FOR EVERY APPLICATION
IMMEDIATELY AVAILABLE – FROM STOCK

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

FILTERS
LOW PASS, HIGH PASS BAND
PASS 50 to 12000 CYCLES.

TELEMETRY/RADIO
400 to 30000 CYCLES.

TELEGRAPH
425 to 2875 CYCLES.

HIGH Q INDUCTORS
VARIBLE STANDARD
DECADE INDUCTOR
LOW FREQUENCIES
PERMALLOY DUST
IMPROVES HIGHEST Q
ACCURACY, STABILITY.

HERMETIC
POWER
COMPONENTS
Military, Industrial

PLATE TO 9 KV CT
REACTORS TO 1.25A
FILAMENT 400 CYCLE

HERMETIC
AUDIOS
FOR TUBE, TRANSISTOR
CHOPPER, AND MATCHING
SERVICE, 3 to 12 OZ.

And Special Units to
Your Specifications

UNITED TRANSFORMER CORPORATION
150 Varick Street, New York 13, N. Y.

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

The new ideas in communications are born at Hallicrafters

SX-110 Receiver. Advanced features and design make the SX-110 an exceptional value for the radio amateur and short wave enthusiast alike. Standard broadcast plus three short wave bands (540 kc-84 mc). Slide rule bandspread dial, calibrated for ham and citizens' bands; built-in "S" Meter, antenna trimmer, crystal filter. Seven tubes plus rectifier.

S-108 Receiver. (not shown) Exceptional value and performance. Same as SX-110 in frequency coverages but without "S" Meter, antenna trimmer and crystal filter. Built-in speaker.

S-107 Receiver. Outstanding new styling and impressive features. Standard broadcast plus four short wave bands—unusually wide coverage (540 kc-84 mc and 48.5-54.5 mc). Separate bandspread and logging scale; slide rule dial; phono jack and headset tips. Seven tubes plus rectifier.

ALL NEW! S-120 Receiver. Finest expression of Hallicrafters' dedication to precision performance at lowest possible cost. Maximum flexibility provided by three-antenna system—ferrite loop for 550-1600 kc broadcast ... adjustable whip or wire for three short wave bands (1600 kc-30 mc). Electrical bandspread with easy-to-read slide-rule dial. All-new design and compact styling. Headphone jack and B.F.O./selectivity control on front panel.


CANADA: Gould Sales Co., Montreal, P.Q.

hallicrafters
Chicago 24, Ill.
Night falls and you are alone in your ham shack. With just a touch of your fingers and turn of a dial your call of goodwill spreads afar. It surges beyond the Baltic and the Sulu, over the Pyrenees and the Andes, across the Sahara and the Mojave. Your message penetrates curtains of iron and bamboo; it transcends blinds of prejudice and nationalism. And from Collins Radio Company go the best wishes of this season to you and to all your fellow members in the world-wide fraternity of amateur radio operators.
DECEMBER 1960
VOLUME XLIV • NUMBER 12

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

STAFF
A. L. BUDLONG, W1BUD
Editor
RICHARD L. BALDWIN, W1IME
Managing Editor
GEORGE GRAMMER, W1DF
Technical Editor
DONALD H. MIX, WITS
BYRON GOODMAN, W1DX
MASON P. SOUTHWORTH, W1YL
Technical Editors
EDWARD P. TILTON, W1HDO
V.H.F. Editor
LEWIS G. MCCOY, W1CCP
E. LAIRD CAMPBELL, W1CUT
Technical Assistant
ROD NEWBERG, W1YRD
Contributing Editor, DX
ELEANOR WILSON, W1QON
Contributing Editor, V.H.F.
SAM HARRIS, W1FX
HELEN HARRIS, W1HOF
Contributing Editors, V.H.F.

LORENTZ A. MOBROR, W1VG
Advertising Manager
EDGAR D. COLLINS
Advertising Assistant
Chris Dunkle and Associates
740 S. Western Ave.
Los Angeles 5
California Representative

DAVID H. HOUGHTON
Circulation Manager
J. A. MOSKET, W1MY
Assistant Circulation Manager

OFFICES
38 La Salle Road
West Hartford 7, Connecticut

TEL.: A Drain 6-2335

Subscription rate in United States and possessions: $4.00 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 payable in the U. S. S. and for an equivalent amount in U. S. funds. Second-class postage paid at Hartford, Conn., and at additional mailing offices.

Copyright 1960 by the American Radio Relay League, Inc. This publication is registered at the U. S. Patent Office. International copyright secured. All rights reserved. Trasmisiones reservadas todos los derechos.

Printed in U. S. A.

—CONTENTS—

TECHNICAL —

Radiooteletype Reception by Tone Conversion
James L. McCoy, W9LQV 11

A Cathode-Ray Transmitter Monitor
R. Wade Caywood, W1KRD 18

Multiband Antennas Using Decoupling Stubs
William J. Lattin, W4JRW 23

A Synchro-Multivibrator Electronic Key
Roy R. Campbell, W4DFR 26

Recent Equipment:
Heath Mohican Transistor Communications Receiver 32
Using the 7360 in the HBR-16
John M. Filipczak, K2BTM 36
Transistor Converter for 6 Meters...........Daniel Mayer 39
Technical Correspondence.................. 45

BEGINNER & NOVICE —

A Simple Antenna System for the Novice
L. G. McCoy, W1CCP 46

For the Command Receiver..............L. G. McCoy, W1CCP 48

OPERATING —

1960 Field Day Results.......................... 54
V.H.F. Sweepstakes Announcement........ 70
September V.H.F. Party Results........ 72
Preliminary Announcement, 1961 ARRL DX Contest... 84

GENERAL —

My Salvation!..........................Bernard J. Covner, K11OX 25
Mobile C.W..................................Katashi Nose, KH6IJ 75
The Congo Story.................Sgt. Edouard Cournoyer, 9Q5US 76
Project Scouting..............Edith Rosner, W3AAU 80
Those Crowded WIAW Code-Practice Frequencies
William Bennett, HC1WB 82
Annual DXCC Membership Listing .......... 109
Amateur Band Usage Survey.............. 112A
How I Was Cured of Ham Radio
Walter J. Kent, K2OCW 194

"It Seems to Us " .............. 9
Hints and Kinks.......................... 51
Happenings of the Month.............. 69
In QST 25 Years Ago ............... 74
Silent Keys................................ 74
Quiz Quiz.................................. 74
IARU News............................... 79
How’s DX?............................... 85
1960 QST Annual Index.............. 215

World Above 90 Ma............. 92
YL News and Views.................. 97
Correspondence from the Members... 100
Operating News..................... 101
Station Activities.............. 112
Index to Advertisers............... 212
4-65A Radial-Beam Power Tetrode
Smallest of the Eimac internal-anode tetrodes, the 4-65A has a plate-dissipation rating of 65 watts and is ideal for deluxe mobile as well as fixed-station service.

<table>
<thead>
<tr>
<th></th>
<th>CW</th>
<th>AM</th>
<th>SSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>3000v</td>
<td>2500v</td>
<td>3000v</td>
</tr>
<tr>
<td>Driving Power</td>
<td>1.7w</td>
<td>2.6w</td>
<td>0</td>
</tr>
<tr>
<td>Input Power</td>
<td>345w</td>
<td>275w</td>
<td>195w</td>
</tr>
</tbody>
</table>

4-400A Radial-Beam Power Tetrode
Ideal for high power amateur rigs, it will easily handle a kilowatt per tube in CW, AM or SSB application. Forced-air cooling is required.

<table>
<thead>
<tr>
<th></th>
<th>CW</th>
<th>AM</th>
<th>SSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>3000w</td>
<td>3650v</td>
<td>4000v</td>
</tr>
<tr>
<td>Driving Power</td>
<td>6w</td>
<td>4w</td>
<td>0</td>
</tr>
<tr>
<td>Input Power</td>
<td>1000w</td>
<td>1000w</td>
<td>1000w</td>
</tr>
</tbody>
</table>

4E27A / 5-125B Radial-Beam Power Pentode
The Eimac 4E27A/5-125B is intended for use as a modulator, oscillator or amplifier. The driving-power requirement is very low, and neutralization problems are simplified or eliminated entirely.

<table>
<thead>
<tr>
<th></th>
<th>CW</th>
<th>AM</th>
<th>SSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>3000v</td>
<td>2500v</td>
<td>4000v</td>
</tr>
<tr>
<td>Driving Power</td>
<td>1w</td>
<td>2w</td>
<td>0</td>
</tr>
<tr>
<td>Input Power</td>
<td>500w</td>
<td>380w</td>
<td>360w</td>
</tr>
</tbody>
</table>

4CX1000A Ceramic Power Tetrode
Specifically designed for SSB operation, the ceramic-metal 4CX1000A Class AB, linear-amplifier tube achieves maximum rated output power with zero grid drive.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>3000v</td>
</tr>
<tr>
<td>Driving Power</td>
<td>0</td>
</tr>
<tr>
<td>Input Power</td>
<td>270w</td>
</tr>
</tbody>
</table>

4CX250B Ceramic Power Tetrode
A compact, rugged tube unilaterally interchangeable in nearly all cases with the famous 4X150A, with the advantages of higher power and easier cooling.

<table>
<thead>
<tr>
<th></th>
<th>CW</th>
<th>AM</th>
<th>SSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>2000v</td>
<td>1500v</td>
<td>2000v</td>
</tr>
<tr>
<td>Driving Power</td>
<td>2.8w</td>
<td>2.1w</td>
<td>0</td>
</tr>
<tr>
<td>Input Power</td>
<td>500w</td>
<td>300w</td>
<td>500w</td>
</tr>
</tbody>
</table>

4-125A Radial-Beam Power Tetrode
The versatile tube that made screen grid transmitting tubes popular. This favorite for commercial, military and amateur use is radiation cooled.

<table>
<thead>
<tr>
<th></th>
<th>CW</th>
<th>AM</th>
<th>SSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>3000v</td>
<td>2500v</td>
<td>2000v</td>
</tr>
<tr>
<td>Driving Power</td>
<td>2.5w</td>
<td>3.3w</td>
<td>0</td>
</tr>
<tr>
<td>Input Power</td>
<td>500w</td>
<td>380w</td>
<td>315w</td>
</tr>
</tbody>
</table>

4-250A Radial-Beam Power Tetrode
A high power output tube with low driving requirements. A pair of Eimac 4-250A's easily handle a kilowatt input in AM, CW or SSB service.

<table>
<thead>
<tr>
<th></th>
<th>CW</th>
<th>AM</th>
<th>SSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>3000v</td>
<td>3000v</td>
<td>4000v</td>
</tr>
<tr>
<td>Driving Power</td>
<td>6w</td>
<td>3.2w</td>
<td>0</td>
</tr>
<tr>
<td>Input Power</td>
<td>1000w</td>
<td>675w</td>
<td>660w</td>
</tr>
</tbody>
</table>

4CX300A Ceramic Power Tetrode
A new ceramic-metal high power tetrode designed for rugged service. Will withstand heavy shock and vibration and operate with envelope temperatures to 250° Centigrade.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>2500w</td>
</tr>
<tr>
<td>Driving Power</td>
<td>2.8w</td>
</tr>
<tr>
<td>Input Power</td>
<td>625w</td>
</tr>
</tbody>
</table>

Information on these popular tubes for amateur applications is available from our Amateur Service Department.

EITEL-MCCULLOUGH, INC.
SAN CARLOS, CALIFORNIA
The World's Largest Manufacturer of Transmitting Tubes
Unconditionally Guaranteed

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

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

40 and 80 Meters, PR Type Z-2, ± 500 Cycles... $2.95 Net
Third Overtone, PR Type Z-9A, 24,000 to 24,666 and 25,000 to 27,000 Kc., ± 3 Kc. ... $4.95 Net

6 Meters, PR Type Z-9A, 50 to 54 Mc., ± 15 Kc. ... $6.95 Net
Citizens Band, PR Type Z-9R, .003% ... $2.95 Net

PR Crystals
Since 1934

USE PR AND KNOW WHERE YOU ARE

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

EXPORT SALES: Royal National Corporation, 250 W. 57th Street, New York 19, N. Y., U. S. A.
<table>
<thead>
<tr>
<th>Section Communications Managers of the ARRL Communications Department</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ATLANTIC DIVISION</strong></td>
</tr>
<tr>
<td>Eastern Pennsylvania</td>
</tr>
<tr>
<td>Maryland-Delaware-D.C.</td>
</tr>
<tr>
<td>Southern New Jersey</td>
</tr>
<tr>
<td>Western New York</td>
</tr>
<tr>
<td>Western Pennsylvania</td>
</tr>
<tr>
<td><strong>CENTRAL DIVISION</strong></td>
</tr>
<tr>
<td>Illinois</td>
</tr>
<tr>
<td>Indiana</td>
</tr>
<tr>
<td>Wisconsin</td>
</tr>
<tr>
<td><strong>DAKOTA DIVISION</strong></td>
</tr>
<tr>
<td>North Dakota</td>
</tr>
<tr>
<td>South Dakota</td>
</tr>
<tr>
<td>Minnesota</td>
</tr>
<tr>
<td><strong>DELTA DIVISION</strong></td>
</tr>
<tr>
<td>Arkansas</td>
</tr>
<tr>
<td>Louisiana</td>
</tr>
<tr>
<td>Mississippi</td>
</tr>
<tr>
<td>Tennessee</td>
</tr>
<tr>
<td><strong>GREAT LAKES DIVISION</strong></td>
</tr>
<tr>
<td>Kentucky</td>
</tr>
<tr>
<td>Michigan</td>
</tr>
<tr>
<td>Ohio</td>
</tr>
<tr>
<td><strong>HUDSON DIVISION</strong></td>
</tr>
<tr>
<td>New York</td>
</tr>
<tr>
<td>N.Y. C. &amp; Long Island</td>
</tr>
<tr>
<td>Northern New Jersey</td>
</tr>
<tr>
<td><strong>PACIFIC DIVISION</strong></td>
</tr>
<tr>
<td>Iowa</td>
</tr>
<tr>
<td>Kansas</td>
</tr>
<tr>
<td>Mississippi</td>
</tr>
<tr>
<td>Missouri</td>
</tr>
<tr>
<td><strong>NEW ENGLAND DIVISION</strong></td>
</tr>
<tr>
<td>Connecticut</td>
</tr>
<tr>
<td>Massachusetts</td>
</tr>
<tr>
<td>New Hampshire</td>
</tr>
<tr>
<td>Rhode Island</td>
</tr>
<tr>
<td>Vermont</td>
</tr>
<tr>
<td><strong>NORTHWESTERN DIVISION</strong></td>
</tr>
<tr>
<td>Alaska</td>
</tr>
<tr>
<td>Utah</td>
</tr>
<tr>
<td>Montana</td>
</tr>
<tr>
<td>Oregon</td>
</tr>
<tr>
<td>Washington</td>
</tr>
<tr>
<td><strong>ROANOKE DIVISION</strong></td>
</tr>
<tr>
<td>Virginia</td>
</tr>
<tr>
<td>South Carolina</td>
</tr>
<tr>
<td>West Virginia</td>
</tr>
<tr>
<td><strong>ROCKY MOUNTAIN DIVISION</strong></td>
</tr>
<tr>
<td>Colorado</td>
</tr>
<tr>
<td>Utah</td>
</tr>
<tr>
<td>New Mexico</td>
</tr>
<tr>
<td>Wyoming</td>
</tr>
<tr>
<td><strong>SOUTHEASTERN DIVISION</strong></td>
</tr>
<tr>
<td>Alabama</td>
</tr>
<tr>
<td>Eastern Florida</td>
</tr>
<tr>
<td>Western Florida</td>
</tr>
<tr>
<td>Georgia</td>
</tr>
<tr>
<td><strong>SOUTHWESTERN DIVISION</strong></td>
</tr>
<tr>
<td>Los Angeles</td>
</tr>
<tr>
<td>Arizona</td>
</tr>
<tr>
<td>San Diego</td>
</tr>
<tr>
<td>Santa Barbara</td>
</tr>
<tr>
<td><strong>WEST GULF DIVISION</strong></td>
</tr>
<tr>
<td>Northern Texas</td>
</tr>
<tr>
<td>Oklahoma</td>
</tr>
<tr>
<td>Southern Texas</td>
</tr>
<tr>
<td><strong>CANADIAN DIVISION</strong></td>
</tr>
<tr>
<td>Maritime</td>
</tr>
<tr>
<td>Ontario</td>
</tr>
<tr>
<td>Quebec</td>
</tr>
<tr>
<td>Alberta</td>
</tr>
<tr>
<td>British Columbia</td>
</tr>
<tr>
<td>Yukon</td>
</tr>
<tr>
<td>Manitoba</td>
</tr>
<tr>
<td>Saskatchewan</td>
</tr>
</tbody>
</table>

*Officially appointed to act temporarily in the absence of a regular official.*
A Merry Christmas and Happy QSO's for 1961

Felicidad Navidad
Mele Kalikimaka
Buon Natale
Fröhliche Weihnachten
Joulun Joulavuosi
Festive Natal
Gott Jul
Falig Kristfest
Joyeux Noël

Peace on Earth

The Technical Materiel Corporation

MAMARONECK, NEW YORK
in Canada: TMC Canada Ltd.,
Ottawa, Ontario
THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, founded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct. It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worthwhile 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 prerequisites, 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, WSEMP, 1936-1940
GEORGE W. SAILEY, W2KH, 1940-1952

Officers
President GOWIN L. DOSLAND, W5TUS
First Vice-President WAYLAND M. GROVES, W5NW
P.O. Box 586, Odessa, Texas
Vice-President FRANCIS E. HANDY, W1BDI
38 La Salle Road, West Hartford, Connecticut
Vice-President ALEX REID, VE2BE
240 Logan Ave., St. Lambert, P. Q., Canada
Secretary A. L. BUDLONG, W1BUD
38 La Salle Road, West Hartford, Connecticut
Treasurer DAVID H. HOUGHTON
38 La Salle Road, West Hartford, Connecticut

General Manager A. L. BUDLONG, W1BUD
Communications Manager FRANCIS E. HANDY, W1BDI
Technical Director GEORGE GRAMMER, W1DF
Assistant General Manager JOHN HUNTOON, W1LWQ
Assistant Secretaries PERRY F. WILLIAMS, W1UED
GEORGE STEVANS, JR., K1LYW
38 La Salle Road, West Hartford, Connecticut

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

DIRECTORS
Canada
NOEL B. RATON .................. V2ECJ
R.R. S. Burlington, Ontario
Vice-Director:
Atlantic Division
GILBERT L. O'BRIEN .................. WAYA
Dept. of E., Penn State University
State College, Pa.
Vice-Director: Edward W. Van Densen .... W3ECP
3714 McKinley St., N.W., Washington 15, D. C.

Central Division
JOHN G. DOYLE .................. W9GPI
4311 N. Woodley Ave., Washington 11, D. C.
Vice-Director: Philip E. Hailey .... W9GPF
6000 S. Tripp Ave., Chicago 36, Ill.

Dakota Division
CHARLES A. HAMPTON .............. W9RUO
1011 Fairmount Ave., St. Paul 8, Minn.
Vice-Director: Martha J. Snider .... W9QAL
Box 75, Black Hawk, S. D.

Delta Division
SANFORD M. DE HART ............. W4RBY
227 S. Purdie Ave., Oak Ridge, Tenn.
Vice-Director: Victor Cathell .... W4BRS
414 Weber Blvd., Lake Charles, La.

Great Lakes Division
DANA E. CARRINGTON .................. W8UPB
2979 Observatory Ave., Cincinnati 5, Ohio
Vice-Director: Robert H. WRAQA
182 Guild St., N.E., Grand Rapids 5, Mich.

Hudson Division
MORTON L. B. KAHN .................. W2KR
22 Birch Hill Rd., Great Neck, N. Y.
Vice-Director: Lloyd H. WAGGON
709 Seventh Ave., Asbury Park, N. J.

Midwest Division
ROBERT W. DENNIGHTON .............. W8NWX
561 G. S., New York, N. Y.
Vice-Director: Sumner H. Foster .... WQGO
3218 Linden Dr., S.E., Cedar Rapids, Loysa

New England Division
MILTON E. CHAFFEE .............. W1EFW
23 Homestead Ave., Southington, Conn.
Vice-Director: Caroline A. Ploch .... W1RJO
17 Park St., West Haven 16, Conn.

Northern Division
R. J. ROBERTS .................. W4CPY
837 Park Hill Drive, Billings, Mont.
Vice-Director: Harold W. Johnston .... WTNP
2727 Belvidere Ave., St. Louis 6, Wash.

Pacific Division
HARRY M. ENGWITH .................. W4HNC
776 Chapman, San Jose 39, Calif.
Vice-Director: Ronald C. Marti .... W4EWF
1053 Baywood Lane, California

Roanoke Division
P. L. ANDERSON, JR. .............. W4MWH
428 Maple Lane, Danville, Va.
Vice-Director: Joseph W. Abney .... W4AEK
768 Colonial Drive, Rock Hill, S. C.

Rocky Mountain Division
CLAUDE M. MABIK, JR. .............. W0IC
484 Race St., Denver 16, Colo.
Vice-Director: John H. Farnum .... W0CYN
3618 Mount Oviden Drive, Oviden, Utah

Southeastern Division
JAMES P. BOW, JR. .............. W4ZGD
159 First Ave., N.E., Atlanta 17, Ga.
Vice-Director: Thomas M. Moss .... W4HYY
P.O. Box 664, Municipal Airport Branch, Atlanta 20, Ga.

Southwestern Division
RICHARD E. WEBER .............. W6NLZ
214 Jackson St., P. O. Box 90, Saline, Mich.
Vice-Director: Virgil T. Lack .... W7FF
1178 Longhill Way, Monterey Park, Calif.

West Gulf Division
GRADY A. PAYNE .................. W5ETA
5302 Lindon St., Houston, Texas
Vice-Director: Robert S. Rea .... W5KY
4539 S. Poona, Tulsa 4, Okla.
“It Seem to Us...”

OUR COVER, OUR ANNIVERSARY

We wear several hats — IARU Secretary, League Secretary, Editor of QST, and General Manager of the League — and this column frequently reflects the varied facets of the multiple job. But this month we speak strictly — and with pride — as QST’s Editor.

QST is now forty-five years old, the only radio magazine published with just one purpose for such a long period of time. Our cover this month depicts our aim, to bring all the news of amateur radio to all the amateurs. The satellite symbolizes the new and exciting days ahead of us. Radio bolts bouncing off an ionized cloud remind us of the quantity and quality of amateur experimentation through the years, perhaps most notable in the field of propagation. Schematic symbols tell of QST’s firsts in design for ham gear. A QSL card from W1AW recalls our co-founder and first president, Hiram Percy Maxim, while also symbolizing the helping hand extended to newcomers. News of operating activities can always be found in depth in QST, symbolized by the basic tools of our trade, the mike and key. The drafting aids express the precision QST strives for in all its technical material, while the beam, mobile whip and loading coil, the tube and transistor hint at the wide scope of QST coverage.

The traditions of forty-five years also are depicted here — The League emblem, the Wouiff-Hong (neither quite as old as QST, though), and, one might add, the tradition of covers drawn by Harry Hick, whose first QST cover appeared in May, 1916.

It is easy to take for granted something which has been established as long as QST, but let’s flip back through 45 years of QST pages and see how the Editor (and then half-owner), Clarence D. Tuska, felt about his first issue:

“...After considering the matter for several months, it has finally been decided to issue regularly some kind of a bulletin to League members. . . . The difficulty has always been how to pay for it. The members did not order the new List of Stations book and License Certificates as fast as they ought to have, and the officers had to go down in their own pockets to pay the bills. . . . After obtaining the views of several members and thinking it over, the President [Maxim] and Secretary [Tuska] finally decided to risk a few more dollars on a different plan . . . a magazine, which the membership would be willing to support.

. . . After much hard work, the President and Secretary out of their own pockets have produced QST Nr. 1.

. . . They hope to follow it each month with a new one. . . .”

And follow it, they did. Tuska and Maxim published the magazine regularly from December, 1915 until September, 1917, when Tuska enlisted. Post-war, the League took over QST officially, resuming publication with the June, 1919, issue, and members have gotten a copy every month since. And with the help of thousands of amateurs, QST has gotten bigger and better all that time.
W9BRD and/or his family, inveterate Chicago apartment dwellers, lived happily in one of three flats at 1517 Fargo Ave. from 1935 through 1950. This summer, a decade later, a piece of "How's DX?" correspondence was forwarded from the Fargo Avenue address accompanied by a note from K9BDK: "This must be for you, OM. I found it kicking around the vestibule of the building I live in."

An item in the weekly newspaper of the Springfield, Mass., Technical High School read: "W1GCR . . . is also planning a modulator that will allow transmission without the use of a microphone."

W6DIE has a gimmick—"Surplus-of-the-Month Club." You sign up with him for a nominal fee, and each month you receive some piece of surplus gear that he has accumulated in his travels. Contact him at 883 7th Avenue, Sacramento 18, California, if this intrigues you. He'll send you the dope.

One of the calls you'll hear on the air these days is K9UJQB. He's the grandson of the late K. B. Warner, W1EHE, who was secretary and general manager of ARRL until his death in 1948.

K5RAB is attempting to compile a list of all optometrists who are hams. Send all the details on yourself and your station to K5RAB at Box 609, Garland, Texas.

You think ham radio is getting complicated? Admiral Jaap, USN, pointed out in a recent speech that a light cruiser of World War II carried about 300 pieces of electronic equipment on board, while the same type of ship today, converted to a guided-missile cruiser, carries more than 1200 pieces of electronic gear.

Speaking of the Navy, a new Naval Communications Division has been formed in the New York City area and is meeting regularly. It has an interesting assignment, and if you are an amateur and a Naval Reservist or if you are an amateur with a military obligation still ahead of you, this would be a good unit for you to investigate. Obviously, you should live in the New York City area. Contact W2KGO, 15 Foxhurst Lane, Manhasset, who is the commanding officer.

Said the Halo to the Cubical Quad, "We're both on an aimless rat; But I'd rather be round, cool and hip, Than like you — you square!"

The International Ham Hop Club is looking for members. This is an exchange deal to help cut down the cost of overseas travel. Members volunteer to provide meals and lodging for other members, on a reciprocal basis. For further information you should write to Bryan Fogerty, E16X, Hillcrest, Plasy A., Corbally, Limerick, Ireland.

Perhaps DU1RC wasn't first on a motor scooter. Along comes W1KR to say that he operated mobile from a Vespa in 1957.

Ever try using counterweights on the halyards to your flat-top antenna, to keep it taut despite shrinkage, expansion, and the like? The Navy is using some on the antennas of its new megawatt station in Maine—there are 36 of them and each weighs 200 tons!

A census enumerator out in Idaho had a bit of trouble getting to one of the families who lived up on a remote mountain peak, servicing a TV station's relay equipment. It seems that there was a ham in this family (although the census enumerator didn't give out the call letters) and so the Idaho SCM (W7GGV) stepped in and provided the necessary communication. This saved the census enumerator about a 6-mile walk!

A flotilla of 18 yachts left Bermuda this summer, bound for Sweden. W2ZXM (remember the Flying Enterprise?) was aboard one of the yachts, complete with sideband gear, and was able to maintain communication with either Europe or North America all the way across. His was the only vessel that could do so, the result being that he handled plenty of traffic.

On June 21 The Amfetam Radio Association of Hagers town, Maryland, placed a wreath on the grave of Hiram Percy Maxim, founder of the American Radio Relay League. The wreath was in the shape of the League emblem, being made up of red and white carnations and with the letters and symbols in gold. Present at the ceremony were, left to right, standing, K3HPG, KN3MBV, W3LQP, W3VAM, W3EPF, W3OXY and W3AMX. Kneeling, W3UI and W3EHA, vice-president and president of the Amfetam Radio Association.

QST for
Radioteletype Reception
by Tone Conversion

A Complete Converter Including Monitor
and A.F.S.K. Oscillator

BY JAMES L. McCOPY* W9LQV/AF0LQV

There are two commonly-used methods for receiving radioteletype signals. One is to
detect the frequency shift at the receiver i.f.
The other makes use of the two audio tones cre-
ated by beating the receiver b.f.o. against the
shifting carrier.

Tone conversion has two advantages over i.f.
conversion: Audio filters having a band pass of
only 200 or 300 c.p.s. can be used to reduce inter-
ference more effectively than the band pass of
the i.f. system. The tone method can also be used
for reception of modulated signals with audio
frequency-shift keying (a.f.s.k.) as is authorized
on the v.h.f. bands.

This article will discuss the operation and
construction of one type of tone converter as
well as accessory circuits such as a tuning oscil-
loscope and a two-tone generator for a.f.s.k. trans-
mission. Two frequencies have been standardized
on for tone conversion. These are 2125 c.p.s. for
"mark" and 2975 c.p.s. for "space," and will be the frequencies referred to when the terms mark
and space are used.

Operation

Fig. 1 is a schematic diagram of the tone conver-
ter proper. Mark and space signals coupled

* 4944 Booth, Shawnee Mission, Kansas.

from the receiver through line-to-line transformer
T1 are separated by band-pass filters FL2 and
FL3. Each filter has a 200-c.p.s. bandwidth cen-
tered on its particular frequency and an impedance of 600 ohms. The filter inputs are paral-
leled. This does not disturb the match because
the impedance of either filter is quite high at the
center frequency of the other, and only one tone
is present at a time. Potentiometer R1 is used to
take off part of the incoming signal for the tuning
scope of Fig. 3.

1 These filters can be obtained from William Gates, 16183
Kneant Drive, Sherman Oaks, Calif., for $25.00 per pair,
f.o.b. Los Angeles.

Front view of the tone-conversion unit. The meter on the left indicates keyer plate current, and below it is the TUNE/
OPERATE switch. The meter and control for setting the keying loop current are in the center of the panel, and the two glass
domes immediately below are for the NE-51 neon triggers. To the right is the 902A cathode-ray tube used for monitor-
ing. Below the c.r.t. face are the vertical and horizontal centering knobs, and below them are the intensity and focus
controls. From left to right across the bottom of the panel are the power switch, the THRESHOLD control which sets the neon
firing voltage, the FSK/AFSK switch which transfers the keying loop between an external f.s.k. exciter and the built-in
audio frequency-shift keyer, the BALANCE control for setting the relative amplitudes of the mark and space pulses going
to the trigger driver, a FORWARD/REVERSE switch to reverse the operation of the detector for signals using the higher
frequency on mark, the monitor SCOPE LEVEL control, and a pilot lamp.
Fig. 1—Circuit of the basic tone converter. Resistances are in ohms; resistors are 1/2-watt composition except as indicated. Capacitors marked with polarity are electrolytic; others can be either paper or ceramic.
C₁, C₂—0.005-μf. disk ceramic.
C₈, C₉—0.01-μf. paper.
C₅—0.008-μf. paper.
F₆—See Fig. 2.
F₇₈, F₇₉—See text.
J₁—Closed-circuit jack.
J₅—Open-circuit jack.
K₁, K₂—Polarized relay (Sigma 7A02-160T or equivalent).
K₃—S.p.s.t. relay, 115-volt a.c. coil.
L₁—100-hy. choke (original taken from BC-733, Stancor C-2301 usable).
M₁, M₂—0-100 d.c. milliammeter.
R₁—0.5 megohm composition control, audio taper.
R₃, R₄—1-megohm composition control, audio taper.
R₅—1-megohm composition control, linear taper.
R₆, R₇—3.3 megohms, ½ watt.
R₈—0.1 megohm composition control, linear taper.
R₉—4700 ohms, ½ watt.
R₁₀—50,000-ohm composition control, linear taper.
R₁₁—70,000-ohm wire-wound control, linear taper.
R₁₂—2500-ohm, 25-watt adjustable.
R₁₃—5000-ohm, 10-watt adjustable.
S₁, S₂—D.p.d.t. toggle.
S₃—S.p.d.t. toggle.
S₄—S.p.s.t. toggle.
T₁—Line-to-line transformer (Stancor A-4350).

F₉₄, a band-pass filter with cut-off frequencies of 2000 and 3100 c.p.s., can be switched in ahead of the tone filters by throwing S₄. This filter is only used under extremely noisy conditions to provide better rejection of random signals.

The separated tones are applied to two separate but identical channels starting off with amplifier stages V₇A and V₇B, the two sections of a 12AU7. Then each signal is clipped to a level of about 7 volts in cathode-coupled limiter stages V₂ and V₃, two 12AX7s. Then come equalizing controls, R₂ and R₃, which are used to compensate for any unequal response in the above stages or the receiver audio section.

After additional amplification in V₄, another 12AU7, the tones are rectified by voltage-doubling detectors, V₅ and V₆, two 6AL5s. C₁ and C₂ bypass the audio components. On mark about 80 volts negative is applied to the upper end of balance control R₄, and on space about 80 volts positive is applied to the lower end of R₄. Throwing S₃ reverses the action for any signals which use the higher frequency for mark instead of space.

The arm of R₄ connects to a low-pass filter made up of L₁, C₅, C₆ and C₇. This filter cuts off at about 140 c.p.s., and helps to remove noise and keying transients. From the filter the signal passes through isolating resistor R₅ to the grid of the trigger driver V₇A. This 12AX7 section is directly coupled to V₇B, the trigger stage. When a negative mark pulse appears on the grid of V₇A, plate current to that stage is cut off, and the plate voltage rises to the supply value. Since the plate of V₇A is connected to the grid of V₇B, the latter

![Fig. 2—Schematic of the band-pass filter marked F₉₄ in Fig. 1. Capacitors are molded paper and should be within 5 per cent of the values shown.](image)

L₁, L₂—12.3 mh; 272 turns No. 24 Formvar on toroidal form with ¾-inch mean diameter, tapped 68 t. from bottom end. (May be wound 4-filar; see text.)

L₄—10.3 mh; 248 turns No. 24 Formvar on toroidal form with ¾-inch mean diameter.

---

The 902A c.r.t. and the centering, intensity and focusing potentiometers are all mounted on an aluminum bracket fastened to the chassis. The three scope amplifier tubes are toward the rear of the chassis. The high-voltage supply for the c.r.t. is in the bottom corner. Band-pass filter F₉₄ is housed in the aluminum shield can in the center of the chassis near the back. In front of F₉₄ are the hermetically-sealed Gates mark and space filters, and the tone converter tubes are grouped between these filters and the neon sockets on the panel. The polarized keying relays are near the upper corner of the chassis along the panel edge. The two tubes next to them are the a.f.k. oscillator and amplifier. Main power transformer T₈ is in the right corner, and the 80-μf. filter capacitor and regulator and rectifier tubes are lined up in front of it.

---

December 1960
Fig. 3 — Circuit of the monitoring oscilloscope. Resistances are in ohms; resistors are 1/2-watt composition except as indicated. Capacitors with polarity marked are electrolytic; others are ceramic except as specified.

C6 — 0.05-μf, molded paper.
C7 — About 0.03-μf, mica (to resonate with Le at 2550 c.p.s.).
Le — 120-mh. TV width control (similar to Miller 6324).
Le — 100 to 500-mh. toroid (to resonate with C6 at 2550 c.p.s. similar to UTC MQA-7).

will conduct and there will be a large voltage drop across cathode resistors R7 and R8. Therefore, the two NE-51 neon lamps will fire through the 6AG5 diode, V8, R7 is a threshold control and is set so that the neon show a normal orange glow under these conditions. Positive space pulses cause the trigger driver plate current to increase until all but about 2 volts of the supply voltage appears across plate load resistor R6. The reduced positive voltage on the grid of VT8 decreases its plate current and extinguishes the neon.

Two 6AJ5 keyer tubes, V9 and V10, are paralleled to handle a current of 60 ma. R9 is used to set the negative grid bias to a value above cutoff (about 45 volts) when the neon lamps are not conducting (space). During mark pulses the neon fires, and the bias voltage is neutralized; then the 6AJ5s conduct, operating polar relay K1. The plate current of the keyer tubes is metered by M1 and adjusted to 60 ma. with screen-voltage control R12.

The mark contacts of K1 are connected in series with a 60-ma. local loop. With S5 in the AFSK position as shown, this loop consists of loop current adjustment R11 and meter M3, an external 120-volt d.c. supply, the tele-type selector-magnet circuit (connected through J2) and the keying coil of AFSK polar relay K2. Relay K3 is used to short the mark contacts of K1 during transmitting periods so that there will be no possibility of a circuit interruption causing erroneous keying. The mark contacts can also be shorted with OPERATE-TUNE switch S4.

The converter was designed to be compatible with an f.s.k. exciter requiring 60 ma. for its keying circuit, and S4 transfers the 60-ma. loop current from the f.s.k. relay to a pair of terminals provided for the exciter. Bias current of 30 ma. for both polar relays is taken from the 300-volt plate supply; the current is measured with a meter plugged into J1 and adjusted with R12.

Monitor Scope

Since the converter operates with two audio frequencies which must be held within a few cycles tolerance, it is quite desirable to have some method of monitoring these frequencies. About the best method the writer has found is the c.r.t. display circuit designed by W0IZR and modified for use in this converter.

Fig. 3 is a diagram of the monitor. The heart of the unit is the phase-shift circuit consisting of R12, C7 and L6 in series. C7 and L6 are resonated at 2550 c.p.s., halfway between the mark and space frequencies of 2125 and 2975 c.p.s., respectively. The voltage across C7 and L6 is amplified by 12AX7 sections V12A and V13A and applied to the horizontal deflection plates of the 002A c.r.t., V14. The voltage across L6 is amplified by V12B and V13B and applied to the vertical deflection plates.

The trace displayed on V14 depends on the frequency or frequencies fed to R12. At the res-3 Meyer, "F.S.K. Tuning Indicator," CQ, May, 1956.
Some parts in this bottom view can be identified by comparison with the top view. The a.f.s.k. oscillator and amplifier components are in the upper left. The oscillator inductance, L7, is the dark object between gain control R13 on the left and the line-to-line transformer. Resonating capacitors C5 and C6 are just below L5 in this view. Farther toward the back of the chassis are shorting relay K9 and the controls for setting keyer-tube screen voltage and grid bias. Filter capacitors C11 and C12 and choke L8 are mounted underneath the power transformer. The switch for FL1 is just visible to the right of L8, and input transformer T1 is mounted between the terminals of FL1 and the mark and space filters. Toward the front of the chassis is the converter section, where much of the wiring is done to ground and high voltage bus wires running between the points. The metal can between the converter tubes and the panel is low-pass filter inductor, L13. The extension shaft to the right connects the SCOPE LEVEL control, R21, with its panel knob. The monitor scope amplifiers and power supply are in the lower right-hand corner. From left to right along the rear apron are J9, the jack for connecting the teletype printer; a 115-volt accessory socket; bias current jack J13; bias current adjustment R22; and another accessory socket. Then comes a terminal strip for making connections to the receiver output, the f.s.k. keyer, the 120-volt loop supply, and modulator of a v.h.f. transmitter for a.f.s.k. Finally, there are male a.c. connectors for the power supply and control relay, K9, and the power-supply fuse.

Resonant frequency, 2550 c.p.s., the voltage across the T2L6 combination is very small compared with that across L6, and the trace is a vertical line. At higher frequencies the horizontal signal is larger than the vertical one, and both are in phase. The resulting trace is a line that slopes up to the right. The horizontal signal also increases at frequencies below 2550 c.p.s. but is 180 degrees out of phase with the vertical signal. For these frequencies the trace will be a line sloping up to the left. The relative gains of the horizontal and vertical amplifiers can be adjusted so that the mark and space frequencies produce the arms of a perfect 90-degree "X" on the c.r.t. face. So adjusted and calibrated, the scope will disclose several things about the incoming signal as shown in Fig. 4.

Mark and space signals from voltage divider R1 in Fig. 1 are amplified in V11A, one section of a 12AU7. Follower stage V12 cathode-couples the tones to series-tuned circuit C6L8 resonant at about 2200 c.p.s. This provides slight peaking at the mark frequency and compensates for the lower Q of the phase-shift network at 2125 c.p.s.

\[ R_{14} \text{ and } R_{15} \text{ are used to adjust the gains of the horizontal and vertical amplifiers. Since much less gain is required in the vertical channel, the cathode-coupling of the follower stage is used.} \]

\[ \text{Fig. 4---Patterns observed on the monitor scope. Horizontal and vertical gain controls should be set so that mark and space signals of correct frequency and spacing will produce a perfect 90-degree } "X" \text{ as in (A), (B), (C) and (D) show the effects of incorrect tuning and frequency shift.} \]
Fig. 5—Circuit of the a.f.s.k. oscillator section. T2 feeds the carbon microphone input of a v.h.f. transmitter. Resistances are in ohms; resistors are 1/2-watt composition except as indicated. Capacitors with polarity marked are electrolytic; except for the 5000-μfd. capacitor which is mica; others are ceramic except as specified below.

C9, C19—970-μfd. mica trimmer.
C8—About 0.0018-μf. mica (as required to resonate with C7-Cm-C1l-L7 at 2125 c.p.s.).
C1l—About 0.01-μf. mica (as required to resonate with C6-L4 at 2975 c.p.s.).

odes of V12A and V13A are left unbypassed as shown.

A conventional voltage-divider circuit is used to obtain centering, focusing and intensity potentials for the 902A.

Audio Frequency-Shift Oscillator

A.f.s.k. operation on the v.h.f. bands requires an audio oscillator for producing the mark and space tones. Such an oscillator was incorporated on the converter chassis. The circuit, shown in Fig. 5, is a slight modification of one used by W2JTP.\(^3\)

V1b, a 12AU7, functions as a cathode-coupled, diode-keyed oscillator. The diodes, CR1 and CR2, are in turn controlled by polar relay K2 in the loop circuit. On mark, K2 grounds the lead from R20, and on space, this lead is left open. In the latter condition there is no d.c. path through CR1 and CR2, and they do not conduct. The diodes appear as small capacitors of about 1 μf., and the frequency of oscillation is determined essentially by the C6-C7L7 parallel combination. C10 tunes the combination to the space frequency. When R20 is grounded, rectification of the audio voltage across CR1 causes a current to flow through CR1, CR2 and R20. The resistance of CR1 drops to a low value, and C8 and C9 are effectively paralleled with C6-C7L7. Trimmer C8 adjusts this new combination to resonance at the mark frequency.

Oscillator output is coupled through gain control R21 to the grid of amplifier stage V16, one section of a 12AU7. T2 matches the output of this amplifier to a 500-ohm line which can be connected directly to most carbon microphone input circuits.

Power Supply

The built-in power supply, diagrammed in Fig. 6, provides all necessary voltages for the converter, scope and a.f.s.k. oscillator. T3 supplies 150 volts regulated for the oscillator and 300 volts regulated for the remaining stages through full-wave rectifier V17, a capacitor-input filter and regulators V18 and V19. A half-wave rectifier, V16, connected to one end of the secondary of T3, is used to get 125 volts of negative bias for the keyer tubes.

T4 and half-wave rectifier V2 supply 600 volts for the c.r.t. The 6.3-volt winding on T4 takes care of the 902A heater, which must be ungrounded because of the high negative voltage on the cathode.

Accessory sockets J4 and J5 can be used for auxiliary equipment and are controlled by power switch S6.

Construction Notes

The converter and its associated circuits are built on a 17 × 13 × 3-inch chassis with a 19 × 10½-inch panel for standard rack mounting. The locations of most components can be discovered from the photographs and their captions. Since only audio frequencies are involved, layout is not critical.

Toroids L2 and L3 are tapped ¼ of the way from one end, so it may be easier to wind these coils 4-filar. To do this, start with four wires and wind them together around the core. Each wire then becomes ¼ of the coil if properly connected to the others. Take one of the wire ends that went

---

Fig. 6—Power-supply section. Resistances in ohms; resistors are wire-wound; capacitors are electrolytic except as specified
C10, C12—8-μf, 700-volt electrolytic (Aerovox 078110).  
C14—2-μf, 600-volt bathtub (Aerovox P302N).  
F1—Fuse (rating determined by accessory load).  
I4—6.3-volt pilot lamp.  
J3—115-volt male connector, chassis mounting (Amphenol 61-M).  
J4, J5—115-volt female connector, chassis mounting (Amphenol 61-F).  

on the core first as the bottom end of the coil.  
Connect the other end of that wire to the starting  
end of a second wire; this is the tap point.  
Now connect the other end of the second wire to  
the starting end of a third wire and the other end  
of the third wire to the starting end of the fourth  
wire.  
The other end of the fourth wire will be the  
top of the coil.  

It is recommended that an audio generator and  
oscilloscope be used to get the tuned circuits of  
the monitor scope and a.f.s.k. oscillator properly  
adjusted. The oscilloscope should also be used to  
check pulse shaping in the tone converter.  

The value of R14 determines the band-pass  
characteristics of the C7-L65 resonant circuit in  
the monitor. If the trace obtained at 2550 c.p.s. is  
much larger than those at the mark and space  
frequencies, then the value of R14 is too small.  
The toroid or coil used for L7 in the a.f.s.k.  
oscillator should not have too high a Q or the  
frequency shift during shorter pulses will be  
incomplete.

---

Two reports of stolen equipment this month.  
Sometime during the evening of October 7  
K1MQ's car was broken into and his Collins  
KWM-2 and its mobile mount were stolen. The  
power supply, however, was not touched. The  
KWM-2 was Serial No. 484, and on its cabinet  
was a plaque with the call letters K1MQ/W8- 
1WK. K1MQ is offering a $100 reward for  
information leading to the recovery of this rig. If  
you can help, contact police lieutenant Rourke,  
Brookline, Mass.  

While WA2CJL was attending the Syracuse  
VHF Roundup, someone broke into his car and  
stole his 6-meter Communicator III, Model No.  
3136, Serial No. B. 2256. A reward of $50 is  
offered for information leading to the recovery  
of this unit. Contact either WA2CJL or the  
Rochester Amateur Radio Association, Box 1388,  
Rochester, N. Y.  

Elsewhere in this issue we report on a QSO  
from ground to ferris wheel. Well, now it seems  
that K4TRY, K4Y3, and K4V1U did it too.

December 1960
A Cathode-Ray Transmitter Monitor

Incorporating the Most Needed Features for Amateur Operation

BY R. WADE CAYWOOD,* W1KRD

The cathode-ray monitor to be described will display either the r.f. envelope or the trapezoidal monitoring pattern of single-sideband or amplitude-modulated transmitters. It will show linearity or nonlinearity in Class B r.f. amplifiers, parasitic oscillation, neutralization, and r.f. output. The cathode ray beam responds instantly and provides information that moving coil meters can never provide. In addition, it gives a continuous complete picture of the overall performance of the transmitter — and we can all understand pictures.

The monitor shown here was designed to remedy the annoyances and shortcomings of oscilloscope lash-ups, which have had a habit of growing like Topsy: external tuned circuits hung on the input terminals, the wrong sweep, uncompensated phase shift, no blanking so that the tube became burned or — even worse — the intensity turned down so that the scope does not fulfill its function of monitoring, and so on. Nevertheless, Fig. 1 shows that the circuit is relatively simple and straightforward.

The heart of the monitor is the 2BP1 two-inch cathode-ray tube. Experiment with one-inch tubes, two-inch round and rectangular tubes, and three-inch round and rectangular tubes showed the two-inch round tube to be the best choice for the job. The two-inch round tube provided an entirely adequate display of envelope, trapezoid,

---


This is a manufactured version of the circuit, and although its mechanical construction could not be duplicated with ordinary home-workshop facilities, it illustrates some features that are desirable in any scope layout. One is the magnetic shield, which in this case is a type (such as the Millen 80042) that serves as a support for the cathode-ray tube and includes a base clamp for secure positioning. A molded bezel supports the face of the tube and dresses up the panel. Another feature is the mounting of the intensity control, which is at high voltage with respect to the chassis; it is on an insulated extension coupling (Millen 39023) as shown in the near corner of the panel. The principal constructional point is that a really effective magnetic shield should be used so that magnetic fields from the power transformer will not influence the beam.
and bow-tie patterns. The one-inch display seemed inadequate. The rectangular tubes were fine for envelope display but the vertical height proved inadequate for trapezoidal and bow-tie monitoring. The three-inch round tube provided good display but was no longer compact.

Two-inch tubes are fairly insensitive, particularly when the accelerating voltage is high enough to give a bright, sharp trace. However, in this monitor lack of sensitivity proved to be no problem. In fact, with the link-coupled tuned circuits feeding the deflection plates, the monitor is so sensitive that a grid-dip meter coupled to the pickup loop provides usable vertical deflection. The horizontal deflection voltage for the envelope display is easily provided by the 115-volt 60-cycle power source.

Power Supply

The over-all power-supply voltage is slightly over 1000 volts d.c., but since the maximum current drain is only 1 3/4 ma. the power transformer can be quite small. The most economical way to get this voltage is to use a replacement-type power transformer rated at 700 to 750 volts total secondary voltage. Such a transformer will have the 6.3-volt winding for the 2BP1 heater and will also have a 5-volt winding that can be used for the rectifier, which may be a 2X2A, 5R14G, or other tube having sufficient voltage rating (some tubes may require dropping the heater voltage to the rated value). Selenium rectifiers may be used instead of a tube, six of the ordinary 130-volt type being required in series to stand a.c. voltages of this order. However, the smallest current rating available can be used, so the cost does not greatly exceed that of a tube rectifier.

An a-c filter is used to smooth the half-wave rectified d.c. so that the remaining peak-to-peak ripple is only about 0.35 per cent. \( R_{14} \) is used to limit the charging current of \( C_7 \) and thus protect the rectifiers. The filter capacitors are rated at 1500 volts d.c. working because the peak voltage is quite substantial.

All d.c. voltages are taken from the series divider made up of \( R_1, R_5, R_8, R_4, R_9, R_6, R_8 \) and \( R_{12} \). This divider is directly across the output of the filter system. A high-resistance bleeder, \( R_{40} \), is also used, for reasons of safety. The bleeder uses two resistors so that the voltage across any one resistor will not be excessive. A separate 6.3-volt filament transformer is used to operate the beam blanking relay and pilot light, because the 6.3-volt winding that supplies the 2BP1 heater is several hundred volts above chassis. The separate transformer avoids the possibility of voltage breakdown in the relay.

Balanced deflection and balanced centering are not required for the 2BP1 tube. This greatly simplifies the circuit and construction. If tubes other than the 2BP1 are used, it is quite likely that keystone distortion (greater deflection sensitivity at one side of the tube than at the other) will result.

The intensity control is at a very high negative potential with respect to the chassis and must be insulated from it. Although the current available may not be enough to cause death, contact with the high voltage can be very painful. Use caution!

Vertical Deflection Circuit

Low-voltage r.f. can be picked up by means of a small single-turn coil loosely coupled to the transmitter output circuit, the antenna matching circuit or any other convenient point. If a multiple outlet box is used in the feed line, one outlet jack can have a small loop across it. The pickup loop can be connected through a convenient length of small coaxial cable to the terminals marked "r.f. input." One wafer of \( S_1 \), the band switch, selects the link coil coupled to the desired tuned circuit, and the other two wafers of \( S_1 \) select the coil to be placed in the tuned circuit.

The relatively high r.f. voltage developed across the tuned circuit is coupled to the c.r. tube vertical deflection plates through a blocking capacitor, \( C_4 \), so the coil will not short-circuit the d.c. centering voltage. \( R_8 \) and \( C_2 \) make up a filter network to prevent the r.f. from going back to the centering-voltage supply.

Horizontal Deflection Circuit

For trapezoidal or bow-tie display, audio voltage from the output of the transmitter modulator must be supplied to the audio input terminals. \( C_{10}, R_{16}, R_{19} \) is a phase-shift network for precise audio phase correction. The phase-corrected audio is applied to the "width" control, \( R_{13} \), through \( S_5 \). The output of the width control goes to the horizontal deflection plate through \( C_9 \). An audio filter network, \( C_{9}, R_{19} \), prevents the audio from getting to the centering supply.

For envelope display the horizontal sweep voltage, applied to the width control through \( S_5 \), is a 60-cycle sine wave taken from the 115-volt line.

Blanking

The blanking bias is developed across \( R_{12} \). When the relay is closed, \( R_{40} \) is shorted out and the normal bias developed across \( R_{20} \) and \( R_{4} \) fixes the trace intensity. The relay may be operated either by the transmitter send-receive relay or by the "beam" switch, \( S_4 \). When the beam switch is on, the relay is closed and the transmitter switch can no longer control. A cable should be run from the blanking terminals to an extra set of contacts on the transmit/receive relay. This method of blanking is positive and requires no careful adjustment of anything. It would be easy to rectify a little of the r.f. voltage to provide the blanking but this requires careful adjustment of the r.f. level. The relay was quite inexpensive and seemed a good investment in reliability.

Installation

Three cables connect the monitor to the transmitter. The one which connects to the r.f. input terminals should be a small-diameter coaxial cable with a single-turn loop coupled to the
Fig. 1—Circuit diagram of the cathode-ray monitor. Unless otherwise indicated, resistances are in ohms, fixed resistors are 1/2-watt composition; decimal values of capacitance are in µF, others in µF.

- **C₁**: Electrolytic.
- **C₂, C₃, C₄, C₅**: 400-volt paper.
- **C₆**: 35-µF midget variable (Millen 20035).
- **C₇**: 1500-volt oil-filled paper.
- **C₈**: Mica.
- **C₉**: Disk ceramic.
- **CR**: See text.
- **I₁**: No. 44 dcl lamp (0.25 amp).
- **K₁**: 5-s.p.s.t., 6.3-volt a.c. coil (Potter-Brumfield CA3A).
- **L₁**: 90 turns No. 34 enam., close-wound. Link 3 turns No. 28 enam.
- **L₂**: 45 turns No. 28 enam., close-wound. Link 3 turns same.
- **L₃**: 17 turns No. 28 enam., close-wound. Link 3 turns same.
- **L₄**: 8 turns No. 28 enam., close-wound. Link 2 turns same.
- **L₅**: 5 turns No. 28 enam., close-wound. Link 2 turns same.
- **L₆**: 2 turns No. 28 enam., spaced 1/4 inch. Link 1 turn No. 28.
- All coils wound on 1/2-inch diam. polystyrene forms (Millen 47001) with link at top. Upper end of tuned winding connects to chassis ground.
- **R₁, R₃, R₅, R₁₀, R₁₁**: Carbon control, linear taper.
- **S₁**: Phenolic rotary, 3 sections, 3 poles, 6 positions, nonshorting.
- **S₂**: S.p.d.t. toggle.
- **S₃, S₄**: S.p.s.t. toggle.
- **T₁**: See text.
- **T₂**: 6.3-volt filament transformer, 1.2 amp.
tional amplification. Fig. 2 shows a circuit which can provide full horizontal deflection without distortion with an input of 0.6 volt r.m.s. It is essential that there be an input gain control, $R_1$, in the amplifier, to avoid overdriving the grid of the first triode section. This amplifier requires only 2.6 ma. at 315 volts d.c. and heater voltage of 6.3 volts a.c. at 0.3 amp. It can be tucked into the transmitter or into a corner of the monitor oscilloscope. In most applications it will be possible to take the required power from the transmitter.

If only envelope display is required, no connection need be made to the audio terminals on the monitor. For monitoring purposes, the envelope display is adequate, but the trapezoidal and bow-tie displays divulge more information about linearity.

The cable to the blanking terminals should connect to a pair of contacts on the send/receive switch (or relay) or the VOX relay. The contacts should close when the transmitter is on.

**Checking and Trouble Shooting**

The monitor is relatively simple and probably will work properly immediately on completion. In a circuit which contains six potentiometers, it is often possible to have one or more wired so that it functions backward, but this is easily remedied. The d.c. supply voltage may be checked with a d.c. v.t.v.m. Since the voltage will exceed 1000 volts, it may be necessary to connect a resistor (10 megohms, ½ watt, will do) in series to put the reading on scale; it is then necessary to determine the multiplying factor by measuring a voltage which is between 500 and 1000 volts, first without the multiplier and then with it. If the power-supply voltage is significantly under 1000 volts, the wiring should be checked. Do not attempt to measure the voltage with a low-resistance voltmeter as it will draw enough current to cause considerable voltage drop in $R_8$.

With the transmitter off but with $S_1$ closed and $S_2$ at "trapezoid," a small bright spot should appear on the face of the cathode-ray tube when $R_1$ is turned clockwise. Adjust $R_1$ so the spot is not too bright and then adjust $R_3$ for the smallest (sharpest focus) spot. If no spot appears, set $R_1$ full clockwise and set $R_3$, $R_7$ and $R_8$ at about half scale. If all is well, a spot will appear, but if not, check the voltage between chassis and either end of $R_3$. It should be possible to set this voltage to zero by adjustment of $R_7$. If there is still no spot, check the voltage between chassis and either

---

The coils for the tuned circuits are mounted in a circle around the band switch. Input links connect to the r.f. terminals on the rear of the chassis through a length of coax. The leads from the tuned-circuit coils to the deflection plates should be kept reasonably short.

An interesting space-saving feature here is the use of a switch with concentric shafts, the inner one being used to operate the tuning capacitor.

---

December 1960
end of $R_{10}$; it should be possible to set this voltage to zero by adjustment of $R_3$. If there is still no spot, check to be certain that $R_{12}$ is shorted out by the relay. Once a focused spot is on the face of the tube, it should be possible to blank it out by turning $R_1$ counterclockwise.

Next, set $S_2$ to "envelope." The spot should become a line. It may be necessary to advance $R_1$ slightly clockwise. If no line, set $R_{12}$ to about half scale and try reversing the polarity of the power cord. If there is still no line, check the wiring of $C_6$, $S_2$, $R_{12}$ and $C_5$.

With a line on the face of the tube it should be possible to control its length by $R_{12}$ and its sharpness by $R_3$.

If the line is not horizontal, note approximately how much rotation of the tube is required to make it so, shut off the monitor and rotate the tube; then turn the monitor on and get exactly the right position, being very careful to touch only the socket and not the wiring. Shut off the monitor again and secure the tube without allowing it to rotate. Proper alignment of the trace will result when the tube locating pin is at about 11 o'clock, viewed from the front.

Clockwise rotation of $R_8$ should move the line to the right and clockwise rotation of $R_7$ should move it up. If both directions are backward, the tube is upside down. If only one direction is wrong, check the wiring of the centering control and the deflection plates.

**Operation**

With $S_2$ on "envelope," set the monitor band switch, $S_1$, to the desired band and turn on the transmitter. With an unmodulated a.m. transmitter or an s.s.b. transmitter with single-tone modulation, adjustment of $C_6$, the monitor tuning capacitor, should produce a smooth rectangular raster whose height can be controlled by the tuning knob. With no modulation on an s.s.b. transmitter only a horizontal line should appear if the carrier suppression is adequate. If the height of the raster cannot be controlled satisfactorily, it may be necessary to adjust the position of the pickup loop at the transmitter. If the raster appears at one end of the capacitor range, the circuit is not tuning properly; note the position of the capacitor rotor and make the required alteration in the coil. If no raster appears, check the cable, pickup loop, and the wiring of $S_2$ and the coil in use.

After a satisfactory raster is on the tube face, apply a test tone to the a.m. transmitter. Since the horizontal sweep on the monitor is 60 cycles, the frequency of the test tone must be very close to some harmonic of 60 cycles to give a recognizable envelope pattern. At 100 per cent modulation the down peaks thin just to points. If these points become lines, the transmitter is overmodulated and splatter is resulting. Adjust the tuning control for convenient height of the peaks, and mark the height when there is 100 per cent sine-wave modulation. Regardless of meter indications, this point represents 100 per cent upward modulation.

In the case of an s.s.b. transmitter, a two-tone test signal must be used. Adjust the transmitter audio level so that there is no flattening at the peaks.

The tuning control on the monitor need not be adjusted for maximum height; it is necessary only that the height be sufficient for convenient viewing.

With $S_2$ in the "trapezoid" position, single-tone modulation on an a.m. transmitter should cause a trapezoid to appear on the monitor tube. If not, check the wiring of $S_2$ and the audio connections at the transmitter. When the trapezoid becomes a triangle, 100 per cent modulation is indicated. Overmodulation will put a horizontal spike at the point of the triangle. If the top and bottom of the trapezoid are elliptical instead of straight lines, adjust the phase control, $R_{18}$, so that a single sharply-focused trapezoid is displayed. If it is not possible to set the phase control properly or if it does not function at all, check the wiring of $C_9$ and $R_{18}$. If $R_{18}$ cannot adjust the trapezoid width properly, adjust the voltage divider at the modulator.

After completing the performance check, turn the beam switch to "off" so the scope pattern will appear only when the transmitter is on.

**Applications**

Since the monitor is quite sensitive, it may be used as a neutralization indicator. Use the envelope display. Remove the plate and screen voltage from the stage to be neutralized, and couple the monitor pickup loop fairly tightly to the plate circuit of the stage to be neutralized. Apply excitation and tune both the plate circuit of the transmitter and the monitor for maximum raster height. Adjust the neutralization control for minimum raster while keeping the plate circuit tuned for maximum raster. This method of neutralization indication is considerably more sensitive and simpler than using meters.

The linearity of a modulated r.f. stage is best studied by the trapezoidal display. At 100 per cent modulation, the sides of the triangle should be straight lines. Leveling off at the top indicates flattening of the peaks. In a.m. this is usually an indication of insufficient r.f. excitation or of insufficient modulator power. In the case of an s.s.b. linear amplifier, such flattening indicates either overexcitation or poor driver regulation. The flat-topped envelope corresponds to this flattened triangle display.

With an s.s.b. linear amplifier, a two-tone test signal should result in a straight-sided symmetrical display with no discontinuity at the point of crossover. This is true whether the envelope or double trapezoid display is used. Excessive bias will result in a narrow envelope with discontinuities at crossover. Too much drive or incorrect loading will cause a fat rounded envelope.

Parasitic oscillations usually cause drastic discontinuities in the smooth patterns which should result from sine-wave modulation. Al-

(Continued on page 190)
Substituting Transmission Line Sections for Lumped-Constant Traps

By William J. Lattin, W4JRW

Multiband Antennas Using Decoupling Stubs

Since amateurs usually desire to operate on more than one band, several methods have been devised to use a single antenna on several bands. The earliest arrangements employed various combinations of feeder lengths, antenna lengths, and series or parallel tuning of the coupling circuit. Later on, the use of parallel-tuned “traps” with lumped constants which act as insulators at a particular frequency was invented. A practical arrangement of this system for amateur use was developed and is in rather wide use.

It is well known that the parallel-tuned circuit and quarter-wavelength shorted stub of Fig. 1 are very similar electrically. Both configurations show a high impedance across points A and B. However, if a stub is connected to an antenna in this manner it does not act as an insulator but rather as a phase changer. The collinear antenna uses such stubs to operate a series of half-wave sections in phase.

There is a different connection possible for the stub, that is from A to C, which will result in insulator action or decoupling in an antenna. For instance, shorted stubs a quarter wavelength long at 28 Mc. can be attached to the ends of a 28-Mc. dipole as in Fig. 2. The 28-Mc. dipole is effectively isolated or decoupled from the balance of the antenna which can be made long enough to resonate at 14, 7 or 3.5 Mc. If another pair of stubs is added for 14 Mc., there will be isolation at both 28 and 14 Mc., and a 10–20–40-meter or 10–20–80-meter antenna can be made.

The stubs can be made of open-wire line, Twin-Lead, or coax. Their lengths can be found from the formula:

\[ \text{Length (feet)} = \frac{246 \times \text{Velocity Factor}}{\text{Frequency (Mc.)}} \]

The over-all length of an antenna containing decoupling stubs will be somewhat less than the figure given by the usual formula for a half-wave length dipole — Length (feet) = 468/Frequency (Mc.). For instance, an antenna for 10 and 20 meters must be 29 feet, 10 inches long for resonance at the lower frequency, whereas the formula gives a length of 33 feet.

If open line with a velocity factor of nearly unity is used for the stubs, the over-all length of a two-band antenna would be nearly a full

Since W4JRW obtained a patent on this multi-frequency antenna system nearly ten years ago we can't call it "new," but at least it should be welcome news to those seeking a simple way to get good radiation on several bands. Shorted 1/4-wavelength stubs provide r.f. insulation and also serve as part of the antenna.

---

Fig. 1 — A parallel-tuned circuit has a high impedance at its resonant frequency, and so does a 1/4-wavelength shorted transmission line.

Fig. 2 — A two-band antenna for 28 Mc. and some lower frequency. The center portion is an ordinary 10-meter dipole. The shorted stubs are 1/4 wavelength long at 28 Mc. and look like an open circuit at that frequency when connected to the dipole as shown. Extensions on the ends of the stubs can be used to resonate the antenna at any frequency less than half of 28 Mc.

Fig. 3 — Construction and dimensions of an antenna for 10 and 20 meters using 300-ohm tubular Twin-Lead for both the dipole and stubs. Either a 50- or 75-ohm transmission line can be connected at the center of the dipole.
free-space wavelength at the higher frequency and the whole antenna would resonate at something less than half that frequency. Very fortunately, the velocity factor of 300-ohm tubular Twin-Lead (0.8) gives such lengths for the stubs that, in most cases, adding the stub makes the antenna resonate at just half the original frequency.

Fig. 3 shows how tubular Twin-Lead can be used for the antenna itself as well as the stubs and includes dimensions for 10- and 20-meter operation. The foam-filled type of Twin-Lead is recommended to keep out moisture. Lengths for three- and four-band antennas using the same construction are given in Fig. 4. Fig. 5 indicates the standing-wave ratios observed across various bands when these antennas were fed with 50-ohm coax.

The antenna of Fig. 6 can be used when only 40- and 80-meter operation is desired. Since the 40-meter portion is not made up of stubs, it must be longer than the antenna of Fig. 4A. However, the isolating stubs must still be 1/4 wavelength long (allowing for velocity factor), and the whole antenna would resonate at a frequency below 3.5 Mc if the stubs were simply added to the ends of the 7-Mc dipole. To get around this, the dipole is shortened until the whole antenna tunes to 80 meters. Then resonance at 40 meters is restored by adding extra lengths of wire at the stub junctions. These wires are short and can just hang down from the antenna as shown.

Any of the antennas which will operate on 40 meters can be used on 15 meters as the 40-meter stubs will be approximately 3/4 wavelength long and will provide decoupling. The result is equivalent to operating a 7-Mc dipole at three times its resonant frequency, and we have found the s.w.r. is usually not lower than 3 to 6 when using 40-meter antennas of any type on 15 meters.

Theoretically, a center-fed antenna working on its third harmonic shouldn't be more than about 80 per cent higher in resistance than on the fundamental. One would expect an s.w.r. on the order of 2 to 1 rather than such high figures. — Rd.

---

Fig. 6—A stub-decoupled antenna for 40 and 80 meters. In this case wires must be hung from the ends of the 40-meter dipole to resonate the antenna in that band.

---

Fig. 7—Dimensions and suggested construction for coaxial, ground-plane and tubing dipole antennas for 10 and 20 meters. The arrangement in A might be mounted with standoff insulators attached to the 1/4-inch sections near the center of the antenna. The dipole in C could be closed at the center and fed with a gamma or "T"-matching system. Similarly-constructed parasitic elements could be added to make a multiband beam.
The power rating of the antenna will depend on the insulation at the stub junctions. These junctions can be painted with corona dope and covered with vinyl tape. It has been our experience over several years that the insulation will not break down with a kilowatt-input transmitter, 100 per cent modulated, except when wet or very damp. In this case, the input should be reduced to perhaps 500 watts unless special precautions have been taken to seal up the junctions at the open ends of the stub. Of course, on the lowest band for which the antenna is designed the stubs do not have voltage across them and will not be subject to breakdown or flashover. The high voltage across the open end of a stub occurs only at the resonant frequency of that stub.

Fig. 7 shows the construction of several 10- and 20-meter antennas which have been built and the dimensions required for resonance in these bands. The spacing between the rods forming the shorted stubs is not critical — the same lengths were obtained with 1-inch instead of $\frac{1}{4}$-inch spacing. Insulators should be made of low-loss material. Reflector and directors for a multiband beam could be made up the same way.

---

**My Salvation!**

**BY BERNARD J. COVNER,* K1IOX, ex-WSAWD, ex-W5IDI**

Getting back into hamdom after an 18-year absence presented an unanticipated problem of major proportions — where to locate the rig? The notion of a clean, dry basement retreat was nipped in the bud by two children who complained they had lost their father, and an XYL who was allergic to microphone chit-chat that permeated the bedroom floor (directly above the rig) in the wee small hours.

Every possible location (à la W9BRD’s recent scholarly discourse) was tried out mentally, only to be rejected for failure to satisfy one criterion or other. Sympathetic to the problem, and not wanting to limit the progress of ham radio, the XYL granted temporary use of the dining room, pending solution of this knotty problem. This deal was warm, dry, paved with wall-to-wall carpeting, accessible, sociable, and — in contrast with my boyhood experiences in the early ’30s — an unheard-of luxury!

The move patched up relations rapidly, but then reality began to “lose its.” With a group of 10 for dinner there is a limit to the containment capacity of even the best-made girders. And who likes the rig turned on inadvertently (and illegally) by milady’s posterior as she takes her place at the table. Further, despite the current craze in “science,” some guests were so uncultured as to consider a ham rig “not pretty.”

What to do? Trade in the bulky equipment for a tiny transceiver of equal power? Too expensive! Built-in customized cabinet? Too much money, and would it look right even then?

Just prior to giving up, the solution shown in the photo was conceived. An internal portable! No company, king in the dining room. Guests for dinner, disconnect coax and a.c. plugs and in 4 minutes the complete rig is safely hidden in the den (without blocking the children’s view of TV).

Any ham who has set foot inside a factory will recognize “my salvation” as an ordinary portable tool stand stocked by mill supply houses. This one comes knocked down, has three 31" × 36" tray-type shelves, legs punched for adjustable shelf heights, and 5" rubber caster wheels. Sells for about $30. Keys, beam indicator, and speaker rest on a simple wooden platform whose top surface is at a comfortable operating height for c.w. The bottom shelf is large enough to house certain linearss, and presently serves as a convenient and socially acceptable catch-all. How many hams can get away with having tools, soldering iron, instruction books, odd bits of wire, and so on, in the dining room?

---

*75 Barrett Ave., Stamford, Conn.*

---

*December 1960*
A Synched-Multivibrator Electronic Key

BY DR. ROY R. CAMPBELL* W4DFR

Since the very beginning of the electronic key there has been considerable circuit development aimed at a hand sending device that would imitate the perfection of punched tape code. Such keys tend to make for pleasant receiving, but they also can place a strain on the sending operator, particularly if he is called upon to send at various speeds. While the keyer described here is not offered as a machine for perfect sending, we do think it is an economical step in the right direction for better and easier sending.

Even a Novice can learn to send with this key and do it better than with a straight key because the uniform characters are more readable. Yet the manual control is flexible enough so that it need not make a robot out of the operator and wipe out every trace of style. Sometimes in "pushing" a key, one will hit the dot post a split second too soon after a dash. At high speeds with a self-completing type key the dot may never be formed and the letter will be wrecked. With this key the dot will be made and the character will be readable even if the space is a bit short.

A few words about code: Code characters and words can be broken down into basic timing elements called bauds. A dot tone and the space following it are each considered as one baud. A dash tone is three bauds and its following space one baud. Thus in a string of dots and dashes the tones are in 1 to 3 ratio but the total time for dots is half the time for dashes since the space is one baud in each case. Now the old-timer who

is used to reading most anything and sends on a "bug" rarely notices differences in these ratios from one speed to another. In fact, most of us will set the weights on the dot lever at about 25 w.p.m. and attempt to send slowly by making rather long dashes and to send fast by making short dashes. It is not uncommon to hear code speed extended from 12 to 30 w.p.m. without any adjustment of the key mechanics. Sometimes an operator will attempt to QRS by making side-swiping motions on the dash post, and it is very difficult to send well by this method. The only sure cure for these bad habits is to have a system which simultaneously expands and contracts the dots, dashes and spaces. With this keyer, only one knob is ever used to adjust for different rates of sending, and this control works from about 8 w.p.m. until one's reflexes fail to register.

The clacking of relays operating at their best is bothersome, and later in their life they tend to stick and be generally unreliable. This keyer is absolutely silent in operation, since it has no relays to clack or adjust. It also features a sidetone keying monitor that operates independently but simultaneously with the transmitter keyed circuit. The keyer will operate in adapted cathode keying circuits up to the current limitation of the keyer tube, and it will also work with transmitters that use grid block keying. All parts are standard, and the cost should not exceed $30.00 if everything must be purchased new.

Those who have tried multivibrator key circuits in the past have experienced erratic opera-

---

*P.O. Box 168, Lenoir City, Tenn.
A free-running multivibrator is very much like a beagle hound — it will take off and follow any tramp who whistles. In short, it will react to very weak alternating voltages from remote sources. However, this also has its advantages, for a multivibrator will synchronize with an a.c. voltage of desirable frequency and sufficient amplitude introduced at the proper place. In this keyer a generated audio voltage is introduced into the timing circuit. The amplitude of this synchronizing voltage is made just high enough to trigger the multivibrator circuit at regular intervals, and these intervals are controlled by adjusting the speed control. The same method is used to synchronize the sweep of an oscilloscope so waveforms can be viewed. In the time base of a scope, the reverse phase is made as short as possible and often blanked out (return trace), but in the keyer this is not the case. The reverse phase has a specific time that is equal to the desired space time between the dots and dashes. Another portion of the timing circuit operating in the opposite phase can be used to make the tone time of either a dot or a dash. Once the relative lengths of these times are set up, the actual lengths can be expanded or contracted without changing the ratios. Adequate control voltage is supplied to the timing circuits so they will not be subject to extraneous influences like hum or r.f. pickup.

**Circuitry**

As shown in the schematic diagram of Fig. 1, two triode sections of two 12AU7As, V₁ and V₂A, are used for the multivibrator. While the keying lever is in its neutral position, the cathode lead of V₁ is open, and V₂A draws current heavily. This causes the voltage at the plate of V₂A to drop to a low value. (Cathode resistor R₉ was made just

---

**Fig. 1 — Schematic diagram of the multivibrator key. Unless otherwise indicated, resistors are ½-watt composition; capacitor with polarity marked is electrolytic, others are disk ceramic.

C₁—0.3-μf. (three 0.1-μf. disk ceramics in parallel).
C₂—0.1-μf. disk ceramic.
C₃—About 6800-μf. [see text].
C₄—0.01-μf. disk ceramic.
C₅—0.001-μf. disk ceramic.
R₁—3900 ohms, 2 watts.
R₂—15,000-ohm 2-watt control, wire-wound.
R₃—43,000 ohms, ½ watt.
R₄—25,000 ohm 4-watt control, wire-wound.
R₅—100,000 ohms ½ watt.
R₆—500,000 dual control (CTS-IRC 11-133 PQ control and M multisection).
R₇—270 ohms, ½ watt.
R₁₀—2.2 megohms, ½ watt.
R₁₁—1 megohm, ½ watt.
R₁₂—500,000-ohm control.
R₁₃—92,000 ohms, ½ watt.
R₁₄—About 68,000 ohms, ½ watt [see text].
R₁₅—20,000-ohm control.
R₁₆—10,000-56,000 ohms, ½ watt [see text].
T₁—3:1 audio transformer (Triad A31X or similar).
sufficiently large to self-bias the tube and prevent a ragged audio oscillation from occurring. With no excitation coming from $V_1$, this condition will continue as long as the paddle is in the neutral position. The resistance network, consisting of $R_{1b}$, $R_{11}$, $R_{12}$, $R_{13}$, $R_{14}$, is adjusted to put a negative voltage greater than cutoff on the grid of the 6CL6 keyer tube $V_2$. Thus $V_2$ looks like an open circuit to whatever is connected across it.

Operating the key reverses the picture. When the paddle closes the cathode circuit of $V_1$, plate current flows and the voltage at the plate of $V_1$ is reduced because of the drop across $R_3$. The voltage across coupling capacitor $C_1$ cannot change instantaneously, so the voltage at the grid of $V_{2A}$ goes negative by the same amount as the drop in plate voltage at $V_1$. In other words, $C_1$ charges up very quickly through $R_3$, $R_4$, the power-supply impedance, $R_9$, and the cathode-to-grid impedance of $V_3$. This charge causes a negative voltage greater than cutoff to appear at the grid of $V_{2A}$. When $V_{2A}$ is cut off, its plate voltage rises suddenly and a portion of the increase feeds through resistors $R_{18}$ and $R_{19}$ to the grid of $V_3$. The latter will then draw current heavily if its plate and cathode are connected to a d.c. source of proper polarity. This condition is found at the key jack of cathode keying circuits as explained later. With a slight modification, $V_3$ will also control grid-block keying circuits.

$V_{2A}$ will not remain cut off indefinitely. As soon as the charge on $C_1$ drains off through $R_7$, $R_8$ and the resistance of $V_1$ so that the grid voltage of $V_{2A}$ reaches cutoff, $V_{2A}$ begins to conduct. Its plate voltage then drops, and $V_1$ is cut off in turn by the voltage put across $C_2$. As long as the paddle keeps the cathode circuit of $V_1$ closed, $V_1$ and $V_{2A}$ will switch back and forth automatically. The interval when $V_1$ is cut off (space) is determined mainly by $C_2$ and $R_8, R_6$. The length of a dash tone ($V_1$ cathode grounded, $V_{2A}$ cut off) is set by $C_1$ and $R_7, R_8$. Since $R_7, R_8$ always equals $R_7, R_8$, and $C_1 = 3 \times C_2$, a dash will be three times as long as a space. $R_4$ provides a fine adjustment of this ratio and serves to balance the currents drawn by $V_1$ and $V_{2A}$. When the paddle is thrown to the dot post, $R_1$ and $R_2$ are added to the cathode circuit of $V_1$. The self-bias they provide limits the plate current, and when $V_1$ begins to conduct, its plate voltage and the grid voltage of $V_{2A}$ drop less than before. $V_{2A}$ is cut off for a shorter period forming a dot tone, and the relative length of this tone can be set by $R_2$.

Ganged potentiometers $R_6$ and $R_8$ become the sole adjustment necessary for speeding up or slowing down the dots, dashes, and spaces. $R_4$ and $R_5$ should have the same taper although it does not matter what taper is used. The speed control actually works from about 8 w.p.m. to as fast as anyone can manipulate the key. Please do not turn it loose on me.

$V_1$ and $V_{2A}$ generate a wave shape that is close to a square wave, and a small capacitor, $C_5$, is used to suppress a transient click that occurs at the end of a tone. The smallest value that will prove satisfactory here is the most desirable because it does have some effect on the timing ratios. Further shaping of the keying characteristic is done at the grid of the keyer tube. A large capacitor at $C_4$ makes soft keying, while a smaller one makes sharper characters.

Another 12A3TA section, $V_{2A}$, was used for the stabilizing audio oscillator in one of the oldest circuits, the simple feedback. Low plate voltage is required for smooth operation as the feedback is very high, and the power supply should be thoroughly decoupled and filtered. Regeneration and also tone can be controlled by the variable resistor $R_{18}$. The exact frequency is immaterial, and any tone between 200 and 2000 c.p.s. that pleases the ear can be used. A small portion of the generated audio is fed to the grid of $V_1$ through $C_8$ and $R_{18}$ to synchronize the multivibrator.
The other use of the audio is for the side tone. We could see no use wasting a good tone when a face simule was needed for monitoring, but using it proved to be quite an accomplishment. A circuit had to be used that would not only follow the operation of the keyer tube but also not affect it in any way. One experimental circuit worked beautifully until it was tried on the exciter. A nice modulated tone was found on the signal output. The solution was again the use of a very old circuit trick, keying the power supply to a small amplifier. One section of a 12AX7 tube, \( V_{4a} \), was rigged up as an electronic keyer in the plate lead of \( V_{4b} \), which is a side tone "amplifier." The latter stage is not necessary to increase the volume (actually, it operates at a loss), but it is necessary to isolate and follow the keyer, \( V_3 \). \( C_5 \) is to prevent any possible reaction on the grid of \( V_3 \). A small value should be used here as the face simile will not be exactly the same as the actual transmitted signal. Also, certain values will cause the side tone output to ring.

The power supply diagramed in Fig. 2 is a conventional 40-ma. regulated job, except that a resistor is included in the center-tap lead to provide about 80 volts of negative bias. Of course, power may be obtained from the utility sockets on a receiver or transmitter if the correct voltages are available.

