March, 1949
40 Cents

QST

devoted entirely to

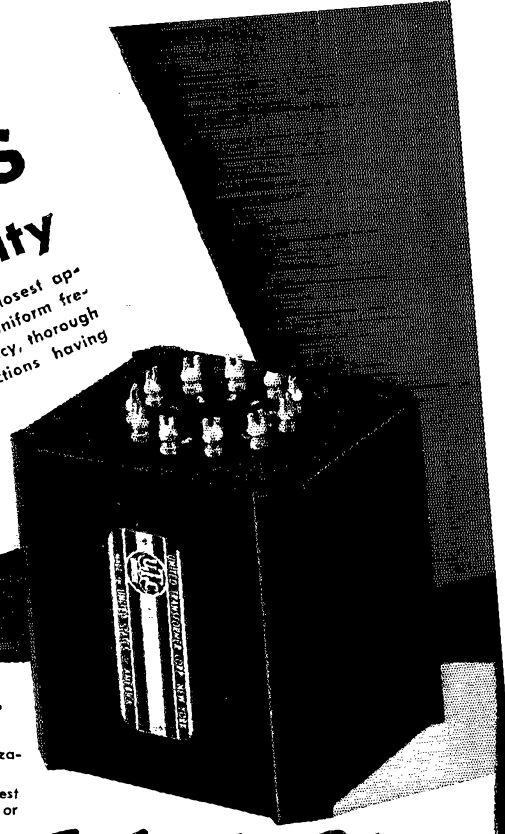
amateur radio

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

LS SERIES

The Ultimate in Quality

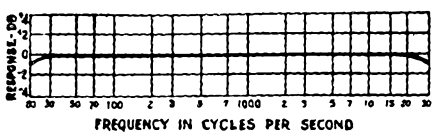
UTC Linear Standard Audio Transformers represent the closest approach to the ideal component from the standpoint of uniform frequency response, low wave form distortion, high efficiency, thorough shielding and utmost dependability. Wartime restrictions having been lifted, and UTC production running at full capacity, we now offer these transformers for immediate delivery.



UTC Linear Standard Transformers feature...

- **True Hum Balancing Coil Structure** . . . maximum neutralization of stray fields.
- **Balanced Variable Impedance Line** . . . permits highest fidelity on every tap of a universal unit . . . no line reflections or transverse couplings.
- **Reversible Mounting** . . . permits above chassis or subchassis wiring.
- **Alloy Shields** . . . maximum shielding from induction pickup.
- **Multiple Coil, Semi-Toroidal Coil Structure** . . . minimum distributed capacity and leakage reactance.
- **Precision Winding** . . . accuracy of winding .1%, perfect balance of inductance and capacity; exact impedance reflection.
- **Hiperm-Alloy** . . . a stable, high permeability nickel-iron core material.
- **High Fidelity** . . . UTC Linear Standard Transformers are the only audio units with a guaranteed uniform response of ± 1.5DB from 20–20,000 cycles.

For Immediate Delivery



Typical Curve for LS Series

Type No.	Application	Primary Impedance	Secondary Impedance	Max. Level	Relative hum-pickup reduction	Max. unbalanced DC in primary	List Price
LS-10	Low impedance mike, pick-up or multiple line to grid.	50, 125, 200, 250, 333, 500/600 ohms	60,000 ohms in two sections	+15 DB	−74 DB	5 MA	$25.00
LS-10X	As above	As above	50,000 ohms	+14 DB	−92 DB-Q	5 MA	$32.00
LS-21	Single plate to push pull grids Split primary and secondary	8,000 to 15,000 ohms	135,000 ohms; turn ratio 3:1 overall	+14 DB	−74 DB	0 MA	$24.00
LS-30	Mixing, low impedance mike, pickup, or multiple line to multiple line	50, 125, 200, 250, 333, 500/600 ohms	50, 125, 200, 250 333, 500/600 ohms	+17 DB	−74 DB	5 MA	$25.00
LS-30X	As above	As above	As above	+15 DB	−92 DB-Q	3 MA	$32.00
LS-50	Single plate to multiple line	8,000 to 15,000 ohms	50, 125, 200, 250, 333, 500/600 ohms	+17 DB	−74 DB	0 MA	$24.00
LS-55	Push pull 2A3', 6A5G's, 300A's, 275A's, 6A3's, 616's	5,000 ohms plate to plate and 3,000 ohms plate to plate	500, 333, 250, 200, 125, 50, 30, 20, 15, 10, 7.5, 5, 2.5, 1.2	20 watts			$28.00
LS-57	Same as above	5,000 ohms plate to plate and 3,000 ohms plate to plate	30, 20, 15, 10, 7.5, 5, 2.5, 1.2	20 watts			$20.00

The above listing includes only a few of the many units of the LS Series. For complete listing — write for catalogue.

United Transformer Co.

150 VARICK STREET • NEW YORK 13, N. Y.

EXPORT DIVISION: 13 EAST 40th STREET, NEW YORK 16, N. Y., CABLES: "ARLAB"

GL-8005 TRIODE

Typical operation, one tube (ICAS)

	Class C telephony	Class C telegraphy
Plate voltage	1,250 v	1,500 v
current	190 ma	200 ma
Driving power	9 w	7.5 w
Power output	170 w	220 w

That's the GL-8005, rating and cost-wise. Substantial plate input at a price that unzips timid wallets!

YOUR G-E tube distributor will be glad to tell you how small a sum *(about as much as for one 600-w-input tube)* buys *two* GL-8005's for push-pull operation . . . giving you:

1) A better-balanced circuit than with one tube for your final.
2) A circuit with which you can reduce second-harmonic radiation. This should be cut to a minimum in today's ham work.
3) Opportunity to purchase a "spare" for your shelf for half the investment otherwise tied up in an extra 500- or 600-watter.

As for power — a pair of GL-8005's has all you are apt to require, taking 600 w max input CW or 480 w phone *(ICAS)*. Frequency at this power is up to 60 mc, or well beyond the 6-meter band. Drive needs are low.

Primarily useful as r-f amplifier or final, the GL-8005 also serves as a good Class B modulator. Two in this service will produce a healthy 300 w of aduio output.

The tube has a 10-v heavy-duty filament. It's a husky, able to stand the gaff. It's a triode, so easy to apply and use. Investigate its good qualities, check the high value it offers . . . by visiting your nearby G-E tube distributor, or writing *Electronics Department, General Electric Company, Schenectady 5, New York.*

Series 2 in a listing, by areas, of tube distributors who can supply you with Ham News, G. E.'s bi-monthly magazine:

Albany, N. Y.: Fort Orange Radio Dist. Co.
Amsterdam, N. Y.: Adirondack Radio Supply
Binghamton, N. Y.: Federal Radio Supply Co.
Bridgeton, N. J.: Joe's Radio Shop
Brooklyn, N. Y.: Electronic Equipment Co.
Buffalo, N. Y.: Radio Equipment Corp.; Standard Electronics Dist. Co.
Camden, N. J.: Radio Elec. Service Co.
Ithaca, N. Y.: Stallman of Ithaca
Jamaica, N. Y.: Peerless Radio Dist. Co.
New York, N. Y.: Fischer Dist. Co.; Harvey Radio Co.; Milo Radio and Electronics Corp.; Newark Electric Co.; Radio Wire Television, Inc.; Sun Radio Co.
Newark, N. J.: Continental Sales Co.
Poughkeepsie, N. Y.: Electra Supply Co.
Red Bank, N. J.: Monmouth Radio Supply Co.
Rochester, N. Y.: Hunter Electronics
Syracuse, N. Y.: Onondaga Supply Co.; Syracuse Radio Supply Co.
Trenton, N. J.: Allen and Hurley
Utica, N. Y.: Langdon and Hughes Elec. Co.; Onondaga Supply Co.; Vaeth Elec. Co.
Watertown, N. Y.: Onondaga Supply Co.

(List as of Dec. 24, 1948)

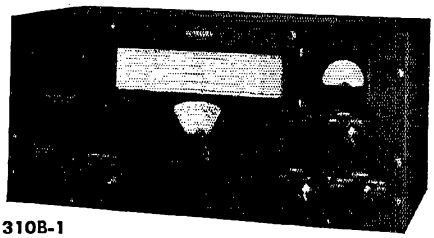
ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

GENERAL ELECTRIC

More contacts, more quickly, easily, with a . . . COLLINS PTO Exciter Unit

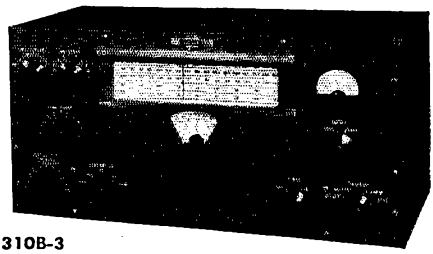
All these Collins exciters give you the flexibility of variable frequency, with the accuracy of calibration and remarkable stability inherent in the 70E-8A PTO around which they are engineered. The slide rule dials of both the 310B series and 310C series roughly indicate operating frequency, while their vernier dials read directly in kilocycles. See them at your Collins dealer's. If you don't know him write us for his name and address.

The 310B-1 is a versatile, self-powered unit with an input of 40 watts on all ham bands under 32 mc. It is bandswitching with the exception of the final amplifier, where plug-in coils are used. Output coupling is by means of a link in the plate tank coil. The tube complement consists of 1—6SJ7 PTO, 3—6AG7 multipliers, 1—2E26 r-f amplifier, 1—6SL7GT sidetone oscillator, 1—5R4GY H. V. rectifier, 1—5Z4 L. V. rectifier, 1—6H6 bias rectifier, 1—VR105 voltage regulator, 1—VR150 voltage regulator. Price, $190.00.

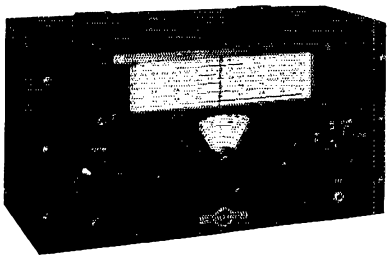


310B-1

The 310B-3 has a series-parallel tunable matching antenna network, of the universal type, which will match balanced or unbalanced antenna systems over a wide range of impedances. Otherwise it is identical with the 310B-1. It makes a fine standby transmitter, is excellent for spot frequency network and, because of its low power requirements, for emergency work. Also, it is unexcelled for the beginner. Later, when more power is called for, he has only to add the final amplifier stage. Price, $215.00.



310B-3



310C-1 and 310C-2

The 310C-1 exciter is a straightforward unit consisting of a 70E-8A and a multiplier, with an r-f output of approximately 80 volts rms across 40,000 ohms. Its output frequency range is from 3.2 mc to 4.0 mc. The output of the 310C-1 can be plugged into the crystal socket, or applied to the grid of an 807 buffer stage, providing crystal accuracy and stability with greater versatility than a large number of crystals would afford. Price, $85.00.

The 310C-2 is identical with the 310C-1, but with self-contained power supply. Price, $100.00.

COLLINS RADIO COMPANY, Cedar Rapids, Iowa

11 West 42nd Street, New York 18, New York **458 South Spring Street, Los Angeles 13, California**

QST

MARCH 1949

VOLUME XXXIII • NUMBER 3

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

OFFICES

38 La Salle Road
West Hartford 7, Connecticut

Subscription rate in United States and Possessions, $4.00 per year, postpaid; $4.50 in the Dominion of Canada, $5.00 in all other countries. Single copies, 40 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

Entered as second-class matter May 29, 1919, at the post office at Hartford, Connecticut, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized September 9, 1922. Additional entry at Concord, N. H., authorized February 21, 1929, under the Act of February 28, 1925.

INDEXED BY
INDUSTRIAL ARTS INDEX

—CONTENTS—

47TH YEAR OF CERAMIC LEADERSHIP

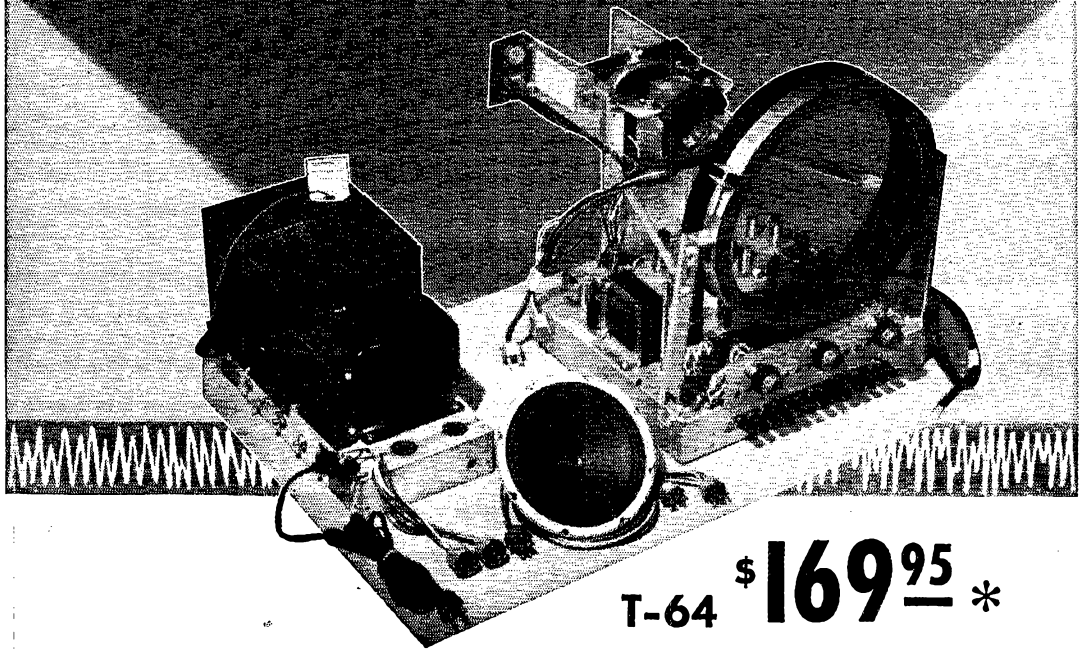
AMERICAN LAVA CORPORATION

CHATTANOOGA 5, TENNESSEE

SALES OFFICES: ST. LOUIS, MO., 1123 Washington Ave., Tel: Garfield 4959 • NEWARK, N. J., 671 Broad St., Tel: Mitchell 2-8159 • CAMBRIDGE, Mass., 38-B Brattle St., Tel: Kirkland 4498 • CHICAGO, 9 S. Clinton St., Tel: Central 1721 • LOS ANGELES, 324 N. San Pedro St., Tel: Mutual 9079 • PHILADELPHIA, 1649 N. Broad St.

hallicrafters

NEW *Custom Installation* TV!



T-64 $169.95 *

. . . for 10-inch or 12-inch tube *

Our *improved* 10-inch chassis with new Dual Focus switch; one position gives completely linear 56 sq. in. picture; the other, a big circular telescopic 64 sq. in. view for dramatic close-ups.

Chassis taken right out of our regular production, factory-wired, completely aligned and tested. Regular RMA 90-day guarantee applies to all parts. Complete with speaker and all tubes except CR tube. See your local parts distributor or write to the factory for data sheet S-220-Q.

* **Regularly supplied with frame for 10-inch tube. Frame for mounting 12-inch tube approximately $8.50, including all necessary parts.**

the hallicrafters co.

4401 W. Fifth Ave., Chicago 24, Ill.

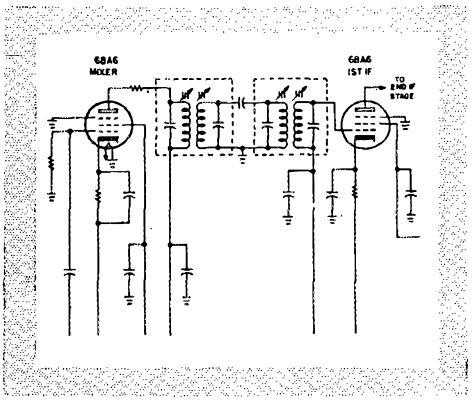
MANUFACTURERS OF PRECISION RADIO AND TELEVISION EQUIPMENT

Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club reports are also desired by SCMs for inclusion in *QST*. **All ARRL Field Organization appointments** are now available to League members. These include ORS, OES, OPS, OO and OBS. Also, where vacancies exist SCMs desire applications for SEC, EC, RM, and PAM. In addition to station and leadership appointments for Members, *all amateurs* are invited to join the ARRL Emergency Corps (ask for Form 7).

ATLANTIC DIVISION				
Eastern Pennsylvania	W3BES	Jerry Mathis	623 Crescent Ave.	Glenside Gardens
Maryland-Delaware-D.C.	W3BWT	Eppa W. Darne	132 Tennessee Ave., N.E.	Washington 2, D. C.
Southern New Jersey	W2OXX	G. W. (Bill) Tunnell	22 Wyoming Ave.	Audubon
Western New York	W2PGT	Harding A. Clark	753 Westmoreland Ave.	Syracuse 10
Western Pennsylvania	W3KWL	Ernest J. Hlinsky	509 Beechwood Ave.	Farrell
CENTRAL DIVISION				
Illinois	W9EVJ	Lloyd E. Hopkins	27 Lynch St.	Elgin
Indiana	W9FSG	Charles H. Conway	3335 College Ave.	Indianapolis 5
Wisconsin	W9RQM	Reno W. Goetsch	929 S. 7th Ave.	Wausau
DAKOTA DIVISION				
North Dakota	WØGZD	Paul M. Bossoletti	204 Polk St.	Grand Forks
South Dakota	WØNGM	J. S. Foasberg	509 Idaho Ave., S.E.	Huron
Minnesota	WØCWB	Walter G. Hasskamp	116 3rd Ave., S.W.	Crosby
DELTA DIVISION				
Arkansas	W5JIC	Marshall Riggs		Danville
Louisiana	W5VT	W. J. Wilkinson, jr.	Room 313, Jefferson Hotel	Shreveport
Mississippi	W5IGW	Harold Day	Route 2, Box 333	Greenville
Tennessee	W4QT	Ward Buhrman	1000 Overlook Ave.	Chattanooga
GREAT LAKES DIVISION				
Kentucky	W4CDA	W. C. Alcock	155 St. Mildred's Court	Danville
Michigan	W8SCW	Joseph R. Beljan, jr.	13959 Tuller Ave.	Detroit
Ohio	W8WZ	Dr. Harold E. Stricker	RFD 5	Marysville
HUDSON DIVISION				
Eastern New York	W2EOD	Fred Skinner	500 Wolfs Lane	Pelham 65
N. Y. C. & Long Island	W2KDC	Charles Ham, jr.	200 Harvard St.	Westbury
Northern New Jersey	W2ANW	Thomas J. Lydon	190 Mortimer	Rutherford
MIDWEST DIVISION				
Iowa	WØPP	William G. Davis	3rd St.	Mitchellville
Kansas	WØICV	Earl N. Johnston	624 Roosevelt	Topeka
Missouri	WØICD	Ben H. Wendt	RFD 10	North Kansas City
Nebraska	WØRQK	William T. Gemmer	1708 West 6th St.	North Platte
NEW ENGLAND DIVISION				
Connecticut	W1VB	Walter L. Glover	Glover Ave.	Newtown
Maine	W1GKJ	F. Norman Davis	RFD 1	Old Orchard Beach
Eastern Massachusetts	W1ALP	Frank L. Baker, jr.	91 Atlantic St.	North Quincy 71
Western Massachusetts	W1AZW	Prentiss M. Bailey	62 Dexter St.	Pittsfield
New Hampshire	W1AQQ	Gilman K. Crowell	15 Academy St.	Concord
Rhode Island	W1CJH	Roy B. Fuller	17 Ledge Road	East Greenwich
Vermont	W1NLO	Burtis W. Dean	P. O. Box 81	Burlington
NORTHWESTERN DIVISION				
Alaska	KL7IG	Charles M. Gray	Box 1237	Douglas
Idaho	W7IWU	Alan K. Ross	2105 Irene St.	Boise
Montana	W7EGN	Fred B. Tintinger	328 Central	Whitefish
Oregon	W7HAZ	Raleigh A. Munkres	Box 744	Baker
Washington	W7ACF	Clifford Cavanaugh	Route 1	Auburn
PACIFIC DIVISION				
Hawaii	KH6HJ	Dr. Robert Katsuki	1817 Wilhelmina Rise	Honolulu 17
Nevada	W7CX	N. Arthur Sowie	Box 2025	Reno
Santa Clara Valley	W6BPT	Roy E. Pinkham	1061 Fremont St.	Santa Clara
East Bay	W6TI	Horace R. Greer	414 Fairmount Ave.	Oakland 11
San Francisco	W6NL	Samuel C. Van Liew	215 Knowles Ave.	Daly City
Sacramento Valley	W6ZF	Ronald G. Martin	2638 13th St.	Sacramento 14
Phillppines	KA1AI	M/Sgt. Stanley J. Gier	14th Communications Sqdn. Command, APO 74, c/o Postmaster	San Francisco, Calif.
San Joaquin Valley	W6FKL	Ted R. Souza	3515 Home Ave.	Fresno 4
ROANOKE DIVISION				
North Carolina	W4CVB	W. J. Wortman	c/o Duke Power Co.	Charlotte 1
South Carolina	W4BQE/ANG	Ted Ferguson	3422 Rosewood Drive	Columbia 25
Virginia	W4KFC	Victor C. Clark	Box 73	Annandale
West Virginia	W8JM	Donald B. Morris	303 Home St.	Fairmont
ROCKY MOUNTAIN DIVISION				
Colorado	WØIQZ	M. W. Mitchell	1959 Uinta St.	Denver 7
Utah-Wyoming	W7NPU	Alvin M. Phillips	RFD 2	Ogden, Utah
SOUTHEASTERN DIVISION				
Alabama	W4GJW	Dr. Arthur W. Woods	411 Woodward Bldg.	Birmingham
Eastern Florida	W4FWZ	John W. Hollister	3809 Springfield Blvd.	Jacksonville 8
Western Florida	W4DAO	Luther M. Holt	223 W. Romana St.	Pensacola
Georgia	W4DXI	Clay Griffin	1557 Athens Ave., S.W.	Atlanta
West Indies (Cuba-P.R.-V.I.)	KP4KD	Everett Mayer	P. O. Box 1061	San Juan 5, P. R.
Canal Zone	KZ5AW	Everett R. Kimmel	Box 264	Gamboa, C. Z.
SOUTHWESTERN DIVISION				
Los Angeles	W6IOX	Vincent J. Haggerty	1017 Indio Muerto St.	Santa Barbara
Arizona	W7MLL	Gladden C. Elliott	39 North Melwood	Tucson
San Diego	W6GC	Irvin L. Emig	4852 Marlborough Drive	San Diego
WEST GULF DIVISION				
Northern Texas	W5CDU	Joe G. Buch	5234 Vickery Boulevard	Dallas
Oklahoma	W5AHT/AST	Frank E. Fisher	104 East 11th St.	Pawhuska
Southern Texas	W5HIF	Ted Chastain	3037 So. Staples St.	Corpus Christi
New Mexico	W5SMA	Lawrence R. Walsh	P. O. Box 1003	Los Alamos
MARITIME DIVISION				
Maritime (Nfld. & Labr. att.)	VE1DQ	A. M. Crowell	69 Dublin St.	Halifax, N. S.
ONTARIO DIVISION				
Ontario	VE3CP	Thomas Hunter, jr.	1774 Westcott Road	Windsor, Ont.
QUEBEC DIVISION				
Quebec	VE2GL	Gordon A. Lynn	c/o Radio Division Montreal Airport	Montreal, P. Q.
VANALTA DIVISION				
Alberta	VE6MJ	Sydney T. Jones	P. O. Box 373	Edmonton, Alta.
British Columbia	VE7HP	J. T. Hepburn	1149 Cortell Rd.	North Vancouver
Yukon	VE8AK	W. R. Williamson	Radio Range Sta., D.O.T.	Teslin, Y. T.
PRAIRIE DIVISION				
Manitoba	VE4AM	A. W. Morley	26 Lennox Ave.	St. Vital
Saskatchewan	VE5DW	J. H. Goodridge	c/o Canadian Pacific Air Lines	Prince Albert

Two Reasons for Superior Performance in the S-53



2.075 Mc IF . . . for high image rejection. Avoids images from other Ham stations within Ham bands. Possible with high-Q ironcore IF coils developed during the war. Pre-war coils of comparable Q were too cumbersome for such compact design. Extra coupling transformer gives added skirt selectivity.

MINIATURE TUBES . . . for lower minimum circuit capacitance, better high-frequency performance. The S-53 is the lowest priced set with all miniatures in RF and IF sections. A concrete example of Hallicrafters high engineering standards plus their endeavor to give you ever increased value.

S-53 $89.50

BEFORE YOU BUY, see and try the S-53. Compare its features, learn the thrill of its superior performance. Lift its top and examine its compact, precision-engineered chassis. You'll agree, here is advanced Hallicrafters design!

RANGE 540 kc to 31 Mc plus 48 to 54.5 Mc in five bands. 6-Meter Band calibrated on bandspread scale. Other features include series-type noise limiter, phono input jack, built-in speaker. 7 tubes plus rectifier.

the hallicrafters co.

4401 W. Fifth Ave., Chicago 24, Ill.

MANUFACTURERS OF PRECISION RADIO AND TELEVISION EQUIPMENT

THE AMERICAN RADIO RELAY LEAGUE, *INC.*,

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

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

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

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

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

Past Presidents

HIRAM PERCY MAXIM, W1AW, 1914–1936
EUGENE C. WOODRUFF, W8CMP, 1936–1940

• • • • •

Officers

President . . . . . GEORGE W. BAILEY, W2KH
New York, N. Y.

Vice-President . . . . . J. LINCOLN McCARGAR, W6EY
Oakland, California

Acting Secretary . . . . . A. L. BUDLONG, W1BUD
West Hartford, Connecticut

Communications Manager . . . . FRANCIS E. HANDY, W1BDI
West Hartford, Connecticut

Treasurer . . . . . DAVID H. HOUGHTON
West Hartford, Connecticut

• • • • •

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

Assistant Secretaries . . . . . JOHN HUNTOON, W1LVQ
LEROY T. WAGGONER, W1PEK, RICHARD L. BALDWIN, W1IKE
West Hartford, Connecticut

DIRECTORS

President

GEORGE W. BAILEY W2KH
1 East 79th St., New York 21, N. Y.

Vice-President

J. LINCOLN McCARGAR W6EY
66 Hamilton Place, Oakland 12, Calif.

Canadian General Manager

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

Alternate: Leonard W. Mitchell VE3AZ
6 Orchard Green Toronto 17, Ont.

Atlantic Division

WALTER BRADLEY MARTIN W3QV
1033 Arbuta Rd., Abington, Pa.

Alternate: Henry W. Wickenhiser, Jr. W3KWA
1112 State Ave., Coraopolis, Pa.

Central Division

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

Alternate: Wesley E. Marriner W9AND
624 College Ave., Dixon, Ill.

Dakota Division

GOODWIN L. DOSLAND . . . . . WØTSN
Moorhead, Minnesota

Alternate: Robert A. Kimber . . . . . WØBLK
Canyon Lake Rd., Rapid City, S. D.

Delta Division

VICTOR CANFIELD W5BSR
P. O. Box 965, Lake Charles, La.

Alternate: James W. Watkins W4FLS
220 N. Howell St., Chattanooga, Tenn.

Great Lakes Division

HAROLD C. BIRD W8DPE
114 Hickory Dr., Crescent Lake, Pontiac, Mich.

Alternate: John H. Brabb W8SPF
1321 Berkshire Rd., Grosse Pointe Park 30, Mich.

Hudson Division

JOSEPH M. JOHNSTON W2SOX
Avon-by-the-Sea, N. J.

Alternate: Gay E. Millus, Jr. W2NJF
170 Broadway, New York 7, N. Y.

Midwest Division

LEONARD COLLETT . . . . . WØDEA
Civil Aeronautics Administration
Box 776, Joplin, Mo.

Alternate: Alvin G. Keyes . . . . . WØKTQ
1201 Merchants Nat'l Bank Bldg., Cedar Rapids, Ia.

New England Division

PERCY C. NOBLE W1BVR
37 Broad St., Westfield, Mass.

Alternate: Clayton C. Gordon W1HRC
70 Columbia Ave., Providence 5, R. I.

Northwestern Division

R. REX ROBERTS W7CPY
110 W. Brennan St., Glendive, Mont.

Alternate: Allan D. Gunston W7GP
7209 Wright Ave., Seattle 6, Wash.

Pacific Division

WILLIAM A. LADLEY W6RBQ
200 Naylor St., San Francisco 12, Calif.

Alternate: Kenneth E. Hughes W6CIS
810 W. Orange Ave., So. San Francisco, Calif.

Roanoke Division

EVERETT L. BATTEY W4IA
2008 N. Cleveland St., Arlington, Va.

Alternate: J. Frank Key W4ZA
Box 707, Buena Vista, Va.

Rocky Mountain Division

FRANKLIN K. MATEJKA . . . . . WØDD
P. O. Box 212, Estes Park, Colo.

Alternate: William R. White . . . . . WØPDA
1263 Pearl St., Denver 3, Colo.

Southeastern Division

WILLIAM C. SHELTON W4ASR
527 Revilo Blvd., Daytona Beach, Fla.

Alternate: William P. Sides W4AUP
Fleming Road, Montgomery, Ala.

Southwestern Division

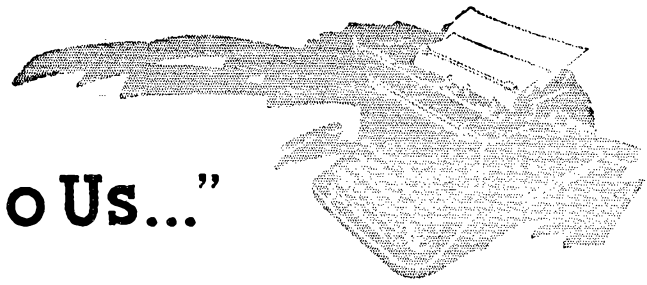
JOHN R. GRIGGS W6KW
3212 Grape St., San Diego 2, Calif.

Alternate: John E. Bickel W6NY
1834 Whittier Blvd., Whittier, Calif.

West Gulf Division

WAYLAND M. GROVES W5NW
P. O. Box 586, Odessa, Texas
W5NW at Humble Pipe Line Camp, Odessa

Alternate: David H. Calk W5BHO
7730 Joplin St., Houston 17, Texas



"It Seems to Us..."

The amateurs of the United States are about to regain some of their operating rights in the old 160-meter band!

As we write this, all details have been worked out and will come into force as soon as FCC can process the necessary orders. It is quite possible this will have been accomplished by the time these words appear in print.

What we will obtain, and the conditions under which we will be permitted to resume operation, are set forth in the latter part of the article on the Inter-American Regional Radio Conference on page 27 of this issue.

This plan reflects three and a half years of hard work and careful negotiation by your League on behalf of the amateur service, on the one hand, and the Federal Communications Commission, the Coast Guard, the Army, the Navy and other Government agencies on the other. Actually, it would perhaps be more accurate to say there is no "other hand" because one of the most heartening and significant features of this extensive study has been the unanimity of objective on the part of all concerned, a determined effort to see if somehow something couldn't be worked out. Amateur radio owes these agencies and their representatives a real vote of thanks.

We think it is appropriate at this time to outline briefly the steps which have preceded this final development. As we imagine most amateurs know by this time, the basic complicating factor in the whole picture was the development, during the war, of a secret long-distance navigational system for airplanes and surface vessels known as loran. It was put into operation at that time in our 160-meter band for the simple reason it was the only place in the spectrum it could go without a lot of costly delay; that band is by no means the ideal place for it from an operational standpoint. Conceived for wartime military use it subsequently turned out to be so essential for long-distance overseas flying that its retention became a matter of peacetime as well as wartime necessity and it is today a growing service both for aviation and for shipping. We do not propose here to argue its merits or demerits or alternative means of accomplishing the same end, but will summarize these aspects by saying that extensive and costly attempts to develop a substitute system have so far failed to produce results, that technical difficulties inherent to the system and physical problems of installation have so far prevented shifting loran to more suitable frequencies (150–200 kc.), and that until one or the other of these alternatives is possible it is the policy of the United States government, reflecting the view both of Government and non-Government interests, that loran must be continued as an essential safety service.

This, then, was the situation that confronted the League when, in 1944, it participated in the famous September hearing before FCC to begin the job of drafting a postwar frequency spectrum. At this hearing the League's position with respect to "160" was that amateurs should be restored the band, as set forth in the League's presentation for that hearing and reported at the time in *QST*.[1] However, when FCC issued its subsequent report on proposed allocations below 25 Mc., in May of 1945, it turned down this request and assigned 1800–2000 kc. to "navigation aids," meaning loran.[2] In its appearance a month later to comment on this proposal, the League, obliged to recognize the firm position of the United States in respect to loran, for the first time proposed the arrangement which is reflected in the development we chronicle this month; we pointed out that the characteristics of the system, as used in the United States, offer some hope of a sharing arrangement based on the fact that the loran system uses one frequency (1950 kc.) on one coast, and another frequency (1850 kc.) on the other coast. We suggested that it might well be practicable to permit amateurs on one coast to use the 100-kilocycle band not in use on that coast, and at that time we formally requested FCC to institute a study with the appropriate Government agencies to examine the feasibility of our suggested sharing arrangement.[3]

[1] p. 20, November 1944
[2] p. 15, July 1945
[3] p. 25, August 1945

The Commission, coöperative as always, then set up a special engineering study on this question, as a result of this request of the League; this was conducted between the engineering division of the Commission and the U. S. Coast Guard radio engineering department, under whose supervision the loran system is operated. Unfortunately, as reported by the writer to the special meeting of the League's Board of Directors in March, 1947, the results of this study, while never published, indicated that it would be inadvisable at that time to inaugurate such a sharing arrangement on any simple basis. We were at that time rapidly approaching the opening of the Atlantic City conference, and further study of the knotty problem was impossible because of the necessity for everybody concerned devoting their energies to preparations for the world conference. Nevertheless, almost on the eve of the conference itself, the League was responsible for getting the basic U. S. allocation proposal changed, with respect to this band, so that instead of the proposal for 1800–2000 kc. being only for loran, it was for navigation aids, amateur, fixed and mobile services. Admittedly only a foot in the door at that time, it reflected our feeling that sharing could eventually be worked out and our determination to pursue the subject later. To that extent, our Government went along with us.[4] As is now known, we were successful in having just exactly this assignment carried into the international table of allocations at Atlantic City.[5]

Following Atlantic City, we revived the subject in Washington circles and, beginning early in 1948, the studies were resumed. Complicated by technical difficulties, and a host of factors including considerations of national security, they went forward intensively through 1948 and have finally resulted in what you now see. We remark at this point, paraphrasing a famous statement, that never has so much hard work and negotiation been covered in so few words as in the previous sentence!

We want to conclude this report with some pretty plain talk. First of all, let there be no undue griping from amateur ranks over the conditions imposed upon us in this initial authorization. We know it's going to be tough on some of the amateurs in the states bordering the Gulf of Mexico to have to forego night operation altogether and we imagine there are amateurs elsewhere who will not be entirely happy about the power restriction indicated for them. Let us realize, however, that there is nothing arbitrary about these decisions; they reflect only what is deemed essential at this time in the interests of safety and security. Second, it can and should be said right here that our future on these fre-

(Continued on page 122)

[4] p. 45, April 1947
[5] p. 42, November 1947

FIRST TRANSCON TT QSOs REALIZED!

As we go to press, confirmation has been received of successful amateur two-way teletype communication and message exchange between W1AW and W6PSW, Bakersfield, Calif. The stations effected partial contact on January 30th, repeated more successfully on the 31st, and on February 1st rag-chewed and exchanged congratulatory-message traffic solidly. Earlier, on January 23rd, William T. Knott, W2QGH, Larchmont, N. Y., had been able to make rough copy of W6PSW's test transmissions. Stations participating in this notable work used 11 meters and the a.f.s.k. teletype system described by John E. Williams, W2BFD, in October, 1948, *QST*. *Left:* Tom McMullen, W1QVF, who operated W1AW TT installation during transcon; *right:* Johnny Agalsoff, W6PSW, scans 'print' from W1AW.

Parasitic-Array Patterns

Experimental Measurements on Parasitic Arrays

BY JOSEPH L. GILLSON,* W3GAU

THE work described here is an experimental determination of the radiation patterns of several horizontal parasitic arrays. Patterns are presented for a 3-element array adjusted both for maximum forward and minimum rear radiation at several heights, and for a 2-element array at a height of 5/4 wavelength with various lengths of the parasitic element between that of a too-short director and that of a too-long reflector.

• Here's an article that will interest every user and prospective user of a rotary beam. It shows, on a relative basis, where your power goes with respect to that all-important "angle of radiation."

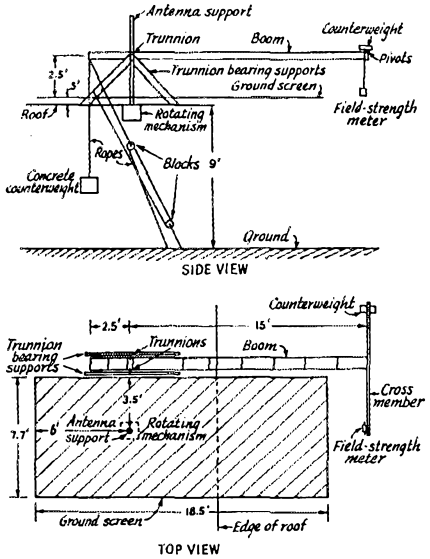


Fig. 1 — Physical arrangement of the test set-up for measuring antenna patterns. With this gear, field-strength measurements could be made in both the horizontal and vertical planes. The work described in the text was done with model antennas working in the 420-Mc. band.

The vertical patterns were determined as follows: A field-strength meter was moved up in small steps through a vertical arc of 90 degrees about a point on the ground below the test array, then the test array itself was rotated horizontally through 180 degrees, and finally, the field-strength meter was stepped down through the same 90-degree arc, thus completing a vertical semicircle in the antenna field. Readings were taken at each step.

The azimuthal patterns were determined by fixing the field-strength meter at some vertical angle and taking readings as the antenna was rotated horizontally. Thus the field-strength meter effectively moved through a complete circle in the antenna field.

The field-strength readings taken were plotted directly on polar-coordinate paper to give the radiation patterns in terms of relative field strength.

The radius of the field-strength meter arc was 15 feet, or about 6.5 wavelengths at the operating frequency of 427.95 Mc.

The most important of several theoretical limitations on the accuracy of the results is that a radiation pattern measured near an antenna differs from the true pattern (the pattern measured at a very great distance) as to the amplitudes and vertical angles of maxima and minima. It can be shown, however, that the greatest error in the results from this cause is less than 0.7 degree in the determination of the vertical angles of maxima and less than 8 per cent in the amplitudes of maxima.

Measuring Set-Up

The equipment used (Fig. 1) was located within, and on the roof of, a shed of wooden construction. A rectangular wooden frame 7.7 by 18.5 feet was mounted horizontally on the roof and covered with copper fly screening to form an artificial ground surface. A round wooden pole, projecting vertically through the ground screen, served as the antenna support and was rotated by means of a selsyn-driven gear train.

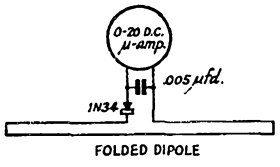


Fig. 2 — Field-strength meter circuit.

A light wooden boom, pivoted in a wooden frame, was mounted by the side of the ground screen with the pivots opposite the antenna sup-

* Mullin Lane, Wilmington 278, Del.

port pole. The boom was 17.5 feet long and the pivots were located 2.5 feet from one end. By means of a cast-concrete counterweight and a system of block and tackle the boom could be elevated from 0 to 90 degrees. The angle of elevation was measured on a large angular scale mounted with its origin on the line of the boom pivots.

At the far end of the boom and at right angles to it, a cross member was attached horizontally. The field-strength meter was suspended from this member in a free-swinging pivoted frame so as to be directly in front of the antenna support and the same distance below the cross member as the ground screen was below the boom pivots, thus making the center of rotation of the field-strength meter a point on the ground screen directly below the test array. Because the boom was not perfectly rigid, it was necessary to counterweight the cross member to keep it horizontal.

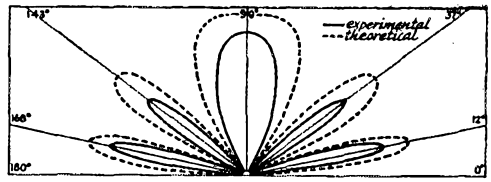


Fig. 3 — **Field-strength pattern of a half-wave dipole in the vertical plane perpendicular to the wire. This is one of a series of such patterns taken at different heights to check the accuracy of the measuring system. The theoretical pattern is shown by the broken curve for comparison.**

The field-strength meter, the circuit of which is shown in Fig. 2, was read by means of a telescope located on the roof 13 feet from the antenna

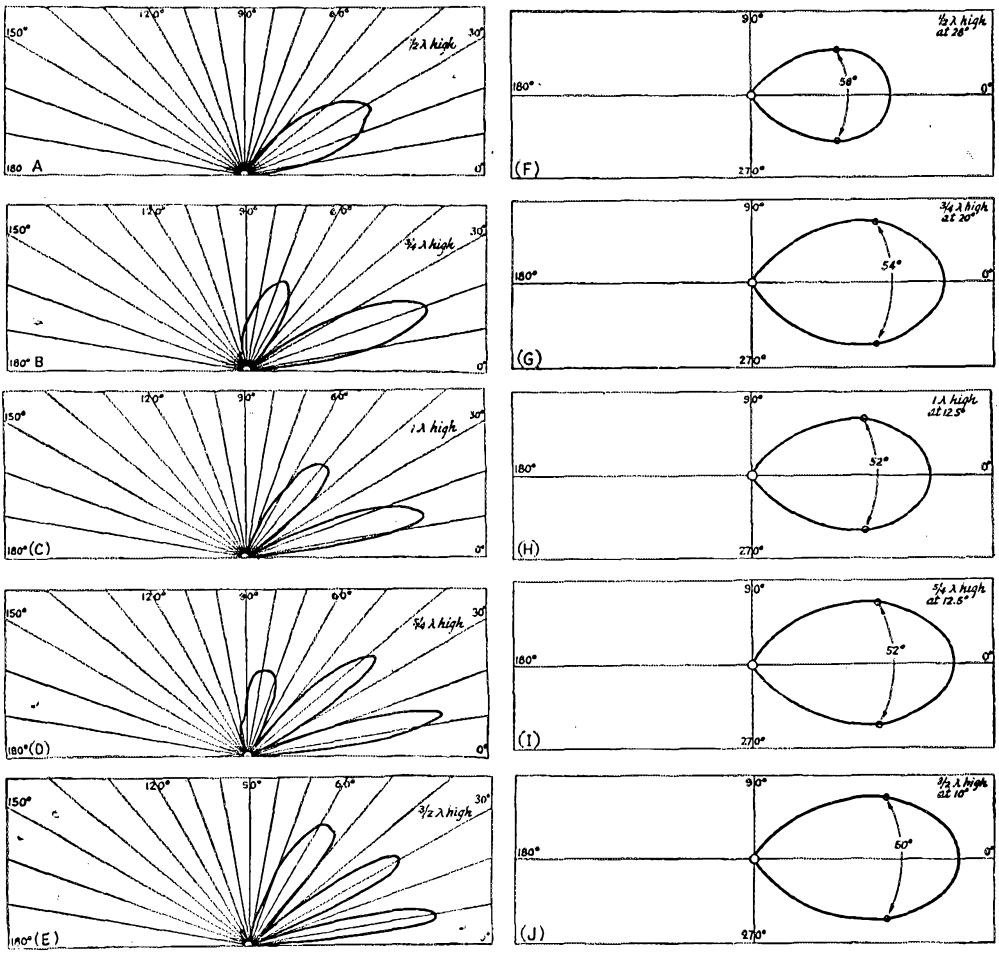


Fig. 4 — **Vertical (A to E, inclusive) and azimuthal (F to J, inclusive) patterns of a 3-element array, adjusted for minimum rear radiation. Spacing between antenna and reflector was 0.15 and between antenna and director 0.1 wavelength. The small circles on the azimuthal patterns indicate the half-power points. Comparison of amplitude between patterns taken at different heights is not significant.**

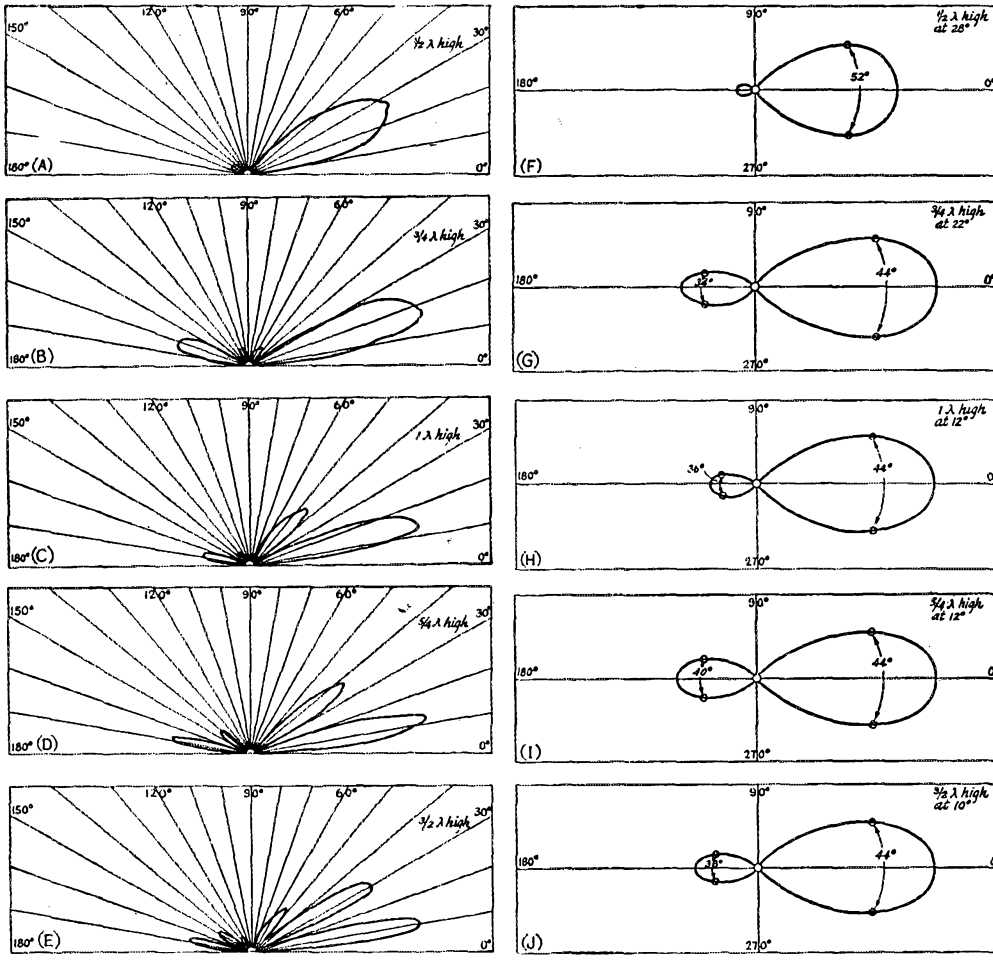


Fig. 5 — Same as Fig. 4 except that the array was adjusted for maximum forward radiation.

support, in the opposite direction from the field-strength meter. The actuating selsyn of the antenna rotating mechanism was also located at this position.

The transmitter was located inside the shed below the ground screen. It consisted of an SCR-522 driving an 832A tripler. The tripler output was fed to the test arrays through a 17-foot length of RG-59/U coax. To preserve the electrical symmetry of the antenna system, despite the use of the unbalanced feeder, a line balancer was connected at the antenna end of the line.

An approximate match was secured between the coax and the test arrays by the use of the folded dipole as the driven element in the arrays. The ordinary folded dipole was used in the 2-element and the 3-wire folded dipole was used in the 3-element arrays.

Quarter-inch brass tubing was used for both the driven and parasitic elements. For the latter, the tubing was cut about an inch shorter than the expected necessary lengths and the ends were reamed out to make a close-sliding fit with 2.5-inch lengths of brass-rod inserts. Cross pins were put through the tubing 3.5 inches from each end and a spring was placed between each insert and the pin in back of it. A short length of fishline was attached to the back of each insert and looped out through a guide at the middle of the tubing. Then a 15-foot length of fishline attached to the center of this loop provided a means of adjusting the length of the elements with the adjuster far enough from the test array as to cause negligible alteration of field.

The elements were mounted on the edge of, and at right angles to, a one-inch board a foot long which was provided with a clamp for holding it to the antenna supporting pole.

The linearity of the field-strength meter was checked by applying a low voltage at 60 cycles

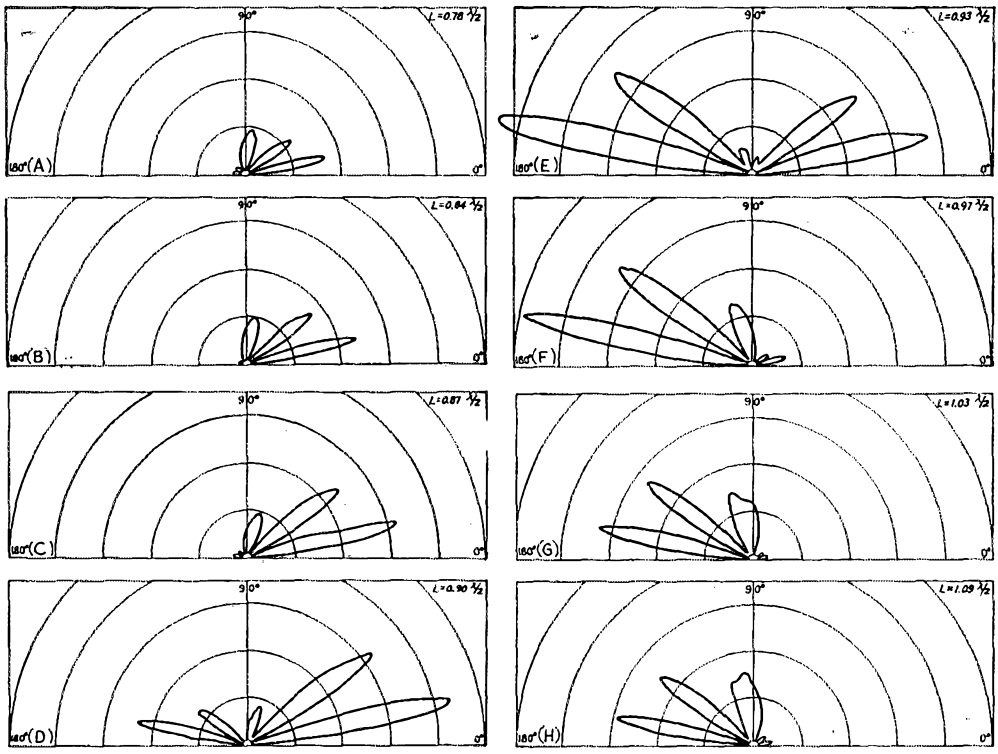


Fig. 6 — Vertical (A to H, inclusive) and azimuthal (I to P, inclusive) patterns of a 2-element array with 0.1-wavelength spacing, height 5/4 wavelength. *L* is the length of the parasitic element. These lengths have no general significance and should not be applied to low-frequency antennas where the length/diameter ratio of the elements

to the rectifier and microammeter and plotting variations in this applied voltage against the d.c. indicated by the meter. The relation was found to be linear down to about 1 microampere. While no calibration was carried out at the operating frequency, there is no reason to believe that linearity at 60 cycles should not indicate linearity at the higher frequency.

Radiation Patterns

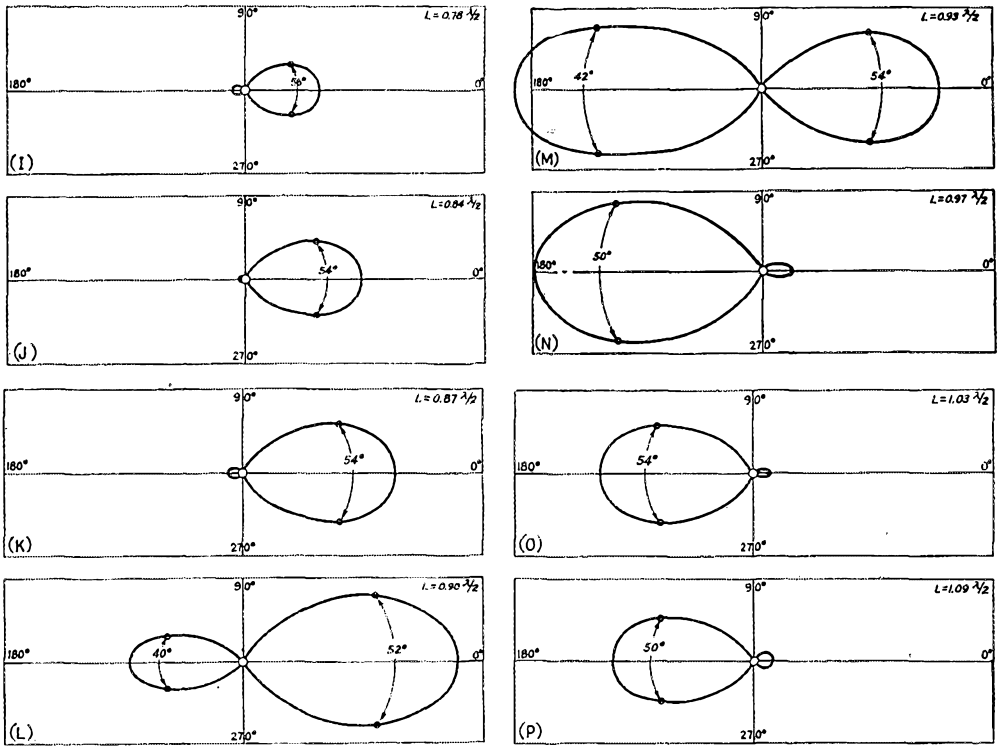
A check on the validity of the results was obtained by measuring the vertical patterns at right angles to a standard dipole at heights of 0.5, 0.75, 1.0, 1.25 and 1.5 wavelengths and comparing these patterns with the theoretical patterns (as found, for example, in the *ARRL Antenna Book*). Very good agreement was found to exist. Only one of these experimental dipole patterns is given here (Fig. 3).

During initial tests of the apparatus some marked irregularities were found in some of the dipole patterns. It was suspected that the concrete-boom counterweight, then mounted directly on the short end of the boom, was acting as a reflector. It was therefore removed from the boom and suspended as shown in Fig. 1 below the level of the ground screen. This smoothed out the irregularities considerably, though not completely. Further investigation showed that the material of the boom itself was acting to some extent as a reflector. However, since the experimental-dipole patterns now agreed very well, in general, with the theoretical patterns, no further changes were made in the apparatus.

The vertical patterns were all taken at right angles to the elements of the arrays. The azimuthal patterns should have been plotted, of course, on the surfaces of cones of semivertex angle 90 minus the angle at which they were taken. Nevertheless, they do show the relative field strength in any direction at the indicated angle.

It should be noted that while the adjustment for minimum rear radiation could be made with considerable precision, the maximum forward radiation adjustment could not be made so accurately because the tuning was broader. Consequently, the maximum forward-gain patterns were measured with an array adjustment that was probably not exactly the same in each case.

Comparison of the array vertical patterns (Figs. 4, 5, 6) with theoretical patterns of dipoles at corresponding heights gives little support to the widespread belief that a parasitic array has a



(Fig. 6 continued)
is different. The small circles on the azimuthal patterns indicate the half-power points. All azimuthal patterns were taken at a vertical angle of 12 degrees.

lower angle of radiation than a dipole. In the array patterns, the few maxima that occur at slightly different angles than corresponding maxima in the dipole patterns at the same height are, almost without a doubt, displaced by defects in the apparatus. Of course, since the array has a much larger proportion of its total radiation in its lowest forward maximum, it actually does radiate more power at lower angles than a dipole at the same height.

Sets of patterns like those given here for the 3-element array with spacing refl. — 0.15λ — ant. — 0.1λ — dir. were also made for a 3-element array with spacing refl. — 0.15λ — ant. — 0.2λ — dir., and for the 2-element array with 0.1λ spacing. So far as vertical angles of maxima were concerned, all six sets were the same. The wider-spaced 3-element array had a slightly better front-to-back ratio and slightly higher gain than the close-spaced, and the 2-element was poorer in both respects.

The vertical angles at which maxima occur in the patterns of the arrays mentioned here may be computed in the same manner as for the dipole. Assuming perfect ground,

$$\theta_m = \sin^{-1}\left(\frac{\lambda}{2\pi h}\sin^{-1} 1\right)$$

where

θ_m = angle at which field is maximum $\left(\leq \frac{\pi}{2}\right)$

h = height in wavelengths

Azimuthal patterns were actually taken at approximately the maximum of each maximum in each vertical pattern. The width (angle between half-power points) of the lobes in any one pattern was practically constant, though there was found a considerable (as much as ten degrees) and erratic difference in the widths of the patterns of the same array at different heights, particularly in arrays adjusted for maximum forward radiation. This erratic variation was probably caused, at least in part, by the fact that array adjustments were not precisely the same in each case.

The only adjustment made during the determination of the 2-element array patterns of Fig. 6 was to change the length of the parasitic element. It is seen that the total power in some of the patterns is very considerably greater than in others. The reason for this is not clear, and since no measurements were made of the power input to the antenna system or of the standing-wave

(Continued on page 104)

An Arizona Kilowatt

A Cool-Running Tetrode Rig for the C.W. Man

BY JOHN GIRAND,* W7JYZ

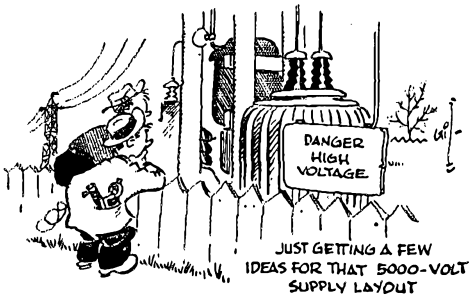
• Haywire may be all right for the low-power man, but when you start thinking about building for a kilowatt it's time to change from the clip-lead-and-bell-wire school and plan on doing the job right. Though the rig W7JYZ describes here is a kilowatt c.w. job, the ideas he expresses are worthy of your attention, whether you are c.w. or 'phone, low-frequency or v.h.f.

Just in case there are any old-line dyed-in-the-wool hams still around who don't know what single sideband, temperature inversion, phase modulation, and all those other two-dollar words mean, here is a rig for straight c.w., with no trick circuits, no frills and no gadgets but with plenty of what it takes — power.

It doesn't take an electrical engineer with a Master's Degree in radar to build it, or the President of the local bank to pay for it; and when you get through, you'll have a full gallon — really full. Sure, I know you can work the VKs with a 6L6 running 15 watts, but can you do it for a hundred *consecutive* nights? Having now settled the QRP argument so handily, we proceed to the designing and construction of the rig.

Design

Most of the c.w. fraternity abandoned the crystal long ago, except for net operations, and the VFO exciter that takes its place usually has some kind of a tube line-up ending in an 807 delivering 8 to 10 watts. Befo' de Wah, from a 10-watt start, it took four yards of breadboard-layout amplifiers to get up to a kilowatt, and the power supplies for said layout were a wonder to



behold. These days, with the new tetrodes, from 10 watts to a jugful is one easy step. The whole deal is only 42 inches high, and my 10-year-old junior operator can lift the power supply — with two hands. The only thing that really needs to be worried about is the Theorem of Electric Chairs which states that 3000 volts at one ampere will kill you awful dead, awful fast.

The writer of this treatise admits to having had no personal contact with 3000 volts, but from results with 440 volts data have been obtained which have been extrapolated to 3000, indicating that definite allergies exist among human beings for voltages in the higher ranges. Translated into English, that means 5000-volt insulation — *everywhere*. From here on, push-back wire is out. Starting right now, every joint or connection is wrapped with rubber tape, then friction tape, then doped up with goo. As of today, a "ground" means an electrical ground, carried all the way back to the power company's generating plant at Niagara Falls.

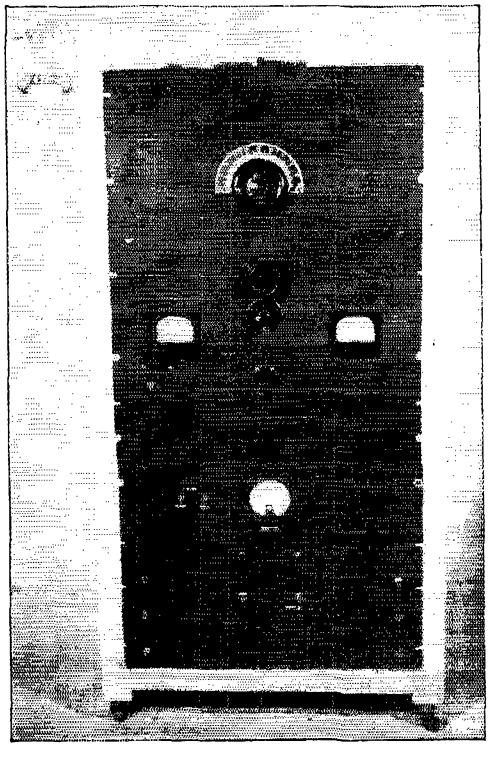
Another corollary obtained from the Theorem of Electric Chairs indicates the necessity for designing the unit h — 1 for stout. Although it is not suggested that the power supply be tested by dropping on a cement sidewalk from a third-story window, the fact remains that the power supply described was dropped on a concrete floor and the only damage discovered was a chip in the concrete. Mechanical rigidity is essential when handling voltages in the 3000 bracket. Components must be mounted with large-size bolts — with lock washers — and wiring must be supported on stand-off insulators. Go down to the power company's substation or switching yard and you'll get the idea. For this phase of the operation, put the *Handbook* away for a while and start reading the National Electric Code.

Electrically, from the meter in the service porch to the antenna on the roof, the unit will run at less than 25 per cent over-all efficiency, so to run a full kilowatt you have to take some four kilowatts off the a.c. line. Now, four kilowatts looks like an electric stove, which means a 220-volt three-wire grounded-neutral circuit right into the power supply, with a breaker mounted on the wall high enough so the harmonics can't reach it while you are down at the sweatshop mooning over the DX you are going to work. An overload relay in the negative plate lead is good insurance; with pentodes at $37.50 per, you don't kick them around like you would a surplus 807.

*% Johannessen & Girand, First National Bank Bldg., Central at Washington, Phoenix, Ariz.

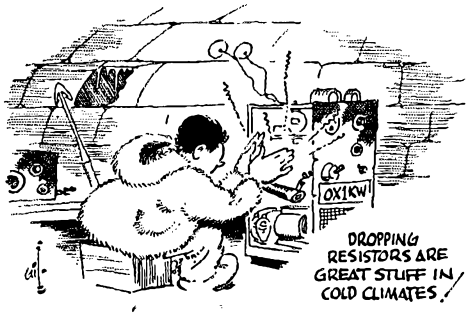
For tubes in the final, a pair of 4-125As would do the trick, but for an additional ten bucks each you can get the 4-250As which will give you peace of mind worth far more than the extra money invested. Reserve capacity, or call it safety factor; anyhow, tiz a grand and glorious feeling to be sitting behind a pair of 250As loafing along under a guaranteed full-kilowatt input.

The 250As take 500 volts on the screen at 140 ma., and you could do it with a dropping resistor. But a little quick mental figgering of I equals E over R will show that it will be a man-sized resistor and will warm up the shack some. In cold climates this would be a distinct advantage; in Arizona, not so good. Besides, when you buy a power transformer you want the power from it to go into the tubes, and not into heating up the shack. Electric heaters for warming a room are available at most appliance stores; dropping resistors are not designed for this purpose. This means a separate power supply for the screen. Just to be consistent, it was designed according to the Theorem of Electric Chairs (junior size).



Front view of the kilowatt amplifier and its associated power supplies. The two large knobs are the grid and plate tuning controls. The meter at the left is used for measuring the grid and screen currents and is switched between these two circuits by the knob adjacent to the meter. The other meter on this deck reads the final cathode current. The power-supply panel meter reads line voltage. At its left is the overload-relay adjustment and reset.

The grid circuit of the final is a bandswitching doodad that you get store-bought. You could use plug-in coils, but did you ever squeeze in back of



the transmitter, fumble around under the final chassis taking out a coil (famous last words: "I hope I turned the power supply off"), then try to put in the new coil upside down? Those plug-in coils under a chassis look pretty in the photographs, but did you ever own one?

Separate transformers are used for the 250A filaments. Reason: no room for one big filament transformer. Also, wiring is simplified and mechanical balance is achieved.

The final chassis is sealed with a bottom cover and a blower installed to air-cool the tubes. At only a kilowatt input the tubes might not require air cooling, the purpose of the blower being to impress the visiting ignorant and uncouth amateur who calls CQ fifty times then signs once. The voltmeter on the power-supply panel is for a similar purpose: the occasional 'phone man who drops in for a chat is filled with awe and goes home resolved to be a better amateur and start learning the code.

The design of the transmitter control circuits will depend a lot on the individual requirements; however, most c.w. men want a relay in the final power supply that can be controlled from the operating position, either manually or by break-in relay. For this reason a two-pole relay is installed to break both hot legs of the 220-volt primary; the ground lead must be continuous. Two switches in series, the first connected to the rectifier filaments and the second to the power-transformer relay, will insure that filaments are turned on before plate voltage is put on the rectifier tubes.

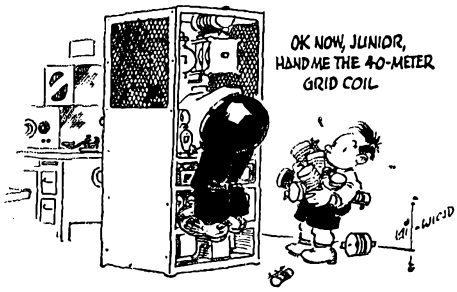
A cabinet interlock switch should be provided to keep the company that has your life insurance happy. This switch costs less than a dollar and may save your friends the extra expense of sending flowers that you won't be able to smell if the switch is omitted. When its purpose is properly explained, kind and loving relatives will be glad to donate the cost of the interlock switch just to keep you around for a few more years.

Metering for the final is easy. A separate meter

for the plate circuit is provided in the *negative* lead so it can be wired in and taped up. A meter for the grid and screen circuits is switched across resistors in the grid and screen leads — the switch must have a 1000-volt breakdown capacity. The 4-250A screen current must be controlled and the grid current set at proper value, so don't try to get along without this double-purpose meter.

Construction

Most articles on construction of gear of this type say placement of parts is not critical, wiring is straightforward, and assembly is standard



practice. Everything is just lovely and some night when you have an hour or two of spare time to kill you can go out in the shack and build yourself a kilowatt transmitter. Phooey! Building a kilowatt is a job with a lot of hard work in it and don't fool yourself before you start.

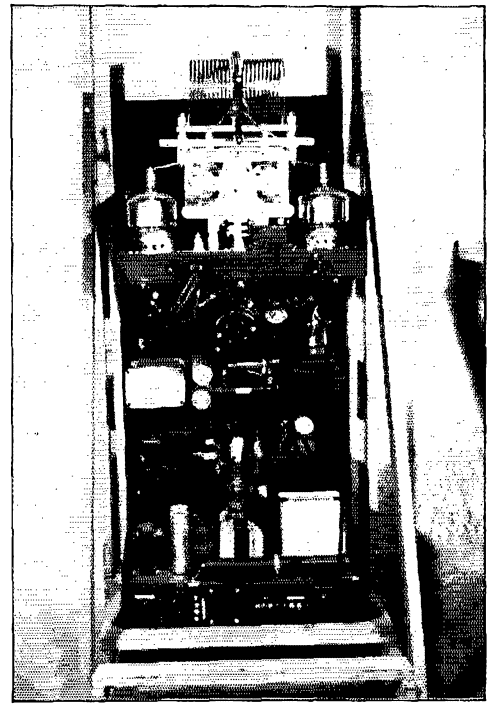
The first thing to do is to plan the project so you don't take your present rig off the air. If you do you'll be in a hurry to get the big rig on, and hurrying means botched up holes and haywire wiring. Take your time, do it right, and when you finish you'll have something you can be proud of.

It would be pretty nice to have a machine shop with a flock of drill presses, circle cutters, and the long list of tools given in the *Handbook* as needed in the amateur's workshop, but most c.w. men I know are interested in c.w. and not in machine shops and their tool list includes a pair of dime-store pliers, a pair of diagonal cutters that stopped cutting 7 years ago, a soldering iron won at the 1938 Hamfest, and an assortment of screwdrivers with broken points, missing handles and bent stems.

Therefore, the first item of expense to be charged to the kilowatt transmitter is a few tools. It can be done with a hand drill, but with ¼-inch chuck electric drills available for fifteen bucks, doing it with a hand drill is earning fifteen dollars the hard way. From a ¼-inch hole, a tapered reamer in Uncle Harry's brace will get up to any hole except the meter holes and the socket holes. A socket punch — the kind you twist the bolt with a wrench — is a necessity. The meter holes will have to be done at a machine shop, unless you have hours and hours of time to waste filing.

Most instructions on assembling units say that after the location of holes is marked on the chassis, the dimensions should be carefully checked before drilling. The writer has found this to be an unnecessary step. After carefully checking many hundreds of dimensional layouts before drilling, the writer finds that most of the holes don't fit anyway, and have to be reamed out a little. At first this is disconcerting and leads to high blood pressure, but after 25 years of radio the writer is able to mount a part requiring four bolts and find that three of the bolts would fit the holes and ream the fourth hole with aplomb. A Code Proficiency Certificate does not necessarily imply the ability to drill a hole exactly where it should be.

After all parts are mounted, the first wiring attempt should be made. About halfway through this it will be found that if the parts had been reversed and placed in another location the wiring would be much simpler, and more efficient electrically. Here is where the true c.w. man comes through with flying colors: tear out all the wiring, dismantle the components, throw the chassis away and start all over again. After all, your lost time doesn't cost you anything, and the chassis is only three bucks.



Back view of the Arizona Kilowatt. The bottom chassis contains the high-voltage supply and bias supply. The screen supply is mounted on a separate rack panel just above it. The kilowatt amplifier, with its sealed chassis and blower, is at the top.

The second wiring attempt will turn out better if you remember that wire has two fundamental characteristics: carrying capacity and insulation. Don't send a little boy to do a man's job; don't use No. 18 wire in a 110-volt circuit carrying 10 amperes. The safe carrying capacity of wires is given in the National Electric Code. It's the same story on insulation: a screen circuit carrying 500 volts should be insulated for 1000 volts. Consider this: when you get through building your kilowatt, you will be so tired out you won't want to build anything else for five years — and what's going to happen to that insulation five years from now?

So here you are: all put together and wired up; now boys, let's fire it up and work AC4YN.

But just a minute! This is the time to go fishing or deer hunting or take a week off. Just go away and forget it for a while. Then, when you come back, take the pair of 4-250As down to the bank Friday night and have them locked up until Monday morning. Spend the week end checking all the circuits.

Adjustment

First, if you haven't a multimeter, go borrow one, preferably from a 'phone man. While you are visiting him, you can lift a small but important part from his modulator when he is not looking. This will not only inconvenience him in causing him to hunt for the reason his modulator won't work, but will also take one 'phone man off the air, thereby giving room for ten c.w. men. Having obtained the multimeter, first check every circuit for grounds. Tie one of the test prods to a waterpipe ground, and poke the other prod into everything that looks like metal, the chassis, transformer cases, panels, all exposed metal on the front of the panel, and the circuits that are supposed to be ground circuits. If any point tests resistance to ground of more than one ohm, get to work and make a real *electrical* ground. The purpose of this is just to arrange things so you will die of old age instead of in the prime of your life. Remember the previously-quoted Theorem of Electric Chairs.

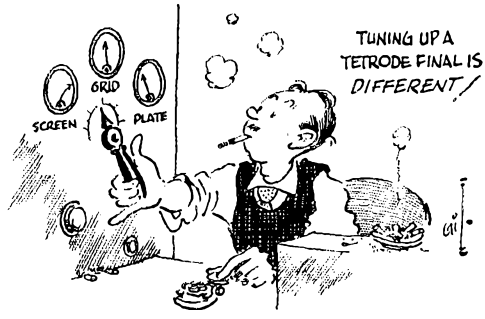
Now, it is necessary to undo that beautiful job you did wiring up the 220 primary of the plate transformer. Disconnect the 220, and make a temporary connection that will put 110 volts across the 220-volt primary of the plate transformer. This reduces the voltage on the plates of the tubes to half value, a perfectly lovely way to start off with new tubes in a new rig.

Before putting the tubes in, check all voltage points and make sure they are at rated voltage. Get this: for once in your life you have a rig that is going to run at *rated* capacity, and if the book says 500 volts on the screen don't try to whoop 'er up to 600. Also, 5-volt filaments last longer when run at 5 volts than when you accidentally put 110 across them.

Put the tubes in, then with a silent prayer, turn on the filaments and bias, crank up the 10 watts excitation and start tuning. The 4-250As require no neutralization, and if you have followed the layout shown in the photographs, or any similar layout that will effectively shield the grid from the plate circuits, no neutralizing adjustments will be required.

If you have never fooled around with any high-power screen-grid tubes the most difficult part of the tuning is in learning that there are *three* circuits that have to be adjusted simultaneously. An increase in plate loading will cause a *decrease* in screen current, other things being equal, and an increase in grid current causes an *increase* in *both* screen and plate current. Your job is to set *all three* at the values given in the *Handbook*. Old-line c.w. men who have five children will find this simultaneous adjustment a restful relaxation after trying to get the five dear little kiddies to bed. Others, who are not so accustomed to complete insanity, may find a few hours of this type of adjustment leading them gradually into the frustration which precedes schizophrenia.

The usual practice in starting triodes is to load lightly the final and tune the tank condenser to minimum plate current. With the screen-grid tube a light loading of the tank circuit can give



screen current dangerously high, and it becomes necessary to tune the amplifier fully loaded. The amplifier cannot be run at reduced power input by loosening the coupling in the final link. It will run correctly *only* at rated capacity; overloading results in too high a plate current, and underloading results in too high screen current.

Well, there you are; on the air with a full kilowatt.

Results

The articles in *QST* by amateurs describing gear they have built usually end up with a coupla paragraphs of brag about how they never could work so-and-so before but since using the above described what's-it they have a shoe box full of cards from there. Well, the kilowatt rig described

(*Continued on page 128*)

A Sensitive Crystal-Type Field-Strength Meter

Full-Wave Rectification for Improved Performance

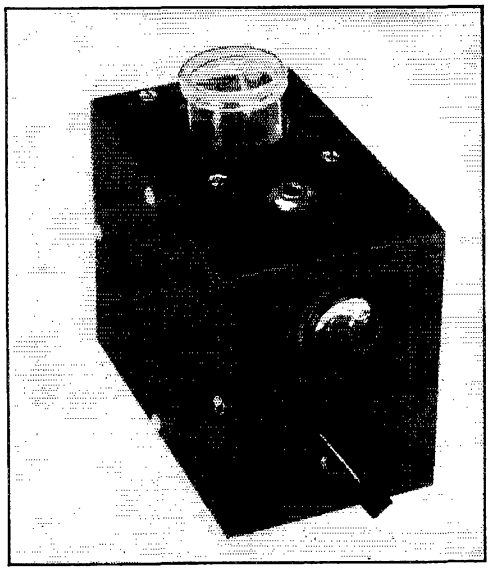
BY RUFUS P. TURNER,* K6AI, EX-W1AY

INCREASED sensitivity can be obtained in the crystal-type field-strength meter by employing two crystals in a full-wave circuit and a microammeter instead of the more-common milliammeter. Thus observations can be made with this tubeless instrument at a greater distance from the station transmitting antenna than is possible with single-crystal field-strength meters.

The complete circuit schematic is given in Fig. 1. Each half of the center-tapped secondary, L_2, is tuned separately by a section of the dual variable capacitor, C_1. A closed-circuit headphone jack, J_1, is provided for aural monitoring of a modulated signal, but headphones should be removed from the circuit when using the microammeter. Six plug-in coils are used to cover the range of 3.5 to 200 megacycles.

The device is built in a 3 × 4 × 5-inch steel box and is small enough to be held in one hand. The coil socket is mounted on a small piece of aluminum suspended from the top edge of the box on metal pillars at the corners. A clearance hole is cut for the coil so that it may be removed from the top. The tuning condenser is fastened to the front edge of the box. Since the writer did not intend to use the instrument for frequency measurement, the condenser was fitted with a plain knob, but a small dial such as the National type AM may be used if calibration is desired.

*919 East 116th Place, Los Angeles 2, Calif.



This field-strength meter, weighing only a few ounces, is small enough to be held comfortably in one hand. It requires no power supply.

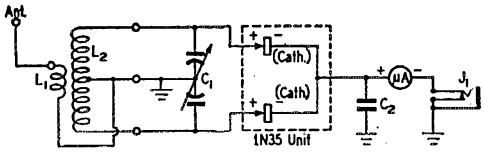


Fig. 1 — Circuit of the crystal-rectifier field-strength meter.
C_1 — 50-$\mu\mu$fd.-per-section midget variable.
C_2 — 0.0022-μfd. mica.
L_1, L_2 — See coil table.
J_1 — Miniature closed-circuit 'phone jack.
μA — 1-inch d.c. microammeter, 200-μa. scale (International Instruments, Inc., New Haven, Conn.).
1N35 — Dual-crystal-diode assembly — Sylvania.

The double-diode crystal unit is a Sylvania type 1N35, but two individual 1N34s may be substituted if preferred. The crystals are wired in between the tuning condenser and the headphone jack in front of the coil opening as shown in the side-view photograph. The microammeter is a one-inch instrument with a 200-μa. scale. It is mounted on the front edge of the box above the tuning control. The antenna terminal is a small feed-through insulator at the rear of the box.

The coils are wound on Amphenol type 24-4P

(*Continued on page 104*)

TABLE I
Dimensions for L_2, Fig. 1

3.5–7 Mc. — 86 turns No. 26 enam., close-wound.
7–14 Mc. — 36 turns No. 24 enam., close-wound.
14–28 Mc. — 20 turns No. 22 enam., 1 inch long.
28–54 Mc. — 12 turns No. 22 enam., 1 inch long.
50–100 Mc. — 5 turns No. 22 enam., 1 inch long.
100–200 Mc. — 2¼ turns No. 22 enam., 1 inch long.

L_1 in all cases is 1 turn No. 24 wound in space between halves of L_2 (see text).

An Inexpensive Sideband Filter

Notes on the Filter-Type Single-Sideband Exciter

BY DAVID O. MANN,* W3MBY

• That complicated and mysterious filter required to knock out one sideband in a single-sideband transmitter has stopped a lot of hams who would like to try the system. To the eternal credit of the art, however, a few ingenious amateurs have refused to be stopped, and this article tells how one of them did the trick with materials that anyone can get. There is also additional material on aligning a filter-type single-sideband exciter, using your receiver for the job.

ONE of the articles that heralded the latest revival of interest in single sideband appeared in the January issue of *QST* for 1948, where the details of constructing an exciter were presented by Art Nichols, WØTQK. Those of us interested enough to get beyond the first few paragraphs can recall the dismay upon arriving at the requirement of a 9- to 11.6-kc. bandpass filter, indicated by a suitably-labeled rectangle on the circuit diagram, Fig. 2, of the article. Aside from the filter characteristics given, and the suggestion that an excellent filter could be designed with the assistance of Terman's *Engineering Handbook*, the problem was promptly dismissed as a tough one. Without a reasonable amount of laboratory equipment this problem can be too great to solve, even if the apparent complexity of the circuit diagram doesn't sour one on the idea before that. Unfortunately, this single difficulty is probably responsible for the rather poor popularity among amateurs of this system of single-sideband generation, though, once constructed, an exciter of this type has some distinct advantages over other systems. As an example, once the filter is constructed, intelligent use of a standard communications receiver (something most amateurs have) is all the test equipment required to tune up the exciter. With the addition of a potentiometer, any desired amount of carrier can be inserted, and the resultant a.m. (A3 minus one sideband) signal used to establish contacts before switching to single sideband. Most of the necessary construction details, except the filter, were sufficiently covered in Art's original article. Changes in the exciter that were found to be advantageous by both the writer and "Butch" Mason, W3MGG, during the construction of three units, are included in this description, together with a tune-up procedure. This article is primarily intended to describe a bandpass filter suitable for use in the circuit and within the reach of even the relatively inexperienced amateur.

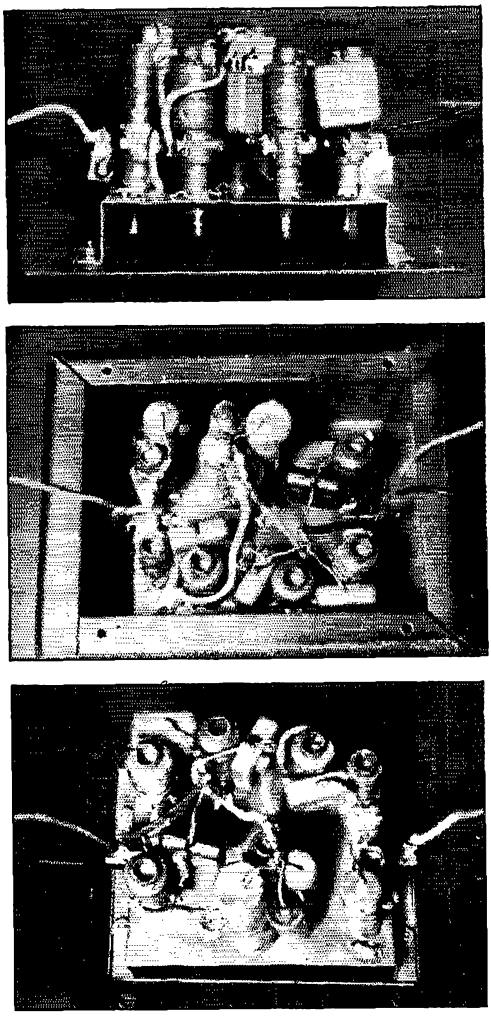
*Riva, Md.

The Filter

The filter details to be given are the outgrowth of difficulties in constructing the first exciter. The first filter design was successful, but a good filter wasn't built until after about three tries at getting suitable iron for the inductances. For small values of inductance, iron cores with good properties at high audio frequencies are available; however, they are usually costly and in the form of toroids that are not easy to wind without special equipment. The toroid is generally considered the best physical configuration for high-Q inductances, but if a filter is to be built by amateurs with a minimum of investment and test equipment, a compromise has to be made between performance and ease of construction. To make this clear, the toroid cores for the inductances were cut from the core of a television horizontal-sweep transformer by boring and slicing a cylindrical section of it. This material is called "sponge iron" and was tried because it was designed for use at 15 kc. It made some pretty good coils, but such construction isn't at all inviting and of course would be extremely difficult to describe to anyone else. One of the inductance values required in this first filter was 21 mh., much larger than the others for which the toroids were used. To make up this value using the toroid core would have required an enormous number of turns, and this started a search of all available coils having this larger inductance and a reasonable Q. An RCA standard television variable inductance, used in the horizontal-sweep circuit, was found to have a range of inductance between 5 and 21 mh., and a Q at 10 kc. of from 10 to 35. This served the purpose at the time, but it appeared to be such a handy component that various filter designs were computed, in an effort to find one in which it could be used throughout. Eventually a filter was built, tested, and even substituted for the first filter with acceptable results, but it was decided it could be better, and two more revisions resulted in the one described here. These little coils are called Horizontal Linearity Coils, RCA part No. 201R3, and they can be obtained for less

than a dollar. They contain about 1300 turns of No. 33 enamel wire, and to use them for the lower values of inductance in the filter it is necessary that they be pruned, to permit keeping the slug well in the winding and thus maintain a higher *Q*.

Another variable in the filter design is the image impedance (an impedance similar to the surge impedance of a transmission line), and the value of 200 ohms was selected because audio line transformers for this impedance are very reasonable and, because of unity transformation ratio, they will pass 10 to 13 kc. This is important, because audio components for this frequency range are usually tagged "Hi Fi" and priced accordingly. Fortunately they are not required in this case. The transformers listed in the diagram are quite reasonable and have been very satisfactory.



Three views of the homemade single-sideband filter. The top view shows how the components are mounted on a metal channel that is fastened to one side of the shield box. The other two views show the unit in and out of the box.

Construction of the Filter

The photographs show three views of the filter in a standard 3 × 4 × 5-inch box, as one method of assembly. It is almost obvious that no attempt was made to give the job a commercial look, but it does indicate the relative size to be expected when completed. Fig. 1 is a complete diagram of the filter and, though it may look complicated, it really isn't any worse than some of the clipper filters in common use today. The frequency range is not an old stamping ground, but the same techniques are still good and the measuring methods used shouldn't scare anyone away from tackling the job. In addition to the filter schematic, Fig. 1 contains a table dividing the filter into seven elements and illustrating the recommended method of making up the odd values of capacitance from standard condenser units. The center column of this table gives detailed information for altering the standard coils so that the required inductance can be set with the slug. Reasonably uniform results can be expected of a standard procedure, since several of these coils were measured and the individual variation was quite small.

The condensers are small enough so that the lugs of the coils can be used for tie points. It is suggested that each element be made up as shown and all mounted, leaving pigtails long enough to permit tune-up and interconnection. Before interconnection, each element is then tuned to series resonance at the frequency shown in the right-hand column of Fig. 1, using a test set-up as shown in Fig. 2. Since the values of standard condensers vary, setting the inductances compensates for the error by making the elements have the same resonant frequencies they would have if all components had exact design values. This also helps to compensate for any fixed error in the calibration of the oscillator used to tune the elements. To guard against errors, it is suggested that the best available type of condensers be used, i.e., a mica condenser can usually be expected to be more closely watched than a tubular paper during manufacture, but the paper condensers should be satisfactory for the larger sizes. Referring to the photographs, the elements were mounted on the "U"-shaped bracket by forcing the heads of the coil forms through the proper-sized hole (approx. ¼ inch). The elements were then tuned and, after bolting to the side of the box, the slug screw adjustments are protected from accidental change during wiring and final insertion in the box. The open face of the box can then be secured down on the chassis to enclose the filter and protect the components.

As a word of encouragement, there is no need

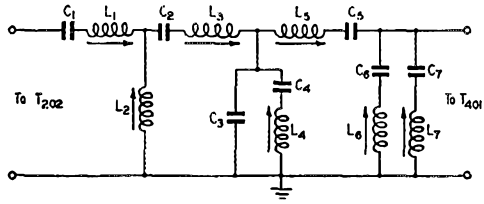


Fig. 1 — Circuit diagram of the single-sideband filter. The T_{202} and T_{401} references are to the original WØTQK nomenclature, which is carried throughout this article.
C_1–C_7 — Small mica, molded-paper or paper condensers — not electrolytic — combined as below.
L_1–L_7 — RCA Horizontal Linearity Coils (RCA No. 201R3) modified as described below.

Element	Make-up	Tune to
C_1 L_1 7.5 mh.	C_1–.02-μfd. paper L_1–Remove 400 turns	13 Kc.
L_2 2.9 mh.	L_2–Remove 650 turns	Tune with 0.1-μfd. condenser in series to 9.4 Kc.
C_2 L_3 18.8 mh.	C_2–.01-μfd. paper or mica L_3–No turns removed	11.6 Kc.
C_4 C_3 L_4 13 mh.	C_3–.11 μfd. (.1 and .01 in parallel) C_4–.02 μfd. L_4–Remove 200 turns (Save wire for L_6)	9.8 Kc.
L_5 C_5 17 mh.	C_5–.012 μfd. (.01 and .002 in parallel) L_5–No turns removed	10.9 Kc.
C_6 L_6 27 mh.	C_6–.01 μfd. L_6–Add 175 turns (wire from L_4) in same direction	9.6 Kc.
C_7 L_7 19 mh.	C_7–.007 μfd. (.005 and .002 in parallel) L_7–No turns removed	13.6 Kc.

for extreme accuracy in either the number of turns pruned from the coils or the calibration of the audio oscillator used to line up the elements. The specified turns to be removed includes a fair margin of safety, and if the combination doesn't tune to the given frequency the condenser value is probably too far off and another should be tried. As mentioned above, should the marked frequencies on the oscillator be off, the eventual operation of the filter will not be impaired, provided the operation of the *same* instrument is used to tune all elements.

The matter of obtaining use of the necessary test equipment may seem troublesome, but since it is at worst a ten-minute job to complete the tuning (assuming the elements are made up and mounted), it does not appear the least brazen to request this favor of your parts supplier should other sources fail. Audio oscillators and v.t.v.m.s are rather common test equipment in the present-day laboratory, and a reasonable will to get the job done should be all that is necessary to get over this barrier.

The finished filter can be expected to have an insertion loss roughly as shown in Fig. 3 which, though not ideal, will be found satisfactory in producing easily-copied good-quality single-sideband signals. During the development of the filter, an earlier design was substituted in the exciter for the regular filter and no noticeable difference reported by either new or well-established contacts, even though this particular job had nearly 15 db. less attenuation between 7 and 9 kc.! Apparently this indicates that a suppression of the undesired sideband of only 20 db. will permit easy copy, but it would hardly justify our claims to an unqualified 3-kc. bandwidth. The filter given here does much better than this.

It should be emphasized that the filter is not symmetrical, and therefore care should be taken to see that the connections in the exciter are as indicated in Fig. 1. This means that the right end of the filter will be terminated in approximately 200 ohms as required (see Fig. 4).

The remainder of the transmitter is practically identical to that described by WØTQK, with only the following exceptions. In Fig. 4 of his article he uses a 50-μμfd. trimmer from grid to ground on the balanced modulator, but it was connected from plate to ground in our case. In the same diagram, the 6SK7 amplifier was replaced by a 6AB7. The only other difference is that the trap consisting of L_{603} and a 100-μμfd. trimmer, shown connected in series with the grid of the 6SG7 in Art's rig, was link-coupled to L_{602}, and L_{602} and its condenser were connected directly to the 6SG7 grid.

The transformers T_{402} and T_{601} are slightly different than those described in the WØTQK unit, as can be seen in Fig. 5, although the general principle is of course the same.

When the filter and some of the other expensive or special components in this exciter are either explained, or replaced by more reasonable parts, the complexity of the problem disappears and really, if you will compare the circuit with a *complete* diagram of your present a.m. trans-

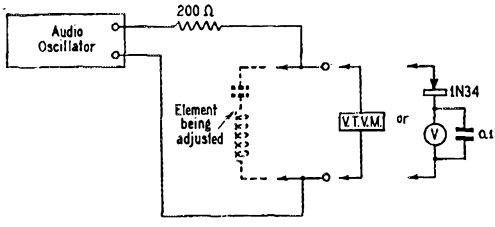


Fig. 2 — The test circuit required to adjust the elements of the sideband filter. Two types of indicators are shown. The inductance is adjusted for minimum indication by the meter at the test frequency given in Fig. 1.

mitter, you may be rather surprised. The entire exciter can easily be built on an 18 × 18-inch chassis, and even though you don't complete the job in a week it will be well worth the education and operating enjoyment later on. A further consolation is that most of the adjustments to the circuits are made once initially and then need no further attention. You don't adjust the i.f. amplifier in your receiver very often; at least you shouldn't have to. The same idea applies here, too.

Alignment Procedure

A few modifications in Art's original circuit were found that make operation and tune-up much easier. The most significant of these is the carrier-reinsertion network shown on the output of T_{203} in Fig. 4. By varying R_C, any desired amount of carrier can be by-passed around the balanced modulator to T_{401}, and being able to do this offers two very important advantages. The first is that the carrier can be used to tune up the exciter and any following amplifiers. The second is that having the carrier-reinsertion control during operation permits adding enough carrier to permit the signal to be copied just like any conventional a.m. station, or it can be operated with a 20-db. suppressed carrier, or no carrier. Operating experience has revealed a great deal of controversy concerning the value of a 20-db. suppressed "pilot" carrier, in view of the usual blanket of other carriers, but at any rate this arrangement is versatile enough for most requirements. The feature of being able to set up a signal that can be copied in the normal manner will be found invaluable in establishing contacts.

Barring unusual difficulties, any receiver with an S-meter is the only essential to tuning up the whole circuit, but it should be appreciated that a receiver is a very sensitive instrument and that the r.f. gain should be kept as low as possible, to reduce the chance of false readings. A test probe will be found convenient and can be made by connecting the receiver antenna input lead to the test points through about a 50-$\mu\mu$fd. or smaller condenser to an alligator clip.

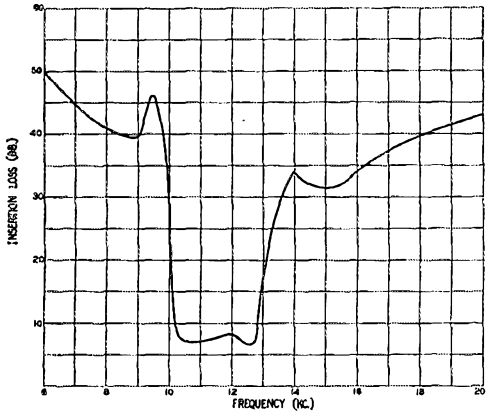


Fig. 3 — **The frequency characteristic of the home-made sideband filter.**

If you are fortunate enough to have good ears, you can probably hear the 10-kc. oscillator in the vicinity of T_{203}, but if not you can test the oscillator later in another way. Connect the probe to either plate of the 550-kc. balanced modulator, and check for a signal from the 550-kc. oscillator, tuning T_{405} to obtain maximum output. A little exploring 10 kc. above or below this frequency may reveal two signals, which should be present if the 10-kc. oscillator is working. If present, tune to one of the side signals and see if its intensity can be varied by the carrier-insertion control, R_C. If so, all is fine so far, since the receiver is tuned to one of the sidebands produced by modulating the 550-kc. carrier with the 10-kc. oscillator signal. Let's assume we want to tune to the upper sideband coming from this modulator, so set the receiver to about 560 kc. (the signal just above the 550-kc. oscillator that can be controlled by R_C), shift the probe to the secondary of T_{402} and tune the trimmers for maximum signal. Vary R_C again just to be sure you have the *sideband* and not the 550-kc. oscillator signal.

The proper frequency for the 10-kc. oscillator, with respect to the filter characteristic, can be set with this arrangement. Watching the S-meter, set R_C for minimum indication. This now means that the only path for the 10-kc. oscillator signal is through the unbalance in the ring modulator, T_{202}, and the filter. Run up the sensitivity of the receiver until a reading of about S5 is obtained; R_B in the ring modulator can be varied to increase this reading if necessary. Start with maximum capacity in the 10-kc. oscillator tank circuit and increase the frequency (decrease capacity) until the receiver indicator shows a fairly rapid rise to a maximum. If no pronounced rise is noted (3–4 S units) by the time the 500-$\mu\mu$fd. compression condenser is all out, it may be necessary to reduce the fixed capacity in the tank from 0.002 to 0.0015 μfd. and try again. When the response levels off to a maximum, the oscillator is up in the passband of the filter and thus has been "located." To get the oscillator on the proper part of the filter curve it is merely necessary to decrease the frequency (increase capacity) until the response drops two S units.

When R_C is set for a minimum we don't want any of the 10-kc. carrier sneaking through, and to prevent this the ring modulator has to be balanced. This isn't at all tough, as even rough balance will produce a carrier attenuation of around 60 db. (10 S units!). To do the balancing, set the receiver for a good indication, S5 or so, with the probe still connected to the secondary of T_{402}. Check again to see that R_C controls the

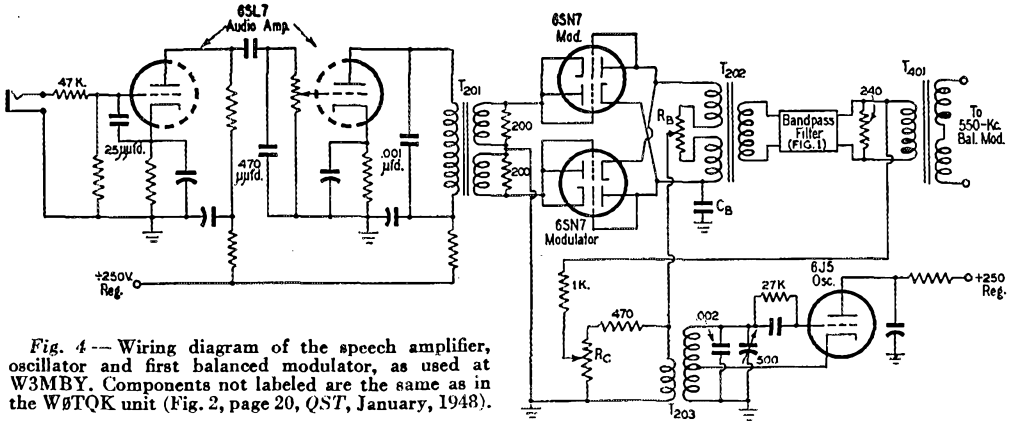


Fig. 4 — Wiring diagram of the speech amplifier, oscillator and first balanced modulator, as used at W3MBY. Components not labeled are the same as in the WØTQK unit (Fig. 2, page 20, *QST*, January, 1948).

C_B — Balancing condenser, approximately 0.004 μfd. See text.

R_B — 30-ohm wire-wound potentiometer, for balancing carrier.

R_C — 100-ohm wire-wound potentiometer, for carrier insertion.

T_{201} — Single-plate-to-200-ohm-balanced-line (SNC 1P152 or Thordarson T55A15).

T_{202}, T_{401} — Balanced-line-to-line, 200 ohms (SNC 1P161).

T_{203} — Push-pull output transformer (Thordarson T22S86) with iron core removed and replaced by wood for mounting.

signal and that it is set for a minimum (center point ground). Take C_B, 0.004 μfd., and connect to the side of the primary of T_{202} that produces the smallest S-meter reading. If this reduces the signal so low that the receiver sensitivity will not bring it back on scale, leave further balancing until more of the circuit is tuned up and a higher level is obtained.

The rest of the tune-up is very conventional as will be seen presently. Turn up some carrier with R_C until a good indication is obtained; then shift the probe to the secondary of T_{403} and tune both sides of T_{403} for maximum. Leave the trap, L_{401}, until later. Turn on the plate switch and step the probe successively to the primary and secondary of T_{404} and T_{601} reducing the receiver, or setting of R_C, as each circuit is peaked up. Check again to see that the signal is controlled by R_C and also by the 10,000-ohm potentiometer in the cathode of the 6AB7. Set the receiver to the 6-Mc. crystal frequency, connect the probe to the grid of the 6SL7 frequency doubler, and tune up the oscillator. Reconnect the probe to the secondary center-tap of T_{601}, tune the receiver to twice crystal frequency, and then tune plate tank of the doubler. Set the receiver to the output frequency, 14.2–14.3 Mc., and move the probe along from L_{601} to L_{606} as these circuits are tuned, but omit the trap, L_{603}. The acid test for "bugs" comes when the probe is connected to the output link of the 807 and the signal can be controlled by the carrier control, R_C! An 807 in a circuit like this usually demands a special "cooling-off" operation which is impossible to describe or predict. A thorough job of shielding the grid and plate circuits, including the lower section of the tube, is practically a "must," but it can be made to function as an amplifier eventually.

The tuning of the carrier traps, L_{401} and L_{603}, has been deferred purposely because they cannot be tuned properly until the receiver input is free of any appreciable pick-up radiated from the carrier oscillators. With the receiver connected directly to the output of the 807, radiated fields should be relatively small indeed, and if the output is controlled by the carrier injector R_C, the whole job can be wrapped up promptly. The first time through the 560-kc. and 14-Mc. channels, the tuning was rather rough because of probe loading on the tuned circuits, radiation pick-up, body capacity, etc., so while the receiver is connected to the 807 output go back and touch up both channels, from the 550-kc. oscillator tank right up to the 807, again omitting the traps L_{401} and L_{603}. Now with all this gain on the signal, when R_C is turned to a minimum the carrier leakage at the ring modulator can easily be detected, so vary R_B and see if a sharp null can be obtained. If the null is broad, it will be necessary to try a little different value of C_B until the minimum attained by varying R_B is sharp. When good balance is obtained, a hum will be audible in the receiver; i.e., the carrier is so weak that the heater-cathode leakages cause appreciable modulation. Ten kc. above or below the carrier frequency (which side depends whether a 14.7- or 13.7-Mc. carrier is used in the last balanced modulator) another fairly strong signal will be found which is *not* controlled by R_C. This is an undesired output that comes from the 550-kc. oscillator and must be eliminated by balancing the 550-kc. modulator, in the same manner as the ring modulator, by means of the 5000-ohm potentiometer in the cathode circuit and the 50-μμfd. trimmer connected to one of the plates. If T_{402} happens to end up just so, a rather sharp

balance will be found initially, but a nearly perfect balance can be made by working between the condenser and the potentiometer, varying the condenser by *small* increments and carefully watching for a smaller minimum as the cathode balance control is moved through the minimum S-meter reading. When this has produced an absolute minimum, tune L_{401} for a further minimum which should practically eliminate this signal. To set the high-frequency trap, L_{603}, simply tune the receiver to twice the high crystal or VFO frequency and tune the trap for a minimum.

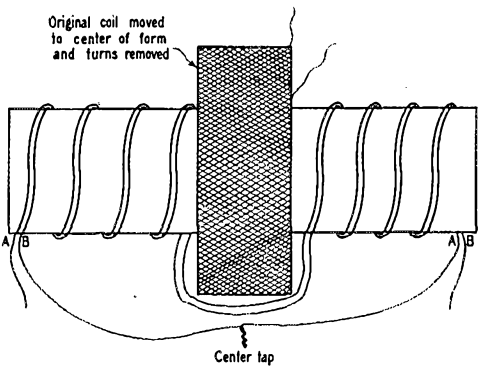


Fig. 5 — Modification of 450-kc. slug-tuned i.f. transformer for T_{402} and T_{601}. One coil was unwound, and the other moved to the center of the form. About 40 per cent of the turns was then removed from this coil. The wire from the first coil was doubled and used for the new winding, starting at the center so that all of the wire would be used. After doping the windings and connecting them as shown, the two iron slugs were stuck in the center of the form with wax. The assembly was then replaced in the i.f. can.

That's it, though it might be advisable to bring in a little carrier again with R_C and retouch the tuning of both channels to correct any interaction effect the traps may have had. Bringing up the carrier with R_C should produce a lot of voltage at the 807 and practically nothing when it is turned down. To QSY it is *not* necessary to tune up the whole exciter. Only the circuits from the last balanced modulator need any retuning, and if the move is small (20 kc. or so) only the crystal or VFO need be touched. The two-stage speech amplifier is simple enough so that little trouble should be encountered. An r.f. filter has been added to the input circuit and some condensers inserted to make the response fall off above 4000 cycles. The 10–13 kc. bandpass filter will trim the radiated sideband down to an effective 300 to 3000 cycles,[1] but the response of the speech amplifier to frequencies above 17,000 cycles must be well down to prevent their modulating any second harmonic of the 10-kc. oscillator and producing spurious sideband frequencies within the passband of the filter. The audio circuit has ample gain for a crystal-microphone input.

As Art Nichols stated in the previous article, the unit puts out about 10 watts peak, which is enough to drive an 813 or a pair of any medium-power high-μ triodes listed for Class B modulator service. Another 807 following the exciter, operating Class AB_2 with only 500 volts on the plate, 300 volts on the screen and 45 volts grid bias, will not require 10 watts drive, but will put out a 30-watt peak signal that either can be radiated or used to excite push-pull 250THs or a 450TH to 1-kw. peak input. Yes, you can get to high power almost as easy as with c.w., but the premium is about 10 per cent less efficiency than with Class C, and the amplifiers have to have real stability when operated Class B. However, there are also dividends; less harmonic generation and less driving power required — this not counting the 9-db. communications gain. The over-all result will be a net advantage eventually, because TVI will soon rank harmonic generation of paramount importance to amateurs. A properly-operated push-pull Class B amplifier generates a negligible amount of harmonics in the plate-load circuit. "An ounce of prevention is worth a pound of cure."

Conclusion

After about four months on 20, Butch and I have found that going on single sideband compares closely with the thrills of first getting on the air. Occasionally it seems like some of the stations contacted for the first time even appreciate single sideband more than we do. No fooling — this system of transmission appears to live up to all the nearly unbelievable things claimed for it. In operation it looks as though the 9-db. figure obtained theoretically for a signal-to-noise ratio gain is overshadowed by the signal-to-QRM gain observed with single sideband. Stations equipped with panadapters have reported the signal completely covered and yet readable. Another station contacted frequently over a two-week period stated that he estimated difficulty in copying the signal began when the QRM had about a 30-db. advantage. This is significant if we will admit that it is QRM that is gradually strangling the maximum enjoyment of our low-frequency 'phone bands. Possibly this extra signal-to-QRM advantage is not accountable because of the difficulty in accurately appraising the "suppression effect," previously mentioned by Villard, of a large carrier on the normal A3 signal. Suppression takes place countless times on the 'phone bands, as for example when your R5 QSO is abruptly terminated by an AØ transmission that "hits him" and "takes him out." In most cases the usual A3 signal is completely smeared in the presence of a large interfering carrier because its

[1] Audio fidelity after detection or bandwith of r.f. signal.

(*Continued on page 104*)

The Inter-American Regional Radio Conference

Conference to Open April 1st in Washington — Preparatory Work Largly Completed — IRAC-FCC Report Forecasts Action on League Request for Sharing Rights on "160"

Hold your hats, boys. . . .

The long-awaited many-times-postponed inter-American regional radio conference of the nations of North, Central and South America, originally scheduled to be held in Bogota, Colombia, late last year, has now been announced to begin its sessions on Friday, April 1, 1949, at Washington, D. C., with the expectation it will continue in session approximately six weeks.

The League will be in attendance throughout, to represent the amateur service, the ARRL Board having appropriated $5,000 for the purpose at its meeting last year.

To avoid misunderstandings, amateurs should have a clear idea of just what this conference can and cannot do affecting us. First and foremost, it *cannot* change the Atlantic City allocation table, which is the over-all governing table until the next world-wide conference. The exclusive bands we amateurs were assigned under Atlantic City are ours; the inter-American meeting can do nothing to take them away from us.

But while it is a fact most of our Atlantic City bands are "exclusive amateur" this statement is not true of all of them: since the very first days of international regulation, our bands *below 4000 kc.* have been indicated, under the international table, as available for assignment not only to amateurs but to some other services as well — usually the fixed and mobile services. (The same is true of assignments for the other services, where similar "sharing" among them is provided at the lower-frequency spectrum.) There is nothing new about this; it is simply a device to give the various regions of the world more flexibility in deciding just how they want to allocate services in the short-range bands where the effects are not world-wide and don't, therefore, require uniform allocation throughout the world. Regional radio conferences, of which the forthcoming inter-American in April is an example, then break down these shared bands definitely for their regions, following the world-wide conference (Atlantic City, in this case).

The League has always attended these regional conferences [1] as they apply to this region, therefore, to ensure that any amateur shared bands (our 80-meter band is one, and the old 160-meter band is another) are fixed up to earmark them exclusively for the amateur service in this country and, so far as possible, throughout the entire region — the region, in this case, being the entire Western Hemisphere.

Preparatory work for this conference, with the exception of allocations studies, began last spring and was essentially completed by fall; the League's Acting Secretary Budlong, together with Assistant Secretary Huntoon on occasion, attended and participated in these meetings. Thus, except for more or less cursory review, most of the nonallocation phases of the preparatory work have been pretty well fixed up so far as the United States is concerned. On allocations, meetings will have begun several weeks before you read these pages, being scheduled to start February 14th, again with the League's Acting Secretary in constant attendance. These meetings will be of Government people and "industry" representatives and will have as their objective the determination of the United States' view on the various shared bands. Needless to say, the League's traditional view that any regional shared band involving amateurs should be allocated exclusively to amateurs, beginning with the United States and extending throughout all nations of the region if possible, will again be our position.

Will we succeed in this with our U. S. preparatory group? The chances are excellent that we will. For there will have come into existence a few days before the preparatory group meets an exceedingly important document in this connection: On February 11th the Interdepartment Radio Advisory Committee (a group of representatives of the military and other Government departments making use of radio — and on which body the League's present Acting Secretary served for nearly four years during his military service) and the Federal Communications Commission each submitted identical recommendations to the Department of State representing their conclusions on how the regional bands we are interested in should be handled at the inter-American conference, and it is almost certain these will have a powerful influence in determining the decisions of the preparatory group.

In this report, it is recommended for 3500–4000 kc. (assigned to amateur, fixed and mobile

[1] Habana, 1938; Santiago, Chile, 1940; Rio de Janeiro, 1945.

services under Atlantic City) that "The U.S. recommend that the exclusive amateur service allocation discussed at Rio be adopted." So much for that.

But now get this (quoted exactly as it appears in the report):

1800–2000 kc	(a) Amateur (1) (b) Radionavigation (Loran) (2)	In Region 2, Atlantic City authorizes the amateur, fixed, mobile (except aeronautical mobile), and radionavigation services to employ whichever of the two bands, 1800–1900 kc or 1900–2000 kc, is not required for Loran in any particular area on condition that they do not cause harmful interference to Loran. Both of these bands are used by Loran in Region 2. The United States has studied the problem of sharing among these authorized services and has reached the conclusion that it cannot be done in Region 2 without interference to the existing Loran system. However, it recognizes the desirability of taking a calculated risk and intends to permit amateur operation under the following conditions on a non-interference basis to Loran. The areas in which the amateur service will be permitted to operate and the power it may use are based upon the existing Loran system and the maximum permissible interfering signal to the Loran skywave signal at maximum service range. It should be noted, however, that the tolerable degree of interference can only be determined by actual operation. Furthermore, the Loran system may be expanded in specific areas. Either or both of these factors may operate to require revision of the following conditions.

Note (1) (a) The amateur service may use in any area whichever bands, 1800–1825 and 1875–1900 kc, or 1900–1925 and 1975–2000 kc, are not required for Loran in that area, in accordance with the following conditions. The use of these frequencies by the amateur service shall not be a bar to expansion of the radionavigation (Loran) service:

(i) The amateur service shall not cause harmful interference to the radionavigation (Loran) service;

(ii) Only classes A1 and A3 emission shall be employed;

(iii) Amateur operation shall be limited to:

Area	*Band, kc*	*Power (watts)* *Day*	*Night*
Mississippi River to East Coast U.S. (except Florida and states bordering Gulf of Mexico)	1800–1825 kc 1875–1900 kc	500	200
Mississippi River to West Coast U.S. (except states bordering Gulf of Mexico)	1900–1925 kc 1975–2000 kc	*500	*200
Florida and states bordering Gulf of Mexico	1800–1825 kc 1875–1900 kc	200	No operation
Puerto Rico and Virgin Islands	1900–1925 kc 1975–2000 kc	500	50
Hawaiian Islands	1900–1925 kc 1975–2000 kc	500	200

*Except in State of Washington where daytime power limited to 200 watts and night time power to 50 watts.

Note (2) In any particular area the Loran system of radionavigation operates either on 1850 or 1950 kc, the band occupied being 1800–1900 or 1900–2000 kc.

What does this mean?

It means exactly what it says: That the three-year study between the ARRL (at whose formal request it was initiated in 1945), the Federal Communications Commission, the U.S. Coast Guard, the military and other Government agencies has finally resulted in a conclusion. The conclusion is that trial sharing between us amateurs and Loran on "160" is now contemplated by the United States, under the conditions indicated.

It means even more than is stated in the report: It means that the report reflects planning almost completed for changes in the amateur rules to make possible such operation domestically as soon as the details can be worked out and the necessary orders cleared. It means that actual operation on the terms and frequencies indicated above is imminent.

For further details on this long-awaited development, see the editorial in this issue. And keep an ear bent for W1AW official bulletins, which will carry news of actual authorization as soon as it is forthcoming.

— *A. L. B.*

BOOK REVIEW

The Universe and Dr. Einstein, by Lincoln Barnett. Published by William Sloane Associates, New York, 1948. 127 pages. Price $2.50.

As pointed out by Dr. Einstein in his foreword, anyone who has attempted to interpret the works of advanced scientists for the benefit of the average reader knows well the difficulties of such a project. Either the writer tends to cover the subject superficially, taking only the aspects which may be most readily made intelligible, or he does a thorough job and ends up with a work which is sufficiently technical to scare off many of his intended audience.

Lincoln Barnett has turned out an exceptionally well-done exception to this rule. His exposition on the Theory of Relativity and other works of Dr. Einstein and the profound thinkers who preceded him brings these concepts down to a level which is within the capabilities of the high-school physics student, yet he accomplishes it in a manner which meets with the hearty approval of Dr. Einstein himself. More important, to most of us, he has, in the process, given us a volume which will provide an evening of fascinating reading; a book we will want to keep within easy reach on our library shelves long after the first reading has been completed. — *E. P. T.*

Using the "Cascode" on 50 Mc.

Improved Signal-to-Noise Ratio with a Simple Triode Amplifier

RECEPTION on 6 meters is better in the Boston area these days, as the result of the efforts of Jim Nye, W1EZV, in adapting the Wallman "Cascode" [1] to 50-Mc. service. News of the improved performance obtained with Nye's preamplifier got around fast and more of these low-noise amplifiers appeared in short order. Since the construction of a cascode is simple, indeed, others who are interested in improving the signal-to-noise ratio of 50-Mc. receivers may wish to give it a whirl.

The cascode preamplifier was developed as the result of wartime research at the M.I.T. Radiation Laboratory, aimed at improving the noise figure of radar receivers. It was first used at 30 Mc., as a preamplifier preceding the string of pentode stages used in the broadband i.f. amplifier. If properly designed, a two-stage cascode amplifier gives approximately the same gain as a single pentode stage, but with appreciably lower over-all noise.

Briefly, it consists of two triode r.f. stages, the first a grounded-cathode circuit with inductive neutralization, and the second a grounded-grid stage. The low noise results from the inherent characteristics of the triodes used, and the reduction of regenerative effects by the neutralization in the first stage. The original circuit and the 50-Mc. adaptation by W1EZV use a 6AK5 connected as a triode in the first stage and a 6J6, with its unused terminals strapped to the grid, in the second. Other combinations may be used, including various dual triodes, provided that they have separate cathode connections. Possibilities in this connection include the 12AT7, 7F8, 2C51 and others.

The circuit and constants used by W1EZV are given in Fig. 1. Both input and output circuits are tuned, and the unit is made so that it may be used in conjunction with various receivers, with a low-impedance line connecting the preamplifier to the antenna terminals of the receiver or converter. An alternative arrangement is shown in the insert in Fig. I. This is applicable if the antenna circuit of the receiver or converter has a pick-up coil, and if it is possible to mount the preamplifier directly adjacent to the antenna terminals of the receiver. The 6J6 plate voltage is run through the receiver antenna coil, which is made to take the place of L_3.

Two models of the cascode were built and tested in the ARRL lab, and on various receivers at W1HDQ. The first used a 12AT7 dual triode with tuned circuits similar to those used by W1EZV. The second had self-resonant slug-tuned coils, and used the original 6AK5-6J6 line-up. Except for bandwidth, there was no great difference in the performance of the two, approximating that reported by W1EZV and others. The bandwidth can be altered by changing the value of R_3, the usual value of which is around 3300

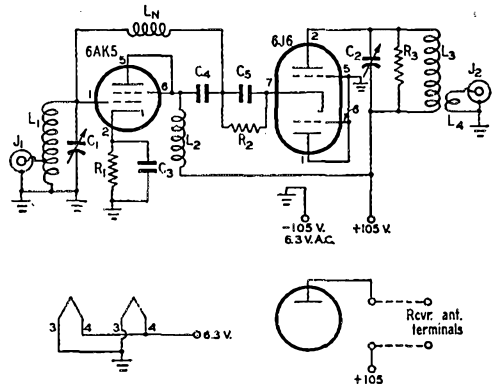


Fig. 1 — Schematic diagram of the "Cascode" preamplifier, as adapted to 50 Mc. by W1EZV.
C_1, C_2 — 25-$\mu\mu$fd. variable.
C_3, C_5 — 470-$\mu\mu$fd. mica or ceramic.
C_4 — 220-$\mu\mu$fd. mica or ceramic.
R_1 — 68 ohms, ½ watt.
R_2 — 100 ohms, ½ watt.
R_3 — 3300 ohms, ½ watt.
L_1 — 8 turns No. 16, air-wound, 9/16-inch diam., ⅞ inch long, tapped at 2½ turns.
L_2 — 16 turns No. 18 on ¼-inch rod.
L_3 — Similar to L_1, but no tap.
L_4 — 2 turns interwound in cold end of L_3.
L_N — 43 turns No. 22 on ½-inch diam. rod.
J_1, J_2 — Coaxial fittings.

ohms. This results in a bandwidth of about 3 Mc., making it possible to use one middle setting for the active portion of the 50-Mc. band, with activity at present levels. Dispensing with the tuning condensers, C_1 and C_2, and making the inductance of the coils adjustable to resonance with the tube and circuit capacitances increases the bandwidth. Our slug-tuned model was flat over the entire band, and some more besides.

The neutralizing coil, L_N, resonates at the operating frequency with the tube's grid-plate capacitance, but it is not critical. It is, in fact, possible to remove this coil without causing self-oscillation, but the noise figure is impaired somewhat. If it is wanted to adjust L_N on the nose it

(*Continued on page 106*)

[1] Wallman, Macnee and Gadsden, "A Low-Noise Amplifier," *Proc. I.R.E.*, June, 1948.

Reducing Key Clicks

Some Notes on Improving Transmitter Keying

BY OWEN M. CARTER,* W9ADN

• Fortunately for the art there are a few amateurs who realize that keying a transmitter properly consists of something more than connecting the key in some circuit that doesn't arc too much. In this article, one of them tells of a simple test procedure that will allow you to check your keying right in the shack, with a few added pointers on how to avoid clicks.

SATISFACTORY keying has probably caused the writer as much concern over the years as any other one problem that should have been relatively easy to solve. Despite the fact that delay circuits, tube keyers and continuous monitoring have been used, plus checks from amateur operators far and near, every once in a while some busy little bee at an FCC monitoring station has seen fit to send one of his cogent stingers in the mail.

Listening to the increasing number of stations with key clicks initiated a fresh study of the writer's gear. It is believed that the simple factors discussed here are well known to many radio men, but they have neglected to pass the information on to the rest of us. It is for the benefit of other poor souls who are struggling with key-click problems that this is being written.

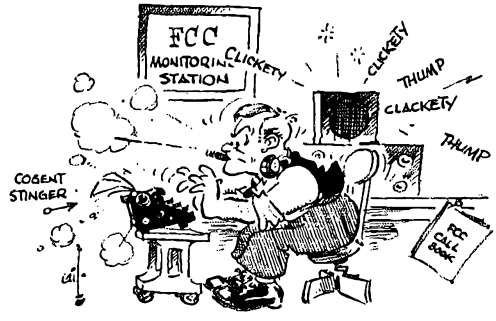
It had been observed that when a low-power stage had been properly adjusted with delay circuits to give clickless keying, clicks reappeared when another stage was added between the keyed stage and the antenna.[1] It had been possible to slow down the make and break times of the keyed stage so that one additional stage wasn't awfully bad for clicks. However, when other stages were added between the keyed stage and the antenna, the shaping of the keyed wave became such an interlocking set of adjustments that no straightforward set of rules could be established for getting both clickless operation and keying that sounded good. All sorts of things were tried: the various stages were neutralized and reneutralized, low-C tank circuits were replaced by high-C arrangements, and tubes were operated as frequency multipliers instead of straight-through amplifiers, to remove the likelihood of oscillation. Always the clicks remained.

* Box 433, Lockport, Ill.

[1] Ballou, "Keying the Tetrode Amplifier," *QST*, December, 1947; Goodman, "Some Thoughts on Keying," *QST*, April, 1941.

Test Methods

During the course of the experiments, keying was checked by the following methods: (1) by ear with a radio receiver, (2) on an oscilloscope using r.f. from the transmitter, (3) by oscilloscope connected to the receiver output, b.f.o. on, and (4) by oscilloscope connected to the receiver output, b.f.o. off. These methods are mentioned because what appeared to be satisfactory by one method of testing was not always confirmed by others. For example, checking the shape of the r.f. envelope at radio frequency with the 'scope indicated that there were no transients, and yet a receiver tuned to the same frequency said "Clicks!" Likewise, the 'scope connected to the receiver with the b.f.o. on showed freedom from transients, but the clicks appeared when the



b.f.o. was turned off. Method No. 4 was found to be the one to use for checking relative key-click intensity, while Method No. 1 is the one that finally determines how far one can go in softening the keying.

Probably the greatest single factor in the production of clicks in the stages following the correctly-adjusted keyed stage had been the fact that a surplus of excitation was available for each stage. To get the correct value of rectified grid current for each stage, the practice of W9ADN had been to increase the fixed bias until the grid current was normal. This, coupled with the fact that the stages were operating at low plate and screen voltages, meant that the tubes were operating at three to five times cut-off bias.

Finally, during the course of some tests, it was noticed on the 'scope that the keying transients dropped when the grid bias was decreased. Following this path, it was found that the tube,

(Continued on page 108)

A High-Power VFO Unit

Forty Watts Output on 80, 40 and 20

BY C. W. SCHWENZFEIER,* W8MQR

• In this article, W8MQR describes his high-powered VFO. It delivers sufficient output to drive a 500-watt triode amplifier. We have listened to the 7-Mc. signal on schedule and can vouch for the fact that the signal is clean.

AFTER a few months of not-too-successful crystal-controlled DX hunting on the 14-Mc. band, it became apparent that no quantity of DX could be worked without a VFO. Accordingly a careful search was made for a simple VFO exciter. Although a great number of circuits were found, all of the units of sufficient power output to drive a 500-watt triode amplifier were many-stage affairs, generally including gang tuning and inefficient Class A isolation stages.

In view of the ready availability of high-gain well-shielded tetrodes, it did not seem that all of these complications should be a necessary part of an exciter unit designed for amateur service. On this basis, a fresh start was made, with a 2-stage exciter that would deliver approximately 40 watts usable r.f. output as the goal.

The 807 was decided upon for the output stage because of its low driving-power requirement. In order to avoid the need for gang tuning, it was decided that the oscillator tube should be one of high dissipation rating so that off-resonance in the plate circuit would not damage the tube. In order to avoid the need for Class A isolation stages, use of a screen-grid tube was indicated. Our old stand-by — the 6L6 — was chosen for this job.

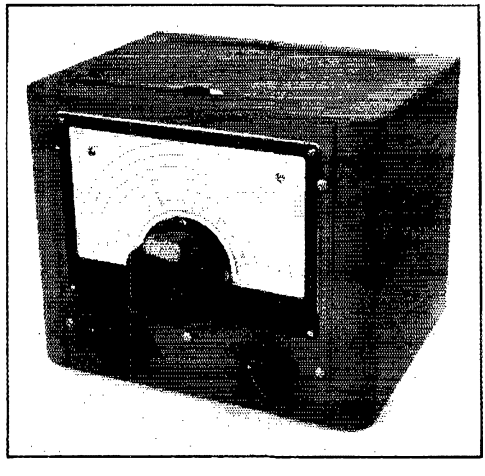
One of the most important requirements to be met by the proposed exciter was simplicity of construction and therefore bandswitching was promptly discarded. Anyway, in most ham installations antenna and amplifier changeover and tuning take so much time that the additional required for changing plug-in coils is not significant.

The circuits selected are conventional and proven; a high-C Colpitts-type oscillator and a standard Class C doubler-amplifier as shown in Fig. 1. Although the 807 was its usual independent self, operating on frequencies of its own selection at first, a few minor changes converted it into a tame, effective amplifier.

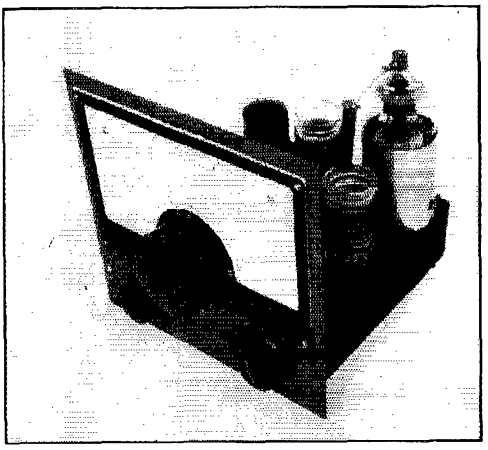
For 3.5-Mc. output, the oscillator circuit is tuned to 1.75 Mc., while L_2C_8 and L_3C_{14} are tuned to 3.5 Mc. At 7 Mc., the oscillator is tuned to 3.5 Mc., and L_2C_8 and L_3C_{14} to 7 Mc. The arrangement is the same for 14-Mc. output except that the 807 is operated as a doubler with L_3C_{14} tuned to 14 Mc.

The unit as a whole is no more difficult to build and adjust than an exciter of comparable output using a Pierce or Tri-tet crystal oscillator. There are, however, a few very important precautions that must be observed. The most important of these is that the fixed capacitors, C_1, C_3, C_4 and C_5, Fig. 1, must be high-quality

*403 Longbeach Parkway, Bay Village, Ohio.



The completed 70-watt VFO unit enclosed in an 8 × 10 × 8-inch Par-Metal cabinet. The dial is a National ACN.



This view shows the arrangement of tubes and coils on the chassis. The VFO tuning condenser, C_2, is behind the panel. The large resistor in the 807 plate lead is a parasitic suppressor. The two knobs are the tuning controls for the VFO and 807 plate circuits.

zero-temperature-coefficient condensers; otherwise the frequency stability will be very poor. Several types of mica capacitors and two types of ceramic capacitors were tried without success before Ceramicons, made by The Erie Resistor Co., of Erie, Pa., were selected. These condensers gave superior frequency stability.

As the Colpitts oscillator is quite sensitive to variations in either screen or plate voltage, a regulated source is essential if the oscillator is to be keyed. Use of a 25-watt variable-tap voltage-dropping resistor of 20,000 ohms to supply the VR tubes from the 700-volt plate supply for the 807, as shown in Fig. 2, was found to be a very simple and practical solution to this problem. To adjust this resistor to the proper value, the tap is first set at maximum resistance and is then moved in steps toward the other end until the VR tubes just ignite completely when the key is closed.

As might be expected, making the 807 operate only when driven by the oscillator and on no more than one frequency at a time proved to be the most difficult task encountered in constructing the first model. All of the recommended 807 taming procedures were tried without success and finally, in desperation, the heater return was made through the chassis and, most important,

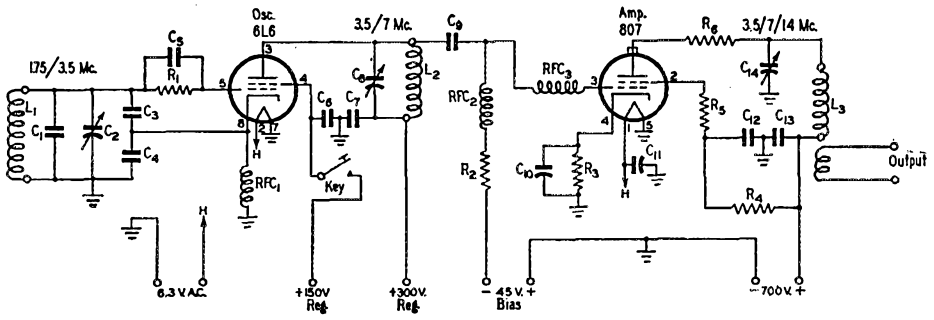


Fig. 1 — Circuit diagram of the 70-watt VFO unit.

C_1, C_4 — 500-$\mu\mu$fd. zero-temp. ceramic (two 250-$\mu\mu$fd. units in parallel — "Ceramicon").
C_2 — 150-$\mu\mu$fd. variable (National TMS150).
C_3 — 150-$\mu\mu$fd. zero-temp. ceramic ("Ceramicon").
C_5 — 250-$\mu\mu$fd. zero-temp. ceramic ("Ceramicon").
C_6 — 0.01-μfd. 600-volt mica.
C_7 — 0.002-μfd. 1000-volt mica.
C_8 — 75-$\mu\mu$fd. variable (Hammarlund MC75M).
C_9 — 100-$\mu\mu$fd. 1000-volt mica.
C_{10}, C_{11} — 0.01-μfd. paper.
C_{12} — 0.005-μfd. 600-volt mica.
C_{13} — 0.005-μfd. 1250-volt mica.
C_{14} — 50-$\mu\mu$fd. variable (Bud 17A57).
R_1 — 50,000 ohms, 2 watts.
R_2 — 7000 ohms, 2 watts.
R_3 — 700 ohms, 10 watts.
R_4 — 20,000 ohms, 10 watts.
R_5 — 50 ohms, 1 watt, noninductive.
R_6 — 50 ohms, 5 watts, noninductive.
L_1 — 3.5-Mc. output — 21 turns No. 20 enam.
— 7- and 14-Mc. output — 12 turns No. 16 enam.
L_2 — 3.5-Mc. output — 38 turns No. 20 enam.
— 7- and 14-Mc. output — 20 turns No. 16 enam.
L_3 — 3.5 Mc. — 44 turns No. 20 enam.
— 7 Mc. — 23 turns No. 20 enam.
— 14 Mc. — 11 turns No. 16 enam.
All above wound on 1¼-inch diam. forms, turns spaced to make winding length 1½ inches. L_1 coils should be doped.
RFC_1 — 2.5-mh. r.f. choke.
RFC_2 — 10-mh. r.f. choke.
RFC_3 — 10 turns No. 22 enam. on 1-megohm 1-watt resistor as form.

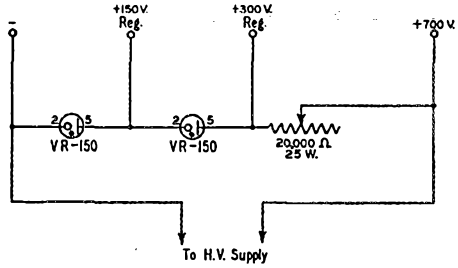


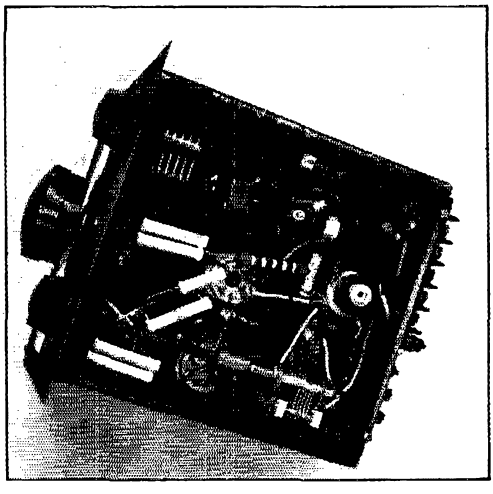
Fig. 2 — Voltage regulator for the oscillator screen and plate.

a 50-ohm 5-watt carbon resistor was connected in the plate lead. The resistor completely eliminated all tendency toward parasitic oscillation without noticeable effect on the output.

Two keying methods, cathode and screen-grid, were tried in the oscillator. Both worked well, but click suppression, as might be expected, was very difficult when cathode keying was used. No filter has been found to be necessary when keying the oscillator screen.

Because this exciter-transmitter is so simple to build, there is no need to comment on its actual construction, except for the 807 coils. In the first model all connections were taken from the plate coil in the conventional manner and a fixed lead was run from the coil socket to the 807 plate. This line proved to be troublesome and was eliminated by providing each coil with its own 50-ohm resistor and plate cap.

A further recommendation for this exciter is its relatively low cost. All tubes and parts, including the dial, were purchased new for less than $15.00.



Bottom view of the VFO unit showing the placement of the 6L6 plate tank condenser to the right and the 807 tuning condenser to the left. The tubular "low-temp" fixed condensers may be seen toward the front of the 7 × 9 × 2-inch chassis.

Strays

Amateurs, radio clubs and SWLs from 46 states, Canada, England and Puerto Rico cooperated with members of the Kingsport (Tenn.) Amateur Radio Club to make Christmas 1948 the happiest ever for the boys and girls of the Holston Methodist Home, an orphanage at Greeneville, Tenn. Started during the course of casual rag-chews on 3900 kc., the worthy undertaking caught on like wildfire and by Christmas Eve Santa was able to deliver 1000 gifts of toys, clothing, religious articles and money to the approximately 160 orphans at the home. As a special treat W4LNF/4 was set up at the home and the youngsters were able to talk with St. Nick himself, who happened to show up at the shack of W4JD. A fitting climax to the evening was a 3-hour round table on 3900 kc. participated in by scores of amateurs who had contributed gifts.

Members of the Kingsport (Tenn.) Amateur Radio Club, prospective hams and XYLs happily engaged in the pleasant task of wrapping Christmas gifts for the orphans at Holston Methodist Home. *L. to r., seated:* Mrs. Bill Armstrong, XYL of W4GCS; W4DB; Forrest Pilgrim, W4JD; Mrs. Bob Delius; Mrs. Winston Jackson, XYL of W4DB; Mrs. Ward Lantis, XYL of W4LEB. *Standing:* Scott Delius (holding doll); Ed Shaulis, W4EUM; President Jim Litton, W4LNF, of the Kingsport Amateur Radio Club; Jim Welch, W4CBU; W4GCS; W4LEB; Dan Delius; and Mrs. Jim Litton. Other participating KARC members not present were Lee Davy, W4FCU, Ralph Dougherty, W4MCZ, and Joe Selby, W4GHL. The Kingsport club is a 100%-ARRL-member affiliate.

W6OHU notes that of the 288 postwar DXCC Certificate (c.w.) holders listed in December *QST*, 50, or 17.3%, are W6s. Furthermore, 28, or 10.8%, are located within a 20-mile radius of Los Angeles!!!

Amateurs who are fraternal Masons are asked to get in touch with Ted Ferguson, W4BQE, Room 5, Union Station, Columbia 12, S. C. Ted is compiling a directory of Mason hams and will appreciate a postcard stating your call and lodge affiliation.

The ARRL Emergency Corps Is Ready!

October, 1948, Simulated Emergency Test Proves Efficiency of National Emergency Net, AEC Groups and Traffic Nets

BY ALBERT E. HAYES, JR.,* W1IIN

No matter how you slice it, the 1948 ARRL Simulated Emergency Test was the greatest demonstration of readiness to render service in the public interest, convenience and necessity that the amateurs of the United States and Canada have ever provided. The number of communities participating in the Test was almost double the number represented in the '47 trial, and the number of 100-per-centers rose proportionately. Do we have something to be proud of? Yes!

In the 1947 Simulated Emergency Test the final results indicated that the AEC groups of 54 ECs took part, and that 18 of them hit the 100% mark in planning and execution. This year the comparable figures were 94 AEC groups, with 31 hitting the bull's-eye. Well done, gang!

With the National Emergency Net assisting the regular traffic circuits, over 3000 messages — originated by participants in the Test — were delivered to ARRL headquarters and the National Red Cross in Washington. Last year's battle cry, "It's greater than the Sweepstakes," was again heard throughout the land. As a warm-up for the regular traffic season, most net managers admit that the 1948 Simulated Emergency Test filled the bill.

* National Emergency Coördinator, ARRL.

The following are the "scores" as reported by the ECs who captained the teams of AEC members:

Boone County, Ark.	100	Niagara County, N. Y.	89
Fort Smith, Ark.	100	Ashland, Ky.	88
Richmond, Cal.	100	Flint, Mich.	88
Hartford, Conn.	100	Mobile, Ala.	87
New Port Richey, Fla.	100	Racine, Wis.	87
Cochran, Ga.	100	Los Alamos, N. M.	86
Ayer, Mass.	100	Winston-Salem, N. C.	86
Groveland, Mass.	100	Cleveland, Ohio	85
Haverhill, Mass.	100	Westchester C., N. Y.	83
Winthrop, Mass.	100	Toronto, Ont.	82
Deckerville, Mich.	100	Walnut Creek, Cal.	80
Mt. Pleasant, Mich.	100	West Hartford, Conn.	80
Columbia, Mo.	100	Lake City, Fla.	80
Jefferson City, Mo.	100	Shirley, Mass.	80
Cortland, N. Y.	100	Plumtree, N. C.	80
Nassau C., L. I., N. Y.	100	Eau Claire, Wis.	78
Tonawanda, N. Y.	100	Atlanta, Ga.	77
Elizabeth City, N C.	100	Olympia, Wash.	76
Mansfield, Ohio	100	Mitchell, S. D.	74
Piqua, Ohio	100	Washington C., Okla.	73
Comanche C., Okla.	100	Portland, Ore.	73
Oklahoma C., Okla.	100	San Fernando Valley, Cal.	72
Pawnee County, Okla.	100	Lake Charles, La.	72
Klamath Falls, Ore.	100	W. Los Angeles, Cal.	71
Philadelphia, Pa.	100	Tucson, Ariz.	70
Milbank, S. D.	100	Pittsfield, Mass.	70
Mitchell, S. D.	100	Newton, Mass.	67
Madison, Wis.	100	Pontiac, Mich.	66
Wausau, Wis.	100	Dorchester, Mass.	65
Kirkland Lake, Ont.	100	Albany, N. Y.	64
Stratford, Conn.	97	La Crescenta, Cal.	63
Syracuse, N. Y.	96	Worcester, Mass.	63
Louisville, Ky.	95	Windsor, Ont.	63
Charleston, S. C.	92	Dunkirk, N. Y.	62
Watertown, Mass.	91	Auburn, Wash.	60
Sidney, N. Y.	91	York, Penna.	56
Manchester, Conn.	89	Orange, N. J.	54
Monmouth C., N. J.	89		

♦

A view of three of the five operating positions at National Emergency Net station K3NRW with (*l. to r.*) W3CDQ, W3BWT and W4IA at the controls. Acting not only as a delivery point for reams of Red Cross traffic, but also as a key relay point for much of the traffic flowing to ARRL headquarters, the Washington gang proved they have what it takes when the going is rough. It was the operating staffs at the NEN stations who best realized how efficiently the emergency coördinators all over the country had laid their emergency plans. Without the best efforts of the ECs, their assistant ECs, and the many ARRL Emergency Corps members, installations such as this would be powerless to render public service in time of emergency.

Here is Francis D. Cook, W9GQS, at one of the two operating positions at National Emergency Net station W9DUA. Operated by members of the Amateur Radio Emergency Association of Evanston, Ill., W9DUA was kept on the air for the entire duration of the Simulated Emergency Test. Traffic addressed to both ARRL and National Red Cross headquarters flowed in a steady stream through W9DUA, proving to the operating crew that the ECs of the Midwest are ready, and that there is no substitute for advanced planning if traffic is to be handled in quantity in time of emergency.

♦

New Orleans, La.	52	Twin Falls, Idaho	40
Butte, Mont.	51	Cedar Rapids, Iowa	40
Dubuque, Iowa	50	Merrimac, Mass.	40
Pendleton, Ore.	50	Medford, Ore.	40
Hamilton, Ont.	50	Everett, Wash.	37
Nashville, Tenn.	48	Boise, Idaho	23
Muscatine, Iowa	46	Lebanon, Penna.	20
San Diego, Cal.	45	West Toronto, Ont.	20
Sharon, Penna.	45	Lancaster C., Pa.	11

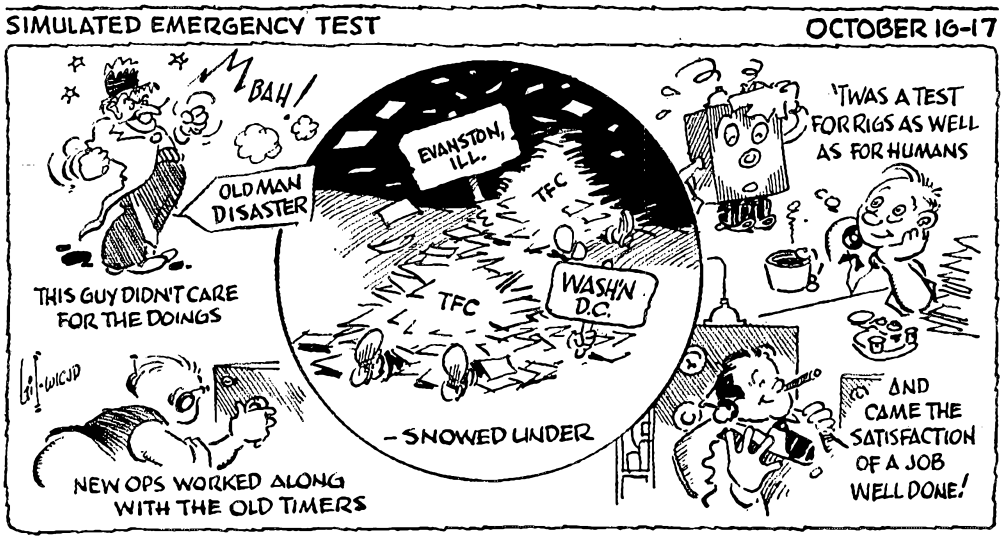
This year the Red Cross traffic originating during the test was funneled, either directly, or through the National Emergency Net, into two stations whose calls became familiar to all who took part — K3NRW and W9DUA. Perhaps you have wondered just what these stations are that they should provide such excellent message service into National Red Cross headquarters in Washington, D. C. The accompanying pictures will give you an idea of the capabilities of these installations, both of which are provided with leased teletype facilities tied into the nationwide Red Cross telecommunications system of leased lines.

K3NRW, installed in downtown Washington by USNR, and manned during the Test, as it has been several times during emergency, by a group of Washington and near-by amateurs, is provided with five operating positions and a battery of transmitters that would warm the heart of any old timer.

W9DUA, Evanston, Ill., is controlled and operated by members of the Amateur Radio Emergency Association, and, provided with two operating positions, joins the amateur service and the Red Cross wire net when emergency calls.

A similar installation, W6CXO, operated by the Naval Shipyard Radio Club of San Francisco, was not in service for the Test but is also on the ARC wire circuit, and is prepared to take its place with K3NRW and W9DUA when next disaster strikes.

We have shown what we can do when we want to, fellows. Let's show the public that we can surpass even the FB record we made in 1948 when the '49 Test rolls around in October. More AEC members, more emergency coördinators, and more and better emergency-powered equipment are the order of the year. QRV?



Happenings of the Month

REGULATORY MATTERS

The 1948 proposals of the ARRL Board of Directors [1] remain on file with FCC, overload of the staff and frequent absences of several Commissioners combining to make even slower the necessarily-complex routine of processing. In brief, the major ARRL recommendations are:

1) Expansion of the 75-meter Class A 'phone band to 3800–4000 kc.

2) No change on 40, 20 or 10 meters.

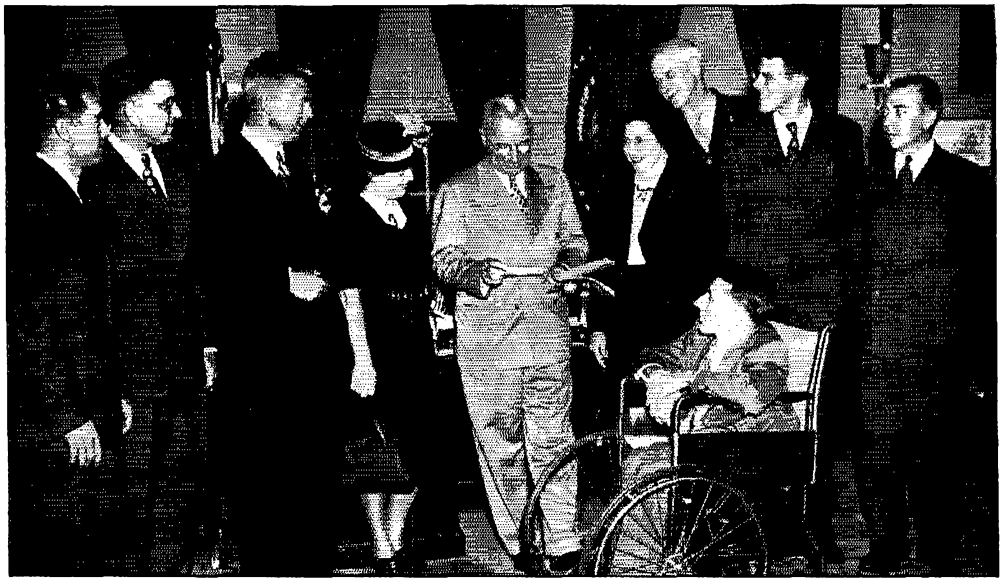
3) A 16-w.p.m. code test for *future* Class A license examinations.

4) One year "apprenticeship" for new amateurs before permitting them use of 'phone below 29.7 Mc.

5) An exclusive c.w. assignment 50–50.1 Mc.; AØ or "duplex" above 51 Mc.; and n.f.m. permitted above 50.1 Mc.

Late last year two additional sets of proposals were sent to FCC by minority groups unwilling to accept the Board's recommendations. As might be guessed, one group feels the ARRL stand is too restrictive to 'phone, while the second feels equally strongly that the ARRL position is too liberal toward 'phone. Without commenting at this time on the effects on the amateur body as a whole of minority groups separately approaching the Commission to further their desires, we

[1] *QST*, p. 29, June; p. 9 and p. 30, July; p. 9, August, 1948.



On the occasion of his inauguration, President Harry S. Truman receives congratulatory messages which funneled into the Nation's Capital via amateur radio in the ARRL Governors to President Relay, January 19th and 20th.

Members of the Washington Radio Club, the Potomac Valley Radio Club and other amateurs in the District of Columbia area manned about thirty stations in this history-making event. Radiograms were filed by the Governors of thirty-nine states and four possessions; receipt in Washington was prompt and 100 per cent delivery achieved. Section Communications Managers designated local amateurs to obtain and start the messages. For the most part relaying of GPR traffic was accomplished by organized amateur message-handling networks.

Amateurs representing the ARRL and the Washington-area radio clubs met with the President on January 26th and made official delivery of the numerous messages. *L. to r.*: Cedric Van Pelt, W4LRI; E. L. Battey, W4IA, director Roanoke Division; A. L. Budlong, W1BUD, acting secretary ARRL; Miss Elizabeth Zandonini, W3CDQ, assistant director Atlantic Division; President Truman; Frances R. Darne, W3AKB, assistant SCM. Md.-Del.-D. C.; Col. E. S. Van Deusen (Rtd.), W3ECP, RM Md.-Del.-D. C.; Donald McClenon, W3EIS, president WRC; Malcolm Williams, W3ER, past president WRC; (*in foreground*) Gordon Walter, W3EYX. Mrs. Darne, W3AKB, acted as spokesman for the group.

QST is indebted to Eppa W. Darne, W3BWT, Md.-Del.-D. C. SCM, for providing a complete report covering the Washington end of the GPR, and to Thomas Kelley, W3KAM, who provided the photo. A complete report crediting all those known to have participated in the GPR will appear in the April issue.

list the major provisions of the two sets of proposals:

The "'phone" group asks:

1) Expansion of the 75-meter 'phone band to 3750–4000 kc.

2) Expansion of the 20-meter 'phone band to 14,200–14,400 kc. (14,200–14,350 after Atlantic City regulations come into effect.)

3) Defeat of the ARRL recommendation for 16-w.p.m. code test in the Class A exam.

4) Defeat of the ARRL recommendation that newcomers be denied 'phone below 29.7 Mc. their first year.

The "c.w." group proposes these:

1) No expansion of the 'phone assignments.

2) Allocation of small portions of the present 'phone bands exclusively to single sideband (25 kc. on 75 meters, 15 kc. on 20, and 25 kc. on 10).

3) A 20-w.p.m. code test for the Class A license exam, to be required also for renewals of Class A licenses.

4) A new short-term (six months to a year) license with relaxed code and technical requirements, nonrenewable, the holder restricted to c.w., crystal control, and certain portions of 80, 40 and 2 meters.

FCC NIPS BOOTLEGGERS

A few fellows who recently thought they could get away with hamming without benefit of licenses found that FCC's monitoring system keeps a close finger on the pulse of radio operations — including ham radio.

In suburban Kansas City, Mo., one evening last December, FCC engineers paid three simultaneous "friendly" calls at the homes of three bootleggers who had set up their own communications system on ham bands and with self-assigned ham call signs. The three stations were closed down, with a stern warning to each of the operators; a fourth station which had been under suspicion disappeared during the Commission's monitoring activities. These bootleggers thought they could mislead any official checking-up activity by announcing false locations, but the monitoring division's network of intercept stations, equipped with d.f. gear and interconnected by teletype for simultaneous bearings, sealed their doom. Once the local area of operation was determined, mobile d.f. and monitoring units went into action — to trace source of signals right to the front door. In January the Commission closed down a similar set-up in and near Lincoln County, North Carolina. Tipped off by suspicious amateurs and with their assistance, FCC engineers investigated and tracked down the bootleggers again with d.f. procedures. The moral is twofold: If you're not a ham, don't kid yourself into thinking you can get away with some unlicensed operation, however harmless it seems to you; if you are a ham, help FCC to keep our bands clear of unlicensed operation by reporting to them any activity which on its face is not bona fide amateur.

YEAR-END LICENSE FIGURES

FCC has issued a tabulation of license authorizations outstanding as of the end of 1948, showing a total of 76,666 amateur radio operators and 77,338 amateur stations. For the first time, all amateur licenses are now on a five-year basis — and thus for the first time since the war it is possible to get a precise count of amateurs. Comparisons with the previous year cannot be accurate since the 1947 year-end figures were estimated and included an unknown amount of "deadwood" — all licenses issued since 1938 were automatically kept in the active file by the series of extension orders. Paper statistics, for what they are worth, show a decrease of 4334 operators and an increase of 2338 stations in the amateur service during the past year. Perhaps the most accurate comparison for purposes of determining over-all recent growth is the 1948 year-end count of 76,666 ham operators and the 1940 midyear count of 56,295.

STAFF NOTES

Hq.'s "Ten Year Club" met on February 11th, with President Bailey as a guest, to enroll two new members and to take note of two additional anniversary milestones. On that date Acting Secretary Arthur L. Budlong, W1BUD, completed 25 years with League Hq., and several days before Chief Accountant Alice V. Scanlan had marked her 20th anniversary with the staff. Appropriate initiations were administered Asst. Communications Manager Joseph A. Moskey, W1JMY, and Asst. Secretary John Huntoon, W1LVQ, who on December 6th and February 8th, respectively, completed ten years. The club now boasts a membership of 16 persons with ten or more years' service. In order:

Treasurer David H. Houghton.....27
Acting Secretary A. L. Budlong, W1BUD.....25
Communications Mgr. F. E. Handy, W1BDI.....24
Production Supt. Ralph T. Beaudin, W1BAW.....22
Circulation Supervisor Cecelia C. Hatch.....21
Chief Accountant Alice V. Scanlan.....20
Technical Director George Grammer, W1DF.....19
Technical Asst. C. Vernon Chambers, W1JEQ.....19
Communications Asst. Lillian M. Salter.....18
Asst. Technical Editor Donald H. Mix, W1TS.....15
Asst. Technical Editor Byron Goodman, W1DX.....13
Traffic Manager Harold K. Isham, W1MFA.....12
Circulation Supervisor Marion E. Bayrer.....11
Communications Asst. George Hart, W1NJM.....10
Asst. Comm. Mgr. Joseph A. Moskey, W1JMY.....10
Asst. Secretary John Huntoon, W1LVQ.....10

—···—

By the way, almost immediately after asking the question in our last issue, concerning departure of two staff members for points west, "What is it California winters have that Connecticut dittos don't?" newspaper accounts gave us adequate answer: snow, snow and more snow!

(Continued on page 120)

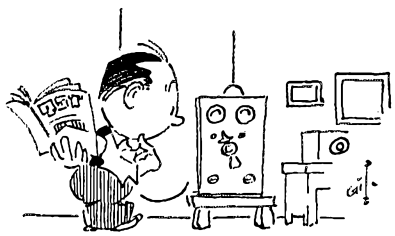
Electrical Shock—Pfttt—Obituary

BY RONNIE MARTIN,* W6ZF

IT happened suddenly. An electrical shock, then pfttt! and the Grim Reaper smiled as he looked at the prostrate form of another victim lying upon the floor of a home. This home was like any ordinary American home. It was a happy home with healthy and contented occupants. One of them was an amateur radio enthusiast. His equipment was well engineered and designed, well constructed and, above all, complied with all of the very necessary safety regulations. Yet, while working on one of his transmitters, one contact with a circuit carrying less than 500 volts caused his sudden death. Another life, a loved one, an amateur radio operator, was suddenly snatched away into another world . . . the Grim Reaper's world — DEATH!

As the Grim Reaper turned to seek another victim he looked back over his shoulder and said to himself, "Like these careless automobile drivers of today, you know, I believe this electricity stuff is really dangerous to mortal man. I'll have to look into its possibilities a little more!"

The above could very well be a scene in *your* home — *your* station. Take a minute and seriously consider what you have just read. If you



DON'T TAKE SOME OF THE POINTS FOR GRANTED

are a sensible person you will really be concerned. If you are not, you might as well stop reading this and devote your time to something else. Let all of us who possess equipment operating from electrical-power sources realize the danger of death lurking within. Transmitters, receivers, frequency standards, monitors, and other pieces of equipment operating at voltages from 115 on up certainly are instruments of death. If you wish to live to enjoy the pleasures they can give you, you should read on.

I have just returned from attending funeral services held for one of my closest friends. He was an amateur like you. In everyday life he was an electrician. He knew the pitfalls and dangers of electricity and he knew how to handle it. Yet one move, one contact with the object of his vocation and — pfttt — his life was blotted out quickly and completely. While sitting in the little chapel listening to the services for my friend, I couldn't help thinking of the other 75,000 amateurs throughout the United States and elsewhere. I wished that you all might be sitting there with me. It may have made each of you realize the lethal effects of electrical shock. It may have brought it to you so forcibly that you would have vowed this very day to be *careful*, to take safety precautions and above all *"Switch to Safety."* This procedure and this alone can prolong your life.

Let us look at the facts of electrical shock. The following data were compiled with the kind assistance of Dr. Pothoff of the National Safety Council, and the Pacific Telephone and Telegraph Company.

Type of Resistance	*Resistance Values*
Dry skin	100,000 to 600,000 ohms
Wet skin	1000 ohms
Internal Body	
Hand-to-foot	400 to 600 ohms
Ear-to-ear	approximately 100 ohms

For example, with 120 volts and a skin resistance plus internal resistance totaling 1200 ohms, the result would be a current of 100 milliamperes. That much current is definitely enough to cause death!

The following data make a very clear and self-explanatory summary of the effects of various currents through the human body:

Safe Current Values

1 ma.: Causes no sensation — not felt.

1 to 8 ma.: Sensation of shock, but not painful; individual can release his contact at will, as muscular control is not lost.

Unsafe Current Values

8 to 15 ma.: Painful shock; individual can let go at will. Control is not lost.

15 to 20 ma.: Painful shock; muscular control of adjacent muscles lost. Cannot let go.

20 to 75 ma.: Painful shock; severe muscular contractions with breathing extremely difficult.

100 to 200 ma.: Painful shock, causing *ventricular fibrillation* of the heart. This is "irregular twitching of the wall of the ventrical of the heart." It is a fatal heart condition, *for which there is no known remedy or resuscitation. It means DEATH!*

200 ma. or over: Severe burns, severe muscular contractions, so severe that chest muscular reac-

* 3820 Second Ave., Sacramento, Calif.

tion clamps the heart and stops it for the duration of shock. This reaction prevents ventricular fibrillation. Artificial respiration should be administered immediately and in most cases the victim can be revived.

If skin contact in the circuit is maintained while the current flows through the skin, the actual skin resistance is gradually decreased.

Remember this! — *current* is the killing factor in electrical shock. The voltage is important only in that it determines how much current will flow through a given body resistance. A voltage of 110–120 is enough to cause a current many times greater than that necessary to be fatal. Currents of 100 to 200 ma. cause a fatal heart condition known as *ventricular fibrillation.* There is no known remedy to prevent death in this condition. Artificial respiration proves ineffective in reviving victims receiving this amount of shock. It is a generally accepted fact that fewer low-voltage shock victims can be revived than those receiving shocks of 1000 volts or more. So remember this when you work around your equipment! Low voltage as well as high voltage can be lethal! Be careful — be extremely cautious — when working with or around electricity.

Do you want to be the next victim of the Grim Reaper? Even should you escape his clutch, you may receive burns that may cause total or partial disability for life! It may mean amputation of a badly-burned finger, hand, arm, leg or foot!

Do "safety precautions" pay dividends? Attend funeral services held for a very dear friend killed by electric shock. Nothing will bring it home to you more quickly.

FEED-BACK

The wiring diagram of the "basic 'phone exciter" (Fig. 4, page 14, January, 1949, *QST*) had a drafting error that should be corrected if the unit is to perform properly. The diagram shows a lead from the junction of $R_{55}R_{57}$ to C_{35} — this is incorrect and should be omitted.

W2KUJ points out that the double-sideband 'phone quality of the unit is impaired slightly by the connection of C_{50} to C_{49} as shown, and suggests that C_{50} be connected to the junction of $C_{30}R_{37}$ (Pin 5 of the 6SA7). When this is done, C_{30} can be omitted. Under these conditions, the 6SJ7 carrier amplifier should not be removed during adjustment, since its input capacity replaces C_{30}.

It is also suggested by W2KUJ that unless C_{18}, C_{19}, C_{24}, C_{25} and R_{29}, R_{30}, R_{52}, R_{54} all have similar values, phase-shift differences may creep in because of the tolerances of the components. He suggests increasing the condensers to 0.5 μfd., and also connecting the "tops" of R_{15} and R_{38} together, to parallel C_{14} and C_{20} and eliminate possible phase differences at this point.

TWO-WAY communication across the Atlantic had indeed become commonplace by March of 1924. According to *QST* for that month, at least 13 European and 17 United States and Canadian amateur stations had made the grade. An especially bright star on the transatlantic-DX horizon was the arrival on the air of Italian amateurs, particularly 1ACD, who QSOed 1XW and 2AGB. All of this outstanding work was done in the vicinity of 110 meters.

Pay-off time has arrived for the winners of the past winter's Fourth ARRL Transatlantic Tests. In this final listening competition the codes of thirty-seven European amateur stations were copied by a total of one hundred American and Canadian amateurs. R. B. Bourne, 1ANA, Chatham, Mass., has been adjudged winner of the first-prize $1100 Grebe transmitter.

In the Far North, the MacMillan Arctic Expedition has experienced a most severe winter. However, despite violent fading conditions, ARRL Operator Don Mix has been able to maintain reliable communication with home, mainly through the coöperation of Jack Barnsley, c9BP, Prince Rupert, B. C., and Len H. Weeks, u9DKB, Minot, N. D.

Anticipating the usual mild weather of early spring, this issue gives full discussion to the subject of antennas. John L. Reinartz, 1QP, contributes "How Antennaz Work," an outline of a series of interesting antenna experiments; Technical Editor Kruse tells how to build a good "antenna series condenser," and appraises the various types of antenna lead-in insulators.

The search for more efficient receiving methods continues and Stuart Ballantine's easy-to-understand article, "Radio-Frequency Amplification," rehashes the methods of designing, constructing and tuning these stages. To show the BCL that all interference isn't ham-made, Perry O. Briggs, 1BGF, describes his technique for successfully tracking down power-line interference.

Pictorial introductions to a number of renowned stations here and abroad are in order this month. Photos of two British Transatlanticers, Gerald Marcuse's g2NM and E. J. Simmonds' g2OD, provide an insight to British amateur gear. Representative American stations pictured are 8BDA, Parkersburg, W. Va., licensed to Edward Garrison, 6LV, San Mateo, Calif., station of William Baker, and 8ZD-8VE, Pittsburgh, Pa., joint station of P. E. Wiggin and F. B. Westervelt.

Tube bargain: E. T. Cunningham, Inc., announces a new low price for C-301A and C-299 receiving tubes — only $5.00 each!

A.R.R.L. COUNTRIES LIST

Official List for ARRL DX Contest and Postwar DXCC

Aden and Socotra Island VS9
Afghanistan ..... YA
Alaska KL7
Albania ..... ZA
Aldabra Islands .....
Algeria ..... FA
Andaman Ids. and Nicobar Ids. .. VU
Andorra ..... PX
Anglo-Egyptian Sudan ..... ST
Angola CR6
Antarctica .....
Argentina ..... LU
Ascension Island ZD8
Australia (including Tasmania) .. VK
Austria ..... (MB9) OE
Azores Islands CT2
Bahama Islands VP7
Bahrein Island VU7
Baker Island, Howland Island and Am. Phœnix Islands KB6
Balearic Islands EA6
Barbados VP6
Basutoland ZS8
Bechuanaland ZS9
Belgian Congo ..... OQ
Belgium ..... ON
Bermuda Islands VP9
Bhutan .....
Bolivia ..... CP
Bonin Islands and Volcano Islands (e.g., Iwo Jima) .. KG6IA-IZ
Borneo, British North VS3
Borneo, Netherlands PK5
Brazil ..... PY
Brunei VS5
Bulgaria ..... LZ
Burma ..... XZ
Cameroons, French FE8
Canada ..... VE
Canal Zone KZ5
Canary Islands EA8
Cape Verde Islands CR4
Caroline Islands KC6
Cayman Islands VP5
Celebes and Molucca Islands .. PK6
Ceylon VS7
Chagos Islands VQ8
Channel Islands ..... GC
Chile ..... CE
China ..... XU, C
Christmas Island ZC3
Clipperton Island .....
Cocos Island ..... TI
Cocos Islands ZC2
Colombia ..... HK
Comoro Islands .....
Cook Islands ZK1
Corsica ..... FC
Costa Rica ..... TI
Crete ..... SV
Cuba ..... CM-CO
Cyprus ..... (MD7) .. ZC4
Czechoslovakia ..... OK
Denmark ..... OZ
Dodecanese Islands (e.g., Rhodes) SV5
Dominican Republic ..... HI
Easter Island .....
Ecuador ..... HC
Egypt ..... (MD5) .. SU
Eire (Irish Free State) ..... EI
England ..... G
Eritrea ..... (MI6) .. I6
Ethiopia ..... ET
Faeroes, The ..... OY
Falkland Islands VP8
Fanning Island (Christmas Island) VR3
Fiji Islands VR2
Finland ..... OH
Formosa (Taiwan) C3
France ..... F
French Equatorial Africa FQ8
French India ..... FN
French Indo-China FI8
French Oceania (e.g., Tahiti) .. FO8
French West Africa FF8
Fridtjof Nansen Land (Franz Josef Land) UA1
Galapagos Islands .....
Gambia ZD3
Germany ..... DL
Gibraltar ZB2
Gilbert & Ellice Islands and Ocean Island VR1
Goa (Portuguese India) CR8
Gold Coast (and British Togoland) ZD4
Greece ..... SV
Greenland ..... OX
Guadeloupe FG8
Guantanamo Bay NY4
Guatemala ..... TG
Guiana, British VP3
Guiana, Netherlands (Surinam) ... PZ
Guiana, French, and Inini FY8
Guinea, Portuguese CR5
Guinea, Spanish .....
Haiti ..... HH
Hawaiian Islands KH6
Honduras ..... HR
Honduras, British VP1
Hong Kong VS6
Hungary ..... HA
Iceland ..... TF
Ifni .....
India ..... VU
Iran ..... EP-EQ
Iraq ..... YI
Ireland, Northern ..... GI
Isle of Man ..... GD
Italy I
Jamaica VP5
Jan Mayen Island .....
Japan ..... JA
Jarvis Island, Palmyra group (Christmas Island) KP6
Java PK1, 2, 3
Johnston Island KJ6
Kenya VQ4
Kerguelen Islands .....
Korea ..... HL
Kuwait .....
Laccadive Islands VU4
Lebanon AR8
Leeward Islands VP2
Liberia ..... EL
Libya ..... (MD1-2) .. LI
Liechtenstein HE1
Luxembourg LX
Macau CR9
Madagascar FB8
Madeira Islands CT3
Malaya VS1, VS2
Maldive Islands .....
Malta ZB1
Manchuria C9
Marianas Islands (Guam) KG6
Marion Island (Prince Edward Island) ..... ZS
Marshall Islands KX6
Martinique FM8
Mauritius VQ8
Mexico ..... XE
Midway Island KM6
Miquelon and St. Pierre Islands FP8
Monaco ..... CZ
Mongolian Republic (Outer) .....
Morocco, French ..... CN
Morocco, Spanish EA9
Mozambique CR7
Nepal .....
Netherlands ..... PA
Netherlands West Indies ..... PJ
New Caledonia FK8
Newfoundland and Labrador ..... VO
New Guinea, Netherlands PK6
New Guinea, Territory of VK9
New Hebrides ..... FU8, YJ
New Zealand ..... ZL
Nicaragua ..... YN
Nigeria ZD2
Niue ZK2
Norfolk Island VK9
Norway ..... LA
Nyasaland ZD6
Oman ..... (MP4) .. VS9
Pakistan ..... AP
Palau (Pelew) Islands .....
Palestine ZC6
Panama ..... HP
Papua Territory VK9
Paraguay ..... ZP
Peru ..... OA
Philippine Islands ..... DU
Phœnix Islands (British) VR1
Pitcairn Island VR6
Poland ..... SP
Portugal CT1
Principe and Sao Thome Islands ..
Puerto Rico KP4
Reunion Island FR8
Rhodesia, Northern VQ2
Rhodesia, Southern ..... ZE
Rio de Oro .....
Roumania ..... YR
Ryukyu Islands (e.g., Okinawa) . KR6
St. Helena ZD7
Salvador ..... YS
Samoa, American KS6
Samoa, Western ..... ZM
San Marino M1
Sarawak VS5
Sardinia ..... IS
Saudi Arabia (Hedjaz and Nejd) .. HZ
Scotland ..... GM
Seychelles VQ9
Siam ..... HS
Sierra Leone ZD1
Sikkim AC3
Solomon Islands VR4
Somaliland, British VQ6
Somaliland, French FL8
Somaliland, Italian ..... (MD4)
South Georgia VP8
South Orkney Islands VP8
South Sandwich Islands VP8
South Shetland Islands VP8
Southwest Africa ZS3
Soviet Union:
European Russian Socialist Federated Soviet Republic UA1-3-4-6
Asiatic Russian S.F.S.R. UA9-0
Ukraine UB5
White Russian Soviet Socialist Republic ..... UC
Azerbaijan UD6
Georgia UF6
Armenia UG6
Turkoman UH8
Uzbek UI8
Tadzhik UJ8
Kazakh UL7
Kirghiz UM8
Karelo-Finnish Republic UN1
Moldavia UO5
Lithuania ..... UP
Latvia ..... UQ
Estonia ..... UR
Spain ..... EA
Sumatra PK4
Svalbard (Spitzbergen) ..... LA
Swan Island KS4
Swaziland ZS7
Sweden ..... SM
Switzerland ..... HB
Syria ..... YK
Tanganyika Territory VQ3
Tangier Zone ..... EK
Tannu Tuva ..... TT
Tibet AC4
Timor, Portuguese CR10
Togoland, French FD8
Tokelau (Union) Islands .....
Tonga (Friendly) Islands VR5
Trans-Jordan ZC1
Trieste ..... (AG2) (MF2)
Trinidad and Tobago VP4
Tristan da Cunha & Gough Island ZD9
Tunisia FT4
Turkey ..... TA
Turks and Caicos Islands VP5
Uganda VQ5
Union of South Africa ..... ZS
United States of America ..... W, K
Uruguay CX
Vatican City ..... HV
Venezuela ..... YV
Virgin Islands KV4
Wake Island KW6
Wales ..... GW
Windward Islands VP2
Wrangel Islands .....
Yemen .....
Yugoslavia ..... YT-YU
Zanzibar VQ1

NOTE: Prefixes in parentheses are used by occupation forces.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

On Facing Page —
UP-TO-DATE COUNTRIES LIST
• For the information of DX-Contesters and DXCC members and aspirants, this *QST* reproduces in full the official postwar ARRL Countries List, including all modifications and additions made to date.

How:

It's rather doubtful whether anyone has the time or inclination to peruse our monthly alphabetical stew this trip. Old twenty is really sagging in the center and the other h.f. bands sound somewhat singed on their lower edges after those first DX Contest week ends! Verily, this is that time of year when power companies all over the world are mightily mystified by the appearance of strange peaks on their consumer graphs. Let them ponder; we're having fun, anyway!

BG's recent editorial aptly covered the subject, so added superlatives become superfluous. Nevertheless, it is interesting to note that Jeeves, imperturbable as he usually is, was strongly impressed by the huge amount of Contest activity. He says, despite the fact that he had soldered them into their sockets, one slow swish of the receiver across 14 Mc. caused two r.f.-stage 24As to pop out onto the operating table waving little white flags.

Now that's pretty steep, we'll admit, but Jeeves is an amazing fellow. For instance, look what he's wrung out of the month's mail sack. . . .

What:

Either everybody has been standing in the **ZC8PM** queue around 3508 kc. or else it's a widespread case of resting up for the annual DX fray now in progress. At any rate, *eighty* reports are few this month. WØCFB wound up with **CN8MI** (3515), FA8IH, F3MS, Gs 2JT, 6RB, 8JR, KH6IK, VO2CY and ZLs 1AAX, 1IB, 1MB, 2BD, 4AV, 4DU and 4JA . . . . . At W9AND the good words are **VP2LA** (3577), FA8BG, **HH2BL** (3501), **HH1ES** (3501), **VP9U** (3525 t7), G5LI and G6CJ; **KL7s PB** (3550), **TM** (3730), **LP** (3550) and **KB** (3517) have been heard . . . . . The 50-watter at W2YZG grabbed VOs 2BL, 2BV, 2R, 4AD, G4JZ, **HB9GQ** (3630), D5FF and ZC8PM . . . . . W9BMV succeeded handsomely with **CT3AB** (3515), **KV4AA** (3505), **D4AAJ** (3503), **ZL4JA** (3510); Gs 6GM and 8AX.

The afternoon-daylight DX on *forty* has been delighting the eastern half of the country lately. W9KFO's kw. amassed this assortment: **CN8s AN** (7040), **BC** (7050), **ER** (7005), **D4AAJ** (7005), **D5AA** (7015), **GD3UB** (7010), **ZC6UNJ** (7008), **OH3NB** (7015), **SL2AD** (7070), **ZB1Q** (7015), **PAØLB** (7008), **ZLs 1LZ** (7070), **1GE** (7020), **11ET** (7030), **VK4EL** (7005), **HK3CT** (7018), **PY2ACT** (7010), six Swedes and more besides! . . . . . **ZC8PM** (7055–7085) was tackled by W8YGR, who also collected **F9BC** (7026), **I1MQ** (7068) and Gs galore . . . . . Being from Missouri didn't cause WØETF to scoff at **HP2X** (7040), **CM1AJ** (7020), **HC1JW** (7010), **ZS1M** (7060), **VKs 3XB** (7030), **5JE** (7030), **ZL2MM** (7010), **PYs 6AK** (7030), **7WS** (7010) as well as the omnipresent ZC8PM . . . . . At 14 years, W5ONL is breaking into the racket on such as **ZLs 1GE, 2ACV** (7004), **KH6IF** (7025) and NY4DD . . . . . The ground-plane job still puts out for WØVDC: **ZS1H** (7001), **PZ1WX** (7010), **F3KH** (7010), **ON4s JW** (7010), **QF** (7010), **LAs 8RB** (7070) and **7Y** (7070) . . . . . W3JAK quotes a few dandies in HA1KK, UA1KAC, UQ2AB, ZC1CL and LA7N, while the school vacation resulted in ZS1GV, HB9EI, KG6DI, VK3AE, ZC8PM and KV4AA at W9TKV . . . . . A Canadian report that escaped VE3QD has VE3OY chatting with **HB9X** (7090), **SM2LS** (7055) and **GI6TK/A** (7025) . . . . . Specified

* DX Editor, *QST*. Please mail reports of DX activity to W9BRD's home QTH: 1517 Fargo Ave., Chicago 26, Ill.

by W2MVP and his BC459 are **FA9RZ** (7030), GI3CTU, SM5AFB, OK1ZW, YV1AI and GD3UB, with ZC8PM as WAC insurance . . . . . W3NNL is a real Forty-Forever fellow and recommends OK1EA, FA8BG, HH2BL, ZS2G, I1AIV, ON4DB, PAØEU and SM5AN. A card from ZC8PM will net his 807 a hard-earned WAC . . . . . Back again, WØCFB swapped salutations with FA8JO, F8EO, W8SIR/KH6, ON4DO, OH7NF, OK1XA, OZ2RS, PY7s GD, CK, UR2KAE, UA3MR and ZC6UNJ . . . . . Gossip running the rounds has **YK1AB** (7010) being snared by more fortunate individuals during the late evenings.

Gleanings on *twenty* haven't been too lean. In the really fancy class there's one **VU7AF** (14,305) who has been generously handing out the first Nepal contact for many. You'll need a modulator to catch him . . . . . The Solomons never have been too well represented on the air so quite a few fellows are joyful over **KH6VP/-VR4** (14,075) who has been pushing through consistently during the late morning hours, as specified by W4NNN . . . . . W4IUO had some miserable luck in the loss of 10 rare QSLs in the mail. When they were finally located all okay by the P.O., Jim felt so good he worked, on 'phone, **CT1SX** (14,307), **CT2AB** (14,310), **OQ5DE** (14,378), **VK6PJ** (14,335), **VP3MCB** (14,250), **VP4TX** (14,308), **VP7NK** (14,311), **ZD1PW** (14,318), **ZL1CD** (14,220), and **W2HVJ** aircraft/mobile (14,270) who was over the North Atlantic in a DC-6 . . . . . 200 watts gives W9RBI enough sock to snag **FF8AA** (14,305), **EA8CO** (14,190), **C3EA** (14,315) and **PJ5KO** (14,400) via the mike method.

Among the c.w. proponents, we have the cream of G6RH's crop in **VP8AJ** (14,120), **VP4TAR** (14,125 t8), **ZK2AA** (14,123), **ZD9AA** (14,045 t7), **VP2AA** (14,100 t9), **KW6RF** (14,105), **LU1ZA** (14,052 t6), **KP6AE** (14,060), **CZ2AC** (14,120) and **ZD7AA** (14,120 t8) . . . . . KH6PM jumps up and down about the tardiness of QSLs and has a scrumptious variety of juice: **C1MY** (14,060), **CE7AP** (14,005), **CX5AL** (14,060 t6), **CX6AD** (14,-005), **FA8IH** (14,060), **HK4AD** (14,070), **HP1BR** (14,020), **KX6BB** (14,105), **UAØKFA** (14,065), **VK9GW** (14,002), **VK9NR** (14,140–002 t9), **VP8AI** (14,070), **VQ2PL** (14,090), **VR2BF** (14,150 t8c), **VR5PL** (VFO), **VU2CR** (14,050), **YS1AE** (14,-090), **ZK1AA** (14,070), **ZK1AL** (14,075) and **CR7BB** (14,100) . . . . . A card from W7BE/KH6 agrees with KH6PM that Hawaiian conditions are inspiring. Bill's 10-watt VFO unit has over 55 countries already pinned down . . . . . Back to the Mainland now, W4IYT managed **UG6AB** (14,043), W7KPA/VP2 (Antigua), **TF3JS** (14,105), **ZD4AU** (14,050), **EK1GW** (14,010) and **VP8AK** (14,045) . . . . . A quarter-kw. and a ground plane scared up MI3AB, ZC8PM, TA3AA, UI8KAA, UL7BS, ZB2F, ZD4AM, VS6AZ and MP4BAB for W8DEN, and W9MDG's indoor wire reached **UA9KCA** (14,-000) and **OH2OP** (14,110) . . . . . W3QLW has really been bearing down: **CN8AS** (14,006), **CR6AF** (14,010), **CR7AF** (14,063), **CT1LZ** (14,-088), **CT3AA** (14,050), **CX4CZ** (14,018), **FE8AB** (14,015), **TF3SF** (14,020), **VP3MCB** (14,341f) and VP9CC all gave him a tumble . . . . . W2LXI mentions confabs with ZC6UN, HZ1AR, ZCs 1AZ-1CL, UC2CT, UD6BM, KP6AA, CR6AQ, TF3AB, OE5YL, GC5OU and ZD2GHK . . . . . Between high-school homework sessions, W5NLU gave Arkansas QSOs to **UB5BA** (14,045 t6), KG6CT, CT1JS, **YS1ZG** (14,080), **OQ5RA** (14,090), CN8EM and HK1FU.

The status of *ten* meters has left little to be desired, especially on A3, where W5OJH devolved **VQ2JO** (28,300), **ZD4AH** (28,315), **KX6BC** (29,600), **OQ5LL** (28,250), **VP2KM** (28,348) and **EL7A** (28,450) . . . . . W9RBI lined up his larynx on **VQ8AE** (28,410), **VP8AD** (28,360) and **4X4AD** (28,100), while G6RH spoke to **VP5EM** (28,390), **VP5AL** (28,360), **HI6EC** (28,300), **HH1HB** (28,320), **MI3LZ** (28,130), **ZD4AU** (28,160) and **VS6AM** (28,150) . . . . . Just what can possibly be done through the exclusive use of 28-Mc. 'phone only is demonstrated by W1GOU's total of 141 postwar countries. His latest: AR8AB, UB5KAJ, ZD1AS, MF2AA, GD3AGE, VQ4SC, VQ2DH, VU2GB, KG6DF, VP8AD, 4X4AA, TA3FAS, ZS8A, ZS3G and

♦

HP1BR has furnished a new country to a multitude. Bob toys with all bands, 28 through 3.5 Mc., but prefers good old 20. There's an 813 in the final at 100 watts input; a single-wire-fed 40-meter half-wave is usually employed on all frequencies with good results. The receiver shown is an Australian job but a 75-A has recently been added. HP1BR is also famous for a lightning-fast 100% QSL policy.

***QST* for**

ZD4AB . _ . _ . _ . XE1TE finally got his 48 WAS cards together and celebrated the event by contacts with OQ5BQ, EL2A, ZK1AE, VR2AQ, PZ1M, CP5FB, CP1AP and 37 ZLs! _ . _ . _ . At last reports W1EKU had just about 100 countries on 10 'phone during 1948. Vern lists as most consistent DX signals from the different continents, D4AAZ, KG6AW/VK9, CX4CS, CR9AG, with several tied for first place in Africa. KG6AW is back home but Vern has yet to hear a signal from that area to compare with him. Recent catches at W1EKU are VQ4RF, AG2AD, EK1CG, VQ4CUR, ZE2JK, VQ5PBD, VQ2JC, OE7FR, PZ1M, HK5MO, CT1FM, GC2RS, GD3AGC and LX1BT . _ . _ . _ W9AND clung to c.w. and was rewarded with people such as **YR5A** (28,077), **TF3SF** (28,045), **EA1W** (28,032), **OE1AD** (28,010), **SP8XA** (28,010), **HE1EL** (28,004), **IS1AFM** (28,012) and **CN8ER** (29,080). Wes hears that SM5LK is due to visit personally with some of the 100 W6s he has worked. We hope he can stand the weather out there!

Where:

Somebody must have yanked out the cathode by-pass condenser in this stage. Looks like a bit of degeneration showed up this month. But then the period has probably been the lull before the annual Test storm. The Amateur Radio Club of India announces the existence of a new centralized bureau to handle QSLs for VU2, VU7, AC3 and AC4 areas. Address: P.O. Box No. 6666, Bombay 20, India.

Miscellany:

C3EA/C3	Sgt. Al Hattlested, AAG Nanking, APO 909, % PM, San Francisco, Calif.
CAR	4000780, A. C. Smith, Nicobar Det., via RAF, Changi, Singapore, Malaya
D4AFS	(via W9CFT)
EA8AO	Apartado 22, Villa Cisneros, Rio de Oro, West Africa
GD3AGC	W. A. Curphey, House "A," Ballasalla Housing Estate, Isle of Man, U. K.
HZ1A	Ron Wisson, British Civil Air Mission, Taif, Saudi Arabia
HZ1AH	(via HZ1A)
KG6CR/KL7	Wm. D. Gilley, USN, Radio City NOB, Adak, Alaska
KG6ET	Fleet Aircraft Service, Squadron 13, FPO, San Francisco, Calif.
KX6BC	Navy 824, FPO, San Francisco, Calif.
MD4BLC	% Post Office, Hargeisa, British Somaliland
MD4BPC	W. H. Caunter, SQMS, Royal Signals, % British Somaliland Signal Station, Hargeisa, British Somaliland
MI3AB	Box 427, Asmara, Eritrea
ex-OA4CS	Wilson H. Moore, % Comm. Dept., Pan American World Airways, LaGuardia Field, New York City
OE5YL	(via RSGB)
VK9NR	(via WIA)
VO2CY	Wm. Raymond, Gander, Newfoundland
VO4AF	Stephenville Crossing, Newfoundland
VP2LA	Frank Defreitos, APO 867, % PM, Miami, Florida
VP5AO	C. Soares, No. 6 Retirement Road, Cross Roads P. O., Jamaica, B. W. I.
VQ4SS	P. O. Box 581, Nairobi, Kenya

Three well-known Trieste amateurs are shown here in charge of the ARI display exhibited at the recent International Fair of Trieste. I1RC is the fellow attempting to unscramble fifty-seven zero-beat Ws while I1BCB and I1NU look on sympathetically. (*Photo via W2NFQ*)

VU4CN	Sgt. Forsyth, Nicobar Det., via RAF, Changi, Singapore, Malaya
W8OZG/C1	Box 501, Tsingtao, China
YI1DD	% U. S. Embassy, Santiago, Chile
YK1AB	Box 35, Damascus, Syria
YN1RO	153rd AACS Sqdn., APO 3024, % PM, New Orleans, La.
ZC6UNJ	(via W1NYI)
ZD4JT	(via GM3AFG)

Thanks go to W1s IIN, KMY; W2s CJX, LXI; W3s DPA, OHC; W4s CYY, IUO; W5OJH; W8TLL; W9s CFT, CIA; WØCFB; VS7PH; *Skywire* (Montreal Radio Club, VE2KG).

Tidbits:

We're pretty sure that nobody is going to shed tears over the welcomed report that the spoofing "AC3GG" had the boom lowered on him by the FCC. He succeeded in fooling very few of the gang, anyway . _ . _ . _ This OE5YL claims to be the only feminine operator in Austria. Jane's the name but we didn't get her 'phone number. [No use, boss — she's on c.w. — *Jeeves*] . _ . _ . _ With W4CY also working stuff on the bands, squinch-owlish W4CYY struggles to keep from going batty. Still, JB volunteers some tasty morsels: Chaps who have given CR4HT up as a bad job might be able to get their cards from CT1HT; AR1OD and MD4BPC have pulled their big switches while G3SS has become VQ4SS . _ . _ . _ U. S. citizenry in the Philippines were supposed to have been handed the big QRT in January. Just prior to this, they were using the prefix DU instead of KA. W5ALA and D4ALN add other changes: J, J9 and D4 become JA, KR and DL

respectively . . . . . If you still need your VS4JH pasteboard, try a line to G2FSR . . . . . That FY8 business is back again. A peep at W4GNT's Dade Radio Club bulletin reveals that a legit French Guiana station may appear on 7 Mc. at any time now. And don't be too skeptical if you should bump into characters claiming Kuwait or the Turks and Caicos Islands as their QTHs . . . . . W1KMY received FP8AB's QTH by radio as "Box 15, St. Pierre Island." Well, the odds are still 648 to 1 . . . . . "You fellows certainly hear me okay, judging by the numbers calling me," reads a letter from VS9AL. Hmm, as a VE4 once put it, "All who are being called are not necessarily being heard, these days." But Bert's 807 really does step out . . . . . Ex-YI2FDF writes from Surrey to say that although he tried to make it 100% QSL from Bagdad, a request to G2FDF will take care of cards gone astray . . . . . W4BYF is handling HC1ES QSLs for 14th ARRL DX Contest contacts, having recently received the log . . . . . A sked with AC4YN should be offered as first prize to the high man in the next DXCC Roundup, states W2BXA. Maybe we should make that on 75 'phone, too. We've never heard Tibet on 80 — postwar, that is . . . . . Quoting W9LNH, the Roumanian bureau has a stack of cards on hand for YR5VP who is unknown to them . . . . . W0PXU has it that LXs 1AS and 1RB are the only Luxembourgers using 20 c.w. Others heard via the same medium are most probably ungood. LX1RB, by the way, engineers at the famous Radio Luxembourg . . . . . Brothers who have cards awaited which are a few months overdue need not be faint of heart. W6DNF just received a QSL from SM6SB confirming a 7-Mc. QSO way back in 1930! . . . . . Your chances to hook Trieste will be much enhanced by the FTT DX Contest slated for the entire month of March on 7, 14 and 28 Mc., both 'phone and c.w. I1RC vows to have all licensed personnel in there pitching . . . . . W2SNN will do the honors for PK4DA as regards cards, upon receipt of the fellow's logs . . . . . There's always some sad news floating around and here's the latest: Ex-SU1HF reports that the Egyptian bureau at Box 360, Cairo, is no more. Neither is amateur activity allowed at present. Tardy SU1HF cards may be obtained from Hal Frost, P. O. Box 3352, Corpus Christi, Texas . . . . . Add itinerants: The personnel turnover in Korea is terrific right now. HL1s AA, AB, AH, AI, AY and BM are QRT. Major Blencoe, HL1AA, who really helped keep the ham spirit sprightly over there, returns to the States to get W9ESM on the air . . . . . We'd like to list the call changes in Japan but are unable to do so for lack of space; there's no set system as in the case of J8-to-HL1. We'll have to leave it to W9TRD. We can say, however, that the FEARL Hq. station, J2USA, has returned to the air as JA2US, using a kilowatt input on all h.f. bands . . . . . W9s CIO and IWT are pleased to have VU2VJ as a classmate at the Milwaukee School of Engineering . . . . . ZS6BT (ex-G6UO) writes an interesting epistle to W1VG concerning circumstances surrounding ZD9AA. For one thing, there has been no boat to Tristan in over a year, so Bert was licensed by radio! Also, you're not necessarily going to receive your card tomorrow or the next day; the boat only hangs around the island for a few hours. Thus it will most likely be that cards delivered in 1949 will not be answered until 1950. So let's stop this nonsense of working ZD9AA once a week to see if he's QSLd yet . . . . . "Another pet peeve of mine is the big boy who, after an initial contact, calls me every morning just to see if he's still RST 589. . . ." So speaks the ever-popular ZC8PM, plunking a bad nail right on the head, too. Pat has been expecting to pull that big switch at any time and he certainly made a lot of pals with those snappy Asian all-band QSOs! . . . . . We hate to say it, but CE3AB's statistics declare that W9s are the most lax QSL-answerers in the States — a spindly 57.62% comeback. W2s run a close second for the booby prize and W3s top the standings with a none-too-good 84%. Grand total W average: just over 66%. If it would do any good, we'd repeat that much-maligned proverb about our big glass house . . . . . W4CQL (AR1YL) has cards on hand for ARs 1AK, 2LD, 3AB, 8BK and 8FZ. Former operators of these stations can claim their stacks by writing Elsie Harmanson at 245-58 60th Ave., Douglaston, N. Y. . . . . W8QOH/MM is Asia-bound on 28 Mc. and intends to have a look-see at the ham situation in such areas as FI8, FN8, CR8, HS, et al . . . . . We learn from good authority that cards for OE hams are being either censored or confiscated. ARRL has the undercover QTH, and will be glad to QSP.

—...—

While gathering data for his new pamphlet on the proper water cooling of 6L6s, Jeeves ran across the ionosphere theory in the new 1949 *Handbook*. *Now* they tell us; after all these years of calling Asians with our beam pointed straight down.

HAMFEST CALENDAR

NEW JERSEY — The Delaware Valley Radio Association will sponsor its Fifth Annual Old Timers' Nite & Banquet on Saturday, April 9th. The affair will be held in the ballroom of the Hotel Stacy-Trent in downtown Trenton. A turkey dinner will be served promptly at 6:30 P.M. Guest speakers will be prominent old timers from all branches of radio, and there will be a "Grand OM" award to the old timer whose experiences date back the farthest. Another special attraction will be W2ZI's collection of old-time wireless gear. Reservations must be made before April 1st and are $5.00 per person; write Ed G. Fraser, W2ZI, General Chairman 1949 Old Timers' Nite, 315 Beechwood Ave., Trenton, N. J. Latecomers may purchase tickets at the door at $6.00. As in the past, the party will be *stag*.

The "Capital X" Array for 28 Mc.

A High-Gain Bidirectional Array of Extreme Simplicity and Low Cost

BY R. R. CAMPBELL,* W4DFR

THE performance of the array about to be described has been such as to result in numerous inquiries as to its construction. It is simple and inexpensive in the extreme, yet it provides a gain equal to the usual 3-element array — in two directions. It is of particular interest to those who have neither the purse nor the mechanical facilities for rotary-antenna construction. The array is built entirely of 300-ohm Twin-Lead and small hemp rope, 150 feet of each being required. These items, and a couple of awning pulleys for convenience in raising and lowering it, comprise the bill of material; five bucks will handle the job easily. It is made and erected as one unit, the entire job requiring only a few hours' time.

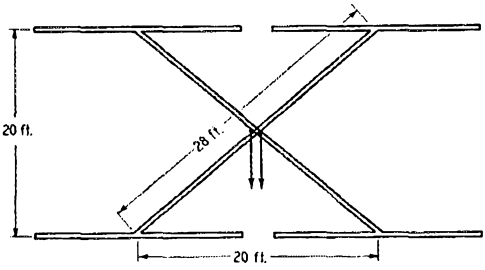


Fig. 1 — The "Capital X" array as described by W4DFR is composed of four Twin-Lead dipoles fed in phase. The transmission line and phasing sections are of the same material. Though it provides, in two directions, a degree of gain which is comparable to the average 3-element array, it can be erected for a total cost of about five dollars. Dimensions given are for 29 Mc.

Briefly, the array consists of four folded dipoles, suspended two-over-two, and fed in phase, as seen in Fig. 1. The two dipoles in each section are 20 feet apart, center-to-center, and the two pairs are stacked vertically, one set being 20 feet above the other. Feeders to each dipole are arranged in "X" fashion, and fed at the central point of the system. Directivity is broadside to the array.

No insulators were used, suspension of the dipoles being accomplished by sewing them to the hemp rope, as shown in Fig. 2. Small holes are punched in the Twin-Lead at intervals, and the "sewing" is done with waxed linen shoe thread. This seemingly fragile construction is of sufficient strength, because of the extremely light weight of the entire system. A 1 × 1-inch piece of Plexiglas was used at the junction of the phasing lines, but even this might be omitted.

*Grand Theater Building, Lenoir City, Tenn.

Probably everyone has his own idea about the proper length for a folded dipole made of Twin-Lead, but in our case it was determined by experiment to be according to the formula:

$$Length\ (\text{feet}) = \frac{449}{Freq.\ (\text{Mc.})}$$

The phasing sections are each one wavelength long, minus the propagation factor of the line. The lengths may be figured from the formula:

$$Length\ (\text{feet}) = \frac{492 \times 0.82}{Freq.\ (\text{Mc.})}$$

For 29 Mc. this comes out to be approximately 15½ feet for the dipoles and 28 feet for the phasing sections. Just to be sure, we checked the phasing section length by experiment, too. The 150-foot length of Twin-Lead was coupled to the transmitter and checked Lecher Wire fashion. The answer came out 82.9 per cent, so it appears safe to take the manufacturer's word for it!

Care should be taken to see that all four dipoles and the two phasing sections are exactly alike, to insure balanced current distribution and mechanical symmetry. The array can be assembled most readily by attaching the dipoles to the ropes before the feedlines are connected. Stretch a rope tight and sew on one dipole, then measure 20 feet from its center and make this the midpoint of the second dipole. Repeat this procedure for the lower half of the array. The 20-foot dimension is correct for a 29-Mc. array; it will vary slightly for other frequencies. If the two sections thus constructed can be suspended 20 feet apart in a horizontal plane it will facilitate the connection of the phasing sections, the next operation. At the exact center of the crossed phasing sections open up the sides and solder as shown in Fig. 1, connecting on the 300-ohm line which will go to the transmitter position.

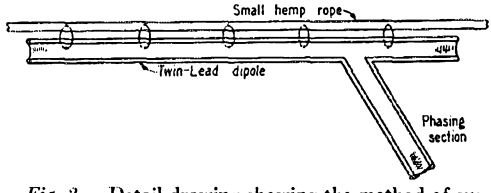
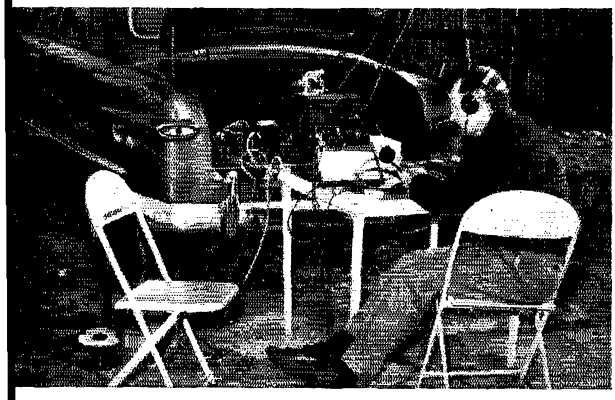


Fig. 2 — Detail drawing showing the method of suspending the dipoles in the "Capital X" array. Small holes are punched in the Twin-Lead at intervals, and the dipoles are sewed to the supporting hemp rope with waxed linen shoe thread.

(*Continued on page 110*)



Ham Radio Scores a Turkey Run

BY GAY E. MILIUS, JR.,* W2NJF

HAMS and "mudders" — the latter the truly-descriptive nickname of amateur endurance motorcyclists — have much in common. Timing, distance, operating skill, stamina, routing, reliability — all are critical factors entering into the pursuit and enjoyment of both hobbies. It was only natural, therefore, that success was assured when the Yonkers (N. Y.) Motorcycle Club invited the Westchester (N. Y.) Amateur Radio Association to participate in the scoring and administration of the Northeastern States Championship Turkey Run.

Ninety-eight riders braved the hazards of the Yonkers run, which ran for 175 miles over — and through — all manner of terrain, including water holes, cowpaths, dense woods, gullies and precipices. Drivers negotiated the route without preview or rehearsal, and were timed and scored at twenty check points manned by YMC officials and WARA members, the latter using all forms of portable and mobile gear. Thanks to this communications set-up, YMC officials at the finish line had a clear picture at all times of the progress of the test, and the probable winner was known when the last rider had crossed the finish line, eliminating the three-day wait experienced in past years.

Over 2000 messages were speedily and accurately handled during the meet. Though most traffic related to scoring and timing, there were instances when routine was broken by the need for getting through reports of vehicle breakdowns and illness among supervising officials. On one occasion, a WARA operator was arrested for

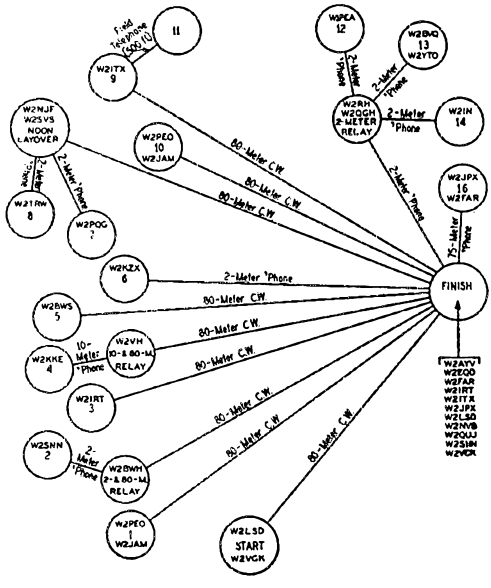
♦

Amateur radio ops and motorcyclists in action during the Northeastern Championship Turkey Run. *Top:* A Yonkers Motorcycle Club rider surmounts a water-hole obstacle. *Top center:* Phil Chubb, W2PHF, operating W2PEO's rig at Check Point 10. *Lower center:* Dave Bulkley, W2QUJ, at finish line with Bill Tracey, YMC official, standing by. *Lower left:* Mike Hoyer, W2BWS, in business at Check Point 5 (messengers standing by). *Lower right:* Otis Trowbridge, W2NVB, and SCM Fred Skinner, W2EQD, receiving traffic at the finish line while a YMC scorer looks on. (*Photos by Al Lane, W2PHO.*)

speeding while on the way to his post. This news was, of course, relayed by ham radio to the WARA net control and a relief provided.

Al Lane, W2PHO, YMC member and equally at ease be it kilocycles or motorcycles, acted as coördinator between the two clubs. The WARA committee handling plans consisted of Bill Knott, W2QGH, J. C. Ward, W2ITX, Ken MacLea, W2RH, Eric Roberts, W2PEO, Larry Trigg, W2YBK, and SCM Fred Skinner, W2EQD. This group received, in strict confidence, a list of all check points on the proposed route. After weeks of investigation and radio testing, the communications plan shown in the diagram was evolved. Patterned along emergency-net lines, the gear employed included 30 portable or mobile transmitters, a similar number of receivers, and five 115-volt a.c. generators.

"Turkey Run?" Oh, a name stemming from the fact that the winning "mudder" takes home a Thanksgiving turkey as a prize. And how did the WARA gang fare? Well, after all bruises and equipment breakdowns had been counted and



Plan of smooth-working Westchester Amateur Radio Association communications net for scoring and coördinating the Yonkers Motorcycle Club endurance test. Over sixty WARA amateurs participated in this unusual field test of emergency equipment, plans for which were carefully worked out in advance. 'Phone was used to advantage mainly on short-haul intercom circuits while c.w. routes carried a large volume of long-haul record traffic.

things squared with the XYLs, the OMs sat down to a festive board with YMC members. The pièce de résistance? You guessed it — turkey!

* Alternate Director, Hudson Division, ARRL.

OUR COVER

December *QST*, featuring Little Miss W3OVV as our cover girl, hadn't been out a week when the young menfolk of the land decided something should be done about regaining the youngest-ham title for themselves. In accepting the challenge, they found formidable contenders in the persons of nine-year-old Kent Lattig and his "older" brother, Lowell, age eleven, of Cropsey, Ill. The star second baseman and the ground-covering shortstop, respectively, of the Strawn (Ill.) Elementary School baseball team called on the FCC examiner in company with their mother, Orletta Lattig, W9KOD. The brother team handled the exam confidently and without assist — they had won their 15-w.p.m. ARRL Code Proficiency Certificates months before. In short order FCC issued Kent W9FZE and Lowell W9FZJ; W9KOD received her Class A endorsement, too.

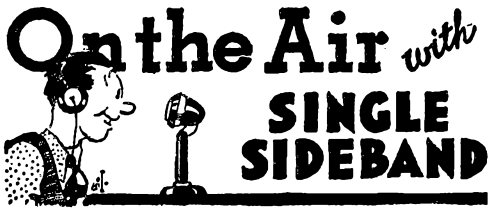
This month's cover shows W9FZE pounding brass on 40 while W9FZJ waits an opportunity to build his WAS total. In the short time the boys have been licensed Kent has an edge over Lowell — 22 states to 17. But to quote Lowell: "No wonder, a fella in the sixth grade has lots more homework than a fourth-grader."

The boys come from a most unusual radio family. Mom — "Letta" to the gang on 75 'phone — is WAS, RCC, holds a 25-w.p.m. Code Proficiency Certificate, and ably takes care of the needs of four other children younger than our new hams. And since we mustn't overlook Dad, he's Jim Lattig, W9QJR, ex-K6UQK, WAS, WAC, RCC, 25-w.p.m. CP, member of the Illinois Emergency Net, and superintendent of Strawn schools. In addition, competing for schedules and attention as favorite uncles, there are W9NRT and W6VAV!

Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

W1AWQ, Charles A. Garcelon, jr., North Lovell, Me.
W5EIN, Joseph E. Nelson, Nogal, N. M.
W6DSS, Stanley A. Tryce, Inglewood, Calif.
W6MSO, Frederick P. Stapp, Inglewood, Calif.
W7HKI, W7IHA, A. H. Gould, Portland, Ore.
W9NYL, Raymond N. Breecher, Waukesha, Wis.
WØYPZ, Henry J. Wood, St. Paul, Minn.
G3DIU, Richard Davies
G3PZ, Raymond R. Waite, Gloucester
OK1SM, Jaroslav Kucher, Prague



DOWN New Mexico way **W5NRP** has done it with his single-sideband rig. The phasing job uses the networks described in *GE Ham News* into four 6K6s driving a pair of 4-125As at a kilowatt peak. Just to make it tough, Ray is on 28 Mc., where he says there is an amazing scarcity of b.f.o.s and knowledge of how to tune in the stuff. But he has managed to educate a few, by raising them on a.m. and switching to single sideband. The few include ZL2BE, ZL1TJ, JA2AB, G3AO, G2AKR, ZS3G and ZP5FA, which will give him the first single-sideband WAC, when he gets the cards!

In St. Louis, Mo., **WØJSY** is on 20 and 75 with a pair of 4-125As in the final running a kilowatt peak. The exciter ends up with four 807s, screen-modulated for single sideband, with provision for f.m., a.m., c.w. and single sideband. On a.m. the audio is used as a driver for a big modulator on the output amplifier. Using his old exciter and audio equipment, WØJSY spent less than $20 to make his station modern.

In Oklahoma City, **W5HEV** is on 75 with a rig patterned after Dawley's in the July, 1948, *QST*, with plans for a push-pull 805 amplifier in the near future. John borrowed a 'scope for the original alignment, but finds he can check balance and phasing fairly well by just using his receiver. In common with many operators of single-sideband rigs, he proposes that the League inaugurate a "National B.F.O.-Rebuilding Week."

Out West, **W6CEM** isn't a newcomer to the stuff, since he has been on since last fall with the rig he described in *CQ*. That unit ended up with four 4-65As, and he has used it into the antenna or as a driver (with 400 volts on the plates) for a pair of 4-250As. Leigh's best DX is only G, KH6 and KL7 since, as he puts it, he believes "more good can be done by working among our own heathen." He would like to see all of the single-sideband boys get together in one spot for some extensive tests to see just what the stuff will do in intense interference conditions.

W3ASW and **W2VVC** have been doing just that, on 75 and on a small scale. In their latest tests, their (suppressed) carriers were spotted only 275 cycles apart, but W4OLL was able to copy either one simply by a small shift of the BC-221 he was using for carrier reinsertion. This was with both stations using the same sidebands — they have also demonstrated that by using opposite sidebands the receiving operator can select one or the other by judicious receiver tuning when both stations are on practically the same (suppressed) carrier frequency.

Another new one out West is **W6NVH**, who runs about 600 watts peak on 75. The exciter is patterned after the one at W6YX, where NVH was introduced to the stuff while active in the Stanford club. He hangs out around the high end of the band several nights a week.

W3MBY opened a filament in his big bottle, and had to resort to a 50-watt-peak 807 on 20. But at that he had a 3-hour solid contact on Thanksgiving afternoon, and that is a feat for any power on that band! (No, it wasn't with someone two blocks away — it was with W8CDT.)

It might be well to take time out and do a little philosophizing on how far we have come in amateur single-sideband technique, and how things shape up for the future. It may help to ease the minds of those fellows who want to try the stuff but can't decide what kind of a rig to build.

It really boils down to only two things: filter or phasing, and high- or low-level generation. While there are strong supporters of both the filter and phasing methods, it is really only a matter of choice. The filter is not as expensive as you may have been led to believe at first, and *QST* has a couple of articles on the hook [one on page 21 of this issue — *Ed.*] describing how good filters can be made at home with parts you can buy fairly reasonably. The filter system requires a few more heterodyning jumps to get where you can shift frequency with the same relative ease as on a.m. or n.f.m., but this can be done with receiving tubes and components. You can't get p.m. with a filter rig, and it takes a little doing to get the other sideband, but most of the fellows using filters now have provision for carrier reinsertion at the transmitter, so the original hurdle of establishing contact with fellows who don't recognize single-sideband signals no longer exists. You can align a filter job with nothing more than an all-band receiver and a source of audio frequency, and that's a big help to the fellow who is long on ambition but short on test equipment.

The phasing system gives you either sideband very handily, you can get p.m. or double-sideband at a flick of a switch, and you don't have to start out on a low frequency so you heterodyne not more than once, if at all. It is a tough job to align the audio phase-shift network without a 'scope and a good audio oscillator, but such things can and have been borrowed. If the audio networks were available prealigned, you could do all of the adjusting with only a communications receiver.

As for high- *vs.* low-level generation, everything would seem to point to low-level generation aimed at ending up around 5 Mc. Then a 9-Mc.

(Continued on page 112)

United States Naval Reserve

PLANS for the installation of radioteletype at Naval Reserve activities are being implemented. Equipment is under procurement, with shipment to start in the near future to those activities for which an initial evaluation set-up is planned. Six such initial points are planned, three on the East Coast and three on the West Coast. In addition, a number of equipments will be distributed for maintenance training.

The equipment which will be installed at the six evaluation points will consist of the following: a Model 15 teletype page printer; a Model 19, which is essentially a Model 15 with tape-cutting and transmitting facilities; a typing reperforator, receive only, Model 14; and frequency-shift keyers and converters for adapting standard Navy receivers and transmitters to frequency-shift keying.

Training in the Naval Reserve as regards these automatic communication devices will be operational and rate training for communication personnel and technical training for maintenance personnel. The technical training will embrace all phases of automatic communication, landline as well as radio techniques. Operational training will cover the use of automatics from the relatively simple set-up such as will be found in smaller ships; that is, from reception of teletype "Fox" schedules and "press-to-type" automatics such as are used on v.h.f. and u.h.f. circuits to the relatively elaborate communication-center type of operation involving automatic tape relay and other techniques.

The equipment to be furnished the Naval Reserve will be the same as that now used in the Naval communication service and is the most modern to be found in either military or commercial establishments. It is the policy to replace this equipment with more modern equipment now under development as it becomes available. An example of what may be expected in the future is the new page printer which will probably be known commercially as teletype Model 28. This machine will be smaller, considerably lighter, practically noiseless and will operate at various speeds from 60 to 120 words per minute, in any position. In addition, it will have certain automatic-switching features incorporated which will permit the unit to perform functions that now require additional equipment.

17 January 1949

From: **Chief of Naval Operations**
Subj: **Press items or other public statements pertaining to the radio amateur**

1. Certain press items in recent months, allegedly from Navy sources, which reflected criticism of the radio amateur, have been brought to the attention of the Chief of Naval Operations. The content of these items indicates a lack of appreciation and understanding of the importance which the Navy has consistently attached to U. S. radio amateurs and their national organization, the American Radio Relay League (ARRL). Such statements adversely affect the public relations of the Department of the Navy.

2. The Navy enjoys the best of relations with U. S. radio amateurs through the ARRL and is desirous of maintaining such relations. Both in peace and in war amateurs have repeatedly demonstrated their value and importance to the National Security. Accordingly, it is the policy of the Navy Department to support and encourage U. S. amateur radio activities.

A. W. RADFORD,
Vice Chief of Naval Operations

The above letter, which was addressed from Chief of Naval Operations to Naval commanders afloat and ashore, is of interest to all amateurs.

—•••—

Commander James C. Picken ("Pick"), W7BZ, ex-2RX, has recently reported to the Potomac River Naval Command as district Reserve Electronic Warfare Program officer, and will soon be back on the air as a W3.

—•••—

Public Law 810 authorizes retirement benefits for reservists. Naval Reserve Multiple Address Letter 54-48 further explains this law. This is one of the most significant pieces of legislation affecting members of the reserve components of our armed forces.

—•••—

Items for this page should be sent, *via official channels*, to Cmdr. F. G. Blasdel, USN, Rm. 3062, Arlington Annex, Navy Dept., Wash. 25, D. C.

CONDUCTED BY E. P. TILTON,* W1HDQ

WELL, was it a success, or wasn't it? From the standpoint of an observer on the East Coast, the Second Annual V.H.F. Sweepstakes was the biggest and best v.h.f. contest ever held. For the first few days after the contest the Headquarters mailbag was heavy with the fat reports of the W1s and W2s, many of whom reported more than 100 contacts. "Twice the bedlam of last year!" "New contacts to be made right through the contest period." "Much fun!" So the comments ran — the V.H.F. SS was great stuff, obviously. Activity was at a high level all along the Atlantic Seaboard, down to Washington, D. C., and Virginia. Ohio and Western Pennsylvania and Ontario sections turned in impressive totals, and several California sections had a lively time of it. Much of the rest of the country was rather quiet, however, or so it would appear, on the basis of early reports.

Conditions? For once we managed to pick a week end for a v.h.f. contest when propagation was at least up to the season's average. The 50-Mc. band was open at least three times during the contest period, and tropospheric bending was quite pronounced from the beginning of the contest until around noon on Sunday, making it possible for the 2-meter gang to run up impressive section totals. Chances are, however, that January 15th and 16th would have passed as just an ordinary winter week end, had it not been for the heavy and continuous activity engendered by the contest. Never was the importance of such activity in determining the possibilities of the v.h.f. bands better demonstrated. If as many stations were using the v.h.f. bands all the time, winter operation would be more productive of DX than most people suppose.

In a few minutes of listening just before the zero hour on Saturday, W1ATP, Holliston, Mass., was amazed to hear W4EID, Jacksonville, Fla., coming through on 6. Promptly at 2 P.M. he called, and Number 1 was exchanged each way for a flying start. This didn't last long, however, being the only sporadic-*E* contact thus far reported for that portion of the contest period. W1ATP went on to roll up 102 contacts in 8 sections on 50 and 144 Mc., for 1632 points, but W4EID could add only four more QSOs.

The highest score yet received was turned in by W2SAI, Riverton, N. J., who made 189 contacts in seven sections for 2646 points, more than 700 points above his nearest rival. His work was on 50 and 144 Mc. W2QNZ, Paterson, N. J., used 144 Mc. only, but spread his 106 contacts over *nine* sections, to total 1908 points. W8ZFJ/2, Atlantic Highlands, N. J., worked 131 stations on 144 Mc., and W2ZBO, 126. W1CTW, Arlington, Mass., had 130 contacts on three bands, but his section total being lower prevented him from topping W1ATP for Eastern Massachusetts honors.

Not all the big scores were turned in by stations in a position to tap the reservoirs of activity in the Boston and New York areas. W8UKS, Burton, Ohio, piled up 66 contacts in Ohio, Western Pennsylvania, Michigan, Ontario, Western New York, West Virginia, Indiana and Maryland — a lot of territory to cover on 144 Mc. from North Central Ohio! W3RUE, Pittsburgh, reached seven sections, with 51 contacts on 144 Mc. for 714 points, and W8CYE, Miamisburg, Ohio, made 46 contacts in seven sections.

As in the past v.h.f. contests, Hogback Mountain, Vermont, was the scene of valiant efforts. This time the hero was John Townsend, W1OIQ, who braved the wintry blasts and spent the entire contest period in a summer cabin near the summit. Hogback is the prize v.h.f. location of Vermont's Green Mountains, one of the few accessible spots in that state having a clear shot in the right directions to hit many of the populous areas of New England. W1OIQ/1 was prepared for operation on four bands, but contacts were made only on 50, 144 and 420 Mc. The 2-meter band opening Saturday night was the principal source of excitement, giving several New York and New Jersey stations their prized Vermont contacts. The score of W1OIQ/1: 46 contacts on 144 Mc., 18 on 50 Mc., one on 420 Mc., with a section multiplier of 9, for 1170 points.

One surprise was the number of stations worked on 50 Mc. in some sections. W1EKT worked 40 stations on 6, W1HIL 42, and W1LSN and W1ATP 43 each. There was no provision in the SS rules for participation by stations outside of ARRL field-organization sections, but that didn't stop XE1KE and XE1GE, Mexico City, from working W5s FFM, JLY, VV, ML, VY, ESZ, OLA, JTI, LKP and W4EQR — ten stations in five sections. This opening started at 5:35 P.M. CST on Saturday, and was still going

* V.H.F. Editor, *QST*.

strong at 9 P.M. when XE1KE left the air. Signals from Oklahoma, Texas and Louisiana were heard briefly in W1 and W2 just before noon on Sunday, but the Middle West got the better of this opening. The report of W5AJG lists WØYXS, W8LHV, W8UZ, W9AQQ, W9GYX and W9JMS as worked during this period.

One batch of reports from W2, although far from the top in total scoring, is of interest because the stations worked on 220 Mc. exclusively. W2UWK worked 6 stations in 3 sections for 36 points. W2FMI and W2POD were also in the 220-Mc.-only class.

Listed below are some of the higher scores from the more than 100 reports received in the first ten days after the contest. Though these scores are listed in numerical order, they were picked to show possible section winners and some of their closer rivals. They represent only a small part of the higher-bracket scores, of course, but they were chosen to show something of the activity around the country.

Call	Section	Points	Multiplier	Score	Bands Used
W2SAI	S. N.J.	378	7	2646	50, 144
W2QNZ	N. N.J.	212	9	1908	144
W8ZFJ/2	N. N.J.	261	7	1827	144
W2ZBO	N. N.J.	252	7	1764	144
W2QED/2	S. N.J.	238	7	1666	144
W1ATP	E. Mass.	204	8	1632	50, 144
W1CTW	E. Mass.	260	6	1560	50, 144, 220
W1JKC	Conn.	164	9	1476	144
W1HIL	E. Mass.	234	4	1404	50, 144
W1QXE	W. Mass.	190	7	1330	50, 144
W1OOP	E. Mass.	216	6	1296	50, 144, 220
K1FAA	Conn.	151	8	1208	144
W1OIQ/1	Vermont	130	9	1170	50, 144, 420
W2TZU	N.Y.C.-L.I.	180	6	1080	50, 144
W8UKS	Ohio	132	8	1056	144
W2COT	N. N.J.	172	6	1032	50, 144
W2ADA	S. N.J.	154	6	924	50, 144
W3FUF	E. Pa.	170	5	850	50, 144
W2AOD	N.Y.C.-L.I.	160	5	800	144
W2KTU	N.Y.C.-L.I.	150	5	750	144
W3CGV	Md.-Del.-D.C.	124	6	744	50, 144
W3RUE	W. Pa.	102	7	714	144
W1FZ	N.H.	108	6	648	50, 144
W8CYE	Ohio	91	7	637	144
W1LSN	N.H.	106	6	636	50, 144
W2PCQ	E. N.Y.	72	8	576	144
VE3AIB	Ontario	108	4	432	50, 144
W1EIO	Maine	72	6	432	50, 144
W6AJF	E. Bay	82	5	410	144
W3GKP	Md.-Del.-D.C.	66	6	396	144
W2QNA	W. N.Y.	90	4	360	50, 144
W6VCG		68	5	340	144
W9JMS	Indiana	46	7	322	50, 144
W6EKP	San Joaquin V.	62	5	310	144
W9PK	Illinois	90	3	270	50, 144
W6BVK	Sacramento V.	46	5	230	50, 144, 420
W4LVA	Virginia	74	3	222	50, 144

These are some of the leaders, but the picture may be changed materially, as each day's mail adds to the pile of reports. It is too early to be sure, at this writing, but it may well be that the Second V.H.F. Sweepstakes will turn out to be the biggest v.h.f. contest ever sponsored. Like any form of contest, it has some weaknesses, some inequities. We are evolving v.h.f. contest forms by experience. They will be changed when and if something better can be devised. If you have ideas along this line let us know. You may be sure that all suggestions will be given careful consideration. Next contest: June 4th and 5th — a hot spot in the v.h.f. propagation calendar. It should be good, and you should be in it!

January Highlights

The month provided numerous treats for those v.h.f. enthusiasts who were on hand to take advantage of them; in fact it would be hard to find a better example than January, 1949, as evidence to refute the widespread belief that the v.h.f. bands are interesting only during the summer months. The 50-Mc. band was open around the States, and down to Mexico City, several times, and at least twice to South America. On 144 Mc. the first authentic examples of two-way work by means of reflection from the auroral region were recorded.

HC2OT, Guayaquil, Ecuador, worked W5VY/5 on 50 Mc. at 10:02 A.M. on the 2nd. XE1KE and XE1GE worked several W5s on the 6th, in addition to the SS work on the 15th previously reported. The 6th and 7th were 50-Mc. aurora and E_s dates in the northern part of the country as well, skip contacts being reported all the way from W1 to W7. This coincidence of aurora reflection in the north and sporadic-*E* skip in the south was in evidence again on the 24th and 25th, two dates which will go down in v.h.f. history. On the 24th aurora effect was noted on 50 Mc. in the early evening hours, and around 9 P.M. EST there was a period when VE3, W4, 5, 8, 9 and Ø were readable in the East on voice, though most stations were barely intelligible because of the aurora distortion. At this time several 2-meter operators noted aurora fuzz on signals, and turning their beams north and going on c.w. they proceeded to make 2-meter history.

W9PK, Downers Grove, Ill., worked W4RBK, Newport, Ky., and W8EP, Terra Alta, W. Va., on 50 Mc. aurora, and then went over to 144 Mc. and found aurora sigs there, too. Hastily connecting a key in the primary of his final plate transformer, Jack worked W4FBJ, Shepherdsville, Ky., W9EHX, McLean, Ill., and WØKYF, University City, Mo., and heard W9ASM, W9FVJ and W9FKI, all on 2-meter c.w., beams north. W3RUE, Pittsburgh, Pa., worked W1AEP on 50 Mc. and went to 144 Mc. immediately thereafter, calling CQ on c.w. for nearly an hour before he ran across W9PK, whom he called without result. Another CQ netted W9ASM, Indianapolis, at 10 to 10:15 P.M. W9EHX and W9FVJ were heard. The 50-Mc. gang were

2-Meter Standings

	States	Call Areas	Miles
W8UKS	14	7	
W8WJC	14	6	
W8WXV	13	–	
W8CYE	12	6	
WØNFM	12	6	
W3KUX	12	5	575
W1BCN*	12	4 plus VE1	
W1PIV*	12	4 plus VE1	
W2NLY	12	4	
W4FBJ	11	5	
W3PGV	11	5	
W3RUE	11	5	
W2QNZ	11	5	
W9JMS	10	5	
W2WLS	10	4	
W3GV	9	6	660
WØIFB	9	6	
W3BLF	9	5	
W3HB	9	5	
W9AB	9	–	
W8WRN	9	5	
W2PJA	9	4	
W1BDF/1	9	3 plus VE1	
W1HDQ	9	3 plus VE1	480
W1CTW	9	3	
W1JMU	9	3	
W9PK	8	5	
W3QKI	8	4 plus VE3	
W4AJA	8	4	
W1OOP	8	3 plus VE1	
WØHAQ	8	–	
W1QXE	8	2	
WØWGZ	7	4	660
W9NFK	7	4	
W8DIV	6	4 plus VE3	
WØWGZ	6	4	
W8RDZ	6	–	
WØBZE	6	3	
WØGOK	6	–	
VE3AIB	5	4 plus VE3	
W4KKG	5	–	
W9OBW	5	2	
WØHXY	5	2	
WØJHS	4	2	
WØKPQ	3	2	
W5JLY	1	1	275

* Winners 1948 Medallion award for most states worked during year on 144 Mc., 12 each.

Note to 2-meter operators: This month we add maximum DX and VE call areas worked, where known. Please supply this information for your standing.

making hay all that evening over at least half of the country.

The following night it was the same story, but more so! Beginning at 6:03 P.M. EST, HC2OT found the 50-Mc. band wide open to the States, and he worked W5NXM, Hosston, La., WØQIN, Minneapolis, Minn., W7FGG, Tucson, Ariz., and W5s KSW, Brownsville, JLY and VY, San Antonio, FFM, Beaumont, JAK, Wink, and ZZF, Big Spring, Texas, in a period of about one hour. He was heard for a few minutes at the first of this by W8NQD, Ashland, Ohio. At exactly the same time, 6 P.M., W3QKI, Erie, Pa., began hearing rough notes on the 2-meter band, with signals peaking from the north. In the ensuing three hours he heard W9s PK, EHX and FVJ, and W8WNM, Canton, Ohio, and W3RUE, Pittsburgh, all on c.w. W9PK and W3RUE were worked.

It was a three-day spree for HC2OT. Beginning shortly after noon on the 26th and lasting for more than two hours, the band was open again to the States and excellent contacts were had with W5s JTI, Jackson, Miss., ZZF, VY, ML, Oil City, La., FFM, W8UZ, Columbus, Ohio, W9KQE, Richmond, Ind., W7FGG, W4GMP and W4FBH, Atlanta, Ga., W9FDD, Chicago, W4FWH, Nashville, Tenn., and W5SM, Beaumont, Tex. W6GTG was heard and called. W5KSW, Brownsville, Tex., broke through at 10:50 P.M., and this contact was followed by one with YV5AC, Caracas, Venezuela. This one was the result of two months of schedules, and was the first 6-meter QSO for YV5AC. He is on 50.2 Mc. HC2OT will be found on 50,016.

For once we have more DX reports in the winter months than we have room to report in detail. However, we wish to thank W1LSN, W1MEP, W2RLV, VE3YY, W7QAP, W7JPA, W7DYD, W5ML, W9ZHL, W3RUE, W3QKI, W4LNG, W9PK, XE1KE, XE1QE, HC2OT and many others for their detailed accounts of the interesting doings.

Club-Sponsored 2-Meter Contests

If SS participation was somewhat lower than normal in the Los Angeles area it was probably because the gang were worn out after the V.H.F. QSO Party staged by the Two Meters and Down Radio Club (W6EMM) the previous week end. Activity on the v.h.f. bands had fallen off markedly, so the club sponsored the party to stir things up. The contest was open to all occupants of the 144-, 220- and 420-Mc. bands. One point was credited for each contact made on the lowest band, and two points per contact on 220 and 420 Mc. Two prizes, a 16-element W6IDF beam and a W6NMW coaxial tuner, went to the top scorers. Some of the leaders and their scores follow: W6YYG 181, W6WSQ 140, W6ZRU 137, W6FOW 114, W6CRV 104, W6EKK 101, W6WKO 100, and W6MJ and W6WWP 90 each.

2-Meter Mileage Contest

Feeling that a contest for 2-meter men only is needed, the V.H.F. Institute of New York is sponsoring a mileage contest to be held the week end of April 23rd and 24th. The rules are simple: just report the stations worked on 144 Mc. between 6 P.M. on the 23rd and midnight on the 24th, your local time, giving the mileage for each. Certificates will be awarded to the top man in each ARRL section (see *QST*, page 6) and to the leader in each foreign country. In addition, special recognition will be given to the two stations making the best DX contact during the contest period. Send reports to the V.H.F. In-

stitute of New York, 47-01 Maspeth Ave., Maspeth, N. Y.

V.H.F. Net Activities

To promote year-round utilization of the v.h.f. bands many groups are sponsoring nets on the various bands. Some of these, with their operating schedules, are listed below. If you are part of such a group, send us the information and we'll list it similarly, with the hope of attracting greater participation. Give the frequency and time of operation, the number of stations, antenna polarization used, and other pertinent facts.

New England: 50 Mc. — Horsetraders, Tuesday, 7:30 P.M. New England Net, Tuesday, 8 P.M. New Hampshire Net, Wednesday, 9 P.M. 144 Mc. — Monday Nighters, Monday 9 P.M. 220 Mc. — Thursday, 9 P.M. 420 Mc. (Hartford area) — Wednesday, 8 P.M.

Hampton-Newport News, Va. — Emergency net operating on 144.7 Mc. each Thursday night. Stations include W4s AJA, JHC, IT, MXY, OLK, ODG, KDV, NAQ, NRK and NRB.

Akron area: 50 Mc. — Potlickers Net, Monday and Friday at 7 P.M.

Chicago area: 50 Mc. — Tuesday nights. 144 Mc. — Wednesday nights.

Charleston, W. Va.: W8s BKI, LYG and YIF desire 144-Mc. schedules within 50 to 60 miles.

Evansville, Ind.: 144 Mc.—W9UNT, W9UIA and W4LLR, Henderson, Ky., keep nightly sked at 7 P.M. CST.

If the general use of horizontal polarization is hindering you in local net operations, and a nondirectional horizontal antenna is needed, try the suggestion of W1JFF, Newport, R. I. Fred uses a folded dipole made of Twin-Lead in the usual way, except that it is fastened to a thin stick and bent into a circle. This should give a uniform signal in all directions, with a sacrifice of about three db., as compared to a single horizontal dipole in its favored direction. The three db. can be regained by stacking a couple of these a half wave apart vertically.

The local coverage possibilities of 50 Mc. are emphasized in a letter from W8QYD, Dayton, Ohio. "Hams in this vicinity are missing a good deal. I can work W9ZHL, Terre Haute, Ind., any night, though the distance is 170 miles. His antenna is 100 feet in the air, but my set-up is nothing out of the ordinary — 100 watts to an 829B, a homemade converter into an NC-80X receiver, and a 4-element array 47 feet above ground. How about telling the boys in Chicago, St. Louis, South Bend, Elkhart, etc., to get on when the band *isn't* open?"

Final Results — V.H.F. States-Worked Contest

We take pleasure in announcing the winners of the bronze medallion awards for the most states worked on each of the three v.h.f. bands during 1948. The top scorer on 50 Mc. was J. L. Peterson, WØKPQ, Robbinsdale, Minn., who worked 42 of the 48 states on 6 during the year. It is noteworthy that Pete's winning total was racked up with 25 watts input. The 144-Mc. section was headed by two Massachusetts Eds, Edward Goodhue, jr., W1PIV, of East Freetown, and Edward Gosselin, W1BCN, of Hyannis. Both fellows worked every Atlantic Seaboard state from Maine to Virginia, and VE1 besides, on 144 Mc. in 1948. The top bracket on 220 Mc. was a walkaway for Calvin F. Hadlock, W1CTW, who worked Maine, New Hampshire, Vermont,

(*Continued on page 112*)

50 WAS Mc.

Standings as of Jan. 25th

W9ZHB	48	W5AJG	43	W9DWU	46
WØZJB	48	W5ML	42	W9PK	46
		W5VY	40	W9QUV	44
W1CLS	44	W5HLD	40	W9ZHL	43
W3CIR/1	42	W5JLY	40	W9JMS	43
W1LLL	40	W5FRD	38	W9ALU	42
W1HDQ	39	W5FSC	37	W9QKM	40
W1CGY	39	W5DXB	35	W9RQM	38
W1LSN	37	W5ZZF	34	W9UIA	36
W1HMS	36	W5GNQ	32	W9AB	26
W1JLK	35	W5JBW	32		
W1NF	35	W5IOP	30	**WØUSI**	47
W1KHL	34	W5LIU	24	WØNFM	46
W1AF	27	W5LWG	19	WØQIN	45
W1EIO	24			WØBJV	45
W1HIL	21	**W6UXN**	47	WØCJS	45
		W6OVK	40	WØKYF	44
W2BYM	39	W6ANN	38	WØDZM	43
W2IDZ	39	W6BPT	35	*WØKPQ	42
W2AMJ	38	W6AMD	35	WØTQK	42
W2QVH	37	W6IWS	37	WØSV	42
W2RLV	37	W6FPV	31	WØINI	42
W2RGV	26	W6BWG	18	WØHXY	41
				WØYUQ	39
W3OJU	38	W7BQX	45	WØJHS	38
W3OR	35	W7ERA	43	WØPKD	36
W3RUE	34	W7DYD	41	WØGSW	29
W3MKL	33	W7HEA	40		
W3MQU	26	W7FDJ	36	VE1QY	28
		W7FFD	35	VE3ANY	27
W4EQM	41	W7KAD	35	VE1QZ	26
W4QN	40	W7JPA	35	G5BY	24
W4GIY	40	W7QAP	32	XE1KE	23
W4EID	40	W7ACD	28	VE4GQ	20
W4DRZ	38	W7JRG	27	G6LK	16
W4FBH	34	W7JPN	19	XE2C	14
W4GMP	34	W7OWX	15	VE2GT	14
W4WMI	33			XE1QE	10
W4FNR	33	W8QYD	44	HC2OT	8
W4KKU	31	W8NQD	31		
W4HVV	29	W8RFW	25		
W4LNG	29	W8TDJ	22		
W4MS	26	W8LBH	21		
W4FJ	26				

* Winner, 1948 Medallion award for most states worked on 50 Mc. during year. 42.

I.A.R.U. News

TWENTY-FIVE YEARS OF UNION

A little more than 25 years ago the first transatlantic QSOs occurred, soon to be duplicated by many eager experimenters. As a result, ham radio began to take on more of an international flavor, and the need arose for coördinating amateur activities throughout the world. The idea of an international union of amateur radio operators was the logical conclusion.

In Paris, France, on March 12, 1924, amateur representatives of nine different countries sat down together to discuss the possible formation of such a union. The countries represented were France, Great Britain, Belgium, Switzerland, Italy, Spain, Luxembourg, Canada and the United States of America. A letter from Denmark expressed regrets at not being able to have a representative in attendance, but asked that the Danish amateurs be counted in. At this meeting and at another meeting two days later, preliminary organization plans were completed. Hiram Percy Maxim was elected temporary president, Dr. Pierre Corret of France was elected temporary secretary, and the ARRL was invited to submit a recommendation for a constitution. Plans were made to hold a Congress to effect permanent organization, this Congress to be held during the Easter holidays of 1925, in Paris.

The I.A.R.U. congress of 1925 saw amateur radio representatives of 25 countries complete the final organization of the International Amateur Radio Union. Mr. Maxim was elected the first international president, Mr. Gerald Marcuse, g2NM, Great Britain, was the international vice-president, K. B. Warner was elected secretary-treasurer, and *QST* was named the official organ of the Union. The 25 nations represented were Argentina, Austria, Belgium, Brazil, Canada, Czechoslovakia, Denmark, France, Finland, Germany, Great Britain, Hungary, Indo-China, Italy, Japan, Luxembourg, Netherlands, Newfoundland, Poland, Russia, Spain, Sweden, Switzerland, Uruguay and the United States.

In its original form the I.A.R.U. membership was not made up of the national societies in each country, as is the case now. Instead, individuals joined I.A.R.U. by paying a small membership fee. In each country from which there were 25 or more individual members, a national section was formed, with the first such national sections being those of the United States, Canada, France and Great Britain.

Thus, 25 years ago, was conceived the International Amateur Radio Union, which, though it has changed slightly in structure, has continued to carry out the aims and purposes laid down at those first meetings: the promotion and coördination of two-way contact between the amateurs of the world; the effecting of coöperative agreements on amateur radio matters between the various national amateur societies; and liaison for representation of amateur radio interests at international telecommunication conferences.

CALL-SIGN PREFIX CHANGES

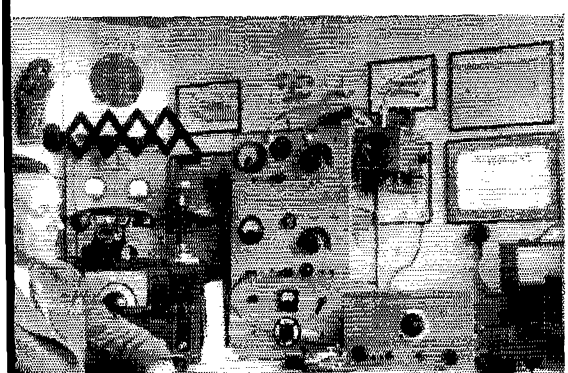
The following prefixes are currently effective in the areas indicated:

KZ5AA–KZ5WZ	Canal Zone
KG6IA–KG6IZ	Iwo Jima
KG6SA–KG6SZ	Saipan
KG6TA–KG6TZ	Tinian
KC6AA–KC6ZZ	Caroline Ids.
KR6AA–KR6ZZ	Ryukyus Ids.
KX6AA–KX6ZZ	Marshall Ids.
JA2–JA7	Japan
HL1AA–HL1ZZ	Korea
AG2	U. S. Trieste
MF2	British Trieste
DL2	British Zone of Germany
DL4	U. S. Zone of Germany
DL5	French Zone of Germany

GREAT BRITAIN

You'll be hearing quite a bit of DXing over the week end of March 5th and 6th, which will be the annual B.E.R.U. contest, sponsored by the *Radio Society of Great Britain*. This contest, extending from 0001 GCT, March 5th to 2359 GCT, March 6th, is open to all British subjects living within the British Empire and British-

(Continued on page 118)

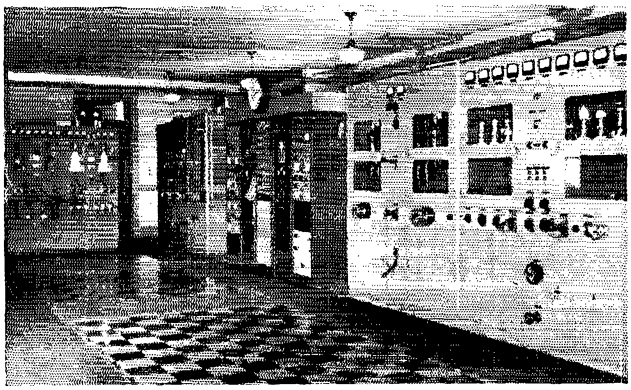


Here is the neat layout of Paavo Kantanen, OH2PK. The 2-stage 150-watt crystal-controlled rig is in the center, with a 6-meter converter at the right. The receiver is an NC-200XA.

Military Amateur Radio System

OKAY, fellows, now you can get all the latest G-2 on MARS as well as a bit of clear-channel code practice in plain text that just suits your needs, unless you happen to be a super-swift. Until requirements show a need otherwise the code speeds will be from 5 to 35 w.p.m., on 20, 40 and 80 meters.

Every Monday night at 0100 GCT on 6997.5 and 14,405 kc. (MARS frequencies), WAR, the NCS for Army nets, will broadcast simultaneously the latest information on MARS on the above two frequencies, beginning at 10 w.p.m. and repeating it at 15 and 20 w.p.m. At the same time AF4AF, the NCS for Air Forces, will be coaching the beginner on 3497.5, sending word groups at the rate of 5 w.p.m. but the characters at the rate of 13 w.p.m. WAR will repeat the transmission at 0400 GCT on 6997.5 and 14,405 kc.



This is Kilowatt Alley at WAR, from where the husky signals of the MARS emanate. The big chrome-and-plate-glass rig in the foreground is a Press Wireless 40-kw. radioteletype transmitter for overseas operation. To the rear are PW 2.5- and 15-kw. transmitters with the control panels in the center. The signals from WAR on the MARS circuits come from PW 2.5-kw. transmitters.

♦

Present temporary keying position at K4AF (AF4AF on MARS frequencies). The "keying head" is Matt (ex-5BKA-W7GUC), whose eight years with CAA and Globe Wireless as a c.w. op from Ketchikan to Singapore developed those machine-like dits and dahs (he's also put in 12 years with the Signal Corps and the Air Forces), and Jim (W4OST) is the "recording head." Jim's radio began with being a Navy flight operator and he had two years as an airplane driver for the Navy before he came over to the Air Force.

Tuesday night at 0100 GCT, on 14,405 kc., AF4AF will send as nearly 13-word-group-per-minute code as is manually possible, with the dum-dittys at 16 w.p.m. (That new Class A code requirement may show up sometime, OM.) After all information on MARS is transmitted, Federal Communications Commission regulations pertinent to amateur operation will be sent.

Wednesday night — same time, same station — there will be a repeat performance on 14,405 at 25 w.p.m. for a full hour. Thursday and Friday nights the schedule is the same as to frequency and time but the speed will be increased to 30 w.p.m. on Thursdays and 35 on Fridays.

The trusty wrist action at WAR is authored by M/Sgt. Paul E. Allyn, W4EEP, ex-W2QEM, chief op at K4USA, and Ron Griffin, W6COD, who beats a mean bug. The di-dahs at AF4AF are coauthored by S/Sgt. Ira W. Matteson, ex-5BKA-W7GUC (Matt is sweating out his W4 call right now), and S/Sgt. James M. Williams, W4OST. Before too long a Boehme keying unit will give their tired wrists a rest.

Transmissions are being arranged for the Central States by the Air Training Command at Barksdale Field, La., and 4th Army Head-

(*Continued on page 120*)

Hints and Kinks For the Experimenter

GREATER SELECTIVITY WITH THE LAZY MAN'S Q5-ER

THE advantages of low-frequency high-Q i.f. stages obtained from the now-famous Q5-er are many, but the selectivity is still not as great as it could be. A marked increase in selectivity was obtained by further increasing the separation between the i.f. coils in the BC-453 unit. This is done by removing the plug-in i.f. transformer, opening up the can, and removing the bottom coil and its form. Saw off the lower half-inch of the form, and reassemble, cementing the coil in place.[1] Don't try to slide the coil down on the form, because it is impossible to do so without wrecking things!

Selectivity is increased to the point where the b.f.o. in the first receiver is almost useless. The critical test, digging for DX on 40 meters, was passed with flying colors. I estimate the effective bandwidth to be about 500 cycles, which is sharp enough to keep almost anyone happy. I can't recall having gotten more return for less effort in a long time. — *Maynard B. Chenoweth, W8CUS, ex-W2GCC*

IMPROVED OSCILLATOR-MIXER COUPLING

ANYONE who has been aggravated by that troublesome interaction between mixer and h.f.-oscillator circuits known as "pulling" will find the use of an untuned buffer stage interposed between the oscillator and the mixer an effective means of reducing the trouble. This method is an improvement over the usual pentagrid-converter arrangement, in that while the former provides good isolation, it does so at the expense of lowered sensitivity, because the conversion transconductance of the tube is comparatively low.

In order to achieve freedom from pulling, and at the same time maintain mixer sensitivity, an untuned triode may be used as a buffer, as shown in Fig. 1. This takes advantage of the fact that although the control grid has a large influence on the plate circuit of a tube, the influence of the plate on the control grid is negligible. We have, then, a one-way affair that does not allow the mixer tuning to "back up" into the oscillator.

[1] In some units the coil forms are ceramic, which makes this a pretty tough job, but in many units the forms are mica-filled bakelite, which makes it a snap.—*Ed*

The grid of the triode is coupled to the tuned circuit of the oscillator, and the plate of the triode is, in turn, coupled to the tuned circuit of the mixer, the connection being made by a tap on the tuning coil of the mixer only a turn or two above ground. This permits the use of a high-sensitivity tube such as the 6AC7/1852 or 6SK7 as a mixer.

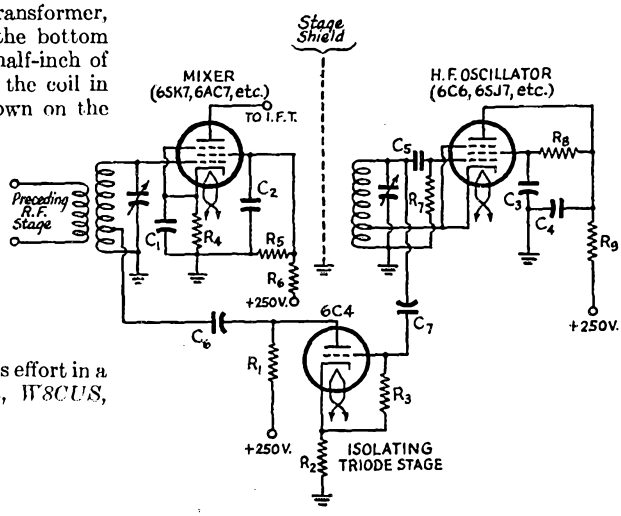


Fig. 1 — An untuned buffer stage used to provide maximum isolation of the h.f. oscillator and mixer circuits to reduce "pulling."

C_1, C_2, C_3, C_4 — 0.01-μfd. paper.
C_5 — 220-μμfd. mica.
C_6, C_7 — 0.005-μfd. paper.
R_1, R_6 — 0.1 megohm.
R_2 — 2200 ohms.
R_3 — 0.47 megohm.
R_4 — 22,000 ohms.
R_5, R_8, R_9 — 47,000 ohms.
R_7 — 10,000 ohms.

It should be noted that poor interstage shielding or injudicious placement of parts will tend to undo the benefits of the isolating triode. Conversely, any measure designed to prevent the oscillator and mixer from coupling by means other than through the triode buffer stage will make the arrangement more successful.

Choice of a 6C4 miniature triode is favored because the tube is small, its power drain almost negligible, and it seems to give results equal to those obtained with pentodes, in spite of expectations to the contrary.

The results have been something more than encouraging. Over all amateur frequencies up to

(*Continued on page 118*)

Correspondence From Members-

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

MICHELSON'S INTERFEROMETER

P. O. Box 985, A. & M. Annex,
College Station, Texas

Editor, *QST:*

I don't suppose that it will make any difference in the course of world history, but the use of Michelson's Interferometer[1] to measure microwave frequencies is not unknown down in "these hyar parts."

When I was in high school down in Goose Creek, the professor of physics in our junior college and I did this experiment from a diagram found in a college physics book. Our equipment was almost identical with that described in your article, and Mr. Nelson allowed me to write up the experiment for the Texas Junior Academy of Science. This article can be found in an issue of *Terciana*, the official magazine of the organization.

We found that the complete pattern could be determined at the focal point by connecting the quarter-wave dipole to the intensity meter with a short length of coaxial cable. This made the unit flexible and readings could be taken at many points in front of a large sheet of paper to determine the patterns that you illustrate in Fig. 1.

— *Don Hinton*

QRM

2211 Bryan St., Commerce, Texas

Editor, *QST:*

I would like to thank all amateurs who operate on the frequencies of W1AW when code-practice transmissions are being sent. Keep it up, fellows, you're doing a swell job! Some of the boys with kilowatts are very courteous; they move up the band about 3 kc. This gives the listener the fun of trying to pick out the signal from their key clicks. Then there are guys with flea-power rigs that park right on the frequency. That's OK — they're not even getting out of their backyard. Will someone please tell them about skip?

I am trying to copy W1AW so that I may get a license. There are times that these fellows make wartime "jamming" look like a peanut whistle.

— *William Potts*

King, Ont., Canada

Editor, *QST:*

I am waiting on our trunk-line frequency while VE4AM relays 5 QTC to W8TBP. Conditions are bad tonight, and we require plenty of fills. So along comes some joker, swings his VFO down on us and without even thinking, or listening, starts a long CQ. Needless to say, VE4AM has to QRX.

Why couldn't these fellows check the *QST* list of active nets, and avoid all this painful procedure. With a lot of messages and QRN, the difficulty is only increased by this thoughtlessness on the part of others.

— *T. H. Ussher, VE3AWE*

TVI

15 East Van Ness Ave., Rutherford, N. J.

Editor, *QST:*

I read this letter by Robert James, Frederick, Md., in the *Model Railroader* for January, 1949: "My popularity has decreased in my neighborhood ever since the television set owners have traced their ruined reception to my trolley layout.

"The radio and television repair shop next door reports excessive noise out of the television sets as well as poor visual reception.

"Of the several radio men I have consulted none has been able to offer a remedy. Can any readers help out?"

My first reaction was, "Ye gods! Is there anything that a fellow can do for relaxation beside collecting stamps or visiting the corner gin mill without becoming the target for the dirty looks and accusing remarks of TV lookers-on?" Then the recollection of having heard someone say, "The ultimate criterion of a good radio receiver is not necessarily what it can 'pick up,' but, rather, what it will reject." To which I say, "Amen!"

— *William H. Schmidt, W2NEL*

50 MC. AND UP

R.F.D. 3, Ashland, Ohio

Editor, *QST:*

Sometimes I think that the best efforts in "The World Above 50 Mc." may be wasted, as fellows not working on the v.h.f. bands may not read the column regularly. It seems to me that a little space in the regular editorial columns might help to sell these fellows on greater use of the 50-Mc. band.

Here is an approach I have used on a few fellows, which seems to start them thinking. I point out that it is not sufficient for us to ride our hobby for our own pleasure entirely. We owe it to ourselves to put something into it, rather than merely take something out. I try to show them that operation on the v.h.f. bands helps to relieve the overcrowded condition on our lower frequencies, and at the same time helps to further interest in the higher ones. I try to point out that it is not a case of trying to find some v.h.f. activity, but rather of *making* it.

— *Tom Stence, W8NQD*

301 Warren St., Needham, Mass.

Editor, *QST:*

Cal Hadlock's January *QST* article entitled "Making the Higher Frequencies Pay Off" was certainly timely, since those amateurs who are TV-conscious will find an important reason why high-band (174–216 Mc.) TV reception is very often marginal in acceptability.

Technical literature of recent vintage has dealt with this "aperture" concept probably with more emphasis placed on the microwave spectrum, but W1CTW's paper is the first semipopular exposé encountered by the writer. His treatment of the subject was excellent in its essence and should be underlined as must reading for those v.h.f. enthusiasts interested in basic v.h.f. principles.

— *H. Sargent, W1OGA*

"HANDLE" HABITS

2008 No. Cleveland St., Arlington, Va.

Editor, *QST:*

The exchange of "handles" or names appears to have become an integral part of the standard exchange of data between hams in QSO. Our names are now included in the rubber-stamp routine, along with RST and QTH. I have no argument with the practice, although I do feel that the good old expression "OM" is fully as appropriate.

So firmly imbued in the habits of present-day operators has this "handle" complex become, that when you fail to transmit your given name, your correspondent invariably comes back with, "Sorry, I missed your handle," or, "You forgot to give your handle." The fact is, he didn't miss

(*Continued on page 118*)

[1] "A Novel Microwave-Measuring Technique," p. 26, *QST* for Dec., 1948.

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
J. A. MOSKEY, W1JMY, Asst. Comm. Mgr.
ALBERT HAYES, W1IIN, Natl. Emerg. Coördinator

GEORGE HART, W1NJM, Communications Asst.
JOHN E. CANN, W3IEM, Communications Asst.
LILLIAN M. SALTER, Communications Asst.

Ice-Storm Emergency. Southern Missouri, Kansas and Oklahoma have just suffered one of the most severe icing conditions in recent years, leaving many cities without power or communications. With no little pride we report that amateur networks swung into action, assisted in train dispatching, reëstablishment of power, and all of the important communication jobs incident to a protracted emergency which will require months for the complete restoration of pole lines and facilities. Many amateurs in the area carried on under tremendous odds, outside amateurs relayed to overcome "skip trouble," intelligent amateurs *not* needed stood by, self-monitoring plans of some nets worked well and participating hams can boast that no requests for FCC-cleared frequencies were required. However, as the effects of the storm became widespread, an FCC order promulgating a *declared emergency* under FCC § 12.156 became effective for a two-day period, making it incumbent on all operators within 500 miles of the areas having communications difficulties to curtail all communication in the specified frequencies *except emergency* communications. ARRL-FCC designated stations named in the emergency order, including W1AW, transmitted the order to amateurs and these assisted in the monitoring-policing responsibilities required by § 12.156(d). The National Emergency Coördinator is busy putting together the whole story (for next month) from the reports now coming from scores of points concerned with this emergency. Our congratulations to all who helped.

R.S.V.P. Every amateur is invited to be constantly ready for emergency operations. Preparedness and amateur community plans made in advance pay big dividends. *Every* community should have its ARRL emergency coördinator. By radio message or card to your SCM recommend a qualified amateur for EC, or ask his name should one have been appointed; ask for an Emergency Corps blank unless you have an AEC membership card signed by the local EC within the year. All amateurs, regardless of the organizations they belong to, should be *supporting* or *full* AEC members. There's no cost to it. The only requirement is the willingness to serve. Get lined up today for information on emergency working. There is a place for *every* amateur in the ARRL Emergency Corps.

On Keeping Off Emergency Frequencies. "Must kick about the unholy QRM on '75' while the Iowa 'phone men were trying to handle emergency traffic. Overeagerness to help from all over the map was partly at fault. . . . Anyone with a think tank knows that the minimum stations needed to handle a job can turn in the best performance. Yet, on this band they will call in even if 500 miles away. I asked W5GHF to monitor the band and try to keep the channel in emergency use clear. When those in an emergency net want help they will always ask. In the meantime make it strong in *QST* that *standing by*, to avoid jamming work in progress, and *more listening and less transmitting* are of top importance! What a shame that frequency was jammed." — *W5IGW*

"With too many opening up to clear a band, QRM can be worse than ever. . . . Why not set up emergency channels on other amateur bands free of this interference? — *W4IA*

Invitation — Official Observers Needed. Ever listen to the key thumps and poor notes that prevail at intervals in some of our precious h.f. bands and want to help do something about it? Have you ever noted bad splatter from some particular voice-operated station and wanted to help advise the operator about it even though unable to work on his frequency? All members are cordially invited to assist in keeping brother amateurs out of FCC difficulties and lending effort to keep our operating pleasurable in *all* bands. Care in observing is necessary as well as tact and discretion in mailing the coöperative-type notices designed to implement this ARRL program.

Perhaps you have thought that an expensive frequency standard was required to become an observer and do anything about these matters? That's not so, and the chief requirement is that an observer-applicant have appropriate equipment to do a good honest job in the particular field of observing in which he plans to engage. Only the Class I (70 parts per million accuracy) and Class II (350 parts per million accuracy or better) observers are engaged in frequency measuring, as a rule, and while opportunities to get into this class through actual tests are presented in the form of Frequency Measuring Tests four times per year, the greater volume of observer activity is in the matter of sending the good word concerning poor notes, clicks, too-strong har-

monics and parasites, and modulation difficulties that are observed and studied with a view to keeping all of our stations and bands at top-notch performance — to make amateur radio a pleasure for all of us.

ARRL will be delighted to provide appropriate forms to every new observer appointed, as promptly as possible. Address your application to the SCM whose address is listed on page 6 of this issue of *QST*. Help us to help you on this important operating problem, please!

Give True Reports . . . Dishonest Ones Despised. The following is from W1—'s letter to an official observer: "Many thanks for your report. Very embarrassing to have the worst note you have heard since '46. Also interesting to compare your report with that from W5— who gave me T8 (a slight trace of ripple, not objectionable)! A source of troublesome r.f. feed-back to the VFO was found and treated and my sig is again T9. Thanks!" W2JUF writes in similar vein: "Kindly forward W4—'s card. W5— gave him 589x but it should have been T5. Keying was bad, too, and the signal very broad. The 'five' even said it was like a Naval station and that he himself would *like* to have such a signal. Pity poor 40 meters if they were all like that." *Be honest with all reports. Make your reports valued, gang.*

New Meanings for QNZ and QNA. ARRL netters utilize a list of special QN signals to facilitate clear and rapid communications in section-net and trunk-line operations. Such lists are available from ARRL on request and are ordinarily provided by the NCS to stations "joining up." Staff members responsible for review of suggestions relative to traffic and net betterment have recently noted W4NNJ's suggestion that the present meaning for QNZ is not being used; also that QNA is seldom required under present conditions. Effective on publication of this notice in *QST*, all netters will please note the adoption of revised special meanings, for amateur networks, as follows:

> QNZ Zero beat your signal with net control station.
> QNA Answer in prearranged order. . . .

It strikes us that the above warrants a QNC over all ARRL nets to request netters to mark over their present lists to show these new meanings. The first signal should get fellows closely *on* net frequencies instead of spread over 5 to 10 kc., and a helpful QNL or QNH in individual cases will get all concerned on the ball. The second meaning above can be used for alphabetical order or any previously-decided net reporting order.

CD Staff and DXCC Note. Our heartiest good wishes go with Al Hill, W6JQB, ex-W1QMI. Now returned to California to be with his family, Al will pursue radio and control engineering with Northrup. Bets are being placed on how soon he will be on the air. John E. Cann, W3IEM, has accepted the vacated post as communications assistant. John was an AACS chief operator, and is ROWH, A-1, ORS and holder of a 35-w.p.m. Code Proficiency certificate. He is well known to hams for his work in AARS, TO, VN, SSN and his Md. Section net and also has 43 countries to his credit. Applications for DXCC are processed at John's desk. With these piling in right and left his present ambition is to get procedure on a current basis, since the change in personnel caused coverage of the desk to lapse for some two weeks. This is to report that the award machinery is rolling again and his listing of New Awards and Endorsements will first appear in *next QST*.

DITS and DAHS. "Your ham days begin the moment you pass the code examination for your operator license. It is one of those events in a fellow's life that he rarely forgets. It's a milestone in his amateur career, marked 13 w.p.m., and like all other milestones should be marked along a highway of progress. In a few days after receiving his ticket the average newcomer is deep in construction projects which rapidly increase his knowledge of radio theory to the point where he would think nothing of having to go back and take the theoretical portion of the ham exams. How about equal progress in code proficiency? Can you still take 13 w.p.m.? . . . or 15? Or have you slipped a bit in the long hours with the soldering iron? Why not find out on January 13th at the next ARRL Code Proficiency Run. Newcomers ought to make at least the 15-w.p.m. certificate. It's fun from there on to copy the practice runs once or twice a week, take the qualifying run once a month and receive concrete evidence of your progress in the form of endorsement stickers for 20 and 25 w.p.m. as your speed comes up. Consult *QST* 'Operating News' for

details. *Don't let that 13-w.p.m. milestone turn into a tombstone for your code speed!*" The above from KZ5AW was from the Canal Zone Amateur Radio Association bulletin, Jan., 1949. This is just a reminder that the Code Proficiency Program is *not* just for the fellow who is getting started.

—*F.E.H.*

WITH THE A.E.C.

W8VVL, call of the late Judge J. D. M. Outcalt, has been assigned to the station of the Queen City Emergency Net. The late Judge's widow has presented his entire station to the group, and, installed in the Red Cross headquarters in Cincinnati, W8VVL will be the focal point for the emergency activities of the QCEN and Greater Cincinnati Amateur Radio Association.

—•••—

The Oregon Emergency Net is now in ful operation, with its c.w. wing on 3600 kc. and a 'phone section on 3865 kc. This is no casual group, but a gang that drills nightly. The amateurs of Oregon are ready . . . are you?

—•••—

Colby A. Foss, W4ISR, of Clewiston, Fla., has been cited for exceptional service in connection with his operations during the recent Florida hurricane emergency. Marooned in his station, with the water level above that of his floor, Foss stuck to his post for two-and-one-half days, handling weather reports and Red Cross and Coast Guard traffic on a continuous basis.

—•••—

The Illinois AEC fellows have designated 29,640 kc. as the emergency calling frequency for their 28-Mc. mobile units. The Illinois State Police are making arrangements to monitor this channel in addition to the normal police channels. Any ham in Illinois who finds himself in an emergency situation should be able to obtain help in short order with this set-up. Sounds like a good idea to us. How about sending information about your local emergency channels to the NEC so that we can present a list in *QST*?

—•••—

The new BPL award mentioned in January *QST* looks like a "natural" for the AEC crowd. We all handle lots of traffic during drills of our traffic and emergency nets. How about really working at it, and getting the message total about 500 this month so that those letters "BPL" can sit next to the "AEC" after our calls? Of course, a message total of 500 might be called "the hard way" — 100 deliveries-plus-extra-delivery-credits will bring the coveted pasteboard just as quickly.

AMATEURS FILL GAP LEFT BY NEBRASKA BLIZZARD

Nebraska hams responded to the call of duty when the first blizzard of the winter swung across the state to wipe out communications in many sections.

WØHYR of Lincoln, member of both 'phone and c.w. state nets, was one of the first to step into the breach when he attempted to contact McCook via the state 'phone net, with emergency traffic for the Burlington railroad waiting for clearance west. McCook was not contacted but WØOWP of Brush, Colo., answered and said he could handle anything for McCook as he still had one central train-control wire functioning. As the 'phone net was crowded at the time, WØHYR and WØOWP dropped down to 3745 kc. and handled further traffic there.

On Thursday evening, during scheduled operation of the c.w. net, a weak signal calling QRRR was heard on the frequency and was copied by WØHYR. The signal turned out to be that of WØUDH of Palisade, Nebraska, seeking communications for his town. Communications were swiftly revived for that small western Nebraska community as ham radio replaced the missing wire circuits.

Early Friday morning WØBDO of Broken Bow called WØRQK, seeking information for the manager of the Rural Electrification Administration in regard to the position of line breaks between Elm Creek and Ansley and giving instructions on methods of switching circuits in the district to resume service wherever possible. The same information was requested through WØMLB of Kearney and WØIOO at Grand Island. The information was furnished by the Platte Valley hydro plant.

WØTHF, one of the reliables of the c.w. net, swung into action early in the disaster to furnish connections to other points for his city of Bloomfield, which was completely isolated when the blizzard left from three to five feet of snow and occasional drifts to twenty feet covering the highways. Action taken by WØTHF opened communications to Norfolk, via Lincoln, and succeeded in furnishing needed directions to operators of highway equipment in their efforts to open the

♦

The hams of Elizabeth, N. J., proved their readiness to render a public service on December 4th when a combined Red Cross-AEC Simulated Emergency Test was held under the leadership of Emergency Coördinator Ryan, W2NKD. Here is a shot of the crew which manned a station in a "first-aid" tent set up in Scott Park. *L. to r.:* W2ZGG, W2UQY, W2BWI, W2YQM, W2IIN, and Red Cross "Gray Ladies" McGreene, Deegan and McAllister. The control station was set up in the Fire Headquarters and effective communication was provided between there and the "tent station," the U.C.A.R.A. station at Red Cross headquarters, and mobile units of the North Jersey Mobile Radio Club and U.C.A.R.A.

highway and reach stranded tourists.

Omaha was well represented during the entire stretch of sleepless days and nights in pounding out traffic for Western Union. The Omaha hams made use of both 'phone and c.w. stations to furnish a needed link. The voices of WØEUT, WØGTC, WØYMU and WØNZ were kept busy on 'phone while WØKJP, WØFQB and WØGMZ were the brass pounders on the c.w. net frequency.

WØFAM, NCS of the c.w. net, was kept on the jump the entire period. Although his community was not too-seriously affected, he was hard-pushed at times, especially during the long hours of the nights, to keep the many stations tied in on the circuit. Through his efforts traffic from neighboring states was kept functioning smoothly and no serious snarls were permitted to "snaggle" the lines of communications.

The 'phone net was kept operating in good style by WØJED of Wayne, Nebraska, who was pinch hitting as control station. WØJED was on from Friday morning to Monday night.

Being short a few trains following the "big blow," representatives of the C. B. & Q. railroad showed up at the shack of WØQNP in Culbertson seeking an outlet to company offices. Information regarding a passenger train tied up in a ten-foot drift a few miles west of Culbertson was transmitted to WØLJO of Hastings for relay to Lincoln and Omaha. Work trains and line repair men were requested via the same route. Company officials were kept advised of weather conditions with the able assistance of WØNME.

Deserving credit must be given to the hams in the surrounding states of Colorado, Kansas and Iowa for their work in the handling of emergency traffic. It is impossible to list in detail all the work done during the storm but credit must be given to the following stations: WØs AMY, AZH, BDE, BDO, BXJ, COU, CUL, DHO, DMY, DQW, EKP, ERW, ESX, EUT, FAM, FEE, FMW, FQB, GFQ, GHQ, GMZ, GTC, IOO, IRZ, IXL, JCB, JED, JLD, KON, KQX, KJP, LEF, LJO, LRF, MGV, MJY, MLB, NCV, NME, NVE, NZ, OKI, OVS, OWP, OZC, PDH, QFY, QNP, RQK, SAI, UDH, UFL, UFZ, UHT, VMP, WML, YAD, YMU, ZNI, W6VRI/Ø and W7IRX.

— *W. T. Gemmer, WØRQK*
C. E. Longstreth, WØSAI

NATIONAL EMERGENCY FREQUENCIES

C.W.	*'PHONE*
7100 kc. (day)	3875 kc.
3550 kc. (night)	

During periods of communications emergency these channels will be monitored by stations of the National Emergency Net for the handling of third-party personal-inquiry traffic.

CODE-PROFICIENCY AWARDS

The next qualifying run from W1AW/WØTQD will be made on March 16th at 2200 EST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 3555, 7215, 14,100, 28,060, 52,000 and 146,000 kc., from WØTQD 3534 kc. The next qualifying run *from W6OWP only* will be transmitted on March 5th at 1900 PST on 3590 and 7248 kc. For additional dates, see the ARRL Activities Calendar elsewhere in these pages. These W6OWP-only runs will have different text from the runs sent by W1AW and WØTQD, but copy will be handled in exactly the same way as the transmission from W1AW and WØTQD.

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 five speeds transmitted, 15 through 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening, Monday through Friday, at 2200 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. To get sending practice hook up your own key and buzzer and attempt to send in step with W1AW.

Date	Subject of Practice Text from January *QST*
Mar. 4th:	*80 and 40 on Wheels*, p. 18
Mar. 5th:	Qualifying Run, 1900 PST, from W6OWP only
Mar. 8th:	*Propagation and Antennas above 50 Mc.*, p. 24
Mar. 10th:	*A Doorknob Oscillator for 420 Mc.*, p. 29
Mar. 14th:	*A Versatile Low-Power 'Phone-C.W. Transmitter*, p. 38
Mar. 16th:	Qualifying Run, 2200 EST, from W1AW and WØTQD
Mar. 18th:	*Some Notes on the Clapp Oscillator*, p. 45
Mar. 22nd:	*I Will Do It in '49!*, p. 46
Mar. 24th:	*The Black Box*, p. 48
Mar. 28th:	*On the Air with Single Sideband*, p. 60
Mar. 30th:	*The "Basic" 'Phone Exciter*, p. 11

BRIEFS

All present or former radio officers of the Merchant Marine are invited to join the activities of the Radio Officers Net on 7280 kc., 11 P.M. EST, Wednesday. The net call is "CQ RON."

—...—

The Golden Empire Radio Club, Chico, Calif., presented a 15-minute discussion of amateur radio as a hobby, with emphasis on emergency work, public service and other phases, in a broadcast over KHSL. The occasion was in connection with National Radio Week. The club met at W6RAQ's and the broadcast was in the form of an actual three-way QSO between W6TID, W6TKE and W6GUV. In reporting the success of this feature, W6CKV remarks that other clubs should try to get more such programs before the public. Any club group that can get time over a local station may contact ARRL headquarters for background material and suggestions.

A.R.R.L. ACTIVITIES CALENDAR

Mar. 5th: CP Qualifying Run — W6OWP
Mar. 11th–14th: DX Competition (c.w.)
Mar. 16th: CP Qualifying Run — W1AW, WØTQD
Mar. 18th–21st: DX Competition ('phone)
Apr. 3rd: CP Qualifying Run — W6OWP
Apr. 18th: CP Qualifying Run — W1AW, WØTQD
Apr. 23rd–24th: CD QSO Party
May 6th: CP Qualifying Run — W6OWP
May 20th: CP Qualifying Run — W1AW, WØTQD
June 3rd: CP Qualifying Run — W6OWP
June 4th–5th: V.H.F. Contest
June 15th: CP Qualifying Run — W1AW, WØTQD
June 18th–19th: ARRL Field Day
July 23rd–24th: CD QSO Party

— • • • —

Jan. 1st–Dec. 31st: Most-States V.H.F. Contest
First Saturday night each month: ARRL Officials Nite (get-together for SCMs, RMs, SECs, ECs, PAMs, Headquarters Staff, Directors, Alternate and Assistant Directors.)

AMATEURS ASSIST EVACUEES

Amateur radio is often called upon to render communications assistance when the wires are down, but the recent work of members of the Far East Amateur Radio League, in conjunction with amateurs in China, is outstanding in the magnitude of the work load on a few stations. J2USA, Tokyo, J2HYS, Yokohama, C1AF, Shanghai, and C1RO and C1VF, Nanking, found themselves deluged with an avalanche of third-party welfare traffic associated with the evacuation of the dependents of American Military personnel from China as the civil war in that country reached a critical stage during the Christmas season. The five stations mentioned above, with the assistance of J2NZI and J2GIL, handled nearly 2000 messages during the six-week period ending January 1, 1949. J2AHQ and J2AHI carried the lion's share of the operating burden at J2USA.

BRIEFS

In answer to a CQ on 14-Mc. c.w. W4IYT received two replies, one from G3AWK, the other from VE3AWK, both on the same frequency.

— • • • —

Add "Father and Son" schedules: KP4KD, father, keeps in regular touch by amateur radio with his son, W4OLC, Miami, Florida.

— • • • —

The South Shore Amateur Radio Club offers a certificate to any amateur who contacts ten of its members. 'Phone or c.w. may be used and crossband contacts are allowed. Applications should be accompanied by a QSO list and sent to P. O. Box 8, Quincy, Mass.

TRAFFIC TOPICS

The changes in the special QN signals for net use should find widespread application among traffic nets. QNA, which now means "Answer in prearranged order," can be used by any net which has a specified order of reporting. In effect, the meaning is broadened so that it can apply to *any* order that is prearranged, instead of only to alphabetical order, which had little meaning in nets containing stations from various call areas. QNZ, which previously meant "The following new stations are now in the net," was receiving very little use, and has been changed to mean "Zero beat your signal with the NCS." Used in conjunction with QNH and QNL, it should be helpful to net control stations in getting member stations lined up on a common frequency. W4NNJ is responsible for suggesting the latter change. All stations who have copies of the QN signals are requested to make these changes on their lists. The net signals QNE, QNJ, QNM, QNQ, QNU and QNW all have useful meanings in any net, but are little used. Let's put them to work.

— • • • —

Don't let low code speed keep you out of traffic work. There are several slow-speed traffic nets now functioning in several areas, and amateurs in those areas who wish to get into traffic work are invited to QNI. In Kentucky we have "KYW" meeting on 3600 kc. every Monday and Thursday at 2000 CST, using speeds of 10 or 15 w.p.m., "or slower if necessary" (courtesy of *Blue Grass Ether Clippings*). From W4KGI comes information that a new slow-speed net is being formed in South Georgia, with six towns already represented. The meeting place is 3582 kc., the time 2100 EST. W4KGI stands by on the net frequency each night at 2100, although net drill is held only on Wednesdays. In Illinois, Chief RM W9KQL informs us that a slow-speed net has been organized and is operating on 3765 kc. at 2000 CST, with SCM W9EVJ as principal perpetrator. Other slow-speed nets include Slow-Speed Trunk Line (3545 kc., 1900 EST Monday through Friday) and Connecticut Emergency Net (3640 kc., 1900 EST Saturday and Sunday). Progressive sections nationwide are coming to the realization that there is a real healthy interest in traffic handling among amateurs who lack the ability or the desire to work at speeds above 20 w.p.m. What a net lacks in speed it can more than make up for in efficiency. Please send us further reports on organization of slow-speed traffic nets.

— • • • —

Have you got your BPL certificate? Your SCM will issue you one each month your traffic count totals 500 or more, or 100 or more deliveries-plus-extra-delivery-credits. We traffickers for years have awaited this kind of recognition for our efforts. Now let's get busy and acquire at

least one of these certificates to post above our ORS certificates to show that we have more than justified our appointments.

—•••—

Add to 'teen-age nets: W1RDB reports a 'teen-age net operating on 3700 kc. at 1600 EST every Monday and Friday. Interested amateurs should contact him for details.

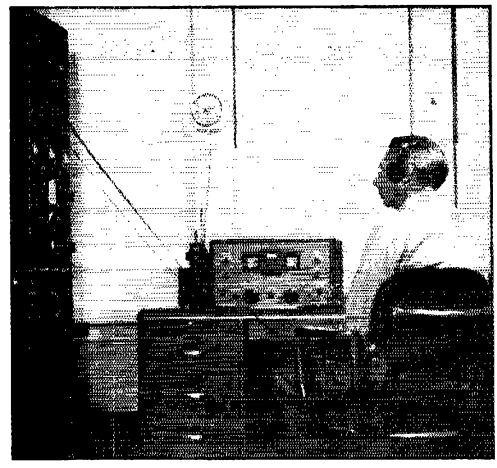
—•••—

Twenty-three of the nation's top traffic-handlers appear on the roster of TLAP. For speedy East-West traffic service, TLAP is hard to beat. Stations with traffic to put on TLAP should report into Jersey Net which meets on 3630 kc. at 2100 EST each week day.

SUPPLEMENT TO DIRECTORY OF ACTIVE NETS

This listing is to be added to the directory as published in November, 1948, *QST*, page 72, and the supplement in January, 1949, *QST*, page 68. An asterisk (*) indicates a change from the November listing; a double asterisk (**) indicates a change from the January listing.

Net	*Freq.*	*Time & Days*
Arizona Slow-Speed Net*	3757	7:00 P.M. MST, Mon.-Fri.
Colorado Utility Net	3540	7:30 P.M. MST, Mon.-Fri.
Eastern Shuttle Net**	7210 7120	7:00 P.M. EST, Mon., Wed., Fri. 10:30 A.M. EST, Sat., Sun.
Illinois Slow-Speed Net	3765	8:00 P.M. CST, Mon., Tue., Wed.
Kansas 'Phone Net*	3920	6:45 P.M. CST, Tue., Thurs.
Knights of the Kilocycles	3910	7:30 A.M. EST, Sunday
KYW/KYE (W. & E. Ky. Slow-Speed)	3600	8:00 P.M. CST, Mon.-Fri.
Minn. Noontime Net	3960	12:05 P.M. CST, Mon.-Sat.
Minn. 'Phone Net**	3960	6:15 P.M. CST, Mon.-Sat. 9:00 A.M. CST, Sun. & Holidays
Montana State Net	3520	8:30 P.M. MST, Sun., Tue., Thurs.
North Dakota 75 'Phone Net	3860	3:00 P.M. CST, Sun.
North Texas E.C. Net	3930	8:00 A.M. CST, Sun.
Northeast Texas E.C. Net	3880	8:00 A.M. CST, Sun.
Northern New Jersey Net*	7260	7:00 P.M. EST, Mon.-Sat.
Northwest Texas E.C. Net	3950	8:00 A.M. CST, Sun.
Oklahoma Traffic Net (OLZ)*	3682	8:00 P.M. CST, Mon.-Fri.
Oregon Emergency Net (OEN)	3600/3865	7-9 P.M. PST, Daily
QMW (Midwest Net)*	3615	7:30 P.M. CST, Mon.-Fri.
Quebec Emergency Net (QEN)	3570	10:30 A.M. EST, Sun.
Quebec Traffic Net (PQN)	3525	7:00 P.M. EST, Mon.-Fri.
South Georgia Slow-Speed	3582	9:00 P.M. EST, Wed.
'Teen-Age Net	3700	4:00 P.M. EST, Mon., Fri.
Tennessee C.W. Net*	3737	7:30 P.M. EST, Mon.-Fri.
Virginia 'Phone Net	3880	7:30 P.M. EST, Mon.-Fri.
Western Mass. Net (WMN)**	3760	7:00 P.M. EST, Mon., Wed., Fri.
Wisconsin Slow-Speed Net	3775	6:00 P.M. CST, Mon.-Fri.



We present W1JE, Hal Larson of Worcester, Mass., one of the more-active traffic men in New England. Hal is the organizer and manager of Swing-Shift Net (7280 kc.), is ORS and OBS, holds 35-w.p.m. Code-Proficiency certificate, is a member of the RCC and OTC, and is active on Western Mass. Traffic Net and Traffic Outlet. The rig at left consists of a VFO band-switching exciter, two identical 75-watt finals and antenna tuners. Frequency-measuring gear is at the right, and to the left of the receiver are antenna selectors and break-in relays.

BRASS POUNDERS LEAGUE

Winners of BPL certificates for December traffic:

Call	*Orig.*	*Del.*	*Rel.*	*Extra Del. Credit*	*Total*
W7CZY	38	66	1752	17	1873
W7IOQ	84	101	1030	0	1215
W6CE	12	29	1085	28	1154
WØHMM	11	18	1014	6	1049
W2RUF	24	70	890	36	1020
W6FDR	37	223	368	220	848
W7FRU	53	12	704	4	773
W5GZU	4	8	724	6	742
WØTQD	6	701	8	8	723
W6REB	22	32	604	28	686
W7KWC	7	12	634	10	663
W5LSN	19	18	592	15	644
W4PL	10	19	589	15	633
W1CRW	303	59	198	16	576
W2LRW	18	25	512	21	576
WØHSO	56	464	22	10	552
WØTQD*	2	531	4	4	541
KG6DI	235	121	67	100	523
W9LFK	74	53	350	45	522
W3ECP	20	95	306	87	508

The following made the BPL for deliveries:

W6UXF 267	W1NJM 137	VE3APS 106
W6DDE 191	W7ZU 125	VE3ATR 103
W9SYZ 141	W1BIH 121	W9NH 100
	W8TRN 117	

A message total of 500 or more or 100 "deliveries plus extra delivery credits" will put *you* in line for a place in the BPL. The Brass Pounders League listing is open to all operators who qualify for this monthly "honor roll."

* November Traffic

PRIZE-ARTICLE CONTEST

• The accompanying article wins a prize in the CD Article Contest. The author, for obvious reasons, prefers to use the pen name Ol' Joe.

You are invited to submit entries in this contest. The author of each article used is awarded a $10 prize, consisting of $5 in U. S. Savings Stamps and $5 in ARRL supplies or publications (except *QST*). Contributions may be on any subject of interest to amateur radio operators. Articles are selected on originality and value to the fraternity.

Give this contest a try. You may wish to write on Emergency Corps planning work and drills; 'phone or c.w. operating procedures; work on radio-club committees; organizing or running a club; the most interesting band for you; code-proficiency techniques; DX activities; traffic work; getting the most out of ham radio; or some subject we haven't mentioned. You are not limited; make your contribution on any topic of interest to radio amateurs. Please mark your contribution "For the CD Contest."

IS THIS YOUR CLUB?

By Ol' Joe

[Here's a picture of Ol' Joe's radio club. Read it carefully, and see how your club compares. — *Ed.*]

Our club meeting starts at 8:00 P.M. (it says in the rules), but it's usually 8:15 P.M., or 8:25 P.M., before a quorum straggles in. Some of the members are on hand at 6:45 P.M., however, sitting around in an informal bull session.

To start with, we have an ideal set-up for a meeting place, good officers, and there isn't any reason why we shouldn't have good meetings, but we don't.

Our club roster shows 36 members, but we frequently fail to get a quorum, or 12 members. Our meetings are held at regular intervals, and all members are aware of this. When asked why they don't attend, it's usually, "You don't do anything but sit around and chew the rag." Of course, the logical answer to this is, "What would you like to see in our meetings?" The reply is always, "Well-ll —," and that ends the subject. They always squawk, but never turn a hand to help.

The president, shortly after election, instituted code and theory classes, both of which petered out in short order because of lack of interest, although some members had howled for the classes. Also along an educational line, we attempted having a technical talk every other meeting, but some of the big-mouths in the club finally overruled those as "uninteresting (to them, anyway) and too frequent." Mindful of this, the president asked the program committee to arrange such talks on a monthly basis, with ARRL movies in between. That plan soon fizzled out, too, because no member was willing to lead discussions on various technical subjects after the first three or four.

The club attempted having a weekly door-prize drawing through donations from members, but it got to the point where certain members were donating all the prizes, while the others sat back and tried to win, without ever donating a thing.

Our club dues have been paid with the same spirit. Most of the members paid in full, but there are a number who paid only part of their dues and, despite any number of suggestions and hints from the treasurer, still attend regularly, expecting full membership. Under the club rules they can be refused a vote on any subject, but until now, the president has not invoked the rule.

Generally speaking, a majority of our members are doing just that — generally speaking. Regardless of who is recognized by the president, and has the floor, a half dozen members are chewing the fat among themselves around the room, paying no attention to the subject at hand. Good manners? They never heard of them!

In short, our club has deteriorated to about this: Approximately seven members take care of all activities, with a dozen or more barnacles hanging around the edges. Our meetings are called to order, occasionally some old business is discussed, possibly an item or two of new business, a motion is made for adjournment, and carried, and that's that. One or two members (who constructed it with parts donated by the half dozen or so good members) drift in to the club's 100-watt transmitter, pound out a couple of QSOs, and we go home.

The solution? Who knows? Our club has been in existence 22 years, with some of the original members still attending. While the field is almost unlimited, very few new members have been added in the past three years, and no member goes out of his way to hunt up new candidates. There is some talk of the "solid" members withdrawing and forming a new club with strict membership requirements, to weed out the deadwood.

Ol' Joe hopes this doesn't describe your club, too. Generally, entries in the CD contest are of a constructive nature. Maybe there are other clubs with similar problems who will read this and see the light and correct their situation. If so, this article has served a constructive purpose.

[EDITOR'S NOTE: ARRL will be glad to furnish to any club material on organizing a radio club and maintaining interest in club activities. Training Aids, including movies, film strips, slides, tape-operated keying equipment and other material useful in club work are also available to ARRL-affiliated groups. Club secretaries are invited to write the Communications Department for further information.]

BRIEFS

A network for blind amateurs, the White Cane Net, has been organized by W8UDA and W1JQD. The schedule of operations calls for a session each Saturday at 7:00 A.M EST on 7265 kc. with W1JQD acting as NCS. Amateurs interested in joining are invited to get in touch with Dorothy A. Willett, W8UDA, 3513 Fleming Road, Flint, Michigan.

W1AW OPERATING SCHEDULE

(All times given are Eastern Standard Time)

Operating-Visiting Hours:

Monday through Friday: 1130–0600 (next day).
Saturday: 1900–0230 (Sunday).
Sunday: 1600–2200

A mimeographed local map showing how to get from main state highways (or from Hq. office) to W1AW will be sent to amateurs advising their intention to visit the station.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules:

Frequencies: C.W. — 3555, 7215, 14,100, 28,060, 52,000, 146,000 kc.
'Phone — 3950, 14,280, 29,000, 52,000, 146,000 kc.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibration purposes.

Times: Sunday through Friday, 2000 by c.w., 2100 by 'phone.
Monday through Saturday, 2330 by 'phone, 2400 by c.w.

General Operation: Use the chart below for determining times during which W1AW engages in general operation on various frequencies, 'phone and c.w. Note that since the schedule is organized in EST, certain morning operation periods may fall in the evening of the previous day in western time zones. Mimeographed master schedules showing complete W1AW operation in EST, CST, MST or PST will be made available to any amateur upon request.

W1AW is not open on national holidays. On Saturdays and Sundays during which official ARRL activities are being conducted, W1AW will forego general-contact schedules in favor of participation in the activity concerned (see Activities Calendar).

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. are made on Tuesdays and Thursdays on the above-listed frequencies, starting at 2200, and on Monday, Wednesday and Friday at 9, 12, 18, 25 and 35 w.p.m. Approximately ten minutes of practice is given at each speed. Next certificate qualifying run is scheduled for Thursday, March 16th.

The station staff:

T. F. McMullen, W1QVF, "fm"
Richard N. Eidel, W1RUP, "re"
R. E. Morrison, W3LRK, "lr"

AMATEUR RADIO AIDS RESCUE MISSION

With the lives of nine airmen downed on a Greenland ice cap depending on the speed of its operations, the Air Rescue Service of the U. S. Army maintained essential voice communication between Washington, D. C., and a Labrador outpost by means of amateur radio in December.

Through K4USA, an amateur station installed at the Pentagon in connection with the activation of the Military Amateur Radio System, officers of the Air Rescue Service were in day-by-day contact with VO6AN at Goose Bay, Labrador, where rescue efforts were being directed. They exchanged information and advice, evaluated the problem in terms of daily weather conditions, and dispatched special equipment flown from widely-separated areas to assist in the rescue.

Rescue officers in Washington stressed the value of the conversational exchange in reaching quick decisions. K4USA was able to contact VO6AN within an hour after a request was made by the Air Rescue Service.

W1AW GENERAL-CONTACT SCHEDULE

W1AW conducts general operation, open for contact with *any* amateur station, welcoming calls in accordance with the following time-frequency chart.

EST	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0015–0200	7215 *	.....	7215 *	3555 *	14,100 *	3555 *	7215 *
0200–0300	.....	.....	← – – 3950- or 14,280-kc. 'phone ** (Tues. through Sat.) – –→				
0300–0400	.....	.....	← – 3555-, 7215- or 14,100-kc. c.w.** (Tues. through Sat.) – →				
1130–1230	.....	← – – – – – – 29,000-kc. 'phone (Mon. through Fri.) – – – – – – →					....
1230–1300	.....	← – – – – – – – 28,060-kc. c.w. (Mon. through Fri.) – – – – – – – →					....
1530–1600	.....	← – – – – – – 14,280-kc. 'phone (Mon. through Fri.) – – – – – – →					....
1600–1700	.....	← – – – – – – 29,000-kc. 'phone (Mon. through Fri.) – – – – – – →					....
1700–1800	.....	← – – – – – – – 14,100-kc. c.w. (Mon. through Fri.) – – – – – – – →					....
1800–1830	.....	14,280	← – – – 7215-kc. c.w. (Tues. through Fri.) – – – – – →				....
1830–1900	.....	3950	← – – – 7215-kc. c.w. (Tues. through Fri.) – – – – – →				....
2015–2100	14,100 *	3555 *	7215 *	14,100 *	14,100 *	7215 *	....
2110–2200	3950 *	14,280 *	52/146 Mc.**	3950 *	14,280 *	3950 *	....

* Starting time is approximate. General-contact period on stated frequency immediately following transmission of Official Bulletin which begins on the hour.

** Operation will be on one of frequencies stated, depending on propagation conditions, expediency and general activity.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, Jerry Mathis, W3BES — Most of the reports received this month deal with radio club doings. The new Northeast Radio Club mentioned last month now has elected officers as follows: KIW, pres.; HNW, vice-pres.; DWA, secy.; NTD, treas., BXE, chairman of the board. New officers of the Car-Le Radio Club are: AVM, pres.; TCC, vice-pres.; AIW, secy-treas.; JPR, act. mgr. A new member of the club is OWP, a recently-licensed ham in Lehighton. The Lehigh University Radio Club is putting its sixteen-year-old transmitter back on the air under the call AEQ. Secretary 2WTI states that the club would welcome help from any generous alumnus. ADE was appointed to handle the Governors-President Relay for Pennsylvania. AQN has worked 108 countries on 'phone with 100 watts. He has just received his first ZL QSL card. DZ handled a nice bunch of Christmas traffic. OP has a traffic schedule with OX3BC. HA is experimenting with an ARC-5. SNZ spends most of his time on 7 Mc. LTU is forming a DX club in his territory. DGM has an 829 on 50 and 144 Mc. FLH has added a new 50-Mc. beam. EQA uses an 829 tripler for 144-Mc. work. HRD has completed his new 'phone and c.w. transmitter for 3.5 to 28 Mc. and has taken out of service his BC-610 on which he made his DXCC in short order. KT has a pair of TB35s on 50 and 144 Mc. Traffic: W3DZ 228, NHI 222, QEW 78, AQN 55, ELI 45, ADE 24, AXA 22, KFK 14, EU 6, CAU 3, OML 3.

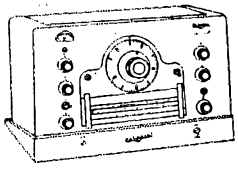
MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Eppa W. Darne, W3BWT — The Washington Radio Club held its annual Christmas Party on Dec. 18th, featuring games, refreshments, and exchange of gifts. On Dec. 28th the Washington Mobile Radio Club had a combined "activity" and meeting. After a roll call on the air and an exchange of messages for practice, the members journeyed from their activity positions to the home of BDU for a regular meeting. The M.D.D. Net continues to show tremendous activity. The best c.w. operators in the section are regulars in same. Our Net has become very important in the scheme of things, now functioning as a vast interchange point for traffic between many nets and trunk lines contacted by the regular members in addition to their work with M.D.D. LVJ has made DXCC. CJS has made WAS on 7 Mc. and still is chasing DX. JZY has been working some nice DX on 3.5 Mc. ER gets out well on 144 Mc. CDQ schedules VP4TZ on 14 Mc. QL has a nice rig going on 3.85-kc. 'phone. AKR's sister married 5NNE. EYX is having considerable trouble with his 28-Mc. mobile rig. NNX is now operating mobile. IKX has regular schedules with South Africa. BDY is now e.c.o. and n.f.m. on 28 Mc. MYM has finished a new 150-watt rig for 3.5 and 7 Mc. IEM left the section in mid-January to take a job with ARRL Communications Dept. FWP, formerly 9FZU and 5FWP, is now on 7 Mc. with 20 watts. Tex handles traffic with the Swing Shift Net and gets out well chasing DX. ECP makes the B.P.L. both ways this month. One of the most active members in the section is GZH. He is president of the Delaware Amateur Radio Club, editor of its bulletin and notice writer, is building a club transmitter, meets the M.D.D. Net, and is a member of other traffic nets. He is WAS and WAC on 14, 7, and 3.5 Mc., has worked 121 countries, is EC for the Wilmington Area, and also is RM and ORS. WN reports that the Frederick members are planning on organizing a radio club in that area. MTQ is on 28-Mc. 'phone. Traffic: W3ECP 508, AKB 260, GZH 149, MJQ 104, FWP 80, JZY 53, OPG 44, QL 25, BWT 23, CJS 11, IEM 11, AKR 10, MYM 9, NT 6, EYX 3, JHW 2, LVJ 2.

SOUTHERN NEW JERSEY — SCM, G. W. (Bill) Tunnell, W2OXX — Election results for the SJRA are as follows: UCV, pres.; ADA, vice-pres.; QKO, treas.; PFQ, rec. sec.; PAU, corr. secy.; OQN, ASG, AKI, SDO, PFT, REB, and GQO, directors. The Cumberland Club had a successful Christmas Party with 100 attending. PWP handled arrangements for the Frankford Club Christmas affair which was held in Delanco. The HTRA reports that GSP is about to successfully complete a code class with twenty members. UNT received his Class A ticket. A five-way QSO using 3.85-Mc. 'phone was reported between BGP, SWP, BAY, ZX, and BEI, who are all past-presidents of the SJRA. ZI takes traffic honors this month and also handled "GPR" message. 3NF/2 has new antenna for 3.5-Mc. band. RDK reports 118 countries to his credit on 7 Mc. alone. RPH fired up his new 500-watt final. BAY has new rotator for his 50-Mc. beam. WTJ took his Class A exam. UKS, our faithful reporter for the Ocean City area, is having plenty of interference trouble and offers the following about his local friends: VUM is sporting a new 152-A, YAO is putting up a new three-element beam with t.v. on top, K2AZ is working plenty of DX with twelve watts and a beam. Traffic: W2ZI 124, SUG 74, BEI 20, 2RDK 18, 3NF/2 18, 2RG 13, RPH 12, 3BAY 10, 2ORS 6, HAZ 2, WTJ 1.

WESTERN NEW YORK — SCM, Harding A. Clark, W2PGT — SEC: SJV. RM: FCG. We regret to hear of the passing of TGA to Silent Keys after a long illness. SEN has moved to Pittsburgh, Pa., and soon will be looking for the gang from his new QTH. YGW has new VFO and is reporting in to NYS regularly. QY has replaced the 813s with a pair of TZ40s with hopes of reducing harmonics. WUB is operating new bandswitching rig with a pair of 8005s. MA has next DX Contest in mind and has added Q-5er and a new preselector. RMS also has a new preselector. The Rochester Club has made recommendations for OO appointees for each band in order to cope with B.C.I. and T.V.I. problem. Anyone interested in participating in the ARRL Trunk Line on 3.85-Mc. 'phone should contact the SCM. QNA caught the 50 Mc. opening on Dec. 12th and added two more states to his total. BLP snagged CN8EK and a flock of KH6s on 3.85-Mc. 'phone and also is a member of the Susquehanna Emergency Net. The Christmas mail rush curtailed DX activity for QHH but he managed to handle a good volume of traffic. VVC is having good success with s.s.s.c. 1RCQ/2 is a new-comer to Lockport and has had his ORS appointment transferred to Western New York. SJV is forming 28-Mc. mobile net. Anyone interested, please contact him. UYG has weekly schedules with 5MTG and 5BUZ. SSS gave a talk before the KBT Club on f.m. telemeter systems for guided missiles. Congrats to "Grand-Slam" RUF on his FB traffic total — she says the OM hasn't moved out yet, but threatens to do so. NYS still is looking for active stations in the Southern Tier and the eastern part of the section. Anyone interested, call in on 3720 kc. at 7 or 9 P.M. Traffic: W2RUF 1020, PGT 341, WFU 181, WZQ 141, VIQ 108, WOE 96, QHH 87, SJV 67, UYG 29, USO 9, BLO 6, VBH 3.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — During 1948 Western Pennsylvania made tremendous progress in club activities, ORS nets, 'phone nets, weather nets and individual coöperation. The WPA ORS Net has changed operating time to 8 P.M. daily. During the month of December alone the Net handled 929 messages. The Steel City Amateur Radio Club of Pittsburgh introduced its club publication, *Kilo Watt Harmonics*, the name taken from the letters of its club call, W3KWH. Its editorial staff includes DNO, LBE, RIK, TVG, and MPO. The ATA Club of Pittsburgh has a club publication, *The ATA News*, and from it we learn that a swell Christmas party was held. With the help of the Detroit Amateur Radio Assn. and the Carnegie Tech. Radio Club, the ATA and the Polecat Net were responsible for the first known inter-city rifle match handled by amateur radio. Let's give a big hand to CEO, YDJ, KSR, NUG, KVG, and LFK of the ATA, and OZT, MTA, John Miller, and Bill Kail of CTRC for their fine job in this activity. The Horseshoe Radio Club of Altoona club call, QZF, was used in the SS and 330 contacts in 61 sections were made. Also heard were TXQ and LJS. The WESCO Club scored over 167,000 points in the SS. The Mercer County Radio Assn. had GEG, ODB, NCD, and KWL participating in the SS. MKH is on 144 Mc. KQU now boasts of 67 countries. RIS installed splatter choke and limiter with FB results. AER has a final which is T.V.I. proof. DNO reports that the Steel City Radio Club Net is active with UUG, OMY, RIK, JSS, NKM, and PAS. NLU is all set as OBS with 400-watt final. NCJ has 56 countries confirmed. LSS says his new Collins 32V-1 works FB. OB is using new 28-Mc. beam. During the SS 7ZU, formerly 8ZU of Wilkinsburg, had 27 QSO's at his home station in Seattle, then took a plane across the country to Pittsburgh and made 15 more QSOs from 30C. PAB is a new station in Johnstown. UVD is conducting code classes at his home. The Polecat Net operates on 3665 kc. Sundays from 11:30 A.M. to 1:30 P.M. Traffic: (November) W3NUG 54. (December) W3GEG 210, KWL 172, KKA 162, NCJ 130, YDJ 67, GJY 32, NKI 29, DNO 24, LIW 20, AER 16, LSS 7, OOU 2.

(Continued on page 68)



WHENEVER a major rearrangement of the shack has been contemplated, with a new operating table or desk to be installed, or maybe a super-duper custom-built console, the problem has always arisen as to where to locate the microphone jack, transmitter control switches and divers other gimmicks needed for accessible, convenient operation of the rig. The receiving end offered no problem because the essential operating controls were already at the operator's finger tips on the front panel of the receiver.

On the other hand, the transmitter might be almost anywhere and it was usually necessary to run some sort of cable to it from a control panel at the operator's position. On occasion, the control panel would be recessed into the top of the operating table; at other times, it would be screwed to the side of the table or to some other point that seemed convenient.

Experience with various lash-ups of this sort has led to the conclusion that the best place for the transmitter controls would be right at the receiver where an operator could, with a minimum of lost motion, switch the receiver off and the transmitter on or vice versa. Naturally, we don't want to drill a lot of holes in our receiver panels to take these controls, for more reasons than one: First, it would probably pretty well ruin any resale value it might have. Second, it solves only half the problem because the wires still have to be taken out the back. Third, these wires running through the receiver could conceivably upset the alignment or otherwise impair performance. Fourth, it's too messy anyhow! Thus, the tilt base.

Why not mount the receiver two or three inches above the table top on a sort of sub-chassis, the front of which would serve as a panel for the microphone jack, keying jack, transmitter switches and other controls essential to the operation of the station? The wires from these controls could be run under the receiver, out the back, and cabled neatly on to their destination; then we would no longer have leads from the mike and/or key draped all over the operating table. If, in the process of making this base, it is dressed up to match the receiver and tilted back a little so the operator's hand falls into a more natural tuning position and the outside dial scales become easier to read — why, so much the better!

Actually, mounting your later model National receiver on a tilt base of the type designed for it results in a more massive appearing and impressive set-up, as well as operating convenience second to none.

ROBERT J. MURRAY, W1FSN

CENTRAL DIVISION

ILLINOIS — SCM, Lloyd E. Hopkins, W9EVJ — Your section now has 28 counties with active ECs. Contact QLZ for information on our emergency set-up. OLU is busy with EC duties. BRX has 55-ft. tower completed and is preparing rotator. NN has ½-kw. rig perking at last. OBB is proud owner of KP81 receiver. PBY and IQC switched to screen modulation. 7MOA now is living in Kankakee. The Midwest VHF Club held a joint meeting with the FRRL in Aurora. Sixteen members made the trip with mobile equipment going full blast. The Illinois Valley Radio Assn. of La Salle and the Wheaton Community Amateurs are providing code practice for new ham prospects. SWO is working 3.85- and 28-Mc. mobile from his Crosley. DEI has new QTH and the landlord thinks his receiver is a t.v. set! ZJU has a new wire recorder. DEL has joined the sales force of a large Chicago radio parts house. ZDK made the YL an XYL. JJD has HRO-7 receiver. IZI is working 28 Mc. from a plane. The Society of Radio Operators had a bang-up Christmas Party. FZE, age 9, is the youngest known operator. His OM is KOD. FKC is owner of a new 14-Mc. beam. QIO got curious about the inside of his mike and now has a new one! LKK is a new man on 3.85-Mc. 'phone. QIE became the proud father of a son on Christmas Day. We welcome VE1MZ to Chicago. EVJ has gone high power after 16 years. ZPC is active on 3.85-Mc. 'phone. MXX and LI are waging a friendly war over DX. FED finds the way to work DX with 15 watts on 28-Mc. 'phone. BRD has resolved to send in a report each month during the coming year. HON rebuilt his power supplies. DUA is getting motor generator mounted on wheels. CTZ has new antenna on 54-ft. poles. NDA is busy DXing on 14 Mc. EBX has resumed schedules. QFF got his Class A. FRP and EJX worked each other on all bands New Year's Day. 8WVX now is FYF in Geneva. BUK gets a big kick out of traffic work. SYZ has antenna troubles. DXL snagged ZS2G on 7 Mc. BGC is waiting for rack mounted HRO-7 receiver. LIN works for a Chicago suburban railroad. KQL leads in traffic this month. FLQ is very active with traffic schedules. UIN is kept busy operating at DUA. MRH has new kw. final and new 28-Mc. beam. DOQ reports FSN and FVQ are new calls at Fifth Army Hq. where they are relief operators at USA under the MARS program. EHX has four-element 28-Mc. beam. EEK worked three W7 hams with 3 watts on 28 Mc. KOK has worked 181 countries. D4AGC visited with RSM during Christmas week. ASN is working on emergency rig. NIU enjoys Slow Speed Net. IVU has worked over 65 countries on 28-Mc. 'phone. JVC has a new daughter. PMK is now KZ5MB and sends his best to FKI and the ILN. GNU has new Collins 75GA receiver. SM5LK visited Rock River Radio Club. OSJ sports new NC-183 and Premax beam and is remodeling shack. The Illinois Council of Amateur Radio Clubs elected UQT, pres.; PEK, vice-pres.; and MRT, secy. and treas. QLZ is hard at work building a new rig. CXT is on his way back to Japan. IDA has new final with 812s. YBY has VHF-152 and hopes to be on 144 Mc. soon. ZEN carried mail during the holidays. DGY writes several columns of witticisms for commercial publications. ATA strained his back and is having a tough time of it. Your SCM appreciates your interest and co-operation and will try to visit all the groups he can during the coming year. Traffic: (Nov.) W9VOA 5, FET 4. (Dec.) W9KQL 352, EVJ 343, FLQ 220, SYZ 175, CMC 164, CTZ 105, EBX 61, CBA 58, ZPC 49, BUK 43, FRP 33, DUA 30, GDM 29, RSM 24, SXL 24, MRQ 23, BRD 20, ASN 18, LIN 18, DXL 10, EEK 10, NDA 10, VOA 6, BPU 5, NIU 5, NN 4, ACU 2.

INDIANA — SCM, Charles H. Conway, W9FSG — UIA has his APS-13 and BC-788 working on 430 Mc. DX is five miles with R9 signals. DGA won the TARS Annual QSL Contest for the second consecutive year. New TARS officers are: UMS, pres.; QLW, vice-pres.; FJI, secy.; UIA, treas. NH makes the BPL this month with a total of 100 deliveries plus extra delivery credits. One of the messages handled by him totaled 459 words. JST now is 6LEC, Ontario, Calif. IOH joined QIN. DKV is new ORS. YDP, ERB, FKE, and SII joined the Emergency Corps. BVS moved to new QTH with plenty of room for antenas, if they are verticals. Traffic: W9NH 436, RCB 357, TT 251, DKV 187, HUV 42, PMT 26, DHJ 14, BKJ 10, QLW 4.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — The Mancorad Club elected the following officers: RKT, chief op.; OVE, 2nd op.; QFC, keeper of log; AOF, operations mgr. Meetings are held the 2nd Tues. of each month, with a local 28 Mc. net being organized for emergency work. A card from HL1AB gave WAC to KXK, who now has 73 countries worked. DPN has a new NC-57 and is active on 3.5, 7, and 14 Mc. CIZ is on 28 Mc. with a new TBS-50. Operation on the BEN keeps ESJ busy. WJH is newly-appointed OO. LFK is first Wisconsin station to receive new BPL award. LVR is working with "ETA," a 7-Mc. teenagers net. CWZ is working on an 829B rig for 28-Mc. 'phone. DJV was the originating station for Wisconsin Governors-President Relay message. SYT is planning 32V-1 set-up for BEN and WIN operation. YCV's new QTH includes a radio shack. A new call at Marshfield is FYL. UFX's Assistant ECs at Madison are HMG, NGM, WFZ, and HZS. WLZ is new EC for Green Bay. NYS is back on 7-Mc. c.w. AFT is trying 24Gs in final of 144-Mc. rig. THH is active on the C.W. Net. FPI sends a nice report on the Kenosha Club, whose president is DTE. TSW's kw. on 28 Mc. feeds a "dream" beam on a 70-ft. tower. RHP threatens to go on 3.5 Mc. for ragchewing if DX doesn't improve! BOM and RCM linked a Colombian ham and his vacationing wife via 28 Mc. A new electric clock adorns the shack of CIH as a result of his top score in the recent Frequency Measuring Test. Our new Director, GPI, is busy getting things lined up. HEE completed new kw. final. RLB and LED are building new electronic keys. FXA and FYP are new calls at Wausau. FCF is active on the C.W. Net. All appointees are reminded to watch the expiration dates on their certificates. Traffic: W9LFK 522, ESJ 187, SZL 116, CWZ 95, SIZ 57, CBE 56, DND 48, IQW 40, BVG 31, DJV 30, RQM 21, TOA 6, LVR 5, SYT 5, YCV 5, AFT 4, BZU 4, DKH 3.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Paul M. Bossoletti, WØGZD — New calls in Grand Forks are OGD and YUI. KAI is on 3.85-Mc. 'phone from Dickenson. MYD is back on with a 32V-1 transmitter. NAW is back on the air. DM got newly-built n.f.m. working right off. HIV got a new transmitter from the YF and is on in Fargo. TUF built a new modulator. GZD snared HS1MA and CR7BC. SHI got on 3.85 Mc. MLE is 7MZE in Bremerton, Wash. DAO has a pair of new 807s in the final. ZRT and ZLs are doing business on 28 Mc. Jamestown's AZV is on 3.5-Mc. c.w. WIQ is thinking of putting a mobile job in his new Packard. KOY keeps Stanton on the 28-Mc. map. RGT will try t.v. Groundwork is being laid for a big "Hamboree" to be held late in the spring in Island Park, Mayville, on a sunny Sunday. The Forx Radio Amateur Club will be host to the North Dakota Fete and will mail publicity soon. Traffic: WØSSW 222, LHB 11, GZD 9.

SOUTH DAKOTA — SCM, J. S. Foasberg, WØNGM — WUU reports that he had his first South Dakota contact on 28-Mc. mobile in over a year with MMQ. Most of the mobile jobs in the Huron area have trouble with low batteries. OXC is building an FB transmitter for all bands. UVL has a full-wave antenna on 3.5 Mc. and also is rebuilding. GCP returned from vacation Feb. 1st. PIIR and OLB handled the SDN until Bill's return. The SDN is doing fine with CJS, DB, and other OTs checking in, but Bill still needs outlets in Aberdeen and Watertown and other places so let's give him a hand. All that you need is a 6L6 and a receiver that will tune 3720 kc. Mon., Wed., and Fri. at 7:30 P.M. LMB, at Bridgewater, is on all l.f. bands with a TBS-50. Judge is a student at the U. of S. Dak. BLK qualified for OO Class I, as did IWE. CRY is a Class II OO. Traffic: WØGCP 40, FJS 2, WUU 1.

MINNESOTA — SCM, Walter G. Hasskamp, WØCWB — Ex-9AMK now is ØNOD in Rochester. HM of St. Paul, HMW of La Crosse, Wis., and DWA of Minneapolis are all now in Winona. TPN got his three-element 14-Mc. beam 100 ft. above the ground. UWG visited the gang at Litchfield. TUO has a VHF-152 converter. JIE originated the GPR (Governors-President Relay) message. TIE needs only the State of Arizona to complete his WAS on 7 Mc. QND's and RQT's dad now is OAZ. DNY is back on MSN after a long absence. "Hardluck Francis" is DEI. He got a new Collins 32V-1 but when he connected the mike it burned out! Then in two different storms he lost his 28-Mc. antenna and his tall 4 x 4 pole. (It had been up only 23 years!) FID is new OBS, BGY new ORS, TKX new OO Class I. CRO has an FB-sounding 696 using screen-modulation on 3.85-Mc. 'phone. BPK is experimenting with s.s.s.c. FLK alternates for JIE on MSN c.w. LLW is working on controlled carrier. VJH got going on 28 Mc. while ITQ fired up his prewar 28-Mc. rig. PPK, on 3.85 Mc. with 500 watts n.f.m., is new station in New York Mills. EHO has his rig on all bands now with FB DX results. W3QP/Ø now is WØRA and also is new ORS. RPT has electronic key. ZPB has a nice new mike. A new net has been organized on 3960-kc. 'phone at 12.05 P.M. More details next month. UMD rebuilt his VFO so it works FB. ORJ's appointment as PAM has been endorsed. ICM added an RME VHF-152A ahead of his NC-57. His first DX was KH6SP on 27 Mc. KNR and GKP are coordinating Navy Communications under KNR. HQW and his brother have a 400-Mc. rig and the beam squirts a signal around like a flashlight! NRV is moving from 7 to 28 Mc. JLH has new T-55 final and a BC-348 receiver. CWB got a BC-459A from his XYL. GKP sweated out the 50-Mc. tests for nil. TSN, our Director, attended and spoke on ARRL policy at the St. Paul Club's annual "Minneapolis Night." TSN is building an all-band exciter with a Collins 70E-8A VFO, 6AG7s in intermediate stages, and a 4D32 driver. JOIN THE EMERGENCY CORPS! Apply now to our new SEC, Bob Prehm, BOL, 108 West College, St. Paul. Traffic: WØHFF 319, YBM 123, HEO 58, ITQ 49, BGY 35, ORJ 24, CWB 23, RJF 19, EHO 17, MXC 14, UWG 10, VJH 11, BOL 9, FID 4, RA 4, EPJ 2, TKX 2, EG 1.

DELTA DIVISION

ARKANSAS — SCM, Marshall Riggs, W5JIC — LUX has new SX-28 and Signal Shifter. OCY is firing up the

(*Continued on page 70*)

EVERY ORDER IS RUSH AT PR!

Jobbers and quantity buyers of crystals are enthusiastic about prompt PR delivery. By most standards our regular service will meet or beat so-called "Rush" orders. Actually EVERY order is "Rush" at PR. We know your problems. We know you want your crystal supplies as quickly as possible . . . and we are in business to meet your needs . . . not weeks from now . . . but NOW!

10 METERS, Type Z-5, $5.00 • 20 METERS, Type Z-3, $3.75 • 40 & 80 METERS, Type Z-2, $2.75

PR

SINCE PR CRYSTALS 1934

PRECISION CRYSTALS

USE "PR" and KNOW where You Are!

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

813 rig. FIV is working on 813 rig. MRD is trying to get his 810s on 28 Mc. ONL is putting the finishing touches on power supply for the 813. PGA is new on the air at Fort Smith. FMF is recuperating in fine shape. JAP is active again after being laid up for a while. New calls heard on 3.85 Mc. are EKD and OPD. Where have you been, boys? Does it take an emergency to get you out? EA's thermometer is busted. Someone lit a match under it? This is another skull-scratching job, boys. How about it? We have several Emergency Coördinators who should have their appointments renewed. Traffic: W5LUX 234, MRD 78, ICS 38, EA 36, HPL 14, JIC 6.

LOUISIANA — SCM, W. J. Wilkinson, jr., W5VT — KTE is QRL trying to get his new home fixed up, but finds time to keep his SEC duties up to date. CEW has received his DXCC Certificate and his total is now 110. Turtle is PAM. When FMO is in NOLA you'll find him on 3.85 and 14 Mc. KRX is active on 3635 kc. KUM and FVK are building small low-power rigs. DHE and IUG are keeping 3.85 Mc. hot while MHZ is on 7-Mc. c.w. and 3.85-Mc. 'phone. MKP, BRR, and GIX have been doing some 144-Mc. work. DGB, AAT, and KC have obtained Class A tickets. The Baton Rouge Club has nominated officers for the coming year. BPL is communications chief for 814 Bomb Sq. 482 GP. LJT was home from Notre Dame for the holidays and spent lots of time on 7 Mc. IHR has 60 watts on 3.85 Mc. and says he'll also be on 3.5 and 7 Mc. KYK reports activity and traffic. BSR manages to get in a little operating although busy with Income Tax returns. NHN, NKX, and MOQ are active on 7 Mc. in Lake Charles. JBW has been having T.V.I. trouble. IYG is on 28 Mc. occasionally. FDC is active in several 'phone nets. EGK is running a kw. to p.p. 813s on 14-Mc. c.w. DRF is QRL hospital. EC MOQ, of Lake Charles, reports increased interest in emergency operation. IUW has reënlisted in the Air Forces and is stationed at Barksdale Field. DIJ should soon be on with D4ANR. LQO and LQV have reported activity. KJE has been DXing on 28-Mc. 'phone with low power. VT has been traffic-handling along with DX on 7 and 14 Mc. Traffic: W5KTE 96, VT 27, FMO 16, KYK 4.

TENNESSEE — SCM, Ward Buhrman, W4QT — PL was host to the Chattanooga gang, the occasion being marked by a visit from 1IIN, National EC, who discoursed on the AEC work. FCF, our SEC, was a visitor from Memphis. Benton displayed his new station equipment, having just placed three new rigs in service — one each on 3.5, 7, and 14 Mc. He is definitely back in business, with a BPL total this time. The Kingsport Club's Christmas Party for the Holston Orphanage at Greeneville was a walloping success and a repeat is planned for next year. Amateurs in 46 states, England, and Canada participated. A large portion of credit for the success of the venture belongs to LNF. GQQ is setting up at a new location and accumulating gear for a bigger signal. HOJ says his rig is now behaving nicely at 500 watts on 3.5 Mc. He is planning n.f.m. on 3.85 Mc. LCB now runs 150 watts on all major bands. NNJ found a snazzy electronic keyer on the Christmas tree and as a result nearly made BPL. CZL discovered the right combination on tuning up his wire on 7 Mc. and immediately found the DX was there for the asking. Another good traffic man now wants a letter of introduction to the QSL Manager. KG6DG should be packing up his sea bag about the time this is printed, destination W4 Land. OPO is a new call in Chattanooga. NXR bumped up the power a notch or two and added v.f.o. with a 696. CBU is new EC for Kingsport and vicinity. Traffic: W4PL 633, NNJ 425, ETN 212, DIY 53, CZL 32, BAQ 26, HOJ 10, EBQ 4.

GREAT LAKES DIVISION

KENTUCKY — SCM, W. C. Alcock, W4CDA — New names of Kentucky's nets are: KYN (3600 kc.), KYP (3955 kc.), KYX (145.8 Mc.), KYW (3600-kc. slow-speed net), and KYE (slow-speed net). Paducah, Henderson, and Louisville are needed on the Ohio River Valley Emergency Net (ORV). BAZ is giving 144 Mc. a whirl while LMN pinch-hits on TL "J." MWX reports OET, OFG, and MFH are charter members of KYW Net. ALR is building cubical quad. MKJ received an award for 144-Mc. DX. OEY is trying voice relay for break-in 'phone on 28 Mc. FBJ won the KKG cup for the best DX (500 miles) on 144 Mc. BPE, hearing 144-Mc. stations 300 miles away, worked W8CYE. NOW reports the Blue Grass Club is hearing good speakers at meetings the first Wednesday of every month. EDV continues on 'phone net and 89-gang daily. JCN is boosting power. VP is new president of ARTS in Louisville. MWX reports NUQ on 7-Mc. c.w. and fixed-mobile 28-Mc. 'phone. LQV is building kw. rig on 3.85 Mc. JQV is well fixed on 3.85 Mc. but pharmacist work keeps him busy. Henderson is making emergency plans with LLR, EMJ, JQV, and OGB on 144 Mc. trying to work the KYX Net. BPE tells them to use horizontal polarization and put beams up high. KRY is going high power on 144 Mc. JDN puts out a good signal from Erlanger. LBY is tooling up for 144 Mc. MWR has a pair of VT127s and a pair of co-ax lines. Wonder why? CDA is trying to improve signal on 3.5 and 7 Mc. Traffic: W4BAZ 145, YPR 116, MWX 60, CDA 52, FKM 38, JCN 28, ALR 26, FBJ 14, TXC 11, EDV 5.

(Continued on page 72)

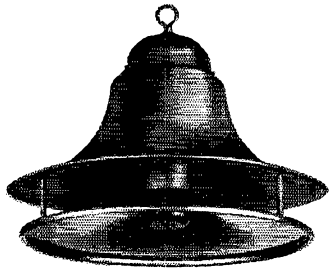
MICHIGAN — SCM, Joseph R. Beljan, W8SCW — SEC: GJH, RMs: GSJ, NOH, PVB, and UKV. Amateur radio was the connecting link in a novel pistol match held Dec. 16th between Southeastern Michigan sharpshooters and the best in the Pittsburgh area. The Michigan team fired in Detroit while the Pittsburgh team fired at Pittsburgh. Throughout the match contestants' scores were transmitted both ways so that all team members knew exactly how they compared with their competitors in the other city. Congratulations for a swell job to IHR, who held down the Detroit end, and to 3NKI, at Pittsburgh. ZKZ has been appointed ORS. Section Net Certificates have been issued to INF and ZKZ. The Detroit Amateur Radio Assn. elected SCW, pres.; BXZ, vice-pres.; FX, financial secy.; and URM, recording secy. The Lake Superior Radio Club has applied for affiliation with the ARRL. The Adrian Amateur Radio Club's EC program is progressing nicely. PZQ is now Class A. EPN is building a quad antenna. YDK is building a quad with director and reflector. ZSN is building a new bandswitching exciter. Ex-CNQ now signs 4CNQ from Montgomery, Ala. QGZ is rebuilding for p.p. 250THs driven by 4-125A. ZGR is n.f.m. with an HT-18. KUG moved to Battle Creek. UNK is California-bound. ND has a new Bud VFO. DAW is back on the air with a BC-610 plus a Collins 32V-1. WPK is back on 28 Mc. with a converted SCR-522. Congrats to DCN on the jr. operator's arrival. BHD is enjoying fine results with his mobile rig. CJ is snagging nice DX on 28 Mc. AHH rebuilt his receiver. URM has a new HRO-5. DIZ proudly twists dials on his new 75A-1. BVY and YMO now have Collins 310-B-1s. RX is building up to an 813 final. MRK is building a new beam. TBP is QRL converting an ART-13 and is planning a little 'phone operation. PZQ and VDS have new NC-173s. RJC has finally gone VFO. NOH is now settled in his new home and is back on QMN taking charge of the 6 P.M. Net. TNO is rebuilding. ZDU has a new S-53 and 60-watt Meck transmitter. CHO is proud of his Collins 32V-1. AIA has a Signal Shifter pushing an 813. CCC has a new four-element 28-Mc. beam and a Gonset 6–10–15 converter. NZU is going mobile now that he has his new car. TRN is high traffic man for the month and makes BPL on deliveries. Traffic: W8TRN 406, TBP 258, SCW 141, UKV 114, RJC 107, WXO 87, IV 70, IHR 55, GSJ 54, AQA 36, UES 26, ZKZ 26, DPE 25, BVY 20, JUQ 20, URM 15, ACW 13, FX 11, BXZ 10, NOH 9, EGI 7, YFI 6, DOI 5, ABH 4, BLR 4, TNO 4, LHH 1.

OHIO — SCM, