & PM-2	$ 85.00



Collins 62S-1

Sure it's expensive, but so is a Rolls Royce. Quality always costs just a bit more. Here's the way to go first class VHF S.S.B. Read all the technical specs in any ad in this magazine, and then, if you are in the market for a first class car, see your local dealer; but if you want a first class trade-in offer on a 62S-1, write us for the best far-out offer in the country.

Amateur net **$895.00**

*Gear made since 1945

Want Our Catalog?

Whatever you want, from a resistor to a complete rig . . . you'll find it here! Check the coupon . . . the new Ashe catalog is 100% free!

IN A HURRY—Phone CH 1-1125

WALTER ASHE RADIO CO.

1123 Pine Street, Dept. Q-4-63, St. Louis 1, Missouri

WALTER ASHE RADIO CO. ***$5 Gift Certificate Offer***
DEPT. Q-4-63 Expires April 30, 1963.
1123 Pine St., St. Louis 1, Mo.

OK—Surprise me! I am interested in .....

.....

What is your Ashe "Surprise" allowance on .....

.....

Be sure to include $5.00 Gift Certificate.

NAME.....

ADDRESS.....

CITY.....ZONE....STATE.....

☐ Send New Catalog (Catalogs sent only in Cont'l U.S.)
☐ Send Reconditioned Equipment Bulletin.

who grasps this golden opportunity. By the very nature of his hobby, the radio amateur — regardless of nationality — has the unique opportunity to gain wisdom, help the scientific effort of his country, and unfold the mysteries of the universe within which we live. To this end, Project Oscar is dedicated.

Credit is due the following Oscar participants whose efforts greatly aided the data handling effort: Jay Merchant, W6ITF (mail), W. L. Walters, WA6UJX (data reduction), J. D. Whitfield, K6BHN (data reduction), R. R. Williams, W6WGF (data reduction) and R. R. Tarbutton and D. C. MacIntyre (data reduction).

Thermal design problems were handled by Wally Raven, WA6AID, Ed La Blanc and Jim Barrett. Material for this article was taken from the formal report of Oscar II, compiled under the direction of Harley Gabrielson, W6HEK. QST

Just One More Guidebook, Please!

(Continued from page 59)

the "ham bug" bites will mellow as rapidly as the agitation from the XYL decreases. Ham wives have a perfect opportunity for developing skills and enjoying all sorts of hobbies, even Ham Radio! No, I'm not a traitor to the YLs and XYLs, I've just found that even a slight interest in the hobby makes it easier to lean with the mad comings and goings in the ham shack. I even find myself referring to the tower as "our" tower. If only there had been a guidebook to help us seventeen years ago, think of all the griping, time and energy I might have saved! QST

How's DX?

(Continued from page 65)

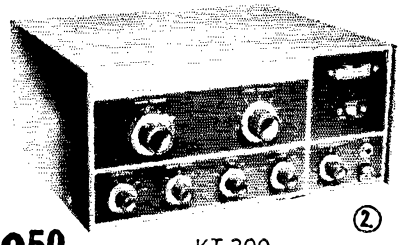
communications have been exceptionally fine since the addition of a 20-meter ground-plane at my Placentia QTH. I'm usually on 20 c.w. Mondays through Fridays from 2200 GMT till the band goes out. There are some fifteen active stations in the Argentia, Placentia and Freshwater areas using all modes except RTTY. Most of the boys are quite satisfied just to work home. I'm using a DX-60 and SP-600, hoping to add a 14-Mc. quad and Warrior later in the year." Jim expects to sign K7GVM/VO1 well into 1964 . . . . . Check with CRAS, Aptdo. 517, San Salvador, El Salvador, for detailed information on that society's new Diploma el Salvador, a certification available to those who collect a necessary quantity of YS QSLs . . . . . The 160-meter bug bit W2EQS so deeply that Charlie's had only four QSOs on higher frequencies so far this year. W2EQS has 37 countries confirmed on 1.8 Mc. . . . . W3TBF/4 fears that the ultimate rare-DX pile-up may come along one of these days to burn a permanent 50-kc.-wide hole in 20 meters and collapse the ionosphere for good . . . . . W6s AM LDD KEV EFV and K6CQM lead Northern California DX Club members with 322, 302, 299, 298 and 294 countries confirmed, respectively. W6s AM LCF, K6s VVA CQM and W6SIA pace phone fans with 311, 187, 171, 156 and 156 in that order. W6s AM SIA and BYB are top multibanders with 1018, 958 and 857 band-countries accounted for . . . . . K6CQM forsakes Kilofornia for Fiveland, leaving NCDXC's famed *DXer* in the able editorial hands of WA6TGY . . . . . FEARL *News* mentions VE2MC of Prince Patrick island, just about the rarest VE2 around . . . . . WGDXC finds FG7s XN XP and XS busily devising single-sideband apparatus.

Ten Years Ago in "How's DX?" — New keyer circuits being described in 1953 *QST*s inspire Jeeves to design some really radical and frightening models . . . . Brand new 40-meter phone has its DX ice broken by CT1s CL QF,

(Continued on page 152)

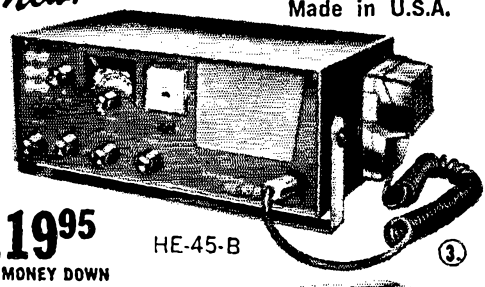
New!

HE-80WX **149.50** IMPORTED
NO MONEY DOWN



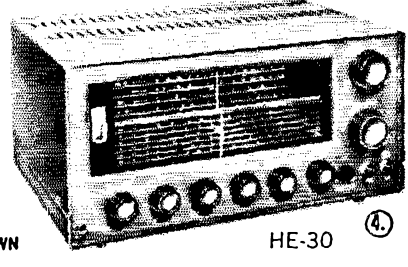
79.50 NO MONEY DOWN KT-390 Made in U.S.A.

New! Made in U.S.A.



119.95 NO MONEY DOWN HE-45-B

IMPORTED



99.95 NO MONEY DOWN HE-30

LAFAYETTE RADIO

QUALITY AMATEUR GEAR SINCE 1923

INVITATION: Stop in at any of our locations and visit our fully stocked **HAM SHACKS — FREE DEMONSTRATIONS** without obligation. Lafayette carries a complete line of famous brand amateur equipment and accessories.

1. NEW LAFAYETTE HE-80 Professional Quality 14-Tube Amateur Communications Receiver

● 5 Bands: 550KC to 54MC ● Extra RF Stage, Mixer/OSC For Dual Conversion on 6-Meters ● 1 RF Plus IF Stages for High Gain Reception on all other Bands ● Product Detector Circuit for Improved SSB Reception ● Separate BFO and Q-Multiplier Circuits (can be used simultaneously) ● Crystal Calibrator for Checking Receiver Calibration Markings ● Improved Automatic Noise Limiter ● Voltage Regulated Power Supply

Designed for Today's Congested Amateur Bands

2. *STARFLITE*™ 90 WATT PHONE and CW TRANSMITTER KIT

● 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.

3. LAFAYETTE HE-45-B DELUXE 6-METER TRANSCEIVER

● High Efficiency—Up To 100% Modulation ● New Modulation and Power Transformers plus 7868 Power Pentode ● New Heavy-Duty Communications Vibrator ● Front Panel Antenna Loading Controls ● New Standby Switch; VFO Power Jack ● Sensitive Superheterodyne Receiver ● Built-in 117 VAC and 12 VDC Power Supplies ● Rugged Push-to-Talk Ceramic Microphone

LAFAYETTE HE-50A 10-METER TRANSCEIVER

Similar to above except for 10-meter operation . **119.95**

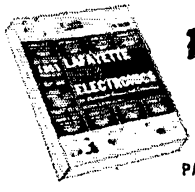
4. THE LAFAYETTE HE-30 Professional Quality Communications Receiver

● 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

Sensitivity is 1.0 microvolt for 10 db. Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER.

LAFAYETTE RADIO ELECTRONICS

SYOSSET	JAMAICA	NEW YORK	BRONX	NEWARK
PARAMUS	PLAINFIELD	SCARSDALE	NATICK	BOSTON



FREE!

CUT OUT PASTE ON CARD

LAFAYETTE RADIO DEPT. VD-3
P.O. BOX 10, SYOSSET, N.Y.

Send me the FREE 388 Page 1963 Catalog 630

Name .....

Address .....

City ..... Zone ..... State .....

KG4AF, KV4BB, PJ2AA, VP4LD, numerous KH6s, VKs and ZLs. On 7-Mc. c.w. there are CR9AD, FF8AJ, KJ6AX, MB9CA, OD5AD, VS6CM, Ws 5QDF/KG6 6INQ/KM6 and 5A3TR — . . . Seventy-five phone really lives it up on CN8FR, CT1BS, EA2CQ, EL2P, HB9s FU MS, HP3FL, HR1s BG SO, TA3AA, VP6SD, ZL1WW and ZS6BW — . . . Eighty c.w. sounds like 20 during the wee hours: CE3AX, DU6s IV RG, EA9AP, GD3UB, FF8AG, LU4ZI, VK1RG, VP8AP, VQ3KIF, VS6CG, YU2AT, ZE3JP, ZK2AA, ZS9I and 5A3TU abound — . . . Twenty phone is the route to CR8NMC, CS3s AB AC, HC8GI, I1YAK/Trieste, KT1LU, MI3US, OE13s GR USA, OQs 5BG 5BZ 5EB ØDZ, SU5EB, TA2EFA, YI2AM, ZD4s AB BK and BL. QST

Hamfest Calender

(*Continued from page 10*)

April 28. Contact N.D.S.U. Amateur Radio Society, E.E. Dept., State University Station, Fargo, N.D.

Ohio — The 12th annual Dayton Hamvention sponsored by the Dayton ARC will be held at the Dayton Biltmore Hotel on April 26 and 27. The Biltmore will be host to such groups as the Quarter Century Wireless Association, MARS, various DX clubs, and many others. There will be separate day-long programs for YLs, highlighted by their own private luncheon. For further info contact John W. Pratt, W8RJH, 3413 Pobst Drive, Dayton 20, Ohio.

Oklahoma — The annual Quartz Mountain hamfest will be held on April 27 and 28 near Lone Wolf, Mangum and Altus. Enjoy a look at southwest Oklahoma's scenic beauty. Preregistration and Sunday noon meal, $3.00. Contact Earl L. Street, K5JCH, Carter, Oklahoma.

Pennsylvania — The Radio Association of Erie will sponsor their annual hamquet at the Cesare Battisti Club, 1602 East 38 St., Erie, Pa., in celebration of the Perry Sesquicentennial. The date is April 27, and the time 7:00 P.M. Dress is optional, but it is hoped that most of the people in attendance will dress in styles of the 1800's. Contact Hank Schneider, W3KPJ, 1806 Water St., Wesleyville, Pa., for further info.

South Carolina — The annual Hamfest of the Blue Ridge Radio Society will be held at Paris Mountain State Park, Greenville, S. C., Sunday, May 5. Tickets are $3.00 for adults, and $1.50 for children. Tickets may be obtained at the hamfest or in advance. For further info contact L. H. Gregory, W4VWW, 111 Coleman Court, Greenville, S. C.

April 1938

. . . In response to popular demand, W5CJB developed a code-practice oscillator, the construction of which consisted only of a tube and socket, transformer, two condensers, two carbon resistors, and a resistor line cord.

. . . W1BDI wrote on the expansion of and new aims in ARRL emergency organization.

. . . QRM was a problem even then — W6KVL wrote in *Operating News* that individual action was the cure, not letters to the editor of *QST* complaining about lids, long CQs, QRM and bum fists. He stated that the amateur bands were not crowded beyond endurance; but the amateurs were all crowded into one part of the band, and suggested that each amateur could help the situation by condemning improper operating practices, while pointing out the correct procedure. In Correspondence, W5EOW had something to say about the growing QRM caused by the increasing number of phone operators.

. . . A new book by F. E. Terman, *Fundamentals of Radio*, was announced. This was a simplified version of his well-

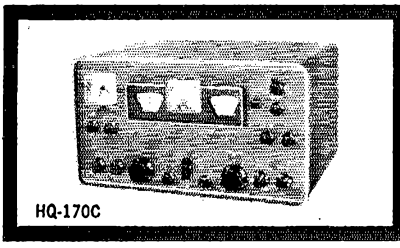
(*Continued on page 154*)

WANTED

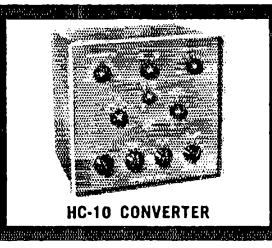
YOUR MILITARY SURPLUS EQUIPMENT

WE NEED: BC-221, BC-312, BC-342, BC-348, RBL, RT-77/GRC-9, GRC-30, RT-68/GRC, RT-70/GRC, R-388/URR, R-390A/URR, R-391/URR, R-392/URR, URR-13, URR-29, URR-32, ARC-27, ARC-34, ARC-38, ARC-44, ARC-52, ARC-55, ARC-58, ARN-14, ARN-21, ARN-30, ARN-31, ARN-32, ARN-44, ARN-59, APX-25, APN-70, PRC-9, AND 10, TEST SETS WITH SG, URM, UPM, USM AND TS PREFIXES. SEND YOUR LIST OF SURPLUS, AND TELL US WHAT YOU NEED.

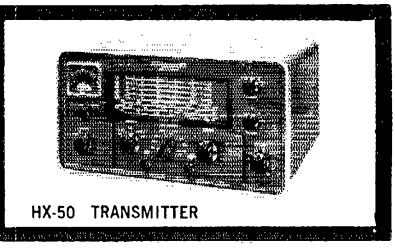
WILL TRADE NEW FACTORY BOXED 1963 HAMMARLUND GEAR. ALL RECEIVERS WITH CLOCK AND MATCHING SPEAKER.



HQ-170C



HC-10 CONVERTER



HX-50 TRANSMITTER

HQ-100AC	$ 213.95	SP-600JX, STANDARD HIGH FREQUENCY MODEL 0.54 TO 54MC WITH 6 FIXED FREQUENCY OSCILLATOR ASSEMBLY	1,140.00
HQ-110C	273.95		
HQ-145XC	298.95		
HQ-170C	388.95	SP-600JLX LOW FREQUENCY MODEL 100KC TO 29.7MC WITH 6 FIXED FREQUENCY OSCILLATOR ASSEMBLY	1,260.00
HQ-170ARC RACK MOUNTED	416.95		
HQ-180C	458.95	SP-600VLF VERY LOW FREQUENCY MODEL 10 KC TO 540KCS WITH 4 FIXED FREQUENCY CONTROL OSCILLATOR ASSEMBLY	1,975.00
HQ-180RC RACK MOUNTED	476.95		
HQ-180XE, 11 CRYSTAL CONTROLLED FIXED FREQ., PLUS VFO, SUPPLIED LESS CRYSTALS	519.45	SPC-10 SSB/CW AM/MCW CONVERTER FOR ALL SP-600 SERIES RECEIVERS, RACK MOUNTED	375.00

HAMMARLUND HC-10 CONVERTER: A COMPLETE IF AND AUDIO SYSTEM . . . USE WITH ANY SUPERHET HAVING A 450-500KC IF. UP-DATE YOUR OLD RECEIVER FOR TOP SSB, AM and CW RECEPTION. HAS SLOT FILTER LINEAR DETECTOR, 3 SPEED AVC, 3KC VERNIER LIKE IN HQ-170C 7 SELECTIVITY POSITIONS, 10 TUBES, EASY TO INSTALL, PRICE $149.00

HX-50 TRANSMITTER 449.50

SLEP ELECTRONICS CO., P. O. Box 178-T Highway 301, Ellenton, Florida, Phone 722-1843

Dear Bill, W4FHY:

☐ I have to Trade in my _____

_____

☐ I'm interested in a Hammarlund _____

Name _____

Address _____

City _____ State _____

NOW

EXCLUSIVE 66 FOOT **MOR-GAIN** 75 AND 40 METER DIPOLE

NO TRAPS — NO COILS — NO STUBS — NO CAPACITORS

Fully Air Tested — Hundreds Already In Use

THREE BAND SECTION — FULLY GUARANTEED — PAT APPLD FOR

40% Copper Clad wire—Under 2 lbs. Air Weight—Rated for full legal power-AM/CW or SB—Coaxial or Balanced 50-75 ohm feed—VSWR under 1.5 to 1 at most heights—Rust resistant hardware—Drop-proof insulators. Completely assembled, ready to put up. Model 75/40 Amateur Net $28.00. Terrific Performance—No coils or traps to break down or change under weather conditions—Fully Guaranteed.

Other MOR-GAIN Antennas—Model 40/20—34 feet—Net $22.00. Model 75/40/15 Net $35.00. Verticals 5 to 34 feet—Net $9.00 to $22.00. 40/20 Rotable Dipole $69.50—Plus many more.

Phone 703-768-2171

ORDER DIRECT OR WRITE FOR FULL INFORMATION **MOR-GAIN** P.O. Box 6006 Alexandria, Virginia

known *Radio Engineering*, and was considered a good introductory course in radio.

. . . The editorial announced the completion of 54 copies of the complete 12th edition of the *Handbook* and the same number of copies of the latest edition of the *License Manual*, in Braille. The work was done by the New York Chapter of the Red Cross and paid for by a special appropriation from the Library of Congress. This was the first time that amateur literature had been made available to the blind in any quantity, the first transcription of the *Handbook* having been made available 3 years earlier — in 12 volumes!

. . . The ARRL emergency plan received its first test when amateurs mobilized successfully during a destructive flood which hit 6 counties of Southern California.

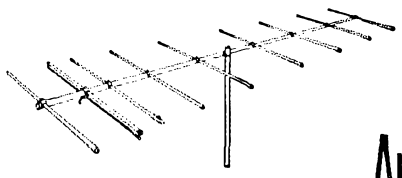
. . . Technical articles included a tuned loop for 80- and 160-meter reception, an article on the construction of TV receivers, how to shock-proof the transmitter, a description of a de-luxe battery-operated portable station, and a modern version of the 56-Mc. transceiver — crystal controlled with a non-radiating receiver.

Silent Keys

IT is with deep regret that we record the passing of these amateurs:

W1DFC, William R. Murphy, Old Orchard Beach, Me.
K1GYB, Elmer F. Dolloff, Hillsboro, N. H.
W1HUD, William S. Graves, Sunapee, N. H.
W1KCX, Meyer White, Hartford, Conn.
W1KUA, Harry J. Fitzgerald, Newburyport, Mass.
W1MIA, Malcolm G. Bliss, North Grafton, Mass.
ex-100, Dominick Alioti, Medford, Mass.
W1RK, Edmund P. Drozek, Reading, Mass.
K1TVC, Osborne S. Hamm, Dover, N. H.
W1UMK, Norman E. Devlin, Newton Center, Mass.
K1YNM, Robert S. Wilson, Dedham, Mass.
W2DD, Dudley J. Connolly, Jackson Heights, N. Y.
WN2DYQ, William R. Putnam, Lockport, N. Y.
W3HYB, John H. Jenkins, New Cumberland, Pa.
W3KSJ, George W. Friend, Clairton, Pa.
W4DGT, William L. Lee, Richmond, Va.
K4GH, Charles J. Brown, Dunedin, Fla.
W4MVO, William H. Wright, Fayette, Ala.
K5IOW, Henry Hensley, Big Sandy, Tex.
K6EL, Raymond J. Selwyn, Sherman Oaks, Calif.
K6EXP, Hill L. Cameron, Sierra Madre, Calif.
ex-W6FPU, Richard C. Barrett, Trumbull, Conn.
WA6UTU, Albert E. Metcalf, Los Angeles, Calif.
W7FF, Hubert F. Fagan, Tacoma, Wash.
W8CSB, Leland D. Lathrop, Berkey, Ohio
W8TIO, William C. Denison, Powell, Ohio
W9DLM, Herbert G. Cole, South Bend, Ind.
K9IAE, John C. Mohr, Hayward, Wise.
W9PBF, Ernest B. Sedig, Keithsburg, Ill.
WØBRN, Stanley H. Cox, Butler, Mo.
WØJRV, John M. Roper, Bethel, Kans.
WØKUN, Wilbur S. Felt, Wellington, Kans.
WØMVH, Lee C. Boynton, Mound, Minn.
WØVIY, Kenneth T. Deutsch, Denver, Colo.
ex-G6AQ, Arthur H. Bird, Peckham Rye, London, England
VE3BKN, Kenneth S. Hall, Scarborough, Ont., Canada
VE7NL, S. W. Lawrie, Vancouver, B. C., Canada
ex-VE7ZF, Russ C. Upsdell, Assiniboia, Sask., Canada

NEW SCOTCH! MASTER



2&6 Meter Antennas

MOSLEY Model A-92-S

An introduction to the New MOSLEY SCOTCH-MASTER two meter beam. This nine element antenna may be mounted vertically or horizontally, providing excellent front-to-back ratio, handling maximum legal power, amplitude modulated or 2,000 watts P.E.P. SSB. Mounting bracket fits masts up to 1½ inch OD. Antenna is matched for 300 ohm balanced line. Boom is made of sturdy medium weight wall 1¼ inch OD aluminum tubing to achieve maximum strength with minimum weight and wind loading characteristics. Stacked arrays feature 300 or 75 ohm balanced feed.

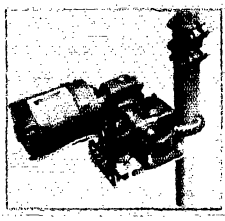
SPECIFICATIONS AND PERFORMANCE DATA: Forward gain, 14 DB. Front-to-back, 20 DB. SWR, 1.5 to 1 or less at resonant frequencies. Maximum element length, 41 inches. Boom length, 12 feet. Turning radius, 6.5 feet. Assembled weight, 4 pounds. Maximum wind surface area, 1.25 square feet. Wind load, 25 pounds. Antenna is shipped in kit form.

MOSLEY Model A-76-S

Also introducing for the first time, the MOSLEY SCOTCH-MASTER six meter beam. This seven element array provides maximum forward gain with excellent directivity. SCOTCH-MASTER will handle the full legal power, amplitude modulated. Mounting bracket fits up to 1½ inch OD mast. Antenna is "Gamma" matched for 52 ohm unbalanced line. Boom is of heavy guage 1¼ inch OD aluminum. Easily rotated with TV rotor and can be mounted vertically or horizontally.

SPECIFICATIONS AND PERFORMANCE DATA: Forward gain, 12 DB. Front-to-back, 20 DB. Boom length, 24 feet. Turning radius, 13 feet. Assembled weight, 12.5 pounds. Maximum wind surface area, 2.5 square feet. Wind load, 51 pounds. Antenna is shipped in kit form, complete with detailed instructions.

MOSLEY ELECTRONICS, INC. 4610 N. LINDBERGH BLVD. BRIDGETON, MO.



TELREX ROTATOR-INDICATOR SYSTEM MODEL TS238-RIS

- MAST FEEDS THRU ROTATOR FOR SAFER AND EASIER INSTALLATION MAINTENANCE
- 1300 IN/LBS ROTATION TORQUE
- SELF LOCKING BY STURDY WORM GEARS
- AZIMUTH INDICATION BY SELSYNS
- AUTOMATIC LIMIT OF ROTATION
- DESIGNED FOR 2" O.D. MASTING
- MALLEABLE CAST MASTING CLAMP SUPPLIED
- OUTPUT SPEED APPROX. 1 RPM
- WILL FIT INTO OR ONTO A 6" SIDED TOWER

A REALLY STURDY ROTATOR-INDICATOR SYSTEM NOT A MODIFIED TV ROTATOR

WILL HANDLE A 12M BOOM OR EVEN A 20M 4 EL BEAM IN WINDS UP TO 110 MPH

$238.00

FOB ASBURY PARK N.J.

OTHER TELREX ROTATORS LARGER HIGHER TORQUE RATING MODELS AVAILABLE

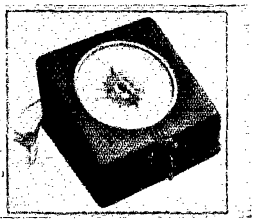
MODEL TS435-RIS $435.00 1300 IN/LB TORQUE

MODEL TS535-RIS $535.00 2500 IN/LB TORQUE

(CUSTOM DESIGNED MODELS AVAILABLE)

TELREX LABS. ASBURY PARK N.J.

WRITE FOR FREE PL-77 DESCRIBING THE WORLDS MOST POPULAR ANTENNAS



LAMPKIN METERS + 2nd Commercial License = YOUR OWN PROFITABLE BUSINESS!

YOU ALREADY HAVE EARNED ONE FCC LICENSE . . . YOUR HAM TICKET. IT HAS GIVEN YOU LOTS OF FUN. WITH A LITTLE EXTRA STUDY YOU CAN EARN ANOTHER — A 2ND-CLASS RADIO TELEPHONE. THIS TICKET CAN LEAD TO LOTS OF MONEY — IN A BUSINESS THAT'S A NATURAL FOR A HAM!

THERE IS AN URGENT NEED FOR TECHNICIANS WITH 2ND-CLASS COMMERCIAL LICENSE, TO MAINTAIN TWO-WAY COMMERCIAL RADIO. CLOSE TO 3,000,000 NON-HAM MOBILE RIGS MUST BE KEPT OPERATING. CITIZENS BAND RADIO IS EXPLODING. FREQUENCY ADJUSTMENTS ON ALL THESE OUTFITS CAN ONLY BE MADE BY PROPERLY LICENSED AND EQUIPPED TECHNICIANS. TO LEARN MORE . . .

LAMPKIN 105-B FREQUENCY METER
RANGE 0.1 TO 175 MC AND UP.
PRICE $260.00 NET.

LAMPKIN 205-A FM MODULATION METER
RANGE 25 TO 500 MC.
PRICE $270.00 NET.

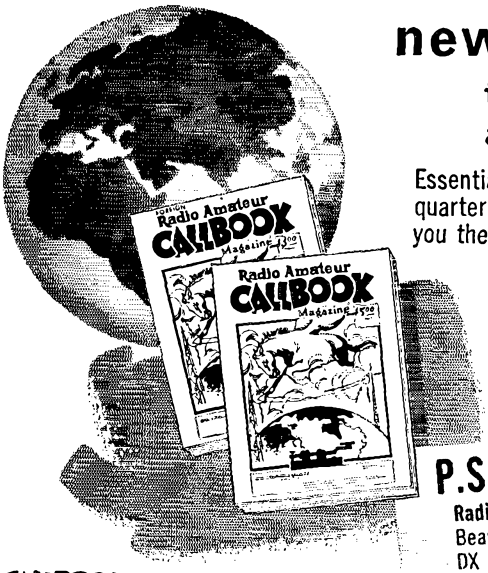
LAMPKIN METERS ARE PREFERRED TEST EQUIPMENT . . . BY THOUSANDS OF MOBILE-RADIO ENGINEERS!

LAMPKIN LABORATORIES, INC. BRADENTON FLORIDA

Send for FREE BOOKLET
"How to Make Money in Mobile-Radio Maintenance!"

LAMPKIN LABORATORIES, INC.
MFG Division, Bradenton, Fla.
At no obligation to me, please send me free booklet "HOW TO MAKE MONEY IN MOBILE-RADIO MAINTENANCE"—and data on Lampkin meters.

NAME_____
ADDRESS_____
CITY_____ STATE_____



new issue just out!

the radio amateur CALLBOOK

Essential QTH information for all radio amateurs and SWL's. Each quarterly issue of the CALLBOOK is completely revised to bring you the most up-to-date information on QTH's.

PLUS THESE EXTRA FEATURES!

- Great Circle Bearings
- Great Circle Charts
- Prefixes by Countries
- International "Q" Signals
- World Time Chart
- International Postal Information
- And many other features

CALLBOOK of United States Listings
(Over 250,000 K & W calls)
Each quarterly issue..... **$5.00**

CALLBOOK of Foreign Listings (Over 100,000 calls outside the U.S.A.)
Each quarterly issue..... **$3.00**

P.S. ORDER THESE VALUABLE RADIO AMATEUR GUIDES, TOO!

Radio Amateur DX Guide—62 pages of vital data; 291 Great Circle Bearings for 22 major U.S. cities; Prefix Map, Time Conversion Table, DX Log, plus other features..... **$2.00**

World Prefix Map—Full color, 29" x 42", shows prefixes on each country . . . DX zones, time zones, cities, cross referenced tables **$1.00**

World Atlas—Only Atlas compiled for amateurs. Polar projection, six continents, prefixes on each country . . . full color, 16 pages..... **$1.00**

RADIO AMATEUR CALLBOOK

Dept. A, 4844 W. Fullerton Ave., Chicago 39, Ill.

See your favorite dealer today for your latest issue or order direct from the publisher (add 25c for mailing).

HUNTER

AMATEUR NET:
$575.00

BANDIT 2000A

LINEAR AMPLIFIER

NEW! COMPACT!

BUILT ESPECIALLY FOR SSB AND CW OPERATION !

Grounded grid operation, 2000 watts PEP (twice average DC), 160 watt driver PEP required . . . 80, 40, 20, 15, 10 meter operation . . . 115 or 230 volt operation available . . . Relay operated with exciter controls . . . Solid state rectifiers . . . Many other features . . . Size, 14¾" x 6¾" x 14" deep . . . Weight, 45 lbs.

WRITE FOR MORE INFORMATION

Hunter Manufacturing Company, Inc.

IOWA CITY, IOWA

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 non-commercial 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.

MICHIGAN State Hamvention, Grand Rapids, 16th Annual, April 6, 1963, Pantlind Hotel, Michigan's best. Write Post Office Box 1333.

BREAKFAST Club Hamfest July 20 and 21.

DAYTON Hamvention Apr. 26 and 27! Biltmore Hotel.

HAMFEST June 2. Annual Starved Rock Radio Club Picnic. Watch this section for further details. See May Hamfest Calendar for late info or write W9MKS/W9QLZ, G. E. Keith, RFD #1, Oglesby, Illinois, after April 1 for brochure.

14 WEATHER Instrument Plans, $2.00. Saco Industries, Box 2513, South Bend, Ind.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCQ, Ralph Hicks, Box 6097, Tulsa, Okla.

WE buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, N.Y.

TOROIDS: Uncased 88 Mhy. like new. Dollar each. Five/$4.00 P. P. DaPaul, 309 So. Ashton, Millbrae, Calif.

SOUTHERN California: Transmitters and receivers repaired, aligned, bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllogg 8-0500.

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, W8RP. 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.

"FOR The operator that has everything." Samples 10¢. Call Signs, Box 933, Aurora, Ill.

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, K5MKT, 501 N. Maxwell St., Tulia, Texas.

304TL tubes wanted. Also other xmttg and special purpose tubes. We will buy military or commercial transmitters and receivers with designations ARC, GRC, URR, 51 and MN. Air Ground Electronics Co., 64 Grand Pl., Kearny, N.J.

CASH promptly paid for your ham gear. Trigger, 7361 North, River Forest, Ill. FR-8616.

QSLS? WPE? Get great returns. Largest variety samples 25¢. Deluxe samples 50¢ (refunded). Sakkers, W8DED, Holland, Michigan.

QSL, SWL, cards that are different. Quality card stock. Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

C. FRITZ QSLS. Highest quality consistently for a quarter century! Samples 25¢ deductible. Box 1684, Scottsdale, Ariz. (formerly Joliet, Ill.).

RUBBER Stamp. Call, address, name. Case, ink-pad: $1.00. K4ISA, Perry, Box 8080, Allandale, Fla.

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, Badensburg, Md.

QSL Specialists. Distinctive Samples 15¢. DRJ Studios, 2114 N. Lavergne Ave., Chicago 39, Ill.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Catalog with samples. 25¢.

QSLS-SWLS. Samples 10¢. Maigo Press, Box 375 M.O., Toledo 1, Ohio.

QSL-SWL-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N.J. Samples, 10¢.

QSLS. Special, 100 50 Star U.S. Flags on glossy cards, $3.70. Ppd. Other samples 10¢ or 25¢ refunded. Dick, W8VXK, Rt. 4, Gladwin, Mich.

QSLS-SWLS. 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 757, Kansas City 16, Mo.

QSLS: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

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 73, Hobbs, New Mexico (formerly Bellaire, Texas).

DON'T Buy QSLs until you see my free samples. Bolles, W5OWC, 7701 Tisdale, Austin, Texas.

QSLS, 300 for $4.35. Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSLS-SWLS. Samples free. W4BKT Press, 123 No. Main, McKenzie, Tenn.

QSLS. Samples 25¢. Rubber stamps: name, call and address $1.55. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS. Free Samples. W7IIZ Press. Box 183, Springfield, Oregon.

QSLS. 3-color glossy. 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., Somerset, N.J.

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.

YLRL QSL Specials, OM's, Reasonable, samples dime. W2DJH PRESS, Warrensburg, N.Y.

POCKET Rubber Stamps. Your call plus name and address, $1.00. Ralph, KØUMY, Box 238, New Ulm, Minn.

RUBBER STAMPS. $1.00. Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N.J.

QSLS, $2.50 per 100. Free samples and catalog. Garth, Jutland, N.J.

QUALITY Rubber stamps. Low prices. Pocket Size, 3 lines, $1.00. Sam Koury, K8TCJ, 3867 Fernleigh, Troy, Michigan.

QSLS. $2.00 per 100 postpaid U.S. only. Glossy red and green. Free sample. Hobby Print Shop, Umatilla, Fla.

RUBBER Stamps for hams, sample impressions. Hamm, W9UNY, 542 N. 93, Milwaukee, Wis.

QSL Cards. New, cute designs. Three day service. Low as $1.50 for 100. Free samples. H. Hellwig, Box 425, Lake Wales, Florida.

QSLS. Stamp and call bring samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS, Glossy, samples 10¢. Brigham, Colson St., North Billerica, 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.

"1½" Call QSLS (2 sides printed) 100, $3.15. Sample free. Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

QSLS. Samples free. Filmerafters, Box 304, Martins Ferry, Ohio.

QSL Cards. New, cute designs. Three day service. Low as $1.50 per 100. Free samples. H. Hellwig, Box 425, Lake Wales, Fla.

QSLS, SWLS, 3-colors, 100 $2.00. Samples dime. Bob Garra, Lehighton, Penna.

HUNDRED QSLS. $1.00. Samples, dime. Meininger, Jesup, Iowa.

QSLS, SWLS. Same day service. The kind you'll be proud to send. Reasonable! Samples 10¢. Refundable. Joe Harms, WA4FJE, 905 Fernald, Edgewater, Fla.

RUBBER Stamps for hams, sample impressions, W9UNY, Hamm, 542 N. 93, Milwaukee, Wis.

CANADIANS! Sell SX25 with manual, less spkr. Reasonable condx, eighty five dollars plus transportation. Walker, Box 1682, Edson, Alta., Canada.

CANADA. HQ-110C, in excint condx. Best offer. VE7BHM, H. Meadows, 1163 Connaught Dr., Vancouver, B.C., Can.

FOR Sale: R.T. 159B/URC4 transceiver, $25; Johnson Adventurer TX, $50; Knight VFO, $40; C2 frequency meter, $20. C. Gutman, 7526 Mountbatten Rd., Montreal 29, Que. P., Canada.

CANADIANS: Cleaning out; mobile Gonset 12V DC transistor power supply, 12V dynamotor, ceramic mike, 80M helixwhip antenna HD base, modulation monitor; frequency meter, Heathkit preamplifier. Wanted: SX28A. VE2OU, Box 355, Riviere du Loup, Que.P., Canada.

CANADIANS. Hallicrafters SX-111. Untampered with and in mint condx. List $408. Will accept $250. Prefer buyer collects. VE3DPA, 2167 Quinn Crescent, Ottawa 8, Ont., Canada.

"HOSS-TRADER", Ed Moory, offers following closeouts factory sealed Cartons: Swans, $209.00; 75S-1's, $419.00; 32S-1's, $559. Hammarlund HX-500, $469.00; Ham-M Rotor & Demo TH-4 Beam, $178.00; also New NCX-3 transceiver, $329.00; Used Bargains, 75A-4, $469.00; 100-V, $569.00; 200-V, $675.00; HT-37, $369.00; 2-B, $219.00; 2-A, $199.00; 3 Band Swan, $259.00; KW-1, $1395.00; 75S-3 Sealed Carton, $519.00; 30L-1, $359.00; KWM-2, $839.00; 32S-3, $595.00; Johnson Invader, $419.00; SX-140, $98.00; Ham-M Rotor, $69.00; Heath Apache, $209.00; SX-111, $179.00; Loudenboomer Linear, $219.00; Heath Warrior, $189.00; Package Deal, New 32S-3 & Used 75S3, $1095.00; Terms; Cash. Ed Moory Wholesale Radio, Box 506 DeWitt, Arkansas. Phone WHitney 6-2820.

COLLINS Owners work AM! S/Line, KWM-1-2! No drilling! No soldering! No chassis removal! Instant switching! Easy installation! Wired kit, $5.00. Kit Kraft, Harlan, Ky.

CHANGE X-tal frequency, including plated type. Safe method, ammonium bi-fluoride, containers, holders, and complete instructions $1.00. Deluxe model, $2.00. Ham-Kits, Box 175, Cranford, N.J.

ATTENTION: Amateur radio equipment repaired, work guaranteed. L & S Electronic Technicians, WA2OQG, Sid Levinson, 393 So. 3rd, Brooklyn 11, N.Y. Tel EV 4-7564.

ATTENTION Mobileers! Heavy-duty Leece-Neville 6 volt 100 amp. system, $50; 12 volt amp. system, $50: 12 volt 60 amp. system, $60; 12 volt 100 amp. system, $100. Built-in silicon rectifier alternators 12 volt 60 amps, $100; 12 volt 100 amps, $125.00. Guaranteed no ex-police car units. Herbert A. Zimmerman, Jr., K2PAT, 1907 Coney Island Ave., Brooklyn 30, N.Y. Tel. DEwey 6-7388.

HAM Discount House. Write us for lowest prices on ham equipment. Factory sealed cartons. Specify equipment wanted! H D H Sales Co., 327 Greenwich Ave., Stamford, Conn.

SALE: Collins 32V2 xmttr, $220; Globe King 400 xmttr with an extra modulation xfrmr and tubes, $150; RME DB 22A tuneable Preselector, all bands, $25; Collins 75A3 rcvr w/3.1 Kc. mechanical filter, $275; Central Electronics 20A exciter 458 VFO and 600 L linear amplifier, $525. Sell as complete SSB package (on air daily on 75 meters 3.9 Mc. N.J. Phone net and 3.985K/c Inter State SSB Net). Sry, no shipping, pick-up deal only as equipment too large to ship. Harold W. Kutz, JGU, 223 Swarthmore Rd., Glassboro, N.J.

CLEANING OUT. Tubes and parts. Stamp for list of bargains. M. Marshall, 46 Lincoln Place, Waldwick, N.J.

WANTED: SX-42 rcvr. Please state price and condition. K8NVJ.

MODEL 19 Teletype machine for sale. This machine is complete and is in vy gud condx. Sry, will not ship, but will crate. Contact Larry, K9BJM, Hoopeston, Ill.

VALIANT, like-new, $295; Gone SSB, Edwin O'Brien, W2LJF, Mi 1-1298, 132-38-84 St., Ozone Park 17, N.Y.

SOUTHERN California: KWM-2 with AC supply and extra xtals, $910. W6BLZ, 528 Colima St., La Jolla, Calif.

SELL: HT-37, $335; SX101A, $265. K5MWU, QTRS 1831B, Blytheville AFB, Arkansas.

HAWAII: Collins 75A4 serial 4054. In mint condx. Matching spkr, original carton. Extra filters. Some trade considered. Make offer. KH6EWG. Honolulu, 286045.

SELL: HT32A, $500; 75A4, #2776 vernier dial 3.1 Kc filter, $475; HT33A, $550. All in excint condx. W1ECF, Lt. Col. W. M. Wood, 301 Shreveport Rd., Barksdale AFB, La. Phone 7461153.

STILL Looking for old wireless gear before 1925. Will pay good money or trade and particularly want certain spark equipment, a C.R.L. Paragon with amplifigon or matching tube panel; DeForest Type O radiotelephone with tubes, catalogs, government callbooks and other books. File of QSTs is almost complete but need a few issues of 1916, 1917, 1919 and 1923. If you are lucky enough to own any copies I need I will pay real money for them. I want them that badly. Also need quenched gap sections number SE-1001 for SE1075 ship transmitter. In writing please give complete information plus price or specify what you need. W5VA/W5AI. T. Frank Smith, P.O. Box 840, Corpus Christi, Texas.

SELL: 75A4, ser. 5446, spkr, 2 filtrs, $1575—absolutely like new; stereo Fisher AM-FM 101R tuner, $100; stereo amp-preamp, Bell 3030, $95 and TEC transistorized stereo amp, $95; 2-6550 tubes each, $4; 2 E 26 tube RCA, never used, $2; E-V 600 D mike, as is condx, working, $5; mobile pwr. supp. with relays, etc. ready to go, 6 volts inp., about 400 volts, 350 Ma. outp. $25; Johnson 275 watt Matchbox, $30; VFO-matic for transceive operation with 75A rcvrs, $90. All in excint like new condx. F.o.b. Lamb, 1219 Yardley Rd., Morrisville, Penna.

SALE: SX-111, matching speaker, $200. Doug Lutz, K8HFJ, 1109 Luray Dr., Ashland, Ohio. Tel. 27561.

WANTED: HRO coils, type AC 21 to 21.5 Mc and others. W8JDG.

SELL: Collins KWS-1, $800; 75A-4, $475; KWM-1 with AC and DC pwr. supplies, noise blanker, $675; all in mint condx. Matt H. Klapp, W2EQV, 17 Kenosha St., Albany 9, N.Y. Tel. 518-4344-518.

ACT Now!! Barry pays cash for tubes (unused) and equipment. Barry Electronics, 512 Broadway, NYC 12. Call 212-WAlker-5-7000.

GONSET GBS 101 linear amplifier with 3B28 rectifiers over 1,000 watts PEP with 75 watts drive. Will ship freight prepaid for $250 or your best offer. Pepos S. Dounson, W5OSG, 314 Maverick Bldg., San Antonio 5, Texas.

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.

FOR Sale: Collins 30L-1 and 312B-5 station control in original cartons, used less than year. W5SZB, Box 330, Edinburg, Texas.

HEATH Apache, $200; NC-300, $200; TA-33 and 40 ft. tower, $110. K2PCZ, 779 Fay Rd., Syracuse 4, N.Y.

PACEMAKER. Latest modifications. Refinished. New panel. Excint. $300 or you make offer. Robert Campbell, Waseca, Minn., 7th St. and 9th Ave. N.E.

TOROID RTTY Kit: Mark-Space discriminator and bandpass filters. Includes 4-88 Mhy and 1-44 Mhy uncased like new condx. toroids; information sheet, mounting hardware and six mylar capacitors. $5.00 ppd. Toroids; specify 88 or 44, less capactrs. $1.00 each. 5/$4.00, ppd. KCM Products, Box 88, Milwaukee 13, Wis.

WANTED: For personal collection: QSTs January through August 1916; ARRL Handbooks: Editions 1 and 5. WICUT, 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.

SELL, Swap or buy ancient radio sets and parts, magazines. Laverty, 118 N. Wycombe, Landsdowne, Penna.

SK-20 Tunable Preselector, calibrated 3.5-30 megacycles, boosts reception 3+ "S" units. Complete kit, cabinet, built-in power supply, $18.98 ppd. Holstrom Associates, Box 8460-T, Sacramento 22, Calif.

WANTED: Motorola FHTR-80D or 140D unit. Ralph Villers, Box One, Steubenville, Ohio.

KWM-2, AC-DC supplies, speaker, $1100. Huston, RFD 3, Cedar Rapids, Iowa.

FOR Sale: 3600-0-3600 @ 1000ma plate transformers with dual 110V & 220V primaries, $35. 7.5V.C.T. @ 45 amp 4-1000A filament transformers, $16.50. Peter W. Dahl, 5331 Oaklawn Ave., Minneapolis 24, Minnesota.

WANTED: Collins 51J-3, 5U4, R-388, R-390A, R-391, 75A-4, SP-600, teletype, Kleinschmidt, facsimile and test equipment. Cash or trade for new amateur equipment. Sell: 75A2A w/3kc filter, $275.00; Collins 32V xmttr, $175; P&H 400C linear ampf, $125; Boehme c.w. keyer $125. Write: Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

FOR Sale: NC183R with matching spkr, in cabinet, $125; 500 watt 813 final, continuously tuneable 3.5-30 mc with separate scr. bias, plate supplies. Shielded and filtered. In cabinet, $100. Both $200. Also, 15 amp. powerstat $25. D-104 mic and stand, $10. Nearly finished 12 tube exciter with all parts incl. tubes, $50. Cash & carry deal. K2RRT, 226 Elm Ave., Mantua, N.J.

FOR Sale: QST January 1942 to Dec. 1962, $25; Radio News January 1944 to Dec. 1959, $10. F.o.b. Lake Hiawatha, N.J. Harry A. Bremer, 43 Washington Ave.

SALE: Excellent HRO-60, rack mounted. All coils, xtal cal., FM adapter. Make offer. Courtney, 21 Nairn Pl., Nutley, N.J.

SALE: Ranger II, HQ-170, 160-watt amplifier, Braverman, 3150 Rochambeau Ave., New York City, WA2UXL.

LOS Angeles area: Wanted—KWM2 or 32S1. Call: Hollywood 3-1058 week days.

WANTED: Zenith Trans-Oceanic FM. Clegg 62T10. Gonset G76. Sell: Globe Cham pion 300, SX88, Monitoradio DR-200, Gonset Tri-Band converter, Subraco MT15X transmitter. Write Robert Schramm, 5212 Madison St., Skokie, Ill.

YE Imbued collectors: Tune in on this: extremely rare opportunity. One "bible", near mint condition. Stuart Ballantine, "Radio Telephony for Amateurs", David McKay Co., Philadelphia, 1923. Never read over 15 wpm. Highest bidder, deadline April 15, 1963. Proceeds to ARRL Building Fund. K2FT, Box 69, Barnegat, N.J.

FOR Sale: Gonset GC-105, purchased new Aug. 1962, in excint condx. $220 or offer. ARC-2 3-9 2-9 Mcs. transceiver, $10. Prefer deal in northern California. Dick Wilson, K6LRN, 3519 Skylark Dr., Concord, Calif.

SELL: Plate transformer, 4860VCT 1.7A $40; 500W Modulator, all tubes and transformers, $100; Wilcox 2M KW, with exciter, p-p 4-125A final. Complete with all tubes. Fully metered. $155. W40AB, 4117 Murrayhill, Charlotte, N.C.

BEST Offer takes Collins KWS-1, Vernier dial. Used very little. Given latest modernization at Collins factory. Unopened factory cartons. WØHBG/3, 5605 Overlea Rd., Washington 16, D.C.

WANTED: Electronics instructor 1st Class Commercial, 19 plus theory and workshops. Coed science camp. Call NYC MO 3-4808.

FOR Sale or trade: General Electric voltage stabilizer. 103-127v input at 57-63 cycles. 110/115/120/125v output. $100. Newton Amateur Radio Club, c/o Paul DuBois, Rte. 5, Newton, Kansas.

EX-NOVICE lacking funds to go six meters. Appreciate donation surplus or junk box parts or equipment. K4RIW, 19 Glazier, Covington, Ky.

DB-23 Preselector, $25. Converters: Intl. Crystal FCV-1, 6 meter and FCV-2 2 meter, both complete with crystals and tubes. FCV-2 is new kit. Both $20. K8AIA, Box 953, Hamilton, Ohio.

SELL: 75S-3, 32S-1, 30L-1, 516F2. all units serial 10,000 series: $1400 or best offer. K2HWP/2, 125 Amherst Ave., Syracuse 5, N.Y.

FOR Sale: G76 with AC pwr. pack and mike, used two months, in perf. condx. Asking $475. Call TEaneck 6-1607. New Jersey. WA2LJG.

HQ-170C, in excint condx, 1 year old. Need money for college: $265. K8MPF, Dave Clark, 3945 W. Willow, Lansing, Mich.

GONSET Super Six $22; Superceiver, $33; 12 volt coax relay, $7. Mitch Finer, 379 Central Ave., Milton 87, Mass.

FOR Sale: Collins 75A2 recvr with C-E Model B slicer, spkr, calibrator, vernier knob. Perf. for AM, SSB, CW: $295. J. Taylor, W2OZH, Stanwood Rd., Mt. Kisco, N.Y.

COLLINS KWM-2, 312B5, 30L-1, 516F-2. MP-1 and 351D-2. Will ship complete mobile and fixed station in original cartons: $1795. In excint condx. Will welcome inspection. K2MII, 58 Joyce, Hartsdale, N.Y.

VIKING II with Heathkit VFO, $150; National HRO STAL, $100; Stancor ST-203A mobile xmtr, $18. All in tiptop shape F.o.b. Cincinnati, Ohio. W8OVA, 1081 Shangri-la Dr., Cincinnati 30, Ohio. Tel. 231-1958.

COLLEGE: Must sell: Surplus recvr, R45/ARR7, .55 megcy to 34 megcy, aligned and sensitivity peaked on ham bands. Worked WAS and 22 countries in year. Previously commercially advertised in QST, so dfor ABT, $180. Will sell for $100, with pwr. supply, cables and DB-30. Navy Preselector. Fabulous buy! Will ship. John Curtiss, WA2YRL, 154 Brompton Rd., Williamsville 21, N.Y.

SX-71, Preselector, spkr, xtal calibr., T-R switch, all excint, $150. WA6ZPJ, 7609 Errol, El Cerrito, Calif.

SELL: Heath 6M Shawnee transceiver, less than one year old, perf, optg condx, all cables and manual, $220, or will trade for Drake 2A, 2B or SX101A; Maverick 6M filter, $10; 6M halo and mast, $10; if no takers will consider any reasonable offer. Prefer local deal. WA8EEM, Robert Ingersoll, 571 S. Winter St., Adrian, Mich.

GONSET GG linear amplifier, Mod. 500-W for sale: $148. Trade for part payment. W8FQS, 1525(E) Bridge Rd., Charleston 4, West Virginia.

SELL Or trade: 1 HA-10 "Warrior" kilowatt linear. Solid all bands, $190; Drake 2A receiver and Q multp., new tubes, $205; Thunderbird Tribander, up less than 1 yr., $75; BC-348 with AC pwr. supply. Needs some repair, $35; BC453 with AC pwr. supp., all new capacitors, $35. Will consider late Johnson 3-5½ outboard, hi powered rifle, or cash. K9MHD/9. 5507 N. Plaza Dr., Peoria, Ill. Phone 691-6465 after 5 PM.

FOR Sale: HQ-170 with clock, $270. Will ship express collect. Spaulding 40 ft. tower, and TA-33 Tri-band beam, $120. Cash and carry deal. W3SDE, 509 Lansdale Ave., Lansdale, Penna.

WANTED 2.1 Kc filter for 75A4. Write to W1ETF, Box 373, West Haven, Conn.

LICENSE Frame especially designed for Ham License. Unbreakable plastic. $1.50. Carl Ashworth, P. O. Box 8, Welch, W. Va.

HRO-60, 6 coils, spkr, vy clean. $325.00. Scotch Plains, N.J. Phone 889-7625.

MOTHER'S Mink Jacket for Drake 2B. KN3VPY, 420 Gardner Pl., Pittsburgh 37, Penna.

SELL DX-60 and HG-10. Both in vy gud condx. $100. K3NHL, 25 North Stuyvesant Dr., Wilmington 3, Del.

HQ145, calibrator, in excint condx: $200. Eldico SSB Jr., 75M exciter, VOX and 2 xtals: $55. WA2YYI, J. Porter, 228 Grove, Westfield, N.J.

TELETYPE Model 15, tape distributor, perforator, and converter: $275. Lampkin frequency meter, 205B, $235; Federal signal generator, Model 804, $135. Carl Hahn, Whitewater, Wis.

HEATHKIT Mobile station, perfect Cheyenne, Comanche and 12 volt transistor supply, spkr, mike and mount—all for $200. Sry, no shipping! Joseph Ruzich, W6UCL, 5724 8th Ave., Sacramento 20, Calif.

SELL: Viking Ranger, $145; Mosley CM-1 and matching speaker, $110; Lafayette HE45A, $75; Viking Matchbox 250-23-3, $60; Heathkit HD-11 Q multp., $10 and HD-20 xtal calibr., $8. All equipment is in excint wkg condx. Fred Salzman, WB2EHS. 293 Monmouth Ave., New Milford, N.J.

DX100 and SB10, $200, perf. condx. Gonset Comm. No. 2, $100; Gonset Super 12, $40. Contact D. Kastle, 46 Messenger Lane, Levittown, N.J. Tel. TR 7-5971. WA2VMG.

WANTED: Used or new 40-60 ft. tower with Triband beam (10-15-20) and rotator delivered and installed if possible. K3TFZ. Syd Rodin, 217 Clairmont, Clarks Summit, Penna.

WANTED: Speaker console for KWM-1, also crank-up tower. W2OBH, 200-27 46th Ave., Bayside, L.I., N.Y.

DX-40 and VFO, VF-1 for sale. Total $55 shipped express collect. FB condx but going SSB. WA6PGA, 2159 Thrush, Oxnard, Calif.

FOR Sale: 200V transmitter, like new. Price, $675. W1ULR.

HEATH Twoer; Hallicrafters HA-5 VFO 80/2; will sacrifice for house cleaning. K4ZYA.

NYC Hams! Factory wired Viking Challenger with 122 VFO, $105; G-63 receiver, $100. Larry Deutsch WB2ENK, 90 Riverside Dr., NYC. Tel. TR 3-0007.

TO Sell: DX-100, neutralized, FSK shifter, sequence keying, spotting sw, ant. relay, new tubes, new condx. Will ship. $150. Dick Marsino, W2UGM, 66 Columbus Ave., Closter, N.J.

WANTED: F455J-21 Collins mech. filter, 2, 1 Kc/s for 75A-4. State price. Jack Van Hutten, W4SHP, 1898 Idlewood Dr., East Point, Ga.

KNIGHT *100-in-1 kit*, complete, in excint condx, $20. Warren Otte, Rte 1, Osborne, Kans.

TELETYPE: Want teletype equipment. Kleinschmidt late model, also tape perforator, tape distributor, etc. Will swap Collins KWM-1 with AC power supply in perf. condx. W4AIS, 7 Artillery Rd., Taylors, S.C.

ELECTRONIC Equipment. All in excint condx: TS-323, $150; TS-174, $125; TS-175, $125; LR freq. meter, $100; new HP412A-VTVM, $295; TS-34, $40; GR1110A interpolation osc., $125. Lampkin 105B, $100. S. Wolf, 3 Lawrence Lane, Lexington, Mass.

WANTED: KWM-2, in excint condx with AC supp. Bob Avery, 400 West End Ave., Haddonfield, N.J.

DUAL Panoramic adapter with two (2) 5-in. scopes: RCA model REM. Sell or trade. Write for info. WA2PPE, Randall Brook, 25 Parkview Ave., Bronxville, N.Y.

GOING Mobile? KWM2 accessories. Collins 516E1 power supply, mobile mount, noise blanker. Band Spanner and Nu-Tronics Hustler w/10, 15, 20, 80 meter coils. Spring mount. All cables, manuals. In perf. condx. Complete package deal only $325.00. Will ship. WA2EBO, 244 Hansen Ave., Albany, N.Y.

ELECTRONIC Kits wired and tested by licensed technicians. Write Langer and Baham Kit Co. Rt. 1, Box 39, Ponchatoula, La.

QSTS. Selling my duplicates from 1916 to 1960. Want old Callbooks, catalogs, etc. for personal collection. Erv Rasmussen, Box 612, Redwood City, Calif.

SELL: SX-99, $95. With two speakers in cabinet, $110. W7HYJ, Enterprise, Ore.

SWAP: $3,000 worth new stock sporting goods, mostly fishing equipment, some archery, etc. For SS and AM rig. All letters answered. Joe Yutz, W3LXY, Pottsville, Penna.

SX-101-A, late model low time clean, like new condx, no scratches, best offer over $250. HRO-60 coils, best offer AC-21.0-21.5 Mc. AD-50-54 Mc. new, both band spread. Select-O-Ject, like new, best offer. Call daytime. Ph. 642-2233. Wilber Cox, 810 Pendleton Ave., Anderson, Ind.

HOSPITAL Bills too much. Must sell Valiant factory-wired NC-300, Hy-Gain 10-40 vert., Turner 80 mike, Heath balun coils, Johnson 250-23-3 Matchbox with reflected meter. All excint condx. Make it a good deal for both of us! Deliver 200 miles radius. KØKIX, Box #350, Fayette, Mo.

DX-100 perf. condx, one owner, accessories, $145. HQ-110 Hammarlund factory recondx Feb. 1963; speaker, like new, $165; Heath VTVM, $12. Pete Ling, K5IRI/4, 1343B Werner Park, Fort Campbell, Ky.

75A-2, $280; homebrew SSB xmtr. w/VOX, VFO, p.s., $150. Both for $415. K8PSV, Rte. 3, Lowell, Mich.

DC-40 for sale. Best offer accepted. Will answer all inquiries. Box 6023, San Antonio 9, Texas.

HQ-170-C and speaker, in excint condx. TA-33 Sr., CDR rotor. D-104 mike, Original bug, many other accessories. Best offer. Local delivery. K3ERZ, 8124 Brookside Rd., Phila 17, Penna. Tel. ME 5-3028.

KWS-1 for sale; in new condx, less than 20 hours use. Recently calibrated. $1000 firm. D. J. Bridgman, 7007 So. 116th Pl., Seattle 78, Wash.

SELL: G-76 factory modified to C model. Perf. condx. AC supply home built, with Gonset xfrmr. 12VDC supply home brew. $400.00. F.o.b. Arcadia, Calif. Bob, WA6ICT, 6521 No. Golden West, Arcadia, Calif. Tel. HI 7-5201.

SELL: Seneca xmtr, $150; K3MLD, 1414 Shiffler Ave., Williamsport, Penna.

FOR Quick sale: 71 ft. Triex H471 crank-up tower, $150; 20M Swan transceiver and supply $165. Both used very little. In mint condx. W2JE. Mamaroneck, N.Y.

SELL: 4-125's KW linear amp. (described in QST, July 1962) with 3000 VDC pwr. supply mounted in 42 in. cabinet on castor tray. Many extras. $225. All items guaranteed. WB6AWR, 3438 36th St., Sacramento, Calif.

SELL: New Elmac AF-68 PMR-8, M-1070 plugs, cables, T-50 mike, $395; new Hy-Gain 402AB 40M beam, $75; home brew 600 or 750 v. 300 ma. supply, $20; 6M receiver, $20; used NC-120 0.54 thru 36 mcs., $50; ASB-5, $15; MB-150 turret tuner, $15. W1PEX, 5 Fairland St., Lexington 73, Mass. VO 2-0393.

WANTED: I am interested in the lowest possible price for a KW amplifier. K1SPE, Fred Klatt, 36 Ripley Rd., Medford 55, Mass. Phone EX 6-1378.

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.

NC-303, $285.00 plate modulated Seneca, $175; factory-wired Eico modulator, $60; factory-wired 2m and 6m Tecraft converters, $20 each. This complete station available after "on the air inspection. Cash and carry: $535. Sry, will not ship transmitter or receiver. WA2FMC, 191 Hauppage Rd., Smithtown, L.I., N.Y. Area code 516 AN 5-6137.

TOWER Forty foot crank-down lay-over model with ground post. Seventy-five dollars firm. In excint condx. Sry, will not ship. Has been dismantled and ready to go. Location Tidewater Virginia. Joe Mullen, Cobbs Creek, Virginia. Phone 725-2748.

ELMAC *Transmitter* AF-68, $155; receiver PMR-8, $150; power supply M-1070, $50; all like new condx; D-104 mike, TH-3 beam with AR-22 rotator and 150 ft. RG-8/U, $100; Heath Sixer, new, $44; mobile power supply for sixer, new, $14; Halo antenna with coax, $12; Heath SWR bridge, new, $15; Sprague suppressikit, never used, *$14. RCA chanalyst, $40; RCA* sig. gen., $15. Shipped f.o.b. first checks. C. Comee, 1923, St. Joseph, Mich.

FOR Sale: (4) TDQ transmitters. 115 to 156 Mc. Navy surplus; (2) converted to six meters. New condx, with manuals: $125 each F.o.b. Baltimore, Md. Olin Electronic Supply, Inc., 6009 Eastern Ave., Baltimore 24, Md.

HAMMARLUND HQ-150 in vy gud condx, w/instrux mnl, $160; buyer must pick up or pay shipping from Freeport, Long Island. Inquire William B. Rubin, WA2ENK, Ross House, Box 313, Clarkson College of Technology, Potsdam, N.Y.

NEVADA *Stations. Am trying to arrange sked for* EA1GZ, a vy fine operator who needs only Nevada for WAS. Please contact K4EF.

WANTED: Command xmtr (T-27), (7-9 Mc) and Command recvr (R-27) (6-9 Mc). New and unmodified condx only. State price first reply. K4VUQ, 486 Hollyhill Dr., Lexington, Ky.

SELL Communicator III 6-meters with mike and crystals. $175. K9ATY, 1511½ South Main, Goshen, Ind.

HRO-60, calibrator, 15 and 6-meter coils: $250. K6HF.

FOR Sale: SX-71, T-150, AR-22 rotator, Heath SWR bridge, 6 and 2 meter beams. 150 ft. RG-8/U. Write: WA9AGN, 390 Moraine, Highland Park, Ill.

THUNDERBOLT, exclnt, $425; Pacemaker, exclnt, $195; Gonset 500W linear 4N, $95. W2DTD.

BC-348 with spkr, converted, in exclnt conx: $55. Bill Curry, 250 Surrey, Burlington, Iowa.

WANTED Good stereo spkr system such as AR2 and Electrostat 3. Quote price. S40B for sale: $40. Carl Russell, 519 Schring St., Joliet, Ill.

CRYSTALS—Marine, CD, MARS, Net, SSB, Kits, etc.—See monthly QST advertisements. Order now for Marine crystal needs. C-W Crystals (Since 1933) Box 2065-Q, El Monte, California.

FOR Sale: Globe Scout, $65; Lafayette 6-meter transceiver, $40. W1HRR, Taconic, Conn.

KWS-1 No. 689; 75A4, No. 774, in immaculate condx, complete with extras, spare finals, antenna relay, fuses, spare 3B28s, extra coax fittings, .8-2.1-3.1 filter for 75A4. Both include all Service Bulletins and factory modifications. Price: $1500 at your door. Might swap. R. D. Shaffner, W3YXV, RD #2, Carlisle, Penna. Phone 717-243-3949 after 9 PM.

ART-13 Manuals, copy of original TM less catalog and pages not needed for amateur use. $4.25 pp. John Barbiaux, W3NGL, 2537 Leslie Dr., New Kensington, Penna.

SELL: 75A4, spkr, .5, 3.1 filters, $475. Details upon inquiry. Saunders, Delano Road, Marion, Mass.

HIGH Power: Professionally built KW G.G. linear with pwr. supp. Best offer over $100. DX-40, VF-1, Dow TR—all exclnt —best offer over $75. New 701-A KW tubes, $3 ea. K9RII, Hennepin, Ill.

SELL: NC400, 2 yrs. old, in exclnt condx: $600 or your best offer. Write for further details. Tom James, KØGFN, Box 440, Falls City, Nebraska.

DELUXE Rubber stamp, call in king-size type, name, address, $2.00. Compact stamp, $1.00. Frey, Box 296, Schwenksville, Penna.

HX-20 Mobile SSB xmtr, HP-10 12-volt supply, base mount, GH-12 mike, all cables, etc. $275. All used vy little. Also Regency ATC-1 all-band CW-AM-SSB converter, $45. Price includes manuals. Call or write: R. Gobel, WØUJK, 1025 6th St., Fairbury, Nebr.

FOR Sale: 75A-4, Ser. No. 4451, in mint condx: $500; W9PQS.

MUST Sell, college: Heath DX-35 transmitter, $40; Heath VFO, $10; National NC-125 receiver, matching speaker, Heath Q-multiplier, $95; "SSB-Jr.", 5-watt exciter, $25; RCA 3" oscilloscope, $15. All in gud condx. Hugh Smyser, W3GNZ/1, Williams College, Williamstown, Mass.

VIKING Invader, $800; Johnson TR switch, $15; Astatic 10C mike G-stand, $15; Bud tuneable LP filter, $10. Edward Costello, W9QGG, 7821 East End Ave., Chicago 49, Ill.

SALE: Universal AC/DC power supply similar to Foltz Oct. 1957 QST. New parts, no cables, $70; also, most parts for Chambers converter, October 1956 QST. Still in original carton, $32.00. Write for details. Shupe, K3EEZ, 1429 Meadowlark Dr., Pittsburgh 16, Penna.

FOR Sale: Globe King 500-C. Low hours, gud condx, $350; Hammarlund SP-400-X, spkr and pwr. supply. Gud condx. $100.00. Montgomery Amateur Radio Club, P.O. Box 6187, Montgomery 6, Ala.

WANTED: Coil sets for National HRO50T1, E,F,G,H,J, AC. Walter Damkoehler, W4EBO, 919 Crown Point Ave., Gadsden, Ala.

SWAP Or sell: 120 Bass piano accordian, one owner only. Want Apache, SX-100, HQ-170, or best offer over $200. Name your trade. David Holtz, Box 641, Hastings, Nebr.

MOBILE Station. Gonset G66B and G77A (80-10 meters with power supplies that operate on 6, 12, and 110 volts) with all cabling, manuals and factory cartons, $199. Antenna, all-band center-loading coil, bumper mount and Micro-Z Match, $20. Shure Bros. 505C mike, $9. All in exclnt condx. K3JHX, 109 Spring Valley Road, Wilmington 7, Del.

MIMEOGRAPH: Sell $40 or trade for receiver. Will Smith, K4SAY/4, Elkton, Ky.

WARRIOR Kilowatt linear amplifier. Used four months. New condition. $200. Will ship 100 miles. K3NKV.

SWAN Owners. We will convert your present Swan Monobander or Tribander to 300 Watts P.E.P. input, using two 6DQ5s in final amp. Parts, labor and one 6DQ5, $39.95. Your present Adcom or Topaz supply will handle extra power. Outercom of California, 10440 Burbank Blvd., North Hollywood, Calif.

SELL: Heath Apache, $200; SB-10 Adapter, $70; both for $250. Vibroplex Lightning Bug, $12. All in exclnt condx. K5OPL, 5734 Hyacinth Ave., Baton Rouge, La.

CLEANING House: D-104 mike, $9.50; Turner 82-3H chest-mike, $6.50; Archer dynamic mike, $4.50; Johnson Signal Sentry, $12. P. Nieman, 613 W. Roosevelt, Wheaton, Ill.

CENTRAL Electronics 20A complete with QT-1 and converted all band 458 VFO, $165; Bendix TA12 100-watt AM phone xmttr 4 VFO bands, exclnt modulator and husky power supply, $65. Hallicrafters BC669B transceiver less pwr. supply, like new, $40. W2KZ, 61 E. Depew, Buffalo 14, N.Y.

ELMAC AF-67 xmtr, $90; Telvue 50 ft. crank-up tower, $35; 12V. Super Six Converter and clipper, $25; PE-135AX dynamotor, $20; Bud 100Kc xtal calibr. $8; Bud 500w. ant. coupler, $10. Alliance Tenna-Rotor and control, $15. W1YOU, Glastonbury, Conn. 633-4267.

FOR Sale: Teletype T.U., Model 14 strip printer with cover and reel, $40. I need Model 15 base and keyboard. K5AON, 867 Berkinshire, Dallas 18, Texas.

NEW, Surplus, 701-A Tetrodes run kilowatt with a pair similar to 4-250, $2.50 ea. I have 16. J. C. Janecka, K5ZGA, 813 E. Tucker Blvd., Arlington, Texas.

FOR Sale: Gonset G-76 A.C. supply model No. 3349, D.C. supply, Model No. 3350, $145.00 pr. or will sell separate. WA2IRO, Cloverdale 9-4217.

FOR Sale: HQ-150, $200; Apache, $200, MM-1, $25; vertical $20, or sell complete station with all extras $395. WA6AQE, 11673 Rocoso Road, Lakeside, Calif.

VIKING Invader 200. In exclnt condx, $450. W4DQS, 928 Trinidad, Cocoa Beach, Fla.

URGENT: Must sell for school tuition: Polycomm 6-2B, $225; Heath Seneca, $130. Will ship. Larry Albert, Box 840, Lafayette College, Easton, Penna. K2TGR.

GE Radar transceiver CG-43AAW, GE, volt-ammeter portable inkless recorder-Alltronics, telewriter converter; Heath grid dip meter. Sell or swap. Ham, photo, stereo gear. Leo Meiser, 321 River Road, Nutley, N.J.

SELL: Station Viking 500, $495; 10A exciter and 458 VFO, $99; Heath HX-20 wired, $185; Xmas present Mosley CM-1, $142.50. Bill Campbell, Box 95, Lebanon, Va. WA4GML.

SELL: Mosley CM-1 new Dec. 1962, orig. carton, $160; Knight sweep generator, new, 1962, $35; good 200-watt AM transmitter, rack-mounted 2 power supplies, details on request, $125. J. T. Morey, W2HXF, 210 Mountain Ave., Princeton, N.J.

COLLINS 30L1 linear, $450, in mint condx. Late serial number: Polycomm 62B, pert. condx, $250; transceiver 6 and 2 meters. First postal money order or certified check takes it. Ernest Keeskes, WA6OUT, Box 53, Betteravia, Calif. Phone WA-22264.

FOR Sale: Eico 720, modulator, VFO, LP filter, 10M balun, 12V 8ADC P.S., RCA 630 TV, 5BP1, 5BP4 CRT, TV chassis for parts. K2CYH, Sayreville, N.J. Parkway 1-6915.

SELL: 75S-3, 32S-1, 516F-2, 30L-1. All new Oct. 1961. Used vy little, in perf. condx. Cost $1920. Sacrifice at $1375. Please write only. No phone. W2AEB.

GONSET G76 transceiver, less than year old and completely refinished cabinet in 2-tone nickle and chromium finish. In A-1 working condx, with Shure ceramic mike and transistorized 12-volt pwr. supp., manual. A package deal! Prepaid. $395.00. Albert J. Bertolisi, 382 Fulton St., Farmingdale, L.I., N.Y.

HEATHKIT Cheyenne and mike, $75; HP-10 power supply, $35; Gonset Super 12 converter, $50; Mosley Master Bandspreader, $10; Mosley center-loaded 75 meter whip, $5; new Mosley 75 meter loading coil, $5; whole package with some cables, $150. F.o.b. Gardiner, Maine. Hayden Anderson, W1FDL, Route 1A, Gardiner, Maine.

NEED 500-3000 meter long wave coils for National SW-3. K4BNI, 704 Morningside Dr., Fairfax, Va.

QST-CO issues 1945 to 1960, 25¢ each. K6KZT, 4434 Josie, Lakewood, Calif.

COLLINS KW1, used vy little, $1995. W2MI.

SELL: $500 for HT-37, SX-111 and speaker. Individually, HT-37 at $350 and the SX-111 w/spkr, $200. Also Gonset 11B, $150; Gonset 2-meter VFO, with audio preamplifier, $40; Johnson Matchbox, $30; Heathkit SWR Bridge, $15. Hobbs, 40 B, 221 St., Rockaway Point 95, N.Y. Tel.: No. NE-4-8889.

SX-99, $90; Johnson 275W Matchbox, $30; both are in exclnt condx. W4RWQ, 504 Johnson Road, Albany, Ga.

SELL: Heath HX-20, HR-20, matching AC-DC supplies, low air time, $400. R. Arnold, 90 Devon Rd., Norwood, Mass.

SELL: Best offer all or separate units: two Magnecord Model PT-6A and one PT6-6J, W4PSV, 461 1st Ave., Eau Gallie 7, Fla.

SELL: Heathkit FM GR-11 plus free 35HB8 tube, $20; Daystrom DG-297 SWL, $30 or will swap both for general coverage receiver. John Boudeman, 5030 Merryview, Kalamazoo, Mich.

FOR Sale: Drake 2A, spkr, Q-multiplier, four extra xtals. Like new condx, $180. K9RZV, 1419 Ravinia Road, West Lafayette, Ind.

GONSET Super Six, $27.50; Super 12, $40. Gud condx. R. D. Connor, W1ZQP, 65 Suffolk St., Worcester, Mass.

VIKING Kilowatt and desk, operates Sideband, AM, or CW. Will sked you 20 meter Sideband for demonstration, $775. F.o.b. Louisville, Ky. K4ZQR.

SELLING Out Shack. New hobby. S40B, S-76, NC-303, Viking 11, GSB-100, 500w. 813 plus hundreds of small items at bargain prices. 4¢ stamp for list. W2MSJ.

FAULTLESS Equipment in all respects: Hallicrafters HT-37, $400; Drake 2-B with Q-multiplier/spkr combination, best offer over $200. Cannot tell from brand new equipment. Will personally guarantee all components. Gary Goldberg, WA2FAS, 221 Clark St., Hillside 5, N.J. Phone: WAverly 6-2731.

VALIANT, factory wired, in mint condx. Best offer over $250. Also 500 watt unused MultiMatch modulation transformer, $30. W2WVL, 118 Goff Road, Corning, N.Y.

NATIONAL NC-98, $100; Globe Chief 90W, $25; excellent for the Novice. W1TQB, 19 Westford St., Gardner, Mass.

BC-610C, in gud condx, $125; WRL 3-element Triband beam and 34 ft. guyed aluminum tower, $50; QST's 1923-1962, complete, $100; CQ 1948-1962, complete, $25; LM-15 freq. meter, AC regulated pwr. supply, original calibration book, $50; RME DB-20 Preselector, $10. Shipping is extra. Lester Harlow, W4CVO, 5901 Paul St., Alexandria, Va.

$750. Priced for immediate sale. KWM-2 Collins Single Sideband in excellent condition complete with 110 volt power supply and all crystals needed to operate on any frequency set capable of operating. Contact: Robert E. Lee, Jr., 315 Hollywood Dr., Coleman, Texas.

FOR Sale: DX-100B; HQ-140XA, Kaye Young, Rte. 2, Paul, Idaho.

TRADE: New 4-1000A for 4000-0-4000 .500 ma., 220v pri. plate transf. K3EEP, 2649 Colmar Ave., Cornwells Hts., Penna.

INSTANT Operation. Fixed station. Valiant, SX-96, $400. mobile station, Gonset Twins, $300. Both have all accessories. May split, haggle, ship, deliver western states. W7HWL.

GOING VHF. Sell SX-99 receiver and R-48 spkr, Globe Chief xmttr, Blue Racer bug, and Heath output meter. Will sell all or part to highest offer. Will deliver within 100 miles radius or ship. All in gud to excint condx. KN1YAH, Nat. 150 Clintonville Rd., North Haven, Conn.

CLEANING Out shack. Move around country too much. Must sell heavy equipment. Have six racks full. Homebrew linear, kilowatt power supplies, Variacs, meters, capacitors. You name it. Bargain prices. All guaranteed and no junk! Immediate shipment. Send address for list. W4GUG/5. 9203 Waverly Drive, El Paso 24, Texas.

FOR Sale: Lampkin 105-B frequency meter, Lampkin 205-A deviation meter. Measurements 111 crystal calibrator, Bird 43 wattmeter, Gonset G-50 transceiver, miscellaneous test equipment and parts. Vernon Phillips, W7NPV. 715 West Villard, Bozeman, Montana.

SELL: KWM-2 with AC and DC power supplies, BC221, new. Cheyenne 90 watt rig with AC and DC pwr. Instructograph. Best offer. Also, Central Electronics MM-2 'scope with 50 kc IF adapter. W4BLX.

FACTORY Wired Viking Ranger with push-to-talk, like-new condx, $250: Hallicrafters SX-99 with spkr, in excint condx, $100. Robert Lieberman, 213 Dearborn Pl., Ithaca, N.Y.

SELL: Complete volumes QST in binders: 1932-1939, $48; 1945-1955, $60; complete volumes CQ—no binders—1951-1956, $11. All in mint condx. No single volumes or copies sales. All sold as package. Will ship collect for cost plus postage. W3KB, 1061, Beverly Rd., Jenkintown, Penna.

SELL: KWM-2, purchased Dec. 1962; Ser. No. 13642, $940; AC pwr. supply, $90: VFO-matic for 75A receivers, $80; Johnson Matchbox, 275 watts, $30, 75A4, ser. 5446, spkr., 2 fltrs, $575.00. All guaranteed perfect, F.o.b. Lamb, 1219 Yardley Rd., Morrisville, Penna.

SX-71 receiver, in mint condx, best offer over $100 takes it. K9CBJ, 1930 Beverly Place, Highland Park, Ill.

SELL: ART/13 xmtr with Collins built AC pwr. supply and brand new NC-60 rcvr, both for $200, in perf. condx. WA4LDI, Box 248, Winnsboro, S.C. Tel. 92151.

GONSET, all new, GSB201, $310; G76 and AC supply, $410; Communicator IV, 2M, $290,—also 220 Mc., $300; matching VFO, $50. Collins, new AC supply, $85; Hammarlund, new HQ-110C recvr, $160. Ron Terrey, K6RQT, 9125 4th Ave., Inglewood, Calif.

RANGER Filter PWT $125; also SX-101, vy gud condx, $250. L. A. Lynch, Medford Lakes, N.J. K2VKS. Cash & carry deal only.

CODE Matched Delcon telephone speech scramblers. One each model 104 and model 105 w/manual. Cost $525. Never used. Want: SSB 80-10 xmttr. All replies answered. Frank, K8GXH, Box 178, Rte. #6, Mansfield, Ohio.

SX-111, in perfect condition, $175. Barton, K4MYY, Box J-1, Greensboro, N.C.

100 Kc RF Oscillator unit, with xtal and oven, schematic, accuracy, .0001%, used in SRT14, 250VDC 6.3AC new, in original boxes, $24.75 with tubes postpaid. Check with order. RITCO, Box 156, Annandale, Va.

COMPLETE Station: Drake 2-B with matching SSB 5" spkr, HT-37, antenna relay, Turner 254-C microphone. Perfect condx. Original cartons. Package deal: $650. WA4ENA, Rt. 4, Box 615, Charleston, S.C. Phone 803 SN 6-7793.

JOHNSON Thunderbolt. Kilowatt amplifier with power supply. Factory wired. In excint condx. Will ship. $275. Ron White, 210 Alden Rd., Hayward, Calif.

HX-50, 3 months old. Used 3 hours. NC-303, xtal calibrator and spkr used 6 hrs. Heathkit Chippewa linear and power supply, constructed but never used. Shure 520, E-V 720 mikes; Vibroplex Deluxe Original; Heathkit SWR bridge and cables, relays and more. All equipment in new condx. Need college money. $1000 cash and carry. Michael Myster, WA2UNE. 295 Grand Ave., TU 8-8598, Lindenhurst, N.Y.

SELL: SX-99, R46B, QF-1, $90. WA2ODT, Box 802, Route 5, Utica, N.Y.

COLLINS KWS-1, like new, available in France, $1000. P. Simon, c/o Machine and Products, 52 Wall St., N.Y. 5, N.Y.

SELL: Gonset Super Six; Heathkit 6V Vibrator pwr. supply; Transcon R.F. meter; two 3E29 tubes. Write Art Deming, 450 University Dr., Torrington, Conn.

FOR Sale: Heathkit DX60, $65; VF-1, VFO, $15; GR-91 rcvr, $30 or your offer. Robert M. Adams, WA4AUC, 155 Colony Road, Newport News, Va.

ELMAC PMR6A, reconditioned, with manual; PSR12 and S-meter kit, $44.50; Elmac A54H transmitter with manual and new ceramic mike, $45.75; Eicor 12 volt dynamotor, 400 volts @ 200 Ma., $5.50; Hornet V-75 vertical, $9.75; Heathkit grid dipper, $14. W5LLU, 4607 Huisache, Bellaire, Texas.

TRADE: Central Electronics 20-A, 458 (160-15) VFO, and QT-1, for AM transmitter. K9MAJ, 815 S.E. 2nd, Washington, Indiana.

SALE: HQ-129X, matching speaker, in excint condx. Best offer over $110. Enclosed standard racks, 42 in., $10; 76-in., $20; 2-55 mmfd., 20 Kv. vacuum capacitors, $3.00 each. L. E. Aker, 275 Pocahontas Road, Montgomery 5, Ala.

HAVING Baby. Must sell: G-76 Transceiver DC and H.B. AC supplies, $450. "Hustler" mobile ant., $18. Mosley vertical, V-4-6, $22. All in excint condx, $465 for all! Herb. K7NUT/46, 817 Elder, Anaheim, Calif.

WANTED: Gonset IV, two meters. WA4FMC, Box 375, Arlington 10, Va.

TWO DX-20s, AR-3, new Gonset G-33, make offer. Looking for DX-60. Jim Barrett, Whittemore Rd., Middlebury, Conn.

HALLICRAFTERS SR-500, (HT-30, HT-31, SX-100), 500 watt sideband rig, excint, $500. Sry, no shipping. R. E. Lindly, WA5DVD, 609 East 54th Place North, FI 5-8669, Tulsa 26, Okla.

SALES And service: Receivers, transmitters, test equipment. Repaired, aligned, calibrated. Kits wired. Estimates given. Taled Electronics, 266 Park St., Stratford, Conn.

WANTED: Collins 30L-1 or 30S-1 and 3123-4. Jack Hendrick, 2516 57th, Lubbock, Texas.

FOR Sale: HQ-145C, original carton, $250; Knight VFO, $15; homebrew modulator with pwr. supply, 60W, $25. WA2KSJ, Al Schwartz, 4324 Wickham Ave., Bronx 66, N.Y. FA 4-6865.

TRADE For gud ham rcvr, complete set of Schober Electronic organ kits, all wired and tested. Never used! Cost over $500. WØQFZ, 2318 Second Ave., Council Bluffs, Iowa.

SP-44 Panadapter, $48.50; Kreco 20, 15 verticals, ea. $20. P. L. Snyder, W2HSM, 4 East Palisades Ave., Englewood, N.J.

SWAP: 1959 40 HP Elgin outboard motor, controls, ski's, etc. for complete all band mobile station. K3NYG, 34 Neeld Lane, Chester, Penna.

FOR Sale: Ranger with PTT, $150; Gonset G-63 rcvr, $150; both for $280. Tom Berry, WB2AXU, 35 Croyden St., New Hyde Park, N.Y. Local sale only! HU 8-3106.

VALIANT, factory-wired, like new condx, $285; Johnson SWR bridge, $22. J. Bright, 131 Nugent St., New Hyde Park, L.I., N.Y. Tel. FI. 2-0088.

HELP! Need manual for Morrow MB-560 or MB-560/A. Will photocopy and return original. Scott Norman, 9900 Merrill, Chicago 17, Ill.

2 Collins mechanical filters; type F-80-M-03; 300 cy. wide at 80 kc. $35 ea. Sent ppd. K9VQC, 3941 W. 66th place, Chicago 29, Ill.

WANTED: Gonset Super-12 or Regency ATC-1; 1.5 kc, 75A-4 filter. Sell: Gonset 10-11 converter, 12V; Concertone 1401, 10" professional single trac 15 and 7½ i.p.s. recorder with preamp, $125. W2QFR, 25 Cameron Place, New Rochelle, N.Y.

PREMIUM Quality reconditioned equipment! Terms! Trials! Trades! World's largest stock! Elmac AF-67, $99.95; Globe HG-303, $79.95; Heath DX-40, $49.95; MT-1 Cheyenne w/mic, $109.95; Johnson Adventurer, $34.50; Viking II, $175.00; Geloso G-209, $169.00; Hammarlund HQ-140X, $159.00; Heath MR-1 Comanche, $99.95; National NC-188, $99.95; NC-300, $209.00. Leo, WØGFQ, Box 918, Council Bluffs, Iowa.

MUST Sell: HT-37, $340; HQ-170-C, $280; both are crisp as new, used less than 3 weeks. T. Lawyer, W2LBE, 45 Sturgis Rd., Bronxville 8, N.Y.

SELL: ART-13 with 28VDC, 10 amp. and 1250VDC powr supp., $150. Also BC610 modulation and driver transformer, new. Want: BC-610 transmitter in gud shape. Must be reasonable. W. E. Moses, W4UVR, 716 Waco Rd., Knoxville, Tenn.

COMPLETE Station: NC-155, xtal calibrator, Knight T-60, coax relay, key, 5 xtals, E-V 729 mike, phones, lo-pass filter. "On the air" sign, all new condx, complete: $200. F. S. Eggert, 11833 Wisconsin, Detroit, Mich.

NIKON F camera, fl. 4 lens, Photomic system and case. Absolutely brand new, never used. $295, with factory guarantee. Will consider deal on SSB gear. W1RGX, Leonard Hart, 88 Marshall St., Medford, Mass.

PACO RF Signal generator and TV/FM marker generator, model G30, $20; National Radio and TV home study course, $10; Ameco code course, 7½ wpm, $5.00; D.C. milliamperes meter (Triplett), new condx, 0-300, $5.00. J. Neugent, 139 Beaupre Ave., Green Bay, Wis.

SELL: Heathkit Seneca 6 and 2 meter transmitter in perf. condx, $145.00; Ameco model CN-144W, 2 meter Nuvistor converter, $29.95; Electro-Voice model 729SR ceramic mike, $7. K8VEX, 124 Sycamore St., Wayland, Mich.

LAMPKIN 105-B freq. meter with charts for all VHF aircraft frequencies and instrux mnl, $110 or your best offer. John Robertson, K9PKW, 105 Bradley, Roselle, Ill.

SELL, Well constructed, rack cabinet, c.w., 500 watt rig. P.P.813 final, full description, 5c stamp, photos, 3 stamps. WØZWN, 737 S. Dequincy St., Indianapolis 3, Ind.

SELL: Heathkit SB-10 in gud condx, 3000 cps filter added. First $50 accepted. W2CMV, 4873 Creek Rd., Lewiston, N.Y.

WANTED: Unconverted two-meter FM mobile unit complete. Give full description and price. K9UWC, Mason City, Ill.

ATTENTION! Swap equipment, components with other hams! Many interesting offers in "Equipment Exchange". Sample copy free! Write: Brands, 415 E. Sycamore, Sycamore, Ill.

KWS-1 75A-4, in excint condx, $1450. Bob Cava, 113 Wood St., Salinas, Calif.

FOR Sale: KW modulation xfrmr, RCA 901769-501, in gud condx, all offers answered. 3-100THs I've never used, three for $25. WA2MYU, Richard Weber, Jewett, N.Y.

SELL: Heath Warrior Linear, $190; Hammarlund HQ-170C with spkr, $230; Vibroplex Bug, $7; Johnson T-R Switch, $15; Johnson Signal Sentry, $10; Electro-Voice 729 mike, $10; Webcor transistorized tape-recorder, $40; Heath B-1 balun, $5; Globe PA-1 power reducer, $3; Bell & Howell movie camera (worth $23); mimeograph machine, $8; dynamotor $5. W2PBZ, 64 Knickerbocker Rd., Closter, N.J. Tel 201-PO-8-2891.

WANTED: G-E Pyranol capacitors, 2 mfd. 5 Kv. DC. No. 23F50, or equivalent. WØAIH.

WANTED: Radio correspondence course, also back issues of Electronic World and Popular Electronics. Thomas Condon, 321 Moreland St., S.I. 6, N.Y., N.Y.

CUSTOM Building ham gear, VHF specialists. Converters, power supplies, etc. Free quotes. Frontier Electronics, Orr 1, Minn. WØHPS, Everett Hoard, WØPYC, Frankie Hoard.

SELL: Complete station: Ranger II F/W, $285; NC-270, $175; Telrex 15M beam, $20; mike, $10; coax, $5. All like new condx; $475 takes all. Will deliver within 50 mile radius. W1FRX, 186 Lincoln St., Melrose, Mass.

KWS-1, in excint condx, $750. Call Fairmont, West Virginia 363-6509. W8GQE.

FOR Sale: Hallicrafters S-38C, in excint condx: $30. John Cook, 3105 Mt. Vernon, Bakersfield, Calif.

APACHE, In gud condx: $185. Will deliver within 100 miles NYC area, K2PDK. Clive Jacobs, 266 West 44th St., N.Y.C. 36. Tel: LO 4-0774.

SELL: Apache, $240 freight prepaid. W7JKN, Box 646, McCall, Idaho.

SELL: Viking Ranger, $175. P&H 400B linear, $110; both like new condx. M. Maltz, 867 E. 8th St., Brooklyn 30, N.Y. Tel. ES 7-4447.

WANTED: Rheostate, tuning dials and 1 filament dial, in gud condx for Kennedy 110c receiver, also Kennedy Model 110 and 525 schematics and other data. Grebe binding posts. Charles F. Young, W1MGF, Bluberry Hill Rd., Georgetown, Conn.

WANTED: Courier, SX-111, and TA-33 or Tribander with rotor and cables. State condx and price. For sale: Knight R-100 with S-meter and speaker, $80 or best offer. K9WRZ, 2540 W. Bryn Mawr, Chicago, Ill.

KWS-1, perfect, $835; KWM-1, like new, $395; 75A-4, ser. #3324, vernier knob, $450: 100V, exclnt, $450. New 516F-2, $90. W8WGA.

WANTED: Lampkin 205B FM modulation meter. W4FZG, 304 Valley View Dr., Staunton, Va.

GONSET G-63 receiver for sale. "Like-new" mechanical and electrical condition. $135. Will ship prepaid anywhere in USA (48). All inquiries answered. James H. Demler, WØDSU, 318 Garfield Ave., Hastings, Nebr.

BARGAIN: Like new, less than six months old, HT-37, HQ-170A, Viking Matchbox w/GPLR and ind (new) Heath HO-10 Ham-scope, Eico GDO, Amphenol 40M folded dipole w/75 ft. line, Hy-Gain 10-15-20 M Trap dipole w/75 ft. RG-8A/U, Dow DK60-G2C ant. relay, D-104 mike w/G-stand, plus key, bug, tubes, etc. all for $600. E. Bosinski, WA2SHW, 11 Elizabeth Ct., Secaucus, N.J.

COLLINS 75S1, 32S1 spkr and Q mult. 6 months old. In mint condx: $845. WA2REO, 212-TE-7-1306.

WANTED: KW final amplifier 80/40/20/15/10; also B&W HDVL BCL coils, Links mounts. W1BB.

HUNTER Bandit 2000A linear amplifier in unopened carton. Make offer. Collins noise blanker for 75A4, 136C-1, new, $49; used noise blanker for 75S1, complete, $24; Mobile Mount for KWM-1, new, $29. Richard E. Mann, 7205 Center Dr., Des Moines, Iowa.

SELL: Good working 250 watt AM and CW all band transmitter in 66 in. cabinet with Knight VFO, $175. Too heavy to ship. Also, QSTs from 1922. K3MVO, 177 Spruce St., Emmaus, Penna.

COLLINS 75A4, #3301 .8, 3, 6 kc. filters; Collins speaker with light. $375. W1GZL, Box 623, Holyoke, Mass.

WANT: New 4-1000A, no duds. Sell six 304TL, five 810, two 6C21, two 4-125A, one 4E27A; $13.50 each postpaid. Also HDVL kilowatt swinging link and 4 coils, $20: Hammarlund TCD-110H hi-voltage splitstator, $12; Kenyon 500-watt modulation transformer, tapped secondary, $25 and Thordarson 500-Ma. negative peak limiter choke and splatter filter, $12, plus shipping. W4BBL.

FOR Sale: Globe Scout 65A and RME HF10-20 converter. Ted Anderson, Box 354, Phillipsburg, Kans.

HEATH Shawnee 6 meter transceiver, professionally wired. Used two months. Best offer over $200. Jim, K8YQH, 75 E. State St., Athens, Ohio.

CHEYENNE used fixed station, Mohican and AC powerpak, both gud condx, $65 each. WØBTU, 1185 East Bates Pkwy, Englewood, Colorado.

SELL: Xmtr 250w. c.w. 80-20 meters; 170w. 15 c.w. Half power AM. Going SSB. $250. WA2TOW, Dave Roberts, Box 232, Sewell, N.J.

MULTI Elmac PMR8 receiver and M-1070 power supply, used 30 minutes, $210. Hallicrafters SX-100 receiver and R46B speaker. In mint condx, $220. PE-103 dynamotor, in gud condx, $10. Contact WA6UVH, 63 Vine St., San Carlos, Calif.

COLLINS Receiver 51J3 (U388). Tubes 4CX300A, $15, two for $25; 4X150A, $5. Tecraft converter. W7POS, 2319 E. Indianola, Phoenix 16, Arizona.

POLYCOMM 62B. No. 91B151 with mic and accessories. Used very little, have returned to DC bands. Shipped express collect original packing. First certified check or money order for $195. Ray Calhoun, W5ZGZ, 4904 Live Oak (106), Dallas 6, Texas.

KWM-1, A.C. and D.C. supplies, all cables, mobile mount, Mark body mount, 20 meter heliwhip, Turner ceramic hand mike, all in exclnt condx. Will not sell separately. Complete $575, F.o.b. J. Anderson, W6JFW, 5725 Bigelow, Lakewood, Calif.

FOR Sale: Shielded ignition system for Ford V8 engine. Commercially manufactured by Hallet Co. Correspondence invited. K4VUQ, 486 Hollyhill Dr., Lexington, Ky.

FOR Sale: Viking Valiant, factory wired, $389. Used 10 hours and in perf. condx. RME 4300 rcvr w/crystal filter-ant. Gud condx, $115 or buy entire station including connections, electronic tr. key, mike, only $519. Write Rich, K9SEM, 5749 N. Washtenaw, Chicago, Ill.

FOR Sale: Collins 32V2 transmitter, gud condx, currently on air. Built-in VFO. Would make good SSB rig with an adapter, $195. Ralph Rickett, 7390 Sawmill Road, Worthington, Ohio.

HALLICRAFTERS SX-100, used only 8 hours, $210; HT-40, $75. Both in exc. condx. M. Colling, 2140 Walnut, Park Ridge, Ill. WA9DGU.

SELL: Complete station: Elmac AF68, PMR8, M1071 pwr. supply, Slim Jim all-band ant., E-V 210 push-to-talk mike, spkr, and relay. Less than one year old and mobile only one month. Best reasonable offer. K9ORK, H. Sparks, 220 East Grant, Macomb, Ill.

SELL: 75A-4 with speaker, ser. No. 4451, in mint condx. $500. W9POS.

SELL: Deluxe 1 KW CW xmtr, featuring: bandswitching 80-10 m, remote VFO, 4-400A pi-network final, 1.8 KW variac controlled PS, heavy-duty relay rack, extensive TVI suppression, 20M antenna. Send 50¢ for 30 pictures to K6OKY, 220 La Cadena, Riverside. Also sell 2800 VCT at .5 A transformer, 8¾" and 31½" relay racks, complete set B&W HDVL coils, new 4-400A and pr. 100THs. Make offer.

SELL: Model 15 teletype machine with cover. 15N table, 186205J D.C. supply and homebrew TU with 3" tuning scope, $175. Will trade for linear amplifier. WA2VXF, Tom Soukup, 302 So. Buckout St., Irvington, N.Y.

GE, Motorola 2-way, late models only. Buy-sell. Communications Engineering, Box 8338, Minneapolis 26, Minn.

SELL: Collins MP-1 mobile 12V DC supply; 351D-2 KWM-2 mobile mount with cables, both new, never used. Slightly used Collins PM-2 portable AC supply and CC-2 carrying case. Best offer. WØOGJ, 303 N. Wisconsin, Gunnison, Colorado.

SALE: Collins xmtr 32V1, $200; 30K1, $550; National rcvr HRO-60, 5 sets of coils and spkr, $400; all are in exclnt condx. W. M. Reed, WØWRO, 1355 E. Amherst Circle, Denver 10, Colo.

FOR Sale: Shawnee, Heathkit six meter transceiver, perf. condx, $225. WA2BUM, 10 Inness Place, Glen Ridge, N.J.

DX-40, Knight VFO, 150 watt amplifier (unfinished) w/ptt, $65. K5FQR.

SELL: Apache, HO-145C, WA2ZVJ, 2115 East 27 St., Brooklyn 29, N.Y.

ATTENTION YLS! Wigs: two "Merrywigs", No. 11 Titian at $165 and No. 17 medium brown frosted at $175 (fair trade prices); brand new, combination hand and machine made, uncut and unstyled, European imported, 100% human hair, medium size and adjustable. Need 50-250 watt transmiter or receiver or what have you??? William H. Smitherman, 425 Darrell Rd., Hillsborough, Calif.

WANTED—New England Counselor to teach radio at Maine Senior Boy's Camp. Minimum 19. General Class, plus one year college. Androscoggin Radio Club call is W1MYM. Write: Camp Androscoggin, Wayne, Maine.

COLLINS 75-A-4, No. 3684, $495 with Collins speaker, and Viking II with PTT and Johnson VFO, FW, $195, FOB. Both in mint condx. K2RPM, 155 Prospect Ave., Gloversville, N.Y.

MOBILE Station. $100: Gonset AF-67 transciter, PMR-6 rcvr, power supplies for 6 and 12V, all-band antenna, heavy mount. W2CET, 128 Chestnut Hill Dr., Rochester 17, N.Y.

THE Ham Trader—magazine devoted to sale of amateur radio equipment. Advertise free, pay when you sell. Subscription 6 issues, $1.50, 25¢ per copy. Information: The Ham Trader, Box 153, Dept. Q, Franklin Square, N.Y.

GLOBE King 400; 20A witr QT-1 and Deluxe VFO, $125. Both work fine. Worcester Tech Radio Club, W1YIC, 85 Salisbury St., Worcester, Mass.

WANTED: 500 Kc—3.1 Kc mechanical filter for 75A-1, W3-HTF, 506 Dreshertown Rd., Ft. Washington, Penna.

FOR Sale: Heath MT-1, MR-1, AK-6, AK-7, UT-1 (HP-20), all 35% off catalog; CA-1 (Conelrad), $5; Knight Z-Bridge, $2.50; f.o.b. all exclnt condx. James Lichter, 3827 Amundson Ave., NYC.

SELL: HQ-129X and matching spkr, $125; Viking II VFO and Electro-Voice mike, $160. In gud condx and appearance. Sry, no shipping. W2ZLI, 167 S. Buckhout St., Irvington, N.Y. Tel. LY 1-7255.

SELL: 813 Transmitter with VFO, audio and all supplies. Roger, W1QAF, Box 157, Natick, Mass.

FOR Sale: Latest version Polycomm 62B, complete. Best offer over $300. Contact Richard Blom, K3LNI, 311 Carlisle Ave., York, Penna.

SSB DeLuxe: 75A4 and spkr, 500 cycle and 3 kc. filters, $525; HT32A, like new, $495; VFO-matic, $49. All perfect. Will sell complete station for $995. E. A. Kriz, P.O. Box 249, Palmyra, Wis.

QSTs for sale. Complete sets: 1940, '41, '42, '47, '48. Individual copies from 1929 to 1960. To receive listing, send stamp addressed envelope to Oliver Haines, WA2SNN, 107 E. Church St., Absecon, N.J.

SELL: Eico 720 transmitter, Eico 730 modulator, Knight VFO, Mark dipoles for 15 and 40 meters, and AR22 rotor with control box and cables. In A-1 condx, $125.00 complete. Steve Buroff, 6231 N. Claremont, Chicago 45, Ill.

HEATHKIT DX-100, $120; Hammarlund HQ-129X with matching spkr, $100; both for $200. In exclnt condx. F.o.b. KØBXU, 3613 South Osage, Independence, Mo.

SELL: Heath C-3 condenser checker, in exclnt condx, $15. WØKLG, Dassel, Minn.

SALE: SX-99, $85; Eico 720, $70; Eico 730, $55; Globe V-10 VFO, $55; Gonset Communicator III, with xtals, in mint condx. $165. WA2RXO, 6 Richbell Road, Scarsdale, N.Y.

HAM BUERGERS. Used equipment, money-back guarantee: Collins 75A4 mint condx with vernier dial, serial No. 5364, $595. Other items equally as good. Trades. Write for free list. Ham Buergers, Wyncote, Penna. Tel. CA 4-1740.

GONSET G-77 mobile transmitter with cables, manual, etc. In exclnt condx, $135. Wendell Peterson, K6POU/7, c.o. Pacific Lutheran Univ., Tacoma 44, Wash.

DRAKE 2B receiver. Brand new, in factory carton with warranty and manual. Has crystal calibrator and extra crystal for 10 meter CW reception. Perfect. Will ship. $225. C. Brooner, W9FSW, Box 261, Morton, Ill.

COLLINS KWM-2, AC supply, like new condx, $900. Al Mandel, WA2BKT, 1701 Albemarle Rd., Brooklyn 26, N.Y.

WANTED: BC-221 frequency meter w/original calibration book and AC power supply. WA4HGF, Box 55, Union, S.C.

WANTED: Mechanical filter for Collins 75A-4 receiver, 2.1 or 1.5 K.C. State postpaid price. KL7ARY, 3007 Arctic Blvd., #46, Spenard, Alaska.

NOVICES: Hart 75, 80 watt c.w. Bandswitching, 10-160 meters, $45. Heathkit AR-3, $25. Jim Ledvinka, 15-6 Geddes, Ann Arbor, Mich.

KWM-2 serial No. 1362, with 516-F2 power supply. Will ship express charges collect. Send $875 certified check. Charles Cranfill, Worton, Md.

FOR Sale, late 75A4 serial 5603, $550; Hornet 3-el. beam, $30. Rotor $15. K4YVL, St. Petersburg 13, Fla.

Index of Advertisers

Adirondack Radio Supply 110
Airex Radio 152
Allied Radio Corp 168
Alltronics-Howard Co 146
Alpha Aracon Radio Electronics, Ltd 154
Amateur Electronic Supply 154
Ameco Equipment Corp 113
American Radio Relay League
QST 100
Handbook 131
License Manual 158
Understanding Amateur Radio 167
Antenna Specialists Co 148
Apex Keys 148
Arrow Electronics, Inc 141
Ashe Radio Co., Walter 149
Barker & Williamson, Inc 140
Barry Electronics 116
Bomar Crystal 142
British Radio Electronics, Ltd. (Eddystone) 159
Camp Albert Butler 120
Clegg Labs 109
Clemens Mfg. Co 138
Cleveland Institute of Electronics 136
Collins Radio Co 2
Columbia Products Co 118
Communication Products Co 111
Communications Equipment Co 122, 128
Crawford Radio, The 148
Cush Craft 150
Dames Co., Theodore E 150, 154
Denson Electronics Corp., The 142
Dow-Key Co., Inc., The 98, 144
Editors & Engineers, Ltd 119
EICO Electronic Instrument Co., Inc 103
Eitel-McCullough, Inc 4
Electro Sales 114
Electro-Voice, Inc 95
Electrocom Corp 150
Electronic Wholesalers, Inc 139
Electrophysics Corp 146
Evans Radio 130
E-Z Way Towers 102
Fichter Electronics 126
Finney Co., The 130
FM Sales Co 144
Fort Orange Radio Distributing Co., Inc 147
Gain, Inc 159
Gardiner & Co 158
Gertsch Products, Inc 129
Gotham 92, 93
Graham Radio, Inc 138
Grand Central Radio, Inc 124
Groth Mfg. Co., R. W 150
Hallicrafters Co., The 1, 87
Ham Kits 154
Hammarlund Mfg. Co., Inc 99
Harrison Radio 137
Harvey Radio Co., Inc 133
Heath Co., The 90, 91, 146
Henry Radio Stores 126, 135
Hi-Par Products Co 132
Hornet Antenna Products Co 104
Hunter Mfg. Co., Inc 157
Hy-Gain Antenna Products Co 107
IERC Division 125
Instructograph Co., Inc 152
International Crystal Mfg. Co., Inc 97
Johnson Co., E. F 88, 89
Kreckman Co., Herb 144
Lafayette Radio 151
Lampkin Labs., Inc 155
Lattin Radio Labs 156
Magnetica 140
Master Mechanic Mfg. Co 156
Master Mobile Mounts, Inc 127
Millen Mfg. Co., Inc., James 166
Miller & Co., W. J 146
Mini-Products, Inc 124
Mobiliers 128
Mor-Gain 153
Mosley Electronics, Inc 101, 155
National Bureau of Standards 134
National Radio Co., Inc ..... 105, Cov. III
National Society of Crippled Children & Adults 159
New Products 152
New-Tronics Div 121
Organs & Electronics 156
P & H Electronics, Inc 96
Pennwood Numechron Co 140
Petersen Radio Co., Inc 5
Productive Tool & Mfg. Co., Inc., The 152
Radio Amateur Callbook 157
Radio, Inc 120
RCA Electron Tube Div ..... Cov. IV
Ready-Radials 142
RF Communications Associates, Inc 115
Rohn Mfg. Co 132
Sideband Engineers, Inc 123
Skylane Products 134
Slep Electronics Co 153
Smalley's Radio, Ltd 118
Sonotone Corp 106
Swan Engineering Co 156
Technical Materiel Corp 7
Telrex, Inc 117, 155
Tepabco 122
Trans-Pro Labs 148
Tri-Ex Tower Corp 112
Trigger 145
United Transformer Corp ..... Cov. II
Van Sickle Radio Supply Co 158
Vanguard Electronic Labs 154, 158
Vesto Co., Inc 158
Vibroplex Co., Inc 138
Whippany Labs., Inc 159
World Radio Labs 108, 143

For The Newcomer . . .

A brand-new addition to the ARRL family of publications for the radio amateur.

UNDERSTANDING AMATEUR RADIO is written for the beginner and explains in simple language the elementary principles of electronic and radio circuits, tells how transmitters, receivers and antennas work, and includes complete how-to-build-it information on low cost gear—receivers, phone and code transmitters up to 150 watts, v.h.f., measurements, and easy-to-build antenna systems. It is profusely illustrated with hundreds of clear-cut photos, charts, diagrams and tables.

THE 320 pages of this helpful new publication contain a great amount of down-to-earth information unavailable to the beginning radio amateur in any other single publication.

Its 16 chapters cover:

1 Setting Up a Station
2 Some Needed Fundamentals
3 How Receivers Work
4 How Transmitters Work
5 What You Should Know About Phone
6 Antennas and Feeders
7 Workshop and Test Bench
8 Building Receivers
9 Accessories for Your Receiver
10 Building Transmitters
11 Transmitting Accessories
12 The Power Supply
13 Modulators and Speech Amplifiers
14 Making Measurements
15 Antennas and Masts
16 Operating Your Amateur Station

UNDERSTANDING AMATEUR RADIO is a "must" guide for the newcomer in setting up and operating his amateur station.

$2.00 *Postpaid*

U. S. A. Proper • $2.25 Elsewhere

The AMERICAN RADIO RELAY LEAGUE, Inc.
WEST HARTFORD 7, CONN.

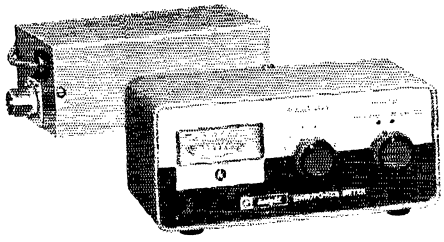
PRINTED IN U.S.A.

from ALLIED

Punch Out a Great Signal with this knight-kit® 150-Watt AM-CW Transmitter

MOST "WATTS-PER-DOLLAR"!

- 150-Watt Input 80-10 Meters; 100-Watt on 6 Meters
- Controlled-Carrier Screen Modulation for Max Power
- Stable Built-in VFO with Planetary Drive Tuning
- Clean, Chirpless Keying—No HV at Key Terminals
- Adjustable Pi-Network Output Matches 40-600 Ohm Antenna



New P-2 SWR/Power Meter Kit

ONLY **$14.95**

Now! Get the most from your transmitter and antenna! This new "in-line" SWR/power meter measures relative power being fed to antenna and standing wave ratio reflected from it; lets you make your own matching adjustment between line and driven element for maximum RF. Features flexible two unit design (coupler and indicator units) with 4-foot shielded connecting cable; has coax connectors, full KW capacity; can be left in line as constant monitor; reads SWR from 1:1 to 20:1; accuracy better than 10%; negligible insertion loss; for unbalanced 50-72 ohm lines, Amateur and CB; range from 1.8 to 432 mc; has sensitivity adjustments; no AC power or batteries required. Coupler, 2 x 5 x 2½"; indicator, 2⅞ x 6¼ x 3". Complete with all parts and instructions. Shpg. wt., 2 lbs.

83 YX 627 EF. P-2 Kit, only..... $14.95

New T-150 Transmitter Kit

ONLY **$119.95**

only $6 monthly on Allied's Credit Fund Plan

Packed with features to put out a solid signal that really punches thru the QRM! 150 watts AM/CW input on 80 thru 10 meters, 100 watts on 6 meters. Highlights: Highly stable VFO has illuminated dial and planetary drive; socket for optional switch-selected crystal operation; efficient controlled-carrier screen modulation; adjustable pi-network matches 40 to 600 ohm antennas; buffer stage isolates oscillator from final; parallel 6146's in output stage; silicon diodes for reliable high-voltage and low heat; voltage regulator in B+; single knob bandswitching; TVI suppressed with all leads in and out of case by-passed for RF; switched meter reads buffer, final grid and final plate currents and relative power output; mode switch provides for VFO spotting and tuning without placing a signal on-the-air; clean chirpless keying—no high voltage at key terminals; plus a host of other fine features. With all parts, tubes, plugs, wire, solder and step-by-step instructions and handsome gray satin metal case, 8½ x 17 x 10½". Less mike, key, crystals. For 110-125 v. 60 cycle AC. 28 lbs.

83 YU 403 EF. T-150 Transmitter Kit, only..... **$119.95**

YOU GET MORE FOR YOUR MONEY IN THESE QUALITY KNIGHT-KITS

satisfaction guaranteed or your money back

NO MONEY DOWN!

Now! More Buying Power with your Allied Credit Fund Plan

manufactured by

KNIGHT ELECTRONICS CORP.

A SUBSIDIARY OF

ALLIED RADIO

ORDER TODAY

ALLIED RADIO

100 N. Western Ave., Chicago 80, Ill.

Ship me the following:

☐ **T-150 Transmitter Kit 83 YU 403EF**

☐ **P-2 SWR/Power Meter Kit 83 YX 627EF**

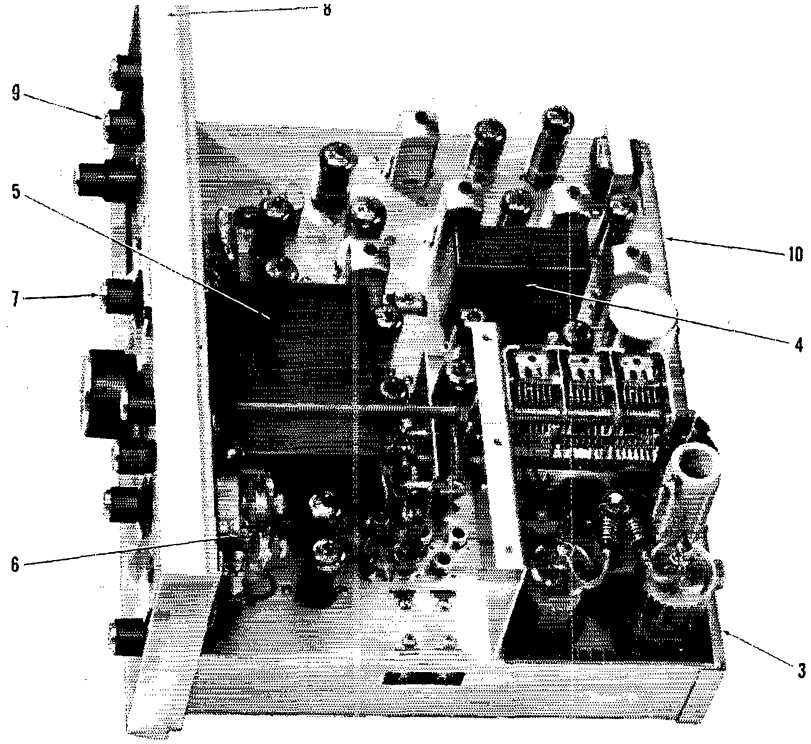
$.....enclosed (check) (money order)

☐ Ship No Money Down on Allied's Credit Fund Plan

Name_____
PLEASE PRINT

Address_____

City_____ Zone_____ State_____



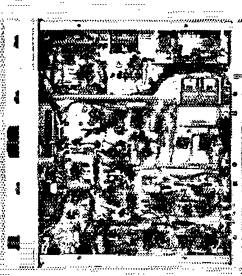
NATIONAL ONE YEAR GUARANTEE

12 inside reasons why your next rig should be the NCX-3 SSB transceiver

1. *Complete* coverage of the 80, 40 and 20 meter phone and CW bands.
2. *All* desirable operating features including built-in VOX/PTT, SSB/CW AGC, AM detection in the AM mode, and break-in CW with adjustable release time.
3. Variable pi-network final amplifier uses parallel 6GJ5 pentodes for *conservative* 200 watts PEP on SSB, 200 watts DC input on CW and 100 watts input on AM. Note: Protective shield removed for photo.
4. High frequency 2.5 kc crystal lattice filter for both transmit and receive, together with RCA 7360 balanced modulator provides 50 db carrier suppression and 40 db unwanted sideband suppression.
5. National "high-zero" VFO for maximum mechanical and electrical stability provide simultaneous transmit and receive frequency adjustment.
6. Combination illuminated D'Arsonval meter automatically switches between signal strength and PA cathode current.
7. Function switch automatically sets NCX-3 up for operation in any mode.
8. Extruded aluminum front panel for maximum solidity, *anodized* instead of painted for resistance to wear and scratches.
9. Front panel carrier balance control for AM or CW operation.
10. External relay control for use with high power linear amplifier.
11. The NCX-3 is backed by National's exclusive One Year Guarantee . . . your assurance of superb engineering and trouble-free operation.
12. Amateur Net $369 — need we say more?

Write for brand new specification sheet!

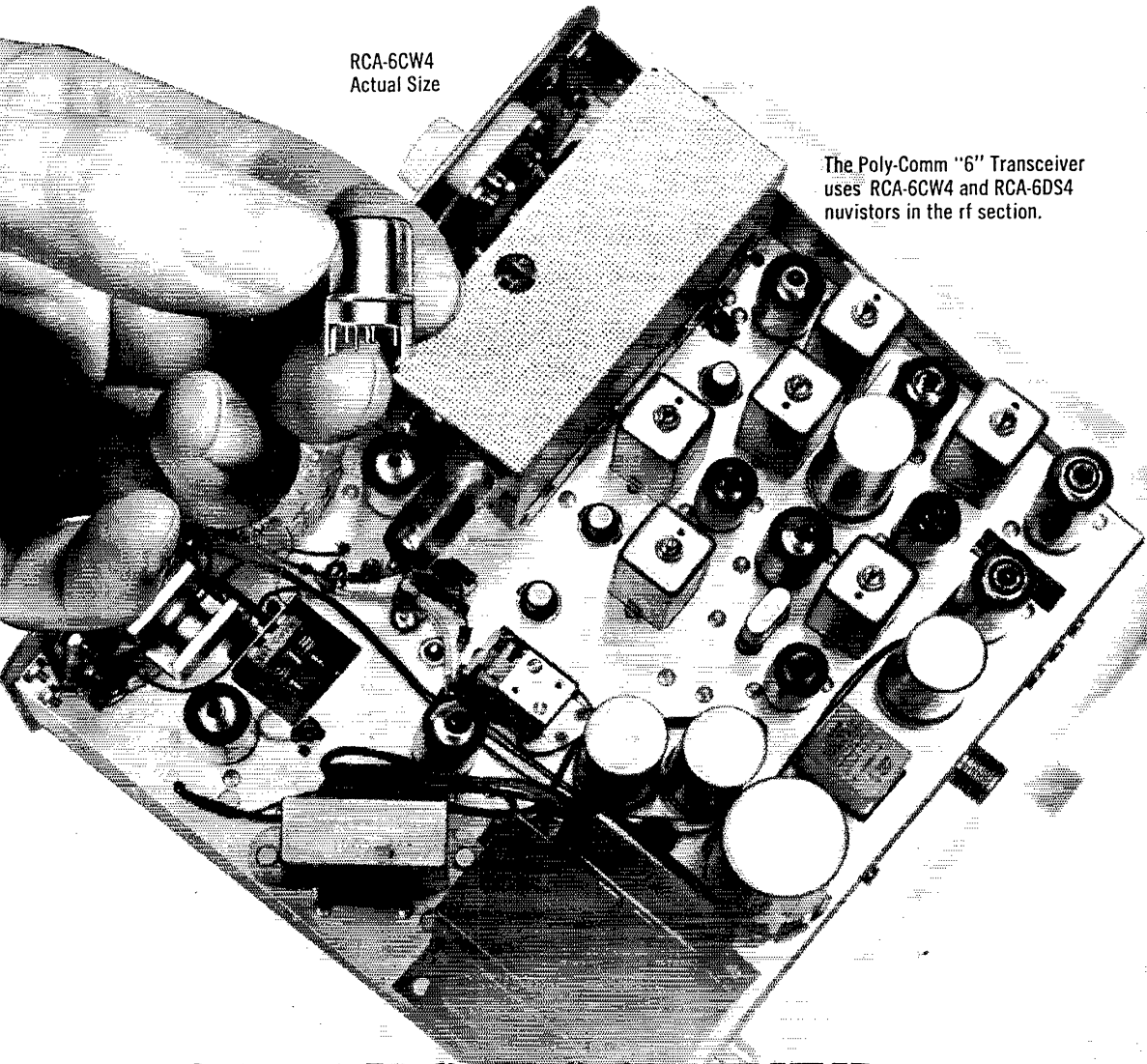
The NCX-3 shown with matching NCXA AC Supply/Speaker Console ($110), is a complete — and compact — 80, 40 and 20 meter amateur station. NCXD Transistorized DC Supply ($119.95) for use in mobile operation. Mobile mounting bracket is included with NCX-3.



The NCX-3 is wired to conform with National's stringent quality standards. Note cable harnessing and neat "right-angle" component placement to make all parts readily accessible.

National Radio Company, Inc.

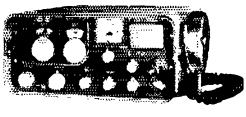
A Wholly Owned Subsidiary of National Company, Inc.
37 Washington St., Melrose 76, Mass., Dept. Q-4
World Wide Export Sales: Ad Auriema Inc., 85 Broad St., N.Y.C.
Canada: Tri-Tel Associates, 81 Sheppard Ave., W. Willowdale, Ontario



The Poly-Comm "6" Transceiver uses RCA-6CW4 and RCA-6DS4 nuvistors in the rf section.

NUVISTORIZED...

FOR "6"



More and more, compact, stable RCA nuvistors are being put to successful use in amateur gear. Take RCA-6CW4 and RCA-6DS4, as examples. These high-mu triodes provide unparalleled sensitivity and low noise characteristics—features that are especially important in vhf work.

Operating at low plate voltages, these rugged, stable RCA nuvistors have been designed into the front end of the Poly-Comm "6" transceiver by Polytronics Labs. They operate in this 6-meter equipment with a sensitivity of better than .1 microvolts at 6 db S/N.

For an electron tube with extraordinary—even exciting—performance capability, try the RCA nuvistor. Your RCA Entertainment Tube Distributor handles a complete line. For detailed information, write: Section D-37-M, Commercial Engineering, RCA Electron Tube Division, Harrison, N.J.

RCA

THE MOST TRUSTED NAME IN ELECTRONICS