**Connecting the Keyer**

Do not expect to plug this keyer into any old keying jack and get good results. Ordinary mechanical keys are not selective as to polarity and offer almost zero resistance to the flow of current. Keyer tubes, on the other hand, will carry current in one direction only, and they do have some resistance which must be taken into account. Since the keyer tube must carry sufficient current to satisfy the circuit that is being keyed, heavy duty may require the use of several such tubes in parallel.

When using this unit with a cathode keying circuit, the grid return of the keyer tube in the transmitter must be connected to the key jack tip. If there is a meter in this circuit, it should be included also, as shown in Fig. 3B. This prevents the transmitter tube from developing self-bias due to the internal resistance of \( V_3 \). If the grid is returned as suggested, the keyer tube offers only a small load in series with the power supply, as would a resistor of equal value placed in the plate-supply lead. The designers of commercial gear have not considered the use of a keyer tube at the key jack and they usually make the grid return to the nearest convenient ground point. Of course, the keyer can be used to operate a d.c. relay of rather high current capacity if it is desired to do so. The keying characteristics are then no longer applied directly to the transmitter, and suitable click and splatter filters would have to be inserted as with a regular mechanical key. The automatic operation would, of course, be retained.

In conventional grid-block keying, the negative blocking voltage is reduced to zero by shorting it to ground with a mechanical key. This allows the normal grid leak or fixed bias to remain operative. The same condition exists if we allow a positive voltage to neutralize the negative voltage. By placing a positive voltage on the plate of keyer tube \( V_3 \) and connecting the cathode of \( V_3 \) to the grid block junction through a resistor, we are able to key the transmitter. Connection is made through the regular key jack. This arrangement is shown with a typical 807 buffer or amplifier.

---

**Fig. 2**—Schematic diagram of a power supply suitable for the keyer. Capacitors are electrolytic.

- \( S_t \): S.p.s.t. toggle switch,
- \( T_t \): Power transformer: 600 volts center-tapped, 50 ma; 6.3 volts, 2 amp; 5 volts, 2 amp. (Triad R-7A).

**Fig. 3**—(A) Conventional circuit for cathode keying. (B) Modified circuit for use with electronic keyer. The grid return is made through the key jack so that the voltage drop across the keyer will not add to the grid bias of the keyed stage.

---

**December 1960**
stage in Fig. 4A. The keyer power supply described provides enough negative bias to cut off \( V_3 \) and key the 807 even with the 100K resistor and blocking bias in the cathode circuit. The circuit of Fig. 1B should be used if the negative blocking voltage is 100 volts or more. The diode tube reduces the negative voltage from the blocking system which appears at the cathode of \( V_3 \) during spaces but does not prevent the flow of positive pulses when \( V_3 \) is actuated. In case you want to use this keyer with both cathode and grid-block keyed transmitters, a d.p.d.t. switch can be added to switch the plate of \( V_3 \) from key lead to B+ and the cathode of \( V_3 \) from ground to the 27K resistor.

The output of the sidetone monitor may be connected to almost any audio amplifier. Some commercial receivers have a “phono” jack which can be used. Since the monitor output is high impedance, there is no deleterious reaction if this is fed directly to the grid of the first audio amplifier in the receiver with shielded wire. It is a general thing to have the audio amplifier portion of the receiver alive even though the front end is muted during transmissions. Problems like this are left to the constructor.

**Construction and Adjustment**

The keyer shown was built on a homemade 5½ × 7½ × 1½ inch chassis, but any standard chassis of about this size can be used. If the keying paddle is to be separate, you can reduce the size somewhat, and if the power supply is built in, you will need a larger chassis. I constructed my own keying paddle, but no claims are made as to its being better than a manufactured one. A modified bug is probably the quickest and cheapest way out if you have one. If the key is mounted on the chassis as shown, it will be necessary to cut an opening and submount it to get the proper operating height. If the key is remote, a double-circuit jack will take care of the problem.

The four tubes are arranged in a line down the back of the chassis, as shown in the photos. The positions of the variable resistors can be arranged to suit the taste of the constructor. Since there are no r.f. or high-frequency audio signals involved, wiring can be cabled and dressed to one’s pet desires. Some may feel that there is an abundance of variable controls that could be replaced by fixed resistors. They do simplify initial adjustment, however, and are very handy for trimming up the action of the keyer after a tube replacement. Parts for the keyer should be of good quality but need not be of the precision type. Beware of bargain-variety paper capacitors, especially in the multivibrator circuit, since they may not hold a charge. General-purpose disk ceramics are good in this respect and occupy little space.

The first section of the key to get working is the audio oscillator. Apply heater and plate voltages and adjust \( R_{15} \) and the value of \( R_{17} \) for smooth operation at the desired frequency. Proper polarization of the audio transformer is important, so if the stage does not oscillate, reverse the connections to one winding of \( T_1 \).

Now connect the sidetone output to an audio amplifier and apply plate voltage to the remaining stages. With the keying lever closed, adjust \( R_{13} \) and \( R_{18} \) until a series of dots and dashes is heard. Adjustment of the multivibrator requires little effort but only an understanding of what one is trying to do. Just remember that a dash should be three times as long as either a dot or a space. Using a slow speed \( (R_8 \text{ and } R_9 \text{ at maximum resistance}) \) it is fairly simple to set the ratio adjustments, \( R_8 \) and \( R_4 \), with the aid of a metronome or sweep second hand. Once this has been accomplished, the speed control will compress and expand all the lengths simultaneously.

To synchronize the multivibrator, connect a variable resistor of about 1-megohm maximum at \( R_{15} \). Adjust this resistor until the multivibrator runs about 20 per cent faster than it did with an open circuit at \( R_{15} \). That is, it should make about five dots or dashes in the time it formerly made four. There will also be a slight change in ratio which can be corrected. Disconnect and measure the value of the variable resistor, and replace it with a ½-watt fixed resistor of similar value. Now the keyer should be ready for business.
If keying is to be done in a cathode circuit, connect $V_2$ across the key jack after having changed the grid return as described above. With the keying lever open, set $R_13$ so that $V_2$ is cut off and no current flows to the keyed stage of the transmitter. Care should be taken not to operate the keyer tube too close to cutoff bias since it can become an effective modulator under these conditions. On the other hand, bias that is too negative may produce key clicks. Once the correct setting is established, no further adjustment is necessary. Capacitors $C_3$ and $C_4$ will also affect the keying characteristics as mentioned above, and they can be varied to suit the taste of the constructor and the circuit with which the key is used.

Grid-block keying requires a different adjustment procedure. The plate voltage applied to $V_3$ must be set to allow the keyed stage to draw normal grid current by the following method:

First, adjust $R_5$ in the keyer until a sidetone is heard strongly from the microphone. Hook a temporary voltage divider resistor between $B_+$ and ground, and connect the slider to the plate of $V_3$. Start with the slider near the grounded end and increase the plate voltage until the grid of the keyed stage draws normal current with excitation applied. Then increase the bias on $V_3$ by turning $R_3$ until the sidetone stops and the keyed stage blocks. Normal operation with the keying lever is now possible. The temporary voltage divider can be replaced with suitable fixed resistors or with a voltage source of the correct value.

No further shaping should be necessary, but make the r.f. bypass in the grid circuit of the keyed stage of the transmitter as small as possible. Excessive bypassing will make the keying too soft. Sharpening of the characters can be accomplished by using lower values for $R_{10}$ and $R_{12}$ to load both the negative and positive supplies more heavily.

Operating the finished key is about as simple as a semiautomatic mechanical key. One only has to let the automatic features do the work of making both dots and dashes. There are no weights or screws to adjust for different speeds; merely turn one knob.

---

The launching of the Courier satellite this fall was a sustained effort in which a good many radio amateurs participated. Among those who played a major role (those with in-line design, development, or managerial responsibility) were the following: W2BQS, W2CMR, W2IFB, W2IZQ, W2JBU, W2MOV, K2SBG, W2SLW, W3GVO, K3OFU, W4PPH, WA6AID, WA6ATG, K6DMW, K6GWV, K6IVR, W6KFO, K6LFI, W6NER, K6OPR, K6RTU, and W6Z0Z. Those playing a supporting role in this project were: K2EBH, W2FTR, W2JX, W2JPF, K3AAP, W3BFI, W3DJV, W3LSZ, W3PZH, W4LQV, K6AMF, K6EYD, WA6EZO, WA6FLS, WA6HIZU, W6MH, W6MIIK, K6MOA, K6OKN, K6RHO, W6WC, W6YFG, W7IV, and W7PRX.

The prelaunch payload activity at the Atlantic Missile Range was supported by a staff that included W2BQS, K2SBG, W2SLW, and W6Z0Z, W2BQS directed Signal Corps payload activity. K2SBG (president of the Ocean County Radio Club) was Signal Corps Logistic specialist. W2SLW served as Signal Corps advisor on satellite environmental and testing problems. W6Z0Z was the senior Philco electrical engineer, the man most directly involved in the satellite’s electronic functioning.

In this photo, left to right, are W6Z0Z, W2SLW, K6GWV, W2BQS, and K2SBG. The flight shells that contain the solar cells have been removed, and W6Z0Z is connecting a cable to one of the v.h.f. receivers while W2BQS is working on the message detector box of the command decoder.

December 1960 31
Recent Equipment —

Heathkit Mohican Transistor Communications Receiver

The new Heath Mohican receiver Model GC-1A should quiet the cries of the skeptics who insist that transistors are still experimental and that their only ham application is in a few "novel" circuits. Although all-transistor communication receivers have been described before, this is the first one that we know of that has been made available in kit or wired form. In any case, this should settle the question of whether transistors are ready for use in rather complicated circuits in the kit field.

The Mohican incorporates 10 transistors and 6 semiconductor diodes and is housed in a steel cabinet measuring 6⅝ inches high, 12 inches wide and 10 inches deep. These measurements are not much smaller than a vacuum-tube unit but represent about the smallest practical size one would want a receiver to have without sacrificing dial area, knob size, and so on. Both the cabinet and chassis are constructed from heavy gauge steel which gives the receiver a rugged, solid feel and probably contributes to its over-all stability. The entire unit weighs about 17 pounds.

Power requirements of the Mohican certainly place it in a class all its own when compared to vacuum tube receivers. Even with its complement of 10 transistors, only 12 volts at about 35 ma. is needed. When powered by batteries (8 standard type C flashlight cells) it can operate for as long as 400 hours under normal intermittent service.

The GC-1A tunes the broadcast band through 32 Mc. in five bands, and has a separate bandspread dial calibration for the 80, 40-, 20-, 15- and 10-meter amateur bands. The five tuning ranges on the general coverage dial are 0.55 to 1.6 Mc., 1.6 to 4.0 Mc., 4.0 to 9.0 Mc., 9.0 to 20 Mc., and 20 to 32 Mc. The five amateur bands are calibrated from 3.5 to 4.0 Mc. 7 to 7.3 Mc., 14 to 14.35, 21 to 21.4 Mc., and 26.0 to 29.7 Mc.

The receiver has an r.f. gain control, b.f.o., noise limiter and antenna trimmer and these are just a few of its features.

Some Circuit Details

The block diagram in Fig. 1 shows that except for the substitution of semiconductor for vacuum tubes, this unit contains about all of the sections usually found in a conventional vacuum-tube superhet receiver. Although the Mohican has a built-in whip antenna, an external one can be used (point E), provisions for which are made at the rear of the cabinet. The antenna is coupled by tuned circuits to the 2N1306 r.f. amplifier, Qd, which is connected in a grounded-base amplifier circuit. The input tuned circuit contains a section of the three-gang main tuning capacitor, Cs, and the proper inductance for the desired band is switched across the capacity by the band switch. An antenna trimmer, Cq, adjustable from the front panel, is wired in shunt with Cs so that the input circuit can be tuned to resonance. Gain of the r.f. amplifier is controlled by bias voltage supplied in part from the a.v.c. system, which may be turned on or off from the front panel. Also, an r.f. gain control, R4, is located in the bias circuit of the r.f. amplifier and allows for manual control. All voltages for the r.f. amplifier, except the a.v.c. voltage, are regulated.

Output from the r.f. amplifier is coupled, by tuned circuits selected by the band switch, to the base of a 2N1225 mixer, Qs, which is wired in a common emitter circuit. A variable capacitor, Cs, also part of the main tuning capacitor gang, tunes the mixer input circuit to the proper frequency. Oscillator signal from the local oscillator, Qo, is capacitively coupled to the mixer and injected in the emitter of Qs, resulting in an i.f. of 455 kc. All voltages to the mixer are regulated, as well as those used to power the local oscillator Qo, which is a 2N1225 connected in a common-base circuit. The oscillator's tuned circuits are switched by the band switch and are tuned by the third section of the main tuning capacitor, Cq. Also located across the oscillator tuned circuit is the bandspread capacitor, Cs. This capacitor tunes only the oscillator circuit, but the r.f. amplifier can be tuned up with the antenna trimmer and brought into resonance when necessary.

The 9½ X 3-inch edged lighted dial commands most of the panel space on the Mohican receiver. The tuning meter is located at the upper left of the photograph with the a.c.v. switch directly below it. From left to right across the front panel are the MAIN TUNING knob, AUDIO GAIN, A.M. switch, B.F.O. control, BANDSWITCH, R.F. GAIN control, DIAL LIGHT switch, ANTENNA TUNING, and BAND-SPREAD knob. The whip antenna protruding from the top of the cabinet rises to about 5⅞ inches and telescopes down to about 4 inches. A speaker not visible in the photograph is inside the cabinet under the perforations at the top left.
As Fig. 1 and the photographs show, some of the wiring consists of printed circuits while other sections are conventionally wired. The r.f. amplifier, mixer and oscillator circuits just discussed are all wired circuits and are assembled on a flat steel plate. All the tuned circuits, including the variable capacitors, band switch and transistors, are mounted on this deck and wired before being attached to the main chassis. The i.f. amplifier, as well as the detector and audio stages of the receiver, are part of the printed circuit portion and are also constructed in a separate operation and then added to the chassis.

The printed circuit i.f. amplifier consists of three stages of amplification all employing 2N373 transistors connected in common-emitter circuits. The first i.f. amplifier, $Q_4$, receives the 455-kc. signal from the mixer through a double-tuned i.f. transformer and the gain of the first i.f. amplifier is controlled by the a.v.c. system when in that function. Leaving the first i.f. amplifier, the 455-kc. signal is coupled into a special 455-kc. filter which occupies the position usually held by a transformer in a conventional i.f. amplifier. This filter is a ceramic element called a Transfilter and it helps to achieve a fixed narrow band pass in the i.f. stages. One advantage of the Transfilter is its relatively high input impedance (2000 ohms) and low output impedance (500 ohms) which make it a natural for use in transistor circuits where impedance levels of this order are usually encountered. Actually, the two filters used in this unit operate somewhat like the conventional crystal-lattice filters since these ceramic elements exhibit a piezoelectric effect. The small ceramic disk (which is encapsulated in the holder) vibrates at the first overtone of its fundamental radial mode, giving the frequency-selective properties necessary in this application. Heath claims an i.f. selectivity of 3 kc. at 6 db. down and 25 kc. at 60 db. down. Fig. 2 shows an i.f. amplifier stage using the Transfilters. It should be noted that the bypass capacitor, $C_6$, in the emitter circuit of $Q_6$, is a 0.1-$\mu$f. unit resonant at 455 kc. It is a special frequency-selective ceramic element similar to the Transfilter. These special emitter bypass elements help improve the i.f. selectivity of the receiver.

A b.f.o. is provided for s.s.b. or c.w. reception and consists of a common-base oscillator using a 2N409 transistor, $Q_8$. Fig. 3 shows the circuit of the b.f.o., which incorporates an HD2257 diode, $CR_1$, instead of a variable capacitor, to control the oscillator frequency. A variable back bias is applied to the capacitor diode by potentiometer $R_2$, the b.f.o. control. The bias changes the capacitance of the diode which in turn can tune the b.f.o. through the pass band of the receiver.

Fig. 2—455-kc. i.f. amplifier using a Transfilter interstage coupler. All resistors are 1/2 watt.

Output from the b.f.o. is coupled through the 4.7-$\mu$f. capacitor and applied to the collector of the 2nd i.f. amplifier, $Q_b$. To insure v.f.o. stability, the voltage to the b.f.o. circuit is regulated.

A tuning meter, calibrated on a scale of 10 for indication of relative signal strength, is connected in the collector circuit of the 1st i.f. am-

---

December 1960
Resistors $R_3$ and $R_4$, along with diodes $CR_5$ and $CR_6$, form a voltage divider resulting in a collector-to-emitter voltage of about 6 volts on each transistor. This permits the power transistors to operate at equal voltages.

In addition to being part of the voltage divider, the 1N2326 diodes, $CR_5$ and $CR_6$, also regulate the operation of the amplifier over a wide temperature range. Since the diodes exhibit a negative temperature coefficient, they tend to compensate for collector current variations due to temperature changes. These diodes also compensate for voltage variations from the power supply and regulate proper bias on the output stage. Output is developed across the 35-ohm speaker, which can be switched out of the circuit by inserting low-impedance headphones in a circuit-closing jack on the rear of the chassis. Audio output is about 0.4 watt at 10 per cent distortion.

Power for the Mohican can be supplied either by batteries or by a 117-volt a.c. supply. The kit comes equipped for battery supply (without batteries) but the 117-volt power pack (Model XP-2) is available from Heath. In either case, 12 volts at about 35 ma. is necessary. As mentioned earlier, several of the stages in the receiver are voltage regulated. This is achieved by the use of the 1N754 diode, $CR_7$, shown in Fig. 1. This diode performs the same job as the common gas regulator tubes but at a much lower voltage. The one used in this receiver regulates at 6.8 volts.

**Construction Details**

The Mohican is constructed in several steps with the various subassemblies wired and then

---

![diagram](image_url)

**Fig. 4**—The Class B push-pull audio stage. Diodes $CR_5$ and $CR_6$ are compensating diodes that stabilize the operation of the amplifier over a wide temperature and voltage range. Resistors are $\frac{1}{2}$ watt.

The front-end circuits in the large compartment appear to be quite complicated and cramped. However, in the step-by-step wiring process, this section goes together smoothly. The four-wafer band switch projects into this compartment at the right and the antenna trimmer control shaft goes through at the left. Notice the large cast flywheels used on the main and band-spread tuning shafts.
attached to the main chassis. The r.f. amplifier, mixer and oscillator stages are wired first and then attached to the flat steel plate visible in the bottom-view photograph. The most difficult step is wiring of the band switch after the baffles have been attached to the flat steel plate. However, a little patience and long fingers will eventually pay off. After the front-end circuits have been wired, components are mounted and soldered to the printed circuit board. The front-end deck and printed circuit are then attached to the main chassis. All of the operating controls, jacks and connectors are then mounted and the various sections are interconnected in the final wiring. Construction of the unit takes about 30 hours and this includes making a parts inventory before starting. Testing and alignment are not included in this estimate and time will probably vary depending upon test equipment and methods used, but it should not take more than two or three hours.

Alignment and Testing

The Mohican instruction manual contains excellent step-by-step information for final testing and alignment. An r.f. signal generator and vacuum-tube voltmeter are used, although the v.t.v.m. is not absolutely necessary since the receiver's tuning meter can be used as an alignment indicator.

Operating controls on the receiver's front panel include the main and bandwidth tuning knobs which are string-coupled to the respective tuning capacitors, an a.v.c. on-off slide switch, audio gain, r.f. gain, a.n.l. slide switch, and dial lights spring return slide switch. The dial-light switch has the spring return feature to preserve the batteries. Antenna and ground connections, as well as the muting terminals and phone jack, are arranged along the rear of the chassis. The muting terminals are merely in series with the 12-volt power supply, since the receiver recovers almost immediately when power is applied. If the receiver is to be used along with an accompanying transmitter it is necessary not only to open the mute jumper but also to short the antenna terminal to ground since the signal from the transmitter could damage or destroy the r.f. amplifier transistor.

In the finer details, Mohican performance can't be expected to compare with vacuum-tube sets of the more-advanced type, of course. However, it certainly can hold its own on s.s.b., c.w., or a.m. with many communications receivers. A few suspicious teletype signals can be heard on the higher bands, but image response is usually a problem with any single-conversion receiver. Hecht claims a sensitivity of 2 microvolts for 10-db. signal-to-noise ratio on all but the broadcast band, and the receiver sounds "hot" right up to the top frequency and does not seem to fall off in performance even on 10 meters. One common complaint usually directed toward all-transistor receivers is their inability to handle very strong signals. However, the a.v.c. system, along with the manual r.f. gain-control feature in the Mohican, seems to cope with even the strongest ones. — E. L. C.

Strays

Ever bring a friend over to the house to show him some new gadget, and then find that it won't work? Or take him to a favorite fishing spot and then find that the fish aren't biting? This seems to be a common experience for many of us, but that isn't the way it worked for Ray Meyers, W6MLZ, ARRL's Southwestern Division Director.

He had as a house guest a TV producer who wanted to hear some of the doings on an amateur band. Ray tuned across 7-Mc, and they listened to some of the local phone nets. After one of the nets stood by, W5FFX operating portable in New Mexico was heard sending QRRR. This distress call was answered by W6GSQ and W6MLZ, who were asked to get some sort of medical advice to assist a man who had just had a heart attack. (The nearest telephone to W5FFX was 15 miles away, and the nearest doctor was 40 miles away.) W6MLZ got a local doctor on the phone, who passed along instructions to W5FFX on what to do pending arrival of medical help at the scene. W6MLZ also made some long-distance phone calls, and got an ambulance dispatched from Des Moines, N. M. After a 65-mile trip the patient was delivered safely to a hospital in Clayton, N. M.

And so ham radio helped to save a man's life, while a TV producer got an excellent demonstration of hams in action.
Using the 7360 in the HBR-16

Beam Deflection Tube for Improved Product Detection

BY JOHN M. FILIPCZAK,* K2BTM

The use of a 7360 beam-deflection tube in the HBR-16 receiver results in a much improved product detector for the reception of sideband signals. The 7360 detector circuit not only provides greater audio output voltage and much lower intermodulation distortion, but also adds the feature of impulse noise limiting. The circuit is so designed that tube replacement does not require adjustment of element voltage.

Although pentagrid converters are basically product-detection devices, they have some inherent limitations. Characteristics of the pentagrid-converter tube are such that small changes in element voltages can shift tube operation out of the "center of the linear range" under large-signal conditions. The pentagrid product detector shown in Fig. 1, for example, has the carrier-insertion signal applied to grid No. 1 and the modulated sideband signal to grid No. 3. Because of the electronic interaction existing between grid No. 1 and grid No. 3, pentagrid converter tubes are seldom used to generate their own beat-frequency-oscillator signals in product-detector circuits.

![Fig. 1—Pentagrid product-detector circuit.](image)

A second method of product detection; i.e., the popular Crosby system, uses two dual-triode units which require additional socket space and components. The limitations of both systems can be circumvented by the use of the 7360 beam-deflection tube.

Features of the 7360

The 7360 is a grid-controlled beam-deflection tube having a cathode, control grid, screen grid, 1 Electron Tube Division, RCA, Harrison, N. J. Home address: 200 Maywood Ave., Maywood, N. J.

New!!

PLATE

DEFLECTING ELECTRODES

PLATE

CATHODE

Fig. 2—Sketches showing the mechanical arrangement of electrodes in the 7360 and equivalent circuit symbol.

two deflecting electrodes, and two plates in a nine-pin miniature envelope. The tube was specifically designed for application in such sideband circuits as balanced modulators, balanced mixers, product detectors, and frequency converters.

The tube structure, shown in Fig. 2, is such that the total beam current is determined by the voltage applied to grid No. 1 and grid No. 2. The difference in voltage between the deflecting electrodes determines the amount of beam current collected by each plate. In balanced operation, the beam current is divided equally between the two plates. When signals are applied to grid No. 1 and one of the deflecting electrodes, the resultant output contains signal components produced by the product of the input signals. Therefore, if the modulated signal is applied to one of the deflecting electrodes and the carrier insertion is applied to grid No. 1, the resultant output contains the desired audio component.

Receiver Modification

The October 1959 issue of QST presented an excellent article by W6TC on the HBR-16 receiver. Because the pentagrid converter origi-

---

**QST for**
nally used for product detection in my own "home-brew" HBR-16 left much to be desired (strong signals produced distortion), conversion to the 7360 for product detection seemed worthwhile.

The incorporation of the 7360 into the HBR-16 required several modifications of the original circuit shown in Fig. 3. The seven-contact socket formerly occupied by the 6BE8 (V9) was removed and replaced with a shielded nine-contact socket.

All circuit components between the two sections of the a.m./s.s.b. switch (S7) were removed. The r.f. filter network, consisting of a 5000-ohm resistor and two 250-μf. capacitors, was left untouched. The bottom end of the second i.f. transformer (T4) secondary was lifted from ground and connected as shown in Fig. 4. (Good wiring technique is essential here because of the limited space available.) Because this connection places approximately 25 volts d.c. on the secondary of T4, a 0.1-μf. capacitor, C1, was placed between the a.m. position of switch S7A and the infinite-impedance detector grid (V10A). A 1-meg-ohm resistor was also added from grid to ground on V10A. It was necessary to rephase T4 for maximum gain after the conversion was completed. It was noted that the secondary of T4 exhibited a sharper peak when tuned; in the original circuit, the tuning was much broader.

The b.f.o. output-coupling capacitor, C9, was adjusted to bring the voltage up to 10 volts peak-to-peak on grid No. 1 of the 7360. Investigation of the particular b.f.o. circuit used in the HBR-10 indicated an output r.f. voltage slightly over 10 volts peak-to-peak. This adjustment is preferably made with the aid of an oscilloscope. If a scope is not available, C9 may be adjusted for maximum undistorted audio-output signal. This value will be a little less than maximum capacitance.

**Performance**

A quick operating check of the completed circuit is simple to perform. Turn on the receiver and place the a.m./s.s.b. switch in the s.s.b. position with the b.f.o. on. Tune in an s.s.b. signal and adjust the b.f.o. for clear reception. Switching off the b.f.o. at this point should result in negligible audio at the speaker. (Because of the good isolation between the two signal elements, interaction is negligible.)

![Fig. 4—Diagram showing circuit and connections for substituting a 7360 in the product detector of the HBR-16. See text referring to C1; other component designations refer to original circuit.](image-url)
Self Excitation

If desired, the 7360 may be used to provide its own b.f.o. excitation, thus eliminating the need for the separate 6BH6 b.f.o. tube, \( V_{11} \). The author used this method of excitation in his final revision and the circuit is shown in Fig. 5. \( C_1 \) is used to adjust the signal level on grid No. 1 to a value of from 5 to 10 volts peak-to-peak with respect to the cathode. This adjustment shifts the b.f.o. frequency somewhat, but the shift can be compensated for by adjustment of the capacitor in \( T_5 \). The pitch control \( C_{12} \) is the front-panel control and is used to zero beat the incoming signal. The 100-\( \mu \)F capacitor shown in dotted lines was required to provide adjustment to zero beat but may not be required in all instances. The grid-clamping diode \( C/R_1 \) prevents the No. 1 grid from approaching too closely to zero voltage, at which point distortion would result. Using this arrangement in my receiver, the stray coupling to the deflection electrodes was in the order of 25 db, below the normal peak-signal level. Because the detector conversion gain of the 7360 in the product-detector circuit is about 6, the audio-output stage can be driven directly in most cases.

Noise Limiting

Another feature of the 7360 is its excellent noise-limiting capabilities. The normal signal voltage appearing at the deflection electrodes should be limited to a maximum value of 8 volts peak-to-peak. If this voltage becomes larger, the audio signal becomes slightly clipped. Noise pulses ten times greater than the s.s.b. signal were only twice the peak audio signal after detection. It is recommended that the deflection-electrode signal be kept near the maximum of 8 volts peak-to-peak to take advantage of this signal-limiting feature. The signal-limiting characteristics of the 7360 are shown in Fig. 6.

Fig. 5—B.f.o. circuit for self excitation. Decimal values of capacitance are in \( \mu \)F, others in \( \mu \)F. Resistances are in ohms and resistors \( 1/2 \) watt.

- \( C_1 \)—30-\( \mu \)F, ceramic or mica trimmer.
- \( C_{12} \)—See original b.f.o. circuit.
- \( C_{13} \)—1N38 germanium diode.
- \( T_5 \)—See original b.f.o. circuit.

Fig. 6—Graph representing the signal-limiting properties of the 7360.

Precautions

The 7360, like other types of beam-deflection tubes, is affected by stray magnetic fields. Variations in magnetic fields cause corresponding variations in plate currents, and upset the tube's exceptionally good balance. Therefore, a tube shield is recommended for most applications. Judging from the past articles in and correspondence to QST, there seems to be a great deal of interest in "home-brew" receivers. I might add that the experience gained from any sort of project dealing with receivers is worth more than the money invested in it.

Strays

Have you ever seen a picture which better depicted the wonder and delight of a youngster first listening to signals on the amateur bands? The young lady is Mary Anne Overton, and the operator is Gene Quiney, K4TTJ. The photo was taken by G. Ross Parsons, who is publicity chairman of the Savannah Amateur Radio Club (W4HBB). The occasion was the Coastal Empire Fair, at which the SARC had set up a booth publicizing amateur radio.
Transistor Converter for Six Meters

A Printed Circuit Unit Which Rivals Vacuum-Tube Models

BY DANIEL MEYER *

Use transistors on six? You’re kidding!” was the usual comment by the local hams when the subject of a six-meter transistor converter was mentioned. Until recently, this attitude was justified, due to the low gain, high noise and high cost of early r.f. transistors. Only superregenerative-type circuits were practical, and they suffered from the usual troubles that are found with superregenerative detectors, namely lack of selectivity, radiation of an interfering signal and critical adjustment.

The recent introduction of “mesa” and “drift” transistors suitable for use in the v.h.f. range has changed this picture. A superheterodyne-type six-meter converter using Ampexer 2N1517 and 2N1518 transistors comes close to matching all but the “cascode” vacuum-tube circuits with respect to noise.

The converter described in this article has been used by KS5VE since March. Over a half dozen converters of the same type have been built since that time for both fixed station and mobile use. Everybody who has tried one has been impressed by the sensitivity and the absence of interference from stations operating at the i.f. The low power consumption and small size make this converter a natural for mobile use. The parts cost is under $25.00, even if all new components are used.

Circuit

Since the circuit design is different from that used with tubes, some of the more important points will be explained for the benefit of readers who would like to build converters for other frequencies or may just be interested in why this particular circuit was used.

The first thing to be considered is the antenna coupling network. This network must couple the signal from a 50-ohm coaxial transmission line to the input of the r.f. amplifier with a minimum of loss. In a standard grounded-cathode vacuum-tube circuit, there is only a very small amount of power transfer in the input grid circuit. The antenna coupling circuit is usually designed to present an impedance to the grid that is optimum with respect to noise figure, and the Q of the circuit is adjusted to give the desired bandwidth. With transistors, this is not the case; there is a very definite input impedance, and power transfer will take place in the input circuit. It is important to understand what this implies, since any losses in the input circuit will add directly to the noise figure of the converter.

The efficiency of the circuit can be expressed in terms of the loaded and unloaded Qs of the

V.h.f. transistors are now available at reasonable prices, and this compact 50-Mc. converter makes good use of them. With a current drain of only 7.5 ma. at either 6 or 12 volts it’s a natural for mobile, but its performance is definitely of home-station caliber. The etched circuitry used for all non-r.f. wiring helps keep size down and makes it easy to exactly duplicate the original layout.

The formula is:

$$\text{Efficiency} = \left(1 - \frac{Q_1}{Q_a}\right)^2$$

where $Q_1$ is the loaded $Q$ and $Q_a$ the unloaded $Q$ of the tuned circuit. To make this clearer, the loss may be shown in terms of db. vs. the $Q_a/Q_1$ ratio, as in Fig. 1. As can readily be seen, to keep the losses in the input circuit below 1 db., the unloaded-to-loaded $Q$ ratio of the tuned circuit must be over nine. “So what?” you say. Well, this shows that at high frequencies the input bandwidth may not be too narrow or the losses will be very high. If, for example, you wanted a 1-Mc. bandwidth at, say, 100 Mc., the necessary loaded $Q$ is approximately 100, since

$$\text{Loaded } Q \approx \frac{\text{Center Frequency}}{\text{Bandwidth}}$$

To keep the losses low, we find that we must build a tuned circuit with an unloaded $Q$ of 900. Since it is usually not practical to wind coils with $Q$s exceeding 200 without special materials and techniques, we would in this case have to increase the bandwidth or take a 6-db. loss in the input circuit. In the case of this six-meter converter, the necessary loaded $Q$ is $52/4 = 13$, since the input tuned circuit is designed to be 3 db. down at 50 and 54 Mc. It is relatively easy

---

*Southwest Research Institute, 8500 Culebra Road, San Antonio 6, Texas.

---

December 1960

39
to wind a coil with an unloaded Q nine to ten times this figure, so the input losses are held to less than 1 db with this circuit.

The r.f. amplifier transistor, $Q_1$, in Fig. 2, is used in a common-base circuit. This is done for two reasons. First, with the transistor specified, the gain at 50 Mc. in a common-emitter configuration would be lower than that obtained with a common-base connection, and second, neutralization is not necessary with the common-base connection. When this transistor is operated at lower frequencies, the common-emitter circuit will produce more power gain if it is properly neutralized. The noise figure is the same with either type connection if enough gain is obtained to override the mixer noise.

Since the antenna circuit must be a wideband, single-tuned circuit (in the interest of maximum sensitivity), it is advisable to use a more selective coupling network between the r.f. amplifier and the mixer. This will keep image and i.f. responses at a low level. A double-tuned circuit will give the desired flat gain characteristics between 50 and 54 Mc. and the needed rapid drop in gain above and below these frequencies. A top-capacitively-coupled double-tuned circuit is used. This type coupling is easier to adjust than inductive coupling when slug-tuned coil forms are used as in this converter. This type network will produce a higher loss than a single-tuned circuit unless it is greatly overcoupled, but the r.f. amplifier has increased the signal level to a point where it can override the mixer noise even with a 6-db. coupling network loss.

The mixer, $Q_2$, is operated as a common-emitter amplifier. At the intermediate frequency used here (either 7-11 or 14-18 Mc.) the common-emitter circuit will give a greater power gain, and neutralization is not necessary since

---

**Fig. 2** — Circuit diagram of the converter. Resistances are in ohms. Mixer and oscillator components specified are for an i.f. of 7-11 Mc. For 14-18 Mc. operation, see Fig. 3.

- $C_1, C_2, C_5, C_{10}, C_{14} = 0.001\mu f$, disk ceramic.
- $C_9 = 20\mu f$, silver mica or NPO ceramic.
- $C_{15} = 8.2\mu f$, silver mica or NPO ceramic.
- $C_{17} = 1.8\mu f$, silver mica or NPO ceramic.
- $C_7 = 12\mu f$, silver mica or NPO ceramic.
- $C_{16}, C_{18} = 0.01\mu f$, 150-volt disk ceramic.
- $C_{15} = 3.3\mu f$, silver mica or NPO ceramic.
- $C_{13} = 330\mu f$, silver mica or NPO ceramic.
- $J_1, J_2 = Coax receptacle, any 52-ohm type.
- $L_s = 1\frac{1}{4}$ t. No. 24 enam., wound between turns of $L_s$ at cold end.
- $L_r, L_s = 35-60$ ohms, slug-tuned (Miller 4509 or equivalent).
- $L_{11} = 1$ t. No. 24 enam., wound on $L_{10}$ near cold end.
- $L_{10} = 14$ turns No. 24 enam. close-wound on 1/4-inch slug-tuned form.
- $L_{11} = 1$ t. No. 24 enam., wound between turns of $L_{10}$ at cold end.
- $R_1, R_2 = 470$ ohms, 1/4 watt.
- $R_3, R_4 = 470$ ohms, 1/4 watt.
- $R_5 = 2700$ ohms, 1/4 watt.
- $R_6 = 33,000$ ohms, 1/4 watt.
- $R_7 = 1000$ ohms, 1/4 watt.
- $R_8 = 10,000$ ohms, 1/4 watt.
- $R_{24} = 820$ ohms, 1/4 watt.
- $R_{FC_1}, R_{FC_2} = 8\mu f$. One layer of No. 38 enam.
- $Y_1 = 43$-Mc. third overtone-type crystal.
the input and output frequencies are different. The mixer amplifies the difference between the incoming signal from the r.f. amplifier and the oscillator frequency. The r.f. signal is fed to the base, and the oscillator signal is coupled to the emitter. Introducing the r.f. and oscillator voltages at different points in the mixer circuit helps reduce interaction between the tuned circuits.

The output circuit for the mixer is another double-tuned circuit. This circuit has maximum response between 7-11 or 14-18 Mc. (whichever is used for the first i.f.). The output section of the network is connected in a pi-type configuration. This matches the transistor collector impedance to the 50-ohm impedance of the receiver input.

The oscillator, Q₃, is crystal-controlled and uses a grounded-base tickler circuit. Positive feedback from collector to emitter causes the oscillation. The crystal is in series with the feedback loop and presents a high impedance to the feedback signal at frequencies close to the third overtone frequency of the crystal. At the third overtone frequency the crystal impedance drops to a low value and allows oscillation to occur, provided the collector circuit is tuned to the same frequency. It is important not to use too much feedback in such a circuit, for stray capacitance associated with the crystal and its holder may couple enough feedback to allow oscillation at the collector circuit resonant frequency with no control by the crystal.

The r.f. filters in the power-supply leads prevent interfering signals from entering the converter by way of the power supply. This precaution, plus the double-tuned circuits and the shielding provided by the case, reduce interference from stations operating at the image and intermediate frequencies to a point where it will rarely be noticed. Image and i.f. rejection have been measured at 68 and 78 db., respectively.

**Layout and Construction**

The circuit design of a v.h.f. converter is only half the story. The layout used can make it either a valuable piece of equipment or just another box to collect dust in the corner. This converter was designed around a printed-circuit board. The construction, however, is not purely of the printed-circuit type. The board is used to mount the resistors and capacitors in the portions of the circuit that do not carry r.f. and for the oscillator feedback circuit. The tuned circuits are arranged so that all signal connections are made

---

**Fig. 4—Bottom view of the transistors and sockets showing pin connections.**

**Fig. 5—Full-size pattern and drilling template for the circuit board.** Black indicates the copper surface which should remain after etching. The four corner circles are drilled to pass 6-32 mounting screws. The nine large circles mark the positions of the coils and transistor sockets indicated. The two holes marked Y₁ are for pins, removed from an old socket, which hold the crystal. The small white dots indicate holes for the leads of resistors, capacitors and chokes. These can be identified by their relation to the top-view photograph.
between the coil-form lugs and the transistor sockets. This prevents any problems with flux or moisture on the printed board causing losses at r.f. or i.f. The small size of transistors makes it easy to keep leads short and to keep stray circuit capacitance to a low value. The use of a printed board results in a very neat and clean layout with very little chance of minor variations in construction causing unsatisfactory performance.

The pattern of Fig. 5 should be copied onto a sheet of copper laminate board. Any method desired can be used, and any of the available “printed-circuit” kits will provide the necessary material. The photographic technique is the quickest and most accurate but it is rather costly if you do not own the necessary equipment.  

1 The author will supply etched and drilled circuit boards for $2.00 each to any readers who would rather not attempt making their own.

Fig. 6—Voltage doubler power supply for operating the converter from 115 v. a.c. Capacitors are electrolytic.

Next, wind all the coils as directed. Coils L9 through L11 should be made for the i.f. you intend to use. Data for 7-11 and 14-18-Mc. i.f. outputs are given. The coils with bifilar windings use the bottom terminal on the coil form as a common point for both windings. Secondaries L9, L10 and L11 are wound between the primary turns on the bottom end of the coil forms. If output frequencies other than 7-11 or 14-18 Mc. are to be used, the oscillator and output coils will have to be changed to suit.

Mount the Elco 3301 transistor sockets in the circuit board first. The retaining rings may be pushed on with a 3/8-inch nut driver. The coils are mounted next in the places shown. Note that the coils are mounted with the windings on the same side of the board as the etched copper conductors. Mount the resistors, chokes, and capacitors on the top side of the board so that the leads extend out the copper side. Where connections must be made to a transistor socket, leads from one of the resistors or capacitors may be cut long enough to reach the socket pins. Fig. 4 shows the pin arrangement used on the transistors and on the sockets. The shield pin on each socket should be bent over and soldered to the retaining ring around the socket. The ring should then be soldered to the circuit board. The capacitors that mount on the coil forms (C9, C10, C11, C12 and C13) may now be installed and the remaining connections to the transistor sockets made with short pieces of wire.
Before alignment is attempted, the coils must be checked for resonance. With the power on, check the r.f. coils $L_2$, $L_4$ and $L_5$ for resonance with a grid-dip meter. These coils should all resonate somewhere between 50 and 54 Mc, and the slugs in the coil forms should have sufficient range to vary the resonance between these two

![Diagram of the converter](image)

Alignment and Testing

To align this converter properly for flat response across the entire band, a sweep generator, oscilloscope and an accurate marker generator are necessary. However, fair results may be obtained by peaking the coils in the middle of the most-used range and then adjusting the slugs slightly for a constant noise output when the receiver is tuned across this portion of the band.

![Diagram of alignment setup](image)
The circuit board is mounted on spacers inside a 4 × 2½ × 1¾-inch Minibox. The coils and the capacitors mounted on them are underneath, and the remaining capacitors, resistors and chokes are on top with their leads running through holes in the board. The antenna connector is on the right. The i.f. output fitting is on the far end and hidden in this view. Connections to these fittings are made after the board is in place.

which version is built. The oscillator coil should resonate at either 43 Mc. (with 7-11-Mc, output) or 36 Mc. (with 14-18-Mc, output). This should be checked with the crystal out of the circuit. The crystal should now be put back in place and the oscillator checked for oscillation. This may be done with a grid-dip meter or an r.f. probe and v.t.v.m. If there is no oscillation, adjust the slug in L10 slightly. The oscillator voltage at the emitter pin of transistor Q2, with Q2 out of the circuit, should be at least 0.2 volt as measured with an r.f. probe and v.t.v.m.

![Fig. 9 - Correct response characteristic as observed with the setup of Fig. 8. Set the marker-generator output to give as small a marker pip as can easily be seen (about ½ to ½ inch high). Too much marker injection will distort the curve.](image)

After checking the circuits for proper resonance, the converter should be mounted in the case and connections made to the input and output as shown in Fig. 8. It is important that the input and output are both terminated with 47-ohm resistors; otherwise the response curve on the oscilloscope will not be correct. The slugs in coils L3, L4, L5, L7 and L8 should be adjusted for a response as nearly like that shown in Fig. 9 as possible. The values of the coupling capacitors, C9 and C10, of the double-tuned circuits determine the distance between the two peaks on the response curve. If the distance between peaks is off by more than 1 Mc., the value of the coupling capacitors should be changed slightly to give a proper response. More capacitance will increase the spacing between peaks and less will reduce it.

The oscillator coil should be set by the following procedure: Watch the trace on the oscilloscope and start turning the oscillator slug either in or out. When the trace disappears, stop. Now count the number of turns in the other direction that it takes to make the oscillator stop. Set the slug halfway between these two points. This adjustment should be made with all covers on the converter housing. After adjusting the oscillator, check the settings of the other adjustments to make sure that installing the cover has not changed the response.

With a good antenna you should find that the noise goes up 1 to 3 S units when the antenna is plugged into the converter input. The noise figure is around 8 db., and the over-all gain is about 20 db. with 50-ohm input and output impedances. The converter has excellent overload characteristics and will not block or give spurious responses until the incoming signal from the antenna reaches approximately 0.2 volt.

The performance of this converter should convince even the most die-hard tube men that v.h.f. transistor equipment has arrived and is here to stay.

Strays

Some hams at Michigan Tech have formed a smallbore rifle team and would like to challenge other such rifle teams whose members include hams. Those on the Michigan Tech team include KS1FI, KS1FM, KS1HMI, W9AGU, and KS8KR. If you're interested in a match, contact KS1FI at 504 Lake St., Ironwood, Mich.
Technical Correspondence

DOUBLE-HUMPED FILTER RESPONSE AND INTELLIGIBILITY

250 Carl St.,
Stage College, Pa.

Technical Editor, QST:

An interesting paper has been published by K. Kryter describing experiments in which word and sentence intelligibility tests were conducted using filters having 500-cycle response centered at one, two, and three frequencies (simultaneously) in the audio spectrum.

Since the crystal-lattice filters commonly used in h.f.b. have double-humped response (which has usually been flattened only with some difficulty) I wish to point out that the uncorrected double-humped response not only can pass intelligible audio, but can actually be used to advantage in poor signal-to-noise situations.

The conclusions arrived at by Kryter for the one-band system are summarized as follows:

1) For a 500-c.p.s. bandwidth filter, a center frequency of 1500-1700 c.p.s. appears best for speech intelligibility.
2) A 500-c.p.s. bandwidth is not intelligible enough for most communications systems.

The conclusions for a band-pass system using two 500-c.p.s. filters are:

1) The lower pass band should be centered around 500 to 750 c.p.s. This band contributes to "naturalness" and is essential to all speech systems.
2) The upper pass band gives the best results in either the region from 1500 to 1750 or from 2500 to 2700 c.p.s.
3) The 500-c.p.s. lower center frequency works better with the 1750-c.p.s. upper center frequency. The 750-c.p.s. lower center frequency works equally well with either the 1750- or the 2350-c.p.s. upper center frequency.
4) Two-band intelligibility is not as good as three-band intelligibility.

The conclusions for a three-band system are:

1) The optimum center frequencies for the three 500-c.p.s. pass-band filters are 500, 1500, and 2500 c.p.s., respectively. Observers uniformly agreed that the speech sounded natural and undistorted, maintaining the identity of the speaker.
2) A three-band system need have a total bandwidth only half that of a continuous band-pass system for equal intelligibility.
3) In the presence of noise, equal intelligibility is achieved when the s/n ratio with the three 500-c.p.s. pass-band system is 5 to 10 db lower than that required with the best nominal 1500-c.p.s. simple pass-band filter system.
4) Audio components as much as 30 db. down from the maximum response contribute to the intelligibility for all systems.

In the practical case of the double-humped response of a lattice filter, it appears that the spacings between hums should be 1.2 kc., 1 kc., or 1.75 kc., to give the center frequency separations mentioned above for the two-band system. The center notch should be 30 db. down, but this may not be possible while still maintaining reasonable peak band widths. The outer skirts should also descend rapidly to more than 30 db. down for good noise suppression outside the desired band. In s.n.b. reception the f.i.o. should be set 500 c.p.s. below the lower center frequency in the first case, and 750 c.p.s. below in the second and third cases.

Angelo J. Campanella, KS1QU

ELECTRONIC EYEBALL

2008 S. Fern
Wichita 17, Kan.

Technical Editor, QST:

Since publication of the article on the "electronic eyeball"¹, I have received a number of letters asking for further explanation of these questions generally stem from four errors in the article:

1) The value of the sweep-width potentiometer is 0.5 megohm. This was omitted from the diagram, but picked up later in QST.

² A 0.25-megohm 1/4-watt carbon resistor should be connected from the open end of the r.f. gain control to the 150-ohm regretted line.

³ The 200-mfd. capacitor in the oscillator circuit should be connected as shown in the accompanying figure.

4) The Miller oscillator coil suggested in the text for 2-Mc. operation should be type 44-C, not 44-0.

Just recently, I purchased a new communications receiver (SX-111) which has a first i.f. frequency of 1560 kc. To convert the unit from 455- to 1560-kc. input I removed the surplus BC-433 coils and installed the Miller broadcast band coils as listed in the article. I found that when these coils are used the following changes must be made in the oscillator:

1) The 44-C oscillator coil should be removed from its shield can and coated with several coats of Q-dope to fix the wires to the form. This reduces frequency drift.
2) Switch the blue and green leads, then switch the black and red leads. These oscillator coils are normally wired so that the plate is connected to the tidder winding and the grid is connected to the frequency-determining winding. In the eyeball circuit this is reversed, so the leads must be switched if the oscillator is to operate.
3) The 210-, 670-, and 100-mfd. capacitors in the oscillator/modulator frequency-determining circuit must be changed to NP0 types.

The coil coating, plus the change to NP0 capacitors, cured a very troublesome drift problem when the unit was changed from 455-kc. to 1560-kc. operation. The unit was connected to my SX-111 1560-kc. i.f. stage in the same manner as described in the article.

Louis I. Hutton, W6QRP

PHONE RECEPTION WITH THE HBR-16

Box 391
Nequita, Wash.

Technical Editor, QST:

I have finished building the HBR-16 receiver which appeared in the October 1959 issue of QST. With the aid of the HBR notes and the enlarged photographs, I found constructing this receiver similar to constructing a commercial kit. The HBR-16 project is somewhat more of a challenge than a kit; in my opinion, the constructor gets a liberal education in receiver circuitry.

The performance of this receiver is outstanding. The stability is there, the selectivity is more than I had hoped for, and the gain is such that separate manual i.f. gain and mixer gain controls were added. After using such a feature, I am surprised that the more expensive ham-band receivers have not incorporated these items.

In my opinion, the selectivity of the HBR-16 was a little too great for a.m. phone reception. The missing sidebands gave me an unfamiliar type of audio response which to my ears was very unattractive. After calling this to the attention of Mr. Ted Crosby, the author of the article on the HBR-16, he suggested that if I planned to use it mostly on phone reception I try stagger-tuning the i.f.'s, I stagger-

(Continued on page 192)

December 1960

45
Beginner and Novice

A Simple Antenna System for the Novice

Using Random-Length, End-Fed Wires

BY LEWIS G. McCoy,* WI1CP

An antenna that gets wide use on the lower-frequency bands, particularly with newcomers, is a random length of wire. The customary procedure is to have one end of the wire connected directly to the output terminal of the transmitter and the other end supported by a tree or mast. (Users of such antennas often refer to their antennas as “long” wires, although a long wire, as considered in connection with directive systems, is usually several wavelengths long at the operating frequency.) As with any antenna, there are certain problems one is likely to encounter in getting the system to work. In this article the random-length antenna will be discussed.

How Long An Antenna?

If the correct coupling methods are used between the transmitter and antenna, a wire that is quite short for the frequency can be made to work, although it is generally true that the shorter the antenna for a given frequency, the poorer its over-all performance. It is customary procedure to recommend antenna lengths no shorter than one-quarter wavelength for the frequency in use. However, shorter lengths will work and produce contacts.

For example, on 75 meters a quarter wavelength is about 60 feet long. Amateurs who operate 80-meter mobile usually have an 8-foot long whip for the antenna. A few years ago, W1BDI, the ARRL Communications Manager, operated 80-meter c.w. from his car on a trip around the country. Using 25 watts input and a short whip antenna, he managed to maintain a daily schedule with Headquarters from distances well over 2000 miles away. This example is mentioned to show the amateur with restricted antenna space that 80- and 40-meter operation is possible using very short antennas.

Nevertheless, assuming that multiband operation is planned with 80 meters as the lowest band, try to make your antenna at least 65 feet long. There are two general rules you can follow with this type of antenna -- make it as long as possible and get it as high above ground as you possibly can. If you don’t have a straight run of at least 65 feet, it is possible to bend the antenna to make up the difference. In other words, part of the antenna can be run at right angles in order to increase the over-all length. If you find it impossible to get a 65-foot run then make the antenna just as long as you can. The shorter antennas, while not having as good performance, will produce plenty of contacts.

Shown in Fig. 1 are a couple of examples of typical installations. For example, if your shack is in the cellar or first floor, you can run the wire out the window, up to the eaves, and then out to the mast or support. If your mast supporting the far end of the antenna is high enough, you can bring a portion of the antenna back down toward ground to increase the overall length.

There is no way to predict in advance what the pattern of your antenna will be. The simplest approach is to put it up and try it. You’ll soon discover which directions are best by the reports you receive. By all means, don’t be afraid to experiment with different antenna layouts. You might be pleasantly surprised by the results.

What Materials To Use

Practically any kind of antenna wire can be used, either copper or aluminum, bare or insulated. However, No. 12 or 14 copper, copper-weld, or “copper-clad” is preferable. The antenna wire should, of course, be insulated wherever it goes through a wall or window and where it is supported. Flexible plastic tubing, available at any parts distributor, can be slipped over the wire at windows or through walls. Ordinary dime-

The knob on the front of the chassis is the control for C1. The clip lead, which is 9 inches long, is connected to the input end of the coil. An E. F. Johnson type LC8 is used for the clip. Feed-through insulators are used to hold the coil in place. A clip on the antenna lead can be used for connecting the antenna to the output end of the coil.

QST for
store glass insulators can be used as end or support insulators.

Some amateurs who have landlord problems use a very fine wire, No. 30 or smaller, because the wire is practically invisible when it is up in the air. With fine wire, rubber bands can be used for supports and insulators. If you happen to be in such a situation it is worth while to consider such an installation. (You’ll probably have to make the installation after dark, so don’t lose the wire putting it up!)

**Fig. 1—These drawings demonstrate a couple of different methods for installing the antenna. As mentioned in the text, try to get the antenna as high as possible above ground.**

**Coupling the Antenna to the Transmitter**

In many instances the end of the antenna can be connected directly to the antenna terminal on the transmitter. Most transmitters these days have a pi-network tank circuit which is capable of coupling over a wide range of values. There is no simple method of determining what the end of the antenna “looks like” to the transmitter. Depending on the band and frequency, the impedance at the end of the antenna will range from a few ohms to several thousand. For this reason a wide-range coupling circuit is needed at the transmitter, otherwise the transmitter will not load. Your instruction book for the transmitter should tell you what values the pi network will work into. While not in the Novice class, it should be pointed out that there are a few commercial rigs that will only work into a 50-ohm load. Only in rare instances will this type of antenna work out to be 50-ohm impedance. For this reason a coupling or matching circuit should be installed between the rig and antenna.

**The Coupler**

Shown in Fig. 2 is the circuit of a simple antenna coupler. The circuit consists of a coil, \( L_1 \), and a variable capacitor, \( C_1 \). In order to have the right amount of inductance for any band the coil is provided with a shorting clip which is used to short out turns on the coil. The unit shown in the photograph was mounted on a 3 × 5 × 10-inch chassis. There is nothing critical about the construction; in fact, the whole unit can be mounted “bread-board” style if desired.

The coupler should be connected to the transmitter via a length of coax line: either 50- or 70-ohm line will be suitable. The length of coax used will, of course, depend on where you mount the coupler. Some hams prefer to have their couplers mounted near where the antenna enters the shack and others want it near the transmitter. The latter position makes for easier adjustments.

If you have an s.w.r. bridge such as the Monomatch \(^1\) or a similar type, it should be installed in the coax line. The use of an s.w.r. bridge is recommended because it will show you when the coupler is correctly adjusted and also serve as an output indicator. If you don’t have a bridge, then you can use an output indicator such as a flashligh lamp in the antenna lead or a neon bulb touched to the end of the antenna.

**Note** in Fig. 2 that the coupler is connected to an external ground. (This is in addition to the ground connection that always should be made to the transmitter itself. See the Stray on page 69 of this issue.) This can be a water pipe or a connection to a ground rod driven in the earth. The setup will work without the ground connection, but you’ll probably get better results if you use one. The thing to do is to try the coupler both ways.

**Adjustment Procedure**

Connect the end of the antenna to the coupler at the junction of \( C_1 \) / \( L_1 \) as shown in the circuit diagram. If you are using enamel-covered antenna wire be sure to scrape off the enamel! Let’s suppose you are starting off on 80 meters. Turn on the rig and resonate the final amplifier for a dip in the plate-meter reading. If you are using an s.w.r. bridge, switch the bridge meter to read reflected power and then adjust \( C_1 \), looking for a dip in the bridge meter. Unless you are very lucky you probably won’t get an indication because the coil tap won’t be at the correct spot. Start at one end of the coil and short out one turn at a time. Continue adjusting \( C_1 \) until you reach a point where the bridge meter starts to dip or “null.” Retune the amplifier tank circuit to resonance each time you adjust \( C_1 \) or the tap.

Once you get close to the correct tap point you’ll probably have to move the tap a fraction

---

\(^1\) See the measurements chapter of the ARRL Handbook.
of a turn at a time in order to get a complete null on the bridge meter. When you find the correct tap point, switch the bridge meter to read forward power. Next, adjust the transmitter loading control to bring your plate current up to whatever full loading is supposed to be. Don’t change the settings of the tap or C1 because once you have the coupler adjusted for a null as indicated by the bridge meter, the coupler is correctly adjusted for the frequency you are using. You can use the forward power reading of the bridge meter to help you adjust the transmitter tank capacitor and the loading control. Tune the transmitter controls for maximum power output as indicated by the bridge meter while keeping the plate current reading to whatever limits are required for the transmitter in use.

If you are using an output indicator instead of a bridge, keep adjusting C1 and the tap until you get an indication of power output. Be sure to resonate the plate circuit of the transmitter for a plate meter dip as you make each adjustment of C1 and the tap. The idea here is to get the maximum power output for a given plate current reading. When you have such a condition the coupler will be adjusted correctly.

Make a note of the settings of C1 and the tap position and then proceed to the next band. Keeping a record of the settings will make it much easier when you want to switch bands. The same adjustment methods outlined above should be used on the other bands.

---

For the Command Receiver:

Noise Limiter, A.V.C., and S Meter

BY LEWIS G. McCoy, W1IECP

RECENTLY in QST it was shown how an economic two- and six-meter receiving setup could be made, using a BC-455 as a tunable i.f. While the BC-455 makes a good receiver for the purpose, a few simple additions will make it even better. These additions include a noise limiter, an S meter, an audio gain control, and improved a.v.c. This article will show how to make the improvements.

Improving the A.V.C.

A better a.v.c. system can be incorporated into the BC-455 by the simple addition of two resistors and a capacitor. Shown in Fig. 1 are the original and modified circuits. This diagram also shows the noise limiter circuit which will be treated a little later. In Fig. 1 the original wiring is shown by light lines. All the components and wiring shown with the heavier lines are the additions. If you happen to have access to a complete diagram of the BC-455 you’ll find that the circuit component designations in the upper drawing are the same as those in the original circuit.

The first step is, of course, removing the bottom plate of the receiver. Locate the socket for the detector tube. Some models of the receiver used a 12SR7 while others had a 12SQ7 for the detector. However, this is unimportant because the base connections for both tubes are identical. On

---

The modifications described here add to the basic ARC-5 set features most amateurs want in receivers nowadays. Although worked up primarily for the BC-455 in the v.h.f. converter combination described in November QST, they can be applied to any of the several similar models in the ARC-5 series.

---

*Technical Assistant, QST.
* QST, Nov. 1959, p. 39.

At the far left of the converter chassis is the small panel that holds the S-meter and Ss. The 6C4 is visible just to the rear of the r.f. output connector. On the BC-455 panel the audio gain control is just below the main tuning knob. The noise-limiter switch and the shielded lead from the S-meter circuit can be seen on the side of the BC-455.
other switch terminal should be connected to Pin 3 of the connector. Connect an insulated wire between the base of Pin 3 and the junction of C16A and the 470,000-ohm resistor, R6. You’ll have to remove the plug-in coil assembly that is immediately to the rear of the connector in order to get to the base of Pin 3. The coils can be taken out by first removing the two screws, one on either side of the BC-455, that hold the coils in place. Once the screws are removed, the coils can be lifted out.

While you have the coils out, install the audio gain control, R2, in Fig. 1. In order to have enough room for mounting the gain control, remove the 3-μF potted capacitor that is mounted on the front panel of the receiver. The capacitor is held in place by two screws. Unsolder and remove the lead that goes from the capacitor to the base of Pin 1 on the connector. Next, mount R6 in the space formerly occupied by the capacitor. Connect a lead from one side of R6 to chassis. The remaining two leads to R6 can be installed when the noise limiter is wired into the set. Replace the plug-in coil assembly, making sure that none of the wiring to the base terminals of the connector is shorted to the coil box.

checking the socket connections you’ll find that Pin 5 is connected to the chassis. Remove this lead from Pin 5. Next, connect a 100-μF mica capacitor, C1, between Pins 4 and 5. Connect a 470,000-ohm resistor between Pin 5 and chassis. Another 470,000-ohm resistor should be connected between Pin 4 and C16A. C16 is a potted capacitor consisting of three sections, 0.05 μF each, and is located directly below the 12A6 audio tube. The terminal you want is the one closest to the front of the BC-455; leave the old (blue) lead connected when you solder on the new lead. Next, find R11, a 100,000-ohm, 1/2-watt resistor (brown-black-yellow) mounted on a block of four resistors located on the same side of the chassis as C16, close to the 12SK7 socket. Remove R11 from the circuit by heating the mounting points and gently pulling up on the leads.

When operating c.w., the a.v.c. should be turned off. This is made possible by changing the b.f.o. switch (S3 in Fig. 4 of the November article) from an s.p.s.t. to an s.p.d.t. toggle. This modification is shown here in Fig. 2. The arm of the switch should be connected to chassis ground and one switch terminal to Pin 5 of the connector in the front compartment of the BC-455.

The Noise Limiter

The simplest method of installing the noise limiter is to mount all of the components, with the exception of R6 and S1, on a small insulating board. The assembly is shown in a photograph. A piece of bakelite or plastic dishware available in any dime store can be used for the board. The board shown in the photograph was cut from a plastic saucer.

When soldering connections to the 1N34A germanium diode, CR1, hold the lead with a pair of pliers between the point being soldered and the body of the diode. Too much heat can ruin the diode and the pliers will prevent excessive heat from reaching the body of the diode.

An s.p.s.t. switch, S1, is used to switch the noise limiter in or out as needed. There isn’t enough room to mount the switch on the front panel of the BC-455, so the next best spot is on the side of the unit. The switch is installed between C14 and the next potted capacitor toward the front of the BC-455. This latter unit has the BC-455 designation C30, and is a 15-μF audio
bypass capacitor. It is necessary to remove the bottom screw holding $C_{38}$ and swing the capacitor more toward the front of the receiver in order to get enough room for $S_{1}$. At the same time you mount the switch make a 3/8-inch hole in the chassis wall beside the switch. This hole will be used for the lead from the S-meter circuit.

Next, locate $R_{18}$, $R_{19}$, and $C_{53}$ (BC-155 circuit numbers). The two resistors are on a block just to the left of and below the 12SR7 socket as you view the bottom of the set with the panel to the left. The first resistor is $R_{18}$, 510,000 ohms (green-brown-yellow), and the second is $R_{19}$, 100,000 ohms (brown-black-yellow). Remove $R_{18}$ from the receiver. One side of $R_{19}$ was grounded and the other side was connected to $R_{19}$ and also, through a short lead, to $C_{53}$. Lift this short lead at the end where it was attached to $R_{18}$. Next, connect an insulated wire from $R_{19}$ to the arm of the audio gain control. $R_{5}$. Dress this lead across the chassis and then down the side to the front, running it under the potted capacitors along the side. You can now install the board holding the noise limiter components in place.

The lead from the junction of $R_{3}$ and $R_{4}$, Fig. 1, should be connected to the end of the short lead you lifted from $R_{18}$. The lead from $C_{3}$ to chassis ground can be connected to the ground terminal that formerly held $R_{18}$. An insulated lead from the junction of $R_{3}$ and $C_{3}$ should be dressed along the side of the chassis up the remaining terminal on the audio gain control. The remaining two leads from the limiter board should be connected to the two terminals on $S_{1}$.

**S-Meter Addition**

Fig. 3 is the circuit diagram for the S meter. A 6C4 triode is used because its heater current is only 150 ma., and the power transformer used in the original converter unit will handle this additional heater current.

As can be seen in the photograph, the components for the S meter are installed at the left-hand corner of the converter chassis. The meter, $M_{1}$, and s.p.s.t. toggle switch, $S_{3}$, are mounted on a small panel made from a piece of aluminum. There is nothing critical about the installation of the various parts for the circuit.

The 130-volt lead to the junction of the two 470-ohm resistors was taken from the arm of $S_{5A}$ of the November circuit. The control voltage for the S-meter circuit is fed from the BC-155 through the octal socket, $J_{4}$, of the November circuit, and the lead from the 6N4 grid to $J_{4}$ should be run in shielded wire to avoid chances of stray pickup. Connect this lead to any unused terminal on $J_{4}$. Another shielded lead should be connected to the corresponding terminal on $P_{1}$, the lead from $P_{1}$ being dressed around the side of the BC-155 and into the hole next to the noise-limiter switch.

The end of this lead should be connected to the junction of $C_{15A}$ and $R_{3}$, the 47-megohm resistor. Toward the rear of the BC-155 are two 10-watt resistors mounted in a vertical position. At the bottom (closest to the chassis) of the one on the same side of the receiver as $C_{15}$ is a terminal with a black lead connected to it. Remove this lead from the terminal. This increases the screen voltage on the r.f. and i.f. tubes in the BC-155, resulting in more satisfactory S-meter indications.

In order to adjust the S meter, turn on the

(Continued on page 190)
COAX-TO-TERMINAL-STRIP ADAPTER

The accompanying sketch shows how I added a coaxial connector to the antenna terminal of my RME 4350 receiver. This method eliminates the need for drilling a hole in the receiver’s chassis to mount the connector. Remove the head from a 6-32 screw and solder the screw to the center conductor of the coax connector. The connector is then screwed into the terminal strip with a section of small tubing inserted as shown in the sketch. Another 6-32 screw is inserted through one of the holes in the connector flange and is screwed into the other antenna terminal. Also connected to this screw is a lead that is attached to the ground terminal on the terminal strip. Almost any terminal strip can be used with this scheme since spacing between the lugs seems to be a standard 1/32-inch, which is just the right measurement to line up with the holes in the SO-239 connector.

— Dr. L. M. Salinger, K5MSQ

BOTTLEING UP CHEMICAL FUMES

Corrosive vapors from chemicals commonly used around the ham workshop can be contained more effectively by storing the liquids in flexible plastic bottles. Fill the bottle about one half to three quarters full, then squeeze the bottle until the liquid almost reaches the top of the bottle. Now screw on the lid. This action creates a region of reduced pressure inside the bottle. If there is a slight leak around the lid, the chemical fumes will be contained inside the bottle since the air outside the container will be sucked into the bottle. The squeezing action will probably have to be repeated periodically, depending upon the size of any leak.

— Robert L. Martin, K1CJX

RESURRECT BROKEN TRANSISTORS

If you have a transistor that is not usable because of a broken lead, take a small needle and force it into the opening around the broken lead and apply some cement to strengthen the connection. If the transistor is going to be soldered into a circuit, it probably would be wise to solder a lead to the needle before it is inserted into the transistor.

— Earl F. Hardwick

PORTABLE MAST HOLDER

The accompanying photograph shows the arrangement used by K1CCL for supporting an antenna mast on portable location. A pipe flange is attached to the piece of plywood. A short length of pipe which will mate with the threads of the flange is also necessary. To use the mast holder, place the board on the ground and drive the car up on it so that one of the wheels is on top of the board. Screw the pipe into the flange and insert the mast in the pipe. The entire assembly can be carried in the trunk if the mast is made up of attachable sections. This scheme will work with most v.h.f. antennas and probably would also take care of a lightweight low-frequency beam.

EARPHONE COVER PADS

Old-fashioned uncomfortable headphones can be modernized by outfitting them with a set of vinyl plastic doorknob covers available from most hardware or five-and-dime stores. Cut a small hole in the center of each cover and slip the covers over the phones. The earphones can then be worn much longer without discomfort.

— Les Collum, KOHRH

12-VOLT SYSTEM FOR VOLKSWAGEN

While planning a mobile installation for my new Volkswagen, I learned that an accessory electrical system is available from all franchised VW dealers. The system consists of a 12- (or 6) volt generator, the necessary mounting brackets and hardware, 6- or 12-volt large capacity battery, and voltage regulator. This accessory system is entirely separate from the original electrical system.
system. Although primarily intended for use with the VW bus or truck, the system will fit the sedan without modification.
—Dave Farrer, W3VBP

BROKEN TAP REMOVER

While tapping a hole in some aluminum stock, I broke off the tap inside the hole. I tried to grip the broken piece with pliers to no avail. Every method I could think of to remove it would destroy the original hole or the threads. A chemist friend of mine suggested that I immerse the part in 50 per cent solution of nitric acid. I tried this and in a few hours the steel tap was completely dissolved and the aluminum was none the worse for wear. If the aluminum piece is too large for immersion, an eyedropper can be used to apply the acid.
—John S. Sisson, jr., WA2GWF

MAGIC-EYE TUBE HINT

Part of the heater voltage in the popular Command Set transmitters is used as bias on the 1029 magic-eye tube. This is fine when the transmitter is used with a d.c. heater supply, but most amateurs use a.c. on the heaters, which gives the tube picture a fuzzy appearance. To use the 1029 with an a.c. heater supply, disconnect its cathode and ground it through a bias resistor. The value is not critical; something like 4700 ohms, 1/2 watt, should do.

TRANSISTOR GAIN CHECKER

It is possible to measure the small signal current gain (beta) of a junction transistor by means of the simple circuit shown in Fig. 1.

An audio signal source of one volt r.m.s. at 1000 cycles is required. This can be supplied by an audio signal generator. The tone from the generator is fed into the input jack of the checker. Also, an a.c. voltmeter will be needed, preferably a.v.t.v.m.

First apply the voltmeter to the input and adjust the signal source for one volt. Connect the voltmeter to the output and adjust R₁ until a maximum reading is obtained on the output voltmeter. The output current is $\frac{E}{1000}$ and the gain is found by dividing the output current by 10μa. The diagram shown is for checking p-n-p transistors. In order to measure n-p-n units, reverse the battery polarity.
—Sol Davis, W3WPN

Plate caps used to protect exposed meter terminals.

USE OF BUG KEY AS SIDESWIPER

The ordinary bug key can be used as a sideswiper merely by Scotch taping the vibrator arm to the damper and readjusting the bug. The “feel” and action of the original bug are not lost by doing this.
—Katashi Nose, KH01J

**Meter Safety**

While building a transmitter recently, a problem arose concerning the method to be used in protecting exposed meter terminals. The solution finally evolved from the use of a pair of ceramic plate caps is shown in the accompanying photograph. Most meters of the 2¾-inch variety or larger come with a pair of washers on the terminals. When the terminal nuts are tightened down on the washers, Millen No. 30002 or National SPP-3, ¾-inch plate caps should slide over the washers, forming a tight connection. If these fit too loosely, perhaps a modification of Millen 30004 will serve better.

Of course, before the caps are placed on, the leads for the meter should be soldered to the cap connections.
—A. Gordon Davis, KN1LYO

---

**Fig. 1**—Transistor beta checker. C₁ and C₂ should preferably be nonpolarized capacitors. However, the polarized type can be used if proper polarity is observed. Resistor R₁ should have a value that will limit the base current to a safe value in case R₂ is set at minimum resistance.

---

**QST for**
PEPPING UP THE SPARC TRANSCEIVER

The greatest limiting factor in the SPARC transceiver written up in July, 1959, QST, was the operation of the receiver section. The modifications shown in Fig. 2 will improve the performance of this section and can be made without any major overhaul in the original unit.

The circuit utilizes a separate interruption frequency oscillator for the superregeneration detector. The heart of the circuit is the coil, $L_1$, which is obtainable from most radio supply houses. The voltage from the oscillator is coupled into the plate circuit of the detector through the transceiver transformer, $T_1$, and the choke, $R_1/C_2$.

Changing over to the new circuit is quite simple. The original 1T4 detector tube is replaced with a 3A5 dual triode with proper socket connection changes. Note that it is not necessary to change the position of $L_6$, $C_1$ or $C_2$. The 0.22-μf. decoupling capacitor shown in the original photo (page 28, July, 1959, QST) is not used in this new circuit. The new coil, $L_1$, can be mounted on a small angle bracket and then attached to one of the coil mounting studs which fit neatly under the chassis. Many original builders had difficulties because $C_1$ was not mounted in the prescribed manner. It is strongly advised that $C_1$ be mounted according to original instructions.

To identify the proper leads of the coil $L_1$, consider the lug with the red paint marker as lug 1, with lugs 2, 3, and 4 following clockwise (viewed from the bottom). A 3-lug terminal strip is mounted just below the 0.25-μf. capacitor and accommodates the two leads from $T_1$ and its associated parts. The 0.056 RF capacitor and the 0.002-μf. disk ceramic below the $R_2C_2$. The 2000-ohm resistor and 0.01-μf. capacitor combination to pin 3 of the 3A5 can be seen to the left of $C_5$, the 3-30-μf. ceramic trimmer. Note the 100-μf. mica capacitor over the 3A5 tube socket and the 10-μf. tubular ceramic capacitor, $C_5$, just to the right of the tube socket. Although not visible in the photograph, $L_6$ is still mounted well away from $C_1$ and $C_2$ in such a manner that it extends partly below the chassis as shown in the original article. High voltage to the 75,000-ohm potentialometer is taken from a terminal strip near the 1T4 amplifier tube. — L. F. Worthington, K4HDX

NOISE LIMITER FOR HYBRID RECEIVERS

Practically all of the automobile b.c. sets today are of the hybrid variety which require a plate voltage of only 12 volts. The dark lines in Fig. 3 show the circuit of a self-adjusting series limiter that can be used in hybrid circuits. It is important that the diode $CR_1$ be silicon and of the high-back resistance type. Some silicon diodes give only fair results and germanium diodes will not work at all. The 1N658 computer diode works well in this application and its performance can be compared to that of a vacuum tube. The limiter can be switched out of the circuit by shorting the diode $CR_1$, but the leads to the switch should be as short as possible and must be shielded. — Samuel M. Bases, K2IUV

---

Fig. 2—Before (A) and after (B) receiver circuit of the SPARC transceiver. All capacitances are in μf unless specified otherwise. Inductance L is a National OSR oscillator coil.

Fig. 3—A semiconductor diode noise limiter for hybrid receivers. Diode $CR_1$ is a 1N658 computer diode.

December 1960 53
1960 Field Day Report

Umpteen million mosquitoes, as many pesky ants, a multitude of moths, a billion black flies (the kind that bite), and 13,488 hams all assembled on Saturday, June 25, for Field Day 1960. The scene varied from a hilltop panorama in New England where beams were going up under threat of tornadoes to the fields and pampas of the South and Southwesi, where masts were being raised in the greatest downpour seen thereabouts in years. That Saturday scene contrasted from a picturesque bluff overlooking the Mississippi, to a majestic corn-field of the Midwest, to a lofty crag in the Rockies, to the fertile valleys of the usually wet Pacific Northwest, where guys were anchored under blue and sunny skies. From Lost Lake, British Columbia, to Dog Island, Florida, one could hear: "Pitch that tent... Fasten that guy. Not him, the wire... Hoist up that beam... Don't burn my hamburger... Who checked the generator last?... Which way's the beam pointing?... Hey, we worked him before." Like the 1775 shot heard round the world, 1960 Field Day shouts echoed: "449, eh? well, we'll fix you... turn on the high power, boys... grrr!" "What's that wire I just tripped over, outsider?" And such famous last words as: "You're sure that guy's going to hold that mast?" "Weather man said we're in for a nice sunny day." "Now listen: at the flip of this switch I can read the s.w.r. on this antenna. Hmmmm." Click.

Prescott: THESE RAKES SURE MAKE GOOD GROUND RODS

54
This just about tells the entire 1960 Field Day story. Photo (1) finds the Old Natchez ARC, WSKHB/5, putting the finishing touches on their beam installation. (2) Probably the most popular guy on Field Day is the chief chef, W60CD here whoops up grub for the Ampex ARC, K6QEZ/6. (3) Of course no Field Day is complete without the generator like that of W1LNI/1. (4) We came here to operate and that’s just what we’re doing says the Coshocton County ARC. (5) W9SXL amends that for the Central Illinois RC, W9AML/9. (6) Pausing between contacts for a munch on a hamburger is this teen-age operator for the Cumberland Valley ARC, K3GF/3. (7) The South Jersey Radio Assn., K2AA/2 found these new quarters this year. (8) “Hoist away,”—Vermillion County AR Assn., W9NML/9. (9) This nice operating tent belongs to the Lake Success RC, W2YKQ/2. (10) And SCV-SCM K6DYX gets in his kicks for the Monterey Bay RC, W6UCS/6. (11) Meanwhile the Muskegon Area AR Council, W8ZHH/8 prefers this style of nighttime operating, Yawn

Just about all set for FD action is this cubical quad being set together by the Caribbean Air Command MARS RC, KZ5AF/KZ5. Handling its construction are from left to right KZ5s R8, B5, RR, LL, and W3VOC.

Band conditions in almost all areas were at least good everywhere and simply sizzling in many places. V.h.f. disappointed a little in the East where DX was hard to come by. Many a FD installation was counting on a better score from their v.h.f. set-ups. Forty meters, as thick as molasses, called for a really efficient antenna system to buck the knee-deep QRM on that band. Eighty and 75 meters was reliable even through the night in most areas, being spared of west-hour black-outs of the past few years. Sideband rigs are becoming a must on 20 meters to score big on voice on that band. Twenty c.w. was a little sporadic but generally reliable. Ten and 15 meters varied as much as being nil in some areas to being “our best band” in other sections of the country.

While sinking our crunchers into a juicy steak, we often forget that the main feature of Field Day is making contacts... making contacts, that is, with emergency power. Those groups that proved that they could handle communications efficiently and effectively without commercial power are the real winners on Field Day whether they made one contact or a thousand. In a natural disaster you might be called upon to operate in like manner as Field Day. Hurrah to those clubs, individuals, and groups that have their stations and generator on immediate recall duty to the field.

Contact, multipliers, scores, competition... spur us on to greater performance heights. In the score department the Valley Amateur Radio Club, W71HZ/7 choused with joy: “Well at last we attained the score we should have had either of the last two years. 1958 buried us with Mr. Borealis, and 1959 took pot-shots at us with atmospherics. But ah! 1960... beautiful conditions, blue sky, and all rigs ready to go. This had to be it, and those of us who had been pointing for this day for thirteen years, knew it had arrived.” Well, that day had arrived, as W71HZ/7 posted the highest Field Day score ever with 3390 contacts and 30,735 points, with 79 people contributing their efforts in keeping 10 rigs scoring constantly. Twenty-four other hard-working clubs soared past the five-figure mark, indicative of 1900’s fine band conditions.

From the competition angle, the idea is to be those running a like number of transmitters. These Class A clubs or groups producing the highest scores in their respective class deserve a round of applause:

<table>
<thead>
<tr>
<th>Class</th>
<th>Call</th>
<th>Club Name</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>W3EIS/3</td>
<td>Potomac Valley RC</td>
<td>7586</td>
</tr>
<tr>
<td>2A</td>
<td>W3FRY/3</td>
<td>Frankfort RC</td>
<td>11,322</td>
</tr>
<tr>
<td>3A</td>
<td>W9AA/9</td>
<td>Hamfester RC</td>
<td>14,919</td>
</tr>
<tr>
<td>4A</td>
<td>W8JBT/6</td>
<td>Citrus Belt ARC</td>
<td>13,140</td>
</tr>
<tr>
<td>5A</td>
<td>K8AIR/8</td>
<td>Amateur MARS</td>
<td>15,336</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comm. Club</td>
<td>15,336</td>
</tr>
<tr>
<td>6A</td>
<td>K2AA/2</td>
<td>South Jersey R Assn.</td>
<td>16,839</td>
</tr>
<tr>
<td>7A</td>
<td>W8SW/9</td>
<td>Chicago Suburban R Assn.</td>
<td>12,231</td>
</tr>
<tr>
<td>8A</td>
<td>K6DTA/6</td>
<td>West Valley RC</td>
<td>9072</td>
</tr>
<tr>
<td>9A</td>
<td>W1GIA/1</td>
<td>Framingham RC</td>
<td>7623</td>
</tr>
<tr>
<td>10A</td>
<td>W7HZ/7</td>
<td>Valley ARC</td>
<td>30,735</td>
</tr>
<tr>
<td>11A</td>
<td>W9GR/6</td>
<td>(nonclub) group</td>
<td>23,535</td>
</tr>
<tr>
<td>12A</td>
<td>W2L/2</td>
<td>Tri-County R Assn.</td>
<td>23,022</td>
</tr>
</tbody>
</table>

Looking at it from the geographical point of view, rather groups came out on top:

- W71EA/1... 10,551 KQ0AH/9... 8838
- W71LI/2... 23,022 KP1ATO/KP4... 4134
- W3RCN/3... 15,996 KZ5AF/KZ5... 5202
- W8SKH/4... 8887 VE1FP/4... 2457
- W5SC/5... 11,349 VE0ADX/2... 4008
- W6RT/6... 23,535 VE3NAR/3... 9561
- W7HZ/7... 30,735 VE6QC/5... 3075
- K7LTZ/KL7... 3060 VE6Q/6... 7003
- K8AIR/8... 15,336 VETARY/7... 6126
- W9AA/9... 14,319 W4HSF/V01... 1368

December 1960
Those beaming faces reflect that the Valley ARC, W7HZ/7, had set a Field Day scoring record of 30,735 points with 10 rigs. A total of 3390 contacts were recorded during the 24-hour period. Left to right are: K7BO, W7SGC, CMQ, FUA, SLB, DNU, JJK, HKQ, MHP, a YL, W7RT, O1V, GHV, K7DOB, W7UMJ, a visitor, W7OUI, Y1I, and K7LRK.

The Class B, unit/individual set-ups of only one or two hams teamed up with either one or two transmitters, fire up their rigs on emergency power, including batteries. This is just the kind of stuff needed should a single ham become the only source of communication in a marooned community. Leading this field was W9WNV/9 who teamed up with W9FWU running one rig to score 15,714. Three complete sets of batteries produced the maximum 13.5 multiplier to score big for the Chicago duet.

The Sixes dominated the mobile section, except for W8PV/C/8, who led the Westpark Radios in piling up the top mobile aggregate score of 51,755 points. This year, however, the Radio Amateur Mobile Society of California issued a serious challenge, proving for the first time that the Ohio-men can possibly "be taken."

Everyone should be proud of his effort in Field Day. Ham radio received some excellent spreads in newspapers throughout the country. More ham radio proved its worth in the public's eye. Congratulations on a job well done. Now let's see what the many groups had to say for themselves by these quotes.

"Fair conditions and fine ops added up to make a most interesting, fruitful, and enjoyable Field Day, S.A.B. says, makes a big difference and is certainly here to stay." — Nittany Mountain Moonsrhine & Rhombo Soc., W3WJD/3.


"The club this year found a fine spot in northeast Philadelphia on the grounds of a state mental hospital. Several XYLs thought it was a fitting place for FD week end." — Beacon Radio Amateur, W3ATR/3.

"Tied n.s., for first time — why didn't we use it before? Everyone here had a great time." — Jewish Community Center ARC, K5PBQ/8.

"And the rains came to the North Texas section where K5QBA/S spent the 1990 Field Day week end immersed on the shore of Caddo Lake. The rains fell throughout the FD period but proved to be less of an inconvenience than anticipated as the tent proved watertight." — K5QBA/5.

"It was perhaps the worst week end rain we have encountered since we all got together many years ago. Taking all into account, however, it wasn't a bad weekend." — VE8C/8.

"Amazed at number of stations active this year." — Upper Arlington High School HC, K3HDF/8.

"We worked many stations over 100 miles on two meters with only a whip on the Communicator III." — ARC of Falls Church, Virginia, W1PA/4.

"It is interesting to note that n.s. outscored c.w. here for the first time." — Pittsburg County ARC, W3UAO/5.

"As we were in a park area, local residents visited us in large numbers." — Intercity HC, W3SMF/8.

"Many a pleasant night before FD while away arguing the hours of mounting and the ways of such poor voltage regulation — after all we were only trying to run two HQ170s and two power supplies for 30-watt rigs and a few lights off the blessed 300 watt alternator." — Three Half Baked Virginia Hams, KA1KF/4.

"Thought the 20 meter rig was haywire until we discovered coax relay installed backwards." — Lower Columbia AR Assn., W7NCW/7.

"We placed some aluminum irrigation pipe underneath our dipoles to afford a better ground. The whole thing was on the bank of the Columbia River." — Twin City RC, W7LA/7.

"This was one of the best FD exercises in which our club has been. The conditions were tremendous and the weather at our location was the best yet. What more could you ask for?" — Albert Lea Spider Web AR Assn., Freeborn Division, K6GCT/8.

"We operated on a high 400 foot bluff overlooking Lake Michigan." — Mason County RC, K5DNF/8.

"Operated from an altitude of 9000 feet. froze during the night and got sun burned during the day. The same group expected to operate from 12,000 feet next year." — K6ITU/8.

"When the receiver info. came up in the wee small hours, W2CTA found that by leaving the transmitter v.i.o. running, it was possible to work c.w. stations on our own frequency. Where else would you work them?" — W2PSD/8.

The Watchung Valley RC, W2WW/2, and many other FD sites were fortunate enough to have beautiful puffy-white skies like this hover overhead.
"Speed it up! You're only working one every three minutes," jeer these two lookers, W8FDI and KBNR, as W8FDI log keeper and W8GBQ opera plug away for the Bendix RC, W8OFW/8.

December 1960
Whoever termed radio as "wireless" never went on Field Day. Feet and heads peering from behind this mob belong to the Linfield ARC, W7SGD/7.

conditions. No mosquitooid almost right at starting time.—Du Page, W6DUP/6. . . . "Worked more stations on six meters after the five element fell and broke two elements than when it had all five."—KSMUG/6. . . . "Rig very reliable; broke down every six hours without fail."—Washington AR, W5CH/6. . . . Who repealed Murphy's Law? Mastsand antennas, low voltage, thunderstorms, shortage of cold beer, and the usual gremlins didn't show this year. Used s.s.b. on 14 Mc, for the first time and expect to try it on 7 Mc next year too."—RC of Tomah, W7DR/7. . . . "One novel feature of our operation was the use of one special setup to fill in time on any band when normal equipment failed. It saved many contacts for us."—Rock Creek AR Assn., W5RSC/6. . . . "Suggest clarification of method of scoring contacts with DX stations. Present rules say we can work ANY amateur station in contest."—Rochester ARC, W6TI/4 (Yep, that's right. . . . ANY amateur station., Ed.) . . . "You're heard of the straw that broke the camel's back; well, we plowed a 20-up coffee-maker into our old generator and it almost broke our generator's back. We had a great time."—Biggs ARB MARS, KI9FI/6. . . . "Much better site than last year, and more operator experience helped us beat last year's score by 65%."—Thurston Schools RC, K7PJK/6. . . . "Great improvement over last year's 600 points."—Planner ARC, K4VMF/6. . . . "Cows gathered around our 50-foot mast Saturday night and almost succeeded in butting it down."—R Transmitting Communications Org., K5QQA/6. . . . "We found that by using our XL ops on 20 s.s.b., we made more g3os than we would have, had we used our OM's. We often had four or five stations answering at a time."—University AR Soc., W6TTE/0. . . . "The moths ate the clothes off our backs. About 0100 they were done."—York Community Hi RC, K6KTO/8. . . . "Our score will destroy any morale victory won last year by our club's phone group."—Ontario Falls ARC (GUP Group), W8SMK/6. . . . "We used an interesting support for our 6-meter beam ... two twenty-foot lengths of 2-inch aluminum irrigation tubing were banded together with a 3-inch coupling made of the same material. With two sets of guys this support performed very well."—Chester County ARC, KS9KZ/8. . . . "We are still looking for the 1959 black Ford Galaxie that ran over the 40-meter power cord and hurled one of the connectors, causing a short circuit. Cutting off 80- and 40-meter operation."—Manchester RC, W1KKS/1. . . . "Gusts up to 50 m.p.h. created problems in raising the 8-element two-meter beam atop a fire tower."—Apple Pie Hill ARC, W5CPU/8. . . . "Weather conditions were ideal this FD. Only trouble encountered this year was the generator cooking out Sun-
"Our old FD site burned down so we had to look at several new sites before we found an ideal spot on a high hilltop farm." — South Jersey R. Assn., K8AAJ/2. "Whoever drained the generator radiator last winter forgot to replace the block plugs. A bit of quick machine work saved the day." — Asheville ARC, W4MOE/4. "Five green operators and four green loggers learned a lot." — KS4VN/6. "Generator never missed a lick the whole 24 hours." — Edmond Air Soc., K8ALM/4. "After staying up all night most of our operators couldn't even push a pencil. Next year we sleep." — S07 Soc. of Central High School, K9T7Z/5. "Things were going great until the generator gave us a present of 160 volts and blow out three transmitters and a receiver. But that didn't stop us. It wasn't until our bread supply ran out that we quit." — Oxford Circle HC, K3ALD/8. "Our second FD a 300% improvement over our first." —rown Hans of Toledo, K8KAS/8. "Except for almost freezing to death we had a good time. Worked K2AA while beam was just being raised up!" — Lower Yakima Valley R. Amateurs, W7B3C/7. "Find 80 c.w. to be the most reliable taking everything into consideration." — KE7IM/2. "We tried to get more contacts on one rig by using two v.f.o.'s. This did not work because of difficulties in coupling the v.f.o. to the transmitter." — Abington ARC, K8OSG/8. "Our group was piloted strictly by teenagers. We broke all our previous records by getting 250 contacts more than last year." — Wisconsin ARC, W6ULX/6. "The S-Line combo sure did rack up the s.s.b. contacts." — Muskingum ARC, W8INS/8. "We had to transport gasoline about a quarter mile by hand for the generator which was mercifully drinking up the stuff." — K8LXJ/8. "This was the first all YL Field Day in Hawaii." — K8G YL ARC, K8GAPL/K8G. "You can expect the boys from the University of Denver to be out again next year to give it the old college try." — University of Denver ARC, W9ANA/9. "Our club's FD activities were featured on a TV newscast including movies taken at the FD site. The newscaster is a ham!" — Northwest St. Louis ARC, K8AXU/8. "One homebrew keyer worked like a charm." — W8BVP/8. "Eureka, nothing went wrong!" — Milwaukee High Speed CW Specialists, K8HS/8. "WSOQW was interrupted from operating the rig long enough to take his wife to the hospital, who in turn presented him with a baby boy." — Neenah-Menasha ARC, W9JLC/9. "Only difficulties were with the nuts that held the mikes and keys." —

Pity the poor Field Day chairman who tries to compute the Field Day score from sloppy, illegible, beer-stained logs. K5UUJ for the Harrison Emergency Communications Assn., K5UUJ/5, here gives it the old college try, but finally looks up amidst log sheets, pen in mouth, and abacuses, searching for sympathy. None here at League headquarters, where 1384 entries had to be checked.

South Amboy R. Amateurs, K2BEV/8. "This was the first FD experience for any of the crew. The young lads' eyes popped as we ran a cool, efficient QRP rig into resonant doublets." — W2RPT/8. "Saturday after everything had been set up, we were hit by winds of a tornado whose center was only about 15 miles away. At one point it took almost 12 men to hold down the tent and prevent it from blowing away. After the winds subsided, everything was hurriedly reassembled. The club was back on again only one-half hour later than planned." — Hellertown

Photo Quiz, Field Day's Guess Who? Can you spot any of these shots as being a fragment from your Field Day set-up? Better check closely... for instance, was that little boy (photo 10) a bystander at your FD site? See page 65 for identities.
Field Day seems to have the uncanny habit of having gremlins turn up in rigs that otherwise work fine. To combat this you need patience and a ready soldering gun. Probing into the rig difficulties of the Radio Club of Kauai, KH6LG/KH6, (left) are KH6LG and KH6DLZ. Meanwhile (right) this rig at the Marine Corps Supply Center, K4MCL/4, goes back into operation thanks to a hot soldering iron.

ABC, W2EKL/3. ...“A group of young promising O.W. guys replacing some of the old hands.” — Candlerood AR Am., W7YVIJ/1. ...“In spite of burning out two Communicators (160 line voltage from a new generator), high SWR on certain circuits, we were going to sleep, and our best two-meter operator suffering from heat exhaustion, we bettered last year’s score.” — Río Hondo RC, K0PPV/5. "...Activity on 7 Mc. was so great that our operators experienced difficulty in separating the amateur stations.” — Brook, AR, W4THIA/4. ...“Fixed weather and ops but not enough of them.” — Harrisbug RA Amateurs C, W3ZSK/3. ...“As far as we can find out, this was the first FD on record in this (county) area.” — W6JUM/6. ...“The order of the day was: ‘Come and take over for a while and let me take a nap...’ third, operator collapsed, his body removed, and another operator takes over.” — K4HIN/4. ...“We had three troubles — coyotes, snakes, and rigs.” — W4AADJ/8. ...“Nutshell.” — K4DLR/4. ...“I just want to say that we Novices should get in the FD. We had more fun in FD than any other operating activity.” — K99UGV/6. ...“Boy, one hour of sleep is worse than no sleep at all.” — W8UJB/6. ...“At the conclusion of FD operations, we pulled up camp, packed tent, etc., in the ear trunk and set up the equipment in the rear seat of the car, where we worked mobile using the generator in the trunk with the exhaust protruding between trunk lid and car body. It goes without saying that the put-put of the generator brought many queer glances from passersby as we proceeded down the highway.” — K7UQ/4/7. ...“The bulk of our contacts were made with the Midwest, South, and West, with most of these stations overjoyed to hear Vermont.” — K1DBX/1. ...“Three days of continuous thunderstorms and small downbursts. And you thought you had QRN!” — K4GTY/4. ...“We used a homemade log made from an old hackaw blade, tin, and rubber bands.” — K90MG/6. ...“Was chased at 3 o’clock in the morning from the operating position by a black bear.” — K4BBX/2. ...“During the first hour of operating I noticed gray columns of smoke coming from my transmitter followed by a terrific smell. Investigating I found a dead beetle, half roasted on my 6Q6A!” — K9ZSKH/3. ...“At exactly 2 p.m. MST, our quitting time, the generator burned up the last drop of gas in the tank, saving us from having to drain it. Wonder how many others figured their fuel consumption so closely?” — Daves County AR, KEKKX/5. ...“Everyone had a fine time except when the fireplace backfired filling the room with smoke...resulting in nine well-smoked hands.” — Adams County AR Soc, WSKGN/3. ...“Some log sheets were destroyed by rain, as we got 4.15 inches during the week end.” — Temple}

ARC, K4HIN/4. ...“We did not run up a high score but opened up a new world for our two Novice operators; they are still up in cloud 19 over the whole thing.” — W6UQY/9. ...“We had a good time but Alaska is lacking something.” — W8JLA of the club provided a wonderful chicken dinner, for the cry this year was ‘Chicken, no ham for the hams this Field Day.” — Kodak ARC, KE74WR/K4T. ...“We operated from Dog Island near Carahelle, Florida. It was like a DX-pedition as we had to transport everything. The story broke down as well, and we had to rely on fishing boats to get some of the gear transported.” — Thomasville, Ga., ARC, W4UC/4. ...“I strongly recommend a fixed dipole for 80 and 40 meter emergency service. It is very light and will not get tangled easily.” — K8LX/5. ...“Well, anyway, I’ll bet I was the lowest powered station on FD...one-tenth watt output on 30 Mc. The entire station, transmitter, receiver, 3-element beam, telephone handset, and 16-foot antenna support pole weighed under 12 pounds.” — W9HDO/1. ...“We claim to be the lowest powered actual FD station in operation with .6 watts input. We worked stations as far away as 350 miles.” — W0ZBY/8 (Ub. ub. See W9HDO/1 above, but he doesn’t claim any DX.) ...“Even cold hamburgers tasted good for breakfast.” — W8BEN/7. ...“We were set up close to the Ohio River, near the border-line between the 4th, 5th, and 9th call areas; could see into three states.” — K9NB/4/8. ...“I set up in the rain, operated in the rain, and dismantled in the rain. I was wet and the equipment was wet.” — 86G/5/6. ...“NCSd the Minnesota Section Net from our portable site with 30 watts.” — K91J/8. ...“The usual mid-winter pre-planning started earlier and lasted longer than ever before with talk of more power, more generators, more food, better antennas. The 80-meter beam was laid out with surveying equipment so that it would favor the heavily populated Northeast and Southwest. Eight masts were required to support this antenna alone. The gang of some 40 fellows consumed 17 pounds of ground beef, three pecks of potatoes, six dozen eggs, three pounds of cheese, five pounds of fish, 15 pounds of onions, 12 pounds of bacon, eight quarts of milk, six cans of beans, four boxes of pancake flour, many loaves of bread, huge pot of homemade beans, to say nothing of the seven cases of pop that disappeared. We cut 40-foot high call letters in the tall grass to identify W82BO.” — Muskegon Area AR Council, WS3HZ/8. ...“We were almost off the air even before getting started when a group of angry campers headed by a forest ranger complained about the noise of our generator. A hastily rigged muffler soon solved the problem. The forest ranger was a ham, hi.” — W9WLY/4.
| W9BBT/9 | Montgomery County ARC | 207-8 | R-  | 1602 |
| W9HTF/7 | | 205-7 | &-15 | 1600 |
| W8WIA/3 | | 185-14 | &- 5 | 1575 |
| W7GBC/7 | Lou;er Yakima Valley | 233-8 | H-13 | 1548 |
| K7TAZ/2 | North-Nez Arc | 218-19 | &-11 | 1521 |
| K7J5L/7 | Yakima Valley ARC | 207-8 | R-13 | 1592 |
| W7GGR/8 | Student EngineerRC. | 218-11 | &-11 | 1542 |
| W9DRB/3 | | 208-24 | &-12 | 1526 |
| W7KWR/7 | Mt. Airy VHF RC. | 204-15 | &- 5 | 1595 |
| K8YTV/7 | | 204-15 | &- 5 | 1595 |
| W9HD2/7 | Mecklenburg AR Soc. | 219-12 | &- 9 | 1596 |
| W8CYP/4 | Avenel RC. | 140-6 | &- -11 | 1111 |
| K8JHC/2 | | 204-15 | &- 5 | 1595 |
| K1EWP/1 | | 204-15 | &- 5 | 1595 |
| W9HNY/6 | | 204-15 | &- 5 | 1595 |
| W8BAM/8 | | 204-15 | &- 5 | 1595 |
| W8AX/3 | | 204-15 | &- 5 | 1595 |
| W9BBT/9 | Flamborough A.Tech. Soc. | 46-7 | H-3 | 276 |
| K9B7R/2 | RABARC | 162-ABC-10 | & | 252 |
| K9B7R/2 | | | | 274 |

**Answers to Photo Quiz**

**W8BBT/9**
- Montgomery County ARC
- Lower Yakima Valley
- North-Nez Arc
- Yakima Valley ARC
- Student Engineer RC.
- Mount Airy VHF RC.
- Mecklenburg AR Soc.

**K7TAZ/2**
- North-Nez Arc
- Yakima Valley ARC
- Student Engineer RC.
- Mount Airy VHF RC.

**W8CYP/4**
- Avenel RC.

**W9HD2/7**
- Mecklenburg AR Soc.

**K9B7R/2**
- RABARC

**K9B7R/2**
- Montgomery County ARC

**W8BBT/9**
- Flamborough A.Tech. Soc.

**Four Transmitters Operated Simultaneously**

**W9BBT/9**
- Montgomery County ARC
- Lower Yakima Valley
- North-Nez Arc
- Yakima Valley ARC
- Student Engineer RC.
- Mount Airy VHF RC.
- Mecklenburg AR Soc.

**K7TAZ/2**
- North-Nez Arc
- Yakima Valley ARC
- Student Engineer RC.
- Mount Airy VHF RC.

**W8CYP/4**
- Avenel RC.

**W9HD2/7**
- Mecklenburg AR Soc.

**K9B7R/2**
- Montgomery County ARC

**W8BBT/9**
- Flamborough A.Tech. Soc.
Can you beat this for a beam mast? Could prove a mite costly as an investment but then again some have proverbial "connections," as the Rochester ARC, WØTJA/Ø.
| W6SH/6 | San Fernando Valley | 30th | AR-14-2118 |
| K2RL/J/2 | Realyn Teenage ARC | 30th | AR-2194 |

**Seven Transmitters Operated Simultaneously**

| W6SW/9 | Chicago Suburban R | 1475-45-12.231 |
| K6AG/G/6 | Covina Pomona Ham Club & Tri-Country Air Assault | 1277-30-11.2668 |
| W2WW/2 | Washington Valley | 1159-40-16.655 |
| K91AZ/2 | University of New Hampshire | 870-16-8035 |
| W3AOG/4 | Geneva City ARC | 1026-70-6142 |
| W4HR/4 | Atlanta Teenage ARC | 1013-25-6261 |
| K2N/A/2 | Port Almouth | 733-22-6200 |
| K9AF/9 | Wheaton Community Club | 741-20-4545 |
| W4MU/6 | Lochwood ARC | 694-25-4545 |
| K91EU/6 | North AFRS | 648-30-4124 |
| W6HAC/6 | Reservoir High School | 523-14-4063 |
| K9GG/6 | Fort Still ARC | 427-10-3843 |
| W5NN/8 | Lake George ARC | 354-12-7658 |
| W5MCR/3 | New York ARC | 373-16-6200 |
| W4M/J/4 | Atlanta ARC | 694-ARC-1360 |
| K9MF/8 | K9LFAR ARC & Allied | 429-14-6200 |
| W6V/W/7 | Royal City AR Asn. | 411-16-7576 |
| W9HL/3 | Lehigh Valley ARC | 487-ARC-1363 |
| K8ZL/8 | Edison Employees ARC | 240-19-101815 |

**Right Transmitters Operated Simultaneously**

| K9DTA/6 | West Valley | 1324-ARC-29-902 |
| W6SW/0 | Four Lakes ARC | 1086-40-7168 |
| W6PF/6 | Peoria Remote Control | 1101-16-7026 |
| W6UL/6 | Fullerton ARC | 909-43-6445 |
| W3OM/4 | Livermore | 752-16-7576 |
| W6M/P/6 | Northern Peninsula ARC | 534-16-6200 |
| W3BN/3 | Hearing ARC | 618-40-4568 |
| K4IM/B/4 | Blue Grass ARC | 678-25-4068 |

**Nine Transmitters Operated Simultaneously**

| W4GL/1/8 | Binghamton ARC | 960-34-7623 |
| W91H/A/8 | Catalina ARC | 1165-22-7623 |
| W4VU/V/9 | Peoria Area ARC | 1044-42-6279 |
| K4CY/2/4 | Communications Club of New Rochelle | 769-30-5525 |
| W9YR/9 | West Valley ARC | 682-16-4092 |
| W6U/4 | West Allis ARC | 496-20-4568 |
| W6U/4 | Tomahawk, Ga. ARC | 496-20-5568 |

**Ten Transmitters Operated Simultaneously**

| W78/7/7 | Valley ARC | 3390-49-73086 |
| W6PM/O | Associated R Amateurs | 3136-16-18618 |
| W2Q/2/7 | Garden State AR Assn. | 1274-48-13.7154 |
| W5N/A/3/6 | Northtown ARC | 1486-40-7658 |
| K9GIG/6 | The Corom Rangers | 576-16-7658 |
| W3RM/1 | Montgomery County | 1994-40-7658 |
| K9Y/O/6 | Free State ARC | 998-24-7612 |
| W7NCW/7 | Lower Comunula AR Soc. | 619-23-4529 |
| W8BSW/9 | Cedar Valley ARC | 812-40-4568 |

**Eleven Transmitters Operated Simultaneously**

| W9W/6/5 | (grouped rank) | 2518-35-23.585 |
| W71D/1 | Rock Creek | 2214-74-31.051 |
| W3RN/3 | Rock Creek AR Asn. | 1776-6035.939 |
| W9RK/9 | Standing Rock | 911-16-8025 |
| W7H/1/2 | Tri-Country AR Asn. | 2533-40-18.522 |
| W6W/1/0 | Elkhart Club | 2488-16-18.786 |

**Twelve Transmitters Operated Simultaneously**

| W3L/2/2 | Tri-Country AR Asn. | 2533-40-18.786 |

**CLASS B**

Grouped in this listing are the scores of portable stations manned by one or two operators. Where there are two persons participating, the call of the operator (if known) is given below that of the amateur whose call was used. Figures following the calls indicate number of contacts, power and final score.

<table>
<thead>
<tr>
<th>Transmitter</th>
<th>Power</th>
<th>Chex</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>W6SW/9</td>
<td>1150-16.714</td>
<td>8451</td>
<td>4284</td>
</tr>
<tr>
<td>W2D/0/2</td>
<td>494-7007</td>
<td>360</td>
<td>3240</td>
</tr>
<tr>
<td>K6H/6/8</td>
<td>400-5751</td>
<td>324</td>
<td>2916</td>
</tr>
<tr>
<td>K6M/6/2</td>
<td>851-4999</td>
<td>200</td>
<td>2855</td>
</tr>
</tbody>
</table>

These energetic lads go to it in the same transmitter class from W6LUX/6, the Winona ARC, Coming from back to foreground we have K59QG, G128, DH1H, RHN, and LWF.

**December 1960**

- W3DUL/3, standing at E. Penna, SEC, W3DUL.
CLASS D

Grouped in this tabulation are the scores of home stations operated from emergency power.

<table>
<thead>
<tr>
<th>Call Sign</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>KAFA</td>
<td>150</td>
</tr>
<tr>
<td>KAL</td>
<td>120</td>
</tr>
<tr>
<td>KALB</td>
<td>90</td>
</tr>
<tr>
<td>KALC</td>
<td>60</td>
</tr>
<tr>
<td>KALD</td>
<td>30</td>
</tr>
</tbody>
</table>

CLASS E

Grouped in this tabulation are the scores of home stations operated from commercial power sources.

<table>
<thead>
<tr>
<th>Call Sign</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>KALF</td>
<td>150</td>
</tr>
<tr>
<td>KALG</td>
<td>120</td>
</tr>
<tr>
<td>KALH</td>
<td>90</td>
</tr>
<tr>
<td>KALI</td>
<td>60</td>
</tr>
<tr>
<td>KALJ</td>
<td>30</td>
</tr>
</tbody>
</table>

CLASS C

Grouped in this tabulation are the scores of entrants in the mobile class. Figures following the call indicate number of contacts, power and final score.

<table>
<thead>
<tr>
<th>Call Sign</th>
<th>Contacts</th>
<th>Power</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>KGCA</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KGCB</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KGCC</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KGCD</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KGCE</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Strays**

The Third U.S. Army Technical and Training Net continues at 1900 each Friday local time on 5850 kc. During December the schedules will discuss good operating and good net operations.

Air Force MARS Eastern Technical Net meets Sundays from 1400 to 1600 local time on 3295, 7540, and 15,715 kc, except that there will be no broadcasts on Christmas or New Years.

TF2WFF worked TF?2WFF in the early part of October. Seems that the Icelandic Post and Telegraph Administration issued the duplicate calls in error last June, and it wasn’t until October that the two fellows, whose stateide calls are WAGHZI and K-APM, worked each other and the error was discovered. They serve at posts about 250 miles apart.
Happenings of the Month

ITU BAN LIST

In July, 1955, FCC announced that Laos had notified ITU it no longer objected to communications between its amateurs and amateurs elsewhere; consequently, Laos was removed from the banned countries list. It now develops that there was an international misunderstanding, and that Laos still has its objections to international amateur communications on file at ITU headquarters in Geneva. Therefore, in keeping with U.S. policy, FCC-licensed amateurs are again prohibited from communicating with amateurs in Laos (XW8), along with those in Cambodia (XU/XV) and Viet Nam (XV8W) and Indonesia (PK).

PARAGUAYAN 3RD PARTY TRAFFIC

Effective November 5, an exchange of notes between the governments of Paraguay and the United States was concluded providing that amateurs of each country may exchange messages on behalf of third parties. The agreement contains the usual broad restrictions limiting conversations or messages to purely personal and relatively unimportant matters — except, of course, in actual emergency. The full list of countries with which U.S. amateurs may freely handle such personal unimportant traffic internationally is: Canada, Chile, Costa Rica, Cuba, Ecuador, Haiti, Honduras, Liberia, Mexico, Nicaragua, Panama, Paraguay, Peru and Venezuela.

GENEVA RADIO REGULATIONS

The final documents of the Administrative Radio Conference, concluded at Geneva, Switzerland, a year ago, are now available from the International Telecommunications Union (at Geneva). The Radio Regulations volume is approximately ARRL Handbook size and the price is 19 Swiss francs (roughly, $4.50), postpaid.

1960 MERIT AWARD

For pioneering 144-Mc. and 220-Mc. tropospheric propagation, John T. Chambers, W6NLZ, and Ralph E. Thomas, KH6UK, were presented the 1960 ARRL Merit Award. The Award, in the form of a plaque, is made each year for "outstanding contributions to the art of amateur radio communication."

The 1960 citation reads:

"For having demonstrated, through persistent effort in the best amateur tradition, that signals on the 144-Mc. and 220-Mc. bands could be propagated over distances previously considered impossible."

An agreement of the 1960 Merit Award was made by Director Harry Engwicht, W6IC, at the Pacific Division Convention at San Mateo, Calif., in September. Engwicht is a member of the Merit and Awards Committee of the ARRL Board of Directors which chooses the award recipient.

Here are the antennas installed on the SS Hope before she set sail to the Far East with Ralph Chorbeneau, W8OJ, on board operating maritime mobile. The Hope arrived in Diakarta, Java, Indonesia, on Oct. 18. On the 14-Mc. band W8OJ has shifted from 14,345 to 14,235 kc., because of interference from Far East stations. The 10- and 15-meter frequencies remain 28,650 and 21,445 kc. Those who work the Hope may obtain QSLs by writing to Project Hope, F. C. Box 9808, Washington 15, D. C.

In achieving the unbelievable v.h.f. records, Chambers and Thomas established two-way amateur work over a 2540-mile path between Palos Verdes, Calif., and Hawaii — first at 144 Mc., on July 8, 1957, and again at 220 Mc., on June 22, 1959. Much of the equipment on both ends was home brew. Still, to prove it could be done on even the higher bands, Thomas and Chambers last summer sought two-way contacts on 432 Mc. Consistent, day-after-day schedules were kept, with 14,095 kc. used as a liaison frequency. W6NLZ heard KH6UK's u.h.f. signal, but equipment failure at the other end prevented an actual completion of another record.

In 1965, Thomas, then W2UK, and Paul M. Wilson, W4HJK, received the Merit Award for their two-year work on communications by meteor-trail reflections at 144 Mc.

We rather expect violent thunderstorms in New England during the summer months, but read what happened to W1CTW on the morning of Oct. 25:

"While we were eating breakfast last Monday, my triband groundplane took a direct hit by lightning. It followed the coax to the transmitter, and thence to ground via the wall plug and fuse boxes. The wall plug was blown to bits, and pieces of the main fuse box were scattered halfway across the cellar. Fortunately there was no fire, but I have a hole in the house, and a complete a.c. rewiring job must be done. We have a temporary a.c. connection to the refrigerator, oil burner, and one plug in the kitchen, but it looks as if I'll be off the air for a while. The telephone installation had to be completely replaced, all the way out to the pole!"
CQ Sweepstakes will ring on 50 Mc. and above on January 7 and 8, 1961, marking the ARRL V.H.F. Sweepstakes contest. Such a call or answering such a call and exchanging information shown at the top of the scoring page will get you started. The exchange follows along the lines of a standard message preamble. You can work stations once per band for score, so band versatility will pay off.

The rules are the same as last year (exception: no Technician award). Contacts count only when the contest is in progress at both ends of the QSO. Suppose K1CRQ starts right out at the beginning of the contest at 1:00 (2:00 p.m. local standard time). During the first hour only stations in the Eastern time belt count for score; during the second hour stations on CST can now be worked as well. By the fourth hour stations in the far west on PST can be worked and counted.

Scoring is exactly as last year. The multiplier is the number of different sections worked, plus ten. You do not get an additional multiplier reworking a station on a different band, although it does count for contact points. Example: W1HDQ works W1PZJ on 50 and 144 Mc., for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only one section multiplier.

Here is an example for figuring the final score. Suppose K5TKR made 100 contacts in 17 different sections:

- 100 QSOs
- 27 if all 88 data exchanged in both directions
- 269 QSO points
- 17 sections plus 10
- 5190 (claimed score)

The top single-op scorer in each section earns a certificate. Where at least three Novice entries from a given section are received, the top one receives an award. The club with the highest aggregate score will receive a cocoabolo gavel with a sterling silver band engraved with the name of the winning club.

ARRL now has contest forms. These log sheets will be sent to you free on request. Follow the log sample shown in this announcement if you make your own forms.

All v.h.f. people are urged to participate, particularly to help increase your club's total score. Mark your calendar now for the V.H.F. Sweepstakes, January 7 and 8.

Rules

1) Eligibility: Amateur operators in any ARRL section (see page 6) operating at home, mobile or portable under one call on or above 50 Mc. are invited to take part.

---

**SUMMARY OF ARRL V.H.F. SWEEPSTAKES EXCHANGES**

<table>
<thead>
<tr>
<th>Free. Band (Mc.)</th>
<th>NR</th>
<th>Sta.</th>
<th>CK-RST</th>
<th>Section</th>
<th>Time</th>
<th>Date (Jan.)</th>
<th>RECEIVED (1 point)</th>
<th>NR</th>
<th>Sta.</th>
<th>CK-RST</th>
<th>Section</th>
<th>Time</th>
<th>Date (Jan.)</th>
<th>Number of Each Different New Section as Worked</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>1</td>
<td>WIAW</td>
<td>57 Conn.</td>
<td></td>
<td>1615</td>
<td>7</td>
<td>3</td>
<td>WRIJA</td>
<td>47 Conn.</td>
<td>1615</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>2</td>
<td>43</td>
<td>1035</td>
<td></td>
<td>1300</td>
<td>7</td>
<td>6</td>
<td>WIRE</td>
<td>399 R. L.</td>
<td>2111</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>3</td>
<td>58</td>
<td>2109</td>
<td></td>
<td>2300</td>
<td>7</td>
<td>33</td>
<td>W100P</td>
<td>58 E. Mass.</td>
<td>2106</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>144</td>
<td>4</td>
<td>57</td>
<td>2150</td>
<td></td>
<td>1115</td>
<td>7</td>
<td>15</td>
<td>KN1MQW</td>
<td>58 Conn.</td>
<td>2143</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>5</td>
<td>54</td>
<td>2030</td>
<td></td>
<td>2235</td>
<td>7</td>
<td>30</td>
<td>W1JA</td>
<td>57 Conn.</td>
<td>2335</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>6</td>
<td>58</td>
<td>2335</td>
<td></td>
<td>2335</td>
<td>7</td>
<td>30</td>
<td>W1JA</td>
<td>57 Conn.</td>
<td>2335</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>144</td>
<td>6</td>
<td>57</td>
<td>2335</td>
<td></td>
<td>2335</td>
<td>7</td>
<td>30</td>
<td>W1JA</td>
<td>57 Conn.</td>
<td>2335</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>144</td>
<td>7</td>
<td>57</td>
<td>2335</td>
<td></td>
<td>2335</td>
<td>7</td>
<td>30</td>
<td>W1JA</td>
<td>57 Conn.</td>
<td>2335</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>144</td>
<td>8</td>
<td>57</td>
<td>2335</td>
<td></td>
<td>2335</td>
<td>7</td>
<td>30</td>
<td>W1JA</td>
<td>57 Conn.</td>
<td>2335</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>144</td>
<td>9</td>
<td>57</td>
<td>2335</td>
<td></td>
<td>2335</td>
<td>7</td>
<td>30</td>
<td>W1JA</td>
<td>57 Conn.</td>
<td>2335</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>144</td>
<td>10</td>
<td>57</td>
<td>2335</td>
<td></td>
<td>2335</td>
<td>7</td>
<td>30</td>
<td>W1JA</td>
<td>57 Conn.</td>
<td>2335</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Clipped score: 23 points X 19 (9 + 10) = 437.

Names and calls of operators having score in above work:

I hereby state that score and points set forth in the above summary are correct and true.

Equipment: 

Signature:

Number of QSOs: 

Address:

---
### EXPLANATION OF V.H.F. SS CONTEST EXCHANGES

<table>
<thead>
<tr>
<th>Exchanges</th>
<th>Contest numbers 1, 2, 3, etc., a new NR for each station worked</th>
<th>Send your own call</th>
<th>CK (Readability and strength or RST of station worked)</th>
<th>Place</th>
<th>CK (Your ARRL section)</th>
<th>Time of transmitting this NR</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>QSO NR tells how you are doing</td>
<td>Identification</td>
<td>RS or RST report</td>
<td>See page six for section list</td>
<td>Time and date must fall in contest period</td>
<td>Send date of QSO</td>
<td></td>
</tr>
</tbody>
</table>

**Sample**
- NR 1
- W1AW
- 57
- CONN
- 1615
- JAN 7

2) **Object:** Participants will attempt to contact as many other stations in as many ARRL sections as possible.

3) **Contest Periods:** The contest starts at 2:00 p.m. your local time, Saturday, Jan. 7, 1961, and ends at midnight, Sunday, Jan. 8, 1961. Contacts between stations in different time zones can be counted only when the contest period is in progress in both of the zones concerned.

4) **Exchanges:** Contact exchanges, including all data shown in the sample, must be transmitted and received for at least one second point.

5) **Scoring:** (a) Contacts count one point when the required exchange information has been received and acknowledged; a second point when exchange has been completed in both directions.

(b) Final score is obtained by multiplying total contact points by the sum of different ARRL sections worked (the number in each of which at least one 88 point has been credited) plus 10.

6) **Conditions for Valid Contact Credit:** (a) Repeat contacts on other bands confirmed by completed exchanges of up to five points per band may be counted for each different station worked. (Example: W1HIDQ works W1RFU on 50 and 144 Mc, for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only one section multiplier.)

(b) Cross-band work shall not count.

(c) Portable or mobile station operation under one call, from one location only, is permitted.

(d) A transmitter used to contact one or more stations may not be used successively under more than one other call during the contest period.

(e) Contacts with aircraft mobiles cannot be counted for section multipliers.

7) **Awards:** Entries will be classified as single- or multi-operator, a single-operator station being defined as one manned by an amateur who neither receives nor gives assistance to any person during the contest period. Certificates will be awarded in each ARRL section to the top-scoring amateur in the single-operator classification. In addition, a certificate will be awarded to the top Novice in each ARRL section where at least three ARRL section where at least three such licenses submit valid logs. Multioperator work will be grouped separately in the official report of results in QST.

When three or more individual club members compete and submit logs naming the club with which they are identified, an ARRL certificate will be issued to the leading club member. When less than three individual logs are received there will be no club award or club mention.

A gavel with an engraved sterling-silver band will be offered the club whose secretary submits the greatest aggregate score, provided such scores are confirmed by receipt at ARRL of the individual contest logs from such members. Only the score of a bona fide club member, operating a station in local club territory, may be included in club entries. Claims from federations, radio club councils, or other combinations of radio clubs, will not be accepted, nor can special memberships granted for contest purposes be recognized.

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

9) **Reporting:** Reports must be postmarked no later than Jan. 27, 1961, to be considered for awards.

---

### Strays

By golly, some people do plan ahead. Way back in late September the fellows in Washington who are responsible for Armed Forces Day amateur activities in May started making plans for the 1961 celebration. Here we have, left to right, Mr. Ed Liscombe (K4KNB), Army MARS; Major Sidney Rexford (W2T2Z), Army MARS; Commander A. B. Kunz, Officer in Charge, K4NAA; Capt. W. E. Bethis (W4LUT), Air Force MARS; MSgt. Herman Philbeck (W4LWG), Air Force MARS; and Lieutenant Commander C. R. Winnette, Assistant Officer in Charge, K4NAA.

Armed Forces Day 1961 will be observed on May 20.
September V.h.f. Party Summary

Nearly 500 Stations Report Lively Week End

Tropospheric propagation was good along the northeastern seaboard Saturday night, and there was a short period of aurora for the northeast and Great Lakes areas, but on the whole the week end of September 17 and 18 was just about normal for that time of year. Despite this, v.h.f. activity was at a high level, and we have 494 entries in our final tabulation for the September V.H.F. Party.

Scores kept pace with the increased activity, and v.h.f. party totals look more like our lower-frequency contest scores all the time. One station made 786 contacts, another 652, and dozens went over the 400-contact figure, once considered all but unattainable in a v.h.f. affair. Entries came in from 53 ARRL Sections.

As always, the Party took on a Field Day character, with 81 of the stations reporting being portable. Some of these groups went all-out, carrying home-station type setups and antennas to the high spots, and pouring it on full-blast. W2PEZ/2, manned by the 6220 V.h.f. Group, involved much hauling and 3/4 mile of hiking, but the labor paid off with the country's leading score: 786 QSOs on 4 bands, for 37,485 points. The Copperhead V.h.f. Society of Washington, D. C., toted kilowatt transmitters, and the best in receivers and antenna systems, up to Foxyville Fire Tower, near the presidential retreat at Camp David, Md., and worked 652 stations on 4 bands, for 32,432 points with W3JZY/3. Other high-ranking eastern portable stations included W1BJ/1, Mt. Kearsarge, N. H., and W2LW1/2, Overlook Mountain, in the Catskills, and many others.

With little or no DX to build up section multipliers, stations out of range of the crowded East did not make so many points, but they worked plenty of stations. (Perhaps we should reiterate here that these country-wide rankings we mention are entirely mythical. There is no national award of any kind: you compete only with other stations in your own ARRL Section for certificate awards.) A spring-and-fall regular, the Southern Peninsula Old-timers Society, K6TJL/6, took it in comparative ease this time. After several bouts with snow and cold weather in higher elevations, they chose 2000-Skagg's Point, in the Santa Clara Valley Section this time, and it proved good enough for 301 contacts on 4 bands, for 8818 points.

W6ZOG/6 led the single-operator stations of the West, with 389 contacts on 50, 144 and 220 Mc., for 4114 points and the San Diego Section award. The West's top effort was the work of WA6IDB. Los Angeles: 453 QSOs on 4 bands, for 7020 points.

The country's leading single-operator score was turned in by W1RJA, Milford, Conn. Ed worked 410 stations on 50 and 144 Mc., coming up with an impressive section multiplier of 32, for 13,120 points, and the Connecticut Section wallpaper. Close behind was W1QXX, Arlington, Mass., who lead the Eastern Massachusetts Section with 309 on 4 bands, for 12,432 points. Many fine efforts are missed if you merely scan the tabulation for high scores. Examples: W4TRT, Seattle, with 131 QSOs for 1018 points, and K7HRW, Reno, Nevada, with 102 on 50 and 144 Mc., for 1221.

One-band work is getting rarer all the time, but some nice scores were made on both 50 and 144 Mc. by one-band operators. W2PUO/2 managed 218 contacts on 50 Mc., and K3VZA 187. A higher section total gave K3VZA a 2-point edge among 6-meter operators, at 2618 points to W2PUO's 2616. Best 2-meter effort was by WA2INB: 177 in 12, for 2301 points. The Northern New Jersey award was won by W2DWH without using 50 Mc., but he did right well on 220 and 420, as well as 144 Mc. W2KIB, second in NJN, ran up a section total of 31 the hard way on 50, 144 and 220 Mc. Jim has no modulator! One-banders took 10 section awards, 5 each on 50 and 144 Mc., the best of these being KS8KCI's leading effort in Ohio: 173 QSOs on 50 Mc., for 1038 points.

SCORES

In the following tabulation, scores are listed by ARRL Divisions and Sections. Unless otherwise noted, the top scorer in each section receives a certificate award. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 50 Mc.; B, 144 Mc.; C, 220 Mc.; D, 420 Mc.; E, 1251 Mc. or higher. Multiple-operator stations are shown at the end of each section tabulation.

ATLANTIC DIVISION

B Pennsylvania

W30JW 3998-239-14 AB

K30PFC 2651-239-16 AB

K30RNP 2624-164-11 AB

WA3KJH 1647-992-22 BCDC

WA3LCL 1892-113-14 AB

WA3AO 1295-129-14 AB

K30PEM 1240-124-14 AB

K30HKS 1224-156-9 A

W30JW 1183-1 01-15 A

W30PFC 1131-1 14-18 BCDC

W30JTS 1186-75-15 AB

K30L1 1111-101-14 A

K30HF 1073-15-15 A

WA3EFT 1041-116-9 A

K30JDL 1030-103-16 A

K30JU2 882-62-14 AB

W30JAE 849-84-10 AB

K30TL 800-85-9 A

K30LH 747-68-7 A

K30JLD 292-47-6 B

K30HRQ 172-45-4 A

W30LDA 129-20-6 AB

K30M1 96-24-4 A

K30LX 57-29-2 A

K30CN 9-1 1-B

W30KX/2 (5 ops.) 1492-112-14 AB

W30BZ/2 (7 ops.) 641-64-22 BCDC

W30BZ/2 (4 ops.) 560-150-22 AB

W30NM 4 (4 ops.) 3570-270-21 AB

K30TM 3011-22-2 Ab

K30ZRT 2996-226-32 AB

K30BZUZ/2 (10 ops.) 1276-127-16 AB

W30WJ 305-50-22 AB

K40PFC 1500-50-22 AB

K301MT 588-78-11 A

K30LZ 297-11 AB

K301RW 295-73-8 B

W30EXV 72-24-3 B

W30WTZ/2 (W30 WZT ZKU, K50MZ) 2029-168-14 AB

K30DLG/3 (K60D LDFY, W4) 1540-169-14 AB

W30JML (K60M CLC) 1500-159-10 A

W30KEL/2 (K60E JHR) 225-45-5 A

K30-DM-D. C.

W30XV/2 (9 ops.) 1599-223-14 BCDC

K30AZ/1 1110-129-9 A

W30LCLC/2 1110-38-14 AB

W300H 625-72-7 B

W30TA 625-72-6 A

W30RH 294-51-4 B

K30LX 176-44-4 A

K30KAN 144-28-4 A

K30NA/4 90-30-3 B

K30DL 51-27-3 A

K30UR 70-35-2 B

K30UR/2 64-18-4 A

W30TV 166-10-3 A

W30JZ/2 (11 ops.) 635-226-46 BCDC

K30CB/2 (7 ops.)

K30KH (W30 EJR W4) 1592-241-19 AB

W30LCLC (W30 DHH KDZ) 1593-241-19 AB

W30CBW (K60L KMOLE) 246-82-3 B

S. New Jersey

W30RSP 3429-180-19 AB

W30JUZ/2 2432-152-16 AB

W30LCLC/2 1551-30-19 AB

K30TPF 1506-78-11 A

W30XU 267-32-11 B

W306VX 272-24-3 B

72

QST for
MEMBERSHIP CHANGES OF ADDRESS

Four week's notice is required to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of QST without interruption.
Mobile C.W.

BY KATASHI NOSE,* KH6/1

The superiority of s.s.b. over a.m. in mobile work is demonstrated in theory and practice, but for those of us who lack s.s.b. facilities why not try c.w.—and I mean c.w. while in motion.

ARRL Director Robert Denniston, W0NWX, is a confirmed c.w. mobilist, and no doubt there must be many more. However, many hams think that mobile c.w. is a gag or stunt.

For long-haul communication in crowded bands, c.w. mobile is hard to beat. Many years of c.w. mobiling from Hawaii, and lately, 25,000 miles of mobiling on turnpikes, mountain roads, country roads, and city traffic on the mainland, have convinced the author that communication-wise, c.w. mobile is vastly superior to a.m. phone.

For those who may want to try it, some preparation is in order—such as:

1. Thorough mastery of c.w. If you need to concentrate to read or send c.w., forget this business. But, if you find yourself carrying on snatches of conversation while driving and copying c.w., you are ready for it.

2. The v.f.o. must be mechanically stable. In a.m. mobile phones, v.f.o. mechanical instability is mistaken for hum or n.b.f.m. But, in c.w. or s.s.b., such a signal makes you sound as if you were gargling your throat. Test transmitter stability by vigorously pounding v.f.o. while listening to the receiver with b.f.o. on.

3. Use good judgment. Even the best of c.w. men get sidetracked when making a left turn in a strange city in a car with stick shift in heavy traffic, and all the while being berated by the XYL in the back seat for making the wrong turn. Lay off while in unfamiliar traffic.

The following aids have been found invaluable in making c.w. mobiling a pleasure:

1. Mount the key on the end of a narrow stick one foot long and 2 inches wide. Place this stick under your thigh above your knee so that the key sits sidewise next to you on the seat.

   This position was found to be more desirable than permanently strapping the key to some fixed object, i.e., the steering column.

   It was also found to be better than the familiar “knee key” used by the armed forces.

2. Use extra wide contact spacing and work the key in the manner of a “pump handle” key of early wireless. Extra wide spacing enables you to monitor your sending by audible clicking of the contacts, thus making monitoring circuits unnecessary. With a little practice you can do about 18 w.p.m. Another trick which may prove helpful is to slap the key instead of using the conventional grip on the knob.

   If you need a monitor in spite of all this, listen to key thumps on the broadcast auto radio.

3. Replace the tuning knob on the receiver with a universal joint (Millen) with a 12-inch plastic rod or tubing with a tuning knob on the end.

   Tuning the receiver then can be accomplished from any position up through a 45° angle. A convenient position for the tuning knob is to have it resting on the seat next to your knee, from which position you can tune the receiver without shifting from normal driving position.

   Conceivably, even passengers in the back seat can tune the receiver by having an extension long enough. Knob and extension can be pushed out of the way like an old-fashioned gear shift and stays put by the friction of the universal joint.

4. Another convenience is a hearing aid dynamic earphone of the type which plugs into the ear. With this accessory, your family can listen to the broadcast set while you haul on long drives.

With these conveniences the 1960 ARRL Field Day was worked while driving through 12 eastern states. Hawaii was contacted on 14 Mc. through heavy field day QRM, while in motion. CT2BO in the Azores answered our CQ, but, of course, being a KH6 mobile in Delaware helped!

However, the most discouraging contacts were those in which the W station would insist on calling me K5BUJ or K4HJJ, and why not? You wouldn’t expect a KH6 to be mobiling on c.w. at 70 m.p.h. (Maine Turnpike) and coming through at an odd hour! 😄

* Now back in KH6-land.

1 Like on the 1939 Ford, eh? — Ed.
The Congo Story

BY SGT. EDOUARD D. COURNOYER,* 9Q5US, W4UMO

During the early part of July when hostilities began in the Congo, the Embassy of the United States at Leopoldville placed a call to General Clyde C. Eddleman, Headquarters USAEUR, for a communications man to be sent down to the Embassy for the purpose of setting up communications with missionaries throughout the Congo. This was no ordinary expedition or safari such as you read about from time to time, but for me—the man chosen—was the shot heard around the amateur radio world.

After the usual series of shots by the medics, we took off in the modern version of a magic carpet—a C-124 loaded with boxes of communications gear. They even put a PE-95 power unit aboard to keep the tail from bouncing! We arrived at Leopoldville, Republic of the Congo, circled a small airstrip below, and leveled off for a landing. When the wheels touched the ground, we acknowledged to the tower that we were down. The tower came back shouting, "I don’t see you, are you sure you’re on the ground?" We told them we were quite sure, as we were taxiing around. Then, suddenly, all hell broke loose. The natives came rushing at us from all directions—we had landed in Congolese territory! This was no time for explanation! The pilot headed the big bird towards the wind, and zoomed off with all the thrust those four engines had left.

After climbing about two thousand feet, there across the Congo river was the longest air strip in the world, surrounded by Belgian troops. We circled and waited for instructions, and were told to change to civilian clothes immediately. Upon landing, photographers and newsmen came from all sides. We were the first plane to land and in order to divert their attention, the pilot gave instructions to his crew to lower the lift which had the PE-95 on it. This ruse worked and I was immediately whisked away in a flag-draped staff car to the Embassy.

Arriving in downtown Leopoldville, I was escorted to Mr. Timberlake. I was immediately given instructions to set up communications with American missionaries throughout the Congo, to determine their needs and the number of people to be evacuated by air. It wasn't long afterward that trucks were unloading the needed equipment to start the ball rolling. I managed to dig out a KWM-1 from the mountain of signal equipment. With the help of a few natives, I had one antenna set up. I looked for a manual, but none could be reached for the moment. However, connections were made to the power supply and microphone, all connections were checked, and everything seemed to be ready. Now for a radio room... what used to be a "language room" and a storage room for food became the room for 9Q5US.

Right next door was the library: we moved in a metal desk, chairs, and whatever supplies were needed to set us up in business. A typewriter was brought in, dark curtains drawn over the windows, a clock was set up on the wall, and last but not least, a 7500-watt generator was hooked up to give us the needed 110 a.c. supply for the equipment.

About 1930 hours that evening, after turning a few knobs, all of a sudden around 21,322 kc. I heard, "Hey, Frenchman, can you hear me? This

* USA Signal Operating Unit, APO 403, N.Y., N.Y.
is Mike, DL4GJ.” I came back, astonished. “Hey, Mike! I hear you loud and clear. Tell me, how do you tune this contraption?”

“Listen, Frenchy,” Mike went on, “what call are you using down there?” “I never gave this a thought,” I explained. “How about Q5US?”

“That sounds all right,” came the voice from the other end. Thus, the Congo Story was beginning to take shape. Later, through the facilities of the local Postal Telegraph and Telephone Company, the call was changed to Q5US.

Later in the evening, the Naval Attaché brought in a KWM-2. Other antennas were made up, and we had three of them on top of the embassy ready to tune any frequency called upon. It was then that I found out I was supposed to use this equipment to keep in contact with the Carrier Wasp anchored some 200 miles off the coast. Names like “Grogan” or “Wheels” (common names used by the Navy) were part of my daily routine.

Captain DuBois (the Naval Attaché) often reminded me, during our conversations about this particular carrier, to refrain from calling it a “battle-wagon, tub, battleship, or what-have-you”, but to call it a “carrier.” So, after a few hours of operation with the Wasp I managed to get things like the Navy wants them. “Sir, I’m in contact with that battleship of yours ... I mean the carrier Wasp ... Any instructions?”

“Battler ship Wasp”

This dual role (Army and Navy) left me very little time to catch a few winks, as the Navy was utilizing me in the day time, and the Army at night. It’s a good thing I was wearing civilian clothes; otherwise I’d probably be wearing a khaki shirt with bell-bottom trousers.

It was the night of the 19th that things began to happen. All local communications facilities failed. Everyone in the city was quitting his post. Mr. Timberlake came to the radio room and asked if it was possible to get hold of General Eddleman, in USAREUR. Capt. Mike Fiorelli, DL4GJ, broke in then and told me he had the General on the line. Upon completion, he was piped to EUCOM Headquarters to General Norstad, with General Palmer also giving needed instructions, which at the time were considered to be an emergency. Upon completion of these calls, Mr. Timberlake was in contact with Ambassador Burnie, in Brussels. The most important

call to wind up the evening was to the United Nations in New York City, for the assistant secretary, Dr. Ralph Bunche. The vice president of the Radio Corporation of America, Lloyd, W2CAA, takes the credit on that one and many other calls throughout New York City.

You would think, by then, that my evening’s work was just about caught up. It was just beginning! I was asked by Captain DuBois if it was possible to get the Pentagon at this stage of the game.

I have read plenty of fiction stories about how easy it was for the hero to overcome his obstacles, but I was no Aladdin, and I didn’t possess a magic lamp, either. At this point, I remember, I made a remark such as, “Nothing is impossible — not even in radio.”

So, I flipped the band switch to 14 Mc., and — lo and behold — there she was, beautiful America in all its pride and glory, just waiting for me to give it a shout. “CQ Stateside, Washington, D. C., with emergency traffic ... this is Q5US ...”

What hit me? Take it easy, fellows ... one at a time!

“W4GGA, this is Q5US, are you in Washington?”

“This is W4GGA, and I’m in Washington. The handle here is Ken, and you’re five and nine plus, beautiful signal, how do you copy me? Over.”

“This is Q5US. Read you 5 by 9, handle here is Frenchy, can you get hold of the CNO at the Pentagon?” I asked.

“Wait one, Frenchy” ... “Go ahead, I have Admiral Burke on.”
“This is Captain DuBois ...” Momentarily, I was stunned while I was working the send and receive switch. I was gazing at my Bible resting on top of the console. That was the answer to this unbelievable story that was taking place. If I ever had any faith in the past, it wasn’t anything like this. I gazed at my chief, Col. Sharpe, the Army’s representative, sitting by my side. He whispered that he was going to buy me a steak dinner for this.

After Captain DuBois completed his talk with the Pentagon, Mr. Timberlake asked to speak to the Chief of Staff. General Lemnitzer handled the call from the Pentagon. While this was going on, Col. Steve Cerwin, K6OJO/4, was keeping the channel clear with his linear while Col. Ken Keyte, W4GGA, was making the calls and getting the message channels ready. The team work on the part of these two individuals was fantastic. Nothing like this ever did happen to me during my 27 years as a ham.

This went on and on for 30 days, around the clock; no let-up, no propagation difficulties, solid contacts night after night. Bill at K4NAA, the Navy’s “bird dog”, made sure every night that Ken and Steve would get on by calling them up and letting them know that the “Frenchman” was looking for them. Anyone in the Embassy who had relatives in the States had direct conversations with their loved ones. At this stage of the game nothing was impossible. Chicago, Philadelphia, Boston, Atlanta, etc., came rolling in one after the other.

Summing up this story, Ambassador Timberlake during his trip to Washington kept us abreast of all instructions he had for his people at the Embassy in Leopoldville through the facilities of W4GGA. While in the Congo he shared my operations till the wee hours in the morning in order that he could talk to his family in Michigan through the help of W8DNS, DL4GJ, DL4ME, AE1US, DL4SD, W2CAA, W4GGA, K6OJO/4, K4NAA, and DL4NAC, as well as hundreds of operators too numerous to mention here, deserve credit for helping us out. I was informed that all QSL cards were to be honored by the Embassy during September.

In conclusion, I want to thank each and every one of you who helped make this story possible. If it hadn’t been for you, I couldn’t have made this dream come true. The Bible was a coincidence: it was used on the 20th of July for a good purpose — you see, that’s the day the Ambassador was sworn in. It reads:

... “Thanks to FreNCY, for the use of his Bible. On this day, 20 July 1960, I was sworn in as Ambassador of the United States of America ...”

(signed) Clare M. Timberlake

---

Each Christmas day the Old Pueblo and the Catalina Radio Clubs in Tucson sponsor Operation 52, so that children at the National Foundation for Asthmatic Children may call by ham radio to their parents all over the country. If you would like to help out in this project, write to W. F. McCaughhey, K7CET, 2549 Florence Drive, Tucson, Arizona. Also, monitor these frequencies on Christmas Day — 28,680, 29,280, 29,300, 29,320, 21,330, 21,390, 14,245, 14,290, 7205 and 7245 kc. The call to listen for is W7GV portable Tucson. If you monitor these same frequencies prior to Christmas Day, you may be able to arrange schedules ahead of time. Last year some 90 amateurs participated in this project, and each one received a copy of the certificate shown at the left.
I.A.R.U. News

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below. Cards for territories and possessions not listed separately can be mailed to the bureau in the parent country; e.g., cards for French Camerons (FES) go to REF in France; cards for VP5s go to RSGB in England. W, K, VZ and VO stations only may send foreign cards for which no bureau is listed to ARRL.

For service on incoming foreign cards, see list of domestic bureaus in most QSTs under “ARRL QSL Bureau.” Bold face listings indicate corrections or additions.

Algeria: G. Deville, F59RW, Box 21, Maison-Carrée, Alger
Angola: L.A.R.A., P.O. Box 884, Luanda.
Argentina: LACA, Carlos Calvo 1124, Buenos Aires
Australia: W.L.A., Box 2011 W, G.P.O., Melbourne
Austria: Oe. V.S.V., Vienna 1/9, Box 999
Azores: Via Portugal
Bahamas: C.N., Albou Telecommunications Dept., Nassau
Barbados: Arthur St. Farmer, Storma Gifts, Brandsia, DuCane Road, St. Michael
Belgium: U.B.A., Postbox 834, Brussels
Bermuda: R.S.B., P.O. Box 275, Hamilton
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: I.A.B.R.E., Caixa Postal 2153, Rio de Janeiro
British Guiana: D. E. Young, VP5YG, Box 325 Georgetown
British Honduras: L. H. Alpuche, VP1HA, P.O. Box 1, El Cayo
Bulgaria: Box 839, Sofia
Burma: B.A.R.S. % Tara Singh, 187 Eden St., Rangoon, Burma
Cayman Islands: Charles Smalley, KB6BH, % F.A.A., USB 1521, George Town, Grand Cayman
Czechoslovakia: C.A.Y., P.O. Box 69, Prague I
Denmark: K.D.R., QSL Bureau, Insstrup
Dominica: VP2DA, Box 84, Roseau, Dominica, Windward Islands
Dominican Republic: Jose de los S. Perkins, P.O. Box 157, Ciudad Trujillo
East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony
Equador: Guayasqull Radio Club, P.O. Box 5757, Guayasquil
Ethiopia: Telecommunications Amateur Radio Club, P.O. Box 1837, Addis Ababa
Estonia: S. H. Mayne, VR2AS, Victoria Parade, Suva
Finland: SRLA, Box 369, Helsinki
Fiji: S. H. Mayne, VR2AS, Victoria Parade, Suva
Germany (DL2 calls only): G. E. Herr, G3IEC, 10 Seehaus, Cape Towns, England
Germany (DL4 calls only): DL4 QSL Bureau, % DL4ABA, 5th Comm., APO 109, N. Y., N. Y.

Germany (DL5 calls only): Via France
Germany (other than above): D.A.R.C., Box 99, Munich 27
Gibraltar: E. D. Wills, ZB21, 9 Naval Hospital Road
Ghana: G9IAB, John Burton, Telecommunication School, Post & Telecommunication Dept., Accra
Great Britain and British Empire: A. Milne, 29 Kechil
Guatemala: A.6, 8 Plater, Bromley, Kent
Greece: George Zarralis, P.O. Box 564, Athens
Greece (Unlisted SV8s only): USAGS, APO 206, New York, N. Y.
Greenland (OZs only): Via Denmark
Guam: M.A.R.C., Box 145, Agana, Guam, Marianas Islands
Guatemala Bay: Guatemalan Amateur Radio Club, Box 55, NAS, Navy 115, F.P.O., New York, N. Y.
Guatemala: C.R.A.G., P.O. Box 115, Guatemala City
Haiti: Radio Club d’Haiti, Box 139, Port-au-Prince
Honduras: O. A. Trochea, P.O. Box 214, Tequeguilaya, D. O.
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong
Hungary: M.S.R.R., Postbox 186, Budapest 4
Iceland: Isolekstir Radio Amateur, Box 1088, Reykjavik
India: P.O. Box 534, New Delhi
Ireland: I.R.T.S., QSL Bureau, 39 Booterstown Ave., Blackrock, Co. Dublin
Israel: I.A.R.C., P.O. Box 4900, Tel-Aviv
Italy: A.R.I. Viale Vittorio Veneto 12, Milan, Italy
Japan (AI): J.A.R.L., Box 377, Tokyo
Kenya: East Africa QSL Bureau, Box 1313, Nairobi
Korea: Korea Amateur Radio League, Central Box 162, Seoul, Korea
Kuwait: William N. Burges, 9K2AZ, % Kuwait Oil Co. 14 — 5th St. North, Kuwait, Persian Gulf
Lebanon: R.A.L., Ammadi, B.F. 3254, Beyrouth
Libya: (ESA only) HARC, P.O. Box 32, Harbed
Libyan: 4ATZ, Box 372, Tripoli
Liechtenstein: via Switzerland
Luxembourg: (ESA only) HARC, P.O. Box 32, Harbed
Macao: Via Hong Kong
Madagascar: P.O. Box 367, Tananarive
Madeira Island: P.O. Box 257, Funchal
Malaysia: QSL Manager, Box 777, Kuala Lumpur
Malta: R. F. Gales, ZB1E, “Coca Gales,” Railway Road, Birkirkara
Mauritius: Paul L’Abeche, VQ8AD, Box 407, Port Louis
Mexico: L.M.R.E., P.O. Box 907, Mexico, D.F.
Midway Island: KKAQ, AIRSARSON Two Detachment, Midway Navy #9089, F.P.O. San Francisco, Calif.
Monaco: 3A2CN, Anderholt Pierre
Montserrat: VP2NN, Plymouth
Morocco: A.A.M.E., P.O. Box 2000, Casablanca
Mozambique: Lá dos Radio-Emissores de Moçambique, P.O. Box 812, Lourenco Marques
Netherlands: V.E.R.O.N., Postbox 490, Rotterdam
Netherlands Antilles (Aruba): Verona, Postbox 392, San Nicolas, Aruba
Netherlands Antilles (Curaçao): Verona, Postbox 388, Willemstad, Curaçao
New Guinea: Via Papua
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington CI
Nicaragua: Club de Radio Experimentadores de Nicarag, Agajaro Posto 925, Matagalpa
Nigeria: Dr. M. Dunsfield, ZD2JKO, Regional Research Station, Samaru, Zaria, Northern Nigeria
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe

(Continued on page 195)
Outside the communications trailer K2DEI set up its v.h.f. station on 6 and 2. Seated in this picture are Edith Rosner, W3AAU; George Ryan, K2DEI; and Bob Stanley, WA2HJL. Standing are two Boy Scout runners and Lionel Miller, W3YPT.

**Project Scouting**

BY EDITH ROSNER,* W3AAU

Early this year a member of the Short Skip Radio Club was asked to supply communications for the Boy Scout Camporee in July. Because of the number of operating personnel and the number of rigs required, Short Skip could not handle the job alone and took the matter to the Council of Delaware Valley Radio Amateurs. Would the member Clubs of the Council be interested? The answer was "yes", and President Harold Carr, W3JFI, appointed Dick Berens, W3UMK, and Edith Rosner, W3AAU, co-chairmen of "Project Scouting."

The Boy Scouts were celebrating the 50th anniversary of scouting in America, and Scout Headquarters had requested that we supply both local communications within the compound and DX communications to the National Jamboree in Colorado Springs, from July 22 to July 24.

Meetings held with the representatives of the participating clubs and the Boy Scout officials produced the idea that this project could best be handled as a cross between Field Day and CD operations, so all our plans were laid with that in mind. In the past years the Scouts had used land lines or "wig-wag". Wig-wag was inefficient, and land lines were both inefficient and expensive. Ham radio could do what land lines couldn't — at least, here was a chance to try to prove it. Besides, the Scouts have a merit badge for communications, and we would also have the opportunity of arousing interest in ham radio as a hobby.

We were fortunate from the beginning in that our contact with Scout Headquarters and with Chief Edgar Grimm, who is Communications Chief for the City, would be Tony Repici. Tony is W3PGR, as well as a member of Chief Grimm's staff and an active participant in scouting. For this event, Chief Grimm would be in charge of communications and Tony his liaison officer.

The plans worked out by "Project Scouting" resulted in the following lineup. Either 2 or 6 meters would be used at the seven field sites, and rigs for both frequencies would be in operation at Communications Headquarters. A ten-meter station and a rig for DX on 20 meters would also be in operation at headquarters. Since the field stations would be a mile apart, 6 and 2 would be perfect and ten would be our link with the outside world. The city provided an antenna tower and a flag pole on which to mount the 20-meter beam and the high-frequency antennas, plus the man power to raise all the antennas. Particular clubs would be assigned to specified areas, bringing in their own equipment for either 6 or 2, maintaining their own stations and providing their own operating personnel. They would have relief and mobile back-up from the clubs who did not supply equipment, since in all cases but one each field station would be handling communications for from two to four Scout Districts, varying in size.

On the afternoon of July 22, headquarters station K2AA/3 went on the air on both 2 and 6 and special event station K3BSA pounded out its first CQ on 20. The field stations using their club calls checked in with headquarters one by one. All headquarters stations were housed in a city-owned communications trailer, but the wonderful weather and close proximity of operation caused George Ryan, K2DEI, to move the 6- and 2-meter stations to a table outside of the trailer, leaving Jon Balch, K3HWX, with the Pacemaker and NC-300 in the van looking for the special event call in Colorado Springs — K0BSA.

Then the trouble started. Two field rigs went out of order and our back-up gear had to be put into immediate operation. Using mobiles, Dick Custer, K3KDP, and Dick Berens, W3UMK, held down the sites until the fixed stations were back on the air, and for the rest of the week end the two Dicks and W3DJW, Jack Mahoney, chased all over the place supplying tanks of propane and cans of oil for the 1250-watt a.c. generators loaned to us by the Bell Telephone Co. through Bill Burnet, W3UFW. Bill had checked out the generators beforehand, and thanks to his foresight the propane tanks supplied us were good for 13 to 27 hours operating time. This saved us from having to lug in any big generator, as well as solving the possible problem of operating entirely from batteries.

The next problem to develop was interference on 146 Mc. This was traced to a city fire radio unit operating from the trailer. So a bunch of Lower Merion Township RACES crystals for 147 Mc. were quickly supplied by their Radio Officer, George Walker, K3EZJ.

* 645 Artwood Drive, Philadelphia 11.
The Phil-Mont Communications truck moved into place to provide a link with the outside via 2 and 10 and Mt. Airy VHF did the same on 6 meters.

In less than two hours, the communications problems smoothed themselves out and traffic commenced. We supplied the scout trading posts with soft drinks (and ice), scout neckerchiefs, and located lost boys and missing parents. But the bulk of our operations came from a source we did not think would keep us so busy. Accidents. We had everything from a splinter in the finger to compound fractures. There were cases of poison ivy, insect bites, stomach aches, heat prostration, and the usual assortment of major and minor ills that one might find in a camp of 5000 scouts, their scout leaders, parents, relatives and any curious or interested parties that showed up during the day. To cover these emergencies, the station farthest from headquarters and the headquarters station were kept in operation all night. All other stations operated from 6 a.m. until 10 p.m. While K3EZJ monitored his all-night station, sleeping in his car, K2DEI at headquarters spent the first night sleeping on a table and the second on a cot beside the rig.

With any event of this type there is bound to be at least one irritating difficulty. Ours was the absence of parking immediately adjacent to headquarters. In fact, we got moved from one place to another half a dozen times a day. Even the co-chairmen were not immune. One park guard refused to believe that a YL could have anything to do with the communications, so I had to sit on the road until Dick Custer came out and convinced the guard that since I was trustee of K3BSA, the station couldn't operate without my presence. What Dick failed to tell the guard was that Jon Balch who was doing the operating had the ticket in the operating shack. Dick Berens had his troubles with the guards, too. He had been in and out of a fairly inaccessible site half a dozen times one day, when finally a guard refused to let him back in. Dick found an opening to drive through that the guard couldn't watch.

Then, when the hospital tent located at headquarters, got busy, orders went out that only the special ambulances assigned to site could pick up the injured, and then only at the direction of the doctor in charge. Mobiles were no longer allowed to bring any patients into the hospital. A few hours later, the decision was reversed and two mobiles, one on 6 and the other on 2, had ambulance signs on the windshield, and were on their way to the rescue. The only trouble was that the guards had not been told, and the Hambulances had their troubles getting into the sites. The guards ignored the signs — they had their orders that no cars were to go through that road! Yet, this is where ham radio proved its versatility. We had direct contact with the two Hambulances. Direct contact with the regular ambulances was not available. Information handed down to us after the event was over indicated that on Saturday, the biggest day of the event, 39 calls came in for ambulance service alone. This does not include the requests that were radioed into headquarters for the advice of the doctor.

On Sunday afternoon all the stations remained on the air while the camp sites folded up, and reported to headquarters on the final official check out of each camp site. Then, as the Bell Telephone Co. truck moved the generators out, the 10-meter mobiles moved in to maintain communications for the final countdown.

One wonders at this point if we had known in advance the beating both we and our equipment would take, would we have gone through with it. Would we do it again? All you have to do is ask.

The Delaware Valley Council of Radio Amateurs is appreciative of the participation of the members of the following clubs:

- Bucks County
- Bucks-Mont Teenagers
- Delco
- Eastern Penna.
- Main Line VHF
- Mobile Sixers
- Mount Airy VHF
- North Penn
- Oxtor Circle

Bucks County  Penn-Jersey YL's
Bucks-Mont Teenagers  Phil-Mont Mobile
Delco  Short Skip
Eastern Penna.  South Jersey
Main Line VHF  South Phila.
Mobile Sixers  West Phila.
Mount Airy VHF  807 Society of Central
North Penn  High
Oxtor Circle

Inside the communications trailer are, seated, Jon Balch, K3HWW, and Edith Rosner, W3AAU. Standing are Dick Custer, K3KDP, and Toni Bayliss, K3CJC.
Those Crowded W1AW Code Practice Frequencies

A New Ham Speaks His Piece

BY WILLIAM F. BENNETT,* HCIWB

The writer has seen very little written on what must be a major problem for Novices and newly-licensed hams—the difficulty we have in working the W1AW code practice frequencies to improve our speed, because of the QRM from other stations.

I'm a new ham, licensed only a couple of months, and perhaps I shouldn't speak up in church yet, but someone should give voice to this practice problem on behalf of several thousand of us, who have that all-consuming ambition to reach the proud goal of being able to copy 20 w.p.m., and to get a certificate from ARRL to prove it.

As a newcomer to ARRL, this situation puzzles me. I joined the League with a considerable degree of awe and respect for the League and its members. I felt that W1AW's nightly code practice was one of the League's most valuable services.

I had assumed that with most hams aware that ARRL was going to considerable expense and effort to provide such a service, and with the code of mutual helpfulness that characterizes ham radio, there would exist an unwritten gentlemen's agreement among hams to stay clear of W1AW's practice frequencies during the one hour nightly that the code transmissions were under way, to give the novices a break.

As those of more experience than myself well know, I had a shockingly rude awakening when I started attempting to copy W1AW regularly three months ago. Every time I fired up my receiver, it sounded as if every station in the world had a schedule promptly at 0130 GMT, and they operated as if there was a law requiring them to stay exactly on 3555, 7080, 14,100, 21,075, and 28,080, W1AW's practice frequencies all across the bands. Of course, all of us have tried many other methods of improving our code skill, working other c.w. operators, practice buzzers, etc. I chose to use W1AW after considerable thought, because of three advantages it offered:

1. Its practice sessions are under actual conditions, on the air, with the usual— I thought—normal QRM, so that an apprentice would automatically learn to read code through interference.
2. W1AW transmissions enabled an amateur to learn to recognize an accepted standard of proper spacing of words and letters, so that his own sending could be modeled on that same crispness and tempo, and all this for free.
3. Because the ARRL qualification certificate serves as a real incentive for an amateur to continue increasing his speed, and provides a visible symbol of his achievement, so he has an accurate objective measurement of his progress. To me, this was an important factor in keeping at the grind of practice.

So, for three consecutive months, I have endeavored to copy enough of W1AW's qualifying transmissions to obtain a certificate. In the beginning, I thought it would be simple.

My QTH is Quito, Ecuador, which we regard as the amateur's dream of a ham location. We are on the equator, on top of the Andes mountain. My own antenna is 9065 feet above sea level, near a mountain top, and 50 feet above an almost ideal ground plane. It is the highest in Quito, and, I believe, one of the highest between Peru and Alaska. There is little local interference. Propagation is straight into the wild blue yonder, in any direction.

So every night, I have gulped my dinner, pretended I didn't hear the XYL's hopeful suggestion that there was a good movie on, and adjourned to my shack, to get the rig thoroughly warmed up before that fatal hour of 0130 GMT (0230 from November through April), when the long count began and W1AW was on the air.

Then began an hour that no human being should be compelled to suffer through. An hour that ran the full gamut of emotions: hope, disappointment, irritation, anger, shock, frustration, and a general disillusionment with fellow hams in general. I was willing to take an oath there is more QRM on W1AW's five frequencies than on all the rest of the bands combined. I was never able to copy more than bits and pieces of practice sessions, and no qualifying runs.

The climax came on the night of September 21. I was determined to catch the qualifying run that night and prepared for it.

I tied my old home brew receiver to a 40-meter dipole. My Heathkit Mohawk was hooked to a

*American Embassy, Quito, Ecuador.
separate 20-meter dipole. My Collins 51J-4 was hitched to a Mosley T-33, jr. beam, and all of this array was centered on Hartford, Conn., U. S. A.

Everything started beautifully. I got the long, clear call 5-8-8. I had the tuner tuned in on 10, 15, 20 and 40 meters. It was cornered on all bands but the 80, with two speakers and my earphones singing out loud and clear. I settled down triumphantly to my typewriter, confident I couldn't miss.

Here it came, the 10 w.p.m. qualifying run:

"W1AW nw — through it the American boy today knows more about electricity and its use —"

"Bang!" I had heard it coming, the howl of a carrier as a station tuned up exactly on my earphone 40-meter frequency, then a W2 near New York came crashing through with a full kilowatt, blithely calling CQ. I could picture a thousand of us neophytes frantically reaching for our dials with words for which there are no Q signals.

I jerked off my earphones, flicked off the home-brew rig, turned up the gain on the Mohawk, and prayed I hadn't missed much copy. By that time a W4 was pounding merrily away on 20. But in 30 seconds he was elbowed by a high-speed bug, who was sending so fast I could still read copy through him. So I caught:

"often owns up soft and lost generation. I have —"

And so help me, another bland soul came along, sending at the same speed as W1AW, on the same frequency. He was righteous. I managed to catch:

"The past year somewhat extended this wave band." Then it was hopeless. I flipped to the 15-meter band. There W1AW was buried three deep (I counted them) but the Collins could weed them out enough so I could faintly hear my signal. I thought I caught:

"Shows that this conference may dismiss the objections that have been raised to this action."

Then my Latin friends got into the act. Two Colombian phone stations came on simultaneously on the same frequency, with "Say coo, say coo, say coo" and my qualification session was finished.

I sat a moment looking silently at all my gear, in deep and bitter frustration. My XYL came in and listened to all the receivers chirping away.

"Sounds like a pond full of bull frogs, doesn’t it?" she commented. I didn’t answer, but after thinking a moment, I concluded she was more right than she knew.

I wonder whether veteran brass pounders are aware of the way some of their operating methods are hampering the efforts of their own League to help us newcomers become proficient c.w. men ourselves. There are still many of us who prefer c.w. to phone, and we need opportunity to work W1AW for an hour or two if we are to learn.

For myself, I intend to keep trying, in the hope that some wise chance some qualifying night, the bands will be clear enough for me to earn that prized certificate. On behalf of all those working for proficiency and Certification of Code Speed may we ask for cooperation in giving W1AW a clearer channel in the period starting at 0130 GMT each evening!

Strays

Is this a first? WSULTA, operating K5VGT mobile, worked K5PYS who was on a Ferris wheel set up at the Mississippi-Alabama State Fair. Both stations were using surplus walkie-talkies on 75-meter phone. Hmmm — was K5PYS mobile or portable? See also the item on page 10, this issue.

W1UG built himself a field-strength meter and straightened out a coat-hanger to use as an antenna. But W1UWW (a YL) decided that a glove dryer would present a much more arresting appearance to any r.f. floating around. So, instead of an "r.f. sniffer," W1UG has an "r.f. grabber."

December 1960

83
Summary of Rules — 1961 ARRL DX Contest

All amateur radio operators throughout the world are invited to participate in the 27th ARRL International DX Competition. You may earn a certificate of performance award issued to the top phone and c.w. scorer in each country. For those DX stations that do not receive complete DX Contest rules (next month in QST) in time for the contest, presented here is a summary of the rules for the 1961 ARRL DX Contest.

1. DATES:
This 1961 DX Contest will be held two week ends for c.w. and two week ends for phone as follows:

PHONE: February 3–5 and March 3–5
C.W.: February 17–19 and March 17–19

S.s.b. as well as a.m. stations are invited to participate in the phone contest.

2. TIMES:
The starting time in each instance is 2400 GMT Friday and ends 2400 GMT Sunday. Phone and c.w. are separate contests.

3. OBJECT:
The rules are unchanged from last year. DX stations try to QSO as many W-K-VE-VO-KH6-KL7 stations as possible during the contest in as many different call areas possible per band.

4. EXCHANGES:
DX stations send RS or RST report followed by a three-digit number representing power input. For example, on c.w. you might send 579050, which means RST 579 and power input 50 watts. U.S. A.-Canada stations will send a number consisting of RS or RST report followed by the name of their state or province. This is the list of state and province abbreviations:

W1 — CONN MAINE MASS NH RI VT
W2 — NJ NY
W3 — DEL MD PA DC
W4 — ALA FLA GA KY NC SC TENN VA
W5 — ARK LA MISS NMEX OKLA TEXAS
W6 — CAL
W7 — HAWAII
W8 — ARIZ IDAHO MONT NEV ORE UTAH WASH WYO
W9 — ILL IND WIS
W9 — ALASKA
W9 — MICH OHIO WVA
W9 — ILL IND WIS
W2 — COLO IOWA KANS MINN MO
W3 — NEBR NDAK SDAK
W5 — NB NS PEI
W6 — MAN
W7 — SASK
W8 — ALTA
W9 — BC
W9 — NWT YUKON
W9 — NFPL LAB

5. SCORING:
Repeat QSOs on additional bands are permitted. Your multiplier is the total call areas (not states) QSOed on each band (maximum of 21 per band). The 21 call areas are listed above. Each completed QSO counts three (3) points. For DX stations incomplete contacts count two (2) points. FINAL SCORE is the number of QSO-points times the multiplier.

6. ENTRY:
Free log forms are available on request from ARRL. You don’t have to use these forms. Logs should contain calls, dates, times, bands, exchanges, and points. Sign your name to the statement: “I have observed all competition rules and regulations for my country.” Send your log with summary data to:

ARRL DX CONTEST
38 LASALLE ROAD
WEST HARTFORD 7, CONN., U. S. A.

Your entry must be postmarked by April 29, 1961 to be eligible.
How:

'Twas the night before Christmas and all through the house strod Alvis Readinquist, feeling much relieved after posting his latest lamen to ARRL Hq. The theme: Alvis had beaten himself to a pulp and had alienated his loved ones in a struggle to the 250-country mark; i.e., DXCC is too hard and the Countries List is too short. It was the third such letter he had mailed this week. He thought it by far his best, for he was beginning to get the hang of it. Alvis doffed his duds, put a few finishing touches on the arrangement of presents under his Christmas tree, and was fast asleep almost before he hit the pillow.

... That last outburst to Hq. must have been a masterpiece, he mused, now heading for his cozy cellar hamshack. Action? Did Alvis Readinquist get action! The Awards Committee had immediately added Brooklyn, Capistrano and the King ranch to the List. Not only that; DXpeditions had been acknowledged to be quite inconvenient in some cases, so ARRL had seeded all inaccessible countries with Courier-type satellite transceivers that automatically handle pipe-ups and transmit daily log transcripts to West Hartford for immediate QSL issuance by IBM servos. No need to worry about those old bothers, skip and smups, either, because the sky had been filled with signal-reflecting ARRLL balloons. But this automation angle is only half the story.

Because the time, skill and diligence required to qualify for the DX Century Club were deemed a hardship by some amateurs, installment-plan DXCC had been introduced. Now, through arrangement with Friendly Freddy of the Longhaul Acceptance Corporation, DXCC certificates are issued to all amateurs as soon as they get their licenses. No countries down, and easy payments of, say, five countries per month. Moreover, a DXer whose credit-rating check turns up a mountaintop QTH, a six-element beam and unlimited operating time can obtain his DXCC-400 endorsement on quite reasonable terms.

(5) What:

Well! Now that another uproarious ARRL Sweepstakes is history DX men can sneeze back down into the fourth layer without imminent danger of shell shock. And we expect 1960’s home stretch with plenty of DX action afoot from 10 through 100 meters. Let’s get this month’s intercontinental activity analysis underway now with a look at 40 c.w., a congested slot now called upon to support more and more international nighttime communication as higher frequencies gradually soften. Our informants, K2JXX, W3QOS, K4s ITH MPK, W6RCV, K6s CIF LAE, W7s DLU LZF, K7KPM, R8NHG, WJFJN, KOAIMS, KB90VG, plus the members of ISW, NCDXC and VERON, stress the 7-Mc. c.w. availability of CN2FZ, CN8AM, CT2BO, EL4A, FG7XP (7010 kr.) 88 hours GMT, GG2FZC, GC2A UY, K4CDZ/YES 9 (59 3-4 on Resolution lane, KQTFP/KW6 9., K4CJL, LA2F/EF mm 5., L83DOK, LX1XBG, L22KSK, MP4BCY (25) 19, OA4 11LY 4FA (17) 5, PYS 1ADA ILY 5GA 7SW, PZ4UB, UAs 1KGA 6KBR 9KB 9KB 9KB 9KB, UAs 6KBR, J6AAG (7) 5., UF6FN (35) 18, UL7s CG 3916-17, FA KKB, U1IAZ, U2KAE, V9A 9UX (35) 29, 40PM, V9S JAR 3RS 4LE REM 94D (20) 6, VOs 2HR (20) 22, JCC (35) 20-31.

*SURE WE CAN BUILD ANOTHER QUAD, JEEVES, BUT WHAT CAN WE SAY TO THE KIDS?

*7862-B West Lawrence Ave., Chicago 31, Ill.
December 1960

87
RM/288 aren't anxious to receive W/K QSLS but they promise to write cards out for all contacts and ship the works to K2FJN for distribution. Yanks expecting QSLS from this October Basutoland DXpedition should file s.a.s.e. with Alice and stand by..."I am most concerned about my QSL situation, writes OK5GM to W8XX. "I've sent cards out for all those received and am now working back through the log to bring things up to 100 per cent. I am told that they haven't received their QSO GM QSLS. Is mail pickup behind? Is there a colorful postage?..."Just returned home to G3HIP," writes ex-ZD2HIP, "and I thank all my W/K friends for the QSLS found waiting for me if anyone has not yet received confirmation of their ZD2HIP contact by now I'll be pleased to put things right. I will be off to VE1-land soon..."W1PWO confirms that F3CA and MA are up and the same station, the SSO Thome enterprise of CROCA..."VQ8BC, ex-EX3BG, to ZD2BEN and S8TAE, covers 100-per-cent report to QSLS in a letter to G3QCX's DX logs. "I promise to remain very active here for the next two years and then probably will become G3JKI again..."F7TAG answers QSLS thoroughly and reports fast, but s.a.e. and ICRC are musts," advise VERON's DX press. "Same goes for F4ABJ. ..."Even a fellow with such a call as ZD1AW complains of poor QSLS return from rare DX, observes K3ZTD..."Just received more cards from the printers," comments ex-ZD2HJG, "and I hope to confirm all contacts in the near future. He's reachable through Z8CB."

Occetania — "The XYL, new first harmonic and I arrived in Nicaragua a few weeks ago..." states ex-KM5JP-61225F, lately of concocted station, and now in charge of W8XX, and generally setting up house. I unpacked some bundles and a watch and found them through bringing back thoughts of QSOs on Chuck. As I write and really still am quite a new amateur, looking back to my working end, I find the old logbook I find that my first contact on Coca-Cola was a DL, then a UA. It took a couple of days before his W7A and Z8A got wind that I was in the air! I expect to be fairly busy here for a few more months before I get down to any hamming. Sold my rig before I left the islands some nine months ago, so will be starting from scratch again, probably with something really small and portable. Will be in contact in one or two years. I am planning a lot of DL and ICRC work, and if you have QSLs to be exchanged, and calls not addressed to needy candidates... International Reply Coupons are neither needed nor desired by SVBVT of Creta, hears 8A51DI of K2XX, and Q5Q1MB voices a similar regret over his way. K8BN has nearly a thousand other overseas requests for non-telegraph QSLing. Don't throw those old CBs away; ship a letter to K8BN with self-addressed stamped envelope stating how many you have to send overseas, and CBs will respond with calls and addresses of needy candidates..."

Oceania — "Just a note to say that I am now working on K6 at this time. I have been working on my DX pileup and have just sent out a few more cards. If anyone has not yet received confirmation of their contact with me, they should send a s.a.e. and ICRC, please..."

Europe — "K6MC, in a clipping from San Gabriel Radio Club's bulletin forwarded by K6CJF, gives several pointers to DXers who would employ Moscow's Box 88 bureau. Use the plainest and simplest QSLs possible, little more specific than date and time of QSO, signal report, band and mode. Cards bearing illustrations, equipment descriptions, personal notes, etc., are said to have little chance of QSP..."

DLS — "Via K8BN, 6A31PSI of the DIAMET co-op reports almost all his QSLing is now handled by the bureau. K2KMB voices a similar regret over his way. K8BN has nearly a thousand other overseas requests for non-telegraph QSLs. Don't throw those old CBs away; ship a letter to K8BN with self-addressed stamped envelope stating how many you have to send overseas, and CBs will respond with calls and addresses of needy candidates..."

Nordic DX — "Just a note to say that I am now working on K6 at this time. I have been working on my DX pileup and have just sent out a few more cards. If anyone has not yet received confirmation of their contact with me, they should send a s.a.e. and ICRC, please..."

Hereabouts — "From ZD2US, formerly V2PLO: "I've

This panel features several outstanding rare-DX personalities of the dying year. At left are W2AYN/EP-EPSX-EQ2AT and W32A/EP-OQ5CT/etc., shown on the Caspian show looking toward UH-60 and Center. Lichstein DXpeditioner H87T1 signed H81T1/F1 with that triband quad and KWM-1 for some 600 sideband QSLs with 65 countries during a 10-day July junket... At right we meet PX1PQ staffers DLs 9PF and 7AH who amassed 4712 midsummer Andorra contacts on several bands. Much credit goes to the performance of that generator, too."
received a number of cards claiming contacts with VP2LO
In this year's ARRL DX Competition. Unfortunately I
closed down as VP2LO at the beginning of January, arriving
in Nigeria in July after a spell in England. So far as I
know, nobody has taken over my call and I can only assume
that shaps may have been misreading some other station,
possibly a 2L2 while I was licensed late in 30. I have QSL'd
all contacts made by VP2LO, direct where ILC was re-
ceived, otherwise via the relevant bureau. However, if
anybody hasn't received a desired card he can reach me
through [the ZD2US address to follow] and I will acknowl-
edge direct provided an ILC is enclosed. --- DL1KV,
second up on at HK4AH, states: "A strict stop-forward QSL
policy will be maintained, and cards will go only via bu-
reaus. European QSLs will be received and answered via
DL2B. No CBQs sent through LORAE at Brazoria."
--- K3ANP, accompanied by W7HVH, run up
many XE8ANP QSLs south of the border this summer.
"Tell the gang it will be a month or so before I can QSL
because the cards are coming up through Mexico City,
S.s.a.r. we will merit QSL direct."
--- "I have deployed F1LGR l.a. as F1LGP. K1RL, KDJZ-1, P1QF, KL4MR, G3APT, M/Sgt. Wm. H. Otto to W1WPO of the ARRL DXCC
Hall. I now call my F7 call at 1962 AACSBN, Box 190,
APQ No. 10. New York, NYZ. Three reasons: dismis-
seminating FPPR QSLs on October Ist for the productive
St. Pierre sorties of W2KGE, K5A LSU and QOA. S.s.a.r.s.
are receiving the 300 who sent cards to Bill without
providing the necessary return transportation.
try again. --- K2TD rushed off a thousand QSLs in
the States and mailed the PSE-QSLs he had received but only 256
in return. "Hereafter my policy is to answer all cards via
bureau. I find the phone boys to be much better QSLRs
than those I have been mailing. W4ICMI, with much ex-
perience as a QSL agent for overseas DX, protests the number
of State-side applicants who do not (1) enclose self-addressed
stamped envelopes with their QSLs, (2) take proper care
in dating QSLs, and (3) use QMT, the only feasible interna-
tional time reference. "I hate to complain, but I'm not
about to start knocking about in addition to the long hours
required, to deal with jokers who don't bother to send return
envelopes properly stamped and addressed. I'd rather be
chasing DX myself!" W1OPE remarks on the same subject,
"I've found Stateside QSL agents wonderfully helpful although a few can give little
service, with the latter I believe the main fault lies with
the DX station that makes QSLs but fails to keep his W4
QSL manager supplied with log data. A good system of
branition should be averted upon before anyone takes on such a
job." Anyway, K9SRR is another volunteer for rare-
DX QSL assistance. --- W7DJD finds spotsy DX conditions
favoring QSLing too difficult to break in the general
and general station bookkeeping up to date. Perhaps we all
and Old Sol's periodic moratorium on easy round-the-clock
DX to bring order to QSL chaos. --- W5ZP, W5GJ, K4JA,
K6BP, K6FZ, W5UZ, K6KI, K5TH, W5TQ and others
are working on their log books. Say, W7DJD's QSL records
were built by combustion, resulting in the need for trans-
mission of W5ZP AE and K5TH, K4JA, MP2AC, Z00's RO and UN.
Furthermore, only a desire to catch up with ex-W5LIA who operated W5LCA/K6J
and was KO3KI. I want a QSL because it happened to EASAW of E40DO Inari sport, and
W8YOR will settle for the current whereabouts of ex-KA2HS
as he claims it doesn't want to know who ended up
WD6P, K6 JLF LVV, W2X G15 UMP, K2S TDI UY
YRF, W2KMR, W3JW, K 8K9KH, W4LV, K8MPF, K5AS, WO4Q, K644B, W5KEM,
LA8 QZL ROU STZ, WA6FCX, W7L LZE UVP, K7KPM,
W8S JSU KX, K5X DXU NHQ QSX, W9LNQ, K9UH, OLA seen W7IEC, K9UH, K644BC, E22ED,
V5PVY, ZD2JS, Hong Kong Amateur Radio Transmitters
Society, International Short Wave League, Japan DX
Radio Club, Radio Vona Radio Club, New York New
Radio Club, No. Calif. DX Club, Ohio Valley Amateur
Radio Association, Universal Radio DX Club, VERNON
of Poland and Bdad DX Club have come up with in the
line of postal matter:
AC4AX, D. Seel. Box 1, Munner, Travancore, India
CA4AI, Jose Cidloa, Box 77, Bissau, Portuguese Guinea
CR5S CA MA (to CR5CA)
CR9AN, Rue Bispo Medeiros 30b, Macao
CR9AU (W/CR9AU)
DL4ALP, SFC 0, Macon, Qtrs. 9F, New York Rd., American
Housing Area, Butzbach, Germany
DQ5BR, Box 252, New York, N.Y.
DM3PBN, P. Sasse, Wolfsmullen Str. 26k, Swereirth via
Leipzig C2, Germany (D.R.R.)
RO3K, K5KOE
EL2W, Liberian Air Taxi, P. O. Box 183, Monrovia, Liberia
FL4B, S. Peterson, Box 89, Monrovia, Liberia
EQAT, P. Borowik (W2AYN) c/o Interpol, Tehran, Iran
FF7AB, A. Dubois, Telecommunications, Nonakohot, Mau-
Mauritania
FF7AG, L. de Faulquier, Telecommunications, Nonakohot,
Mauritania
F8ASQ, P. Guillard, c/o Citrea, Box 253, Dolisie, Gabon
Rey
F8OSI, P. O. Box 449, Ft. Laney, Tehad
F8OSII, P. O. Box 135, Ft. Archambault, U.C.A.R.
F8OSIP, Box 41, Brazaville, Rep. of Congo
F7YYE (via W5JLJ)
F9IRR, R. Brouilet, c/o E. S.7. Imbassdy, Quito, Ecuador
F9SAQ, P. O. Box 109, Cuenca, Ecuador
HK3AH (see preceding text)
HK8AI (via W6MB)
HK8J (see preceding text)
H1MA AA AB (via W1QIV)
K6PSD, P. O. Box 8, La Paz, Honduras
HSIR (to W5Z0I; see preceding text)
JZ0PO, c/o Postmaster, Morant, Netherlands New
Guinea (to W2ZTN)
K4CZD/V68 (to K1CZD)
K6PSO/K1H6 (to K1H6DVG)
K5LKD/KW8, Layor La Banne, P. O. Box 68, Wake
Island
K6TPF/KW8, Layor La Banne, P. O. Box 68, Wake
Island
ex-KG1D/KL7LP (see preceding text)
KH1DVG, J. Montague, 1108 Kuki Pl., Honolulu,
Hawaii
KR6KU, B. Rosenberg, c/o OARC, APO 331, San Fran-
cisco, Calif.
K2C6J, P. O. Box 1749, Balboa, C. Z.
LA8YF/mm (via NNRK)
M4PBCY (via W5P1H)
ex-MP7TAF/V94D, Sgt. D. Lowe, Royals, Camp
Neossew, Bangor, Maine
OA4GM (via RCE)
ex-OQ5FH, Mrs. M. de Roeck, 69 rue J. B. Colonna,
Brussels, Belgium
RA8CAE, S. Konnominak on Amur, Eiber, S. U. S. R.
RB8KIA, Pottoschule of Communication, Kiefer,
Ukraine S. R., U. S. R.
RI8ABB, Charipur, Turkoman S. R., U. S. R.
RP2KKC, Kelme, Lithuanian S. R., U. S. R.
SM5EV/9Q5 (to N1MKV)
SV0WO (via SV1AA)
TV5R, R. Valverde, Querden, Costa Ries
U4AED, Polytechnic Institute, Penna, S. U. S. R.
UR5BF, Box 62, Odessa, Ukraine S. R., U. S. R.
UR5AG, Tashkent, Uzbek S. R., U. S. R.
VK2GP (via RU5CB)
ex-VK9JPF/9M2JE, J. M. Fulton, c/o Cable & Wireless,
Singapore
VK4KM, Box 122, Montserrat, W. I. (via W4CBK)
VP7NY, Box 1007, Nassau, Bahamas
W4XQZ (to DXC)
W9OM, J. R. Yendis, Mauritus
ex-V83B (to V83S)
VK1L, Christmas Island ARC, BPO 170, c/o Postmaster,
Hobart, Tasmania
V81K, S. Newton, RAF Tengah, Singapore
V82SS, S/2 Scout, Box 260, Brunei, Brunei
ex-V80E (via VI8L)
W4CJ, Mrs. Pat Miller (to VK4CJ)
W8ANP (to K5KKE)
xW80A (via BI2E)
YAI18 (via DL8AX)
Y16A EDA EDB, c/o U. S. Embassy, Managua, Nicaragua
Y51AP, Flight Information Office,国际机场, Bogota, Colombia
Y7U7L (via 9X9G)
Y7W0Z, Box 117, Maracaibo, Venezuela
Y7WH, Box 137, Barquisimeto, Venezuela
Y7X6EJ (via ROV)
Y7X6OC (via ROC)

ex-Z2H2I (via G3HHP)
Z32LX, A. & D. Strandfell (G3JLH), Audi Dept., Northwestern Region, Kaduna, Nigeria
ex-Z2H2I (via G3HHP)
Z51AR, B. Bo, P. O. Box 981, Capetown, C. P., S. Afr.
Z51AS O/ ZS5S RM, ZS5S (see preceding text)
Z51SH, L. Colson, 85 de Chavonnes St., Kaege Fk., Port Elizabeth, S. Afr.
Z51SDM, D. Moir, P. O. Box 1091, Windhoek, Southwest Africa

Z51S, 6 Clarence St., Bloemfontein, O.F.S., S. Afr.
Z51SAYF, P. O., Kilnwater, Transvaal, S. Afr.
Z51SAZV, P. O., Box 114, Bukavu, Congo Rep.
Z51SF, E. Prenot, Box 1071, Montevideo, Congo Rep.
Z51SM, D. Rechler, Box 1, Lima, Peru, Lima-1
Z51SU, J. Stock, Box 261, Lima, Peru, Lima-2
Z51SPD, Dr. Urcen, Box 110, Atrida, Rununda-Undundi

Notes: Positive and glorious results from the foregoing directory are possible but not guaranteed. Beats just ain’t coming.

1128S distributed many a phone QSO from Monaco this summer with the 100-watt 3A2XQ outfit above here. Monti had intended to follow up with a c.w. session from the Monte Carlo last month. (Photo via K4KYB)

Whence?
Asa — Iranian chatter via Wa 1B1M 2AYN and SSK:
"W3ZA and I worked some s.a., from a hotel room in Sari on the Caspian sea, making a few Stateside QSO’s," write 1B1M. "I am only left the KWMc with me in Tehran and I have been active with it. Also awaiting a Q51A, 100 power amplifier and Gonet receiver," writes 1B1M.

Z22LZU, P. O. Box 20, Agadir, Morroco, is a well known twoer, using morroco and 1500-kc. his QRP unit is..." writes 22LZU.

Z22LZU, P. O. Box 20, Agadir, Morroco, mentions: "Working in the Agadir area; 100, 1500 kc. and 80 meters."

Z22LZU, P. O. Box 20, Agadir, Morroco: "I am also using the new KWMc with me in Tehran and I have been active with it. Also awaiting a Q51A, 100 power amplifier and Gonet receiver," writes 1B1M.

Z22LZU, P. O. Box 20, Agadir, Morroco: "I am also using the new KWMc with me in Tehran and I have been active with it. Also awaiting a"...
Strays

The little battery portable 50-Mc. rig described in March, 1960, QST has brought in about as much correspondence as anything in the v.h.f. line that has appeared in recent years. A source of much of this correspondence was the method used to prevent drain on the transistor battery during standby periods. With the original circuit a very small drain develops when everything is "turned off."

Two different cures for this were published as feedback items, but both introduced new standby drains and aggravated rather than cured the trouble. But now comes the sure (and simple) cure: It has been found that 9 volts is adequate for good regulation, and this eliminates the trouble to 9-volt tap on a 12-volt battery. Simply connect the minus 9 and minus 12 volt leads shown in Fig. 1, p. 12, to the negative end of the 9-volt battery.

A mercury battery is recommended when this is done, as it will hold its initial voltage substantially constant through its operating life. — E.P.T.
Judging from the information received, it would appear that there is a belief extant that the use of parametric amplifier techniques in the reception of v.h.f. signals is confined to such esoteric projects as moon-bouncing or satellite tracking. Nothing could be further from the truth. If one examines the history of the development of radio receiving techniques, he will find very few major steps forward in the art. Probably the first giant step was the development of the vacuum tube. The next important development was the superheterodyne receiver. Since this latter development, there have been no major steps in receiving techniques. Of course, there have been many minor triumphs such as the development of the close-spaced planar triodes, but until the invention of the maser a few years ago, no new method of amplifying radio signals was discovered. If we were still working only with maser techniques, one could understand why the v.h.f. fraternity was making slow progress in adapting to the new techniques. However, immediately following the development of the maser came the development of the parametric amplifier. Parametric amplifier techniques are not outside the realm of the average amateur. In fact, the use of parametric techniques requires no more expense and no more additional equipment than is normally found in an average v.h.f. installation. It would appear the only deterrent to general acceptance of parametric amplifiers is the somewhat sketchy dissemination of information concerning the art.

Furthermore, the erroneous belief that there is little to be gained by improving your noise figure on v.h.f. bands has dampened the enthusiasm of many potential users. The truth of the matter is that I have yet to see a converter on two meters which could not be audibly improved by the use of a parametric amplifier in front of it. Even on the six-meter band where antenna temperatures run considerably higher, there is almost always a marked improvement in signal-to-noise ratio, and invariably a marked decrease in cross modulation problems when a parametric amplifier is used. On the frequencies above two meters, the improvement in signal-to-noise ratio is literally like night and day. On 420 Mc., signals which are absolutely undetectable in the noise of an average converter are perfectly readable when the paramp is installed.

Now, if you are really convinced that parametric amplifier techniques are beyond your capability, let us consider the actual facts in the case. First, consider the fact that the first parametric amplifier used to receive "on the air" signals was built by a ham. Second, consider the fact that the ham who did this had never before worked with parametric amplifiers. Third, consider the fact that this paramp was built at home without the use of any exceptional equipment. Fourth, consider the fact that this first crude attempt at making a parametric amplifier gave astonishing results first on six meters, next on two meters, and then on 420 Mc. Furthermore, consider the fact that, crude though this amplifier was, no one has since developed a system capable of giving a lower noise figure. Now, while it is true that you can purchase parametric amplifiers commercially for the approximate price of a new Cadillac convertible, it is also true than an amateur can build a parametric amplifier at home for no more than it would cost to build a 417A-type converter. There is one thing you can be sure of, if you don't have a parametric amplifier in your v.h.f. layout, you are about as well equipped as a Model T Ford in a modern drag race.

If you have read this far, you are probably sitting there asking yourself, "What does he expect me to do now?" The answer is, I expect you to get to work, and prove that you do have the initiative, the ambition, or just plain gumption, to be listed as a member of the v.h.f. fraternity. Look around at your receiving setup. How much feedline loss do you have? If it's more than 1/2 a db., fix it. Do you have a tunable coaxial filter in front of your converter? If you don't, why not? The use of a coaxial filter in front of your converter almost invariably provides an

This improvement may be masked, however, if you are not in a low-noise location. — Ed.

W8IJO's 20-foot parabola with "noise cone" receiver mount. Paramp and 1296-Mc. converter are mounted at the focus of the dish. Feedline loss is 0.1 db.

QST for
improvement in received signal-to-noise ratio. In addition, it filters out the commercial garbage generally experienced in the urban areas. And it provides the first step towards constructing your parametric amplifier. I don’t suggest that you go out and buy a coaxial filter, but rather that you get busy and build one. The best test for a properly operating filter is to install it in front of your converter while listening to a weak signal. If the signal remains the same or improves slightly, your filter is doing its job. If the signal decreases in strength, one of two things is happening: (a) your filter is not working properly or (b) your converter is matched to the feed line better than any converter I have ever seen. In any event, with a perfectly-matched converter the coaxial filter loss should not exceed 0.2 db.

If you got this far and you still don’t know how to build a parametric amplifier, and if you don’t want to wait for a 1296-Mc. paramp being described in QST next month, I suggest you drop me a line stating your problem. When it comes to parametric amplifiers I am as full of helpful hints as Lew McCoy talking to a Novice.

Project Moon Bounce

Schedules with W8LIO on 1296-Mc. moon bounce during the past month have resulted in sufficient equipment improvement to allow reliable one-way c.w. transmissions. Jack is presently modifying his receiving setup in order to mount the parametric amplifier and converter at the focus of the dish. It is hoped that the improvement of 3 or 4 db. (due to decrease in feedline loss) will allow our first successful voice transmissions. The status of the various moon bounce efforts known to be in process are as follows. W8LIO, 20-foot parabolic dish mounted on a polar mount. Receiving equipment consists of parametric amplifier into home-built i.f. system. Transmitter under construction. W1BU, 18-foot parabolic dish on polar mount. Transmitter, 300 watts into antenna, sideband or c.w. Receiver is a parametric amplifier into home-built i.f. system. W9QXP, 10-foot diameter parabolic dish on polar mount. Receiver under construction, transmitter under construction. W7GRA, 30-foot parabolic dish under construction. Status of receiver and transmitter unknown. W2CNX, 10-foot dish not mounted as of last information. Transmitter, 300 watts output from e.w. klystron completed. Receiver is under construction. V6Z2DG, 30-foot parabolic dish under construction, parametric amplifier under construction; proposed transmitter to run 30 watts. DJ3FM, 10-foot parabolic dish on order, to be mounted on a polar mount. Receiver, to include parametric amplifier, is being designed. Transmitter proposes the use of the RCA 7680. These foregoing stations do not represent the total number of stations interested in moon bounce work, but rather represent those who have sent a status report on their projects in the last month. I am sure that if you have any words of encouragement for these hardy souls, they will certainly appreciate hearing from you.

KL7FLC

With KL7FLC probably back in the more temperate states at the time this appears in print, here come a couple more reports from stations hearing Bob while he was sojourning at Fletcher’s Lee Island. From the log of Cliff VE4ITX, we learn that on September 13 he heard KL7FLC in QSO with VE8BY but they both disappeared after five minutes. Cliff heard Bob, KL7FLC, very briefly several times later that same date but had no luck in making another contact. September 14 Bob’s code was heard at 0445 (all times in GMT), called in vain at 0457. Heard him once again at 0501 working VE8BY and lost him at 0525. Last heard from KL7FLC in Manitoba was on September 15 when Cliff heard the code well for four minutes.

From KL-land to aurora with antenna aimed East, Cliff heard K2ZFV at 0210. At 0213 worked VE2ALO for five minutes. At 0226 heard K2DBB very weakly, and at 0238 raised VE8BY for a twenty-minute contact. On October 6 a spectacular corona was observed by Cliff while driving but no DX signals heard when he arrived at home a short time later. However, he learned that VE4SH had worked Ottawa, VE2DN, VE2DSY, with 5-9 signals both ways. On October 10 at 0600 VE4GN worked K5LY, good for him but not so good for VE4ITX who needs Mississippi. October 9, VE4SG worked VE3CN and VE5DIH on phone with 5-9 reports both ways.

A letter from Bob Larkin, W7PUIA, relates time he last heard KL7FLC was on September 5 at 2245 PST. He heard Bob for approximately six minutes, the signal peaked 59 with very little flutter but was beginning to fade out by the time KL7FLC changed from the code wheel to call a "CQ." Since that time W7PUIA has erected a new 50-Mc. antenna, a 9-element Yagi on a 32-foot boom, 50 foot in the air, which seems to work at least as well as the old ten-element Storrs curtain.

Here and There on 6 and 2

News from Argentina, via LU3DCA, tells us that he needs only his QSL from W7QNV, Utah, for 50 Mc. WAS; and when HR2DK and VP3EP QSL him, he will have thirty countries confirmed on 50 Mc. (And we thought we were way ahead!) Mike Conklin tells us that all DX expeditions should carry 50 Mc. equipment, particularly during the DX season. We go along with this but the job is to convince the low-frequency DX-minded ham that DX on six meters is worth taking his time from the low frequencies. It's known that this is but the low-frequency man needs convincing.

K1OAA in Huntington, Connecticut, (formerly W3OJD) reports good tropo conditions on September 25 and 26 when he worked North Carolina from his new QTH in Connecticut. Rick also worked Richmond, Virginia during this period and mentions that f.m. stations in Raleigh, N.C., and Roanoke, Va., were coming in with good limiting signals all day of the 26th during Work-a-thon on the 27th. He has noticed that the f.m. band makes a fine indicator for exceptional conditions on six meters for ground wave. Also reported good conditions to South America on October 2 when commercials were coming in as high as 47 Mc., and the same thing on October 8.

More South American dope from Walt Piper, K5GPW, who worked LU4DFN, LU3DCA, LU3EX, LU9AT and

What beautiful 50-Mc. wallpaper! All these and a few more worked on six meters by Mike, LU3DCA.
LUUMBJ on October 1. First contact was made at 1815 CST, and all signals were Q5 most of the time. According to Walt, LUADFKN worked into K1 land about 30 minutes prior to his contact with Walt. Fine conditions on six meters again; Walt got some good signals from the K1 station of such contacts and find out what else they've been working it sure would be nice. Guess Helen will just have to spend twenty-five hours a day on 50 MC again to find out "what gives."

Texas also knew about the opening to South America, 'cause W6SPF, Phil, mentions that the band opened to S. A. on October 4 for him with commericals just outside the low end comaria at 40 db, over 9. Biggest aurora ever heard in Texas occurred on the evening of October 6 when W6JTB/8 in North Michigan peaked 30 db, over 9 on phone. Others worked by Phil were K6PKP, K6KCI, W6JTS, and K6GOW, all worked on phone and all with 59 and 58 report, Q2. Walt, on South America once again when two LUs were heard very weakly, but none worked. However contacts were made with K6KX, K7AEL, K7PXF and K6KEE on backscatter.

A very quick one from W6QMN, Bob, advises everyone that he is looking for s.s.b. and c.w. schedules, both of which are very lacking in his area. Frequency is 30,103, using a kw on weekends. Bob's only contact schedules so far have been K7AAD and W6PZ.

Another report from California and Gib, W6BI, says that he had a fine auroral contact with W7INX on 20 Mc. on October 6 at 1717 PST. Later that evening K6GOX worked K7BDJ. According to Gib this was quite a violent auroral storm rivaling the one of April 30, although no visible effects were seen. (Probably because of broken clouds.)

The word is out that anyone visiting in St. Louis, Missouri, is to be sure to stop in at the "Holiday Inn Hotel" to visit

K9EID presently employed there. Won't Bob be surprised when he is mobbed by visiting firemen? Bob is also looking for schedules on six and two, 50,185 and 115,011; he is using a 20A, P. & H 0003 and a rebuilt Comet III and a pair of 4272s on s.s.b. on 50 Mc. Also an 11-element Spiratone 30 feet high. On two meters the beam is a 24-element collinear 105 feet high.

V.H.F. DXers, Contest workers, take note! An offer from Browning, Montana, to those interested in constructing a "V.H.F. location! You must be one of them that "intrepid v.h.f. men," have lots of will power, stamina, etc., if you'd like to take advantage of Le Conte Lodge, in Gallatin, Tennessee. Taken from the Literature of the "Lodge." Le Conte Lodge, the highest guest lodge in the Eastern United States, is situated on an open glade just below the summit of Mt. Le Conte at an elevation of 6400 feet. The Lodge serves as a grandstand for the entire Park, and commands spectacular views of the valleys. The Lodge offers all v.h.f. enthusiasts the opportunity of hiking and horseback trails starting from points near the resort community of Gallatinburg. Shall we all move to Tennessee right now or should we just commute for contest periods? Surely sounds like a sure-fire v.h.f. location and wish we could take advantage of it.

Brownie points out that the hike is five miles and the riding trail is seven miles. If you are interested, get in touch with him, but don't figure on taking a railroad or two of equipment as just once he will be used to haul the gear. Seems the idea worked out well this past season but probably he would much better during the "off-season" from November through April, when conditions and time are better for all.

Because this is one of the essence of his business, W624J has had little time to operate but has worked Ohio (which is local), Indianapolis, Pittsburgh, Winston-Salem and Louisville, kig consisting of an 821-B at 75 watts and a 4-element wide-scanned beam.

A report from Auburn, Maine, via Dick Huntsman, KC1XX, reports the very good aurora of September 3, when he had to work above 50.5 because of the heavy QRM below that frequency. At 0100 the following morning aurora was still going strong.

Although Maine is one of the "hard to get" states, Dick says that the v.h.f. contest was a flop as far as he was concerned. He worked four other Maine stations and all agreed that most of the guys to the north never did get their beams off W2 land and up into the Northeast at all.

Clubs and Nets

When conditions seem to be good, or even when they don't seem to be good, and you'd like to know whether the band is open toward Cuba, turn your beam that way and listen on 50.4 for the Havana Net gang. These boys, CO2RR, CO2DL, CO2IS, CO2WS and CO2ZX occupy this frequency practically twenty-four hours a day. Whenever any of these bands are home at the frequency and if they have no answer from a net member, they leave the receiver on frequency so that when the next member calls in he is sure to get in contact. In this manner there is almost always someone sure to have a contact. The Net has no definite day or time for net sessions on the air as it just works out that there is someone there at all times.

CO2ZX tells us that the boys are using vertical antennas for local coverage and less TVI.

On July 31 in the Portland, Oregon, area, the Columbia River VHF Society and the AREC held a picnic followed by an evening meeting at which the various groups discussed, voted on and passed the "VHF-AREC 6-Meter Net" came into being.

144 Mc.

The October 6 aurora found Dallas, W9AG, ready and waiting. In addition to hearing a solid mass of QRM for the first 200 kilocycles, Dallas managed to work W4LNG for state number 38. He also said hello to W5JFL, W4EQM and W5XJR who claimed they were in Wayland, at the meeting, Alabama, and Delaware. I'll bet if he promises to look over above 144,300, there are some fellows in New England who will promise to work above that frequency. Rex, W5RCI, will probably work above that frequency. Rex, W5RCI, caught the same aurora and failed to pick up Massachusetts. His signals were heard by W1AZK at this time, however; indicating a fairly wide spread aurora putting signals into Mississippi from east coast to W8 land. Bob W6QVA, benefited from Rex's alertness by picking up Miss...
a sisiphi for his state number 31. Bob also heard Minnesota talking to Minnesota. The same session brought W8BAX up to 11 states when he added Arkansas and Louisiana to his growing list.

A few comments from Rudy, W4LNG, anent this aurora opening. "The lowest signal heard was Walt, W2-CXY on 144.055. The highest was W9EIX on 144.382. Occasionally I tune up to 145.6 but have never heard anything there except static "static. "My chief complaints about auroras are the use of bugs and keys at high speed, that just run together; and the non-uniform band tuning." These comments on auroras are heard on all sides; everyone comments about it but no one appears willing to do anything about it.

Fres, W3BYF, battled the QRN for three more states, giving him a total of 25 on two meters. He suggests shorter contacts on aurora when so many states are vying for aurora states. M12T, W4WJX, is missing in this auroral opening. W8HLD made what is probably the first Georgias-Missouri contact with W4LNG. He went on to contact K3KPT Pennsylvania, W6GIA Pennsylvania, W4ESQMI Alabama, W4VTE Virginia, W4GSI Kentucky, W6QO Boulder, Colorado, W6MOX Denver, and W6AXU Iowa. Charley's first intimation that an aurora was on was from K2QGI in New Jersey who he called and did not raise. All in all he worked sixteen states. Incidentally, Charley needs Maine, Vermont, Massachusetts, Connecticut, Delaware and North and South Carolina in case any one is looking for schedules. Rudy, W4LNG, picked up one new state in this opening. In return he passed out a new state for another Aurora operator, of course. That was W8SFG. Stan has moved up to 11 states this year picking up four new ones on the combination of aurora and tropo.

In case you are looking for WVVM, you might take a listen for WV4PX which is Dick's new call in Marion, Iowa. What was probably the longest and strongest coastal tropo opening of the past several years was reported by W1AZX as follows: "North Chicopee to Jacksonville direct on 144. Our opening worked W4FUI at 0300 EST, September 27. Signals were 85 both ways with some QRM. W4AIB was 88 here for hours both on the 25th and 26th. He was 87 on s.s.b. on the evening of the 25th, K1AZX weak in the tropo mode. Monday night the signals were 88 here in Elkton, West Virginia, was peaking up to 88 here on c.w. on W4VHLL in Charlotte, North Carolina, came through both evenings."

K2AXU/8 in Elkton, West Virginia, says "The whole east coast was coming in here. Got W4AIB, South Carolina, 84 c.w., was hearing from South Carolina, Michigan and New Hampshire on the nights of the 25th and 26th."

K4XU3 at Shaw AFB, South Carolina says "Our first contact was with K1AX on 145.8 KHZ in Hartford, K1AXX in Boston, from that time until 0122 EST when I finished up with K11JK in Harvard, Mass., we really had a field day. It was gratifying to see how well our s.s.b. worked out. We worked seven states which included Virginia, Maryland, Pennsylvania, New York, Colorado, Massachusetts, New Jersey. We are going to pass out as many confirmations as we could and any of the folks we missed I will be glad to set up sced now that I have a rig back in first-class condition. We are running 300 watts input, upper sideband to a 4X350B in the final. (KILSY please note.) K4XU3 normally operates 144,110 upper sideband.

On the same tropo opening WA4AIB, Alkon, South Carolina made 144 contacts with 18 W3s, 4 W2s, 6 W4s. One of these was even a new state, W1AZX, New Hampshire. From the southern end of the tropo W4RMT reports "band opened up to the northeast with longest tropo for two meters. On September 26 at 2200, K4EUS in Chatham, Virginia, was heard calling CQ with 5-4-0X signals, this was followed about a half hour later with QSO with K4EUS, W2AMJ, W4QZ, W2AZI, W4WJX, W4WJX, and W5EJX. The opening lasted until about 0200 EST the following morning. The states above, Virginia were in and out, no one period lasting for over a few minutes. W4AIB's signals were 5-4-0X.

230 Mc. and Up

Good 420 Mc. conditions on the night of September 27 made possible many contacts in the coastal area. W1OOP, W2WS, W4EHE, W3FEY, W1MF, W1O, W2NH, W2WJ, W2BLL, K3EH, K203M, W3C5G, all participated in what turned out to be a 420-Mc. field day. This of course was the same opening which was apparent on two meters and was also evident on 220 Mc. W4KDH for instance, was hearing W3RUE, W8PT caught the September 7 opening on 432 working W8DEN in Iowa with well over 89 signals on phone, as Jack says "None of this weak signal stuff on 432 Mc. We are still looking for more contacts on 220 Mc. He managed to contact W6GSW near Columbus, Ohio, a distance of 475 miles from his location on aurora the 4th of September. The only active stations that Bob heard on this opening were W9UG, K2QG, W8QSG. Luckily too many states were contacted to mention new states on two meters to get on. W1AJR worked W8SFG in Hubbard, Ohio, on 220 on August 26. I still don't know Andy's frequency but if you drop him a card he'll be glad to tell you he can regularly schedule with you a schedule besides if you're looking for Rhode Island on 220."

December 1960
A signal bounced off the moon was used to trip these scissors and cut the tape opening the Hudson Amateur Radio Council’s convention in New York City. Watching the moon being put to work by hams ore, left to right, Harry Dannals, W2TUK, president of the HARC, Sam Harris, W1FZJ, whose transmitter in Medfield, Mass., sent out the moon-bounce signal, and Chester Drexler, K2EAF, convention chairman, W1FRR stayed home and operated Sam’s 1296-megacycle rig for the event.

OES Notes
K6UTF — Operated from Clear Peak during the September V.H.F. contest along with S6HIN, S6AG and W7-OBT. Had lots of rig and generator trouble, made few QSOs on six and two.
K4DZP — Working on two-meter parametric preamplifier. All suggestions cheerfully accepted.
K6FBA — Working on automatic time delay for cooling 41B5 preamp.
K6BGZ — Maintaining six-meter c.w. schedules five nights per week with W8GHTX. (Drop him a line for frequency and time.)
K3RKH — Working on new six-meter converter for use with 8X99.
K3IHZM — Preparing to take advantage of the artificial ionosphere planned by the Air Force.
K3ADS — Installed a 5-over-5 six-meter beam. Looking for skeds.
K3MDL — Working on 10-element 5800-Mc. beam. (Drop him a card for details.)
KMHOP — Plotting nightly groundwave conditions on six and two meters.
K8ANEY — Experimenting with 6CW4 antennas. Can’t find any sockets, anyone help me?
K6HIQ — Converting BC-733 for two meters.
W8OIH — Working on filter for six and two. Suggest dropping Lou a card for pertinent details.
K0MWS — Conditions very poor during v.h.f. contest. Building new modulator to modulate two-meter final one hundred per cent.
W8BFF — Looking for someone in the Detroit area who can run some schedules for propagation research purposes on 50 Mc.
W8FZ — Monitoring six meters for KL7FLC, no luck.
K9HRS — Incorporating tape recorder for use with transmitter and receiver.
K3HWD — Completed 250-watt two-meter final using 828s grounded grid.
K3BYD — Working on transistorized six-meter transmitter using 2N697a and push-pull.
K1CIG — Working on 432-Mc. equipment.

W4FNR — Quite disturbed about EPT leaving ”The World above 50 Mc.” (As who isn’t?) Working on 100-watt, a.s.b., 50-Mc. rig.
W32INB — Installed RCA 6022 in place of 6R7GA in two-meter converter. Observed a worthwhile improvement. (Drop a card for details.)
K6QIA — Finally worked his KL7 on 50 Mc.
W4NYY — Raised power on six meters to 40 watts. Results were gratifying. Working on new two-meter rig.
KI6JLL — Notes that he did not work W01DW, although he did hear him.
K1CHY — Completed band switching two meters, 14-meter exciter. Working on 432-Mc. parametric amplifier. You live next door to me, why not come over and talk over your tricks — Soon.
W9PNE — Discovered that coaxial vertical antenna is no good for six-meter auroras.
W6EY — Working on 1296-Mc. antenna feed for 2 foot poles.
K4KYL — Working on six-meter echo reflections. A fuller report will be forthcoming.
K8BWQ — Running schedules with K3KPF every evening. Hoping for Echo I reflections.
K7CQZ — Modifying communication receiver for use as 2 N 6 meter i.f. strip.
W7ZVY — Working on surplus two-meter converter. More details later.
K7BDD — Experimenting with new six-meter antenna.
K9LQZ — Starting work on 415B converter. Made two meter solar noise recordings as per ARL bulletin, No. 761. W5QDO — Took part in solar radiation measurements on six meter using per ARL bulletin, No. 761.
K2GMB — Maintain night propagation schedules with K2GQL, W2WZR and W4LJU. (Drop him a card for frequency and time.)
K3CNN — Completed a cascade 6A4M r.f. amplifier for two-meter receiver.
K3BSF — Worked nine contacts in two sections on 220 Mc. In last contest. Running only 10 watts to an 8-element beam. Heard 15 stations in four sections but modulator trouble prevented more contacts.
K3KUJ — Completed six-meter field-strength meter. Dron card for more detail.
K3JTE — Complete 144-Mc. Handbook converter. Also would like information on converting SCR-22 for two meters.
W6MV — Keeping two meter c.w. schedules on Tuesdays and Thursdays, 9:30 PM, PST, with K6HMS, Balboa, Island.
W4KRI — Has completed code wheel to call QG on c.w. Drop Joe a card for operating schedules.
K8BOU — Working on 432-Mc. converter, Has GL6299, would like information from anyone who can supply.
W1ZPV — Completed 432-Mc. crystal converter and 16-element beam, looking for skeds.
K6HCP — Starting experimental tests on six-meter halo. Active on 432 Mc.
W4ANEU — Working on s.s.b. exciter for 144 and 220 Mc.
W5RTV — Completed transistorized meter. Have extra transistor available, will donate it to anyone interested in building such a gadget. Drop him a line. Still working on v.h.f. s.s.b.
K2AZT — Completed a 6300 tripler from Gosset to 432 Mc.
W4ABFC — Preparing equipment for 430 Mc. onslight this winter.
K6TWV — Experimenting with a simple coaxial vhf for two meters.
W6CIN — Mailing schedules with K4YTA, Marietta, Georgia, on week ends. Drop him a card for details.
K9CTG — Operating 500-watt two-meter s.s.b. into 20-watt Spiratray, getting good reports. Putting finishing touches on new kW two-meter final.
K9SIX — Working on six- and two-meter transmitter.
K3SUJ — Heard aeronautical WIAEO on September 17 on 50 Mc.
W8PT — Calls CQ at 2300 EST on 230.03, c.w. for three minutes, every Monday, Wednesday and Friday, beam heading east looking for WIs, 16s and 3s.
K1INL — Working on BC434 tuneable i.f. for v.h.f. receiver.
YL Certificates and How to Obtain Them

As of October 15, 1960, 23 YL clubs throughout the United States issue a total of 27 different certificates that are available to amateurs—some are issued to YLs only, some to both YLs and OMs, and a few to OMs only. The South African Woman’s Radio Club also issued two certificates. The four most popular and best known YL awards are issued by the Young Ladies Radio League, an international organization.

Following is a list of the various awards and general rules for obtaining them. Unless it is specifically stated that the awards are for YLs only, or for OMs only, the awards are usually available to both YLs and OMs. In general, contacts made during club net meetings do not apply towards awards, and certificate seekers are requested to make contacts other than during net time. In most cases, the award custodians appreciate (and sometimes require) a stamped, self-addressed envelope with sufficient postage to cover cost of returning QSLs, lists, and logs, usually by first class mail. More detailed information may be obtained from the club that issues the award or from the award custodians. OM KKBX’s new Directory of Certificates and Awards has a section devoted to all YL awards and certificates, in addition to information on some 350 awards from over 50 countries. (Write Cliff Evans, KKBX, Box 385, Bonita, California.)

Issued by the YLRL

Worked All States YL — This award parallels the ARRL’s WAS, Contact a YL operator in each state. Send QSLs and alphabetical by state list showing calls, date, and band to Grace Ryden, W9G4J, 2034 N. Lincoln Ave., Chicago 14, Ill. Include postage for return of QSLs by 1st class mail.

Worked All Continents YL — Proof of contact with a duly licensed YL in each of the six continents should be sent to Barbara Houston, K5Y1B, Rte. 2, Box 178, Garland, Texas.

YL Century Certificate — Contact 100 different YLs anywhere in the world. All contacts must be made from within 35-mile radius of home location. Submit list in alphabetical order by operators’ full names, calls, and dates along with QSLs to Katherine Johnson, W4SGD, Box 666, Fuquay Springs, North Carolina. Include postage for return of QSLs by 1st class mail. Endorsements are issued for contacts with each additional 50 YLs. (This award is for working 100 different YLs, not contacts.)

D.Y.L. — This award is issued to any YL (only) who works 25 other licensed YLs outside of her own country on or after April 1, 1955. A log extract of the 25 contacts should be sent to Maxine Willia, W6UHA, 6502 Wykoop St., Los Angeles 45, California. Note that this award is for working 25 different DX YLs, not necessarily for working YLs in 25 different countries.

Issued by Other Clubs

East

WRONE Certificate issued by the Women Radio Operators of New England. Work 6 members in at least three different N. E. states after May 1, 1950. An endorsement is issued for contact with one member in each N. E. state in addition to the original application. Stations worked for original certificate do not apply towards endorsement. Send QSLs and stamped, addressed return envelope to Blanche Randles, K1ZT, 82 Linda Ave., Framingham, Mass.

Rhode Island YL Club Certificate to contact any 10 YLs in Rhode Island, send QSLs and list with return postage to Ruth Sherman, WJWED, 128 Massasoit Drive, Norwood 7, R. I.

Penn-Jersey Club Certificate issued by the Penn-Jersey YL Club. Contact 10 members, foreign stations contact 5 after June 1, 1956. Send list (no QSLs) to Carolyn Currens, P. O. Box 523, Norristown, Pa.

W4YAHBC Certificate issued by the Washington Area Young Ladies ARC, Contact 6 members on or after Jan. 1, 1960. DX stations need only 3 contacts. Send QSLs, 10 cents, and stamped return envelope to Camille Hedges, WATSC, 22322 Culver St., Washington 21, D. C.

George Pauk Award issued by Patricia Pauk, 7537 Peaches for contacts with 10 paid-up members after Oct. 1, 1957. Send QSLs and return postage to Oliva Coogler, K4DLN, 228 Howard St., Atlanta 17, Ga. Endorsements available for each 5 additional contacts.

Pomona Certificate issued by the Floridora YL Club for contacts with 10 members for U. S. operators, 5 for others. Contacts must date after April 1, 1957. Send QSLs and 15 cents to Shirley Hill, 710 E. South Lambright, Tampa, Fla.

Mid-West

Duck-Roped Queen’s Certificate issued by the Chicago YLRL, Inc. Contact 5 club members or after Jan. 1, 1960. Send QSLs and 10 cents to Lillian Rochelle, 3638 Ruby St., Franklin Park, Ill.


Grandmother’s Certificate issued by the Grandmother’s Club, Contact 10 members after March 17, 1958. Send list to Mary Meyer, W9RJU 15639, Patricia Lane, Brookfield, Wis. If you are a grandmother and would like to join the club, send a card to W9RJU telling her how many grandchildren you have.

GAYLARK Certificate issued by the Gulf Area YL ARKlub. Contact 6 GAYLARKs after Jan. 28, 1958. DX stations required to contact only 5, send log extract and 10 cents to Audrey Beyer, K5PFF, 7339 Guadaleana St., Houston, Tex.

Texas

TYLRun Certificate issued by the Texas YL Round Up Net. Confirm contact with 25 YLs who are full paid-up members of TVILRIN. Send QSLs with alphabetical by call list showing name, member number *, member date *, date of contact, time and frequency, (*)—Information on

December 1960 97
members' QSLs and 10 cents to Ethel Chastain, K50PS, 338 Bealroad, San Antonio 2, Texas.

YL-QM 10 CC issued by the Texas YL Round Up Net to YLs only. Confirmed contacts with 1000 different OMs required. YL may use only one call. List alphabetically by country, area, call letters, showing date, time, station, band and report. Three licensed operators must verify the list and sign the application, or the list and QSLs may be examined and notarized by a Notary Public. Send 15 cents (no QSLs) to Lyn Olson, W5RYX, 7614 Maxwell Ave., Dallas, Texas.

W5OOP Certificate issued by the Women Ham Operators of Texas for contact with 7 members after July 1, 1958. Send log extract to Ruth Jones, K5GMX, 1908-B Argentina Drive, Dallas 24, Texas.

W5HO Certificate issued by the Women Ham Operators of Tarrant County, Inc. Contact 3 members or 2 members and club station K5LTW after May 1, 1958. Send log extract to Margaret Klar, K5HIO, 3523 Bellerive Drive, North Fort Worth, Texas. Endorsement for 3 on one hand, all e.w., or all mobile.

ALAMO Certificate issued by the Alamo Ladies Amateur Microphone Organization, U. S. and DX stations contact 3 members, Texas stations contact 4. Send list and 10 cents to Ines Cole, W5WXT, 329 Meadowbrook Dr., San Antonio, Texas.

West

Portland Roses Award issued by the Portland Roses of Portland, Oregon. Contact and send your QSL to 8 members after Jan. 1, 1956. Club member must receive your QSL. Send log sheet to Helen M. Wise, W7RVM, 4311 S.E. Salmon St., Portland 15, Oregon.

Missions to Missiles Certificate issued by the San Diego YLARC. Contact 7 members on or after June 1, 1956. Send log extract to Pat Means, W6GGX, 3275 Del Mar Ave., San Diego 7, Calif.

Lad 'N Lassie Certificate issued by the Los Angeles YLARC. The requirement is confirmed contact with 10 members after Jan. 1, 1956. After July 1, 1959 contacts made during any YL net do not count. Endorsement for 10 additional contacts with 10 additional members. Send log extract with return postage to Irma W. Weber, 762 Junani Ave., Santa Barbara, Calif.

Chimp-Ticket issued by the Camellia Capital Chirps of Sacramento. Contact 6 members after July 26, 1957. Send QSLs and 12 cents to Jane H. Williss, Route 1, Box 524J, Chico, Calif.

The new President of the YLRF for 1961 is Doris Anderson, K3BNL, Broken Arrow, Oklahoma. Consistently a very active YL since getting her license in 1935, Doris has some 50 ham certificates framed and "the rest in a big brown envelope" to show for her efforts. The XYL of W5IWI, Doris especially likes contests, emergency work, chasing YLs, and, of course, earning certificates. Believe it or not, she has three teen-age children too! (photo by W5IWI)

With regrets, but with deep appreciation for her outstanding service, the YLRF announced the resignation of Wanda Oluck, K6ENG, as editor of YLRM Harmonics. For the past two years under Wanda's capable direction the club's bi-monthly paper has grown and flourished (circulation now about 900). With Connie Hauck, K6EQX, taking over her editorial duties, K6ENG anticipates a happy return to 40- and 80-meter ragchewing.

Mermaid Certificate issued by the Bay Area YLRC of San Francisco, Work 6 members or associate members. Send copy of log to BAYLARCS, 2183 44th Ave., San Francisco 16, Calif.

CBS Certificate issued by the KBS YL ARC. Hawaiian stations must work 7 members. U.S. and possessions and Oceania must work 5 members — all others 3 members. Contacts must date after June 1, 1956. Send QSLs with stamped return envelope to Elise Wright, 735 Murray Drive, Honolulu 18, Hawaii.

The Parka Award issued by the Polar Amateur Radio Club of Alaska for contact with 7 paid-up members after Feb. 1, 1955. Send QSLs and stamped return envelope to Geraldine Niehels, K7IAZ, c/o Alaskan Railway, Anchorage, Alaska.

Union of South Africa

Worked All YL Award issued by the South African Women's RC. Contact after June 30, 1952 10 YLs located in the following areas: ZS1-G, ZS2, ZS2Q, ZS5, or CR7. Contact may be with or without QSLs. Send QSLs at 19 LBCs to Margaret Snyman, ZS1RJ, P. O. Box 80, Strand, Cape Province, Union of South Africa.

K.K.K. Award (Key Keen Klub) issued by the SAURC. Issued in three parts: 1 — for 100 two-way e.w. contacts; 2 — for 500 two-way e.w. contacts; 3 — for 1000 two-way e.w. contacts. All contacts must date after Dec. 31, 1956. Minimum reports R4 and T8. Have form for application completed by "scrutineer" who checks applicant's log and forwards form to Custodian. Members SAURC, no charge. All others, $1.00 or 3/s to custodian Margaret Snyman, ZS1RM, P. O. Box 80, Strand, Cape Province, Union of South Africa.

Miscellaneous Certificates

Seldom Heard OM Certificate awarded by the Western Radio Amateur magazine. Contact 25 licensed OMs who have XYLs who are licensed hams at the time of the contact. Contact must be with the OM using his own call not with the XYL using her OM's call. Contacts must date on or after Jan. 1, 1959. Five states must be represented in these 25 contacts. Send list showing OM's and his XYL's calls; date, and time to Jean M. Kinehelo, K6OQD, 6625 N. Brightview Drive, Glendora, Calif. Stickers for each additional 5 contacts.

SWOOP (Suffering Wives of Operators' Protectors). The San Francisco YLRC sponsors SWOOP designed to
Note: The Texas YL Round Up Net, though a net, is usually considered a YL club as well as a net; hence, information about its two certificates appear above under "Clubs" rather than under "Miscellaneous".

**FD Addition**

Our 1960 YL Field Day story appeared in last month’s column. To complete the record, and with thanks to Ellen White, WITYMY, of headquarters for supplying the information, here is the final summary of 1960 Class A FD YL Club Scores: (For explanation of figures and letters following each call, see complete summary of FD results beginning on page 54 of this issue.)

One transmitter —
KH6 YL ARC operating KH6AFL/KH6 378-AB-5-2484

Two transmitters —
Bay Area YL ARC operating WA6MAO/6 307-AB-9-2193
San Diego YLRC operating W6VSL/6 323-B-7-2098

Three transmitters —
Gulf Area YL ARKlub operating K5SKP/5 252-B-8-1512

Four transmitters —
Chicago YLRL operating W9DEQ/9 95-AB-7-815

**Knit**

Knit JK, Miss Karen Kelly, left, of New Canaan, Connecticut.
She and your column conductor wish everyone a very Merry Christmas and a Happy New Year too.

---

**Strays**

WILIG is co-author of a book entitled Laundered Limericks. Try it for laughs.

W7QZH calls our attention to a source of danger in some surplus gear. Some classified equipments were equipped with detonators to prevent capture by the enemy, and W7QZH has run across one piece of aircraft gear with the detonator still in it. This was a transmitter from an AN/DMZ-2. The explosive capsule was one inch long and 3/4 of an inch in diameter, and when detonated on hard ground, it blew a hole 3 inches deep and 6 inches in diameter. Obviously, this could seriously injure a person. So, the moral of this little tale is that you had best double-check if you are dismantling any gear that was classified secret or the like.

---

If it’s a noise-free location you’re looking for, this should be it. The Navy ice-breaker USS Staten Island is operating from the Antarctic again this winter, and on board will be four operators, using the call K7ISO maritime mobile. Using an HT-32 with a 500-watt linear, and an SX-101, they should get through to the States FB. The Staten Island will attempt to penetrate the Amundsen Sea during February—this area being heretofore unexplored.
UNCLAIMED QSL CARDS

I attended the Central Division Convention in Indianapolis September 11 and 12. Through the cooperation of Pat Hask, KB6CG, I was able to use part of the ARRL booth for the QSL Bureau. I had with me about 7000 unclaimed DX cards and in addition, 25 packages of new cards recently received from the foreign bureaus.

I spent almost 11 hours at the booth — Saturday from 10:00 to 11:00 and Sunday from 10:30 until about 2 when most of the exhibits were dismantled.

Frankly, the number of cards distributed was relatively small, probably not 10% of my file, but I did have the opportunity to discuss the Bureau with a lot of people, many of whom didn’t know such an organization existed much less that it is another service of ARRL. Sure, most of them read QST but I’ll gamble a de-based 210 that few are looking at anything but the ads by the time they reach pages 152, 153 or 154.

The real DX man doesn’t have to be told about the QSL Service. He knows the score. The fellow we want to reach is what I call the casual DX'er. He normally works stateside or by boat; occasion will hook a VK, ZL, G, FY or maybe a CO. He sends the foreigner a card, then later excuses him for not replying. The chances are the card is gathering dust, taking up space and adding to the headaches of some W/KE QSL Bureaus.

As time has permitted, I have sent well over 700 notices to stations having 4 or more (often 15 or 20) cards but my unclaimed file continues to grow. Something has to be done to stop Mr. Casual DX-ex of the facts of life for I'm sure the other ARRL Bureaus are experiencing the same problem. No matter how good a product one has it must have publicity to bring people in to the store and Mr. Casual DX-ex just isn’t coming in to the store, even though we’ll give him the merchandise. — Julian F. Uong, WD5ISO, W6-KK QSL Manager, 2901 Gordon Drive, Florence, Illinois.

A C.W. MAN’S RECEIVER

I knew there was something wrong with my ham-band receivers as it didn’t seem to be what I expected. I put my finger on it until I read the footnote on page 164 in October QST: “... the deliberately poor low-frequency response of most communications receivers.”

I’m a CW man with much more time as a commercial marine operator than a ham, the latter being confined to Field Day work with a club. I reck up an average score on 40-meter c.w. despite my inexperience, and one reason may be that I copy the lowest pitch signal as I did on shipboard.

Those marine receivers I used were simple — 4- or 5-tube regens for L.F. & m.f. and 7- to 9-tube supertes for h.f. with no fancy gadgets like xtal filters or, sometimes, b.f.o. knobs even. I preferred a large (3-inch) speaker to the small outboard or built-in speakers or ear, and in view of the wide i.f.-audio bandwidth of maybe 10 kc., I set the b.f.o. dead center in the pass band on boarding the ship and never touched it again.

Now I don’t feel I’ve got too much more to work with when I’ve got a single-channel selectaleid receiver than I had with the old Federal and RCA clunkers. True, as I tune the band I can set up so I hear the signals squeal down to zero beat and never come back up again, but no adjustment of the constellation of knobs makes the 50-90 cycle signal the loudest one, as it should be for c.w. work, as all my c.w. cohorts agree. It must be true, what you say. But the great majority of tuning receivers at the ARRL convention were not willing to admit that the i.f. audio response was made deliberately poor. I hope the manufacturers are not going to leave us with phone-only receivers, because I can’t tune in an intelligible phone signal in QRM, and from what I read in QST, I wouldn’t want to decode it anyway. — Phil Ellis, K6QKJ, Westbury, N. Y.

THE GENTLEMEN’S AGREEMENT

I want to take this opportunity to express my appreciation for the fortitude shown by you in the lead editorial, “20 Meter Cooperation,” published in October QST.

All amateurs are aware of the fact that s.s.b. and a.m. are not compatible. You are to be congratulated on the directive laid down in the editorial. It reflects sound judgment and indicates that a thorough investigation of the existing confusion was made before your solution to the problem was promulgated. Your analysis of the situation and the solution offered will certainly contribute to general welfare of all amateurs.

I am ratifying the editorial by confining my personal operations to the limitations set out. Let us hope that the great mass of the other members of our fraternity join me in ratifying the operating procedures recommended by your editorial. Universal ratification by all amateurs will give optimum results in the use of our 20-meter band regardless of whether the individual prefers to use c.w., a.m. or s.s.b.

QST and the amateurs on their own have worked on the so-called Gentlemen’s Agreement in the 15-meter band for several years. This “agreement” has never been consolidated into a single document, however. Will you please give us a similar editorial on 15 meters? — Edward Preston, WSJNO, Dallas, Texas.

Your editorial will undoubtedly evoke considerable comment, some of it unprintable. However, I hope you will find these few thoughts worthy of publication.

Most amateurs should agree with you on two points: (1) that a.m. and s.s.b. do not mix well and separation is desirable (not only on 20 meters), and (2) that it is far better that we do this by gentlemen’s agreement than by FCC regulations. I would add that the ARRL, representing organized U. S. amateur operators, could most fairly set forth the suggested divisions of the amateur bands for this purpose.

Having used both modes of operation, I must say that s.s.b. has many advantages, particularly through the generosity of the present wording of the power input regulations. And it seems that a major shift to s.s.b. operation is a virtual necessity if we are to utilize the allotted spectrum most efficiently. However, let’s not eliminate a.m. completely. Aside from the fact that it is so much more pleasant on the ear, this mode requires less exacting technical ability from the standpoint of design, construction and repair. Therefore, it can and should serve as a stepping stone in the evolution of the skilled amateur.

Your editorial missed one important point. You inferred that the half division of the 20-meter phone band is an equitable arrangement. I submit that it is not. In the same issue of QST (page 90), it is reported that a survey of 3126 amateurs revealed slightly over 10% using s.s.b. Assuming that this sampling is accurate, how can one justify the arbitrary allocation of 50% of the phone spectrum to a 10% segment of amateurs? Wouldn’t 10% of the phone spectrum be logical? In fact, it might even be argued that 5% of the spectrum should accommodate an equitable number of s.s.b. signals.

I would like to suggest that the ARRL periodically take a sampling and, based on the relative utilization of s.s.b. and a.m. publish suggested phone spectrum allocations which give fair opportunity to the users of each mode. — James H. Stewart, KSSTJ, New Orleans, Louisiana.

(Editor’s Note: KSSTJ is arithmetically correct, but the 3126 amateurs include a substantial number of inactive, so the 342 who indicated current use of s.s.b. is considerably higher than 10% of the active group. Unfortunately, there is no specific figure on the percentage of telephone users. However, please see the inset questionnaire in this issue, page 1124.)
Holiday Traffic and ARL-Texts. It’s a natural to use the message handling side of our amateur radio to exchange Christmas and New Year’s greetings and other messages at this season. Many amateurs newer in the game, as well as the old-timers, can demonstrate that their own radio stations are capable of handling messages for themselves and families! Receiving a radiogram can be a pleasant surprise, and sets the missive apart from the ordinary greeting card exchanges.

Each ARRL Log Book has a complete list of the ARRL Numbered-text Messages to select suitable texts for different occasions, where there is no expressed preference for individual wording. This provision is designed to help your station and amateur radio cope with the higher volume of traffic that comes with handling seasonal greetings, as well as emergency messages in times of natural disaster. To shorten a text to a number is not to conceal its meaning, but only for abbreviation to permit handling more traffic in a given time. Our list of numbered messages in the log (or CD Form 3, free on request) includes an explanation of how to use the messages effectively. The operating signal ARL? is an inquiry as to whether you have this list of numbered radiograms and are ready to take such a message. ARL (one R) appears in such traffic both in the check of the message and in the text just ahead of the number which identifies a particular text. Such numerals should be spelled out so the possibility of error will not rest on a single character. On receiving a numbered-text message for delivery, the receiving operator must always expand the number into the proper message text indicated, since the numbers merely serve as a transmission abbreviation, to limit the amount of time for transmission. To the addressee a number would be meaningless.

Traffic Routings. In starting any message include a complete and correct address. Unless this is done, you have lessened the chances of delivery. Excepting when you have a direct schedule with a given point, we suggest always starting and routing your traffic through your local traffic-capable net or nets. Otherwise there’s a gamble involved in finding a chap with traffic know-how at the point of delivery. This can be attempted, of course, by using a directional CQ or (better) by studious reference to your call book as you carefully use your receiver to hunt a station at the point where your message is going. This may be fun and a challenge, but it becomes less practical if you have several messages on the hook.

To locate your section net frequency and time of daily operation for ARRL-recommended routing purposes, see the net directory listings given in this part of QST last month. Also consult the Station Activities in any QST; the best traffic handlers can be located in these reports for each local traffic-capable net or nets.
area, and lots of net data is included. To brush up on procedures, if necessary, we suggest you see *Operating an Amateur Radio Station* for any needed information on the correct order of sending your message. It is important for every amateur to use standard form. This minimizes the chance of error. Standard form is expected of you by the operator who takes your message. Your ARRL section net is normally the best one in which to report. Most such nets, phone or c.w., have organized tie-ins with NTS schedules for fast systematic relay in connecting stations and the National Traffic System to all other regions and ARRL sections throughout the country.

To start your message, you merely have to get on net frequency and report in, when the net is called to order. You call the NCS (net control station) and, when recognized, report your traffic. You stand-by until told to pass your traffic. Once your message is acknowledged, which conveys acceptance of responsibility for further handling, your traffic is successfully on the way.

We suggest that all concerned start their holiday traffic at any time during December. Using section nets and NTS, you can take advantage of organized amateur radio to send domestic traffic (as long as no compensation to your station direct or indirect is involved) throughout the year. You can enjoy participation in these local groups that handle traffic *all year*, by occasionally taking part in the net.

More Ideas Re Holiday Ham Work. Inviting persons besides licensed amateurs to talk to their friends and convey greetings back and forth across the USA is a possibility; this can be arranged where the operator behind the mike can fix up the distant schedules. One has to remember here that “third parties” names must be logged per FCC’s section 12.136 (b). Also that internationally, station operation in behalf of third parties is prohibited, excepting for a handful of countries having special agreements with the USA, as explained in *Happenings of the Month* in view of Paraguay’s liberalizing agreement. To give a pleasant service within W/VE land to larger numbers of people, radiograms meet the spirit of the season very nicely. Amateurs get warm thanks too, from those for whom such service can be devised. We should add here that if a message is to be started, and your station is off temporarily, the nearest ORS, OPS, or OES appointee will ordinarily be delighted to handle or originate radiograms.

**Make Your QSL Count.** In connection with WAS and DXCC it’s not exactly news that ARRL has to turn back some of the written evidence as inadequate — and we’re not referring to DXCC’s rule 11 either. How then to write a letter or card that will have the elements essential to be accepted by ARRL or others for bona fide awards? There has to be a statement that backs up the fact of the two-way exchange. In this day of s.w.l. and citizen band work a tabulation of call, date and time looks like any “heard” card, doesn’t it?

You can hardly go wrong if your QSL provides expressions such as “your sign worked . . . thanks for the . . . Me, contact” or “confirming QSO as follows: . . .” Just this week we had to return cards for not so certifying two-way amateur operations. To be useful for state or countries credits the date, time, band, the mode, the location (state for WAS) from which the contact was made should be given. Include the report for phone or c.w., and give your operator signature as the final proper identification or certification that belongs on any document. The report given should conform to the mode used. Some awards (not ARRLs) set minimum report requirements.

Quite aside from the awards value of a card, the recipient appreciates all fraternalism and information that can be shown. We can’t all picture our station on a card, but a description which gives antenna, power and equipment details, operator awards held, nickname, station elevation etc., adding something to whatever you exchanged in QSO, will go far in making you better acquainted — and getting that QSL you expect in return!

**100% QSL!** We expect the record of many Novices and new General Class licensees may come closer to the ultimate of 100% QSL exchanging than the current record of operators who have been in the game many years. However, all true amateurs, irrespective of seniority or bent in amateur radio, generally do acknowledge that the QSL is the final courtesy of a QSO. We hope that everybody will live up to this. Back sometime ago in *QST* a U.S. amateur referred to his poor returns on QSLs sent to overseas amateurs. A letter just received would show that the shoe is sometimes on the other foot. In furtherance of QSLing and as a true appeal to all amateurs we quote the following from *PAJAL*: “I have sent a QSL to all my W and K stations but I received QSL returns only from about 40% of them. I worked in the last years about 250 U. S. stations and much need their confirmations to present for WAS. May you help me get more QSLs returning?” *Now 40% isn’t good.* Can we help him and others by each making it QSL for QSL, and aim at 100%?

**Official Observers Wanted.** In July *QST* we discussed the number of qualified OOs SCMs aim to appoint. A prime service to operating members, we’re proud of the heavy file of thank you letters to reach our hard working Observers. The continuing policy of self help to amateurs through the OO card-notices makes band operating conditions better. These cooperative forms also save many an amateur from receiving an FCC rebuke or official black mark on his record. Most SCMs have recently completed an annual review of the

**NATIONAL RTTY CALLING AND WORKING FREQUENCIES**

3620 kc.  7140 kc.
required activity status of appointees in which they dropped inactive OOs. In many sections SCMIs are now looking for new candidates from those who are qualified to assist in this program. A quota of at least seven active OOs is desired for each one of the 73 ARRL sections.

The post of Observer requires action in card sending; ARRL provides postpaid forms. To be accepted as an OO, one must, in addition to other qualifications have at least 3-years licensed experience as an amateur. Know-how relating to images, receiver overload and other technique is required. Accuracy, tact and neatness in making out observer-cards and reports to ARRL are all necessary to become an OO. A General Class, Conditional Class or higher grade of FCC operator license is required. There are four appointment classifications. If you can devote time observing in phone or e.w. bands, or specialize in the cases of radiated harmonics of amateur stations or other out-of-band signals and like to try to help others, then you may be needed if you can qualify. It is indeed a useful field of service. Standing Information (CID-100) is made available to OOs on receiving appointment from one's Section Manager. Those in a position to apply will find the full address of the SCM indicated on page 6, of this issue of QST.

Exam Fraud Suspension; Novice Suspended for Liberties with Call. April QST reported details on FCC license revocation where exam fraud was a factor in obtaining an amateur license. There is another case. The second example stresses the FCC requirement that one's assigned call must be adhered to.

FCC ordered (May 31, 1960) that the Technician Class Amateur Radio Operator license of Loren B. Chan (WA6EHC), Menlo Park, Cali., BE SUSPENDED for a period of six months, under authority contained in Sec. 305 (m) (1) (A) of the Communications Act and Section 0.292 (f) of FCC rules; his amateur license to be mailed to the FCC at Washington, D. C., it appearing that the licensee, Loren B. Chan, on Oct. 19, 1959, willfully and knowingly, obtained his Conditional Class Operator License in violation of Sec. 12.21 (d) and 12.162 of FCC rules and in violation of 303 (m) (1) (F) of the Communications Act, in that he falsely represented before a volunteer examiner that he resided at Pacific Grove, Cali., more than 75 miles from a location where examinations for General Class are regularly held; whereas his actual residence is Menlo Park, within 75 miles of such location, and in taking the examination, he used a different first name (Yen Fail) from that under which his Novice and Technician Class amateur operator licenses had been obtained. FCC ORDERED in this instance a six-month license suspension. This action was effective from June 26, 1960, the Conditional class license having already been voluntarily submitted and cancelled.

FCC took under consideration the suspension of the Novice Class Amateur Radio Operator license of Robert R. Housel (WV6HMS), Pico Rivera, Calif., it appearing that said licensee on Feb. 20, 1960, while operating WV6HMS transmitted call letters not assigned by proper authority to his said radio station, violating Sec. 12.158 of FCC rules. The Federal Communications Commission ORDERED (Apr. 20, 1960) that this Novice Class License BE SUSPENDED for the remainder of the license term. This action was effective as of May 10, 1960.

Responsibility in Giving Examinations. The SCM of Kansas, WB5FNS, at recent meetings has stressed the important part discussions in assisting newcomers. In addition to his discussion of the need for better operating procedures, he stressed another point concerning "by mail" license examinations. Persons unable to appear for General Class examination because of physical disability or residence more than 75 miles airline from a city where FCC conducts examinations, may apply for Conditional Class exam papers. Novice and Technician exams, of course, must be taken by mail. WB5FNS writes that several Conditional licensees have told him recently of being called in to check their code speed. His thought in mentioning this FCC activity is to stress to all individuals and clubs the responsibility in giving proper examinations. He states: "If amateur examiners will take pride in this job and be as strict as FCC, if not a little more, then there will be operators coming into Amateur Radio who take real pride in their tickets and for whom there need be no apologies to the FCC or the persons thus licensed!"

Can do? — F. E. H.

<table>
<thead>
<tr>
<th>NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3550</td>
</tr>
<tr>
<td>14,050</td>
</tr>
<tr>
<td>28,100</td>
</tr>
</tbody>
</table>

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. — 3555, 7080, 14,050; phone — 3175, 14,100, 28,350 kc.

<table>
<thead>
<tr>
<th>CODE PROFICIENCY PROGRAM</th>
</tr>
</thead>
</table>
| Twice each monthly special transmissions are made to enable you to qualify for the FCC Code Proficiency Certificate. The next qualifying run from W1AW will be made Dec. 19 at 2130 Eastern Standard Time (0230 GMT, Dec. 20). Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,070, 50,580 and 145,300 kc. The next qualifying run from W6OPW only will be transmitted Dec. 7 at 2100 PST (0500 GMT, Dec. 8) on 3590 and 7129 kc.
| Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 38 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers. Code-practice transmissions are made from W1AW each evening at 2130 EST (0230 GMT). Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the training schedules are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To improve your copy, hook up your own key and audio oscillator and attempt to send in step with W1AW. |

**January 1961**

Date Subject of Practice Text from October QST
Dec. 6: Memory Reading by Sound, p. 14
Dec. 12: Limited-Space Antenna, p. 23
Dec. 18: Compression Tuning . . . p. 16
Dec. 26: Two-Way Mobile Station, p. 27
Dec. 27: Screen Protection and More, p. 22
Not so long ago we received a clipping from a newspaper in which a local amateur was featured as a hero in a natural disaster emergency. It was a masterful piece of publicity, occupying a whole page of the paper and replete with pictures and quotations from the amateur in question. To the public, it was a vivid example of how amateurs radio, forcefully bringing to their attention the fact that amateurs are good for something. There was just one thing wrong. The amateur who sent us this clipping (not the amateur featured) scribbled all over it words to the effect that this was all the worst kind of hogwash, that the amateur mentioned was not only a nuisance but a menace to the established emergency nets, that he broke in, caused QRM, used poor operating procedure and was generally offensive and inhumane to the whole cause of emergency communications. Jealousy? Perhaps; we don’t know. But it could happen. We have seen it happen, and probably you have too, that this amateur with the biggest mouth gets most of the attention, not necessarily the one who does the best job. The press, it seems, is very happy to have someone call in with such information, and if the subject has enough human interest or a lot of QRM value they’ll sometimes go all out to give it a big spread. After all, newspapers depend on circulation and circulation depends on attracting readers, and readers want to read about specific things that are done well. They don’t want a lot of generalized information and statistics. Thus, the “character” on the net is more interesting than the “plugger” who keeps at it without thought of anything but the job to be done.

There is only one way we can see to it that the newspapers, magazines and broadcast stations get the proper material to publicize our activities, and that is to give it to them ourselves. Your headquarters can and does submit frequent releases to the news agencies and local papers as appropriate, but the local angle is far more important, and only you can supply this. If you don’t do this, then the press is going to seek out the amateur who makes the most noise and print his version of what goes on. Sometimes this version is correct, sometimes it is not. Sometimes the man is a real leader, sometimes he is just a noise-maker, and while his publicity may seem to be beneficial, it can often redound to our everlasting discredit.

Our first consideration in any emergency is to get the job done. This takes precedence over all else. The giving of publicity, the giving of credit where credit is due, are secondary. Headquarters has a very fine booklet which goes into the greatest detail in ways and means of getting indicated, primarily for use by clubs, but the methods can apply just as well to an AREC group. It is free for the asking, and we urge you to use it. But let’s keep publicity in its proper place in our emergency work — as a means to an end, not an end in itself. — W1NJM

Maybe this will interest you. The Washington SCM and SEC have organized a monthly on-the-air forum consisting of themselves and the ECs in the section to discuss AREC activities and problems. All AREC members are invited to attend and submit comments or problems to their ECs. This is not only a good means of getting the section AREC officials together, but it can assist in keeping up interest in the AREC in the section and give the SCM and SEC ideas of which ECs are active and which could stand replacement or jacking up. If your section is in the AREC doldrums (or even if it isn’t), this may be a device worth trying.

Audubon, Iowa, was hit by a wind and rain storm at 2230 CST, Aug. 6, which put all lights and phones out of business. The sheriff requested five mobiles to help out. W7E V3AU UO5 TV0 and PGA responded, and also fixed stations W7E AIN, K7E PTO, K7U DRV8/SN2 WBY. W7E UW5K was on the air using K7EUC/6 on 7200 kHz in contact with Audubon or acted as relays. The mobiles assisted the cleanup crews, after having handled plenty of emergency traffic, until 1000 CST Aug. 7. — W7YAU, BC Audubon Co., Iowa.

Sometime in mid-August, W5I AJ answered a call directed to Houston, Texas, by OA9UJ of Lima, Peru, who reported an emergency situation. What the Peruvian amateurs and several others made arrangements that resulted in saving the life of a man in Peru with a heart condition that required immediate surgery. The stricken man was flown from Lima to Houston; a specialist was flown from Houston, Pa., to Houston to perform the operation, which was successful. After making all these arrangements, the amateurs made it possible for the patient to talk with his family in Peru. These communications were not available by commercial means. One report comes from a newspaper clipping sent in by W5IQL.

The Lafayette (La.) Civil Air Patrol asked the amateurs to provide communications for a practice search and rescue mission on June 2. The local net was activated from Brousewood Strip to Lafayette Airport with stations at Rayne and Crowley taking part, relaying for mobiles and keeping the channel clear. Mobile units were paired with planes and messages dropped from the planes were relayed to the bases at the airports. Administrative traffic between the airports by C.A.P. officials was also carried on the amateur frequency of 3860 ke. The Civil Air Patrol says this was the best communications exercise ever conducted. The total of 13 amateurs participated in the exercise. — K6DPH, BC Lafayette Area, La.

The Strain Area Radio Club provided communications for the annual top O’Miechon marathon race on July 17. A network of mobile stations was set up at Cheboygan, Indian River, Devils Elbow and Conway with W8GQN, club call, as the NCS. A boat at the turn-around in Conway carried a v.h.f. unit to relay information to the shore. Nine amateurs participated.

Despite inedible weather, eight amateurs provided communications for the sports car race at Brook Park, Spokane, Wash., on Sept. 4. Operating on two meters with all stations on emergency power, there was no time during the day when immediate contact with all critical locations wasn’t available. Six stations were located at turns, one was mobile and a net control station was set up at the start-finish line to give all concerned a convincing demonstration of portable communications. The race chairman said “the one bright spot in today’s activities is the wonderful job done by the hams.” — K7 EP, BC Spokane Co., Wash.

Working as a division of AREC in conjunction with RACES, some 20 radio-equipped mobile units were operated in the Atlantic VPY parade in Detroit in early September. The cars provided communications along the parade route and assisted in maintaining orderly movement of the many segments of this seven-hour parade. Sixteen of the mobiles were stationed along the line of march while the remainder roved the area. All operation was on ten meters.

The Maritime provinces of Canada were plagued with forest fires in August and September which had the AREC of that section in action much of the time. SCM VE1WB sends in three reports and promises more later. The Forest Glade fire, near Prince Albert, N. S., seemed to be under control by Aug. 29 but was fanned back into life by a strong breeze, and later developed into a major emergency. Several amateurs to supplement the already-overworked forestry communications facilities. Annapolis Valley amateurs responded with eight mobiles, five fixed stations and three additional operators, all of whom stationed in job for three days until the fire was out. Mobiles were stationed at strategic points, some in hot spot areas where their personal danger was great; this latter group consisted of VE4L MA 3H and MO. Other mobiles were VE4L OA AJY, VE4L AEF, VE4L WH, VE1GC, VE4L BC 111 and NCS, VE1QG, VE1LD and BT. Other amateurs taking part were VE4L IM AEM ZL and AGL. — VE1MO.

In the Hammond Plains (N. S.) fire of Sept. 8, BC VE1ADE was called by the local V.A. to help in the fire area and wanted some communications equipment. VE1GC was dispatched from Halifax with equipment for an 80-
meter link, but they discovered what was needed was a six-meter link, so base station equipment for that band was set up and operated through the night by VE1PC and VE1GC. The best morning VE1s ADH AEW and AFK arrived at the control center to assist with the operating. The two latter operators stayed until midnight and VE1SP and VE1HC took over the following day (Sept. 11). On Sunday the e.d. truck was put into service as a control station, necessitating more operators, so four operators of VE1AFD were placed into service, with VE1FQ assisting. VE1SP assumed responsibility for the control station and remained until Monday, when the fire was brought under control.

On Sept. 8, provincial c.d. headquarters in Halifax, N. S., received a request to establish a communications net for emergency use during one of the worst forest fires in Nova Scotia's history. The request was forwarded to Queens c.d. and immediate work was begun to gather equipment and personnel. By 1600 EST Friday a station was established at Camp I on the northwestern shore of Lake Rosseignol, using emergency power, thus giving Camp I a link with c.d. headquarters in Liverpool. At 1900 AST a station at Indian Field went on the air, and a three-station net was in operation. The following day a fourth station was located at Camp 21. The frequency of 3700 kc was declared to be an emergency frequency by the Department of Transport. The net operated for seven days and was assisted by a number of other amateurs. Amateurs serving as operators during the period, all members of the Liverpool C.D. Radio Club, were VE1s LB PV PQ LR ABB AP RL US. Assisting stations included VE2s NA QD ADH IN ADJ and VE. --- VEUS, BC Liverpool, N. S.

When Hurricane Ethel was headed for Maine, Ala., on Sept. 14, EC W4W11W alerted nets on six and ten meters and within minutes a good number of stations were active. Evacuation of low areas became necessary and W4KTRR was sent to Dauphin Island to assist in evacuation communications, and later moved to Bayou La Batra. K4TIT was set up at the Weather Bureau and K4SSF and K4HJB set up stations on the Red Cross Building on six meters. By 1800 K4HJB had logged the following in the ten-meter net: K4A DBB PWE ZOC MZ0 EKG S175M ZOE TQS 8Q0 MLF KJP SKX, W4E KKA EXE CSU 1 NU FYT S17 AXM mobile IIF/mobile YAI/mobile CJC/mobile, W2NFAF/4/mobile. At 1900 a monitoring and liaison station for the next 24 hours was set up at the Trade School, manned by W4F EXE/4, IAX and K4QQS. Mobile County C.D. was put into operation on six and ten meter teletype by K4A KV6 EEH BOF QOF GYW THT MLQ MLF, W4S 1NU (radio officer) WPC and HIJ. W7C7Y/4 set up all-band over the land through six meters in the club house and stood by. A traffic link was set up on six meters to Pensacola. Liaison was also maintained with Army MARS. Other amateurs participating, not mentioned above, included K4 DQF Q07 1US PWD U8R URJ YWD ZOL. -- W4HWW, EC Mobile Co., Ala.

---

The month of August produced 29 SEQ reports, the same as this month last year, representing 11,477 ARER members, a decrease of 4% so far this year. If you wish details of these, which will be published later in the journal, just let me know. I am always looking for material for the column. If you have a story to tell, I want to hear about it.

---

RACES News

At the Hudson Division ARRL Convention held in New York in October, the RACES-RACES meeting was attended by approximately 75 people. Master of Ceremonies was Bob Link, W2YKF, RO for the city, and on the program were WINJM for AREC and W2BGO, N. Y. State RO, for RACES. It was an interesting meeting, WINJM (pardon the third person form, but it's better that we urge greater participation under the AREC, bemoaned the fact that many amateurs seemed to go in for emergency work more for what they can get out of it than for what they can put into it and therefore preferred RACES to the AREC because of the better possibility of getting equipment (whereas the AREC can't spend taxes), described the proposed RACES emblem and decals, and wished aloud that RACES people would work harder to make RACES a program that they could take as much pride in as the AREC.---

---

Other Activities

The following lists date, name, sponsor, and page reference of QST issue in which more details appear.

Dec. 3-4: 21/28 Me. Telephony Contest, RSGS (p. 75, last month).
Dec. 10-11: Pennsylvania QSO Party, (p. 120, this issue).

December 1960
Traffic Topix

The half way point in the annual SBL race found K6UVT well established in second place with 336 points, as against 143 for W6LLL in third place. The rest of the top ten include W6CA (114), W5LXJ (112), K6CIP/MMQ (111), W8DHD (108), W8TBA (104), W8PUH (99), and W6JF (91). We’re glad to see our old friends, Ben, WAPL, back in the saddle and right up there with the leaders again. Call area leaders not among the top ten are W8ZIN (47), W7GKY (81), W6TGY (82). Canadian leader is VE3WVT (32). Note that all but three of the ten call area cells are included in the top ten, and two of the others are hanging fairly close on the heels of W4PL, indicating that traffic is not quite so regional as it was.

In the Post-War (since 1946) listing, second place is occupied by W4PL with 2040 points, followed by W7BTA (1941), W2KEB (1873), W8HBD (1820), W6SCA (1805), WN7ZZ (1553), W3WQI (1181), W8CPI (1099) and W7GKY (1082). Call area leaders not among the top ten are K6CIP/MMQ (273), W5WQF (157), W6JF (114), W8JBU (82). And the post-war leader is VE2VT (76). It takes a lot of BPL points to hit the top ten in the post-war category (now over a thousand, and brother, that takes years!), so here’s the rest of the top ten: W8JUJ (923), W7GKY (909), W7CZQ (885), W5CJ (815), W6TQD (800), W8BG (804), K2UVT (805), W8ZIO (603), W8LCA (603), W8PUH (619), W8JUH (594), W7JTI (571), W4PL (32), W2KAP (311), W5QO (479).

The rule of four points for each time you make BPL plus one point for each full hundred points in your BPL total. Only individuals working from their own stations are eligible. If you have less than 25 points and fail to add to them in two years, you lose them all. If you go over ten years without adding to your BPL points, you lose all under 50 points. Otherwise, you are on the BPL list for life.

N. Who is first place? What a question! Anyone who handles traffic knows that W3CULl is always in the lead. She has 314 points in mid-1960, and a total of 4016 (no, that’s not a misprint) in the post-war list. — W1NJD.

September Net Reports.

<table>
<thead>
<tr>
<th>Net</th>
<th>Sessions Checked</th>
<th>Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. E. States Traffic</td>
<td>29</td>
<td>251</td>
</tr>
<tr>
<td>20 Meter Side Band</td>
<td>21</td>
<td>617</td>
</tr>
<tr>
<td>7205-2000</td>
<td>42</td>
<td>224</td>
</tr>
<tr>
<td>Mike Farad Emerg &amp; T/F</td>
<td>51</td>
<td>571</td>
</tr>
</tbody>
</table>

National Traffic System. With the annual Christmas rush fast coming up on us, it is going to be necessary to shorten all our procedure as much as possible if we are to get all the traffic handled in decent season. We have noticed that not many NCS are using the new QN signals (see July 1960 QST, p. 84), even in situations when they might well be used. You still hear NCS say “call WXXX & if OK up 10 Iowa,” or “go down 10 and wait until WXXX finishes with W8YYY, then send him tie for Iowa.” This kind of procedure is a waste of valuable time when traffic is heavy on high on books. Let’s use QNV and QNQ respectively in the shore situations. They are correctly listed in the new Operating Aid No. 9 and in the operating booklet.

In connection with the upcoming Christmas rush, we would also like to point out that because traffic is heavy is no real reason to allow the NTS time schedule to go haywire. Quite the contrary, that’s when the time schedule is important; it’s what makes NTS a system instead of a bunch of individual schedules. A net starts at a certain time. Its participants are usually anxious to get their traffic, get rid of their traffic, and be on their way. In NTS, it is policy, for this reason, to hold net stations for fifteen minutes only. The net leader is required to ensure everyone on the net is aware. So, if policy is followed, you may find yourself without any outlets for traffic if you show up late. But that isn’t the only reason. Another good reason for reporting into nets on time, especially if you have a hook of traffic, is to give yourself time to clear it, and also to give the net time to clear itself. Don’t forget, you may be on your own, with one, with a hookful, and when you report in late, even if not full 15 minutes late, you may very well have held up the net that long.

So, keep your NTS commitments on time. If it occasionally means you have to cut someone off before he is clear, all right! If it’s necessary, it’s necessary. NTS is not an unlimited load system, and sometimes we have more than we can handle. Traffic that cannot be handled in the allotted time should (1) be handled by special schedules, (2) take alternate routings or (3) be held over. But keep those NTS net and schedule commitments on time. September reports.

<table>
<thead>
<tr>
<th>Net</th>
<th>Sessions</th>
<th>Traffic</th>
<th>Average (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAN</td>
<td>27</td>
<td>1259</td>
<td>46.6</td>
</tr>
<tr>
<td>CAN</td>
<td>30</td>
<td>1383</td>
<td>45.5</td>
</tr>
<tr>
<td>PAN</td>
<td>29</td>
<td>1330</td>
<td>45.3</td>
</tr>
<tr>
<td>BNK</td>
<td>28</td>
<td>1333</td>
<td>45.1</td>
</tr>
<tr>
<td>RSN</td>
<td>60</td>
<td>694</td>
<td>11.0</td>
</tr>
<tr>
<td>3RN</td>
<td>50</td>
<td>1341</td>
<td>7.8</td>
</tr>
<tr>
<td>4RN</td>
<td>37</td>
<td>806</td>
<td>21.5</td>
</tr>
<tr>
<td>RN6</td>
<td>53</td>
<td>810</td>
<td>15.1</td>
</tr>
<tr>
<td>RN7</td>
<td>50</td>
<td>1236</td>
<td>24.7</td>
</tr>
<tr>
<td>RSN</td>
<td>50</td>
<td>1340</td>
<td>24.8</td>
</tr>
<tr>
<td>RN9</td>
<td>50</td>
<td>1344</td>
<td>24.4</td>
</tr>
<tr>
<td>REN</td>
<td>50</td>
<td>1347</td>
<td>24.3</td>
</tr>
<tr>
<td>ECN</td>
<td>22</td>
<td>52</td>
<td>2.9</td>
</tr>
<tr>
<td>TWN</td>
<td>29</td>
<td>230</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Sections:
- 9080 7470
- 7580

TCC Eastern, 7580

TCC Central

TCC Summary

| CAN | 11.6|
| PAN | 9.9|
| RSN | 10.3|
| REN | 14.6|
| ECN | 5.4|
| TWN | 8.0|

TCC Eastern, 7580

TCC Central

TCC Summary

1 Region net representation based on one session per night.

2 Section nets reporting: QMN (Mileh); NJN (N. J.); SCN (S. C.); BUN (Utah); WSN, WIN & BEN (Wisc.); MIDD (Mich-Del-D. C.); Iowa 7b; SCN (Calif.); NEB (Nebraska); FTPN (Ft. Totten); FTPN (Ft. Dixon); PBF (Portales); MSN (Mont.).

3 TCC functions reported, not counted as net sessions.

It’s getting so that when there is a report missing in a region, area or TCC level we search frantically for it, unable to believe that it didn’t arrive and thinking it was somehow misplaced. Very often we arbitrate at the level concerned and this is very good gone. Some day we’re going to log a 100% reporting record for a whole year! What’s more, each month’s summary brings down some new records. As we’ve pointed out before, these record-breaking totals are not phenomenally higher than previous totals, but always seem to exceed them. This points to steady, healthy progress.

It was pleasant visiting with 2RN Manager W2PH in the Hudson Division Convention in October. Dick was m.o. at the traffic meeting, although W1NJD did most of the talking. TCC Director W1SNU was there, too, and we had quite a traffic meeting and informal chat before and afterward, W2DY reports a very good traffic attendance at the Central Division Convention in Indianapolis in September, and a successful informal meeting. Attendance of conventions is an important fraternal side to our traffic work, and we hope to arrange for further ones.

W3UE always includes some chit-chat with his 3RN report; this month he comments on the fact that both conditions and interest in 3RN seem to be “in the high bracket.” K4AVU takes over as manager of 4RN, replacing W7WJ; Honny gone extended leave for a while. Region net certificates were awarded, during September, to K5OKC K6LKD WA6HJK and W4DNU/6 for their fine work on RN8; W6B9S says that Nevada is delinquent in attend- ance. Out of the 9 states that are put up on these cards, only three show any attendance; must we give up on Alaska, Alberta, Sask., Mont., and Idaho? W8BDAE says 8RN is doing fine but doesn’t like “book numbers, W6WYK says he was awarded a 3RN certificate for 50 traffic books for increased attendance by the VE26 in ECN during October. K6EDH says that Wyoming is back in TWC, but Arizona is still missing.
Transcontinental Corp., W1SMU is a regular bird dog when it comes to sniffing out new prospects for TCC, and he has uncovered some beauty. The turnover remains rather high. WBDDE's Central Area crew is showing signs of some healthy expansion. September reports:

<table>
<thead>
<tr>
<th>Area</th>
<th>Functions Successful</th>
<th>Traffic</th>
<th>Traffic Out-of-Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern</td>
<td>99</td>
<td>98.0</td>
<td>1387</td>
</tr>
<tr>
<td>Central</td>
<td>92</td>
<td>93.4</td>
<td>2574</td>
</tr>
</tbody>
</table>

Summary: 191 94.8 3061 2074

The TCC Radio Eastern Area (W1SMU, Dir.; W1s AW EMG NJM OBR SMU WEF, W1s FEB OPB, W1s COO APY, K2s SXU UPT, W3WQ, K4KNP, W3EDE, VE2ZAI/WL, Central Area (WBDDE, Dir.; K4AKP, W4ZDB), W3s CXO DYG SYX, W3s BDR LCK SCA. NEW AFFILIATED CLUB TRAINING AIDS

ARRL Training Aids (except quizzes) can be loaned only to League affiliated radio clubs, since we have a limited number of listings and nearly 1500 active affiliated groups that can book items for club meetings. Available items are listed in bulletin TA-21. We are pleased to announce some additions to the availability this season. Besides new listings, extra copies of certain already listed most-in-demand items have been obtained. Concerning new items: We have added and compiled two new titles covering how transistors work. Additional films cover theory and practical applications for testing with meters and multimeters, the principles and applications of the diode tube, and practical safety precautions. Two new audio tapes can be booked as club training aids, one in the field of precise frequency measurement and the other covering the Geneva conference. The listings are all covered in our revised list of training aids, TA-21. Affiliated clubs requiring any of the new items listed will please use the reference number listed before each title. As usual we suggest you refer to our main list and indicate some alternate choices. By indicating an acceptable substitute or specifying more than one possible showing the date on high demand bookings, you improve the possibility of obtaining one booking if the other is not available. Here are our new items:

Filsa 16mm sound:
F-38, Hama Wide World, shows what amateurs do and expresses the true story and meaning of amateur radio.
F-40, SAFETY PRECAUTIONS FOR ELECTRICAL PERSONNEL, shows how to avoid electric shock and stress methods and precautions. We think this film is as basic and valuable as our F-23, which covers artificial respiration.

F-40, THE DIODE: PRINCIPLES AND APPLICATIONS, illustrates the principles of electron flow, basic features of the diode tube and how it controls electron flow; principles of photoelectric cells, x-ray tubes and the use of the diode as a rectifier are explained.
F-41, TRAINING AIDS: P-N JUNCTION AND TRIODE FUNDAMENTALS, explains the theory and mechanisms of semi-conductor diodes and transistor action showing that junction transistors (triodes) have three sections with two P-N junctions separating them.

F-43, CIRCUIT TESTING: WITH METER AND MULTIMETERS. Part 2: Practical Applications, demonstrates the actual use of instruments.

Magnetic Tapes:
T-4, LEA'S TALK ABOUT FREQUENCY MEASUREMENT, is the tile of a discussion by Allan Gunston, WBCQ, on setting up for frequency measuring in ham work. The tape mentions ARRL's frequency measuring tests and runs for about 29 minutes at 33 1/3 ips.
T-5, THE GENEVA CONFERENCE, a tape talk by John Hutton, WILYQ, covers the Geneva conference and frequency allocations proceeding. This is a more personalized account than the complete summarized report (pages 55, Mar. 1960, QST); it runs approximately 1 1/2 hours at 33 1/3 ips.

We sincerely hope that affiliated clubs use these aids when and where possible. If your club is affiliated and has not made bookings, let us send the new TA-21 and booking suggestions. Our purpose is to help club increase your participation and build up interest, and to help instructors in your club courses explain radio and electrical theory, and demonstrate the use of different types of radio apparatus.

We have a new 4RN Manager. At the Rock Hill, S. C., hamfest in early October retiring manager W4SHJ, right, turned the 4RN records over to his successor, K4AVU.

BRASS POUNDERS LEAGUE

Winners of HPL Certificate for September Traffic:

<table>
<thead>
<tr>
<th>Call</th>
<th>Ore</th>
<th>Ore</th>
<th>Ore</th>
<th>Ore</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3CTL</td>
<td>269</td>
<td>2216</td>
<td>1964</td>
<td>340</td>
<td>4689</td>
</tr>
<tr>
<td>W3LX</td>
<td>7</td>
<td>999</td>
<td>602</td>
<td>84</td>
<td>2048</td>
</tr>
<tr>
<td>W3BE</td>
<td>54</td>
<td>949</td>
<td>963</td>
<td>45</td>
<td>1910</td>
</tr>
<tr>
<td>W3GCA</td>
<td>22</td>
<td>848</td>
<td>826</td>
<td>5</td>
<td>1708</td>
</tr>
<tr>
<td>W4IDA</td>
<td>816</td>
<td>708</td>
<td>753</td>
<td>47</td>
<td>1793</td>
</tr>
<tr>
<td>W4LQG</td>
<td>549</td>
<td>747</td>
<td>729</td>
<td>26</td>
<td>1291</td>
</tr>
<tr>
<td>W4KLH</td>
<td>28</td>
<td>674</td>
<td>606</td>
<td>78</td>
<td>1396</td>
</tr>
<tr>
<td>W4BDR</td>
<td>112</td>
<td>666</td>
<td>498</td>
<td>33</td>
<td>1329</td>
</tr>
<tr>
<td>W4KRM</td>
<td>102</td>
<td>607</td>
<td>377</td>
<td>47</td>
<td>1380</td>
</tr>
<tr>
<td>W4KUTY</td>
<td>70</td>
<td>620</td>
<td>500</td>
<td>10</td>
<td>1100</td>
</tr>
<tr>
<td>W4KBR</td>
<td>230</td>
<td>431</td>
<td>242</td>
<td>15</td>
<td>817</td>
</tr>
<tr>
<td>W4WRF</td>
<td>120</td>
<td>400</td>
<td>458</td>
<td>33</td>
<td>1098</td>
</tr>
<tr>
<td>W4P1</td>
<td>15</td>
<td>341</td>
<td>301</td>
<td>19</td>
<td>707</td>
</tr>
<tr>
<td>W3BSY</td>
<td>38</td>
<td>260</td>
<td>238</td>
<td>10</td>
<td>618</td>
</tr>
<tr>
<td>W8PZO</td>
<td>8</td>
<td>261</td>
<td>482</td>
<td>11</td>
<td>502</td>
</tr>
<tr>
<td>W6QHY</td>
<td>243</td>
<td>412</td>
<td>214</td>
<td>11</td>
<td>1007</td>
</tr>
<tr>
<td>W7DQZ</td>
<td>7</td>
<td>468</td>
<td>239</td>
<td>20</td>
<td>954</td>
</tr>
<tr>
<td>W7QD</td>
<td>30</td>
<td>362</td>
<td>235</td>
<td>23</td>
<td>780</td>
</tr>
<tr>
<td>W7QK</td>
<td>291</td>
<td>222</td>
<td>159</td>
<td>64</td>
<td>764</td>
</tr>
<tr>
<td>W9QM</td>
<td>115</td>
<td>226</td>
<td>185</td>
<td>9</td>
<td>529</td>
</tr>
<tr>
<td>W9WQG</td>
<td>-3</td>
<td>320</td>
<td>-347</td>
<td>13</td>
<td>-768</td>
</tr>
<tr>
<td>W9MOS</td>
<td>10</td>
<td>696</td>
<td>737</td>
<td>33</td>
<td>1268</td>
</tr>
<tr>
<td>W9FY</td>
<td>11</td>
<td>303</td>
<td>291</td>
<td>10</td>
<td>615</td>
</tr>
<tr>
<td>W9DNJU</td>
<td>57</td>
<td>290</td>
<td>235</td>
<td>42</td>
<td>642</td>
</tr>
<tr>
<td>K3OK</td>
<td>31</td>
<td>391</td>
<td>239</td>
<td>10</td>
<td>611</td>
</tr>
<tr>
<td>K3QET</td>
<td>6</td>
<td>317</td>
<td>252</td>
<td>46</td>
<td>712</td>
</tr>
<tr>
<td>K3QET</td>
<td>7</td>
<td>291</td>
<td>276</td>
<td>7</td>
<td>565</td>
</tr>
<tr>
<td>K3QET</td>
<td>6</td>
<td>217</td>
<td>256</td>
<td>22</td>
<td>505</td>
</tr>
<tr>
<td>K3QET</td>
<td>10</td>
<td>578</td>
<td>362</td>
<td>6</td>
<td>667</td>
</tr>
<tr>
<td>K3QET</td>
<td>7</td>
<td>578</td>
<td>111</td>
<td>12</td>
<td>607</td>
</tr>
<tr>
<td>K3QET</td>
<td>16</td>
<td>239</td>
<td>209</td>
<td>20</td>
<td>563</td>
</tr>
<tr>
<td>K3QET</td>
<td>7</td>
<td>257</td>
<td>214</td>
<td>14</td>
<td>514</td>
</tr>
<tr>
<td>K3QET</td>
<td>10</td>
<td>230</td>
<td>232</td>
<td>10</td>
<td>572</td>
</tr>
<tr>
<td>K3QET</td>
<td>8</td>
<td>254</td>
<td>145</td>
<td>98</td>
<td>516</td>
</tr>
<tr>
<td>K3QET</td>
<td>10</td>
<td>346</td>
<td>236</td>
<td>20</td>
<td>607</td>
</tr>
<tr>
<td>K3QET</td>
<td>13</td>
<td>287</td>
<td>241</td>
<td>61</td>
<td>503</td>
</tr>
<tr>
<td>W1NJT (AUS)</td>
<td>63</td>
<td>517</td>
<td>465</td>
<td>51</td>
<td>1097</td>
</tr>
<tr>
<td>W3ZLB (AUS)</td>
<td>393</td>
<td>303</td>
<td>291</td>
<td>12</td>
<td>945</td>
</tr>
</tbody>
</table>

More-Than-One-Operator Stations

W3YDK | 210 | 315 | 251 | 56 | 889 |
K3GUM | 17 | 620 | 569 | 16 | 1218 |

HPL for all other stations. More-Than-One-Operator Stations

K7DB | 212 | K5BDB | 115 | K4FSS | 105 |
K3GD | 120 | W3KOB | 105 | K4GK | 108 |
W7QMV/W3S | 126 | W3EWE | 112 | K4KRM | 115 |
W4G8C | 129 | W3QAA | 110 | K3YMU (Aug.) | 124 |
W4F1E | 118 | W4HAB | 109 |

More-Than-One-Operator Stations

K6CGR | 76 | Late Report: K6CGR | 76 |
K6GRS | 212 | Late Report: K6GRS | 212 |

HPL stations (see Aug. 1984 QST, p. 64) have been awarded to the following amateurs since last month's listing: W1JD, K4FEY, K5VIC.

The HPL is open to all amateurs in the United States, Canada, Cuba and U.S. Possessions who report to their SCM a season total of 500 or more of 500 or more orations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt. In standard ARRL form.
**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.

- **Santa Barbara**
  - Robert A. Henke, KE6CVR
  - Aug. 10, 1960

- **Nevada**
  - Charles R. Rhines, W7VTD
  - Oct. 10, 1960

- **Santa Clara Valley**
  - W. Conley Smith, E5DYX
  - Oct. 15, 1960

- **Southern Texas**
  - Roy K. Eggleton, W5QOM
  - Dec. 10, 1960

In the New Hampshire Section of the New England Division, Mr. Ellis P. Miller, W1EIQ, and Mr. Albert F. Haworth, WYBH, were nominated. Mr. Miller received 166 votes and Mr. Haworth received 77 votes. Mr. Miller's term of office began Oct. 28, 1960.

In the Kansas Section of the Midwest Division, Mr. Raymond E. Baker, W6FNS, and Mr. Clarence H. Hillman, KBAWO, were nominated. Mr. Baker received 301 votes and Mr. Hillman received 125 votes. Mr. Baker's term of office began Oct. 28, 1960.

**ARRL AFFILIATED CLUB HONOR ROLL**

This month we present with pleasure, the second section of our Club Honor Roll. The purpose is to extend special recognition to all those affiliated clubs whose entire membership consists of members of the League. See page 83 of June '60 QST for the earlier listing of those affiliates with 100 or more members this year. Our honor list is prepared each time based on analysis of data received in connection with each club's return of a survey or Annual Report form. In early 1961, probably in February, a new survey form will be sent every active ARRL-affiliated club in order to gather the necessary things on which continued affiliation and our QST listings are based. All the following-listed Honor Roll clubs now will receive our "100% ARRL club" certificates shortly after the distribution of this issue of QST: Amateur Radio Technical Society of St. Louis, Mo.; Amateur Transmitters' Association of Western Pennsylvania, Venetia, Pa.; Peacock Radio Amateur Club, Cheltenham, Pa.; Blue Ridge Radio Society, Greenville, S.C.; Coffee Dunks of Detroit, Mich.; Davenport Radio Amateur Club, Inc., Davenport, Iowa; Daytona Beach Amateur Radio Association, Inc., Daytona Beach, Fla.; Garden City Amateur Radio Club, Fimnpark Park, Kansa; Hi Plains Amateur Radio Club, Plains, Kansa; Jefferson Barracks Amateur Radio Club, St. Louis, Mo.; The Mahanoy Valley Brass Pounders Club, Mahanoy City, Pa.; Maui Amateur Radio Club, Kahului, Maui, Hawaii; Northeast Nebraska Radio Club, Fremont, Nebr.; Panama Amateur Radio Club, Pampa, Texas; Postelvo Amateur Radio Club, Inc., Postelvo, Idaho; Porterville Amateur Radio Club, Porterville, Calif.; Prairie Dog Amateur Radio Club, Yakton, So. Dak.; Rappahannock Valley Radio Club, Fredericksburg, Va.; St. Louis Amateur Radio Club, Inc., Webster Groves, Mo.; Shelby Radio Club, Shelby, N. C.; Skagit Amateur Radio Club, Arlington, Wash.; Smoky Valley Radio Club, Abilene, Kansa.; Sweetwater Amateur Radio Club, Sweetwater, Tex.; The Thirteen Amateur Radio Club, Vancouver, B. C., Canada; Valley Radio Club, Eugene, Ore.; West Essex Amateur Radio Society, W. Oldwick, N. J.; Westerly Amateur Radio Club, New Orleans, La.

**CLUB COUNCILS AND FEDERATIONS**

Cleveland Area Council of Amateur Radio Clubs, Gertrude E. Maxim, W80IS, Secy., 23644 Woodhill Drive, Berea, Ohio


Los Angeles Area Council of Amateur Radio Clubs, Inc., Bob Dailey, W6UKC, Sec'y., P.O. Box 25, Whittier, Calif.


The Ohio Council of Amateur Radio Clubs, Karl H. Kanae, W8THX, Sec'y., 225 Tibbet Rd., Columbus 2, Ohio.
DX Century Club

The following list contains the call letters and country totals of holders of the Postwar DX Century Club Award who have submitted confirmations to ARRL during the period from October 1, 1958 thru September 30, 1960. QST space considerations make it necessary to limit the size of the list this year. The total number of DXCC certificates issued as of September 30, 1960 was 7162. Since the necessary space to run the complete DXCC roster is no longer available, this list contains only the calls of those who have shown an active interest in their DXCC rating over the indicated 24-month period.

<table>
<thead>
<tr>
<th>Call Letters</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 W1HP</td>
<td>ZL5GX</td>
</tr>
<tr>
<td>299 W9EC</td>
<td>W6AM</td>
</tr>
<tr>
<td>267 W4EA</td>
<td>W8QHH</td>
</tr>
<tr>
<td>260 W9AD</td>
<td>W9GB</td>
</tr>
<tr>
<td>297 W9AW</td>
<td>W9UQ</td>
</tr>
<tr>
<td>286 W9CA</td>
<td>W9XG</td>
</tr>
<tr>
<td>285 W9JN</td>
<td>K9RA</td>
</tr>
<tr>
<td>296 W1MB</td>
<td>W3JJN</td>
</tr>
<tr>
<td>295 W9CC</td>
<td>W6CWUQ</td>
</tr>
<tr>
<td>284 W9EB</td>
<td>W6BP</td>
</tr>
<tr>
<td>283 W9RQ</td>
<td>W8QV</td>
</tr>
<tr>
<td>272 W9PH</td>
<td>W9XN</td>
</tr>
<tr>
<td>282 W1DO</td>
<td>W9Z3X</td>
</tr>
<tr>
<td>281 W9PH</td>
<td>W9XW</td>
</tr>
<tr>
<td>271 W9XY</td>
<td>W9YK</td>
</tr>
<tr>
<td>270 W9ZQ</td>
<td>W9AB</td>
</tr>
<tr>
<td>269 W9BQ</td>
<td>W9BD</td>
</tr>
<tr>
<td>268 W9AB</td>
<td>W9BE</td>
</tr>
<tr>
<td>267 W9AX</td>
<td>W9DH</td>
</tr>
<tr>
<td>266 W9AT</td>
<td>W9DI</td>
</tr>
<tr>
<td>265 W9AT</td>
<td>W9DJ</td>
</tr>
<tr>
<td>264 W9BT</td>
<td>W9DU</td>
</tr>
<tr>
<td>263 W9CR</td>
<td>W9DF</td>
</tr>
<tr>
<td>262 W9CI</td>
<td>W9DC</td>
</tr>
<tr>
<td>261 W9CY</td>
<td>W9DD</td>
</tr>
<tr>
<td>260 W9CJ</td>
<td>W9DC</td>
</tr>
<tr>
<td>259 W9CQ</td>
<td>W9DD</td>
</tr>
<tr>
<td>258 W9BQ</td>
<td>W9DB</td>
</tr>
<tr>
<td>257 W9AQ</td>
<td>W9DA</td>
</tr>
<tr>
<td>256 W9TB</td>
<td>W9DX</td>
</tr>
<tr>
<td>255 W9AP</td>
<td>W9DS</td>
</tr>
<tr>
<td>254 W9WJ</td>
<td>W9DZ</td>
</tr>
<tr>
<td>253 W9WP</td>
<td>W9DW</td>
</tr>
<tr>
<td>252 W9WJ</td>
<td>W9DX</td>
</tr>
<tr>
<td>251 W9RF</td>
<td>W9DZ</td>
</tr>
<tr>
<td>250 W9RQ</td>
<td>W9D4</td>
</tr>
<tr>
<td>249 W9QK</td>
<td>W9C2</td>
</tr>
<tr>
<td>248 W9WQ</td>
<td>W9C6</td>
</tr>
<tr>
<td>247 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>246 W9ZR</td>
<td>W9C8</td>
</tr>
<tr>
<td>245 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>244 W9VQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>243 W9VP</td>
<td>W9C8</td>
</tr>
<tr>
<td>242 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>241 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>240 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>239 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>238 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>237 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>236 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>235 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>234 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>233 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>232 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>231 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>230 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>229 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>228 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>227 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>226 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>225 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>224 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>223 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>222 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>221 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>220 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>219 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>218 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>217 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>216 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>215 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>214 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>213 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>212 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>211 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>210 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>209 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>208 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>207 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>206 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>205 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>204 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>203 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>202 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>201 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>200 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>199 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>198 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>197 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>196 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>195 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>194 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>193 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>192 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>191 W9WQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>190 W9VR</td>
<td>W9C8</td>
</tr>
<tr>
<td>189 W9XQ</td>
<td>W9C8</td>
</tr>
<tr>
<td>188 W9WQ</td>
<td>W9C8</td>
</tr>
</tbody>
</table>

December 1960
**ATLANTIC DIVISION**

**EASTERN PENNSYLVANIA—SCM.** Allen B. Brenner, W3RQ—Eighty-meter long-haul has been given an assist by the early evening skip and VE and CUL have added another final amplifier for the water work load. Another traffic maker, EML, looks forward to CD Parties. HKK is now in the U. S. Postal Department. Our RM, A2A, CQ and CA9HF list CQ-DX, GTA and keying their QRP CW and 30 meter per cent QNI with 3MR. K3s CAH, BHI, CDL, G3U and JSS and W3s DUD, DGX, GEA and AMO, led by our two 30 meter comb, were worth the trip on 3 M. AK, and 3 YO eye-ball QSO. TIU is now back in the swing of traffic handling and tried his skill in the W-VE Test. K3LLK is on 3 M and K3HTZ has been added to the list of ORS. K3JLW has become an active member of the PFCN. Ed is NF Fri., nights and ZVW Sat. and Sun. The rest of the W3 Network is looking like a DX ham with extra operators now. K3HBU and K3KRN. K3CNN has been filling in as NCS on the PADC Net. ELI has had some trouble with his wire cutters; they always cut his antennas too short for 2500 kc. JNQ lost his 30-meter antenna and beam. K3ALD received the Keystone Award. The V32C Operating Bureau has been added to K3JF, and K3NNA has enlisted in the Army and K3KNQ in the Navy. New officers of the West Philadelphia RC are 60 kw, plus. K3JTB is in W3M. K3CDT. New Generals are K3TDF and K3EGG. A new home-brew 6N2 converter was added to YLH's shack. K3MCD is adding 6 meters to his shack. K3HM is modifying and adding a new rig, low and all. K3HBU in the V.W.P. Contest. DUL and K3KNO have new Viking Valiant transmitters. The Northern Penn ARC has a home-built equipment show. A quote from the Hilltop Transmitting Assn. bulletin is: At the Board Meeting it was decided to dig a well. So dig we will a well. The well will be located at the club-room building. The Mahanoy House is up for parade control of the Schuylkill County Firemen’s Convention in Mahanoy City. The SEC. DUL invites reports from all ECG stations. Furthermore, the school and other Educational Test exercises. When trying out his new mobile, K3LVA was quickly contacted by J2F when LVA's XYL had a J2F on the air. The November 1st, his new home-brew 4UWA forwards a new story hereafter (Centres Daily Times). Traffic: W3CUL 4659, VE 886, V3B 805, V3B 1115, K3KX 99, K3KX 88, W3NN 73, K3HEX 70, W3KMD 47, JUHI 47, K3HTZ 40, IPC 40, J3W 37, ANU 29, MVO 23, W3NF 19, K3CAH 15, W3QO 19, BPF 17, AMIC 11, K3HXC 11, XS 10, W3DUI 9, ITI 9, ADK 8, BUR 8, ADE 7, K3BCV 7, W6Y 6, K3CNN 5, W3TEJ 5, PDJ 4.


**SOUTHERN NEW JERSEY—SCM.** Herbert C. Brooks, K3EE—SEC. W3YRW, RM's: W3BZJ, W3HWD and W3ZLL. September totals of the N. J. Phone and Traffic Net are; 30 meter 900, QNI 525, W3NQY. K3DEI, Maple Shade, again made BPL. K3PC, Pitman, renewed his OES appointment, K3JGU, Gloucester, has his appointment renewed. He now is OES. W3ORT, Audubon, increased his traffic-handling of 2RN service. W2RG, Merchantville, vacation in Vermont, Ed has built a new receiver he is now planning to introduce the traffic room. W3ZI, Pennington, is NCS. Mon. on NNN and also takes 2RN Tue. and Wed. W3ZECR has been handling emergency traffic for the New Jersey Amateur Radio Club. The SJRA's annual "Ham-fest" was a big success. About 1100 attended. The SJRA's 19 to 20 oz. beer and 21 oz. wine coupon was very popular. A lot of interest. K2BZK is NCS, K3XBB, Margate, reports that Atlantic County RACES was activated during Hurricane Donna. Adamson served very well during the bad band conditions. W2IU, Absecon, reports no traffic activity because of bad band conditions. W3ZI, Trenton, supplied a complete report of Mercer Co. Delaware. W3KINH, "Donna." RACES Hq. was manned by W3ZI and K2BJT. The following stations were active during the emergency: W2AA, GNSY, W3BZJ, W3WPT, K3PQH, K3ETJ, K3QUA, W3LQN, W2LY, K3LXN, W3LKY, W3TGE and K3KINH. ZI personally handled over 60 messages. The Club supplies communications for many county activities. W3QIAP, Camden, was the speaker at the September meeting of the local RAC. (J. E. B.) said that QRP is quite active in MAB and is an A-1 Operator. No operators were received from Salem, Cumberland, Cape May and Atlantic Counties. Monthly reports are solicited. Traffic: K3DEI 257, W3BEI 80, W3ZRG 87, K3GJU 64, W3BZJ 69, W3ZI 50, K3XBB 30, K3XBB 29, K3KINH 22.

**WESTERN NEW YORK—SCM.** Charles T. Hansen, K2KHE. W2RZC: PAM: W2PVI. NYS C.W. meets on 3515 kc. at 1000, ESS on 3500 kc. at 1000, NYSPTEN on 3925 kc. WNYT: LPT on 3525 kc. at 1015, TC on 3500 kc. at 1015, 3500 kc. at 1600-W2PVI made BPL for the 21st consecutive night. W2ZAN also made BPL. July 2, W2PVI NHK. W2ZAN and W2PVI are activating again. K2KHE is on 3515 kc. at 1000. ESS at 1000. NYSPTEN on 3925 kc. WNYT: LPT on 3525 kc. at 1015, TC on 3500 kc. at 1015, 3500 kc. at 1600-W2PVI made BPL for the 21st consecutive night. W2ZAN also made BPL. July 2, W2PVI NHK. W2ZAN and W2PVI are activating again. K2KHE is on 3515 kc. at 1000. ESS at 1000. NYSPTEN on 3925 kc. WNYT: LPT on 3525 kc. at 1015, TC on 3500 kc. at 1015, 3500 kc. at 1600-W2PVI made BPL for the 21st consecutive night. W2ZAN also made BPL. July 2, W2PVI NHK. W2ZAN and W2PVI are activating again. K2KHE is on 3515 kc. at 1000. ESS at 1000. NYSPTEN on 3925 kc. WNYT: LPT on 3525 kc.

On page 189
Man's desire to communicate still offers our greatest opportunity to achieve peace on earth and good will toward all mankind.

Merry Christmas and Happy New Year

hallicrafters company

...and 73 from

W. J. Hulgan, W9AC, Barbara, Jr.
Nominating letters for the 1960 Edison Radio Amateur Award must be postmarked not later than January 2, 1961.

Please remember that the judges will consider only candidates whose names are submitted in writing by you and others. There is no other source for Edison Award nominations.

Therefore, between now and January 2, canvass in your mind the activities of amateurs you know, in order to make sure no deserving OM or YL fails to be represented. If you uncover such a candidate, by all means send in his name promptly.

For help with your nominating letter, and for rules of the Award, see the October issue of this magazine, or write to Edison Award Committee, General Electric Co., Electronic Components Division, Owensboro, Ky.

**HERE ARE TYPICAL ACTIVITIES THAT CAN QUALIFY FOR THE AWARD:**

- Emergency communications work in a disaster, such as a flood, hurricane, tornado, or explosion.
- Helping amateurs and others with their specialized problems, through professional knowledge and experience.
- Community service in organizing mobile and fixed communications to promote the success of fund drives and other public events.
- Helping disabled or physically handicapped persons.
- Relaying messages from remote points for the benefit of isolated servicemen and civilians.
- Designing and constructing radio equipment for use by persons in remote parts of the world, who do not have access to regular commercial communication channels.
- Civil-defense organization work; weather reporting; radio assistance to state or local traffic and police authorities; cooperation in forest-fire prevention and control.
- Teaching basic electronics to young people.
**INVADER**

A superbly engineered SSB Transmitter/Exciter . . . add hi-power conversion for 2000 watts P.E.P., (twice average DC) input SSB!

**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 a solid 2000 watts P.E.P. (twice average DC) input on SSB: 1000 watts CW; and 800 watts input AM! Wide range output circuit (40 to 600 ohms adjustable), Final amplifier provides exceptionally uniform "O". Exclusive "push-pull" cooling system. Heavy-duty multi-section power supply. Wired and tested with power supply, tubes and crystals.

**FIRST CHOICE AMONG THE NATION'S AMATEURS**

E. F. JOHNSON COMPANY - WASECA, MINNESOTA
choose your features...pick your power...
from the nation's most popular transmitter line!

VIKING "KILOWATT" AMPLIFIER (Above)
The only transmitter that provides maximum legal power in all modes—SSB, CW, and plate modulated AM. Class C final amplifier operation provides plate circuit efficiencies in excess of 70% with unequaled broadcast-type high level amplitude modulation. Two 4-400A tubes in Class AB; easily deliver 2000 watts P.E.P. (twice average DC) in SSB mode—provides 1000 watts input AM with two push-pull 810 tubes in Class B modulator service. 1000 watts input Class C CW. High efficiency pi-network output circuit will match 50 to 500 ohm antenna loads.
Pedestal contains complete unit. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB. With tubes. Cat. No. 240-1000...Wired and tested........Amateur Net $1595.00
Matching accessory desk top, black and three-drawer pedestal. Cat. No. 251-101-1...FOB Corry, Pa.$132.00

★★★★★ popular transmitters...

"ADVENTURER" TRANSMITTER
Self-contained . . . 50 watts CW input . . . rugged 807 transmitting tube . . . instant bandswching 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.............Amateur Net $54.95

"CHALLENGER" TRANSMITTER
70 watts phone input 80 through 6; 120 watts CW input 80 through 10 . . . 85 watts CW on 6 meters. Two 6F6G6A 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.............Amateur Net $114.75
Cat. No. 240-182-2...Wired........Amateur Net $154.75

"NAVIGATOR" TRANSMITTER/EXCITER
40 watts CW input . . . also serves as a flexible VFO Exciter. 6T46 final amplifier tube—bandswching 160 through 10 meters. Built-in VFO or crystal control. With tubes, less crystals.
Cat. No. 240-126-1...Kit.............Amateur Net $149.50
Cat. No. 240-126-2...Wired........Amateur Net $199.50

"6N2" TRANSMITTER
Rated 150 watts CW and 100 watts phone—offers instant bandswching coverage of both 6 and 2 meters. Fully TVI suppressed—may be used with the Viking I, II, "Ranger", "Valiant" or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 mc. output. With tubes, less crystals.
Cat. No. 240-201-1...Kit.............Amateur Net $129.50
Cat. No. 240-201-2...Wired........Amateur Net $169.50
"RANGER" TRANSMITTER/EXCITER
This popular 75 watt CW or 65 watt phone transmitter will also serve as an RF/audio exciter for high power equipment. Completely self-contained—instant bandswitching 160 through 10 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. Amateur Net
240-161-0. Kit $229.50
240-161-2. Wired and tested $329.50

"VALIANT" TRANSMITTER
275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) 200 watts phone. Instant bandswitching 160 through 10 meters—built-in VFO or crystal control. Pi-network output matches antenna loads from 50 to 600 ohms. TVI suppressed—timed sequence keying—built-in low pass audio filter—self-contained power supplies. With tubes, less crystals.
Cat. No. Amateur Net
240-104-1. Kit $349.50
240-104-2. Wired and tested $439.50

"FIVE HUNDRED" TRANSMITTER
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. Amateur Net
240-500-1. Kit $749.50
240-500-2. Wired and tested $949.50

"COURIER" AMPLIFIER
Rated a solid 500 watts P.E.P. input with auxiliary SSB exciter as a Class B linear amplifier: 500 watts CW or 200 watts AM linear. Self-contained desk-top package—continuous coverage 3.5 to 30 mc's. Drive requirements: 5 to 35 watts depending on mode and frequency desired. TVI suppressed. With tubes and built-in power supply.
Cat. No. Amateur Net
240-352-2. Wired and tested $289.50

"THUNDERBOLT" AMPLIFIER
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 mc's.—instant bandswitching. Drive requirements: approx. 10 watts Class AB linear, 20 watts Class C continuous wave. With tubes and built-in power supply.
Cat. No. Amateur Net
240-353-1. Kit $524.50
240-353-2. Wired and tested $589.50

"6N2 THUNDERBOLT" AMPLIFIER
1200 watts (twice average DC) input SSB and DSB. Class AB: 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 AB; linear, 6 watts Class C CW. With tubes and built-in power supply.
Cat. No. Amateur Net
240-362-1. Kit $524.50
240-362-2. Wired and tested $589.50

FIRST CHOICE AMONG THE NATION'S AMATEURS

E. F. JOHNSON COMPANY • WASECA, MINNESOTA

Viking
Boost performance... add convenience... with these popular Viking station accessories!

"6N2" VFO—Replaces 8 to 9 mc. crystals in frequency multiplying 6 and 2 meter transmitters. Output range: 7.995 to 9.010 mc. With tubes and power cable.

Cat. No. 240-133-1, Kit ........................ Amateur Net $34.95
Cat. No. 240-133-2, Wired and tested ........................ Amateur Net $34.95

"6N2" CONVERTER—Instant front panel switching from normal receiver operation to 6 or 2 meters. Available in following ranges: 26 to 30 mc., 28 to 30 mc., 14 to 18 mc., or 30.5 to 24.5 mc. With tubes.

Cat. No. 250-43, Kit ........................ Amateur Net $59.95
Cat. No. 250-43, Wired ........................ Amateur Net $89.95

PRE-TUNED BEAMS—Rugged, semi-wide spaced with balun matching sections. 3 elements, boom and balun.

Cat. No. 138-420-3, 20 Meters ........................ Amateur Net $129.50
Cat. No. 138-415-3, 15 Meters ........................ Amateur Net $110.00
Cat. No. 138-410-3, 10 Meters ........................ Amateur Net $79.50


Cat. No. 137-102, Pre-tuned ........................ Amateur Net $129.50

VIKING AUDIO AMPLIFIER—Self-contained 10 watt speech amplifier, with power supply and tubes.

Cat. No. 250-33-1, Kit ........................ Amateur Net $73.50
Cat. No. 250-33-2, Wired and tested ........................ Amateur Net $99.50

LOW PASS FILTER—Wired and pre-tuned.

Cat. No. 250-20, 52 Ohms Impedance ........................ Amateur Net $14.95
Cat. No. 250-25, 72 Ohms Impedance ........................ Amateur Net $14.95

CRYSTAL CALIBRATOR—Provide accurate 100 kc. check points to 55 mc. With tube and crystal.

Cat. No. 250-28, Wired and tested ........................ Amateur Net $17.95

"SIGNAL SENTRY"—Monitors CW or phone signals up to 50 mc. With tubes.

Cat. No. 250-25, Wired and tested ........................ Amateur Net $22.00

T-R SWITCH—Instantaneous break-in on SSB, DSB, CW or AM. With tube, power supply and provision for RF probe.

Cat. No. 250-39, Wired ........................ Amateur Net $27.75

"MATCHBOXES"—Completely integrated antenna matching and switching systems for kilowatt or 275-watt transmitters. Bandswitching 80 through 10 meters.

Cat. No. 250-23, 275 Watts, with directional coupler and indicator ........................ Amateur Net $26.50
Cat. No. 250-25, 275 Watts, less directional coupler and indicator ........................ Amateur Net $34.95
Cat. No. 250-30, Kilowatt, with directional coupler and indicator ........................ Amateur Net $149.50
Cat. No. 250-30, Kilowatt, less directional coupler and indicator ........................ Amateur Net $124.50

DIRECTIONAL COUPLER AND INDICATOR—Provides continuous reading of SWR and relative power in transmission line.

Cat. No. 250-37, Coupler ........................ Amateur Net $11.75
Cat. No. 250-28, Indicator ........................ Amateur Net $22.00

ATTENUATORS—Provide 6 db attenuation with required power dissipation to enable various units to serve as exciters for Viking "Thunderbolt".

Cat. No. 250-42, 1 ........................ Amateur Net $21.50
Cat. No. 250-42, 3, For use with HT-32 or similar unit ........................ Amateur Net $21.50

Write Today
Your complete guide to amateur radio’s most exciting equipment. Write today for your free copy.

FIRST CHOICE AMONG THE NATION’S AMATEURS

E. F. JOHNSON COMPANY • WASECA, MINNESOTA
FIELD ENGINEERING WITH A FUTURE

From Boston to Seattle

Raytheon field engineers Steve Herzog, K6RMA, and George Mayo, K1LYE, are shown here on a special technical evaluation assignment at one of the Raytheon Electronic Services Division’s 17 service centers, situated in major marine and industrial communities from Boston to Seattle, Duluth to New Orleans.

This time they’re testing commercial marine radar. Tomorrow it might be an installation project or overhaul and repair. For Raytheon field engineers tackle a broad range of tasks all over the country and overseas. And, with continuing expansion of services, there is plenty of room for advancement to executive positions.

Perhaps you can qualify for a Raytheon field engineering future. Requirements: previous experience plus an E.E. degree or the equivalent in practical experience with guided missiles, fire control, ground and bombing radar or sonar.

Benefits: attractive salary, insurance, educational programs and relocation assistance. For details, please write Ronald Guittarr, Electronic Services Division, 2nd & South Ave., Northwest Industrial Park, Burlington, Mass.
Station Activities

Continued from page 112

dorsements: K2QDT as OPS, K2KIR went back to M.I.T. K2TDG and K2TDE have a new C-33 beam. K2HUG attributes his fire in the roof of his house, which caused extensive damage, to airing in the gutter pipe when the rig was on the air. W2EYY received the WLA Award (Oswestry, England). K2LGF now has over 2 meters. W2FMB operates mobile, WA2QTW has a five-element TACO beam. W2BPB has a new 2-meter Club is invited to write W2LXE with suggestions. K2JFV spoke at the RARA meeting regarding his stay in Russia on a scientific mission. W2LBP got an ARRL citation for his excellent record as the country's top OP. K2CEH now has 28 states on 2 meters. K2L1MG has 6OP states. Every station is invited to make monthly reports regarding station activity. Form 1 cards are available for the asking from ARRL. Anyone interested in appointees should contact your SCM. Remember to let your SCM know your club or personal views on a more representative name for the Western New York Section. Merry Christmas to all and happy new year.


FOURTH ANNUAL PENNSYLVANIA QSO PARTY
December 10-11, 1960

All amateurs the world over are invited to take part in the Fourth Pennsylvania QSO Party. This Party enables amateurs to further stand-

ings for the WAPC (Worked All Pennsylvania Counties) Award.

Ruler 1. The time of the contest is Saturday Dec. 10 at 1800 EST (2300 GMT) until 1800 EST Sunday, Dec. 11. The general call is "CQ PENNA." Pennsylvania stations are requested to identify themselves by signing "DE PA" on c.w. and "Pennsylvania calling" on phone. 3. Exchanges consist of QSO number, RST (T), and Penna. county for Penna. stations. Outside stations send QSO number, RST(T), and QTH (state, VE province, or country). 4. A station may not make a contact more than once per band and only c.w. to c.w. and phone to phone contacts count. 5. Scoring: Each contact counts contact count: (2) points, one for receiving and one for transmitting exchange. Outside stations multiply number of contact points by the number of Pennsylvania counties worked. Penna. stations multiply QSO points by total number of states, VE provinces, and countries worked. 6. Awards: New call book to highest scoring station in Pennsylvania outside Pennsylvania; for the purpose of this event, all VE5 are regarded as stateside and KL7, KH6, KP4, KZS, as overseas. Certificates to 2nd and 3rd place winners; certificates to first place Novices; Logs must show time, band, emission, date, and comment. Entries must be mailed by December 31, 1960, to John F. Wojtklewicz, W2GY, 434 Glenwood Drive, Ambridge, Pa., 15003. The decision of the contest committee will be final.

WESTERN PENNSYLVANIA—SCM Anthony J. McIvor, W3HUM—SEC: OMA, RMA, KUN, GEG and NUG. The WPA Traffic Net meets Mon. through Fri. at 900 EST on 3955 kc. The Pennsylvania, Fone Net meets Mon. through Fri. at 900 EST on 3850 kc. NWP appointments are LIV as 00. The Coke Center RO reports: NCE is building a Valiant; JW still is working DX; new Novices are K3RSA and K2HFF; and one more to school. The Pittsburgh Chapter of the GCAA has AVY as pres. and UG as secy. The Bina RO (W3XW) reports via "Oscillator". DZP reports a new Novice is KNNJ1ZS; TVW has a homebrew mobile of 10 meters. K2GHH is working DX on 10 and 20 meters. The ATA had a 50-th anniversary, for Mr. Bessert from Carnegie Museum, whose topic was "Palaeontology and Spelunking," accompanied by (Continued on page 119)

Your favorite ham and
his favorite magazine

Your favorite ham and

his favorite magazine
can be kept together through
a Gift Subscription.

QST is always informative,
and always welcome.

A membership-subscription
will remind him, twelve
times each year, of your
thoughtfulness.

QST and ARRL Membership $5
$5.25 in Canada, $6 elsewhere

THE AMERICAN RADIO RELAY LEAGUE, INC.
West Hartford, 7, Connecticut

120
Just in time for Christmas...

HEATHGIFTS
for the Radio Amateur

$199.95

SAVE UP TO 50%
WITH HEATHKIT
QUALITY ELECTRONICS

NOTE: 6 METER VERSION MODEL HW-10 COMING IN JANUARY 1961

EXPECTED SHIPPING DATE
DECEMBER 4, 1960

NEW COMPLETE MOBILE OR FIXED 2-METER TRANSMITTER, RECEIVER COMBINATION... ALL IN ONE COMPACT UNIT

- Tracked VFO and Exciter Stages for single knob tuning
- Up to 10 watts RF output to antenna
- Built-in Low Pass Filter
- Built-in 3-way Power Supply for 117 V. AC, 6 V. DC or 12 V. DC operation
- Push-to-talk Ceramic Element Microphone

"PAWNEE" 2-METER TRANSCEIVER KIT (HW-20)

More features, quality, performance and versatility are designed into the new "Pawnee" to bring you the finest in complete AM and CW facilities on the 2-meter amateur band. The transmitter section features a built-in VFO with all frequency determining components mounted on a heat sink plate for temperature stability... plus, four switch-selected crystal positions for novice, CAP and Mars operation. VFO and all exciter stages are tracked for convenient single knob tuning over any 500 KC band segment (greater excursions require simple re-peak of final). A VFO "spot" switch is provided for zeroing-in signals with transmitter off.

A 6360 dual tetrode final RF amplifier provides up to 10 watts of power output to the antenna and a built-in low pass filter is incorporated to suppress harmonics and other spurious radiation which might reach the antenna. The dual purpose modulator provides a full 10 watts of audio for high level plate modulation of the final RF amplifier or 15 watts of audio for public address operation, selectable with a push-pull switch.

The receiver is a superhet with double conversion with the first oscillator crystal controlled for high stability. All oscillators are voltage regulated. The large, slide-rule type dial with vernier tuning provides ample bandwidth for both receiver and VFO tuning. Also featured is an RF gain control, BFO, ANL, squelch, AVC on/off switch and front panel tuning meter. Meter is automatically switched to read received signal strength or relative power output. Meter and tuning dial are edge illuminated for high visibility.

A unique built-in 3-way power supply allows 117 VAC fixed station operation or 6 or 12 V DC mobile operation simply by using either AC or DC power cables furnished. The power supply uses heavy-duty vibrator system with silicon type rectifiers in bridge circuit configuration. All sections of the unit are completely shielded for maximum stability and noise-free operation.

The "Pawnee" comes complete with built-in speaker, two power plugs (AC & DC), heavy duty power cables, primary fused relay for mobile installation, mounting bracket and push-to-talk ceramic element microphone with coil cord and mounting clip. Cabinet measures 6" H x 12" W x 10" D.

Model HW-20...34 lbs....

.................. $20.00 dn., $17.00 mo. $199.95

more exciting
HEATHGIFTS
to choose from
NEW PHONE AND CW TRANSMITTER KIT (DX-60)

This successor to the famous DX-40 offers far more than any other unit in its price and power class. Its smart modern appearance, clean, rugged construction, and conservatively rated components all add up to ease of assembly and trouble-free operation. New features include a built-in low pass filter for harmonic suppression, neutralized final for high stability, grid block keying for excellent keying characteristics and easy access to crystal sockets on rear chassis apron. A front panel switch selects any of four crystal positions or external VFO. Modulator and power supply are built-in. Single knob bandswitching and the pi-network output provide operating convenience. A tune-operate switch provides protection during tune-up and a separate drive control allows adjustment of drive level without detuning driver. May be run at reduced power for novice operation. A fine kit for the beginner as well as general class amateur.

Model DX-60... $7.50... $10.00... $500.00

Look to HEATHKIT® for the

KILOWATT LINEAR AMPLIFIER & POWER SUPPLY KITS

The "Chippewa" and KS-1 power supply combination team up to bring you performance unsurpassed in amateur rig equipment at the lowest cost anywhere! Compare price, features and specifications with any other unit on the market today, and you'll see why any ham would be proud to call this pair his very own! It is the only kilowatt rig with oil-filled, hermetically sealed plate transformer and filter choke and features full kilowatt power in ALL modes of operation (1500 watt Class C capability on dummy load tests). Any of the popular AM, CW and SSB exciters can be used as a driver; provides maximum legal amateur power inputs on 80 through 10 meters, Class AB1 or Class C operation. Power input in Class AB1 attains 2,000 volts P.E.P., with much better linearity than can be obtained with lower plate voltages or other modes of operation.

Model KL-1 "CHIPPEWA" KILOWATT LINEAR AMPLIFIER... $40.00... Write for details... $399.95
Model KS-1 POWER SUPPLY... $105.00

Model GC-1A

"MOHICAN" GENERAL COVERAGE RECEIVER KIT (GC-1A)

Many firsts in receiver design bring you complete portability, high sensitivity, selectivity and stability in this outstanding communications receiver. Features ten-transistor circuit, flashlight battery power supply, ceramic LP "transfilters," Zener diode voltage regulation, front end telescoping 54" whip antenna, S-meter, flywheel tuning and large slide-rule dial. Covers 550 kc to 32 mc in five bands with calibrated bandspread scales (oscillator tuning) on amateur bands 80 through 10 meters, including 11 meter citizens band. Sensitivity is better than 2 uv for 10 db signal-to-noise ratio on amateur bands. GC-1A quickly converts from battery power to 117 VAC operation with plug-in power supply XP-2 for fixed station operation. 20 lbs.

Model GC-1A... $109.95
Model GCW-1A (wired)... $193.50
Model XP-2: 117 VAC power supply for GC-1... $193.50... 2 lbs... $9.95

100 KC CRYSTAL CALIBRATOR KIT (HD-20)

Perfect for amateur or service shop use in dial calibration checks of communications receivers. Provides marker frequencies every 100 kc between 100 kc and 54 me. Transistorized and battery powered for complete portability. Accuracy assured by .005% crystal furnished.

Model HD-20... $14.95
now a new improved 6 meter model joins this famous transceiver series

2, 6 & 10 METER TRANSCEIVER KITS
(HW-30, 29A, 19)

The new 6 meter HW-29A joins “Tener” and “Twoer” to bring you top transceiver performance at the lowest prices anywhere. Like the “Twoer,” the new HW-29A multiplies its output frequency from an oscillator using an 8 mc fundamental crystal for rock steady stability. All models have crystal controlled transmitters and tunable, super-regenerative receivers with RF preamplifiers. Receivers pull in signals as low as 1 uv and the 5 watt transmitter input is FB for emergency work or “local” nets. Features include transmit-receive switch, metering jack, ceramic element microphone, and two power cables. Less crystal. 10 lbs. each.

Model HW-19... (10 meter) ....................... $39.95
Model HW-29A... (New improved 6 meter version) $44.95
Model HW-30... (2 meter) ....................... $44.95

Attn. HW-29 owners: Convert your “Sixer” to the new improved “A” model by ordering this easy to install conversion kit. Allows use of 8 mc crystal for maximum stability.

Model HWM-29-1... 1 lb. ......................... $4.95

best values in Amateur Radio

UTILITY AC POWER SUPPLY KIT (HP-20)
Furnishes filament, plate and bias voltages for converting Heathkit and other mobile amateur gear to fixed station operation. Delivers 120 watt ICAS DC plate power of 600 VDC @ 200 ma or 600 VDC @ 150 ma & 300 VDC @ 100 ma plus bias of —130 VDC @ 30 ma. Less than 1% AC ripple. 6.3 VAC @ 8 amps or 12.6 VAC @ 4 amps for filaments.

MODEL HP-20... 10 lbs. ............ $29.95

MOBILE POWER SUPPLY (HP-10)
Heavy-duty, all semi-conductor circuit furnishes all power required to operate Heathkit mobile gear. With 12.6 v input supplies 600 VDC @ 200 ma or 600 VDC @ 150 ma & 300 VDC @ 100 ma, and —125 VDC @ 30 ma. 120 watt ICAS output rating. Extruded aluminum heat sinks provide efficient cooling of power transistors.

Model HP-10... 10 lbs. ............ $44.95

ORDER DIRECT BY MAIL
OR SEE
YOUR HEATHKIT DEALER

SEND FOR YOUR FREE HEATHKIT CATALOG TODAY!

See how you can save up to 50% or more on over 200 different Heathkit products in Hi-Fi, Test, Amateur Radio, Marine and General consumer fields.

HEATHKIT & DAYSTROM
Heath Company
Benton Harbor 9, Michigan

ORDERING INSTRUCTIONS
Fill out the order blank below, include change for parcel post according to weights shown. Express orders shipped delivery charges collect. All prices F.O.B., Benton Harbor, Mich. A 20% deposit is required on all C.O.D. orders. Prices subject to change without notice.

Please send the following HEATHKITS:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MODEL NO.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ship via               [ ] Parcel Post  [ ] Express  [ ] COD  [ ] Best Way

[ ] SEND MY FREE COPY OF YOUR COMPLETE CATALOG

Name ____________________________
Address ___________________________

City ____________________________ Zone _______ State _______

Dealer and export prices slightly higher.

123
SETS THE PACE!
8 PAGES — GREATEST

Christmas SPECTACULARS

NATIONAL NC-303 SUPER RECEIVER
plus FREE SPEAKER and CALIBRATOR

NC66 & RDF66
All Purpose Portable
& Directional Finder

$139.90

NC 270
DOUBLE
CONVERSION
RECEIVER

$249.00

Regular Net
$494.90
only $22 Monthly

$449.00

* Front Panel SSB Selector * Exclusive IF Shift
Eliminates Detuning during Sideband Selection!

Outstanding Radio Shack value! Imagine, the NTS-2
speaker and the NC-300 calibrator usually sells for $45.90
... but you get them both free with the purchase of this
nationally famous National NC-303 Super Receiver. Many
exciting features are included along with the new Q
multiplier that eliminates any interfering signals. 19½” W
x 11½” H x 15” D. Sh. wt. 70 lbs.
No. 50DX221 Receiver, Speaker, Calibrator ...........$449.50

ORDER TODAY FOR CHRISTMAS DELIVERY

RADIO SHACK CORPORATION
Dept. 12DA
730 Commonwealth Avenue, Boston 17, Mass.
Please send me the following items:
Order No. Price

☐ Send FREE 192 Page 1961 Catalog
Name _____________________________
Address ____________________________
City __________________ Zone __ State __
☐ Check ☐ Money Order ☐ C.O.D.

WRITE FOR RADIO SHACK'S GENEROUS TRADE-IN ALLOWANCES!

125
Another RADIO SHACK Spectacular

NEW LOW, LOW TERMS
IN STOCK FOR CHRISTMAS DELIVERY

HQ-100 VERSATILE LOW PRICE RECEIVER

Direct Dial Calibration, Built-in Q-Multiplier

ONLY $10 DOWN

$189.95

Outstanding Special! Continuously tunable from 450 kcs to 30 mcs; Q-Multiplier permits continuously variable selectivity! Noise limiter; electrical bandwidth tuning with dial markings every 10 kcs on 80, 40 and 20 meter bands; every 20 kcs on 15 meter band; every 50 kcs on 10 meter band. Voltage regulated and temperature compensated, 10 tube Superhet, 16½” x 9” x 9”½”. D. Sh, wt. 33 lbs.

No. 45DX285 HQ-100 $189.95
No. 45DX286 HQ-100 C w/clock $199.00

HQ-170 SSB Receiver

$359

Popular Model HQ-170 features SSB/CW and AM/MCW reception. Dial coverage of 6, 10, 15, 20, 40, 80 and 160 meter amateur bands. 17 tubes, triple conversion with IF freq, 3035, 455 and 60 kcs. for excellent image rejection. Automatic noise limiter. Sh, wt. 45 lbs.

No. 45DX292 HQ-170 $359.00
No. 45DX298 HQ-170 C w/clock $377.00

HX-500 SSB Transmitter

$695

HX-500 features 100 watts of undistorted performance! Superb for amateur and commercial users! Bands covered: 80, 40, 20, 15 and 10 meters. TVI proofed. Complete, no extras to buy! Sh, wt. 100 lbs.

No. 45DX279 HX-500 $333.50 Monthly $695.00

Hammarlund Versatile Receivers

No. 45DX287, Sh, wt. 37 lbs. 12 tube Receiver HQ-110, $115.00 Monthly $249.00
No. 45DX273, Sh, wt. 53 lbs. Best SSB Receiver HQ-180, $20 Monthly $429.00
No. 45DX294, Sh, wt. 49 lbs. General Receiver HQ-145, $12.50 Monthly $269.00

ALL MODELS $10.00 EXTRA WITH CLOCK,

MATCHING SPEAKERS

No. 45DX291, S-100, For HQ-100, HQ-110, HQ-145. $14.95
No. 45DX296, S-200, For HQ-170, HQ-180. $19.95

ORDER TODAY FOR CHRISTMAS DELIVERY

RADIO SHACK CORPORATION Dept. 1208
730 Commonwealth Avenue, Boston 17, Mass.

Please send me the following items:

Order No. Price

Name

Address

City Zone State

Send FREE 192 Page 1961 Catalog

Check Money Order C.O.D.

WRITE FOR FREE COPY OF RADIO SHACK'S NEW 192-PAGE SALE CATALOG!
NOW AT $52.95 SAVINGS!
GONSET G-28 10 METER
COMMUNICATOR—PLUS Mosley
A-310 Antenna Alliance Rotor!

Mfrs. Net $371.95
$319.00

SAVE $53

Complete 10 meter station: transmitter, receiver and 115V AC power supply in one compact unit PLUS superb Mosley A-310 10 Beam with Alliance T-12 "Tenna-Rotor" 50W transmitter uses #6146 tube with pi network output. Highly stable VFO to aid tuning. Double-conversion receiver has adjustable "squelch," noise limiter and "S" meter. Coverage is 28-29.7 mcs. Good looking, compact housing: 13" W x 7½” H x 12½” D.
No. 50DX31 G-28 Ship. wt. 35 lbs. .......... $319.00

GONSET G-50 6-METER
STATION PLUS Hi-Gain 65B
Antenna and Alliance Rotor!

$339.50

Mfrs. Net
$393.30
$15 Monthly

Virtually identical to G-28 in size, appearance and general technical characteristics. 48W transmitter uses 6146 tube, pi network output, cat. VFO (or optional crystal), 115V AC power supply. Package is complete with Hi-Gain 65B Beam and highly efficient Alliance T-12 "Tenna-Rotor.
No. 50DX532 G-50 Ship. wt. 35 lbs. .......... $339.50

WRITE FOR RADIO SHACK'S GENEROUS TRADE-IN ALLOWANCES!
Hallicrafters
Highly Sensitive
Model SX-111 Receiver
Ham Bands Only!

Only $11.50
Monthly $249.95

Exceptionally fine receiver with sensitivity of 1 µV on all bands; 5 steps of selectivity from 500 to 5000 cps. Dual conversion, selectable sideband. Covers 80, 40, 20, 15 and 10 meters; a 6th band tunable to 10 mc. for crystal calibration with WWV. Term. for 3.2 and 500 ohm speakers; "S" meter electrical adjustment. 10 tubes plus v-rectifier and rectifier.
No. 45DX325 SX-111 Sh. wt. 40 lbs. ....$249.95

Model HT-37 Transmitter
Low Priced SSB Transmitter
Only $21
Monthly $450.00

Amateur band transmitter with SSB, AM or CW output on 80, 40, 20, 15 and 10 meters. Instant CW calibration from any mode; precision V.F.O.; 52 ohm pi network output for harmonic suppression. 12 tubes, 2 rectifiers and v-rectifier.
Ord. No. 45DX349 HT-37 Sh. wt. 80 lbs. ..................$450.00

Model S-107 Transmitter
Monthly $94.95

Model S-107 combines quality workmanship with impressive specs at a low price! Features broadcast bands from 540 to 1620 kc plus 4 SW bands; sep. electrical bandwidth; AM/CW switch; FM speaker. 7 tubes plus rectifier.
No. 45DX322 S-107 Sh. wt. 18½ lbs. ......................$94.95

Order Today For Christmas Delivery
RADIO SHACK CORPORATION Dept. 12DD
730 Commonwealth Avenue, Boston 17, Mass.
Please send me the following items:
Order No. Price Order No. Price

☐ Send FREE 1961 Catalog
Name
Address
City Zone State
☐ Check ☐ Money Order ☐ C.O.D.

WRITE FOR FREE COPY OF RADIO SHACK'S NEW 192-PAGE SALE CATALOG!
NEW!

PRE-ENGINEERED HAM EQUIPMENT CENTER With 8 AC and 3 RF Outlets!

Bring the ham center up out of the cellar — let the whole family share in the fascinating world opened up by global communications. The handsome styling of this functional unit fits well in any decor. It will surely appeal to the XYL and neatly organize equipment and cables. Deluxe model: two tone grey, gleaming white formica top, vinyl trimmed ends. Long lasting baked enamel finish.

CONVENIENT “big switch” with indicating fuse holder and neon pilot light.

THREE wire detachable line cord brings in all power — insures proper grounding.

POWER channel has eight 110-volt outlets, 4 above top and 4 below; grounding contact . . . eliminates makeshift outlets. DELUXE model equipped with 3 SO-239 RF antenna lead connectors.

DELUXE STATION FACILITY . . . complete with formica top, trimmed ends, shelf and all electrical and mechanical features listed above.
No. 44DX529 Ship. wt. 190 lbs. $139.95

STANDARD STATION FACILITY OR WORK BENCH . . . melamine top, standard steel ends and all applicable features as described above.
No. 44DX630 Ship. wt. 160 lbs. $99.50

COMFORTABLE operating position. MASSIVE 13/4" thick top 26" W. x 60" L. provides room for everything!

UNIQUE power channel safely encloses all wiring, relays, etc. Room for power supply, etc.

ORDER TODAY FOR CHRISTMAS DELIVERY

RADIO SHACK CORPORATION Dept. 12DE
730 Commonwealth Avenue, Boston 17, Mass.

Please send me the following items:
Order No. 

Price 

☐ Send FREE 192 Page 1961 Catalog 

Name 

Address 

City 

Zone State 

☐ Check ☐ Money Order ☐ C.O.D.

WRITE FOR RADIO SHACK’S GENEROUS TRADE-IN ALLOWANCES!

$139.95

STANDARD $99.95

Only $11 Monthly
$20 OFF!

Finco, Alliance
BEAM-ROTOR
ANTENNA
with control!

Reg. Price $76.55

$56.55

Only $5.00 Down

Shipping weight 27 lbs.

Superb new package provides easy, dependable antenna operation at lowest cost! New Finco A-62 6 and 2 meter combination antenna consists of; 6 Meter: 1 folded dipole, 1 reflector, 2 directors (4 elements) . . . 2 Meter: 1 folded dipole plus special phasing stub, 1 3-element Collinear reflector, 4 3-element Collinear directors (18 elements). Front-to-back ratio at 6 and 2 meters is exceptional, as is the forward gain. Features heavy duty square 10 ft. aluminum boom. Famous Alliance T-12 “TennaRotor” included to assure dependable positive-direction rotation. Features direction dial, “touch-
bar” operation. EXTRA . . . 100 ft. of 300 ohm twin lead . . . 75 ft. of rotator cable!

No. 50D526 .......................... $56.55

★ Assembly in Seconds
★ Sleeve Re-enforced Elements
★ Touch Control Operation
★ All Lead Wire Included

Season’s Greetings
Radio Shack wishes you the HAPPIEST OF HOLIDAY SEASONS! We hope that we shall be able to add to your holiday fun in some way and make the coming year a “Happy Hobby Year” for you. Let Radio Shack be your Ham shopping center!

WRITE FOR FREE COPY OF RADIO SHACK’S NEW 192-PAGE SALE CATALOG!
25% OFF! COMPLETE TRI-BAND Antenna System

2 Complete 10-15-20 Meter Systems!

**BOTH SYSTEMS INCLUDE:**
- CDR AR-22 Heavy Duty, Automatic Rotor!
- 75' RG-8U Coax Cable and 75' Rotor Cable!
- Coax Connector Type PL-259

$5 Down
$6 Mo. **$111.95**

Reg. Value **$147.03**

MOSLEY TA-33 Multi Band Antenna. Is exceptionally broad banded for excellent results over full Ham bandwidth. Good forward gain, excel. front-to-back ratio, 3 element beam, SWR1.1/1, max. element length 28', boom length 14'. Fabulous AR-22 is the ultimate in heavy-duty rotors. Handsome cabinet with control dial, 4 wire cable; easily handles 150 lbs.

No. 50DX306, TA-33, Ship. wt. 76 lbs. ...........$111.95

NO SUBSTITUTIONS PLEASE

**Famous Name COMBINATION For GREAT HAM DX VALUE!**

$5 DOWN
$5 MO. **$89.95**

Reg. Value **$116.70**

MOSLEY TA-33 JR. Multi Band Antenna. Features arrays for 10-15-20 meters. Fine forward gain and front-to-back ratio, maximum element length is 26' 8", boom is 11/4" OD x 12'. Designed for low and medium power transmitters . . . 300 watts or less.

No. 50DX307, TA-33 Jr., Ship. wt. 51 lbs. ....$89.95

ORDER TODAY FOR CHRISTMAS DELIVERY

RADIO SHACK CORPORATION Dept. 12DG
730 Commonwealth Avenue, Boston 17, Mass.

Please send me the following items:

Order No. ____________________________

Price

☐ Send FREE 192 Page 1961 Catalog

Name ____________________________

Address ____________________________

City ____________________________ Zone ___ State ___

☐ Check ☐ Money Order ☐ C.O.D.

WRITE FOR RADIO SHACK'S GENEROUS TRADE-IN ALLOWANCES!
RADIO SHACK MAKES COMMUNICATIONS HISTORY IN SPECTACULAR PURCHASE!
THE BUY THAT SCOOPED THE INDUSTRY!

GONSET
G-11 CITIZENS' COMMUNICATOR
2-Way Radio
SAVE $40!

Only
$5
Monthly
$84.50

Regular $124.50

MICROPHONE AND ONE CRYSTAL INCLUDED!
★ No Technical Knowledge Required to Operate
★ Crystal-controlled . . . No Fussy Tuning
★ Compact . . . Lightweight . . . Wide Range Radio
★ 117 VAC for Home . . . Factory . . . Office
★ 12 VDC for Auto . . . Tractor . . . Boat
★ Meets All FCC Requirements . . . Made in U.S.A.

BUY TWO FOR $164.95

NEW LOW PRICE! 32% OFF!
RADIO SHACK EXCLUSIVE!

Radio Shack's most sensational bargain with BIG savings for you! G-11 Citizens' Communicator now selling at the lowest price ever . . . and for a limited time only! Look at all the big features this 2-way radio station can give you . . . high stability . . . no drifting off frequency . . . provides instant, dependable communications . . . use between any number of stations. It's compact . . . lightweight . . . rugged . . . simple to operate . . . and mounts easily on any vehicle, tractor, boat, plane or at any fixed station, and the built-in speaker permits calls to be heard some distance from self! Imagine all the uses for the communicator on the farm, at home, at work or just about anywhere. Don't put it off any longer, order yours today and cash-in on the BIG savings.
Order No. 45DX788, 117 VAC 3303, Sht. Wt. 10 lbs. 84.50
Order No. 45DX786, 12 VDC 3304, Sh. Wt. 10 lbs. 84.50

SPECIFICATIONS: Frequency Range: 26,965 to 27,285 mags. Power Output: not to exceed 4.8 watts. Modulation: 80% minimum at 15%. Power Input: 60 watts. Receiver Sensitivity: 1.5 uv, 30% modulation at 1000 cycles for 5 db signal-to-noise ratio. Receiver Selectivity: 5 kc at 6 db down. Audio Response: 3 db 500 to 2500 cycles, down at least 10 db from 1000 cycle value at 5000 cycles. Audio Output: 2.5 watts into 3.2 ohms, with 10% distortion. 5¾H x 6¾W x 6¾D.

ORDER TODAY FOR CHRISTMAS DELIVERY

RADIO SHACK CORPORATION
Dept. 12DH
730 Commonwealth Avenue, Boston 17, Mass.
Please send me the following items:
Order No. _______________________
Price ________________________

☐ Send FREE 192 Page 1961 Catalog
Name__________________________________________
Address _______________________________________
City __________ Zone ______ State __________
☐ Check ☐ Money Order ☐ C.O.D.

WRITE FOR FREE COPY OF RADIO SHACK'S NEW 192-PAGE SALE CATALOG!
Z82OB ain't — she's a YF!

Radio amateurs living within a radius of 50 miles of Kansas City, Mo., have Ben Walker, K6AI-F, to thank for their free copies of the third edition of the Kansas City Area Call Book. It lists calls alphabetically, giving name, QTH and phone number; also lists hams by last name; and includes a list of all nets operating in the area, all known clubs and their meeting times, and all mobile stations. Ben sparked the project which is sponsored by HARC.

Two members of the River Park ARC in Chicago are W9TPQ and K9TPQ.

K5QNZ served as youth governor of Oklahoma, being elected in April of this year.
AN APPEAL TO INTELLIGENCE

A product that is consistently advertised in QST month after month, year after year, has to be good. Over 10,000 GOTHAM antennas have been purchased by QST readers. Even the "price-is-no-object" customers choose GOTHAM antennas on the basis of performance and value. Select your needs from this list of 50 antennas:

Airmall Order Today—We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. Proven Gotham Value!

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-10</td>
<td>TWO BANDER</td>
<td>$29.95</td>
</tr>
<tr>
<td>10-15</td>
<td>TWO BANDER</td>
<td>$34.95</td>
</tr>
<tr>
<td>10-20</td>
<td>TWO BANDER</td>
<td>$36.95</td>
</tr>
<tr>
<td>15-20</td>
<td>TWO BANDER</td>
<td>$38.95</td>
</tr>
</tbody>
</table>

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is broad banded. It does not have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-10-15</td>
<td>6 Element</td>
<td>$39.95</td>
</tr>
<tr>
<td>10-15-20</td>
<td>12-El</td>
<td>16.95</td>
</tr>
</tbody>
</table>

NEW LUGGAGE 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 32, 72 or 300 ohm transmission line. Specify which transmission line you will use.

<table>
<thead>
<tr>
<th>Beam#</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>#8</td>
<td>(6 Meters, 4-El)</td>
<td>$38.95</td>
</tr>
<tr>
<td>#10</td>
<td>(10 Meters, 4-El)</td>
<td>40.95</td>
</tr>
<tr>
<td>#15</td>
<td>(15 Meters, 3-El)</td>
<td>49.95</td>
</tr>
</tbody>
</table>

15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact halfway around the world. Working the world with low power is common occurrence on fifteen meters when you have a Gotham beam.

<table>
<thead>
<tr>
<th>Beam#</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std.</td>
<td>2-El Gamma match</td>
<td>21.95</td>
</tr>
<tr>
<td>Deluxe</td>
<td>2-El Gamma match</td>
<td>29.95</td>
</tr>
<tr>
<td>Std.</td>
<td>3-El Gamma match</td>
<td>24.95</td>
</tr>
<tr>
<td>Deluxe</td>
<td>3-El Gamma match</td>
<td>36.95</td>
</tr>
</tbody>
</table>

20 METER BEAMS

A beam is a necessity on twenty meters to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

<table>
<thead>
<tr>
<th>Beam#</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std.</td>
<td>2-El Gamma match</td>
<td>21.95</td>
</tr>
<tr>
<td>Deluxe</td>
<td>2-El Gamma match</td>
<td>31.95</td>
</tr>
<tr>
<td>Std.</td>
<td>3-El Gamma match</td>
<td>34.95</td>
</tr>
<tr>
<td>Deluxe</td>
<td>3-El Gamma match</td>
<td>46.95</td>
</tr>
</tbody>
</table>

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—
with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589!) I have also worked enough stations for my WAC, WAS, WJAJD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna.

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,

Thomas G. Gabbert, K6INI (Ex-T12TG)

FREE GIANT 1960 CATALOG

Name ........................................... Address ...........................................
City ........................................... Zone ........... State ....................

ADVERTISEMENT

134
FACTS
ON THE GOTHAM
V-80 VERTICAL ANTENNA

• If K6INl can do it, so can you.
• Absolutely no guying needed.
• Radials not required.
• Only a few square inches of space needed.
• Four metal mounting straps furnished.
• Special B & W loading coil furnished.
• Every vertical is complete, ready for use.
• Mount it at any convenient height.
• No relays, traps, or gadgets used.
• Accepted design—in use for many years.
• Many thousands in use the world over.
• Simple assembly, quick installation.
• Withstands 75 mph windstorms.
• Non-corrosive aluminum used exclusively.
• Omnidirectional radiation.
• Multi-band, V80 works 80, 40, 20, 15, 10, 6.
• Ideal for novices, but will handle a Kw.
• Will work with any receiver and xmitter.
• Overall height 23 feet.
• Uses one 52 ohm coax line.
• An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. ONLY $16.95.

YOU COULD WORK WONDERS WITH A GOTHAM VERTICAL ANTENNA!

FILL IN AND SEND TODAY!

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.
Enclosed find check or money-order for

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE NOVICE WHO OPERATES 40 AND 15.......................... $14.95

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO.......... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name...........................................
Address...........................................
City...........................................Zone....State.......

135
MOBILETTTE 61, International's *new improved* all transistor, crystal controlled converter provides a "quick and easy" way to convert your car radio for short wave reception. MOBILETTTE 61, units cover a specific band of frequencies providing a broad tuning range. Mobilette units are miniature size and quickly interchangeable.

Check these all New features . . . New and improved circuit for increased gain . . . New internal jumper for positive and negative grounds . . . New RF amplifier, mixer/oscillator . . . New separate input for broadcast and short wave antennas . . . Mounting bracket for under dash installation.

MOBILETTTE 61, is available in a wide choice of frequencies covering the Amateur bands 75 through 6 meters, Citizens band. Civil Air Patrol 136
...with improved circuit
for mobile short wave reception

Write for International’s complete catalog of precision radio crystals, and quality electronic equipment—yours for the asking.

INTERNATIONAL
CRYSTAL MANUFACTURING CO., INC.
18 NORTH LEE • OKLAHOMA CITY, OKLA.

low band frequencies, WWV time and frequency standards. Any frequency in the range 2 MC to 50 MC available on special order.*

Designed for 12 VDC, MOBILETTE 61 will operate on 6 VDC at reduced output. Power connector plugs into cigarette lighter socket.

See the MOBILETTE 61 at Your Dealer Today.

**Mobilette 61 units cover these short wave frequencies.**

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>630 - 110</td>
<td>6 meters (Amateur) 50 - 51 MC</td>
</tr>
<tr>
<td>630 - 111</td>
<td>10 meters (Amateur) 28.5 - 29.5 MC</td>
</tr>
<tr>
<td>630 - 112</td>
<td>11 meters (Citizens) 26.9 - 27.3 MC</td>
</tr>
<tr>
<td>630 - 113</td>
<td>15 meters (Amateur) 21 - 21.6 MC</td>
</tr>
<tr>
<td>630 - 114</td>
<td>20 meters (Amateur) 14 - 14.4 MC</td>
</tr>
<tr>
<td>630 - 115</td>
<td>15 MC (WWV)</td>
</tr>
<tr>
<td>630 - 116</td>
<td>40 meters (Amateur) 7 - 7.4 MC</td>
</tr>
<tr>
<td>630 - 117</td>
<td>75 meters (Amateur) 3.8 - 4.0 MC</td>
</tr>
<tr>
<td>630 - 118</td>
<td>10 MC (WWV)</td>
</tr>
<tr>
<td>630 - 119</td>
<td>CAP (Low Band)</td>
</tr>
<tr>
<td>630 - 119</td>
<td>Special Frequencies 2 MC - 50 MC</td>
</tr>
</tbody>
</table>

Complete, ready to plug in and operate . . . . only **$22.95**

*Special frequencies 2 MC - 50 MC........only **$25.95**

137
Join Our 25th Anniversary Give Globe Gifts

The Globe SM-99 Screen Modulator is the perfect gift for the owner of Globe's Chief Deluxe. Permits radio-telephone operation at minimum cost. Self-contained. Printed circuit board, all parts and complete instructions included. Kit only, $11.95.


Ideal Christmas celebration is in the company of the new Deluxe in the Savvy VFO-55A, Globe VFO-55A, model with power amplifier. Add your choice of either modulator or solid block keying, easy plug-in reconverters for addition of modulator and VFO. Wide choice of PL-Net. Multi-colored kit diagrams. Put it under the tree for $79.95, unless price increased, in wired form, $99.95 as a kit.

The first Yule Surprise is the 99w Chief Deluxe Tone Globe Scout Deluxe, a shortwave-tuned, versatile transmitter with built-in power supply. Outstanding features include straight through operation of final amplifier, front panel tuning, and switchable output. Only $39.95. In kit form, $49.95.

SILVER ANNIVERSARY CATALOG

Over 200 Pages of excellent bargains for the novice, the technician and the advanced amateur. Fully illustrated. Includes the complete service story on World Radio. SEND FOR YOURS TODAY!

SAVINGS UP TO on Reconditioned

WRL's huge Reconditioned Equipment Department carries more than 1,000 items continually in stock, with turnover of nearly 500 pieces each month. Whenever you buy from WRL's reconditioned department, you are assured that your gear has been thoroughly checked, re-
Christmas Celebration

Globe's Universal Modulator UM-1 is a Class A or AB-2 modulator matching output impedances of 500-20,000 ohms. Supplies up to 500 watts with proper tubes. May also be used for driving for higher power modulation. Give the UM-1 and the Chief Deluxe together. In kit form (less tubes), $34.95. Completely wired, with tubes, $19.95.

The new Mobile Six is Santa's answer to those wishing a complete transceiver for 5M mobile or fixed station use. Offers crystal or VFO control with 25W input. Power supply included for 6-1210 V operation. Weighs approximately 20 lbs., with 5x12" face. Receiver portion includes 7 tubes and RF stage, with squelch control. Transmitter portion has voltage regulated VFO, shock mounted, 1000 meter, tuning meter, slide rule dial. Only $329.95 with 10% down and easy payment plan.

Make this Christmas the finest ever ... shop the World Radio way during our Silver Anniversary. What could be more fun on Christmas morning than discovering one of these fine Globe Products under your tree? Better yet, they're yours for only 10% down with easy payment terms under WRL's new Easy Payment Plan.

With 25 hams to serve you, WRL offers maximum trade-in prices, prompt shipment and close personalized attention to your needs.

Take a look at our Reconditioned Equipment Story below, too. Then send for our latest lists of the best used gear with guaranteed factory-new operation.

And of course ... a very Merry Christmas from "Hams to serve your Ham needs."

Products of GLOBE ELECTRONICS,
A Division of Textron Electronics, Inc.

50% at WRL Equipment

Paired, aligned and tested by the five-man technician team at WRL. In short, this equipment will operate as if it came directly from the factory line. With the great demand and subsequent turnover, new lists must be prepared each month. Send for your free lists today.

WORLD RADIO LABORATORIES
3415 WEST BROADWAY • PHONE 328-1851
COUNCIL BLUFFS, IOWA

LEO: PLEASE SEND: □ FREE CATALOG □ LATEST RECONDITIONED EQUIPMENT LISTS, AND □ COMPLETE INFO ON THE GLOBE LINE.

NAME:

ADDRESS:

CITY & STATE: _____________________ CALL: _____________________
color slides in 3D. The Steel City ARC (K7WV) reports via "Kilowatt Harmonies": K7JVM received his General Class license; SDY is a music instructor; the club started participating in the Sept., V.I.F. Party. K7YF, WHA, and NER conducted a mobile test on 10 meters for the Vermontboro Auxiliary Police with good success. The Washington County ARC net meets every 2nd Tues. at 9 EST on 2830 kc. The Cumberland Valley ARC reports via "Valley QRM": Club members operated in the Sept. V.I.F. Contest, using the call ZQ5XU. The greatest success was club officers are RHJ, pres.; EMK, vice-pres.; ACJ, secy.-treas.; ZQ7X, net mgr.; regular club meetings are held every 4th Sat. The Nanticoke ARC reports via K4HKK: The club has a new club house; the EL7/F expedition to Forest County was a success with K7F, K7CR, K7RZP, K3WX and K3LV in good shape. MGP is working DX; the Centre County Six-Meter C.D. Net meets on 50,389 Mhz. each Sat. at 2100 local time; the club station participated in the V.I.F. Party with SYF, W7Y, J8S, K3KAR, K3MMH and K4BVY. The Allegheny-Kiski Amateur Radio Assn. (4-KARA) meets at the Greenwald School in New Kensington on the 3rd Fri. of each month. The Foxfiddle Radio Club's new location is at the Oak Pleasant Valley School. PHH recently became a member. K10-FD is a Chautauqua Fmtr located at Herman, Pa. He operates the WBU CQJ 12, K7F, MBF 34, AUG 29, K3GHI 8, W3Y 6, K3COT 4.

**CENTRAL DIVISION**

ILLINOIS—SCM: Edmond A. Metzger, W3PRN—Ass. SCM: Grace V. Reynolds, 9EGE; SQG: PEP: RM: USR, PAM: RYU, EC of Cook County; HPG, Section net: ILN, 3315 kc. Mon. through Sat. at 1500 CST. The Central Division Convention Committee announced that the 1961 Central Division Convention will be held in Springfield, Ill. Aug. 26 and 27 at the St. Nicholas Hotel. Many an eye was riveted at the recent Central Division Convention held in Indianapolis, which was very well attended and at which an FB program was presented. G6AQT, W7EL, W7UL, 3K4PH, KYK, K7KRU, AB1, TNG, LUG, TQ1, TRM, WH, KK9, K7BYO and K7GKX have been moved from the Chicago Area to Springfield because of the relocation of the Illinois Bell Telephone Company personnel. PRN, K9LVB, K9BB, K9KL and P9FL were elected as the new officers of the Sangamon Valley Radio Club, Inc. The MCE and KH7A have replaced their "shoe-belt" beam with a new Wedel TABB and are now building "in the manner of the DX, DL2P/K7CPEU is waiting for his return to civilization and will be back with the Chicago gang very soon. K9BWI, K7TME and HAE are working the bands with Healthkit Stims. The recently-elected officers of the Champaign Radio Club (Chicago) are K9KPT, K9MJ, K9CQG and K9NVS. New appointees this month include K9QD, K9QK, ZK1A and K9TAY as OBS and K9KXP as OBS, which has received his DXCC certificate and K9QZ. K9QZ is now seeking his WAS. New Novice licensees are K9KVX, K9K9RY, K9JNZ, K9ZB and K2ZU. K9OCU's new beam is now mounted and is ready to be powered up. K9AMC is using the new W40T keyer on c.w. DX. A new club has been formed called the Chain of Lakes Radio Club, Inc., with K9LJ, K9NQ, K9CBZ and K9MBZ as officers. The club station is ADZ, N4A, BBR, DQX and MJB have new JB-37s. CN now as s.s.b. The A.R. Executive Committee has approved affiliation of the South Shore High School Radio Club, KOWH, received his General Class license and a Heath Transmitter the same day. K9KH, K9KH, and K9KH, from Rockford, passed away on Sept. 17, and this column offers sympathy to members of his family. The North Central Phone Net handled 178 points in Sept. A special event, a "Quest to Net Manager K4QWY, IDA is the only one to make the BPL this month. Traffic: (Sept.) W9DBA 140, W9JX 365, PCE 381, W9TQ 214, W9MAK 120, JYX 7, W9QV 71, W9WXL 35, K9QJ 41, W9QW 49, OAD 37, UOY 34, W9AEZ 20, K9AN 20, K9JQ 16, W9PB 16, K9TV 12, W9PV 16, Q9ZQ 6, JJN 6, K9H9 8, BIY 5, W9CP 5, SKR 4, K9LLA 3, QNJ 3, IYF 3, OCU 3, QPJ 2. (Aug.) W9PAW 41, K9OCU 4.

INDIANA—SCM: Clifford J. Sinner, WASWDD—Ass. SCM: Arthur B. Evans, W3WJ; PAM: RM: USR, PAM: RYU, EC of Howard County; HPG, Section net: INQ 300 kc. Mon. through Sat. at 1500 EST. The Indiana State ARC reports via K9JYD: The club has a new club house; the club is located at 100 East Second Street, Indianapolis, Ind. The club is participating in the Sept. V.I.F. Party with SYF, W7Y, J8S, K3KAR, K3MMH and K4BVY. The Allegheny-Kiski Amateur Radio Assn. (4-KARA) meets at the Greenwald School in New Kensington on the 3rd Fri. of each month. The Foxfiddle Radio Club's new location is at the Oak Pleasant Valley School. PHH recently became a member. K10-FD is a Chautauqua Fmtr located at Herman, Pa. He operates the WBU CQJ 12, K7F, MBF 34, AUG 29, K3GHI 8, W3Y 6, K3COT 4.

**E-Z WAY SAT**

E-Z WAY AERO-DYNAMIC design decreases wind load and provides telescoping action that permits raising and lowering of tower sections. CRANK UP TO 60 FEET, DOWN TO 25 FEET AND TILTS OVER FOR ACCESS TO ROTOR OR BEAM. STRENGTH is built-in to E-Z WAY Tower...Heavy welded steel and continuous diagonal bracing of solid steel rod and electrically-welded throughout...no loose bolts or nuts here. E-Z Way design and strength are your assurance of DEPENDABILITY that you can count on year after year. See your nearest distributor today or write for free literature.

The SATELLITE
Model RBX-60-3P (Painted) $335.00
Model RBX-60-3G (Galvanized) $410.00

MOUNTING KITS:
GPK X60-3 (Ground Post) $125.00
BAK X (Wall Bracket) $17.00

Freight Prepaid anywhere in (48) U.S.A.
WHEN WINTER COMES... G-76

When there’s a chill in the air... when thoughts of sunny summer’s mobile operations are crowded out by less pleasant, but highly pertinent considerations of antifreeze—and windshield wipers that haven’t yet been fixed. This is exactly the time to consider the addition of a new Gonset G-76 100 watt, 6 band transceiver to your worldly goods! A most pleasant traveling companion when your activities trend toward mobile, G-76 is also right at home... when winter comes.

There’s real pleasure in store for you in home operation of equipment with the versatility of G-76. Just connect this powerful little gem to your available antennas—load up—operate! Have you tried 75 lately? Or 40? It may also come as a pleasant surprise to find that your G-76 will give the same lively performance on 6 meters as on the other five widely used 10, 15, 20, 40 and 80 meter bands. Like to keep your hand in with a little CW? G-76 has good clean keying characteristics, a stable BFO in its receiver.

Handsome too. Functional, industrial-designer styling, blending, subdued-tone finishes. These are some of the many features that make G-76 as welcome in your fine living room as it is in your new car.

G-76 ............... Model #3338 ............. 376.25

less power supplies

117V AC power supply in combination with speaker in matching cabinet ................................. Model #3349 ...... 145.00
Compact 12V DC transistorized power supply for mobile operation. (Negative ground only). .. Model #3350 ...... 145.00

Dual conversion receiver • BFD for SSB and CW reception • Automatic Noise Limiter • Excellent selectivity: 1 uv for 6 db S+ N/N ratio • Excellent selectivity: 3 to 3.5 kc bandwidth at 6 db down; 14 kc or less at 60 db down • Transmitter and receiver oscillators temperature controlled, have VR tubes... have low drift even with wide variation in both plate and filament voltages • Transmitter has highly stable VFO for all bands except 50 mcF... crystal control may also be used • Transmitter power input 100 watts AM phone; 120 watts CW • 800s Final Amplifier operates into pi-network matching system • Push-to-talk control, or by T-R switch on panel • Tuning meter on panel • Compact... only 12¾”W, 5½”H, 11½”D.

* crystal control

GONSET Division of Young Spring & Wire Corporation 501 SOUTH MAIN ST., BURBANK, CALIFORNIA

EXPORT SALES: WESTREX CORP., 111 EIGHTH AVE., NEW YORK 11, N.Y.
THANKS FOR THE MEMORIES

As the hells of Christmas toll over the land, most of us start thinking of what the Old Man with the white beard and red suit is going to leave us on Christmas morning. Today, I'd like to turn the tables a bit. Instead of asking Santa what I'm going to get, I'd like to offer something to him. And the main thing I'd like to give Santa this Christmas time— is my thanks. So here goes.

Dear Santa:

7 thanks for keeping our country on an even keel when so many other parts of the world are torn with discord and strife.
7 thanks for giving us leaders who are big enough to rise to any emergency—yet humble enough to know they're the servants of the people.
7 thanks for giving us an economic system wherein a company as modest as mine can find its place in the sun.
7 thanks for letting us at Adirondack Radio hold our own and grow and prosper simply by trying to put into practice the Golden Rule.
7 thanks for giving us the privilege of doing business with so many hundreds of people—who start out being our customers and end up as our friends.
7 thanks for giving us the best year we ever had since starting in business all the way back in 1936.

THAT'S IT, SANTA! And a very Merry Christmas to YOU—and all our friends and customers!—WARD J. HINCKLE, W2FEP

ADIRONDACK RADIO SUPPLY

185-191 W. Main St., Amsterdam, N.Y.
Phone Victor 2-8350  Ward J. Hinckle, Owner

WISCONSIN QSO PARTY

December 11, 1960

All Wisconsin amateurs are invited to take part in the QSO party sponsored by the Milwaukee Radio Amateurs Club in order to promote friendship and operating ability within the section.

Rules: 1) The party will begin at 10:00 A.M. CST and end at 5:00 P.M. CST Sunday, December 11. 2) All types of emission and all bands may be used, but a station may be worked only once regardless of mode or band. C.W.-to-phone operation is permitted but crossband work is not allowed. Stations are urged to work all bands from 2 through 160 meters to raise their scores. A station may operate on c.w. or phone or both, as desired. 3) The general call will be "QO Wls." 4) Information to be exchanged during the contact will consist of a QSO number, RS or RST report, county, operator's name and time of contact. 5) Logs should show times, station worked, signal reports sent and received, frequency, mode, emission, power input, QSO numbers sent and received, name, county. It is suggested that sheets from the ARRL Log Book be used for convenience and accuracy. Exchanges must be entered correctly. 6) Scoring: Count one point for each QSO received and one point for each QSO sent. 7) An engraved gold cup will be awarded to the highest scorer, regardless of whether that score has been made completely on c.w., phone, or is a composite of both. In addition, engraved gold cups will be awarded to the highest scorer in phone only, c.w. only, Novice and Mobile. These awards, donated by local radio suppliers, will be presented at the Wauwau Hamfest. 8) A self-addressed stamped envelope to W9ULA will bring contest forms. Send logs, postmarked not later than January 8, 1961, to John Hughes, W9ULA, 3344 E. Van Norman Rd., Cudahy, Wis.

See how many Badgers you can work during the seven-hour contest period. Get on the air December 11 and meet the gang!

(Continued on page 144)
THE MULTIPHASE MODEL MM-2
RF ANALYZER

- Monitors the RECEIVED and TRANSMITTED signals. Shows flat-topping, overmodulation, parasitics, keyed wave shape etc. Silent electronic switching keyed by transmitted RF.
- No tuning required. Broadband response flat 1 MC to 55 MC at power levels of 5 watts to 5 KW.
- New variable sweep control for transmit and receive.
- RF attenuator controls height of pattern. Calibrated in 3 DB steps.
- Function selector for ENVELOPE, TRAPEZOID and BOW-TIE patterns on transmit. For SSB, DSB, AM and CW.
- Built-in 1 KC audio oscillator, less than 0.5% distortion. With 3" scope, is ideal for complete alignment of SSB excitors.
- For use in series with 52-72 ohm coax lines. A short pickup antenna may be used with other systems.
- Plug-in adaptors available to match 50 KC, 60 KC, 80 KC or 455 KC receiver IF systems. Only one simple connection to receiver.

THERE IS NO SUBSTITUTE FOR A SCOPE IF YOU WANT THE CLEANEST, MOST PERFECTLY MODULATED SIGNAL YOUR TRANSMITTER CAN PROVIDE. THE MM-2 IS BY FAR THE MOST DEPENDABLE AND EASIEST TO USE, SINCE IT WAS DESIGNED STRICTLY FOR THIS PURPOSE.

---

**OTHER FINE C.E. PRODUCTS**

- Model 100V  ... New 100 Watt Broad-Band Exciter-Transmitter ... $795.00
- Model 600L  ... Broad-Band Linear Amplifier  ... $495.00
- *Model 20A  ... Bandswitching SSB Exciter   ... $495.00
- *Model 10B  ... Multiband SSB Exciter  ... $183.50
- *Model GC-1  ... Gated-Compression Amplifier  ... $66.50
- *Model B  ... Sideband Slicer with Q Multiplier  ... $104.50

* Also available in kit form

AND MANY OTHERS ... WRITE FOR LITERATURE
We have found the Rider Sound-n-Sight Code Course to be a successful training method. We are currently employing this method with modifications to fit our training requirements. We have found that this method of teaching code saves an appreciable amount of time in our training program. Thus stated the Commanding Officer, U. S. Coast Guard Training Station, Groton, Connecticut. Proof once again that the Rider Sound-n-SIGHT CODE COURSE is the easiest, fastest way ever developed to learn code.

The NAVY TIMES gives details of the successful Coast Guard test that led to the adoption, at the Coast Guard Groton, Conn. Training Station. "The Army at Ft. Monmouth, New Jersey, adopted the radio course. The Coast Guard was impressed with the Army results and gave the method a try. According to the Coast Guard trial runs, the men taught by the new method take a lead immediately in building speed and remain ahead by nearly 100% throughout."

"After 80 hours for example, the first experimental group averaged 19 words per minute, the second averaged 19.5 and the third 18.5. Men in the first class under the old method were clocked at 9 words per minute at this point and those in the second had 9.4 words. There was no comparison in the third class, since all were on the new method."

HERE'S WHY YOU LEARN FASTER WITH THE RIDER SOUND-n-SIGHT COURSE

- Applies Reinforced Learning—psychological principle proved successful by Armed Forces.
- Designed to teach you to hear signal pattern correctly and identify it—how to transmit.
- Use identification "flash" cards to teach you the correct letter association with each signal pattern.
- Has "check yourself" progress charts...

...plus an imaginary instructor (in complete and novice courses) provides correct answers to speed code learning. Many people have learned to receive 5 words per minute within 9 1/2 hours. Eliminates code plateau barrier!

3 INDIVIDUAL COURSES—There's one for you

- COMPLETE COURSE (6-29 words per minute)—Six 10" LP records (192 minutes of recording, 28 recordings), 47 identification cards, book #REC-020, $15.95.
- NOVICE COURSE (4-8 words per minute)—Three 10" LP records (192 minutes of recording, 28 recordings), 47 identification cards, book #REC-08, $9.50.
- ADVANCED COURSE (9-30 words per minute)—Three 10" LP records (192 minutes of recording, 28 recordings), book #REC-020, $8.95.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH, PAMs: NKP and NGT, RM6s: VTP and V1K. New appointee: VCM and K9JT at EC. YQH will remain as SCM for another year. The Lake Club of Wisconsin elected K9KSR, pres.; K9JWT, vice-pres.; K9SIZ, sec.; K9KID, treas. A new station that is lack of an on-air identity is active with a KWM-1, an NC-300 and a vertical. K9GSC passed the Amateur Extra Class, commercial radio diagnosis, photography and radio operators 2nd-class exams. K9KDY received his RCC and ARRL certificates. BEN certificates went out to NLE, HEA, KKM, MAI, K9POL, K9KIS, PLF, K9RE and K9DB. 2NITA is active on 8 nets and assists with TCC relays. K9DOL now is operating RTTY. A new beam has K9UTN active on 10 and 20 meters. A 15-page bulletin, edited by QYV for the Milwaukee Club: DYG called VE1VR during the W6VE Contest and it turned out to be QV1VR. K9RAW, K9QGB and K9TO were all heard from by the 2m phone band monitors. A 10-m phone CP Award went to K9QVR. WIN elected K9EU and WSSN elected CB8 as delegates to the Wisconsin Net Association, NO notices sent during September: K9JP-88, K9GDF-53, K9EQZ-6, COO-1. Are you operating in the "PICON"? Join one of the section's NTS nets: The BEN, 2000 kc; the 800; the W7, 2350 kc; daily at 1915; the WSSN, 3355 kc. Mon. through Fri. at 1830. Happy Holidays to all from your SEC, PAMS, RM6s, Director and SCM, Traffic. (Sec.) W9QYD Y968, W9MTA/9 626, W9CXW 615, K9GDF-16, W9KQB 81, VTP 41, SAA 33, APR 46, K9GSC 8, W9OTL 52, K9MTX 54, WP6R 81. (T.F.) W9LX 22, LFK 21, K9QA 14, ELT 10, W9EZ 8, K9EQQ 8, W9CBE 6, MWQ 6, CCO 3, K9TUD 2. (Aug.) K9QJA 104.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, W8HYA—SEC: K9KBY, PAM: K9KJR, RM6: KTZ. As this is being written your SCM is in the process of moving from Bismarck to Williston. His new address is Bismarck, ND 58501. Net reports for September will be reported next month. The Laramie State High School Radio Club has become an ARRL-recognized club and has increased their membership. They have new news from you soon as well as news from other clubs. We welcome QAR, at Tioga, to the 75-Meter Net. Notice on the May Frequency has been deleted. Stations are required to see the ARRL News, PHC and K9GMR. Traffic: K9WTP 131, YST 9, TY 8, W9GEC 8, K9RZB 8, W8HIT 5, YCL 4, HBF 5, OMA 2, K9TJV 2, VTP 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, WARRN—SEC: SCT. Newly-elected officers of the Sioux Falls ARC are RWE, pres.; K9KSM, vice-pres.; K9YNY, sec.; and K9KRV, treas. K9KQR was a new call of K9WJR, a 100-meter rig for club use. K9WJT is experimenting with a Wintonola antenna, VHC has a new daughter, making VHC a great shock to the second-generation station. K9RJH has purchased a TA-28 beam, DTB, formerly of Centerline, now is located at RDF 2, West Branch, Iowa. VTP has received his Conditional Class ticket. K9MALU, Sioux Falls, passed the General Class exam. A new call in Sioux Falls is K9NEB2, K9UXC is attending college at Orange City, Iowa. K9KVE is a graduate of Oglethorpe U. St. Ogle, is attending Huron College, OJH has moved back to Minnesota and is attending Mankato College. K9RBSW, Madison, passed the Technician Class exam. OOL is working for Western Electric in Sioux Falls. Traffic: W9CST 379, BAQ 263, D9V 256, K9NWH 214, W9WVC 41, ZWL 28, HFR 23, K9DUR 8, I9WTC 10, OFP 5, K97UZ 5, W9XYF 5, K9QOY 3, KOY 2, W9NNX 2, K9REB 2, SEZ 2, W9BNM 2, K9KRL 1, YC 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, W9KJZ—Ass. SCM: Rollye O. Hall, O9ST, SEC: TUS, Ass. SEC: K9KJE, PAMs: OPX and K9KEP, RM6: RIQ and K9KIDZ. The Dakota Division ARRL Convention was well attended with 590 registrations. Hiram Good- man's (IDAX) talk on "Amateur Repeater" was a big hit. All meetings were well attended. The pre-registration prize, an SX-111, went to O9P's XYL, the mink stole to TUS, the Collie to O9ST, the HAMS Program to the 18 Elaa at PM and the DX-100 to SIZ. K9SSBB had a wonderful visit at IAW and met W1WPR, one of the operators. EC HH has fixed over a dozen repeaters for problems and trouble and eye surgery, RTH's new call is FT3BM in the French Riviera. K9MIZ now lives in Wisconsin, K9OTW is attending Iowa State, Thomas Cabell, O9RWS's Northwestern Bible student, has a Globe Scout S80A and a four-element Telex beam on 6 meters. The following appointees renewed their appointment: ECS HEN, (Continued on page 446)
HAMMARLUND HX-500 TRANSMITTER

Tonight, and every night to come, more and more Hammarlund HX-500 SSB transmitters will be operating and serving as the topic of conversation. This new transmitter is rapidly setting the standards by which all other transmitters will be judged.

Loaded with new features, designed to provide the finest performance, and built to the fine traditions of Hammarlund craftsmanship, the HX-500 is your best buy in the fine transmitter field...

Write today for complete details... $695.00 amateur net.

HAMMARLUND MANUFACTURING COMPANY, INC., 460 W. 34th ST., N.Y. 1, N.Y.


See Hammarlund at the 1961 Tropical Hamboree
"everyone preferred the 951"

... writes Dave Brown, ZL1HY, of his Electro-Voice Model 951 Cardioid Microphone

ZL1HY, among the top worldwide DX men, phone and C.W., is a ham that has to be convinced. He first compared his new Electro-Voice 951 with his two other mikes on the monitor and, in his words, "... it certainly sounded better ...". Next, ZL1HY tried "... swapping mikes during the QSO's ...", and discovered, "... everyone preferred the 951 ... they claimed I sounded far more natural and not as deep as with my other mikes."

There are solid design reasons why ZL1HY's contacts claimed he sounded "far more natural." First, the highly directional cardioid pattern of the 951 improves audio quality by effectively reducing random back-ground noise by as much as 67% ... insures smooth VOX operation. Also, the 951's Variable-D® principle, virtually eliminates changes in bass response with working distances.

See and try the Model 951 at your distributor—today. It's the lowest priced cardioid on the market employing E-V's Variable-D principle ... worth a substantial increase in power. You'll be convinced, too.

TECHNICALLY SPEAKING: Model 951 utilizes a Bimorph type Rochelle-Salt element completely sealed against moisture to extend crystal life. Uniform cardioid pattern permits nearly twice the pick-up working range. Variable-D principle insures a uniform frequency response. Proximity effect virtually non-existent. Pop-proof grille minimizes breath blasts. High-pressure die cast zinc case finished in Metalustre gray. Convenient ON-OFF switch.

Model 951 (without stand) Net Price: $29.70
Model 951 (with Model 418 desk stand) Net Price: $35.70

*Patent Pending
GENERAL DESCRIPTION

The 18-HT "Hy-Tower" is a multi-band vertical antenna system designed to work against ground or a grounding system. Through the use of the unique stub decoupling system, automatic band selection is accomplished for the 10, 15, 20, 40 and 80 meter bands. The stubs (or linear traps) effectively isolate various sections of the vertical so that an electrical quarter-wave length (or odd multiple of a quarter-wave length) exists on all bands. The Hy-Tower will withstand very large amounts of RF power. The overall height is 50 feet and it is completely self-supporting in wind velocities up to approximately 80 miles per hour.

The Hy-Tower utilizes the method of stub decoupling. In principle, a quarter-wave shortened stub is used to effectively insulate or decouple various sections of the tower, maintaining low-impedance current feed on all bands. The following illustrations show how the antenna looks electrically on all bands. The dotted sections are the inactive parts on each band.

On both 40 and 80 meters, the Hy-Tower operates as a quarter-wave vertical. As shown above, the entire antenna is in use on 80 meters. On 40 meters the tower proper (which is insulated from the aluminum mast) acts as a quarter-wave stub or sleeve, decoupling the top mast and a quarter-wave 40 meter antenna results. On 20 meters the entire antenna is operative as a three-quarter-wave vertical. On 15 and 10 meters, the decoupling stubs are positioned at the proper points to act as phase reversal stubs and a collinear action results in a gain of 2 db over a quarter-wave vertical at the same height. It is interesting to note that the antenna makes no compromise in efficiency on any band. The stub multiband in no way limits the operational efficiency. The Hy-Tower is slightly shorter than natural length, mostly because of the slight shortening effect due to the large cross sectional area of the tower.

LECTRONIC WHOLESALERS, INC.
61 N.E. 9th STREET - MIAMI 32, FLA. - Phone Franklin 7-2511
FORMERLY ELECTRONIC SUPPLY

LECTRONIC WHOLESALERS, INC.
1301 HIBISCUS BLVD. - MELBOURNE, FLA. - Parkway 3-1441
FORMERLY ELECTRONIC SUPPLY

LECTRONIC WHOLESALERS, INC.
2345 SHERMAN AVE., N.W. - WASHINGTON 1, D.C. - Phone Hudson 3-5200
FORMERLY: ELECTRONIC SUPPLY
ASSEMBLY AND INSTALLATION:
The 18-HT Hy-Tower vertical antenna is easily assembled on the ground. Coded and pre-drilled parts allow for rapid assembly. The antenna utilizes a three-section, hot-dip galvanized tower for the lower half. The upper section is telescoped high-strength 6061ST6, aluminum tubing. Due to the light (yet rugged) construction of this antenna, two men can easily walk it up into position.

Several types of base mountings are available. For permanent mounting, the poured concrete base is recommended. This base requires 3/8 cubic yards of concrete and results in a neat, permanent installation. Also recommended for permanent installation is the Spaulding Products Model X36CBO which is a cylindrical base to be buried in the earth and tamped in place, with no concrete required. This base is available for $19.06 Ham Net. For semi-permanent or temporary installations, the antenna can be mounted on three stakes and a set of heavy, non-metallic guy cables installed at the top of the tower section. For wind velocities in excess of 80 miles per hour, it is recommended that guy cables be installed for any type of base mounting.

GROUNDING:
The Hy-Tower performs very well with a simple ground system consisting of six television ground rods installed directly at the base of the tower. The use of this grounding system eliminates the necessity of an extensive radial system. For somewhat improved performance, especially in dry or sandy soil, a system of ground radial wires may be employed.

FEEDLINES AND VSWR:
The recommended feedline for the Hy-Tower is RG-8/U coaxial cable of any length. However, for long runs at high power levels (in excess of 500W), RG-17/U coaxial cable is preferable. The VSWR of the antenna is low on all bands with exceptionally broad bandwidth. Settings are provided to favor either CW or PHONE operation. Due to the broadband characteristics, the antenna will perform well over the entirety of each band no matter which setting is chosen.

OPERATIONAL RESULTS:
Extensive field testing has shown the Hy-Tower to be an excellent performer on all bands, 80 through 10 meters. It is outstanding on long distance DX contacts due to its low angle radiation characteristics. On short skip contacts, it compares favorably with a horizontal doublet at the same average height.

For the ultimate antenna system on 80 and 40 meters, it is possible to mount two Hy-Tower antennas 65 feet apart and switch the phase in order to obtain gains of the order of 3 db on 80 meters and 3 db on 40 meters.

The Hy-Gain Model HTP phasing kit will supply the necessary phasing networks. The Hy-Gain Model HII indicator and control unit, which matches the RBX-1 Rotobrake indicator unit, completes the installation for the ultimate shack. Write for details.

MECHANICAL
Height: 50' 0''
Weight: 100#
Construction: Tower Base Section: Hot-dip galvanized. Height, 24' Top mast: 6061ST6 Aluminum. Height, 26' Wind Area: 16.7 square feet Wind Load: 503 lbs. at 100 mph Insulators: High-impact cycloc, injection molded
Hardware: Iridite-treated steel to mil. spec. MIL: 14072

ELECTRICAL
Pattern: Low-angle omni-directional on all bands
Gain: 2 db on 15 and 20 meters; unity on 80, 40, 20
Impedance: VSWR less than 2:1 on all bands relative to 50 ohms
Power: In excess of 5 KW
Feedline: RG-8/U, RG-58/U, or RG-17/U

[Image of antenna]

Price: $129.50

113b NO. 22nd ST. LINCOLN, NEBRASKA
“A REAL NEAT BOOK”

by Walker A. Tompkins, K6ATX

If the young man or girl on your Christmas list likes to read books full of action, CQ GHOST SHIP will make an intriguing gift. It’s by a professional writer whose own amateur radio call is K6ATX. SOS AT MID-NIGHT, the first book featuring Tommy Rockford, is also recommended for Christmas giving.

Order both direct from the publisher—only $2.95 each, postpaid. Send check or money orders. No C. O. D.’s.

MACRAE SMITH COMPANY
225 South 15 Street, Philadelphia 2, Pa.
from EICO®...a completely new

**CITIZENS BAND TRANSCIEVER**

*EICO* premounts, prewires, pretunes, and seals the ENTIRE transmitter oscillator circuit to conform with FCC regulations (Section 19.71 subdivision d). EICO thus gives you the transceiver in kit form that you can build and put on the air without the supervision of a Commercial Radio-Telephone Licensee!

**NEW! 60-WATT CW TRANSMITTER #723**
- Kit $49.95
- Wired $79.95
- Ideal for novice or advanced ham needing low-power, stand-by rig.
- 60W CW, 50W external plate modulation, 20 through 10 meters.

**96-WATT CW TRANSMITTER**
- #729 Kit $79.95
- Wired $119.95
- *U.S. Pat. No. D-184,776*
- "Top quality" - ELECTRONIC KITS GUIDE, ideal for veteran or novice.
- 90W CW, 65W external plate modulation, 80 through 10 meters.

**HIGH-LEVEL UNIVERSAL MODULATOR-DRIVER #730**
- Kit $49.95
- Wired $79.95
- Delivers 50W undistorted audio. Modules transmitters having RF inputs up to 100W. Unique over-modulation indicator. Cover $5.

**GRID DIPOLE METER #710**
- Kit $29.95
- Wired $49.95
- Includes complete set of coils for full band coverage.
- Continuous coverage 400 kHz to 250 mc. 500 ua meter.

**COLOR & MONO DC-5MC LAB & TV 5" OSCILLOSCOPE #400**
- Kit $79.95
- Wired $129.50
- 5" Push-Pull Oscilloscope
- #425 Kit $44.95
- Wired $79.95

**PEAK-TO-PEAK VVVM #232 & "UNI-PROBE"**
- Kit $29.95
- Wired $49.95
- *U.S. Pat. No. 2,790,051*

**VACUUM TUBE VOLTMETER #221**
- Kit $25.95
- Wired $39.95

**RF SIGNAL GENERATOR #324**
- (150kc-435mc)
- Kit $25.95
- Wired $39.95

**TV-FM SWEEP GENERATOR & MARKER #368**
- Kit $69.95
- Wired $119.95

**DYNAMIC CONDUCTANCE TUBE & TRANSISTOR TESTER #666**
- Kit $89.95
- Wired $109.95

**TUBE TESTER #625**
- Kit $34.95
- Wired $49.95

**WASHINGTON DISTRIBUTOR**
Send 38-page Stereo - Hi-Fi Guidebook $25 enclosed for postage & handling.

**EICO, 33-00 N. Blvd., L.I.C. 1, N.Y.**

Show me how to save 50% on 72 models of top-quality: □ Ham Gear □ Test Instruments □ Hi-Fi □ Send free Short Course for Novice Licensee. Send free catalog and name of neighborhood EICO Distributor. Send 38-page Stereo - Hi-Fi Guidebook $25 enclosed for postage & handling.

**Name**: ____________________________
**Address**: ____________________________

**City**: ____________________________
**State**: ____________________________
**Zip**: ____________________________
**Phone**: ____________________________

- **QS-12**

**ENGINEERS**: Excellent career opportunities in creative electronics design. Write to the Chief Engineer.

**$90.95**

**$99.95**

**$69.95**

**$59.95**

**$59.95**

**$89.95**

**$79.95**

**$129.50**

**$79.95**

**$44.95**

**$79.95**

**$25.95**

**$39.95**

**$69.95**

**$109.95**

**$49.95**

**$34.95**

**EICO, 33-00 N. Blvd., L.I.C. 1, N.Y.**

Show me how to save 50% on 72 models of top-quality: □ Ham Gear □ Test Instruments □ Hi-Fi □ Send free Short Course for Novice Licensee. Send free catalog and name of neighborhood EICO Distributor. Send 38-page Stereo - Hi-Fi Guidebook $25 enclosed for postage & handling.

**Name**: ____________________________
**Address**: ____________________________

**City**: ____________________________
**State**: ____________________________
**Zip**: ____________________________
**Phone**: ____________________________

- **QS-12**

**ENGINEERS**: Excellent career opportunities in creative electronics design. Write to the Chief Engineer.
An effective converter for excellent 6 meter mobile reception when operated in conjunction with conventional automobile broadcast receivers. This highly stable Converter covers the frequency range of 49-54 mcs., utilizes double conversion with second mixer output at 1500 kc. Has sensitive RF stage for weak signal reception. Distal is full vision, uses planetary drive for ease of tuning. Converter operates directly from 12 volt car battery (110 ولی لے) and has built-in power meter. Housing is small in size, is easily mounted under dash with bracket provided.

Unit also includes separate noise clipper which may be connected to associated BC receiver models using tubes up to the second detector stage.

Model #3275........................................74.50
(12V DC...negative ground only)

GONSET Division of Young Service & Wire Corporation
401 SOUTH MAIN ST., KEBLANC, CALIFORNIA

Hudson Division

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC; W2KGO, RM; W2PXH, PAMS; W2JIG and WENOC, section nets; NYS on 3075 kc. at 1100; ESS on 3565 kc. at 1300; ESS on 3590 kc. at 2300; 454.35 kc. (Fri.) at 1100; F4G (Noyes) on 454.35 kc. at 1100, at 1300. E2JYF has been appointed as BC, Endorser: W2JWF and E2JHNW as ECs. KY2J as OBS and W2AKK as OES. Welcome to the Putnam Co. Amateur Radio Assn., the Colonie Central High School BC and newly formed clubs. The Dutcheess Co. V.H.F. Society participated in the Sept. V.H.F. Contest with K2OCH, K2QST, K2UKE, W2RFX, W2XK, W2MZZ, W2PAT, and W2LWJ as operators. New officers of the ARC, W2LOR, include K2YJL, pres.; W2GZGW, vice-pres.; A new Technician is W2MYU. New 6-meter section meetings are held at K2CJ and W2AYW. K2EJBJ has a new challenge. W2NYU has a Globe Chief. K2CVQ operated ASB in 20-day period with W2JLW. New officers of the RFI Club, W2ASZ, are K2YJN, pres.; K2LCP, vice-pres.; K2DPR, secretary; and K2VZJ, equipment, and Director. The ring included on 40, 80 and 20 meters 150 watts on 6 meters and 500 watts on 2 meters. Twenty students are in the crew and classes of the Communications Club of New Rochelle. K2RHZ is the new editor of the club’s Communicator, and New XTV, General Class license, W2ZP7, dito CMA and K2RHZ. During the direction of K2QGS, mobiles in Youker, including K2OM and K2HGN with K2HBO, operated nearly 24 hours during Hurricane ‘53. The divine RACE group, K2BG is both president of the Youker Club and editor of its Face-Book. W2KBU and W2QAF are the proud possessors of new beam, Congratulations to K2UTV on making the new BPL. Raffle: K2TYF 109; W2EFU 271; K2MB 157; W2PXH 103; K2RYK 66; K2DEM 81; K2OZT 48; W2MAC 25; K2HMY 14; K2HGW 2.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Daniels, WJTFUK–SEC; W2ADO, RM; W2XRC, PAMS; W2EFU, V.H.P. PAMS; W2EWW, Section nets; N.LI, 3030 kc. nightly at 2300 EST (regular session) and 2351 EST (early session) and Sat. and Sun. at 1915 EST. V.H.F.-LIF, 1008 kc., Mon. through Sat. from 1930 EST, NYC-LI AREC, 3030 kc. Sat. and Sun., at 1720 EST. V.H.F. Traffic Net, 148.8 kc., Tue., Wed., Thurs. at 2300 EST. New members were welcomed by K2UTA, K2CPU, K2RBB and W2EFU, the latter reporting his sixth BPL. (Continued on page 154)
NEW!

TA·36 by Mosley

for 10·15·20

The new clean-line design TA·36 . . . the three band beam that will give your signal that DX punch!

This wide spaced, six element configuration employs

4 Operating Elements on 10 Meters
3 Operating Elements on 15 Meters
3 Operating Elements on 20 Meters

Automatic bandswitching is accomplished by means of exclusive design high impedance, parallel resonant "trap circuits". Built for operation at maximum legal amateur power. Low SWR with high gain and front-to-back ratio. Traps are weather and dirt proof offering frequency stability under all weather conditions.

All heavy wall 6061-T6 aluminum - the finest aluminum alloy for antenna construction! Boom measures 2" OD by 24' by 1/8" wall, elements measure 1 1/8" to 5/8" in diameter with center sections of double thickness aluminum to reduce sag . . . fully rust and corrosion proof - Guaranteed!

Before you buy any beam - Check Construction Features!

See your nearest amateur equipment dealer or write for literature describing the TA·36 . . . the newest member of the Mosley TrapMaster family of fine amateur antennas.

Amateur Net $129.50

Mosley Electronics, Inc. 4610 N. Lindbergh Blvd.
Bridgeton, Missouri

WEST COAST BRANCH
1406-08 South Grand Avenue
Los Angeles 15, California

INTERNATIONAL DIVISION
15 Moore Street
New York 4, New York
AN IDEAL CHRISTMAS GIFT...
TO LAST FOREVER

LEARN CODE
and Theory

50c

APPROVED, SIMPLE,
FAST, HOME STUDY

78, 45 or 315/8 r.p.m. Unbreakable Phonola-
tronic "stereo" horn. Heavy-duty, 2 belt-driven motors
HAS HELPED THOUSANDS PASS AMATEUR
AND COMMERCIAL CODE & THEORY EXAMS,

4 AMECO Courses Available:

No. 1 - NOVICE CODE COURSE. You get and keep 10 rec-
cordings (alphabets through 8 W.P.M.). Includes typical FCC
type code exams. Free instruction book on how to learn and
receive code the simplest, fastest way; plus charts to check
your receiving accuracy; pass an album; all for the low price of
only: 45 r.p.m.: $5.95 33 1/3 r.p.m. $4.95 78 r.p.m. $6.95

No. 2 - SENIOR CODE COURSE. You get and keep every-
things given in the Novice Course except that you get 12 recordings
(alphabet through 18 W.P.M.) plus typical FCC type code ex-
ams. You record and keep all 12 alphabets. Also get 8 practice
recordings. Free instruction book on how to learn and
receive code the simplest, fastest way. Total price: 45 r.p.m.: $10.50 33 1/3 r.p.m. $9.50 78 r.p.m. $11.50

No. 3 - NEW ADVANCED COURSE. Prepares Novice oper-
ators for the amateur general class and second class
commercial license tests. Contains 12 recordings (through 18 W.P.M.)
PLUS the complete code book - PLUS typical FCC type exams
and general and commercial tests. ALL for only: 45 r.p.m. $4.95 33 1/3 r.p.m. $4.95 78 r.p.m. $5.95

No. 4 - COMPLETE AMATEUR RADIO COURSE. A complete, simplified home study theory course in
radio covering the Novice, Technician, Conditional and General
classes - all under one cover - nearly four hundred typi-
cal FCC type questions and exams. No technical background required. You also get, FREE, a guide to set-
ting up your own Ham station. All for the amazing, low price of
$3.95

NEW AMECO LICENSE GUIDES
to pass Commercial Theory exams

No. 8-01 - THE COMMERCIAL RADIO OPERATOR'S
QUESTION AND ANSWER LICENSE GUIDE - Ele-
ments 1 and 2. This book covers the two commercial
theory sections. Questions and answers appear simul-
taneously on pages 1 and 2. In addition, it contains
SAMPLE FCC-TYPE EXAM PRACTICE EXAMS
using all the most common Ham station frequencies and
1000 non-commercial questions. For all FCC commercial exams. Only

No. 8-02 - THE COMMERCIAL RADIO OPERATOR'S
QUESTION AND ANSWER LICENSE GUIDE - Ele-
ments 3 and 4. Contains questions and answers and SAMPLE
FCC-TYPE PRACTICE EXAM for element 3. Complete
preparation for 1st class Radio Telephone license. Only

No. 8-03 - THE COMMERCIAL RADIO OPERATOR'S
QUESTION AND ANSWER LICENSE GUIDE - Ele-
ment 4. Contains questions and answers and SAMPLE
FCC-TYPE PRACTICE EXAM for element 4. Complete
preparation for 1st class Radio Telephone license. Only

FREE LITERATURE AVAILABLE
Sold by leading dealers everywhere or write to
Dept. Q12

AMERICAN ELECTRONICS CO.
178 Herrick Rd., Mineola, L.I., N.Y.

TURN COUNTER

Groth

UTURN COUNTER

REGISTERS FRACTIONS TO 99.9
Turns

TUNER

HORN DIALS TO 99.9

BELL DIALS TO 99.9

122 for Parcel Post

R. W. GROTH MFG. CO.
1009 Franklin Ave.
Franklin Park, Illinois
Compare! The B & W LPA-1

With any of the most popular 1 KW Amplifiers...check these 15 outstanding design features...

1. Designed for quality performance, yet lowest initial cost—$375.00
2. Designed for long tube life and lowest replacement cost—Type 813's used
3. Designed for a full KW input under CW conditions
4. Designed for 2 KW PEP* under SSB conditions
5. Designed for efficiency, in excess of 65% average
6. Designed to recover more than 80% of driving power in the output
7. Designed for minimum intermodulation distortion products
8. Designed for plate current cut-off under key-up conditions...built-in bias and filament supply
9. Designed for T.R Switch or Mechanical Antenna Relay
10. Designed for fool-proof operation...only two tuning controls
11. Designed for remote control of power supply

12. Designed for use with your own power supply
13. Designed for minimum space...requires no more than most receivers
14. Designed with smart clean styling...complements other equipment in your shack
15. Designed with heavy duty construction, yet light in weight...your XYL can easily move it about...

...And it's the most copied amplifier by those who build their own.

Listen to the LPA-1's on the air. Note the eloquent power packing punch. It can't be drowned out nor ignored...it gets through when the going is rough.

See one at your favorite distributor. Discover a real thoroughbred in amplifiers. See its clean, uncluttered design and layout. You'll be amazed at its simplicity, accessibility, quality of components and sturdy construction.

After you have heard and seen a B&W LPA-1 you will want to order one for Christmas. If your local distributor does not have one in stock...ask him to get one...also write to the factory for complete brochure in full color.

LPA-MU Matching Unit Price $36.00
LPA-MU-2 Matching Unit Price $36.50
LPS-1 Power Supply for LPA-1 Price $205.00

Barker & Williamson, Inc.
Canal Street and Beaver Dam Road • Bristol, Penna.

Foreign Sales—Royal National Corp., 250 West 57th St., New York 19, N.Y.

OTHER B&W EQUIPMENT: Transmitters AM-CW-SSB • Transistorized Power Converters and Inverters • Dip Meters • Matchmasters • Frequency Multipliers • Low Pass Filters • T-R Switches • K.F. Filament Chokes • Transmitting K.T. Plate Chokes • Band-Switching Pi-Network Inductors • Cyclometers • Antenna Coaxial Connectors Baluns • Variable Capacitors • Fawalk Transformers • Coaxial Switches • Fixed and Rotary edgewound Inductors • Plug-in Coils with fixed and variable links • Straight type air wound coils in a variety of dimensions.
NEIL TRANSMITTERS
Sound Better

NEIL Beta 60 watt Transmitter • 6 or 10 Meters

In a true 50 to 60 watt phone transmitter, the audio system must provide 25 to 30 watts output or the signal will suffer.

Two 6CZ5, 6AQ5, or 6BQ5 tubes simply cannot do it. That’s why NEIL USES FOUR 6BQ5’s in the Beta modulator.

All NEIL transmitters sound better because:

• they do NOT use carrier controlled modulation, nor choke modulation, nor single tube modulators
• the modulator tubes ARE capable of 100% modulation
• the final is extremely stable so that it CAN be 100% plate and screen modulated

To top it off, a NEIL transmitter will amaze you with its ease of tuning.

• no screwdriver tuning
• no long complicated initial tune-up or QSY
• no oscillator circuits
• uses inexpensive low frequency crystals
• complete with tuning meters; no meter switching or calculation involved.

Check the values: NEIL transmitters tune easier (all controls on front panel, no screwdriver tuning), and sound better (because they are fully modulated using the best type of modulation system with the finest audio circuitry).

For use in FIXED STATION or MOBILE OPERATION without any modification.

TRANSMITTER PRICES • 6 OR 10 METERS

<table>
<thead>
<tr>
<th>Mode</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTTA transmitter, 60 watts. Requires 600V at 100ma. 200V at 200ma.</td>
<td>$120.00</td>
</tr>
<tr>
<td>Kit</td>
<td>$90.00</td>
</tr>
<tr>
<td>ALPHA transmitter, 20 watts. Requires 200V at 200ma. 150V at 200ma.</td>
<td>$78.50</td>
</tr>
<tr>
<td>Kit</td>
<td>$58.50</td>
</tr>
<tr>
<td>Power Supply for fixed station use, wired.</td>
<td>$39.95</td>
</tr>
<tr>
<td>MOBILE transmitter, 20 watts. With built-in mobile power supply for 12 volt operation.</td>
<td>$159.00</td>
</tr>
<tr>
<td>Kit</td>
<td>$134.00</td>
</tr>
</tbody>
</table>

All transmitters only 3 inches high.

Please specify band and filament voltage desired.

SEE YOUR DEALER, OR ORDER FROM:

THE NEIL COMPANY
1336 Calkins Rd.
PITTSFORD, N. Y.
• BAKER 5-6170 •

bouquet of the Irvington RAC on Sept. 24 was deemed a success. A good time was had by all, including your SCM, at the Assumption Station ARA night. MDB's holidays to all from your SCM, and remember, this column is for news, not just the news about the traffic men, but the word on any NJ amateur. Please send news about your activities. Traffic: • K5V1, 297, WAZCOO 260, WAQQQ 229, WA2AFY 216, WA2CFC 183, WARCQ 5, SGRCH 124, WCRV 4, WCVY 9, VRV9 14, K2VVL 98, W2PG 86, WA2HiQ 58, K4MF 58, WA2EO 53, K2CRC 23, K3GIF 20, KM2IX 15, WDHV 14, KSIL 12, KSILD 11, KOF2R 8, WA2CVY 7, WAZGR 7, WAMEZ 8, K2PQR 2, K2PIT 1. (Aug.) KSILG 18.

MIDWEST DIVISION

IOWA—SCM, Russell R. Marquis, W6BDR—Aest. SCM: Walter G. Porter, A6IC, SEC; K6EXN, PAM: K6BRS, RM: PZO. The 100-Meter Phone Net reports holding 10 sessions with 220 QSOs and 2 messages handled. The 75-Meter Phone Net held 26 sessions with 1050 QSOs and 114 messages. The T7CN held 18 sessions with 255 QSOs and 74 messages. Y4K, the Y4L of Y4K, has joined Silent Keys. The following have received EC appointments: WSB, F3O, GKN, IAE, KBrijk, QNF, DSC, QTV, ODC, T... (Continued on page 158)
FIBRE-GLASS WHIPS

The Feather-Weight Antenna with Spring-Steel Strength. Completely weatherproof, breakresistant. Includes a whip with special flexibility that prevents accidental shorting-out against overhead obstructions which can cause loss of signal, serious damage to equipment.

151. 60" loaded. $4.95.
FS-72 32". $4.95.
FS-64 44". $5.15.
FS-103 109". $6.95.

WRITE FOR FREE CATALOG

All products are for Universal Use-Mobile, Home, Marine, C.A.P., Civil Defense, Emergency, etc.

AT LEADING RADIO JOBBERS EVERYWHERE

Multi-Band Antenna Coils

New plug-in type coils designed to operate with S.B. base and S.Y. whip.

For 10, 11, 15, 20, 40, 80 Meters

Size 1½" x 19".

Positive action, just slide whip in or out of loading point and lock nut into position.

No. B-1080

$17.95

The Master-Matcher & Field Strength Meter

6 or 12 volt models

Complete $24.95

Automatically tunes entire band by remote control.

Ultra-Hi “Q” Coils

For 80, 40, 20, & 15 Meters

Your Choice $5.25 ea.

The coil with the highest “Q” ever obtained. Tested and found to have a “Q” of well over 515. Use with 90” base section. 60” whip, 3” Diam.

Leaders in the Design and Manufacturing of Communication Equipment & Antennas

FOR LAND, SEA AND AIR

Monopole Antenna

Folded radiating element for installation requiring a ground plane configuration and a wider useful range.

11 Met. $24.50
10 Met. 24.50
6 Met. 16.95
2 Met. 14.95

MOUNTS

No. 444 $17.80
No. 445 $7.95
No. 446 $13.45

Adjustable to any bumper. No holes to drill.

11M. Citizen Band Antenna

46" base loaded S.S. whip antenna. Fitted with a 1/2" dia. brass slug for all-purpose mounts. Low standing wave ratio on most of band when fed with a 50 ohm coax.

$8.27 $12.95

SkyMaster Coax Antenna

Gets your signal through where others fail. Concentrates signals at the lowest angle providing omnidirectional pattern for best coverage. Matched RG-59/U Cable. SM-700

11 Met. $17.95
10 Met. 17.95
6 Met. 15.95
2 Met. 10.95

Universal MOUNTS

Model 232-C 232 Series

Model Model 142 140 100WZ

NEW! SLIM-JIM

All-Band Base Loading Antenna Coil

96" Whip

For 10, 11, 15, 20, 40, 80 Meters

Size 1½" x 19".

Positive action, just slide whip in or out of loading point and lock nut into position.

No. B-1080

$17.95

Multi-Band Antenna Coils

New plug-in type coils designed to operate with S.B. base and S.Y. whip.

No. 900

10-15-20-40-75

No. 999

10-15-20-40 Met

No. SSB-156

40 & 75 M.

- Rigidly tested & engineered—found to have “Q” of 525.
- Handles 500 Watt Input.
- Operates into a 500 Ohm cable.
- Soft DNA type contact noise free, trouble free operation.
- WeatherSealed.
- Factory pre-lugged—no adjustments needed.

YOUR CHOICE EA $14.95

Master Mobile Mounts, Inc.
erally different exciters units. There is increased activity on 164 Ma, throughout the entire State in preparation for the new Racine frequency allocations. New officers of the Iowah Barbkres ARC are EDI. Nom., vice-pres.; K6B1, sec'y.; KQDS, treas. NXX has devoted considerable time to radio classes at the Missouri School for the Blind. As a result of his efforts there are 2 Vee and 2 Novice Class licensees on the air. A1W showed slides and a film of his last DXpedition to the British Virgin Islands at the last meeting of the Iowah (R.C.C.), MIE has retired from the Santa Fe and now has all the time in the world to work the ham bands. Appointments: K6BHD as QRM and W6BPR as QRT. Endorsements: T0D as OBS; K6A as OBS; JH as OBS; and K6L as OBS. CWT; DFR; K6RQW; Y5RT and Y41 as F2QS; DFR; K6PY; K6RQW; and W6BQ as OBS. Re- cified: K6MN 740; LTJ 331; MMR 134; W6K2K 12; K6F 119; WO8J 93; K6Q2C 93; W6IKJ 73; K6BWD 83; MAT 83; W6LOT 83; OF 83; W6Q9 83; WAP 22; K6F 20; WVOV 14; K6LZ 14; WRTW 11; K6HP 9; W6LVN 8; ARU 8; W6VNB 6; FCP 5; HLY 2; VBU 2; W6BPR 1.


NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—SEC: EOR, RM: KYQ, H.P., PAM, YBH, V.H.P.; PAM: HPH. Traffic nets: CPN, Mon., Wed., at 1800. Sun., at 1000 on 3250 kc.; CN, daily at 1440 and 2200 on 3340 kc.; CVN, Mon., Wed., and Fri. at 2030 on 145.38 Mc.; CVN, Sun., at 0600 on 3400 kc. WHR reports H6Q, V6Q, W6R and K6MIM were nets. The CQMBU RACES and AARE during the Sept. 12 hurricane alert, Z6D operated from DX1 in Middletown on 29.38 Mc. during the alert. K6LVR and K6IKR are new contacts in Columbia. KIYV ran his DX score to 191/167 before leaving for school. F1P enjoyed meeting many of the hams he QSO'ed from his mobile rig on 2 and 25 meters while on vacation down South. K1IIM and K1RCW on Cathedral, are now Connecticut Class. F1P has received the W1PP award on phone. W1CC visited in California. Y1HI reports that CPN handled 274 messages during 26 sessions. Average attendance was 11 persons. High QNI were K1AQP, DAB, Y8H, 30; YOQ, 25; K6DBS, 37; HIU, 36. New stations active on CPN are K1ANQ, Norwalk; K8AT, Orange; K1QEI, Ashford; K1IOX, Norwalk; K1TE, Windsor; U6Z, Ellington. APA has a Vee antenna up at the new QTH and is using p.p. 900 watts at 500 watts. K6GJW has a new HQ-199. LCQ has a new Moody TA-33 beam. WILL advises that the Conn. 6 Meter Net handled 42 messages with an average attendance of 15 stations per QTH before going back on CN soon. K6F, the Greenwich High School station, is on with Heath equipment. K6LST and K1CJY are using the Heath Two-Twenty. K6BB is the U-Conn. branch in Stanford. V6X received W1CG and DXCC certificates. K1PST is CO and director of the US-NESL. K6V, New London, is still back on the air. IUN is active on 8 meters. ORR lowered his beam for "Donna," K6SFP gained an interesting talk to the TCARC on the history of YAs in amateur radio. Here on K6BQA is active on CN. The Southington ARC assisted c.d. and the Auxiliary Police with communications during the Hurricane. F2Q and Donna. FVY and V6L celebrated their 34th wedding anniversary. ZP reports that from Sept. 20th to the 27th there were three days of steady signals from New Hampshire to South Carolina on 2 meters, during which a transfer to Arabia 1 must resign as SCM. Serving as your SCM for the past four years has been the most interesting and rewarding period of my 20 years of amateur radio. My thanks to all of you for your help and support. Appointments renewed: ZHI and NQO of EC; K6M with VO; K6RQW as OBS. Reports received: OBS from FVY; VO from K6F and K6GJW. KIYR. (Continued on page 169)
THIS BEAM THINKS IT'S A PIPELINE

THE NEW MODEL TB 1000-4
10-15-20 Meter Antenna
• Famous Hornet Quality
• Rated at Maximum Legal Power
• Four Elements On Each Band
Model TB 1000-4 Cash Price, Only $119.50

YOU WILL THINK SO TOO!
The four triband elements, in operation on each band make the difference —
A Powerful four element punch!

NOW AT YOUR DEALERS!
World famous Hornet antennas are now available from dealers. See your dealer today for the model of your choice, or order direct from Hornet.

THE NEW MODEL TB 750
This husky antenna replaces Hornet's famous Model TB 600, and is now rated at 750 watts AM or SSB.
Model TB 750 Cash Price, Only $69.95

THE NEW MODEL TB 1000 offers top performance in three element design.
• Famous Hornet Quality
• Rated at maximum legal power
Model TB 1000 Cash Price, Only $89.75

ALL MODELS
• Are Pre-tuned and Easy to Install
• Have Custom Fittings of Cast Aluminum
• Use a Single 52 ohm Coaxial Transmission Line
• Have completely weather-sealed Frequency Dividers*
• Have Elements of 6061-T6 Aluminum

All Prices F.O.B. Dealers Store or Factory

MAIL YOUR ORDER TODAY — 10 DAYS FREE TRIAL

HORNET ANTENNA PRODUCTS CO.
P.O. Box 808, Duncan, Okla.

☐ Please ship one Model________Hornet tribander. Cash price in full is inclosed.
☐ I wish to purchase one Model________Hornet tribander, and would like to use your time-payment plan.

NAME ___________________________ My Call ___________________________
ADDRESS ___________________________
CITY ___________________________ STATE ___________________________

ABSOLUTELY NO RISK ON YOUR PART
BE YOUR OWN SANTA CLAUS

The surest way to get that new amateur gear you’ve been wanting for Christmas is to play Santa to yourself. Brown Electronics Inc. is ready to help.

Sit down NOW and complete the Request for Quotation form below. Tell us what new equipment you want the old gentleman in the red suit to bring you and what he will want to trade on it.

We will send Santa a prompt reply (in your care of course) and let him know just what our trade-in offer is.

Santa may choose from the following lines:

Barker & Williamson
Central Electronics
Collins
Cushcraft
R. L. Drake
Elmac
Gomset
Hallicrafters
Hammarlund
E. F. Johnson
Mosley
National
P & H
RME

In addition to our stock of new equipment, we are accumulating an extensive and constantly changing stock of good used gear. Your request for our used goods list will bring you a list that is strictly current as of the day your inquiry is received.

All equipment, new or used, selling for $45.00 or more may be purchased on our payment plan. We require only 10% down payment either in cash or trade-in credit. Our finance charge is $6.00 per hundred per year on the unpaid balance and contract terms may be extended to 24 months. We carry our own contracts and you are dealing with Brown Electronics alone.

Don’t wait, Complete the Request for Quotation form below today and drop it in the mail.

REQUEST FOR QUOTATION (Please Print)

I have the following used gear to trade: [Please use this code to describe it.] 3. Like new, little use; 4. Minor signs of use, no major blemishes; 5. Good condition, with minor modifications; 6. Has major modifications, or requires major repairs.

I am interested in purchasing the following equipment: New □ □

Used □ □

No obligation to buy is implied.

Name: ____________________________

Street No. or R.F.D.: ____________________________

City: ____________________________

State: ____________________________

BROWN ELECTRONICS INC.

1032 Broadway

PHONE Anthony 3381

Fort Wayne, Indiana

= = =


NEW ENGLAND QSO PARTY

December 10 and 11, 1960

sponsored by

The Connecticut Wireless Association

Eligibility: All licensed amateurs in New England are eligible and invited to participate. Only single-operator entries will be considered for awards. CWA members will not be eligible for awards. Time: Three periods during the week end of Dec. 10-11 will be utilized: 7 P.M. to 11 P.M. EST Saturday, Dec. 10; 7 A.M. to 11 A.M. EST and 7 P.M. to 11 P.M. EST, Sunday, Dec. 11. Frequencies: All amateur bands may be used. Each band with its sub-bands counts as one band for scoring purposes. For example, 80-meter c.w., 80-meter Novice, and 75-meter phone all count as 80 meters. It is suggested that the 25 kc. on the low edge of each band and sub-band be used. Exchanges: Call "CQ New England" on phone and "CQ NE" on c.w. The exchange will consist of QN or QN code on Novice and state. For example W1XXX might send: "NR 7 58 40 3046, Mass.," Scoring: Code one (1) point for each contact. Multiply total contact points by number of different counties worked. Multiply again by number of bands worked. For example, W1XXX works 50 stations, 35 different counties and 6 states. His score would be 50 X 35 X 6 = 10,500. Maximum possible multiplier is 67. Maximum possible state multiplier is 6. A station may be worked once per band regardless of mode. Award: Score will be awarded to the 1st, 2nd, and 3rd high scorers in each state: to the 1st, 2nd, and 3rd high scoring Novice in New England; to the 1st, 2nd, and 3rd high scoring Technician in New England. Log: Logs must show date and time of each contact, complete exchange information, call and address of operator and final score calculation. Mark each new county and state as worked. Mail copy or carbon of logs to: Roger E. Cory, W1JYH, 67 W. Allen Ridge Road, Springfield, Mass., no later than January 15, 1961.

MAINE—SCM. Jeffrey I. Weinstein, W1JMN—The State of Maine AREC met its first real challenge during ‘‘Operation Washburna’’ on Sept. 5, 1960. The exercise involved well over 100 State of Maine amateurs and many representatives from the areas, ranging from New York to New Brunswick, Canada. My sincere thanks to all the stations who cooperated so fully with our central control station JMN. This situation only further enlightened us to the fact that emergency preparedness and the AREC is one of the most important phases of our hobby. Your local area GC not only needs AREC members but AECs and group leaders. The time required to be an active State of Maine AREC member is very minute indeed for the important service that the AREC offers the public. Contact your GC immediately for more information, or write me directly: Jeffrey I. Weinstein, JMN, 79 Caleb Street, Portland, Maine. All ARLL members are urged to apply for a state appointment and participate not only in the State of Maine programs. The Maine Slo-Speed Net, which meets Sun., Tue., Thu., Thur., and Sat., at 1730 on 3725 kc., cordially invites all New England Division amateurs to participate in its operation of handling c.w. traffic.

The Pine Tree Net, a higher-speed c.w. net, also extends a hand to newcomers. The PTN meets daily at 1000 on 3550. Phone traffic can be handled on the Sea Gull Net daily at 1700 on 3048 kc. We’re planning fun for ’61. Be on the watch! Season’s Greetings to all Traffic: (Sept.) KIDUG 41, MPG 30, GQV 20, WIUDD 28, KISG 12, KJIMM 12, KIHH 12, DJPV 4, KISG 11, IAA 6, WIBWX 3. (Aug.) KIDUG 65.

NEW HAMPSHIRE—SCM. Robert H. Wright, W1RMH—SEC: K1GGK, RM: K1IKH, PAM: H1Q. The GSPN meets at 1000 Mon. through Fri., and at 0000 Sun., on 3842 kc., through the NET, on 3902 kc., through the 5 IN (c.w.), and on 3942 kc., through the 5 IN (c.w.), at 1830 on 3885 kc. The RACES and AREC nets in New Hampshire were ready and operating during the Hurricane Douglas Alert. The Central New Hampshire Radio Club is now an ARLL affiliated club. K1BCS, long inactive, in (Continued on page 161).
Make This
A Merry (Tecraft) Christmas

TECRAFT CRYSTAL CONTROLLED CASCODE CONVERTERS
For Amateur, Commercial And Special Services

USE WITH ANY COMMUNICATIONS RECEIVER

Amateur Net

$44.95

MODEL

CC-50 50-54 mc - 6 meters
CC-108 108 mc - Satellite Frequencies
CC-120 For Aircraft Frequencies

Specify I.F. Frequency

CRYSTAL-CONTROLLED CONVERTERS
FOR 10 AND 15 METERS
Model C-2-21 15 meters
Model C-3-26 10 meters
Choose I.F. output between 2 and 6 mc. to suit your receiver.

$34.95

TECRAFT VHF TRANSMITTERS
For Mobile And Fixed Stations

Complete with Crystal & Tubes

Amateur Net

$59.95

Model TR 20/21 (10-15 meter band) 6AU6 Osc. 5763
Model TR 20/50 (6 meter band) 6AU6 Osc. 5763
Model TR 20/144 (2 meter band or CAP) 6AU6 Osc.
5763 buf/dblr 5763 bufl/mult. 6360 Final Amplifier.
20 watts input.
Model TR 20/220 (1½ meter band) 6AU6 Osc. 5763
buf/mult. 6360 bufl/mult. 6360 Power Amplifier. 20
watts input.

A.C. POWER SUPPLIES

MODEL PTR2
Provides power for any Tecraft transmitter. It will also power the companion converter.

$39.95

2 Way Radio Communications System
Tunes 22 Channels
In The New 27mc Citizens Band*

Comes complete with press-to-talk microphone-only $144.95

Press A Button . . . and you are in communication with your home, boat, office, car, camp, yacht
club, tractor, pick-up delivery, salesman . . . or
with anyone equipped with a FALCON or similar
radiophone. The New FALCON combines quality
with versatility . . . can be operated either very-
tically or horizontally to meet critical space re-
quirements. It is priced within reach . . . complete
and ready for operation. For excellence without
equal . . . choose the FALCON.

*No FCC Examination Necessary — simply fill in
form 505-D

FEATURES
- Transmits on any 3 channels — receiver tunable on
22 channels and/or crystal controlled
on any single channel
- Fixed channel crystal crystal control operation at the flip
of a switch
- Universal power supply — operates from 6 & 12V
DC and 115V AC
- Adjustable squelch control and series gate
noise limiter
- Double conversion 9 tube superheterodyne receiver
- Full 5 watt input to transmitter
- Pi-net output tuning
- 11 tubes: 2 6BA6, 1 6U8A, 6A8A. 6T8, 9006, 12AU7,
RA60, 6H16, 68W4, and 6CL6 RF Power Amplifier
- Compact — 13" wide x 4½" high x 9½" deep
- Meets or exceeds all FCC requirements

Prices and specifications subject to change without notice
For complete details see your distributor or write us

TECRAFT . . . A symbol of established value

A Product Of EQUIPMENT CRAFTERS
See Your Distributor Or Write Direct

P. O. Box 84 • South Hackensack, N. J.
ATIas 8-9020

TECRAFT SALES CORPORATION
2 AND 6 METERS ON ONE CHASSIS
WITH SEPARATE RF SECTIONS
LETTINE MODEL 262

Powerful 45 to 50 Watt VHF Transmitter
With Mobile Connections and A. C. Supply

The 262 contains the identical RF sections of the 2 meter 242 and the 6 meter 245 transmitters on one chassis, with a single 242 audio and power supply section. The only switching necessary to change bands is in the filament circuit. The separate RF sections make RF switching unnecessary, providing the same high efficiency of single band transmitters. Each RF section has its own tubes and circuits, comprising 4-578's as oscillators and drivers, 2-574's as final amplifiers, 5A4 plate amplifiers, 256a audio driver, 2-5Y6's class B 160w pull-push plate modulator. A.C. rectifiers. The two RF sections are wired with coaxial connectors on the front of the transmitter. These are connected to swinging links, controllable from the front panel, matching antennas from 50 to 300 ohms. The 262 uses standard 8 mm crystals and will operate with the lovely VFO. A socket is provided at the rear for relay connections. Cabinet 8 x 17 x 8 inches. Weight 82 lbs. Will operate mobile from a 100-165 volt ac. Completely wired and ready to operate.

Price with eleven tubes and two crystals—$137.50.
Send Full Amount or $25 With Order—Balance C.O.D.

LETTINE RADIO MFG. CO.
62 BERKELEY STREET VALLEY STREAM, L. L. N. Y.

SIDE INDICATOR PANEL METERS

- MAXIMUM ACCURACY AND READABILITY WITH MINIMUM PANEL SPACE
- FOR HORIZONTAL OR VERTICAL MOUNTING
- 3 SIZES . . . Model 1145, 2.7" scale length; Model 1135, 2.1" scale length; Model 1120, 1.2" scale length.

Accuracy held to ±2% of full-scale deflection for dc (±3% for Model 1120) and ±5% for ac. Dustproof case. Clear plastic front covers permit maximum light on scale and readability. Wide variety of standard and special ranges, and as Expanded Scale Voltmeters, VU and DB Meters.

SEE YOUR DISTRIBUTOR . . . WRITE DIRECT FOR DATA SHEETS

(Continued on page 164)
10 db GAIN

BASE STATION TO VEHICLE

-in both directions

STATIONMASTER
Cat. No. 201-509
Base Station Antenna

The STATIONMASTER consists of a number of collinear radiating elements fed inphase and enclosed in a continuous weatherproof fiberglass housing and withstands winds in excess of 125 m.p.h.

CARMASTER
Cat. No. 181-509
Collinear Gain Antenna

The CARMASTER is a new development in vehicular antennas. It consists of two half-wave and one quarter-wave radiating elements, excited inphase. Catalog No. 181-509 is designed for cowl mounting.

| Nominal input impedance | 50 ohms |
| VSWR                   | 1.5:1   |
| Bandwidth              | ±0.5%   |
| Max. power input       | 150 watts |
| Omnidirectional gain   | 5.8 db  |
| Internal feedline      | RG-8A/U |
| Frequency range        | 450-470 mc |

| Nominal input impedance | 50 ohms |
| VSWR                   | 1.5:1   |
| Bandwidth              | ±1.0%   |
| Max. power input       | 75 watts |
| Omnidirectional gain   | 4.2 db  |
| Feedline               | 10' of RG-58/U |
| Frequency range        | 450-470 mc |

INCREASE YOUR RANGE BY 30%
YOUR COVERAGE AREA BY 75%

-with these advanced design antennas

Communication Antenna Systems for American Business

Communication Products Company, Inc.
MARLBORO
NEW JERSEY

Percentages listed are measured values.
XMAS SPECIALS
at BARRY ELECTRONICS CORP.

Mosley Antennas in stock: New Model TA-36: 4 elements on 10—3 elements each on 15 and 20. $129.50. TA-33 $99.75; TA-33 Jr. $69.50; V-4 $62.75; TD-3 Jr. $12.50; SWL-7 $14.75.

Hi-Par Antennas in Stock: Type S-1: “Saturn.” Mobilier $16.95. Type 6M-5: 6 Meter 5 Element Beam $14.95. Type 2M-6: 2 Meter 6 Element Beam $9.95. Type 2M-8: 8 Element Wide Spaced 2 Meter Beam $14.95.

Tri-Ex Towers: Write for prices and literature.

CD AR22 Rotator $32.77; CD Ham M Rotator $117.10.

Hammarlund HQ145C $279.00; HQ110C $259.00.

National NC270 $249.95; NC270 Speaker Model NTS-3 $19.95; HRO-60 $64.95; NC303 $449.90; NC400 $895.00. PdU USA and Canada.

Complete stocks of Xmtg, Special Purpose and Receiving tubes. Sensible prices. First-quality only. Tube supplies of the month. 2C39A $1.75; 4C39 $1.60; 4C52 $1.70; 4C27 $6.50; 4C150A $12.00; $250B $72.00; 4A125A $25.00; 35TC $1.50; 450TL $37.50; 726A/3 $4.00; 803 $3.95; 805 $3.75; 807 $1.10; 811A $3.65; 815 $1.95; 826 $6.95; 829B $7.50; 832 $4.00; 837 $0.95; 866A $1.90; 5514 $5.50; 7563 $2.00; 6146 $4.00.


Vibroplex Vibro Keyer De Luxe Chrome $19.95. Regular Crackle $15.95.

We at Barry Electronics wish you all sincere Holiday Greetings!

WRITE FOR WINTER CATALOG WHICH WILL BE AVAILABLE SHORTLY!

BARRY ELECTRONICS CORP.
512 Broadway
Dept. Q-12
New York 12, N.Y.
Walker 3-7000
NOW! TWO ANTENNAS IN ONE*
*another FIRST from Finco

Patent Re 24,413
Other patents pending
6 & 2 Meter
Model No. A-62
Amateur Net. A-62 $33.00
Stacking Kit AS-62 $2.19

Introducing..... THE ONLY SINGLE FEED LINE
6 & 2 METER COMBINATION ANTENNA
from Finco

- Heavy Duty Square Aluminum Boom, 10 Ft. Long
- All Elements Are Sleeve Reinforced And Completely Pre-assembled With "Snap-out" Lock-Tite Brackets
- Boom Suspension Rods Are Supplied Completely Pre-assembled, Ready To Be Snapped Into Upper End Of Mast

ON 2 METERS
18 Elements
1 — Folded Dipole Plus Special Phasing Stub
1 — 3 Element Collinear Reflector
4 — 3 Element Collinear Directors

ON 6 METERS
Full 4 Elements
1 — Folded Dipole
1 — Reflector
2 — Directors

OTHER ANTENNAS for the DISCERNING AMATEUR

6 METER
4 ELEMENT AMATEUR NET
AS-4 $17.16
STACKING KIT AS-6 $2.19

2 METER
10 ELEMENT AMATEUR NET
A2-10 $11.98
STACKING KIT AS-2 $1.83

11/4 METER
10 ELEMENT AMATEUR NET
A1¼-10 $11.98
STACKING KIT AS-1¼ $1.26

See your Finco distributor or write direct to
THE FINNEY COMPANY • DEPT. 18, 34 W. INTERSTATE ST., BEDFORD, OHIO

165
SAVE 20% BUY DIRECT
OFFICIAL COMMUNICATIONS CONVERTER

For state, local police and fire networks between 30 and 50 MC AM/FM

- Uses 12V hybrid tubes — requires no B+ supply
- Has built-in squelch
- Stable, drift free operation regardless of input operation
- Easy installation — plugs into cigarette lighter

$5.95 Buy direct for only $4.796 plus $3.75 xtal

Send 25% deposit, balance C.O.D. plus postage or send payment in full, unit shipped postpaid.

TRANSCO DIVISION
NORTHEAST TELECOMMUNICATIONS, INC.
DANBURY, CONN.

CATALOG ON REQUEST
Available from franchised distributors at slightly higher cost.

NOW A 3-BAND,...
SINGLE FEEDLINE QUAD
by CUBEX

No relays, switches or matching devices required. Operate 10-15-20 meters with only one 52 or 72 ohm line, plus all the CUBEX MK III features at no increase in price. Only $67.50 ready to install

HI GAIN • HI FRONT-TO-BACK RATIO • PRETUNED • NO STUBS • HUSKY CAST ALUM. SPINDLES • RUGGED • TUBULAR ALUM. ROOM • TV MOTOR TURNS • LARGE CAPTURE AREA • UNDER 30 LBS.

Write For Free Brochure "SF" CUBEX COMPANY
3322 Tonica Avenue
Altralona, Calif.

ORDER YOUR COLLINS KWM-2 NOW from
AMATEUR ELECTRONIC SUPPLY
3832 W. Lonsale, Milwaukee 8, Wis.
Phone: West 3-3262

Be Sure to Get Our Top Trade-In Allowance Before Trading... Free Used Equipment Lists.

Also see Collins KWM-2 at Harris Radio Corporation

Welcome, and this net should prove a stepping stone to the regular WAIN, OY, EC for Westover AFB, reports 25 Full ARIE members! KIILV has been awarded the "worked All Con" award by the Willimantic Jaycees. YK again is active in the traffic nets with KIKU as chief operator. The new ITN session on 3380 kc. is working very smoothly with all New England sections regularly represented, with the exception of East Mass. Correspondence to DX's on a job well done in organizing that net, so quickly and efficiently. The aim of the address return postcards, RM KIILV has lined up NCS and ITN representatives for the fall and winter session on WAIN. BZW in at Tufts College with pal KG5 BYG will be using his second call, K1APR, this season. The October meeting of the Hampden County Radio Association was held at television station WTAE's new studio. STR were active on 1200 kc. during the September VHF Contest. K1JOW worked KC4USN at the South Shore on 20 meter. W1LMM is a new ham in the area. In Boston, W3HNC has his new Tri-band on a 40-41-44, tower. K1DIN is starting a 6-meter RACES-C-D net in N. Adams, where he is a police officer. BYH has a 6-meter beam and a Hammarlund HC-10, KIDPP has a new Rohn tower and 20-meter beam. K1JPP has a new Heath Sixer, with 100-meter beam and 6-meter beam, and a Hammarlund HC-40, out of space, which is as it should be. HI, Traffic: KIILY 105, W1VVR 97, K1LBB 95, W1YK 33, ZPB 12, D1W 2, K1HCY 2. NORTHEASTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Mullett, W7GGV—Operation Yellowjacket forced Idaho hams to use 40 meters; it was the first time on 40 in over a year! The FARM meeting (800, Mpls. Fri.) held a election. DWE is net manager; JPA, net coordinator; W3ZV, WBK and GGG, officers. The Lewiston-Clarkston Radio Club will conclude the 60th anniversary of founding of Lewiston, then the territorial capital. Contact any two area-area

MONTANA—SCM, Ray Woods, W7FSK—SEC: BOZ. ROUTE 1, BOX 344, MONTANA. K1HCD. W7HCD, W7HCD, Friday, 8:30 to 10:30, at Galt, Thursday, 8:30 to 11:00, at Great Falls, 8:30 to 11:00, at Missoula. W7HCD also calls the school superintendent’s office in Lewistown. K1HCD has a new set, K1HCD is at her school teaching, K1HCD is back from the Vet’s Hospital and is in Chicago and new K1HCD. Montana will miss NJZ, who joined Silent Keys. The Old Faithful Radio Club is ready for any emergency with 1-kw and 2-kw on trailers, K1HCD battled out another BPL for September. The passing of WY2 is deeply regretted in this area. The Harris Radio Club elected W7HCD, pres.; CVTH, secy.-treas.; TGL, act. mgr. The Assistant EC at Harris is K1HCD. New appointments are W7HCD as SEC, W7HCD as QTC, W7HCD as PGM, W7HCD as QTC. Traffic: K1HCD 215, DOR 256, DOR 50, W7WFR 20.

OREGON—SCM, Hubert R. McNally, W7JDX—Beesie, DJC, seems to have recovered from the mumps and is active again. AJN says he has been riding back-
PENTA PL-175A BEAM PENTODES SELECTED FOR OUTSTANDING NEW "INVADER 2000" TRANSMITTER!

In designing the new "Invader 2000" single-sideband transmitter, the E. F. Johnson Company chose a pair of Penta Laboratories PL-175A beam pentodes for the final amplifier. The 400-watt PL-175A was a logical choice, because it employs Penta's exclusive, patented "vane" suppressor grid, which causes it to deliver more useful output than similarly-rated conventional screen-grid tubes.

If your present transmitter uses conventional 250-watt or 400-watt tetrodes, chances are that you, too, can enjoy the many advantages of Penta's newest tube. Most tank circuits have sufficient tuning range to accommodate the slightly higher input and output capacitances of the PL-175A, and slight retuning is usually all that's necessary to put you on the air with increased power output.

The PL-175A has other advantages, too—such as the lower grid-plate capacitance which reduces neutralizing problems, a complete lack of annoying negative screen-grid current, and a sturdy, solid, one-piece plate cap and seal which has no set-screws or separate parts to loosen or fall off.

Follow the lead of the E. F. Johnson Company's knowledgeable engineers, and get the best for your transmitter—the new Penta PL-175A beam pentode.

CHARACTERISTICS AND RATINGS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage</td>
<td>5.0 volts</td>
</tr>
<tr>
<td>Filament Current</td>
<td>14.5 amperes</td>
</tr>
<tr>
<td>Direct Inter-electrode Capacitances</td>
<td></td>
</tr>
<tr>
<td>Input</td>
<td>15.1 μfd</td>
</tr>
<tr>
<td>Output</td>
<td>9.8 μfd</td>
</tr>
<tr>
<td>Grid-Plate</td>
<td>0.06 μfd</td>
</tr>
<tr>
<td>Maximum Plate Voltage</td>
<td>4000 volts</td>
</tr>
<tr>
<td>Maximum Plate Current</td>
<td>350 ma</td>
</tr>
<tr>
<td>Maximum Screen Voltage</td>
<td>1000 volts</td>
</tr>
<tr>
<td>Maximum Plate Dissipation</td>
<td>400 watts</td>
</tr>
</tbody>
</table>

For complete details write for the PL-175A data sheet. Also, ask for your copy of "Transmitting Tubes for Linear Amplifier Service," a nine-page bulletin which shows in detail how and why Penta's pentodes out-perform conventional tetrodes.

PENTA LABORATORIES, INC.

312 North Nopal Street, Santa Barbara, California
The AMECO TX-86 can handle 90 watts input on CW and 90 watts peak input on phone on all bands. It is extremely compact (5" x 7" x 7") and attractively packaged in a satin finished copper panel and a black perforated cabinet. Tube line-up is a 12B7 oscillator, a 12B7 buffer and a 6146 final, modulated by a 12AK7 and a 6AQ5 in an improved low distortion screen type modulator. It is NOT controlled carrier modulation; it is NOT clamp tube modulation. Other features include: push-to-talk mike jack, audio gain control, potentiometer driven control (no detuning of circuits), TVI suppression, crystal control or external VFO.

Power required for maximum output—6 or 12 volts for fillmen, 300 V, at 75 ma. and 600 V, at 150 ma. Will also work with reduced output and with no changes from a 300 V supply.

NET PRICES: Model TX-86K, complete in kit form...$84.95
Model TX-86W, completely wired and tested......$109.95
AC Power Supply for TX-86, to provide full output powering of 3-150, wired and tested..............$44.95

AMERICAN ELECTRONICS CO.
178 Herricks Road, Mineola, L.I., New York
Tel. Pioneer 1-5030

PACIFIC DIVISION

NEVADA—SCM. Charles A. Rhimes, W7TVU—ROI is on the air after a prolonged siege of eye trouble. UPS has his 75SI-3251 on mobile, BYR is back from a big game hunting trip in Africa. VIU has his new shack completed and will be on the air this week. TMI read this, AZP sold his tower to K7HRW. JDI is in Korea. NCO is a new man in Elko operating mobile. We are badly in need of traffic outside of the county, especially in the Reno-Sparks, Las Vegas, Boulder City and Henderson areas. Surely there must be enough hams in the State who operate c.w. so we can get some representation a few nights a week in NTS. I also would like to get our section net going again if we could generate some enthusiasm. If interested in contacting me, I would call.
BAND SPANNER

streamlined mobile antenna for effective 5-band operation

The well established performance advantages of center loading for mobile antennas are obtained without compromise by exclusive Webster design which entirely eliminates large, unsightly loading coils.

Band Spanner is truly streamlined...distinctive...fine looking on any car. Fiberglass support column is strong, durable, lightweight...unaffected by moisture. Because the loading inductor is wound directly on the fiberglass column, the winding proper can easily handle substantial power. There are no flimsy plastics involved. Band Spanners give excellent performance with transceivers, such as Gonset G-76, which operate at power inputs of 100 watts or more.

Band Spanner is a well-proved performer on 5-bands...80-40-20-15 and 10 meters...offers one of the finest antennas for use with multi-band equipment, Collins KWM-2, Gonset G-76 for example. Resonance for maximum performance can be established anywhere within the 5 bands by simple, plunger-type adjustment of the stainless steel top whip. No multiple coil arrangements or other tuning at the base. No exposed joints to corrode. Winding is contacted internally, is encapsulated in durable epoxy for lasting exterior protection.

Carefully engineered...mechanically excellent, built by WEBSTER, foremost manufacturer of marine and mobile antennas.

TWO MODELS:
Short Band Spanner, 37" telescoped, 93" extended.
Long Band Spanner, 63" telescoped, 117" extended.

TWO COMPLETE ANTENNA "PACKAGES"

<table>
<thead>
<tr>
<th>PACKAGE No.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band Spanner (long or short type) complete with universal ball mount and heavy-duty spring.</td>
</tr>
<tr>
<td>38.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PACKAGE No.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band Spanner (long or short type) complete with bumper mount and heavy duty spring.</td>
</tr>
<tr>
<td>39.00</td>
</tr>
</tbody>
</table>

WEBSTER Manufacturing, 317 Roebling Road, South San Francisco, Calif.

Please send free booklet, "Mobile Antennas--Simple Steps to Peak Performance."

Name: ___________________________ Call: ___________________________
Address: ___________________________ NUMBER ___________________________ STREET: ___________________________
City: ___________________________ Zone: ___________________________ State: ___________________________

WEBSTER MANUFACTURING 317 ROEBLING ROAD, SOUTH SAN FRANCISCO, CALIFORNIA.
Third Annual Pancake Breakfast on Oct. 2, K5ZCR was re-elected NCM-7 secretary. Claire has had 220 volts extended to the basement for shack relocation. W2BO is enjoying the GSB-100 won at the Pacific Division ARRL Convention. W5OKE is converting his Viking II to a different keyer. W4HRS is building a triggered electronic keyer. W4AFX is now at Cal. in Berkeley. W6BB is moving from San Francisco to San Bruno soon. W6HDC has returned from his professorial duties at San Jose State after skeletal duty at Stanford. Traffic: (Sept.) W3RSY 1001, K5ZCR 350, W6HR 187, W6ATP 172, K6KX 86, W6GPF 84, K5JOZ 87, W6DEF 66, W6HC 57, K5YKG 37, W6RFF 30, K5VQR 24, W6HER 21, W6WQZ 21, W6HI 16, W6PLG 10, W6WX 4, W6YV 4, W6GZ 2, (Aug.) W6WJ 2.

EAST BAY—SCM, B. W. Southwell, W6OYW—SRC, K6QDM, ECs K6JN, K6VX, K6Ht, K5TYY, K6VXW, W6EEFI and W6LDV (acting). K5GK is working with the Boys Scouts in electronics. W6XC is the new Route Manager for the section and is manager of NCM. K6QDM joined the NCM. The EBRG heard an FB talk on Parametric amplifiers at its Sept. meeting. The MADARC provided communications on 144 Mc. for the Trail Ride, and also for the Walnut Festival Parade and Fruit Race, using mobile gear. The CCRG held its Sept. meeting at the Ranch plaza Christian Church. W6CC was a speaker at the general meeting of the MADARC. The Castro Valley High School Radio Club is putting up a new tower. The XYLs of W6QFGQ and W6AMD are now members of the MADARC. W6FPY is putting up a new mobile. The EBRG has a new YL, W6WFG and K6QMO are new members of the MADARC. W6FPY is putting up a new tower. The XYL club, W6JMCs, W6KYP, W6MXX, K6CMF and K6CJO are new members of the EBRG. W6TTSY is doing a excellent job with mobile equipment when it comes its way.

SACRAMENTO—SCM, L. J. O'Brien, W3GDO—Asst. SCM; William von den Kamps, 8CKV. SRC: K5KXY. I understand that W5DABF spent the summer writing two technical books, both of which have now been published recently. I don’t know the book’s title, etc.

CHRISTMAS SALE

$7.50—at your distributor

EDITORS and ENGINEERS, Ltd., Summerland 5, California

RADIO HANDBOOK

— the comprehensive reference source
— a problem solver for designers and builders of radio equipment

Gives simplified theory on practically every phase of radio. Tells how to design, build, and operate the latest standard types of radio transmitting and receiving equipment. More "How-To-Build" articles than any book in the field.

All information is original, up-to-date, and complete. 800 pages of data, clearly indexed, between hard covers—the largest RADIO HANDBOOK ever published.

Write for Free Lists and Special Prices

HENRY RADIO 073-3127 Butler 1, Mo.

(Continued on page 178)
All Over the World... DX-ing MERRY CHRISTMAS with

COSMOPHONE “1000”

Gledelig Jul
BUONE FESTE
NATALIZIE

Glad Jul
Feliz Jul
Navidad
Joyeux
Noël

▲ A Self-contained 1 KW Transmitter-Receiver
▲ A True Table-top Station with NO Sacrifice of Performance

SPECIFICATIONS

TRANSMITTER
INPUT: Full 1 kw on Voice Peaks (Meters Read 2500 V at 400 ma) in a pair of 4 x 300 A’s
UNWANTED SIDEBAND: 42 db down
DISTORTION (SSB): Third order products approx. 32 db down
FREQUENCY STABILITY: Drift less than 100 cycles
CALIBRATION: Built-in 100 kc marker
AUDIO CHARACTERISTICS: 200-3100 cps

MIKE INPUT: High impedance
VOX: Built-in
LEVEL: Automatic level control
METERING: Screen, plate, and grid current, plus RF output
RF OUTPUT: 52 ohms
VFO’s: Dual VFO’s permit transmitting on the receive or any other frequency

CONTROLS: Vox, Qt, ALC, Grid Tuning, Plate Tuning, Antenna Loading, Audio Gain, Band Switch, Meter Switch

RECEIVER
SENSITIVITY: 1 microvolt for 6 db S/N
SELECTIVITY: 3.1 kc mechanical filter plus a T-notch filter
STABILITY: Drift less than 100 cycles from a cold start at room ambient
TUNING KNOBS: Coarse gear ratio of 20:1, fine gear ratio of 100:1 gives a 1 kc dial reading per division
CALIBRATION: Built-in 100 kc marker
IMAGE AND IF REJECTION: Better than 50 db
AUDIO DETECTOR: Balanced detector for SSB and CW, diode detector for AM
MODE SWITCH: Selects up or low SSB, or up low AM, or CW
DUAL RECEPTION: Two VFO’s permit reception of any two frequencies on one band with the flick of a switch
BFO: Crystal controlled
METERING: S-meter
CONTROLS: T-notch filter, audio gain, RF gain, antenna trimming, tune selector, phone jack, tune A and B.

"The COSMOPHONE 1000"—a complete Station, Receiver, and Transmitter. Dimensions: 17 inches wide, 12 inches high, and 15 inches deep. Power Supplies packaged separately, can be placed under operating desk. Price: "The COSMOPHONE 1000" with Power Supplies...$1,550.00.

A Product of

COSMOS INDUSTRIES, INC.
31-28 QUEENS BOULEVARD
Long Island City, N. Y.

For additional information and dealer nearest you, write Dept. QST-12

171
SAN JOAQUIN VALLEY—SCM, Ralph Suryan, W6JPU—Once again, I would like to take this opportunity to wish everyone of you a very Merry Christmas, with a KW-2 under every Christmas tree. K6KUY has a five-element 6-meter beam up 85 feet. K6AFA is working on a three-element beam for W6LNF. W6LAF passed the General Class exam. W6DPS and party went door hunting with portable rigs and got skunked. K6LK and W6QX attended the SSB Dinner Santa Barbara Oct. 1, and K6LKJ won a portable antenna. W6FQG has an 80-ft. crank-up tower. W6JXY has a 14A-4, a Genec. Single mode beam and a 6-meter whip. K6BGR is having breaking problems. K6OER is heard on 75-meter mobile. W6LOC has a 30" parapendular working. K6HTZ has a 1008 and Picnic. The 2WJN, which was held in Turlock, had 162 in attendance. W6CQA was elected net manager, with W6DTB assisting in the north, and W6UJU assisting the north. K6OLN is building a 6-meter converter. W6DEN is building a 2-kw. base in his mobile rig. K6BOX is attending the VUCC with lots of happened. W6FQG has a new mobile rig. W6RTK had a meet, filter and is building an exciter for possible mobile s.e.d. K6BOG has a new mobile rig and a panel truck. W6EFB is building a 3-trip-head and a S.W. 40' check-ins and a traffic count of 112. The Fresno Radio Club’s 4-meter repeater still is having its problems. K6ZY has a trailer rig. Traffic: K6KCB 294, K6ROU 266, W6ARE 150, K6OZL 60, W6EFB 11.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH; PAM; OBC, V.H.F. PAM; ACY, RM; PNM. "Donna" has come and gone and seems North Carolina was able to take care of communications. Barny gave me a rundown of the activity on the Tar Heel Emerges Net. The Civil defense also was active and aided in calling for communications to n.d. headquarters. The overall picture was excellent in the communications field. Possibly more attention in the future will be given to localities that are not scheduled for BCN. Possibly more attention to the Civil defense emergency activity is needed. K4PYV sent along a report good of the activity in the Cherry Point area, all of which was handled on 204 Mc. with six stations taking part. This type activity surely will relieve the load on the local frequency and at the same time get the local job done. 2WJN/4, of Burlington, N. C., made BPL for the past two months. Congratulations, Activity on the v.f.w. continued to grow. Thanks, Ken and company, for the extra effort it takes to get a good net going and continue to grow. Too few people are interested in hamming as a public service and it should be the first thing in the minds of every amateur. Keep your equipment in good shape. Learn how to operate in a net, be ready when called in an emergency. Take some of the Christmas money and get some gear that will operate on the State Net. Incidentally, Merry Christmas and a good operating year for 1961.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—K4AVU has resigned as RM to take the management of the 4th Regional AEC. PED succeeded and is the new manager of the Central SCN at the Rock Hill meeting Oct. 8 to succeed K4HDX is KNI. AKC was M.C. at the meeting and the guest speaker was MWH, Roanoake Division Director. The Rock Hill Hamfest held Oct. 9 was a huge success. Prize winners were K4QVS and GXR, SPW, president of the best club for the year. The day operation in the State by K4PEE, the SEC, K4HDX and Z4V were new OK2Es. HHK has received his BPL registration. K4HYV is to be commended on his fine showing on UTL as liaison on Nuns. night on the EANN. K4KQK, RDA, VVE, OQA, and GVE were all very missed by the SCN. ECs endorsed are K4MXX, AVU, MBN, IBX, PJE, WHF, ZRH, CAL, OPA, HAQ, VLT, BNN, DX, ALO, HQQ, VLT, AVU, W3W, DTK, and HZ. New ECs are FPF, ITV and KAZFW. Two new 6-meter stations in Greenville are K4QYQ and QOZ. K4YIN is the leader of many AEC members in South Carolina. K4UOR is checking into the SCN regularly and DOV is threatening to K4LNI is moving to Union. K4LNI has a new beam, IQV has left for ONS-Land, Traffic: W4KN 176, K4THV 173, W4KCE 119, K4HDX 104, AVU 58, WCOID 35, K4LNI 32, KIT 13.

VIRGINIA—SCM, Robert J. Follmari, W4QDY—PAM; BCG, RM; K4QER, K4NRX, K4MXF and QTY. The VAF and VAB are both going. Ann, K4KUS, for VN and K4MXF for VSN. Starting times and frequencies of our NTS section nets: VSN 1800, VA 1500 and 2200 on 2200 kHz. Annember was a hectic month, SJH resigned as 41N Mgr. because of a contemplated one year visit to the (Continued on page 178)

Looking for A-1 Reconditioned EQUIPMENT? 

HENRY HAS IT!

Equipment at both Henry stores may be traded back in 90 days at full price on new equipment. Our time payments save you money because we finance ourselves. Write, phone or visit either Henry store to get better equipment at less cost on better terms.

SAN JOAQUIN VALLEY—SCM, Ralph Suryan, W6JPU—Once again, I would like to take this opportunity to wish everyone of you a very Merry Christmas, with a KW-2 under every Christmas tree. K6KUY has a five-element 6-meter beam up 85 feet. K6AFA is working on a three-element beam for W6LNF. W6LAF passed the General Class exam. W6DPS and party went door hunting with portable rigs and got skunked. K6LK and W6QX attended the SSB Dinner Santa Barbara Oct. 1, and K6LKJ won a portable antenna. W6FQG has an 80-ft. crank-up tower. W6JXY has a 14A-4, a Genec. Single mode beam and a 6-meter whip. K6BGR is having breaking problems. K6OER is heard on 75-meter mobile. W6LOC has a 30" parapendular working. K6HTZ has a 1008 and Picnic. The 2WJN, which was held in Turlock, had 162 in attendance. W6CQA was elected net manager, with W6DTB assisting in the north, and W6UJU assisting the north. K6OLN is building a 6-meter converter. W6DEN is building a 2-kw. base in his mobile rig. K6BOX is attending the VUCC with lots of happened. W6FQG has a new mobile rig. W6RTK had a meet, filter and is building an exciter for possible mobile s.e.d. K6BOG has a new mobile rig and a panel truck. W6EFB is building a 3-trip-head and a S.W. 40' check-ins and a traffic count of 112. The Fresno Radio Club’s 4-meter repeater still is having its problems. K6ZY has a trailer rig. Traffic: K6KCB 294, K6ROU 266, W6ARE 150, K6OZL 60, W6EFB 11.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH; PAM; OBC, V.H.F. PAM; ACY, RM; PNM. "Donna" has come and gone and seems North Carolina was able to take care of communications. Barny gave me a rundown of the activity on the Tar Heel Emerges Net. The Civil defense also was active and aided in calling for communications to n.d. headquarters. The overall picture was excellent in the communications field. Possibly more attention in the future will be given to localities that are not scheduled for BCN. Possibly more attention to the Civil defense emergency activity is needed. K4PYV sent along a report good of the activity in the Cherry Point area, all of which was handled on 204 Mc. with six stations taking part. This type activity surely will relieve the load on the local frequency and at the same time get the local job done. 2WJN/4, of Burlington, N. C., made BPL for the past two months. Congratulations, Activity on the v.f.w. continued to grow. Thanks, Ken and company, for the extra effort it takes to get a good net going and continue to grow. Too few people are interested in hamming as a public service and it should be the first thing in the minds of every amateur. Keep your equipment in good shape. Learn how to operate in a net, be ready when called in an emergency. Take some of the Christmas money and get some gear that will operate on the State Net. Incidentally, Merry Christmas and a good operating year for 1961.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—K4AVU has resigned as RM to take the management of the 4th Regional AEC. PED succeeded and is the new manager of the Central SCN at the Rock Hill meeting Oct. 8 to succeed K4HDX is KNI. AKC was M.C. at the meeting and the guest speaker was MWH, Roanoake Division Director. The Rock Hill Hamfest held Oct. 9 was a huge success. Prize winners were K4QVS and GXR, SPW, president of the best club for the year. The day operation in the State by K4PEE, the SEC, K4HDX and Z4V were new OK2Es. HHK has received his BPL registration. K4HYV is to be commended on his fine showing on UTL as liaison on Nuns. night on the EANN. K4KQK, RDA, VVE, OQA, and GVE were all very missed by the SCN. ECs endorsed are K4MXX, AVU, MBN, IBX, PJE, WHF, ZRH, CAL, OPA, HAQ, VLT, BNN, DX, ALO, HQQ, VLT, AVU, W3W, DTK, and HZ. New ECs are FPF, ITV and KAZFW. Two new 6-meter stations in Greenville are K4QYQ and QOZ. K4YIN is the leader of many AEC members in South Carolina. K4UOR is checking into the SCN regularly and DOV is threatening to K4LNI is moving to Union. K4LNI has a new beam, IQV has left for ONS-Land, Traffic: W4KN 176, K4THV 173, W4KCE 119, K4HDX 104, AVU 58, WCOID 35, K4LNI 32, KIT 13.

VIRGINIA—SCM, Robert J. Follmari, W4QDY—PAM; BCG, RM; K4QER, K4NRX, K4MXF and QTY. The VAF and VAB are both going. Ann, K4KUS, for VN and K4MXF for VSN. Starting times and frequencies of our NTS section nets: VSN 1800, VA 1500 and 2200 on 2200 kHz. Annember was a hectic month, SJH resigned as 41N Mgr. because of a contemplated one year visit to the (Continued on page 178)
Do YOU Know

... the field of ELECTRONICS is the most advanced and fastest growing in the world, offering the largest range of jobs for technicians and engineers in history.

Do YOU Know

... PHILCO TechRep is the world's largest Field Service organization and because of this leadership can offer you —

- unlimited advancement
- opportunity to work any place in the world
- experience in the most advanced fields of electronics and guided missiles
- personal security, real challenge, top salary and compensation for your skills.

Do YOU Know

- Philco electronic experts help prepare you for your TechRep Service career
- Philco's especially written Home Study Course keeps you posted on latest electronic techniques, including radar, guided missiles and transistors
- Philco provides financial assistance to continue your education

Do YOU Know

... Philco not only will help you select the position in Electronics best suited to you but can and will provide you with periodic reports as to the openings in our world-wide organization for which you may be qualified.

GET THE FACTS ABOUT YOUR FUTURE WITH PHILCO:
Send Now to Dept. 21
for The Complete Story on What Makes The Philco TechRep Division—

"First In Employment Opportunities"

PHILCO TECHREp DIVISION

P. O. Box 4730 Philadelphia 34, Pa.
For the

ACTIVE AMATEUR

Record keeping can often be tedious. But with the ARRL Log Book. Fully ruled with legible headings it helps make compliance with FCC rules a pleasure. Per book ........................................ 50¢

Mobile and portable operational needs are met by the pocket-size log book, the Minilog. Designed for utmost convenience and ease. .......................... 30¢

First impressions are important. Whether you handle ten or a hundred messages you want to present the addressee with a neat looking radiogram... and you can do this by using the official radiogram form. 70 blanks per pad. .......................... 35¢

If you like to correspond with fellow hams you will find the ARRL membership stationery ideal. Adds that final touch to your letter. Per 100 sheets....... $1.00

The American Radio Relay League
WEST HARTFORD 7, CONNECTICUT

---

ELECTRONIC WHOLESALERS Inc.

NOW THE NAME OF ALL THREE STORES:
WASHINGTON, D.C., MIAMI, FLA., MELBOURNE, FLA.
The Florida Stores Were Formerly Called

ELECTRONIC SUPPLY
Same addresses — same complete inventories —
same management — same excellent service.

ELECTRONIC WHOLESALERS, INC.
61 N.E. 9th STREET • MIAMI 32, FLA. • Phone Franklin 7-2511
FORMERLY ELECTRONIC SUPPLY

ELECTRONIC WHOLESALERS, INC.
1301 NIBISCUS BEVD. • MELBOURNE, FLA. • Parkway 3-1441
FORMERLY ELECTRONIC SUPPLY

ELECTRONIC WHOLESALERS, INC.
2345 SHERMAN AVE., N.W • WASHINGTON 1, D.C • Phone Hudson 3 5200
Your Ham Headquarters—
WASHINGTON to FLORIDA
SPECIALIZING IN THE BEST AT EASY TERMS
HIGH TRADING AND LOW DOWN PAYMENTS
WRITE FOR DETAILS OF OUR TIME PAYMENT PLAN

Two hamshacks

One Transceiver

At home, on the highway, anywhere...
a complete, superior SSB station with
COLLINS KWM-2 and FM-2
PORTABLE POWER SUPPLY

Collins KWM-2 Transceiver gives
you Collins Single Sideband and CW
fixed station performance. It covers all
amateur bands from 3.4 to 29.7 mc with
1 kc accuracy. 175 watts P.E.P. input on
SSB, 160 watts on
CW. Weighs only
18 pounds.

Collins PM-2
Portable Power
Supply with built in auxiliary speaker connects directly to the KWM-2 to give you
a rig that operates on either 115 or
220 volt ac. Foam plastic-lined Samsonite suitcase provides shock resistant
protection for the KWM-2, PM-2 and accessories for a complete station weighing
less than 45 pounds.

See the entire Collins S-Line...stop in soon.

LECTRONIC WHOLESALERS, INC.
61 N.E. 9th STREET • MIAMI 32, FLA. • Phone Franklin 7-7511
FORMERLY ELECTRONIC SUPPLY

LECTRONIC WHOLESALERS, INC.
1301 HIBISCUS BLVD. • MELBOURNE, FLA. • Parkway 3-1441
FORMERLY ELECTRONIC SUPPLY

LECTRONIC WHOLESALERS, INC.
2345 SHERMAN AVE., N.W. • WASHINGTON 1, D.C. • Phone HUDSON 3 5200
VESTO TOWER
Survives 156 mph
HURRICANE "DONNA"

Vesto's famous "Hurricane-Proof" Construction is the Reason!

NO GUY WIRES
EASY TO ERECT
Step-by-step instructions given!
Can be taken down and moved easily!

HOT DIP GALVANIZED
To last a lifetime!

Prices start at $149.00

WEST VIRGINIA—SCM. Donald B. Morris, W2JMN—New officers of the Northern Penhandle ARC of Wheeling are: RKAOQ, pres.; KQPQA, vice-pres.; ETI, secy.-treas. The Blankenshaft ARC of Parkersburg has applied for a club license with IBE as station identification. WUB and NYH reported work in Hurricane Donna. The following stations have qualified for WYN (c.w.) and certificates: CCH, HPO, ERSB, AID, HEPK, SMF, KSCNB, KSHYV, KLRJF, KJPV, KUFFK, KSEQ, KSQLQ, KZC, KJYJY, KRLMB, WJ3JUB and KSBMD. KBRG reports the formation of the Kanawha Valley 6-Meter Emergency Net. KSPFC has installed a new ten-element 2-meter beam. The Clarksville ARC now has an excellent new location. The West Va. 40-Meter Phone Net meets Sun. at 8:30 a.m. on 7249 kc. KSRBJ reports excellent v.h.f. contacts on 220 meters with 38 states covered. ESH is active in the Huntington Weather Net, which meets Mon., Wed. and Fri. Morn. at 1900. TAP is active at the Veterans' Hospital. Radio Club meeting is at Club, 2nd and 3rd Morn. TAP, and 1450. WSB and WJ3JUB, amateurs who have worked all 50 states, are experimenting with low-noise traffic. WSWNY, ESH, WJ3KJ, KSRJ, WJ7F, WJ3FG, KOSX, CNB, W3WUB, KRMZ2, KSGD 19, W6XJL and KSPFC are working with low-noise traffic.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM. Carl L. Smith, W8JWJ—Asst. SCM: Howard S. Eldridge, KD6CW. SEC: NAT, RAI: WME and MYB. PAM: CXW and LJR. OBS: KQDC. Additional club officers are as follows: OTR, TUT, ULZ and KBOVQ as QCOs. AEH, KQDC. AEH, MYB, WME, K6s DTK, EDB, EDH, EDB, ITJ and RTI as OBs; ANA, GHL, CXW, 1A, LJR, 65, DCFW and DMP as OBs; K6CLI, FRY, UFP, 7AP, K6CLI and K6CLI as OBs. In addition there are twenty-five EOC applicants. All who are willing to work in ASEC. My sincere thanks to KQDC, for his work as Asst. SCM in preparing this column the last six months. Remember this deadline for SCM nominating petitions is Dec. 9. Be sure to send in a petition and vote for your favorite candidate! The new editor of CTVN is KFVLA. The Colorado Ham Directory is being revised by the Denver Radio Club and the second edition soon will be ready for 1961 delivery. QGO is on duty with Air Traffic at the airport and operating his traffic from Texas, MYB, net mgr. of CCW, reports that RFD, now in Utah, would be sure to point out our QNI even if he were in a submarine. New officers of the DARC are: NN, pres.; KQOV, vice-pres.; JGW, secy.; and K6EKP, treas. Pueblo Certificate: All contacts with Pueblo, CO, stations in December count toward this Steel City Amateur Radio Club's certificate. Five club-member contacts, any band combination, reported in a list by mail to K6UMS, R.R. 1, Box 300, Pueblo, will bring a certificate and honorary club membership. Any ten Pueblo contacts shall rate a certificate. Merry Christmas to everyone! Traffe: (Sep.) 3.The 433, W6WJR 337, KOSX, WWDF 270, W6KQD 268, K6QGO 133, DCF 101, W8MBY 95, W6PM, W6PM 36, W6RM 31, K6EV 12, W6CC 8, W6CO 10, W6CO 3, (Aug.) K6BF 11.

UTAH—SCM. Thomas H. Miller, W7JWOJ—Asst. SCM: John H. Sampson, TOC8, SEC; K7BLL, RAI. RAI is temporarily off the air because of a blown-up power transformer. GPN is putting the finishing touches on a new small unit. (Oct. 4-1060A). K7BLL has begun to rate on his services as SCM. Let's have some support from all of you. QCX, QNH and K7BDBX received BHAT awards.

(Continued on page 178)
"CALL ME for Personal Service"

Bob Henry
W0ARA
Butler, Mo.
ORchard 9-3127

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

Ted Henry
W6UOU
Los Angeles
GRanite 7-6701
OPENED OCT. 1—
THE 3rd HENRY RADIO STORE
931 N. Euclid Ave.,
Anaheim, Calif.

Collins S/LINE

KWM-2 Transceiver .................. $1150.00
32S-1 Transmitter .................. 666.00
516F-2 AC Power Supply .......... 115.00
516E-1 12V DC Power Supply ..... 270.00
75S-1 Receiver .................. 520.00
312B-3 Speaker .................. 29.00
312B-4 Speaker Console .......... 195.00
30S-1 Linear Amplifier .......... 1556.00

Write, phone or visit either store today!
Inquiries and orders from military men and others outside USA wanted

"CALL ME for Personal Service"

Butler, Missouri
ORchard 9-3127

Henry Radio Stores
11240 West Olympic Blvd.
Los Angeles 64
Ph. GRanite 7-6701

"World's Largest Distributors of Short Wave Receivers"

BIG TRADE-INS

177
MOBILE POWER SUPPLY
MODEL
A12/600/200
NOW $59.50

This 12V input dc to dc transistorized converter is conservatively rated for continuous output of 120 watts at 600V or 300V, or any combination of 600 and 300 volt loads totaling 120 watts.

High efficiency, small size, and light weight, plus freedom from maintenance, conserve your battery and increase the enjoyment of mobile operation.

ELECTRONICS DIVISION
GLOBE INDUSTRIES, INC.
525 MAIN STREET
BELLEVILLE, NEW JERSEY

See Our Booth At
The 1961 TROPICAL HAMBOREE
JANUARY 14th and 15th
BAYFRONT AUDITORIUM, MIAMI, FLORIDA
E-Z WAY TOWERS, Inc.
5901 E. Broadway
Tampa, Florida

ENJOY EASIER SENDING WITH VIBROPLEX
SEMI-AUTOMATIC

No matter how good an operator you are, the smooth and easy operating Vibroplex makes all the labor out of sending. Never tires the arm, never upsets the nerves. The choice of experts everywhere, Vibroplex with its attractive appearance and its precision machining gives long life even under rough usage. Adjustable to any speed and comes in five models, standard or deluxe. Priced from $13.95 to $29.95. Order today at your dealer's or direct.

THE VIBROPLEX CO., INC.
833 Broadway New York 3, N.Y.  
FREE Folded
the hams from Harvey
serve the world!

Hams the world over know and value the Harvey reputation of service and reliability. For 34 years Harvey has served every corner of the globe filling every Ham equipment requirement.

At Harvey's, all orders for ham equipment are personally supervised and handled in all phases by hams. W2DIO and his ham associates devote immediate attention to your order. Your instructions—in any language—are followed meticulously.

Upon your instructions, Harvey's will open the original factory sealed cartons and give the equipment complete inspection and checkout. And there is no charge for this extra service, for Harvey's policy is "satisfaction always guaranteed."

Always ready to discuss your ham problems, always ready to supply your exact requirements—Harvey talks the language of hams—wherever they are.

Harvey Radio carries a complete stock of RCA tubes for every power tube requirement.

Partners in Dependable Global Service

Harvey Radio Co., Inc.
103 West 43rd Street, New York 36, N. Y. • Judson 2-1500
USE CHRISTMAS SEALS FIGHT TB

FACTORY AUTHORIZED SERVICE ON RECEIVERS AND TRANSMITTERS

* TWO-WAY * COMMUNICATION CRYSTALS

UNCONDITIONALLY GUARANTEED FAST—24 HOUR SERVICE


FREQUENCY RANGE     CALIBRATION TOLERANCE     PRICE

2501 KC to 9999 KC  .002%                 $3.00
15 MC to 32 MC TM      .0025%             $3.00
32 MC to 50 MC           .0025%           $4.00
10 MC to 17 MC Fund     .002%             $4.00
2001 KC to 2500 KC     .002%             $4.00
50 MC to 60 MC         .0025%           $6.00
1000 KC to 2000 KC     .002%             $7.50

Write for quantity discounts —

AMERICAN CRYSTAL CO.
P. O. BOX 2366 • KANSAS CITY 42, MO.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: PMJ, PAMS; LZE and ACH, RM: DDD. The GCEN meets on 3995 kc. at 1030 EST Tue. and Thurs.; BRSJ meets Mon. through Thurs. on 3055 kc. at 1000 EST; DDD on NC; the 75-Meter Mobile Net meets each Sun. on 3995 kc. at 1030 EST; K4XCD as NC; the GCEN meets Sun. on 7260 kc. at 1000 EST; K4ZRS as NC: the Alt. Ten-Meter Phone Net meets Sun. on 29.8 kc. at 2200 EST; RBS as NC; the LCJ meets Tues., Thurs. and Fri. on 3970 kc. at 1000 EST; K4AU as Net mgr. The 75-W kc. west end went out in fine. Georgia, many contests were sent to LAY. An AGC in Atlanta on K4NQC, K4PKE, K4RAH and K4RSX handled many many on 2 and 6 meters. New officers of the Barnesville Radio Club are FPG, TK4R, K4POT, K4QY, K4POL, K4WJF, training officer; and FYC activity men. Ten AEC members in Barnesville participated in the SEP weekend drive. The SET weekend drive is K4CWN, K4UWN, K4OCC, CRCN, K4VXL, K4POL.

(Continued on page 188)
### Ideal Gift Gear!

**HA-1 T. O. Keyer**

Precision Built!

**Hallicrafters**

Communications Equipment

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>SX-111 RECEPTOR</td>
<td>$249.50 - 10% Down ($24.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HT-37 TRANSMITTER</td>
<td>$450.00 - 10% Down ($45.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HA-1 T.O. KEYER</td>
<td>$79.95 - 10% Down ($8.00)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The Stradivarius of Electronic Keyers*

Employs digital techniques. Features constant ratio of dot-to-space-to-dash over the entire speed range. All timing circuits are electronic. Dots and dashes are self-completing. Transformer operated. Vacuum-sealed, mercury wetted relay is used only to key the transmitter and side tone signal. Speed is adjustable from 10 to 65 W.P.M. Size 7" x 3¼" x 7".

**THE LEW BONN COMPANY**

Mail Order Address:
1211 Lasalle, Minneapolis 3, Minn.
Federal 9-6351

Your Upper Midwest's Complete Line Industrial Tube Distributor
G4ZU

FLASH!

"G4ZU PAT"

SANTA CLAUS

APPOINTED DISTRIBUTOR

Mr. Claus, a wise man, states G4ZU is his choice for all young amateurs (and the older ones, too). He says specify "G4ZU" to get the best. Last year he brought 10-
15 Mini Beams to all 3 continents. He says 16 pounds—so easy to deliver; 15°-60° allows everyone to use... $89.50

This year he'll have the 20-40 Birdcage abode. Declare he can get down any chimney—after all, only 9 3/4" radius. The reindeer say 14 pounds is the lightest "Big" 20/40 beam they know. 20-40 Birdcage with 25' boom-up mast...$94.50

For those who use their own mast... $87.25

Rohn towers. Thoroughly tested by the Santa Laboratories. Come in all sizes and heights—85, about $1.60 a ft; #25G, about $2.00 a ft.

Rohn #25G tilt-over tower, 50 ft, complete. Will hold two 20 meter beams easily. Built for quality, not for a price... $186.60

Our stock is growing—Cornell-Dubillier—Rohn—Andrews—Telrex and many others. Shop at the antenna "Supermarket."

IMMEDIATE DELIVERY

MERRY CHRISTMAS TO ALL FROM W9H0V, KVOH, W9K1L, KB1G, Dick

SHOP EARLY!

1153 East 82nd
Chicago 19, Ill.
Tel. SO 8-9282

HOUSE of ANTENNAS

MASTEN SERVICE COMPANY

FREE

204 PAGE 1961
B-A CATALOG!

BURSTEIN-APPLEECE CO., 1012 MCGEE ST., KANSAS CITY, MO.

Up To Date

THE RADIO AMATEUR'S LICENSE MANUAL

All the dope between two covers... complete and easy to understand.

- Novice
- Conditional
- Technician
- General
- Extra-Class

Price $50 Postpaid

THE AMERICAN RADIO RELAY LEAGUE, INC.
West Hartford 7, Conn.

VSW/4 and FVC/4. It was a pleasure to visit at our QTH by KALVE and ETD. K4US was third in the QRP CW contest. Everybody had a great time. Lisa had her 400-watt modulation transformer. LNC is running daily stacks with 2WPT in Benton Harbor, Mich., on 144 Mc. Sure glad to know MA is doing better after his recent operation. We renew your ARRL appointments. Traffic: W4DDY 120, K4BVD 96, LVE 48, JU9 47, W4WO 29, K4AS 22, TEA 3, W4VET 17, K2.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA. API reported his trail traffic to the Caribbean operators. The entire operation made only two months, operating all bands 50 to 22 meters, s.s.b. and w.w., and received a 15 w.p.m. On the Pacific, the certificate was given to KA4QD. He has enough radio to get their NVOCC Class licenses and has started E.E. studies at Cornell U. API's brother, WP4AVH, is on with an NC-300 and DX-20. Our newest OPS, KP4AOD, reports a traffic total of 100 and has that AVQ at Roosevelt Roads, and WAP3S/KP4, at Vieques Island, will handle traffic to any point in the world via K4ANNA. Naval Radio at Atlanta, Va., on 14.330 kc, Tue. and Thurs, at 1200 GMT, AOG replaced the plate transmitter at 14.330 and now runs close to a half kilowatt to the 4-250A final. KUJAF, arrived in San Juan from Indianapolis to add a new station to the 20 meter belts. He is now an observer for the 24th-120 converter in Ponce, W5C42, on the Pacific. The San Juan group is transferring a beam south to Ponce so his gang can work them. E3 is getting a new Telrex beam for 6 meters, WACR/KP4 is a new station in Rio Piedras with a homemade receiver, M3D shipped up on 40 meters with Gozet trans, W2YQ and K4ZQS are vacating in S4-P, L那, visiting friends the QSO daily on 11-Mc, s.s.b. ACQ received a Heath Sixer, AMG rebuilt the k.w. linear to use 4-100A s.s.b. for 2-100 P.E.P. MO is on 1000 kc with a Heath Sixer and AOG is on 20 meter s.s.b. into inclusion in the mountains to assemble his Heath Sixer. AOG is on 6 meters with a Heath Sixer. DJ has resumed in 8-Mc, with W4QN. Stations reporting weather to the Antillean Weather Net on 7246 kc, should file information in the following order: temperature, humidity, wind direction and force, sky condition (type of clouds and amount of sky covered), sea conditions if any, and if raining. Stations reporting at the 2130 GMT sessions are K3AEN, NCS, VP3S, AB, DA, GU, LS, LY, GAG, VPMN, VP9AM, HH3VB, FJ2CH and K4MC, WP6M, W4K1, W4K1, ZC opened 40-meter mobile from Carolina handling traffic to civil defense in Rio Piedras during floods caused by Hurricane Emma. CO and K4AHC also operate, but using a KVMD-2, AAA traded the 20-meter beam for a HY-Gain Tri-bander. MV is manufacturing welded tower, W4BQ added a 90-ft tower for ACQ. RV is back on 40-meter phone. AZ sold his s.s.b. transverter, BC-458-20A-280W Linear and is buying a Gozet GSB-100 ana 28W linear. MII is a new station on 6 meters from Caguas using a Scout Deluxe. ARX is another new station on 6 meters from Caguas using a Challenge. Merry Christmas to all. Traffic: K4AOD 159, WT 06.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—At a meeting of the CZAIA members we introduced the new amateur coordinator, Lt. Col. E. H. Schwarze. Several points on licensing were cleared. Mobile operations would not necessarily be required to obtain a q.c. from local housekeeping for mobile operation only. It was also pointed out that the CZAIA licensing authorities do require U.S. Cura- tion licensees to take the regular examination for the C.Z. license on the basis that the license is well within the scope of the examination. Other items taken up were the 28.9-Mc, Net activity was nil and that a 7-Mc, Net should be worked on for an all-sodium band. KQ is back from the hospital and looking very well. RV and VP are in their new quarters and back on the air with a new Tri-bander beam. RK will be back with a KVMD-4, as will KJ, PR in the States for 6 weeks. G4 is using a new Tri-bander beam. MK moved to the F. A. A. housing on a used Radiomaster according to the general activities of active and semi-active amateurs on one square block. Ex-Americans are MG, ME and DU. New YLs are MG, ME and SB. SWLs nearby K4J1T, MARS Net activities are very good. A.F. MARS activities are very good with two new YLs, ME and SB. Added to the group are AR, IV and DT. RV will be W4BM and we will surely miss (Continued on page 184)
THE NEW P/H LA-400-C
800 WATTS PEP SSB LINEAR AMPLIFIER

NOW 800 WATTS PEP FOR ONLY $164.95
THE "BEST BUY" YET

NEW modern styling! NEW high efficiency 3 element
band-switching pi net. Puts more power into any
antenna or load from 50-70 ohms. For SSB, DSB, Linear
AM, PM, CW and FSK. All bands 80-10 meters. Me be
driven to 800 WATTS PEP SSB with popular 100 watt
SSB exciters. Uses four modified 1625's in grounded
grid. On customers order, will be furnished with 837's.
(note: 1625's and 837's are not directly interchangeable,
since sockets are different). Typical P&H Low Z untuned
input. TVI suppressed. Parasitic Free. Meter reads grid
drive, plate current, RF amps output. Heavy duty power
supply using 810's. NEW modernistic grey cabinet
measures approx. 9" x 15 1/8" x 10 1/4". Panel is recessed.
WANT TO SAVE MONEY? BUY IT IN KIT FORM. It's a
breeze to assemble and wire. BEFORE YOU BUY — SEE
THE NEW LA-400-C AT YOUR DEALERS.

LA-400-C Kit complete with tubes............. $164.95
LA-400-C Wired and Tested..................... $219.95

P&H ELECTRONICS INC.
244 Columbia, Lafayette, Ind.

LA-400-C 100 wattham.
NEW 1961 CATALOG FREE!

Exclusively Amateur Equipment
Parts and Supplies—144 Pages

Here is the ham’s own catalog... packed with all the latest gear you’d like to see in your shack... plus the latest in C-B and Hi-Fi.

Here, too, is everything you need from solder lugs to tubes... all at Walter Ashe’s money saving prices!

MAIL COUPON FOR YOUR COPY—TODAY!

HAMMARLUND
HQ 110 C
Twelve tube superheterodyne receiver. Full dial coverage of the 6 thru 160 meter amateur bands. Very stable BFO for SSB.

AMATEUR NET $259.00

Shipping weight 30 lbs.

HAMMARLUND
HQ 170
Optimum reception of SSB/CW and AM/M.C.W. Bands covered are 6, 10, 15, 20, 40, 80 and 160 meters. 14 tubes. Tuning range 3KC with calibration every 1 KC.

AMATEUR NET $359.00

Shipping weight 45 lbs.

HAMMARLUND HQ 180
Outstanding triple conversion receiver. Ideal for amateur or commercial user for a single sideband receiver of general coverage. Continuous tuning in 6 bands from .54 MC to 30 MC. Bandspread on 5 bands.

AMATEUR NET $429.00

Shipping weight 45 lbs.

HAMMARLUND HX-500 Transmitter
Amateur Net........... $695.00

WALTER ASHE RADIO COMPANY
Dept. Q-12-60, 1125 Pine Street, St. Louis, Mo.

I am interested in _________________________________

What is the Ashe "Surprise" Allowance on ________________

Name______________________________
Address______________________________
City________________ Zone State______

□ Send 1961 Catalog □ Send Reconditioned Bulletin

Walter Ashe
Radio Co.
1125 Pine St. • St. Louis 1, Mo.

ASHE TRADES HIGH!
Your used amateur transmitter or receiver, made since 1945, is worth a lot more in trade at Walter Ashe. Get our offer and we guarantee you'll be surprised!

EASIEST TERMS
If cash is short you can still get your new ham equipment at once thanks to Walter Ashe’s easier terms. You can use your trade as a down payment!

GET RECONDITIONED LIST
Only top-grade equipment is accepted in trade... and each unit is completely checked in our own shops. If you are interested in reconditioned equipment, ask for our current list... we probably have just what you want at a rock bottom price!

FOR FASTEST SERVICE PHONE
Chestnut 1-1125

185
GEARED SLOW MOTION DRIVE
For Amatuer Radio & Communications
RECEIVERS & TRANSMITTERS
A high grade assembly, flywheel loaded, manufactured to fine
tolerances, provides a smooth positive drive with a reduction
ratio of 110:1, and with its 100 divisions rotates 5 times
for one pointer traverse, giving 500 divisions with positive reset
readings. A cam adjustment on the vernier assures correct zero
setting, and spring loaded jockey arm minimizes tension of the
pointer device. Overall dimensions 9 1/2" x 5 1/4".

Manufactured by
Stratton & Co., Ltd. (Eddystone) PRICE $15.00 NET
Birmingham, England

EASY TO LEARN CODE
It is easy and pleasant to learn or increase
speed the modern way — with an Instructograph
Code Teacher, excellent for the
beginner or advanced student. A quick,
practical and dependable method. Available tapes
from beginner's alphabet to typical messages
on all subjects. Speed range 20 to 40
WPM. Always ready, no QRM, beats having
some one send to you.

ENDORSED BY THOUSANDS!

The Instructograph Code Teacher literally
takes you from beginner to expert. It is an operator-instructor
and enables anyone to learn and master code
in the shortest time. Thousands of
successful operators have "acquired the code" with the Instructograph
System. Write today for full particulars and convenient rental plans.

INSTRUCTOGRAPH COMPANY
4709 SHERIDAN ROAD, CHICAGO 40, ILLINOIS
4700 Crenshaw Blvd., Los Angeles 45, Calif.

"SURE HOPE THE CHAIN HOLDS" He's safe — the Towers got "IT".

WEST GULF DIVISION

NORTHERN TEXAS — SCM, L. L. Garvin, W6BNG
-If you have been having trouble getting rid of your
trailer, I urge you to try the NTX on 2770
and 2900 and daily. He has handled a
number of pieces of trailer during September. KE6YX is net manager, KE6YX
has built a transisterized hunting monitor
for his trailer, and after listening to
all of the others, you will be surprised at how it
performs. The monitor can be used with any
frequency and should be very useful in
the areas where you want to use it.

OMAHA — SCM, J. D. Walker, W6ZDR-
-The highlight of September activity was the State Convention held at the
Omaha Civic Center. A record attendance was
achieved with more than 100 people attending.
A highlight of the convention was the
presentation of the Amateur Radio Club
awards for outstanding contributions to the
community. W6ZDR was presented
the award for outstanding contributions to the
community.

OKLAHOMA— SCM, Adrian V. Ren, W6DRZ-
The high point of September activity for the
OMAHA club was the annual picnic held on
September 19. The club gathered at
W6ZDR's home for a hearty picnic lunch.

SOUTHERN TEXAS— SCM, Roy K. Eggleston,
W6QBA— SEC— QKF, PAM, ZPD, KALM, KB6YX, KX6L, CB6BZ, KB6BS, KB6ZK, KB6FV, KB6T, KB6T, KB6S, KB6ZK.
- Activity was centered around the mobile
tower 720, and the trailer. The trailer
was used for emergency communications
during the month, and was a big hit among
the members.

SOUTHERN TEXAS— SCM, D. E. Weeks, VE1W— Asst,
SCM, D. E. Weeks, VE1W— Asst.
-Activity was centered around the mobile
tower 720, and the trailer. The trailer
was used for emergency communications
during the month, and was a big hit among
the members.

CANADIAN DIVISION

MARITIME — SCM, L. P. Doucette, VE1W — Asst,
SCM, L. P. Doucette, VE1W — Asst.
-Activity was centered around the mobile
tower 720, and the trailer. The trailer
was used for emergency communications
during the month, and was a big hit among
the members.

The Towers worked states on 2 meters in less than 2 hours

(Continued on page 385)
FREE! LAFAYETTE
324-PAGE 1961 CATALOG
America’s "Electronics Shopping Center"
SATISFACTION GUARANTEED OR MONEY REFUNDED
EASY PAY PLAN—the simplest, and quickest way to get what you want when you want it. As little as $2 down... up to 24 months to pay.

NEW! LAFAYETTE HE-20 DELUXE CITIZENS BAND TRANSCEIVER

99.50
$5.00 DOWN

HE-20WX
Completely Wired

Made in U.S.A.

NEW! LAFAYETTE HE-25 "VOYAGER"
6 TO 80 METER Transmitter
A Sensational Value for Your Ham Shack

Completely Wired HE-25WX
109.50
5.00 Down

IMPORTED
- Single Knob Band-switching—80 Through 6 Meters
- Full 120 Watts CW, 70 Watts Phone
- High Q Pi Network Output Circuit Matches Antennas From 40-600 Ohms
- Filtered and Shielded for TVI Suppression
- Clean Keying—Minimum of Clicks or Chirps

The perfect Transmitter for Novice, Technician or General. Completely self contained with efficient Class C Final amplifier. Operation on all bands. Tubes: 6AU6 crystal oscillator, 6DQ6A multiplier—buffer, 2-6DQ6A final amplifier beam tetrodes, 12AX7 dual triode audio amplifier and a 6AQ5 clamp tube modulator. Shpg. wt., 38 lbs.

LAFAYETTE PROFESSIONAL QUALITY COMMUNICATIONS RECEIVER—ENGINEERED FOR THE AMATEUR

KT-200WX
in Kit Form
64.50
5.00 Down

HE-10WX
Wired and Tested
79.95
5.00 Down

- Superhet Circuit Utilizing 8 Tubes and Rectifier Tube
- Built-in "S" Meter with Adjustment Control
- Full Coverage 80-10 Meters
- Covers 455kc to 31 mc
- Variable BFO and RF Gain Controls
- Switchable AVC and Automatic Noise Limiter

The Communications Receiver that meets every amateur need — available in easy-to-assemble kit form or factory wired and tested. Signal to noise ratio is 10 db at 3.5 MC with 1.25 microvolt signal. Selectivity is —60 db at 10kc, image reflection is —40 db at 3 MC. 7¾" x 15" x 9" Shpg. wt., 22 lbs.

165-08 LIBERTY AVENUE, JAMAICA 33, N.Y.

FREE 324-Page Catalog 1961
Cut Out & Paste on Post Card

Name ____________________________
Address __________________________
City ____________________________ Zone ________ State ________
GET HIM A TOWER FOR XMAS

KTV TOWERS

are SAFE in winds up to 80 m.p.h.
Faster installation... much longer life.

• For Hams
• For Research at Schools
• For Geodetic Survey
• For Wind Measurements
• For Antenna Testing
• For Government Research

We also have heavier towers available for Communication work.

See ed page 110, August 1960 QST

SEND FOR ILLUSTRATED FOLDER

KTV TOWER and COMMUNICATION EQUIPMENT Company

P.O. BOX 294 • SULLIVAN, ILLINOIS

in a recent opening. Deepest sympathy is extended to the relatives and friends of AEA, who passed away recently. QJ (ex-QBJ) and PJ (ex-QBJ) now reside at Camp Gordon, TX. KERVA2Z is now V9A2AC. New calls include AGY, OM is now running 35 watts pep on s.a.b. QV has moved to a new QTH. VOJ9Z has been in temporary duty. VOJ19Z reports that the RCAF has loaned the Goose Bay Club an ATV transmitter for use in its new club house. VOJ9Z is expected to move to a new QTH. Are we having a hamfest in 1961? It is regretted that no club found it possible to sponsor a convention this year. Should the same situation prevail next year, why not inform a central location similar to the S.B.B. Dinner held in Moncton last February? Your suggestions, please. Traffic: VE1OM 23, ADH 15.

ONTARIO—SCM, Richard W. Roberta, VE8NG—AJA was portable at Manistee for the fishing season. AYS was at Craigleith for the same reason. DTO, DXZ and CJI attended the Montreal Hamfest. DBZ was the guest of 2CJ. LH is on again, ARZ also was heard from. The Windsor ARC will hold its Past-President Banquet in November. CAB has had his nose to ye olde grindstone but is in again. New calls heard in Windsor are RWD, EBQ, EBY, EBY and DUR. CNB is back on. TPB has a new Tri-band. DFL is working reel DX. Sudbury’s officers are EAY, pres.; CJF, vice-pres.; DOY, secy.-treas. CJF is now an OBS. The North Bay gang has a relaxing summer with no hamfest. EAW reports that conditions at the former site are not ideal anymore. They may hold an Autumn instead. (RL note: I hope so.) COK was at the Montreal Fest. The s.a.b. gang will hold a dinner at Toronto. Where are all the A-1 operators who hold certificates? How about getting this award going. You got yours, how about the new gang? This is not meant to be a criticism but rather a reminder to get going. This is a fine award. ELO is in the Congo. BPL is on 10 meters. AUU was all this summer but is better now. KM says the ARCE is tough on the increase after the Hamper-club meeting with the Hamilton Club for the fifth year. Our International Club of Banff is off to a good start for the coming season. The Oshawa gang had a good corn roast. Traffic: WACWA 293, IK 93, NG 77, BBZ 69, DFO 50, RN 48, BUR 47, CJF 38. QTF 21, DTO 29, ALA 15, AMT 17, DH 13, EHL 12, DU 11, DWM 8, VB 3.

QUEBEC—SCM, C. W. Skarstedt, VEDMR—The Eastern Canada ARRL Convention, sponsored by the Montreal Amateur Radio Club, was an outstanding success. The VE8MR Contest seems to be growing in popularity. The contest was judged from the enthusiasm displayed by VE and W hams. NL, using only 30 watts, contacted over 600 with a score of almost 140,000. WEDWY, an old friend from CD Parties, visited your SCM. FCW dropped in for a chat. From La Tuque we learn that HW, formerly of Canna, is now living there and intends to get “cracking.” NW also is a new resident, having left his former Rapidville QTH. Another active station is AKB, who uses BHD, on 30 meters. On other fronts, TI, AOJ and AIDM accept traffic for Saguenay on 3780-kc. phone, APF, HO, AUB and AMM keep 144 kHz humming. At Montreal, late Bill Meredith, HM, was bequeathed to the MARC. JH, at Louiseville, is an expert trout fisherman. ABE, at 2a-w.p.m., won the code receiving contest at the recent convention. He noted out A2W who deserves much credit, having operated only seven months. A2G, Noranda, is experimenting with antennas on 40 meters. Our DX king, WW, promises to win next year’s BERU Test. TV has half finished building the new receiver and r.f. transmitter. HY and XM received their new antenna towers and are now fullfledged pilots. OQNngr. W7 reports 175 stations reported on September 14, with 77 messages. Traffic: VEOM/VES 201, VEJ 121, DZ 51, XO 29, BB 21, TA 2. (Continued on page 129)

See Page 168

for the NEW

Ameco TX-86 Xmtxr

FRANKY THE FROG SAYS: MERRY CHRISTMAS

from the six happy handy hams of THE AMATEUR HEADQUARTERS of Southern New England

Come in more often in 1961 and look over our complete stock of name brand equipment which includes COLLINS, ELMAC, GONSET, HALLICRAPPERS, HAMMAR- LUND, HY-GAIN, E. F. JOHNSON, NATIONAL RADIO.

W. H. EDWARDS CO., INC.

116 Hartford Ave., Providence 9 R.I. • Tel. GA 41518—41519—41614

LEARN CODE!

SPEED UP YOUR REceiving
with G/C

Automatic Sender

Type $32.00 Postpaid in U.S.A.

Housed in Aluminum Case, Black Instrument Finished, Small—Compact—Quiet induction type motor, 110 Volts—60 Cycles A.C.

Adjustable speed control, maintains constant speed at any Setting. Complete with ten rolls of double perforated tape. A wide variety of other practice tapes available at 50c per roll.

GARDINER & COMPANY • NEW JERSEY

188
STAN BURGHARDT
has 2 Suggestions for a
Ham’s Christmas—HALLIKITS!
TWO GREAT NEW KITS—A
COMPLETE HIGH PERFORMANCE AM/CW
STATION . . .

HT-40 TRANSMITTER, $79.95
A perfect match for the handsome SX-140, both in quality and appearance. Halliersaiters’ transmitter leadership is evident in every precision-engineered feature of this crystal-controlled 75-watt beauty—features as important to old-timers as they are to novices.

- FEATURES: You get excellent CW performance as well as AM. Full band switching, 80 through 6 meters. Enjoy easy tune-up and crisp, clean styling that has efficient operation as well as appearance in mind. Unit is fully metered, TVI filtered.
- SPECIFICATIONS: Maximum D.C. power input: 75 watts. Power output in excess of 35 watts CW, 30 watts peak AM phone. (Slightly less on 6 meters.) Frequency bands: 80, 40, 20, 15, 10 and 6 meters.
- TUBES AND FUNCTIONS: 6DQ5 power output; 6C8 crystal oscillator and driver; 12AX7 speech amplifier; 6DE7 modulator; silicon high voltage rectifiers.
- FRONT PANEL: Function (AC off, tune, standby, AM, CW); Band Selector (80, 40, 20, 15, 10, 6); Drive control: Plate tuning, plate loading, Crystal-V.F.O.: Grid Current; Meter; AC indicator light; RF output.
- REAR CHASSIS: Microphone gain; antenna co-ax connector; remote control terminals; AC power cord.

SX-140 RECEIVER, $94.95
Doesn’t it make sense to team up your skill with the experience of a company who has designed and built more high-performance receivers than any other in the world? Especially when the result is the lowest-priced amateur band receiver available?

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

P.S. Both units are available fully wired, and tested. SX-140, $109.95. HT-40, $99.95.

This Transmitter Will Become Available in December
This Receiver Will Become Available in January
WRITE FOR OUR NEW AMATEUR BUYING GUIDE H-60

Send for Our Latest Listing of Reconditioned Amateur Equipment

Other Stores:
Aberdeen, S. Dak. Phone D. Baldwin 5-4194
Sioux Falls, S. Dak. Phone ED 8-7888
Rapid City, S. Dak. Phone FIL 3-2093

Burghardts
Your direct line to every manufacturer

189
BRITISH COLUMBIA—SCM, Peter M. McIvor, VE7T—Thanks to AGT for pinching for me last month while I was on vacation. Next month a former SCM will do the column for me as I catch up on the remainder of my holidays. Activity for the winter months will start picking up and net activities should increase. There are appointments available as SEC and net manager open at the time of writing. I have no replies to communications directed to persons who I thought would fit the job and do it well. Glad to see QJ back in full swing after a bout with his appendix. This is the time of year that new executives of clubs take office so would appreciate a list from them as to their new executives. British Columbia recently lost a very active amateur, Stanley Craig, FY, who had been very active and outspoken in the cause of amateur radio and its activities. AGT, chairman of the OANA and AAF is looking after its reproduction. This manual for the RCEN is a good manual and if extra copies are available contact AAF or AGT on 3050 kc. for them. Traffic: VERBAN 115, RAF 66, AGT 40, ALZ 36, BDF 33, JQ 37, AMW 8.

MANITOBA—SCM, M. S. Watson, VE7Y—The Brandon ARC has a new slate of officers for the '60/61 season: XM, pres.; DG, vice-pres.; ES, secy.-treas. The Beaumont ARC was well represented at the Brandon Hamfest by JW, our PAM, who visited EF, HH, IW, HY, OS and JK on his way home. Bill, together with DJ, will be teaching a code class this winter, 21, a pioneer in radio, gave an illustrated lecture to the ARIM at its monthly meeting covering his early days with the Marconi Co. and on board ship. Darby has a new 21-kw transmitter and is busy getting his 30Mc. rig working nicely from a severe illness. TT has his new quad on a really big tower, FB, Ted. The Sixers topped out with all of them too numerous to mention. Many of the Redline Boating Club boats now have 8-meter equipment and report starting results. The Sixers stole his show last season. Traffic: VEAPE 3, AT 4, AN 2, GB 2.

A Cathode-Ray Monitor
(Continued from page 2)

though the display of a parasitic is often quite beautiful to look at, it certainly does not sound beautiful on the air.

Conclusion
It is not within the scope of this article to discuss the various possible transmitter difficulties, the patterns indicating them, or their cure. This subject has been covered thoroughly in the literature. Suffice to say that a short period of use of the cathode-ray monitor will show that it is absolutely essential for a modern phone transmitter, be it a.m. or s.s.b., filter or phase-shift.

For the Command Receiver
(Continued from page 60)

a.c. and remove the 6C4 from its socket. Disconnect the antenna from the converter, R7, the 6000-ohm potentiometer in Fig. 3, should be adjusted to give a full-scale reading on M1. Then replace the 6C4, and after it is warmed up adjust R5, the 1000-ohm potentiometer, for zero reading on M1.

(Continued on page 109)

YES, WE AND THEY SURE
HAVE COLLINS—WILL TRAVEL

Get in touch with WILSON — "That's All"

QCCWA
Willard S. Wilson, Inc.
405 Delaware Ave., Wilmington, Del.
W3DQ
Est. 1920
W3US
FORT ORANGE
Radio Distributing Co., Inc.
904 BROADWAY ALBANY N. Y. U. S. A.
AMATEUR HEADQUARTERS

Cable Address "UncleDave" CALL ALBANY HE 6-8411
NITES GR 7-5891

THE MODEL
2-A, YOU
SUPERIOR
SBB & AM
Drake 2A, receiver 2AS
Speaker, Triple conversion with crystal controlled first
converter for maximum frequency stability,
Continuous sideband operation, simple tuning
Reception of SSB, AM and CW
with full RF gain, complete AVC action and
accurate 5 Meter indication. Distortion-free
product detection. Convenient tuning rate
with deviation scale. High sensitivity, low
noise. Compact size. Also a choice of
slow or fast AVC. Selectivity band width,
Product or diode detector.
Drake 2A receiver $265.95
Drake 2AS speaker 12.50

JOHNSON
MESSANGER
CITIZENS'
RADIO
TRANSCIEVER
Anyone can operate . . . no examilation necessary . . . license issued by the
FCC on request! Complete 23 channel Citizens' Band coverage (Class "D", 27 Mega-
cycle frequencies) Chose any 5 channels by a
flip of a switch!
Model 242-128 (110 AC or 12V DC)
Model 242-127 (110 AC or 6V DC) (with
xtal for one chan nal) $144.75
Extra xtal (set per set) $7.95 Mobile mount
$2.50; Noise Suppression Kit $13.50.

ONL Y
$79500
CENTRAL
ELECTRON-
ICS 100V
(Single Side
band-Trans-
mitter, Exciter.)

Central Electronics — the pioneer of ama-
teur SSB and Broadband linear amplifiers
proudly presents the 100V — the ultimate
in operating ease and convenience — with
any desired mode of operation — SSB,
DSB, AM, PM, CW or FSK.
Changing bands or emission requires no
more effort than bank switching your re-
civer. There is no such thing as "tuning up" a 100V — all tuning (except the VFO,
of course), is completely eliminated! Cen-
tral Electronics' patented broadband cir-
cuitry is used throughout.

COLLINS KWM-2

The advanced amateur's 80-10 meter trans-
ceiver system engineered for mobile and
home operation.
Superior single sideband performance in all
variety of installations is assured by the
Collins KWM-2 Mobile Transceiver. Engi-
neered for the amateur who desires an 80-
through 10 meter mobile transceiver, the
KWM-2 design incorporates time-proven
and advanced communication concepts.
Price $1296.00
516F-2 AC Power Supply 115.00
516E-1 12V DC Power Supply 270.00

Gonset GSB-101 Linear Amplifier
Here's a linear amplifier that gives you
the best power-per-dollar ratio of all.
Capable of 1000 watts P.E.P. input, this
grounded-grid linear amplifier does not
waste drive power by swapping the exciter.
Driving power appears in the output of
final. What's more, the GSB-101's superior
design means up to 85% efficiency!
MATCHING GSB 100-SSB Exciter
Price $499.50

HQ 180
$429.00

The Hammerland
HG-ONE-EIGHTY

Triple conversion—18-tube superheterodyne
circuit • full dial coverage from .54 MGS
to 30.0 MGS • New high frequency crystal
filter • Slot Filter • Separate Linear Detec-
tor • Selectable Sideband • Built-in 100
KGS crystal calibrator • Exclusive design
automatically adjusts audio passband to
fit receiving conditions • Automatic noise
limiter.
Price $429.00 — Clock $10.00 — $520
Speaker $19.95

FREE!
TIME PAYMENTS
18 Months to pay. Life
insurance at no extra cost

Write UncleDave
W2APF
with your needs
and problems.

UNCLE DAVE'S
RADIO SHACK
A SUBSIDIARY OF
FORT ORANGE RADIO
DISTRIBUTING CO.

191
We are not going to attempt to tell you what an "S9" signal should read on the meter. The RST system calls for an S9 signal to be an "extremely strong signal." With the circuit described here a 100-microvolt signal causes the meter to read approximately half scale, and a signal of a few microvolts will give a detectable indication.

Technical Correspondence
(Continued from page 45)

tuned the second I.F. transformer, and to my surprise the audio response was as good as that of any receiver I had ever owned. The loss of selectivity was not as great as you might expect. The complete process took less than a minute to accomplish, and the results on a.m. phone reception were most gratifying.

I consider myself one of the luckier I.B.R.-16 builders: Because of the geographical location (nice vacation spot) of my QTH I had a personal visit with Mr. Crosby and his lovely YXL; they were our guests for a few very short days. Thank you, QSL, for printing the article, and thank you, Ted, for a very PB I.B.R.-16 receiver!

— B. M. (Bim) Jones, W7TIP

(Translator's note: W6TC suggests stagger-tuning T3 for about a 2-kc. spread. This can be done by first aligning the I.F. at the center frequency throughout, then detuning the signal generator or other signal source 1 kc. lower and peaking the primary of T3, after which the signal source should be tuned 1 kc. higher than the center frequency and the secondary of T3 peaked on this frequency. The required deviation can be obtained by first setting the signal on the center frequency, adjusting the h.f.o. for a 1000-cycle beat on the desired side, and then readjusting the signal source to zero beat with the h.f.o."

I.A.R.U. NEWS
(Continued from page 19)

Norway: N.R.R.L, P.O. Box 888, Oslo

Okinawa: O.A.R.C., P.O. Box 789, APO 331, % Postmaster

San Francisco, Calif.

Pakistan: Box 4074, Karachi

Panama: Republic of: L.P.R.A., P.O. Box 1022, Panama

Paraguay: R.C.P., P.O. Box 512, Asuncion

Peru: V.K. QSL Officer, P.O. Box 294, Port Moresby

Peru: R.C.P., P.O. Box 588, Lima

Philippine Islands: P.A.R.A., QSL Bureau, 67 Espana

Extension St., Quezon City

Poland: PJ.E. QSL Bureau, P.O. Box 350, Warsaw 10

Portugal: Ruas de D. Pedro V, 7-4, Lisbon

Romania: A.R.E.R., P.O. Box 95, Bucharest

Salvador: YSIO, Apartado 329, San Salvador

Singapore: via Malaysia

South Africa: S.A.R.L., P.O. Box 3037, Cape Town

Southern Rhodesia: R.S.R.B., Box 2277, Salisbury

Spain: U.R.E., P.O. Box 220, Madrid

St. Vincent: VP2SA, Kingstown

Sweden: Sveriges Sandare Amatörer, Enskede 7

Switzerland: U.S.K.A., Sursee

Syria: P.O. Box 85, Damascus

Tunisia: John A. Hoford, WP7PA, Box 541, Port-of-Spain

Trinidad: Francis DeVeld, 5 Rue Can Robert, Tunis

Uganda: P.O. Box 1825, Kampala

Uruguay: R.C.U., P.O. Box 37, Montevideo

U.S.S.R.: Central Radio Club, Postbox N-88, Moscow

Venice: R.C.V., P.O. Box 2265, Caracas

Virgin Islands: Richard Sneedley, Box 403, St. Thomas

Wake Island: T. D. Musson, P.O. Box 127

Yugoslavia: S.R.J., P.O. Box 324, Belgrade

Strays

ARRL Director Ray Meyers, W6MLZ, was asked to draw the first ticket at a hamfest, and pulled out his wife's number for a set of dishes. That's one way to keep your wife happy at a hamfest!
IT'S TOP DOLLAR TRADE-IN TIME AT NEWARK

Your present amateur equipment is worth more when you trade at Newark. So get top dollar value and trade for Collins.

ON

Collins

AMATEUR GEAR

Trade the old for the new Collins and pay balance in easy monthly payments. Write to "Ham Shack", Newark Chicago address.

75S-1 Receiver. Here's an SSB, AM and CW Receiver featuring unsurpassed selectivity, calibration and stability in the amateur field. When used with the 32S-1 Xmir it enables the operator to transceive. Write Newark's "Ham Shack" today for a generous trade on your present unit.

516E-1 DC Power Supply. For use with the KWM-2 transceiver. Completely transistorized. Operates from 12v DC.

312 B-4 Station Console. Here's a compact unit that neatly ties the 75S-1 and 32S-1 together. Has flexibility that enables operator to perform switching functions. Incorporates an RP directional wattmeter that measures up to 2000 watts, a Collins communication speaker and other facilities.

32S-1 Transmitter. A highly compact and flexible unit which covers all amateur bands between 3.4 and 29.7 mc. Uses the famous Collins Mechanical Filter for SSB generation. Trade your present transmitter on this unit. Dial is calibrated at 1 KC divisions in 200 KC segments.

520.00

195.00

666.00

270.00

1150.00

FREE! Newark's All-New 1961 Catalog No. 711 See the very latest in Ham Equipment featured in Newark's extensive stock! Order Your copy Now!

Write Dept. T-12

NEWARK

ELECTRONICS CORPORATION

193
How I Was Cured of Ham Radio

BY WALTER J. KENT, M.D.* K2OCW

Friends, it is easy to get information and advice about how to get started in this hobby. After you’re hooked, however, you have to shift for yourself, slowly developing your own brand of wild-eyed desperation as you contemplate the painful return to normalcy. I think, however, I can put an end to all that. This is probably the first study ever completed on a practical technique for curing yourself of ham radio.

First of all, you must have, or develop, a sunny, generous, friendly, and sympathetic personality such as I have, and then you must have or develop some pitable, inept, stumbling, ten-thumbed-but-nevertheless-lovable friends, also such as I have. Then just sit back and eventually you will find yourself in the following sort of situation.

With a growing family gnawing at one end of my free time, and a growing practice nibbling at the other end, it seemed that the two ends were getting closer and closer to each other. Eventually they met; spare time activities met with some careful scrutiny and some painful decisions were reached. Hamming had to be curtailed and limited to special and unfortunately infrequent occasions.

After about one year’s worth of dust settled on the dust cover, I decided that some of the guilt ought to be put to more use, that the shack ought to be revamped and re-evaluated, so to speak. Well, where do you logically start a program such as this? You start at the top, and at the top we find the ten-meter beam, home brew. And there, friends, is where the friend comes into the picture.

This poor slob has been putting 125 watts into a folded dipole and doing pretty well. It seemed that I was doing better, though, putting my 8-watter into this beam - I had a lot more DX cards. So, in a reckless, unthinking moment I offered him the beam. You should understand that because of the traditional circumstances beyond anyone’s control, offering this ham a beam doesn’t mean, “Come and get it!” - it means “When should I bring it over and install it?”

Getting the beam off my roof was easy; time — one hour. Getting it onto his roof, not so easy; time — 2 days. He has one of those antique peaked roofs that is difficult if not impossible to climb, and unquestionably impossible to sit on. At any rate, on the evening of the second cold,
for a merry
COLLINS CHRISTMAS

CALL "ACK"

See the famous Collins S-Line
and KWM-2 Mobile SSB Transceiver

Collins KWM-2—the ideal Christmas gift for the amateur radio operator. It covers all amateur bands between 3.4 and 29.7 mc. Equally efficient as a fixed station or mobile unit, Collins 18-pound KWM-2 is easily and quickly moved from the desk top of your ham shack to the mounting bracket of your car. The KWM-2 features exceptional frequency stability and filter type SSB generation. Price of the KWM-2: $1150. Stop in and deal with ACK. He's always in a good mood at Christmas.

ACK RADIO SUPPLY COMPANY
Wholesale Electronics

3101 Fourth Avenue South
Birmingham 5, Alabama
Telephone FA 2-0588
Call W4EC1

331 Luckie St., NE
Atlanta 13, Georgia
Telephone JA 4-8477
Call W4RRW
WEBSTER ELECTRIC Model 2D11 TRANSISTORIZED POWER CONVERTER

Here's an ideal unit for driving mobile receivers and transmitters where size and weight are important — where only 12-volt power supply is available. The Webster 2D11 Transistorized Power Converter is compact, sturdily built — produces up to 500 volts DC. No moving parts. Requires little if any maintenance. Automatic overload protection — a short in the load circuit stops the oscillator, reducing the output to zero without overload strain on parts or input source. Regulation exceeds that of mechanical converting equipment. 4" x 4" punched base for horizontal or vertical mounting.

COMPONENTS DIVISION WEBSTER ELECTRIC RACINE, WIS

DX AWARDS! HOW?
DXERAMA
3rd EDITION
See page 127 February 1960 QST.
$1.60 USA & Possessions $1.85 Foreign.
Write to Sam Fraim, DXerama
1101 Farmingdale Road, Lancaster, Penna.

BUT THIS!
Plus "ITQ"

E-Z WAY TOWERS, INC.
P.O. BOX 5491 - TAMPA, FLA.

wet day it was up, well guyed, with that clean-cut, coldly efficient look, only it didn't work.

This beam was built with a gamma match using a broadcast capacitor as the tuning element. In my installation I had 8 watts going in and practically no watts coming back. Here we could get up to about 70 watts going in and very few watts coming back, but what happened to that other 55 watts? I didn't believe his s.w.r. bridge, so I put mine in the line and it only verified his. You experienced hams can well imagine the activity following such an unhappy conclusion, and I hope you inexperienced hams never have to go through it. We did not rebuild the transmitter, but let me assure you that it was under consideration.

On each of the many phone calls he assured me that (1) the dipole was still outperforming the beam (2) that 8-meters both far and near verified this, (3) that I had been using a malfunctioning beam for 5 years, (4) that aluminum tubing would never replace copper wires in antenna construction.

The only consequence of this could be much thumbing through the books, many valuable minutes spent in pensive reflection, and of course the conferences with professional help. One of our conference assured us that since he had personally conceived and constructed most of the "dew-line" antennas, our search for help would end with him. As it turned out, our nation can be thankful he had more luck with the dew line than with our ten-meter beam.

Today, however, the cure was applied. We went to his home again, well prepared for another session on the roof, but we were greeted with such smiles and effusive happiness that we knew immediately the problem had been solved. The explanation started out like this (I never heard the end), "Y'know, Walter, the beam works better than the dipole and always has. In fact, I just had the two transmission lines confused. . . ."

And, friends, if that won't cure you, give up.

FREE COIL BULLETIN
Technical data on coils specified in QST and Handbooks. Standard coil series ideal for experimenters and designers.

NORTH HILLS ELECTRONICS INC.
Glen Cove, Long Island, New York

DISTRIBUTORS:
Harrison Radio Corp., New York, N.Y.
Merry Christmas"

for those who deserve
the better things of life...

for those who want to
obtain these things with the
least effort, time, and expense...

HARRISON
"HAM HEADQUARTERS, USA"

HIGHEST TRADES
LOWEST PRICES
EASIEST TERMS

Of course! But here, in the "world's
largest Amateur supply establishment,"
you can get much more...

You get the unusual satisfaction of being served by experi-
enced Hams. By men who are interested in you and your
wishes, who are happy to help you select the gear which will
give you the greatest pleasure and results with most

Only at "Ham Headquarters, USA," can you see all of the
newest equipment on display. Here, you can make your
selection from truly the largest inventory, try it out to your
full contentment, take it safely home with you.
Come on in and see for yourself. You'll be glad you did!
(We're open all day Saturdays, including Dec. 24 and 31.)

Bil Harrison
W2AVA

Want to save even more?

Pick up a good used Collins rig in the famous
HARRISON TRADE-IN CENTER
where your satisfaction is guaranteed! Three month
full credit toward a new one. Liberal allowance for
your present gear.
COLLINS SSB KWM-2

The KWM-2 is equally at home in the distinctive company of Collins S-Line equipment (as shown here), or on the go as a compact mobile unit. And no modifications necessary. The KWM-2 weighs only 18 lbs 3 oz. Measures 7¼” x 14¼” x 13¼”. Its compact design makes it an ideal mobile unit. The PA-2 portable power supply teams up with the KWM-2 to give you a complete SSB station weighing less than 45 lbs in its specially designed suitcase.

Place your order now for the Collins KWM-2, 80-10 meter mobile Transceiver.

List Price ........... $1150, (accessories extra). Write or phone communications division 1828 N. SAINT MARY STREET SAN ANTONIO 2, TEXAS

HAM OPERATING DESK KIT

$39.95
P.O.B. Orange, N.J.

ATTRACTIVE STURDY FITS ANY DECOR

Napped equipment shell for neat dial and meter reading. Slide-out typewriter stand. Constructed of smooth surfaced ¾” Particle Board. No ugly edges. Takes one bottle. Assembles in minutes. Dimensions: 39½” H. 42½” W. 20” D. Weight: 95 lbs. Shipped express or freight collect. Send check or money order to:
495 Sn. Day St.
Orange, N.J.

“The World's THRIFTIEST Light Plants”

Have a steady, dependable 115-v. d.c. electricity for receivers, transmitters, antennas, motors, emergency lights, etc., for radio amateurs, camps and Civil Defense at DIRECT-TO-YOU FACTORY PRICES! No wiring needed, just plug in. Model illustrated, our portable 700 watt plant, 13 1/2” H., easy-starting Briggs & Stratton engine, radio shielded, shock mounted, 24” frame only less than commercial price line. Complete with voltmeter and built-in weatherproof 60 amp-aircraft battery. Easily fits in car trunk. Weight: 72 lbs. Price: $149.50

$199.50

PUSH BUTTON START

Exclusive new ELECTRONIC BRAIN provides instant full power upon demand, holds thrifty idle otherwise. Blows out fast cost, doubles engine life! Available on all our plants. Built by experts dedicated to bringing you a better product!

JUST CLIP THIS AD

Fill in your name and address. Receive giant new FREE RADIO SHACK Electronics CATALOG plus every new issue for full year

See America's finest values in Hi-Fi, Stereo, Ham Radio, Kits and Parts! Over 100,000 electronic marvels for today's enjoyment, exciting gifts, all-year pleasure. Low cost, pay balance after Christmas.

Mail this ad to RADIO SHACK, Dept.60M11 730 Commonwealth Ave., Boston 17, Mass.

YES! Without obligation mail free catalogs for full year.

Name
City
Address
Zone
State

198
SAY MAN...

BRING THOSE SIGNALS IN!

GET AN "EASY ON YOUR BUDGET"

DOW PREAMPLIFIER

Signals 'pop out' of the noise!

HELP YOUR RECEIVER! The DKC-RFB Booster is a 50 to 70 ohm impedance matching "broadband preamplifier" guaranteed to increase the over-all gain by 1 to 6 "S" units on all bands (15 to 30mc). Worth dollars and dollars more to the amateur with low cost equipment desiring to improve sensitivity, work with DX, and bring up weak unintelligible signals. Designed for receivers up to the $300 class.

Not a gimmick ... but a highly successful, tested and proven accessory, precision made, fully backed by Dow-Key’s traditional Factory Warranty.

Compact: 1¼"x1¼"x2½". Wt. 10 oz.

DOW-KLEY COMPANY • THIEF RIVER FALLS MINNESOTA

---

DOW KEY COMPANY • THIEF RIVER FALLS MINNESOTA

---

Read These All-New Handbooks!

by William L. Orr, W6SAI, 3A2AF

S-9 SIGNALS! CUBICAL QUAD ANTENNAS

- The Multi-band Ground Plane
- The "Cobra" Ground Plane
- The "Quick and Easy" Dipole!
- Multi-band Dipole Antennas!
- The Demi-Quad Beam Antenna!
- Five dollar Beam Antennas!
- The "Scotsman's" Dipole!
- Six Meter Beam!
- Two Meter Beam!
- New, inexpensive antennas!
- And Lots More for you!

Now! Build these antennas for your station!

#106

Price $1.00

"BUILD IT YOURSELF" INFORMATION FEATURING—

Newly designed X-Q QUAD having 3 db gain over usual design! Newly designed TRI-GAMMA match! One feedline for 3 band Quad! TRUE gain curves, front-to-back ratios, and patterns for Quad! New, improved feed systems. New, improved Quad construction! History and background of the Quad! The true angle of radiation! Simplified, inexpensive Quad assemblies! Cubical Quads for 7 and 50 mc!

A HANDBOOK OF PRACTICAL "BUILD IT YOURSELF" INFORMATION FOR THE FAMOUS CUBICAL QUAD ANTENNA...NEVER BEFORE PUBLISHED DATA!

#104

Price $2.85

---

RADIO PUBLICATIONS, INC., Wilton, Conn.

Please rush the items circled. Enclosed is $ check for books, plus 15c to cover packing and shipping. (Cost prepaid on three or more books.)

100 101 102 103 104 105 106

Name

Address

City Zone

State

199
How Many Turns?

Beset with a knotty technical problem? Why not let an ARRL Lightning Calculator provide the solution and save hours of operating time, or time you might better spend in constructing that new rig.

If you’re trying to figure out how many turns to wind on a coil for a particular band, you’ll find the answer more quickly by using the Type A Calculator, designed especially for problems involving frequency, inductance and capacity. Direct-reading answers to Ohm’s Law problems involving resistance, voltage, current and power may be obtained rapidly on the Type B Calculator. Be sure — and be accurate — with one of these dandy time savers.

ARRL
LIGHTNING CALCULATOR
Type A or Type B

$1.25
postpaid

THE AMERICAN RADIO RELAY LEAGUE WEST HARTFORD 7, CONN.

Are You
TRADING?

Let me make you a trade-in offer on your used amateur equipment. All name-brand merchandise—late serial numbers assured. Quick delivery. WRITE TODAY! Bill W9ZSO-KOJUH

COMMUNICATIONS EQUIPMENT CO.
518 State St., LaCrosse, Wis.
Phone 4-7373

IF YOUR TOWER AIN’T GOT
DIAGONAL BRACING
It Ain’t Got

*ITQ*

INERT TORSIONAL QUALITY

“Diagonal bracing resists twisting caused by constant straining and stopping of large rotary beams. Also twisting of tower caused by gusty winds... All E-Z Way Towers got “ITQ”.

Write for free literature!
E-Z Way Towers
P. O. Box 5491 Tampa, Florida

PROFESSIONAL STYLE

KEY • municator

TELEGRAPH KEY

No. 1060

NOT A BUZZER!
True Signal Tone!

for SCOUTS, SCHOOLS, HOBBY CLUBS

Professional type cast metal telegraph key — not plastic! Transistorized oscillator, inexpensive batteries last for months! Any number of stations, miles apart, can be connected together!

Code characters and phonetics, message blanks on 9”x12” durable base!

Practical, Educational! Easy to learn the code by tone!

COMPLETE... READY TO USE — $9.95

MADE IN U.S.A.

DOW-KEY COMPANY • Thief River Falls, Minn.

200
say

“Merry Christmas”

with a

for every member of the family to make!

• DAD—A transmitter
• MOM—Intercom, to save steps
• BROTHER—Hi-Fi Stereo
• SIS—Transistor clock-radio
• JR.—Science Explorer kits

Visit New York’s HEATHKIT® CENTER...

ENJOY NOW! Pay later

You can CHARGE IT, and pay next month. Or, you can budget-spread any part of your account over many months.

Ask for your
HARRISON CHARGE ACCOUNT, now!

PROTECT YOUR RIG with this compact burglary alarm, easily installed under the hood of any vehicle. The siren and relay mechanism are enclosed in a heavy, tamper-proof, cast aluminum housing. Operation is simple; the alarm is turned on by a key lock switch usually mounted on the fascia. When a door, hood, or trunk lid is opened, the siren alarm sounds and continues until turned off with the key. 6 and 12 volt. Brand new! Postpaid in U.S.A. ................. $59.85

ZIMCO ALARMS
2005 Atlantic Ave., Brooklyn 13, N. Y.
Write or call Herb, K2ZP
Dickinson 2-9121 or Jackson 2-2857

THE QSO THAT

As the skip shortened up on 20 one morning and the VK5 I was QSO QSB’d out, a W8 called me. My contact with him was so long that it could have qualified me for the RCC! But it brought me something much more tangible: from this W8 I learned of the big money many hams are earning in commercial and public-safety 2-way radio maintenance. He told me how several years ago he had sent in a coupon from a Lampkin ad in QST—and received a free copy of “HOW TO MAKE MONEY IN MOBILE-RADIO MAINTENANCE”. It started him on the road to a high extra income.

So after signing him out in the log, I found and mailed the coupon from a Lampkin ad. Now I, also, am in high-paying mobile-radio maintenance.

Why don’t you send in the coupon? It’s at the lower right of this ad!

LAMPKIN LABORATORIES INC.
BRADENTON FLA.

MAIL COUPON TODAY

LAMPKIN 105-B
FREQUENCY METER
CORR. 0.1 TO 175
PRICE $265.00 NET

LAMPKIN 205-A FM
MODULATION METER
RANGE 25 TO 500 MS
PRICE $270.00 NET

NEW: the PPM Meter... an accessory for the Type 105-B... accuracy 0.0001% for split-channel frequency checks. Price $147.00 net.

LAMPKIN 205-A FM
MODULATION METER
RANGE 25 TO 500 MS
PRICE $270.00 NET

THE PREFERRED MOBILE-MAINTENANCE METERS

BEAM EXPENSE can be lowered with a beam designed to last.
• THREE BAND
• TWO BAND
• SINGLE BAND
TENNALAB 17 S. Tenth St., Quincy, Ill.

"Ham Headquarters, USA" • Since 1925

HARRISON
225 GREENWICH STREET
NEW YORK 7, N.Y.
• PHONE: BARCLAY 7-7777
[LONG ISLAND—144-24 HILLSIDE, JAMAICA]
6 METER TRANSCEIVER

TRANSMITTER 12 watts input to 5763 final • All transmitter controls are on the front panel • Both plate and grid of final are metered • Push-to-talk operation • Uses a crystal, ceramic or carbon microphone • Uses popular low cost 8 mc crystals • Provision for a VFO • 35-75 ohm output, can be used with car whip • Spotting switch to check your frequency.

RECEIVER Better than 1/4 microvolt sensitivity • Built-in noise limiter • Double-conversion superhet for selectivity and no band images • L.F.'s of 3 mc and 455 kc • Vernier dial for fine tuning (6:1).

FEATURES Power input: 6 vdc, 12 vdc, and 115 vac • Three input power supply built right in... no separate mounting, no separate costs • Weighs only 15 pounds... great for travel; vacations • 8" x 6" x 12" fits anywhere • Chassis easily removed for service, nothing hidden • Military type construction for ruggedness • High quality components used throughout • Carrying handle/mounting bracket (for car, boat, or plane) • Removable mounting feet for installation anywhere.

$189.50

SOLAR

Send for literature giving full details. Representative inquiries invited.

ELECTRONICS CORP.

149 WOOSTER STREET, NEW YORK 12, NEW YORK

LUXURY IS NOT NO LONGER AN INDIVIDUAL'S PROBLEM.

"ITQ"

Write for FREE BROCHURE

E-Z WAY TOWERS, INC.
P. O. BOX 5491 - TAMPA, FLA.

24-HOUR NUMERAL CLOCK

G.M.T.

"TIME AT A GLANCE"

$15.00

Plus Applicable Tax:
Walnut or ebony plaque.
3 lbs.
110V 60 cy. AC.
Guaranteed 1 year.

At Your Dealer... or WRITE to
PENNWOOD NUMECHRON CO.
7249 FRANKSTOWN AVE.
PITTSBURGH 8, PA.

NEW Especially Designed for Single Side Band! HIGH VOLTAGE POWER SUPPLY DELIVERS 3500 or 4200 VOLTS DC AT 500 MILS

The high-voltage power supply you've been waiting for! All the power you'll ever need—even for that Alaskan Kilowatt! Especially designed for single side band by one of the leading manufacturers of precision electronic equipment since 1947...No transients due to poor dynamic regulation...No chokes. Write for complete descriptive literature.

MODEL 65A — 4.2 KV — $365.00
MODEL 65B — 3.5 KV — $335.00
Send check or money order only—no C.O.D.'s

Specifications:

MODEL 65A — 4200 V. DC @ 500 mls, cont. duty
MODEL 65B — 3500 V. DC @ 500 mls, cont. duty
(350, 750 or 1050 V. screen voltages)

REGULATION: ±5%, no load to full load

RIPPLE: Nom. 1% at full load

WEIGHT: Model 65A—150 lbs. net
Model 65B—130 lbs. net

SIZE: 17"x17"x2½" high

TIC-T-TEST INSTRUMENT ELECTRONICS CORP.
728 GARDEN ST., CARLSTADT, N. J.
CLAROSTAT
C-Line Potentiometers
Superlative quality wire-wound and composition-element types primarily for industrial and industrial-grade requirements. Featuring: Corrosion-proof finish, stainless-steel shafts, greater moisture/dirt protection, closer tolerances, etc. • Ask for catalog.

CLAROSTAT MFG. CO., INC., Dover, New Hampshire

Top SSB Performance
COLLINS 32S-1 TRANSMITTER GIVES YOU CLEAR, STRONG SIGNALS WITH FEWER FRONT PANEL CONTROLS
All amateur bands between 3.5 and 29.7 mc crystal controlled. 100 watts nominal output, 175 watts PEP input on SSB, 160 watts input on CW. Net, only $666.00

Easy terms, big trade-ins. Try us first. Write Tenny Freck, WA4WL

FRECK RADIO SUPPLY
38 Biltmore Avenue  Phone AL 3-3631  Asheville, North Carolina

ON THE AIR
CONTROLLED ILLUMINATION SIGN
• HEAVY GAUGE STEEL CASE • WALL OR TABLE MOUNTING
• BRIGHT RED LETTERS ON WHITE • AC-DC 6-12-120V (SPECIFY)
• BLACK OR GRAY BAKED FINISH • 10½"L x 3½"H x 3"D

ONLY 695 NET
AVAILABLE IN OTHER LANGUAGES 7.95

TO INSTALL SIMPLY CONNECT LEADS TO THE COIL OF YOUR ANTENNA CHANGEOVER RELAY. WHEN YOU "FLIP" TO TRANSMIT YOU ARE ON THE AIR.

COMANCHE PRODUCTS
STEEL ELECTRONIC
BOX 82
GARLAND, TEXAS
WHO IS MY NEAREST DISTRIBUTOR?
NAME
ADDRESS
CALL
STATE

203
Joining the crowd?

Planning to join the ever-increasing ranks of amateurs on sideband? If so, you need a copy of "Single Sideband for the Radio Amateur." It assembles under one cover the most noteworthy contributions to the art that have appeared in QST, revised and grouped as necessary to present a useful reference book. Amateur sideband is covered from its earliest history all the way through the theory and practice of sideband generation, detection, modulation, linear amplifiers, and various accessories which round out the well-equipped amateur station. Keep up to date. Get your copy now.

$1.50 Postpaid
U. S. A. Proper • $1.75 Elsewhere

The American Radio Relay League, Inc.
West Hartford 7, Conn.

Model M-100

NEW SELF-CONTAINED UNIVERSAL SERIES GATE A.M. MODULATOR

JOIN NOW THE CIRCLE OF ENTHUSIASTIC OWNERS!!!

EASILY ADAPTABLE TO MOST COMMERCIAL CW TRANSMITTERS
AN IDEAL MODULATOR FOR THE HOMEBREW TRANSMITTER

- Modulates any beam tetrode or pentode amplifier up to 1 KW
- Extremely economical and efficient method of modulation
- No sacrifice in CW power capacity
- Amazingly small: only 6" x 7 ½" x 5 ½"
- Two years complete guarantee

Find out for yourself why the M-100 is your best ham investment per dollar:
10 DAYS TRIAL, MONEY BACK GUARANTEE
Write for complete technical information. Send check or money order to:

ELECTRO-TONE LABORATORIES
1713 North Ashland Avenue
Chicago 22, Illinois

EVANS HAM SHACK OFFERS FREE COUNSEL TO THE BEGINNER!

Never hesitate! Our job is to counsel as well as sell. As Northern New England's largest distributor we'll help you select new or reconditioned equipment. Our sales are backed by our engineering department — no need to return equipment to factory for repairs. Come to us, we will meet your purpose as well as your purse.

- Service to hams by hams
- Engineering Department
- Good trade-ins and liberal time payments.

Evans RADIO
P.O. BOX 312 • CONCORD, N. H.

204
The first really new QSL Card in years. Beautiful, 4-colors with pop-up eye-catchers. Imprinted with call letters, name and address on both sides. Your picture, too, for small additional charge. Card folds and seals with tuck-in flap. No envelopes necessary. Goes 1st class for guaranteed delivery. And priced right too. Order your supply today!
in 1930 when home TV became a reality

Belden WAS THERE

From TV's infancy, Belden has been a leading TV wire and cable supplier and has pioneered the development of the efficient camera and microphone cables responsible for today's quality picture and sound transmission.

In every electrical and electronic advancement since 1902, Belden wire and cable engineering has played a vital role.

Belden WIREMAKER FOR INDUSTRY SINCE 1902 CHICAGO

microphone cables
tv camera cables
broadcast audio cables
PA, sound, and intercom cables
control cables
multiple conductor cables for every application
magnet wire, hook-up wire

FOR THE FIRST TIME... Your Call and home state in a single custom decal!

In six attractive, permanent colors with simple directions for applying. Unequaled in appearance. Ideal gift. For cars, doors, equip., boats, planes, etc. Beautiful design of world available in place of state for Canadian and DX Amateurs.

Price for either design $1.95 each. Add 4% tax in Calif. Approx. size 3 1/4" X 6 ". Mailed F.P. within 7 days. No C.O.D.'s please. Enclose check or M.O. Designate world design if desired. Ask for quote on reproducing your club insignia.

P. O. BOX 3915, TERMINAL ANNEX CALL-D-CAL LOS ANGELES 54, CALIFORNIA
HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their field of endeavor.

(2) No display of any character will be accepted, nor can any display of rate cards, such as all- or part capital letters be used which would tend to make the column appear a copy of commercial advertising.

(3) The Ham-Ad rate is $5 per word, except as noted in paragraphs (1), (2) and (5).

(4) Remittance in full must accompany copy, since Hawaii Sunday News, Inc., as a newspaper of record, is not a contract discount or agency commission will be allowed. (Commissions must be included in the second month preceding publication date.

(5) Rate cards will apply to advertising which, in our judgment, is obviously non-commercial. A business firm may advertise its surplus equipment owned, and for sale by an individual or apparatus offered for exchange or advertising requiring for special equipment, rates the 10¢ rate.

(6) Address and signatures are charged for. An attempt to deal in apparatus in quality of equipment, by an individual, is commercial and all advertising so classified will be charged the 10¢ rate. Provisions of paragraphs (1), (2), (3) and (6) apply to all advertising in this column regardless of whether the rate may apply.

(7) Because error is more costly avoided, it is requested that corrections be sent as soon as possible, but not later than 10 a.m. the day after the ad is placed.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, neither we nor our affiliates, nor the ad police, are responsible for the integrity or the grade or character of the products or services advertised.

WANTED: Early wireless gear, books, magazines, catalogs before 1923. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif. (Handwritten.


ALL types of transmitting and receiving tubes wanted. Also amateur equipment. Write regularly, Johnson, National, Johnson, Globe, Gain, Maslon and many other names of this genre. Prices offered in all cases. R.G. 305-510 Kishwaukee St., Rockford, Ill.

If you visit Ham Headquarters, USA and see and choose from the hundreds of "Like-New" chassis in the world-famous Harness City, be sure to stop by. More for your money, because tremendous turnover makes lever lower overhead! Terms, trade, Send postcard for mouth-watering photograph and price list. R.G. 334-510 Kishwaukee St., Rockford, Ill.


SSBERS! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering Amateur Radio by single sideband techniques. Single sideband is the wave of the future. For information and membership application, send $5.00 in stamps to "Single Sideband" Radio. M.C. Liddy, Lynn, Mass.

WANTED: 6 to 12 304T tubes. Callman, W9AU, P.O. Box 155, Barrington, III.

ATTENTION: Police and Sheriff's Dept., Lakeview 6 volt 50 amp. system, $12; 12 volt 50 amp. system $20; 12 volt 60 amp. system, $30; 12 volt 100 amp. syste $100. Guaranteed no fuse blows car units. Herbert Anderson, 115 Willow St., Green Lake, Wis.

UNBEATABLE OSL's! Largest variety samples, 25¢ (refunded). Callbooks: (Winter) America, call $5.00; foreign calls $3.00. GOS, Quincy 10, R. Sukkers, W6DE, Box 214, Holland, Michigan.

OSF QUIZ quality OSL at new low priced Samples 10¢. Different cards for home and mobile use, even W6, K8A, K9A. P.O. Box 1644, Scottsdale, California.

OSL-SWLS, different cards for home and mobile use, embossed card stock and "Kromekote." Samples 10¢, K8AIA, Turner, Box 953, Hamilton, Ohio.

OSL Quality, advertisement and economy complete samples dime. OSL Printing, Box 12351, Houston 17, Texas.

OSL-SWLS, Reasonable, Samples 10¢, Glenn Print, Att: M. L. Musgrave, 2314 John Henning Ave., Baltimore 29, Md.


OSL 1400 Series, Samples 10¢, Mace Press, 1916 Glendale Ave., Toledo 14, Ohio.

OSL New design, lower prices, fast delivery. Catalog 25¢. (Handwritten.

CREATIVE OSL and SWL Cards. Are you proud of your cards? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Williams, Jr., KNOZM, Creative Printers, P.O. Box 1064-C, Atascadero, Cal.

OSL-SWLS, Samples free. W4BKT Press, 123 Main, McKeesport, Penna.

OSL Samples dime, Sims, 3227 Missouri Ave., St. Louis 18, Mo.

OSL, Taupin, Union, Miss.

SUPERIOR OSL's, samples 10¢. Ham Specialties, Box 3023, Cactus City, Arizona.

OSL, 3-color glossy, 10¢—$5.40, Rusties Variety Print, Fairfield Rd., New Brunswick, N. J.

OSL-SWLS most needed, different cards, embossed card stock and "Kromekote." Samples 10¢. Turner, K8AIA Box 1644, Scottsdale, California.


OSL Price, 1.00, Riesland, Del Mar, Calif.

OSL, Label price, samples dime, Keburt W2PSV, 4100 Willis, Merchantville, N. J.

OSL-SWLS, W2LOM, samll size assortment approximately 94¢ covering canvass, printing, printing, enamels, mailings, eye-catching, comic, scale, tamnulous, DX-attaching, proto, snazzy, children's cards (W6W0R), Roberts, K8AIA, 137 Lincoln Ave., St. Paul 5, Minn.


OFLUXE OSLS, Pettis, W2HAX, Box 27, Trenton, N. J. Samuel, SwLS, etc.

OSL-SWLS, samples free. Phillips, W7HRG, 1768 Bridge St., The Dalles, Oregon.

OSL-SWLS, 100 2-color glossy, $3.60; OSO file cards, $1.00 per Samples. 10¢, Ruspriint, Box 7597, Kansas City 16, Mo.

OSL-SWLS, Free Samples. Spierer, 4615 Rosedale, Austin, Tex.

OSL-SWLS. Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 10¢. KZV8, 62 Main St., Brookline, Mass.

OUTSTANDING (14¢) Call OSLS. One style: 100, $2.75; samlls free. Garbutt, 3524 Kromer, Pont Wayne, Ind.

OSL-SWLS, Cards in stock, coils, cards 25¢. Chris, W9PPA, 365 Terra Cotta Ave., Crystal Lake, Ill.

DON'T Buy OSL's until you see my free samples. Bolles, 7701 Palisades Ave., Austin, Texas.

ATTRACTIVE OSLS, Peace, 192 Osborne, Danbury, Conn.

OSL-SWLS, Sample, Printer, Cornwall, Iowa.

OSL-SWLS, Stamp blank samples, Eddie Scott, W3CSX, Fairplay, Md.

OSL-10 color, $1.00. Sample sheet, 10¢, RBL Print M.R., 12, Philmont, N. Y.

OSL-SWLS, 300 for 3.95. Free samples, W5SKR, "George," RR #1, Box 208-A, Ingleside, Ill.

OSL's, Attractive, colorful, Variety type styles, backgrounds. Samples 10¢, Jack Crandall, KOAOQ Press, 5015 Elinfield Ave., Enfield, Conn.

OSL Cards printed in 2-colors on glossy Kromekote cards, Two designs are possible, both are color pictures. 14¢ for sample card and brochure. Williams Printers, P.O. Box 2597, Burbank, Calif.


QUALITY OSL's, Large variety multi-color samples. 10¢. Don. R. Rogers, 5800 N. Broad, N. Y.

OSL-SWLS, reasonable, nice designs, samples dime. W2DZH Press, Warrensburg, N. Y.

OSL-SWLS, Samples 25¢ (refundable) W6CMN, Wildcat Press, W6CCK, Box 27, Elyria, Ohio.

OSL-SWLS, different cards, embossed, different colored. Samples dime. RAY, K7HLR, 679 Tabor, Twin Falls, Idaho.

MAKE YOUR own photographic OSL cards. Complete kit of materials. Albertson, W4HUD, Box 322, High Point, N. C.
TONE MODULATOR FOR GRID DIP METER

The Millen "Designed For Application" No. 90751 Tone Modulator is a small package, containing a transistor audio oscillator and its mercury battery, which plugs into the "phone jack" of a Grid Dip Meter to modulate the signal of approximately 800 cycles for applications requiring a modulated signal. Modulator is automatically turned on when plugged into a Grid Dip Meter socket.

In addition to its prime use in modulating a Grid Dip Meter, the No. 90751 may be used in other ways. The Tone Modulator has sufficient power output to drive a pair of headphones without amplification. Therefore it may be kept for code practice or it may be plugged into the mike jack of a phone transmitter to provide a tone for modulation checks and for modulated CW emission.

Dimensions: only 4 1/4" x 3 1/4" x 1 1/4" in.
Weight: 4% oz.

JAMES MILLEN
MFG. CO., INC.
MAIN OFFICE AND FACTORY
Malden
MASSACHUSETTS
Electronic computers are the "time machines" of today — they bring to man the precious gift of time. They think, relate, evaluate and solve fantastic problems in millihours of a second. Each operation they perform releases you, the radio-electronics engineer, the mathematician, the physicist, the chemist — for work that calls for the human mind and heart.

Obviously, you should know about computers. Computers, today, are more compact, more complex, and about 50,000 times faster than those made just a few years ago. Progress such as this means constant and dramatic changes. It would take precious hours each day to keep abreast of all developments.

You can, however, learn about computers far more easily — by reserving your copy now, of this special January issue of Proceedings. In it you will find the sum of all that's new in computers. You get 360 pages of brilliant research and authoritative writing (of course at engineering levels), made up of some 40 separate papers; 12 of these specially-invited.

Like other special issues of Proceedings, the computer issue promises to remain definitive for years to come. If you're not already an IRE member, make sure you get a copy of the Proceedings Special Computer Issue by sending in the coupon below.

INVITED PAPERS FOR COMPUTER ISSUE INCLUDE:
Adaptive Control — Present and Future
J. G. Truxill (Poly. Inst. of Brooklyn)
State of the Art of Perceptron Machines
J. R. Hawkins (Aeronutronic Systems)
Survey of Artificial Intelligence
Marlin Minsky (MIT Lincoln Lab.)
Organization of Arithmetic and Control Sections of Computers
W. L. Lawless, Jr. (IBM)
Survey of Storage Devices
Jan Rajchman (RCA)
Automatic Programming
W. Orchard-Hays (Corp. for Economic Industrial Research)
State of the Art of Digital Communication
J. M. Wier (Bell Telephone Labs.)
Computer Developments in Europe
Isaac Auerbach (Auerbach Electronics)
New Applications of Computers
W. F. Bauer (Ramo-Wooldridge)
State of the Art of Display Equipment
Roger, Sisson (Aeronutronic Systems)

Proceedings of the IRE
1 East 79th St., New York 21

| Enclosed is $3.00
| Enclosed is company purchase order for the January, 1961, issue on Computers 1961

Name:
Company:
Address:
City & State:

Extra copies to members, $1.25 each (only one to a member).

THE INSTITUTE OF RADIO ENGINEERS
1 East 79th Street, New York 21, New York

213
Holiday Greetings
to all our Ham Friends
the world over
from the
Allied Ham Shack—

W9CZE
Jack Schneider

W9WHF
Jim Sommerville

W9BHD
Joe Huffman

W9HLA
Joe Gizzi

W9VOB
Burt Fischel

and from the rest of the gang at Allied

W9BUD Larry Blostein
K9BYD M. Fleischman
W9CCW Rudy Ackermann
K9CDJ Joel Bolker
W9DCB Milt Fojtik
W9ECC Bob Gumm
K9EIL Don Saxon
W9EXQ Chuck Stone
K9GSB Norman Eastman
K9GXF Jack Wolfson
K9HLV R. Archambeault

K9HOB Don Wisniewski
KN9IJO Mike Heinrich
K9KEF Leon Hearn
K9KVQ Rodger Nordlund
KN9KWT Bob Oatley
K9KWH Sherwin Berger
K9MDF Jack Marcus
W9MHB Goodwin Mills
W9QBB Tasker Day
KN9RID Lloyd Mast

W9RND Jack Matin
W9SFW Lou Dezettel
W9SIA Franklin Swan
W9THG Leo Borek
W9VHI Don Kobiljak
W9VHS Tony Marcello
W9WGV George Bercos
W9ZJU “Doc” Towler
HH2LR Louis Roumain
W9VES Phil Simmons
W9ZOA George Duffy

Serving the Amateur since 1921

Allied Radio
100 N. Western Ave., Chicago 80, Ill.
ANTENNAS AND TRANSMISSION LINES
Antenna Patterns From the Sun (Brya, Kirchn)........ 49, Aug.
Antenna Raising — No Climbing (H&K).................. 30, June.
Antenna Rotator Hint (H&K)............................. 40, Aug.
Array Design with Optimum Antenna Spacing (Kasper).... 33, Oct.
Better Way to Install Fittings on ½" Copper, A (Hew- net)........ 37, Oct.
"Budget" Vertical on 30 Meters, The (Casalinski)....... 30, Dec.
Choosing a Transmission Line — Part II (McCoy)....... 41, Nov.
Countertop Antenna Support (H&K)...................... 30, July
Featherweight Array for 50-Mc. Portable Work, A (Tilton)33, Aug.
Feeding Grounded Towers As Radiators (Hubbell)...... 33, June
Forty Feet Without Climbing (Moch) (Bridgman)....... 33, Apr.
Fox Vox Adapter, The (Fox)............................ 29, Nov.
Gamma-Matched Ground Plane, The (Bee)................ 29, Oct.
Guy Anchors (H&K)..................................... 31, Dec.
Inexpensive Antenna Wire (H&K)........................ 28, Aug.
Inverted V-Shaped Dipole, The (Gleazer)............... 28, Mar.
Is There a Design for a Maximum-Gain Yagi? (Tech. Core)........ 31, Aug.
Lightweight Utility Mast (McCullum).................... 31, July
Limited-Space Antenna, A (McCoy)..................... 31, Oct.
Long Antenna for a Short Lot (H&K).................... 31, July
Multiband Antennas Using Decoupling Stubs (Lattin)... 31, Dec.
Notes on Parasitic Beams (Nose)........................ 31, Mar.
Patch Panel (H&K)..................................... 30, Apr.
Portable Antenna Mast (H&K)............................. 30, Apr.
Portable Mast Holder (H&K)............................. 30, Apr.
Printed Circuit Dummy Load (H&K)....................... 30, Nov.
Simple Antenna System for the Novice, A (McCoy)..... 30, Dec.
Simplest is Best (Jones)............................... 30, May
Some Amateur Applications of the Smith Chart (Choles- skl)........ 30, Jan.
Spark-Plug Lightning Arrester (H&K).................... 30, Feb.
Switching Coaxial Feed Lines (Hubbell)................ 30, Oct.
Three-Band Rotory Antenna (H&K)....................... 30, Apr.
Treating Hammo Quadr Sets (H&K)....................... 30, Nov.
Useful Washers (H&K)................................ 29, Apr.
Y.I.P. Dummy Load (Lonon)............................. 29, Mar.
"What's Up Yagi?" (Trouter)........................... 29, June
2 Bands on a 12-Foot Boom (Swann).................... 29, Jan.
8 Special Antenna, The (Vigla)........................ 29, Apr.

AUDIO-FREQUENCY EQUIPMENT AND DESIGN
High-Level Balanced Modulator for D.S.B. (Rocka fellow)........ 29, Apr.
Transister Preamplifier for Dynamic Microphones (Wit ters)........ 29, Nov.
12-Volt 60-Watt Transister Modulator, A (Harper)....... 29, June

BEGINNER AND NOVICE
All-Band C.W. Transmitter for the Novice (McCoy)........ 32, Aug.
Choosing a Transmission Line—Part II (McCoy)......... 40, Feb.
Crystal-Controlled Converter for 14 Through 28 Mc., A (McCoy)...... 37, July
For the Command Receiver (McCoy)..................... 37, Dec.
Harmonics, Harmonics, Harmonics (McCoy)............... 37, May
Feedback............................................. 37, June
How to Get Bid of the Other Fellow's Key Clicks (McC oy)........ 37, Jan.
Limited-Space Antenna, A (McCoy)..................... 32, Oct.
Poor Man's Q Multiplier, A (McCoy).................... 40, Mar.
Preventive Maintenance (Smith)......................... 32, Mar.
Simple Antenna System for the Novice, A (McCoy)..... 40, Dec.
Simple Waveguide for Use in Coax Lines, A (McCoy).... 37, Sept.
"Tech" Special, The (McCoy).......................... 37, June
Using a Broadcast Set for Amateur-Band Reception (McC oy)........ 37, Apr.
50- and 144-Mc. Reception at Low Cost (McCoy)........ 37, Nov.

COMMUNICATIONS DEPARTMENT
Countries List (partial).............................. 35, Jan.
DXCC Membership Listing.............................. 106, Dec.
Frequency Measuring Tests results..................... 38, Jan., 38, Sept.
Meet the SSMs....................................... 38, Aug.
Net Directory....................................... 38, Nov.
Net Directory Supplement.............................. 38, Jan., 99, Mar., 98, May
RTTY Notes.......................................... 38, May
Training Aids........................................ 107, Dec.
General-Contact Schedule............................. 101, May
Summer Schedule...................................... 101, May

CONTESTS AND OPERATING ACTIVITIES
Army Forces Day, 1960
Rules.................................................. 40, May
CD Parties Results.................................. 35, Jan., 70, Apr., 81, July, 87, Oct.
Field Day, 1960 ARRL
Rules.................................................. 50, June
Results.............................................. 54, Dec.
Frequency Measuring Test.............................. 85, Jan., 89, Feb., 85, July
Howdy Days Contest................................ 154, Sept.
International DX Competition,
Announcement......................................... 49, Jan., 10, Feb.
High Claimed Scores................................. 50, Aug.
Results.............................................. 52, Oct.
Novice Roundup, 9th Annual (1960)
Announcement....................................... 61, Jan., 10, Feb.
Results.............................................. 50, Aug.
Operation Alert, 1960
Announcement....................................... 96, May
Results.............................................. 96, Oct.
QSO Parties
Delaware, 8th....................................... 56, Apr.
Glaso Bay........................................... 56, Apr.
Great Lakes Div..................................... 114, Sept.
Maine................................................ 135, Mar., 124, Sept.
Massachusetts....................................... 184, Dec.
Minnesota........................................... 121, Mar.
Nevada................................................ 140, May
New England........................................ 100, Dec.
New Hampshire, 11th................................. 124, Apr.
New Jersey.......................................... 112, Aug.
New Mexico, 1st.................................... 135, Jan.
QWA.................................................... 39, Feb.
Utah................................................... 124, Apr.
Virginia............................................. 123, Oct.
West Virginia....................................... 125, Apr.
Wisconsin............................................ 142, Dec.

December 1960
RTTY Contest Notes ........................................ 85, Jan.; 85, Feb.
RTTY Sweepstakes Contest .................................. 66, Oct.
Simulated Emergency Test, 1959 Results ............... 82, Apr.
Announcement ................................................ 49, Oct.
Sweepstakes
Announcement, 1959 ........................................ 72, Oct.; 50, Nov.
High Claimed Scores, 1959 ................................. 87, Feb.
Results: C.W. ............................................... 84, May
Phone and Club Totals ....................................... 50, June
VEI Contest, 6th Annual ................................... 146, Jan.
VE/W Contest Results, 1959 ............................... 53, June
Rules, 1960 .................................................. 57, Sept.
V.H.F. QSO Party
June Announcement ......................................... 64, June
Supplement, June Results .................................. 49, Oct.
June Results .................................................. 83, Sept.
Sept. Announcement .......................................... 60, Sept.
September Results .......................................... 72, Dec.
V.H.F. Sweepstakes Results, 12th Annual ................ 35, Apr.; 56, July
Announcement, 13 Annual ................................... 70, Dec.
YL-OM Contest, 11th Annual
Announced .................................................... 68, Feb.; 78, Mar.
Results ........................................................ 70, July
Correction ..................................................... 76, Aug.
YLRL Anniversary Party Results ................................ 77, Mar.

CONVENTIONS
Central Division .............................................. 12, Sept.
Dakota Division ............................................... 12, Sept.
Eastern Canada .............................................. 12, Sept.
Great Lakes Division ........................................ 12, Sept.; 10, Oct.
Hudson Division .............................................. 12, Sept.
Mississippi Valley .......................................... 20, Feb.; 78, Mar.
New England Division ....................................... 10, Apr.
North Dakota State ......................................... 12, Sept.
Ohio Valley ................................................... 18, Apr.
Pacific Division ............................................. 10, Aug.
Southeastern Division ....................................... 10, June

DXPEDITIONS
Andaman Island Expedition (King) ....................... 85, May
Socorro Island, XE4B (Medina) ............................ 67, Feb.

EDITORIALS
... And Newcomers ......................................... 9, July
Bread-and-Butter Publicity ................................ 9, Feb.
Directors' Meeting ......................................... 9, May
DX Test ...................................................... 9, Feb.
New Frontiers .............................................. 9, Sept.
Our Cover, Our Anniversary ................................ 9, Dec.
QRP, OMI .................................................... 9, May
Switch to Safety ........................................... 9, June
The Best Years ............................................. 9, Mar.
Those Mail Order Exams ................................... 9, Apr.
Unseen Salesmen ........................................... 9, Nov.
Volunteer Leaders .......................................... 9, July
Which Call to Sign ......................................... 9, Aug.
Year in Review, The ....................................... 9, Jan.
20-Meter Cooperation ...................................... 9, Oct.

EMERGENCIES
Amateurs at Agadir (Hay) .................................. 87, May
Western Illinois Amateurs in the Mississippi Flood .. 87, July

FEATURES & FICTION
Amateur and the Army, The (Cook) ....................... 53, Nov.
"Dick-Dick" (Brodgen) ..................................... 91, May
Hams on Ice (Mellen, Williams, Milner) ................ 11, Jan.
How I Was Cured of Ham Radio (Kent) .................. 194, Dec.
Key to Communication, The (Moreau) .................... 60, Aug.
Larsen E. Rapp Enterprises ................................ 51, Apr.
Mobile C.W. (Nose) ........................................ 75, Dec.
My Salvation! (Corner) ..................................... 25, Dec.
Planning Ahead (Troster) .................................. 85, Nov.
Pleas for Dignity, A (Sikorski) ....................... 59, Feb.
Project Moon Bounce (Harries) (Orr) .................... 62, 65, Sept.
Project Scouting (Rosen) ................................... 80, Dec.
Retreading an Old-Timer (Sheff) ......................... 57, July
Congo Story, The (Cournoyer) ...................... 76, Dec.
Those Crowded W1AW Code Practice Frequencies (Benner) .............................................. 82, Dec.
U.-V.-h-h-b and Ab-h-b-h, Ab-h-b-h (Bleit) .......... 54, Feb.
Unfortunate Ones, The (Amis) ............................ 90, May.
Use Your Amateur License in the Naval Reserve (Huguet) ................................................. 62, Feb.

GENEVA CONFERENCE 1959
Report From Geneva ........................................ 64, Jun.

HAPPENINGS OF THE MONTH
Amateur Growth ............................................ 84, May
Board Meeting Highlights ................................ 64A, June
Board Meeting Minutes .................................... 92, July
Canadian TVI .............................................. 67, Sept.
C.W. Segments on 6 and 2 ............................... 59, June
Election Notice ............................................ 38, Aug.; 67, Sept.
Election Results ........................................... 62, Jan.; 78, Nov.
Examinations Overview ..................................... 58, Aug.
Examination Schedule ...................................... 68, Jan.; 61, July
Family Membership ........................................ 55, May
Haitian 3rd Party Traffic .................................. 68, Mar.
Honduras Third-Party Traffic ....................... 84, May
Iran Off Banned List ....................................... 67, Sept.
ITU Ban List ............................................... 69, Dec.
Minutes of Executive Committee ......................... 64 Jan.; 85, May; 59, Aug.; 79, Nov.
Montana Exam Points ...................................... 67, Sept.
Report from Geneva ........................................ 64A, Jan.
Report of the Finance Committee to the Board of Direc-
 tors of The American Radio Relay League .......... 154, July
Report of the Planning Committee to the Board of Direc-
 tors of the ARRL ........................................ 156, July
Saskatchewan License Plates ............................... 68, Mar.
Staff Notes .................................................. 84, May; 81, July
Temporary Use of Amateur Frequencies by Army .... 79, Nov.
Venezuelan Third-Party Traffic ....................... 84, Jan.
V.E. Phone Expansion ..................................... 10, Oct.; 78, Nov.
What Bands Available ...................................... 62, July
W9OSO Now ITC Secretary-General ...................... 69, Mar.
15-MC: Radioacoustics .................................... 78, Nov.
14 Me., in Canal Zone ..................................... 84, May
14-Me. Phone Expanded ................................... 68, Mar.
14-Me. Phone Order ....................................... 68, Mar.
14-Me. Army Use ......................................... 84, May
1990 Merit Award .......................................... 69, Dec.
HINTS AND KINKS

January, pages 54-55
Inexpensive Antenna Wire
More Sweep Voltage for the Electronic Eyeball
One-Tube Crystal-V.F.O. Input Circuit
Oscilloscope Circuit
Portable Antenna Mast
Useful Washers
Using Dynamic Speakers

February, pages 58-51
Automotive C.W. Monitor
Crystal Saver
Distilled Water
Improved Keying and Drive for the DX-100
Improving Buffer Performance
Lecher Wires
Mobile Logging Tips
Pen-Light Cell Caution
Reducing Stand-By Noise in the Viking Ranger
Soldering-Iron Tip Saver
Spark-Plug Lightning Arrester
Transistor Two-Meter Transmitter Receiver

March, pages 54-57
Variable A.C.-D.C. Power Supply
Apache Adjustments Made Easy
Formica Aid
Hoop Ruler
KWS-1 Hint
Lazy Susan for Tools
Long Antenna for a Short Lot
Take-Off for R.F. Sampler

April, page 29
Guy Anchors
Patch Panel
Three-Band Rotary Antenna
Treating Bamboo Quad Elements

May, pages 82-83
Antenna Rotator Hint
Cable Twister
Colored Tape for Identification
Cooper-Serve Source
Hair Curler Heat Sink
Modulating the Grid-Dip Oscillator
Mounting Air-Wound Coils
Reducing the Noise Figure of Pentode Amplifiers
Talk-in on Frequency with the GSB-100
Transistor Power Supply

June, page 41
Farm Catalog Items
Liquid Tape
N.B.M., With the NC-300
Stand-By Noise in the GSB-101

July, page 80
Blown Transistors
Counterweight Antenna Support
Multi-Error M1670 Power-Supply Notes
Sheet-Metal Drill

August, pages 49-50
Antenna Raising -- No Climbing
Ball-Point Test Probes
Extra Coverage on 20 with the KWM-1
Good Chassis Layout Procedure
Miniature Tapes
Using the Grid-Dip Oscillator
Using the Heathkit SS-10 with the Johnson Viking Valiant

September, page 61
Borecav Substitute
Frequency Spotter
Handy Tube Puller
Insulating Paint
Low-Frequency Parametric Amplifier
Nort Starter
Safety Mat

October, pages 80-81
Circuit Change for the Heathkit MT-1 Mobile Transmitter
Notes on the Heath "Sixer"
Ranger Operating Convenience
Sensitive Meter Protection
S.S.B. with the 100 and Valiant

November, pages 54-55
Apache Transmitter Modification
Adding Squelch to the Heathkit VX-1
Printed Circuit Dummy Load
Using the Johnson Viking Valiant V.F.O. on Six and/or Two Meters
10-Minute Transmission Reminder

December, pages 51-53
Broken Tap Remover
Coax-To-Terminals-Strip Adapter
Earphone Cover Pads
Magic-Eye Tube Hint
Meter Safety
Noise Limiter for Hybrid Receivers
Popping Up the SPARC Transceiver
Portable Mast Holder
Reseal Broken Transistors
Bottling Up Chemical Fumes
Transistor Gain Checker
Use of Bug Key as Sidsniper
12-Volt System for Volkswagen

I.A.R.U. NEWS

Belgium and the Congo
Chilean Earthquake
Emergency Work by Amateurs Overseas
Folksale Conference
John M. Moyle
QSL Bureaus of the World

KEYING, BREAK-IN CONTROL CIRCUITS

Adding Squelch to the Heathkit VX-1 (H.K.)
Automatic C.W. Monitor (H.K.)
Complete Break-In Unit for C.W. (A. McGraw)
Electromonitomer, The (Adolph)
Field Day Tranquiliser, The (Garrett)
Fox Vox Adapter, The (Fox)
How to Get Rid of the Other Fellow's Key Clicks (McCoy)
How to Make a Sidsniper (Sones)
Improved Keying and Drive for the DX-100 (H.K.)
"Magikse", The (Thornwall)
Screen Protection and More (Evans)
Synchro-Multivibrator Electronic Key, A (Campbell)
"Ultimatic" - Transisterized, The -- Part I (Kanda)
Universal Control System, A (Perksin)
Use of Bug Key as Sidsniper (H.K.)

MEASUREMENTS AND TEST EQUIPMENT

Ball-Point Test Probes (H.K.)
Calhode-Ray Transmitter Monitor, A (Oxeway)
Dummy Load Off the Mind, A (Howard)
Frequency Spotter (H.K.)
Hoop Ruler (H.K.)
Lecher Wires (H.K.)
Measure Cell Q (Strandlund)
Meter Reading by Sound (Blaney)
Modulating the Grid-Dip Oscillator (H.K.)

November, pages 54-55
Apache Transmitter Modification
Adding Squelch to the Heathkit VX-1
Printed Circuit Dummy Load
Using the Johnson Viking Valiant V.F.O. on Six and/or Two Meters
10-Minute Transmission Reminder

December, pages 51-53
Broken Tap Remover
Coax-To-Terminals-Strip Adapter
Earphone Cover Pads
Magic-Eye Tube Hint
Meter Safety
Noise Limiter for Hybrid Receivers
Popping Up the SPARC Transceiver
Portable Mast Holder
Reseal Broken Transistors
Bottling Up Chemical Fumes
Transistor Gain Checker
Use of Bug Key as Sidsniper
12-Volt System for Volkswagen

I.A.R.U. NEWS

Belgium and the Congo
Chilean Earthquake
Emergency Work by Amateurs Overseas
Folksale Conference
John M. Moyle
QSL Bureaus of the World

KEYING, BREAK-IN CONTROL CIRCUITS

Adding Squelch to the Heathkit VX-1 (H.K.)
Automatic C.W. Monitor (H.K.)
Complete Break-In Unit for C.W. (A. McGraw)
Electromonitomer, The (Adolph)
Field Day Tranquiliser, The (Garrett)
Fox Vox Adapter, The (Fox)
How to Get Rid of the Other Fellow's Key Clicks (McCoy)
How to Make a Sidsniper (Sones)
Improved Keying and Drive for the DX-100 (H.K.)
"Magikse", The (Thornwall)
Screen Protection and More (Evans)
Synchro-Multivibrator Electronic Key, A (Campbell)
"Ultimatic" - Transisterized, The -- Part I (Kanda)
Universal Control System, A (Perksin)
Use of Bug Key as Sidsniper (H.K.)

MEASUREMENTS AND TEST EQUIPMENT

Ball-Point Test Probes (H.K.)
Calhode-Ray Transmitter Monitor, A (Oxeway)
Dummy Load Off the Mind, A (Howard)
Frequency Spotter (H.K.)
Hoop Ruler (H.K.)
Lecher Wires (H.K.)
Measure Cell Q (Strandlund)
Meter Reading by Sound (Blaney)
Modulating the Grid-Dip Oscillator (H.K.)

December, pages 51-53
Broken Tap Remover
Coax-To-Terminals-Strip Adapter
Earphone Cover Pads
Magic-Eye Tube Hint
Meter Safety
Noise Limiter for Hybrid Receivers
Popping Up the SPARC Transceiver
Portable Mast Holder
Reseal Broken Transistors
Bottling Up Chemical Fumes
Transistor Gain Checker
Use of Bug Key as Sidsniper
12-Volt System for Volkswagen
MISSCERNOUS — GENERAL

Amateur and the Army, The (Cook) .................. 58, Nov.
Annual DXCC Membership Listing .................. 109, Dec.
California Mobilebde, 2nd Annual Announcement .................. 57, Apr.
Results .................. 78, Aug.
Console for the Home Station, A (Alexander) .................. 48, July
Edison Award to W4ABU .................. 92, Apr.
Hear That Meter Reader? (Richardson) .................. 162, Aug.
Home-Built Stations • 60, 61, Feb.; 78, May; 73, Oct.; 63, Nov.
Sudden Death .................. 10, Nov.
Voice of America Amateur Radio Program .................. 15, July
Word Puzzle, A .................. 156, Aug.
10-Minute Transmission Reminder (H&K) .................. 55, Nov.
100 Years of Army Signals (Rexford) .................. 11, June

MISSCERNOUS — TECHNICAL

After Sungloos — What? (Chambers) .................. 68, Mar.
Feedback .................. 29, June
Aluminum Eyebcols Make Good Ferer Medicine (Howard) .................. 49, Sept.
Amateur Color Television (Shadbold) .................. 13, Sept.
Amateur IRTY in Europe (Gee) .................. 12, Sept.
Amateur V.L.F. Observations (Johnson) .................. 50, Mar.
Antenna Patterns from the Sun (Henry, Kirchner) .................. 11, July
Rottling Up Chemical Fumes (H&K) .................. 51, Dec.
Break Tape Remover (H&K) .................. 32, Dec.
Compression Tuning in the V.F.P. Range (Sargent) .................. 16, Oct.
Distilled Water (H&K) .................. 51, Feb.
First Amateur Transatlantic Picture Transmission .................. 75, Mar.
Hams on Ice (Meilen, Williams, Milner) .................. 11, Jan.
Hints and Kinks
Beeswax Substitute .................. 61, Sept.
Crystal Saver .................. 49, Feb.
Distilled Water .................. 51, Feb.
Farm Catalog Items .................. 41, June
Formula Aid ........................ 48, Mar.
Handy Tube Puller .................. 61, Sept.
Improving Booster Performance .................. 50, Feb.
Insulating Paint .................. 61, Sept.
Lear Skinny for Teens .................. 46, Mar.
Liquid Tape .................. 41, June
Miniductor Taps, 41, Aug.
Nut Starter .................. 50, Feb.
Oatmeal Coffee Filter .................. 61, Sept.
Safety Mat .................. 61, Sept.

How About a JUNKtion Box? (Howard) .................. 77, Sept.

How to Solve a JQXTion Box? (Stark) .................. 23, June
How to Stabilize Your Transmissioned Equipment (Boekee) .................. 43, Sept.
Junk-Box Magic (Morgan) .................. 100, Sept.
Lace That Wiring (Rosenbaum) .................. 38, July
Measuring Coil G (Sandland) .................. 36, Nov.
Meter Safety (H&K) .................. 52, Dec.
More on Homemade Transformer Design (Macarea) .................. 30, Nov.

Now Apparatus
Anticn Kol, The .................. 47, July
Tubex Quad Foundation Kit .................. 49, June
Edystonw Slow-Motion Drive .................. 17, Apr.
Elcno Gunchoke .................. 43, Jan.
Millie Sepak-Mike .................. 32, May
New Miniaturized Variable Capacitors .................. 77, Nov.
Sivon—One Chaos Punch .................. 19, May
Vibroplex "Vibor—Keyer" .................. 47, Feb.
Preventive Maintenance (Joe Smith) .................. 22, Mar.
Quxt Quax .................. 45, Jan.; 22, Feb.; 70, Mar.; 41, April.
48, May; 77, Nov.; 74, Dec.

Radioteletype Conversion from Receiver l.F. (J. McCoy) .................. 32, Jan.
Feedback .................. 54, Mar.

MOBILE

California Mobilebde Results, 2nd Annual .................. 75, Aug.
Design and Construction of Transistor Power Converters (Teta) .................. 46, Apr.
Feedback .................. 49, Sept.
Extra Coverage on 20 with the KWM-4 (H&K) .................. 40, Aug.
Low-Frequency Mobile (Noble, Pratt) .................. 49, May
Mobile Logging Tips (H&K) .................. 51, Feb.
Multi-Emer M1070 Power-Supply Notes (H&K) .................. 60, July
Quietion Mobile Transistor Circuits (Duncan) .................. 37, Feb.
Transistor v.f.o. with Linear Tuning (Arnold) .................. 29, Mar.
Two-Board Mobile Station (Leslie) .................. 26, Oct.
Two-Meter F.M. for Noise-Free Local Communications (Ansgar) .................. 33, July
12-Volt System for Volkswagen (H&K) .................. 51, Dec.
12-Volt 60-Watt Transistor Modulator, A (Harper) .................. 46, June
50 Watts — Mobile (Sulmen) .................. 19, July

MODULATION

(See Audio-Frequency Equip. & Design)
OPERATING PRACTICES
Critique on DXing, A (Tapas) .......................... 148, Aug.
How to Win the ARRL V.H.F. Sweepstakes (Kasper) 52, Aug.
On Working We (Kensler) .................................. 54, Aug.
Flea for Dignity, A (Silkowski) 59, Feb.
So You Want to Win a Contest (McClennon) 55, Jan.
Those Crowded W1AW Code Practice Frequencies (Benett) 82, Dec.
Working DX (Davies) .................................. 56, Feb.

POWER SUPPLY
Design and Construction of Transistor Power Converters (Tet.) 46, Apr.
Feedback .............................................. 49, Sept.
Field Day Tranquilizer, The (Garrett) 29, Apr.
More on Homemade Transformer Design (Marzona) 30, Nov.
Portable Kilowatt Power Supply, A (Jennings) 18, Aug.
Transistor Power Supply (H&K) .................................. 83, May
Variable A.C.-D.C. Power Supply (H&K) 51, Feb.

RECEIVING
Build Your Own Receiver? (Greenlee) 19, Mar.
Coax-to-Terminal-Strip Adapter (H&K) 51, Dec.
Complete 80-Meter C.W. Station Using Surplus Units (Cubanine) 27, June
Crystal-Controlled Converter for 14 Through 28 Mc. (McCoy) 16, July
D.F. Loop for 75 (Marshall) 38, June
Direction Finding Loop for V.H.F. .................................. 82, Sept.
Double-Conversion Amateur Band Superheterodyne (Lamann) 11, Feb.
Earphone Cover Fad (H&K) 51, Dec.
For the Command Receiver (McCoy) 45, Dec.
HBR-16 Notes ........................................... 35, Apr.; 44, May; 83, June
High-Pass Filter for the Ham Receiver (Baard) 38, Nov.
I.F. Noise Limiter (Stiles) .................................. 16, June
Improved Audio-Driven A.C.C. Circuit, An (Woodis) 29, Sept.
Improved Selectivity for Older Receivers (Palmer) 26, July
Low-Frequency Parametric Amplifier (H&K) .................................. 61, Sept.
More Sweep Voltage for the Electronic Eyeball (H&K) 55, Jan.
N.H.F.M. With the NC-300 (H&K) 41, June
Noise Limiter for Hybrid Receivers (H&K) 53, Dec.
Rivistor as a R.F. Amplifier at 144 Mc. 38, Sept.
Popping Up the SPARC Transceiver (H&K) 33, Dec.
PEJ-1, The (Lee) ...................................... 39, Sept.
Feedback .............................................. 77, Nov.
Poor Man's Q Multiplexer, A (McCoy) 49, Mar.
Quieting Mobile Transistor Circuits (Dunlap) 27, Feb.
Radiotelegraphic Conversion from Receiver I.F. (J. McCoy) 32, Jan.
Feedback .............................................. 54, Mar.
Radiotelegraphic Reception by Tone Conversion (J. McCoy) 11, Dec.
Self-Contained Portable Station for 50 Mc. (A, Tilton) 11, Mar.
Feedback .............................................. 15, May; 40, July
Single-Crystal Converter Covering 5 Bands (Gillespie) 34, June
Some New Ideas in a Ham-Band Receiver (Arnold, Allen) 35, May
Feedback .............................................. 25, July
S.S.B. Exciter Circuits Using a New Beam-Deflection Tube (Yance) 33, Mar.
Transistor Converter for 6 Meters (Meyer) .................................. 39, Dec.
Transistorized Handi-Talker, A (Engel) 20, Feb.
Tuning (S)-Meter Circuits (Tepper) 29, Aug.
Two-Band Coverage With the HC-454 (Beavers) 35, Jan.
Two-Meter F.M. for Noise-Free Local Communication (Aznarad) 33, July
Using a Broadcast Set for Amateur Band Reception (McCoy) 18, Apr.
Using Dynamic Speakers (H&K) 54, Jan.
Using the 7300 in the HBR-16 (Filipczak) 36, Dec.

RECENT EQUIPMENT
Aircon Converters ........................................... 45, Aug.
B & W Transistor Power Converters 46, Aug.
Chippawa Linear Amplifier and Power Supply, The 41, July
Drake 2-A Receiver, The .................................. 43, July
Globe Electronics "Deluxe" Transmitters 43, June
Genet GSB-101 Linear Amplifier 45, Aug.
Hallcrafters HA-1 Electronic Keyer 44, Nov.
Hallcrafters HT-37 Transmitter 39, Mar.
Hallcrafters SX-111 Amateur-Band Receiver 42, May
Hammarlund HQ-100 Receiver, The 42, June
Hammertone 45, July
Hammarlund HX-100 Transmitter 45, Oct.
Heathkit Mobican Transistor Receiver 33, Dec.
Heathkit Mobile Equipment 41, Apr.
Heathkit Ten-Meter Transceiver 46, Nov.
Johnson Viking GN2 Thunderbolt 46, Jan.
Knight-Kit Grid-Dip Meter 42, Mar.
KL-1 Amplifier, The ...................................... 41, July
KS-1 Power Supply, The .................................. 41, July
Mars Thunderbird Mobile Transmitter 41, Mar.
Transon Mobile Gear 43, Aug.
Tranquelec 43, Aug.
Voxbox ............................................... 44, Aug.
XC-2 Crystal-Controlled Converter Kit for 3 Meters 47, Sept.

REGULATIONS
G. W. Segments on 6 and 2 59, June
 FCC Written Exam Procedure Changing 54, July
Haitian 3rd Party Traffic 68, Mar.
ITU Ban List 69, Dec.
Montana Exam Points 67, Sept.
Panamanian 3rd Party Traffic 69, Dec.
Temporary Use of Amateur Frequencies 78, Nov.
Which Call to Sign 9, Aug.
14-Me. Phone Expanded 68, Mar.
14-Me. Phone Order 68, Mar.

SINGLE SIDEBAND
Adding Squelch to the Heathkit VX-1 (H&K) 55, Nov.
"Dr. Loudenboom" (Bergen, Bishop) 37, May
Fox Vox Adapter, The (Fox) 18, Nov.
High-Frequency Crystal Filters for S.S.B. (Flaney) 38, Oct.
High-Level Balanced Modulator for D.S.B. (Rockafellow) 22, Apr.
"Imp" — a 3-Tube Filter Riz, The (Galeski) 11, May
More Beef for the "Imp" (Galeski) 11, Nov.
Some Notes on the "Side-Band Package" (White) 48, Febu
S.S.B. Exciter Circuits Using a New Beam-Deflection Tube (Yance) 33, Mar.
Feedback .............................................. 77, Nov.
S.S.B., on 144 Mc. with the T-23/ARC-5 (May) 20, May
S.S.B. Transceiver Modifications (Vester) 42, Oct.
S.S.B. With the 10h and Valentian (H&K) 51, Oct.
Stand-By Noise in the GSB-101 (H&K) 41, June
Talk-in on Frequency with the GSB-100 (H&K) 93, May
Using the Heathkit SH-10 with the Johnson Viking Valentian (H&K) 49, Aug.

TRANSISTORS
Blown Transistors (H&K) 60, July
Design and Construction of Transistor Power Converters (Teta) 46, Apr.
Feedback .............................................. 49, Sept.

December 1960 219
How to Stabilize Your Transistorized Equipment (Boelke) ......................................................... 43, Sept.
Portable Kilowatt Power Supply, A (Jennings) ................................................................. 16, Aug.
Quieiting Mobile Transistor Circuits (Dunlap) ................................................................. 27, Feb.
Remedies Broken Transistors (H&E) .................................................................................... 51, Dec.
Transistor Gain Checker (H&E) ......................................................................................... 52, Dec.
Transistor 2-Meter Transmitter-Receiver (H&E) .............................................................. 49, Feb.
Transistor Power Supply (H&E) .......................................................................................... 83, May
Transistor V.F.O. with Linear Tuning (Arnold) ................................................................. 29, Mar.
Transistorized Ham-Talkie, A (Eagle) ............................................................................... 20, Feb.
12-Volt 50-Watt Transistor Modulator, A (Harper) .......................................................... 45, June

**TRANSMITTING**

Apache Adjustments Made Easy (H&E) ............................................................................. 48, Mar.
Apache Transmitter Modification (H&E) .......................................................................... 54, Nov.
Case for Narrow A2. The (Snider) .................................................................................... 44, Oct.
Complete 80-Meter C.W. Station Using Simple Units (Cabanne) ................................... 27, June
Deluxing the ARC-5 Transmitter (Stuart) ......................................................................... 22, Sept.
"Der Loudenbouner" (Hergen, Bishop) ........................................................................... 37, May
Extra Coverage on 20 with the KWM-I ........................................................................... 49, Aug.
Frequency sr. Amplitude Modulation (Hadlock) ............................................................. 164, Oct.
KWS-1 Hint (H&E) ............................................................................................................. 48, Mar.
Magic-Eye Tube Hint (H&E) ............................................................................................. 92, Dec.
Meter Safety (H&E) ........................................................................................................... 92, Dec.
More Neat for the "Imp" (Galinski) ................................................................................... 11, Nov.
One-Tube Crystal-V.F.O. Input Circuit (H&E) ............................................................... 55, Jan.
Ranger Operating Convenience (H&E) ............................................................................. 51, Oct.
Reducing Stand-By Noise in the Viking Ranger (H&E) .................................................... 51, Feb.
Self-Contained Portable Station for 50 M., A (Tilton) ...................................................... 11, Mar.
Feedback .............................................................................................................................
Screen Protection and More (Evans) ................................................................................. 22, Oct.
Some Simple HT-32 Modifications (Goldwin) ............................................................... 34, Feb.
S.S.B. Exciter Circuits Using a New Beam-Deflection Tube (Vance) ................................ 33, Mar.
Feedback ............................................................................................................................. 77, Nov.
Stability with Simplicity (Haneltt) .................................................................................... 11, Oct.
Stand-By Noise in the GSB-101 (H&E) ............................................................................ 41, June
Table-Top Half Kilowatt, A (Coons) .................................................................................. 24, Jan.
Transistor V.F.O. with Linear Tuning (Arnold) ............................................................... 29, Mar.
Transistorized Handi-Talkie, A (Eagle) ........................................................................... 20, Feb.
Two-Meter F.M. for Noise-Free Local Communication (Aagaard) ................................ 33, July

Using the Heathkit SB-10 with the Johnson VikingVault (H&E) ..................................... 48, Aug.
V.H.F. Variable-Frequency Crystal Excitor, A (Soborsky) ............................................. 27, Nov.
818 in Grounded-Grid (Stengel) ..................................................................................... 40, Aug.

**TRANSMITTERS**

All-Band C.W. Transmitter for the Novices (McCoy) ...................................................... 32, Aug.
Complete Six-Meter V.F.O. Transmitter, A (Harrington) ............................................. 11, Apr.
High-Efficiency 2-Meter Kilowatt, A (Tilton) ............................................................... 30, Feb.
Feedback ............................................................................................................................. 35, Apr.
8J-9TA Transmitter, The (Perlitz) .................................................................................. 27, Aug.
Transistor V.F.O. with Linear Tuning (Arnold) ............................................................. 29, Mar.
50 Watts — Mobile (Symes) .......................................................................................... 19, July

**TVI**

Harmonics, Harmonics, Harmonics (McCoy) ................................................................. 16, May
Feedback ............................................................................................................................. 29, June
High-Pass Filter for the Ham Receiver (Baird) ............................................................... 38, Nov.
Low-Pass Filters and Spurious Radiations (Kuper) ......................................................... 43, Oct.

**V.H.F. AND MICROWAVES**

Antenna Patterns from the Sun (Bray, Kirchner) ............................................................... 11, July
Coast to Coast Via the Moon on 2996 Mc.1 (Tilton) .................................................... 10, Sept.
Communication on 1215 Mc. with the APX-9 (Tilton) .................................................. 31, Sept.
Complete Six-Meter V.F.O. Transmitter, A (Harrington) ............................................. 11, Apr.
Compression Tuning in the V.H.F. Range (Schwettman) ........................................... 16, Oct.
Direction Finding Loop ..................................................................................................... 82, Sept.
Experimental Transceiver for 5680 Mc. (Preschell) ...................................................... 11, Aug.
Featherweight Array for 50-Mc. Portable Work, A (Tilton) ......................................... 38, Aug.
Hams on Ice (Mellen, Wilkins, Milnor) ........................................................................ 11, Jan.
High-Efficiency 2-Meter Kilowatt, A (Tilton) ............................................................... 30, Feb.
Feedback ............................................................................................................................. 35, Apr.
High-Frequency Satellite Scatter (Soifer) ....................................................................... 36, July
Low-Frequency Parametric Amplifier (H&E) ................................................................. 61, Sept.
Notes on the Heath "Sixer" (H&E) .................................................................................. 30, Oct.
Nuriser as an R.F. Amplitfier at 144 Mc. ......................................................................... 39, Sept.
Project Moon Bounce (Ow, Harris) ................................................................................. 62, Sept.
Reducing the Noise Figure of Penetrate Amplifiers (H&E) ......................................... 82, May
Self-Contained Portable Station for 50 M., A (Tilton) ...................................................... 11, Mar.
Feedback ............................................................................................................................. 16, May; 40, July; 91, Dec.
S.S.B. on 144 Mc. with the T-26/ARC-5 (May) ............................................................ 20, May
"Tech" Special, The (McCoy) ............................................................................................ 17, June
Transistor Converter for 6 Meters (May) ........................................................................ 39, Dec.
Transistor Two-Meter Transmitter Receiver (H&E) .................................................... 49, Feb.
Feedback ............................................................................................................................. 54, Mar.
Two-Meter F.M. for Noise-Free Local Communication (Aagaard) ................................ 33, July
Using the Johnson Viking Valiant V.F.O. on Six and/or Two Meters (H&E) ................ 35, Nov.
Using the 90-Meter V.F.O. on 2 (Guest) ........................................................................ 34, May
U.H.F. Coaxial S.W.R. Bridge (Burhanu) ..................................................................... 30, June
V.H.F. Dummy Louis (Tilton) .......................................................................................... 28, Mar.
V.H.F. Variable-Frequency Crystal Excitor, A (Soborsky) ........................................... 27, Nov.
50- and 114-Mc. Reception at Low Cost (McCoy) ......................................................... 30, Nov.
INSTANT SSB—CW—AM—SELECTION WITH NATIONAL'S FERRITE FILTER* IN THE NEW NC-270

National's patented Ferrite Filter provides instantaneous selection of 5 kc, 3 kc, and 0.6 kc bandwidths plus 2.5 kc selectable sideband with no extra filters to buy! It's available only in National's new "Cosmic Blue" NC-270!

The compact high permeability construction of the Ferrite Filter provides an average "Q" of 500 at 230 kc. The higher filter frequency in the NC-270 means superior secondary image rejection—none of the blocking problems or spurious signals characteristic of receivers using very low intermediate frequencies. And—stable "IF Shift" selectable sideband means... the NC-270 does not rely on mixing oscillators to maintain zero-beat.

Make Sure You Check These Features Of The NC-270: 6 meter band included, (no converters to buy); sensitivity—1.5 uV for 10 db signal to noise ratio; product detector for SSB and CW; Bi-Filar T-Notch Filter with external depth control; built-in 100 kc calibrator; extreme mechanical and electrical stability; compact, modern styling—the NC-270 includes National's "Flip Foot" for maximum operating convenience... plus many other features.

Only *24.99 down**

Suggested cash price: $249.95. NTS-3 Matching Speaker: $19.95 (slightly higher west of the Rockies and outside the U.S.A.). **Most National distributors offer budget terms and trade-in allowances.

NATIONAL RADIO COMPANY, INC.  MELROSE 76, MASS.
A WHOLLY OWNED SUBSIDIARY OF NATIONAL CO., INC.
Export: AD AURIEMA, INC., 85 Broad St., New York,N.Y.
Canada: CANADIAN MARCONI CO., 830 Bayview Ave., Toronto 17, Ont.

*PATENT PENDING
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE
Beginning...

THE NEW AGE OF
THE ELECTRON TUBE

The Most Trusted Name in Electronics
RADIO CORPORATION OF AMERICA
Attention, All U.S. and Canadian Amateurs

How Best to Use our Bands?

Your Views on Frequency Usage, Please

The League's Board of Directors has voted (Minute 31, page 64 July '60 QST) "to conduct a study of desires of ARRL members as to the mode of usage of the amateur frequencies between 3.5 and 29.7 Mc." To determine your preference and operating plans and wishes, QST includes this insert and return post card this month. We request that you indicate your wishes for personal amateur operating on the card which is a part of this page. Please stamp and mail the card promptly to ARRL. Thus your desires in band use will become part of this official survey.

This information is primarily for ARRL Directors. Referring to the other side of this page: the data you put in column one on the card will show your current use of our bands. This will assist analysis and also help our Communications Department's planning in operational matters. Column two is used to show us how you would like to work in the upcoming months. Your column two report should reflect your desires or expectation to undertake any new projects or spend more time in one mode or another in the future. At the right of this second column write in your preferred future operating as to RTTY, a.m., s.s.b. or other (estimated figures, please). Your figures here should add so that the total for the different modes of work on each horizontal line exactly equals your column two estimate, opposite which the figures are written. Director Eaton, VE3CJ, asks that all Canadian amateurs return their cards to ARRL fully filled out also, the analysis of these to be in terms of the Canadian (DOT) assignments for the given bands under study.

— F. E. H.
1. In column one (1) show for each mode, on the line provided, the ESTIMATED PER CENT of your present total operating interest.

This may be one entry of 100% if you work entirely one band and mode. However, should your operating include various bands (e.g., for DX, rag chewing, traffic and v.h.f.), you need to estimate the percentage of each mode in the different bands used. You may even review your log for a fair period dividing the hours in each category to help you show percentages on the card. Example: You find that your log covers several sessions: 15 hours in all on your Section 3.5-Mc. traffic net, 32 hours of ragchews on 75 phone, 24 hours chasing 14-Mc. DX (c.w.) and 8 hours of v.h.f. mobile on 2 and 6 meters. Total 16 + 32 + 24 + 8 = 80 hours. This works out to support column one entries: 3.5 Mc. c.w. 20% (16/80); 3.5 Mc. phone 40% (32/80); 14 Mc. c.w. 30% (24/80); V.h.f. 10% (8/80).

2. In column two (2) show, by putting in another ESTIMATED PER CENT just how you would like to use your operating privileges as to bands and modes in the future.

If you expect to work more phone and less c.w., or vice versa, use different bands more, or install s.a.b. or RTTY soon, your plans and expectations should reflect this in the proper parts of the blank chart, and in column two. (A DX man may feel the lower frequency bands will deserve more of his operating time in the coming months — or, if you are going v.h.f., the chart should reflect your increasing time to be spent in that direction.)

3. Under MODES OR SPECIAL INTEREST you should detail the kinds of amateur operation you prefer in future operation.

Estimate your work by s.a.b., amplitude modulation, c.w., RTTY or other method. The "other" column is for any operation you would like to engage in (by estimated percentage) in case such does not come under standard column headings. A note under "Remarks" will show us what specialty you have in mind. Things like facsimile, slow-scan picture transmission or items you would favor, if regulations could provide, can be shown as such entries.

4. At the bottom of the form show your call, name, division, and kind of license so as to help us interpret your plans and take proper account of trends in interest that may be indicated in the study, results of which are to be reported to the Board. We want to hear from each Full Member. Let us hear from you soon. Thanks and 73.

---

Detach the postcard below.

Fill it out carefully.

Mail without delay.

---

In col. 1 below, I am indicating my current division of operating time, estimated per cent, by bands and modes, as now used in my on-the-air work. Then in col. 2 my desired future use by bands and modes. AT THE RIGHT of column two each col. 2 entry is broken down to show my wishes and preference as to MODES or the KINDS OF OPERATING INTEREST OR EQUIPMENT.

<table>
<thead>
<tr>
<th>BAND SECTORS</th>
<th>MODES OR SPECIAL INTEREST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Mc.</td>
<td>(%)</td>
</tr>
<tr>
<td>3.5</td>
<td>c.w. 100%</td>
</tr>
<tr>
<td></td>
<td>phone 100%</td>
</tr>
<tr>
<td>7</td>
<td>c.w. 100%</td>
</tr>
<tr>
<td></td>
<td>phone 100%</td>
</tr>
<tr>
<td>14</td>
<td>c.w. 100%</td>
</tr>
<tr>
<td></td>
<td>phone 100%</td>
</tr>
<tr>
<td>21</td>
<td>c.w. 100%</td>
</tr>
<tr>
<td></td>
<td>phone 100%</td>
</tr>
<tr>
<td>28</td>
<td>c.w. 100%</td>
</tr>
<tr>
<td></td>
<td>phone 100%</td>
</tr>
<tr>
<td>Above 50 Mc.</td>
<td></td>
</tr>
<tr>
<td>c.w./phone</td>
<td></td>
</tr>
</tbody>
</table>

Remarks: ........................................

My Call: ........................................

Class Opr's License ................................

ARRL Division ......................................

Signature ..........................................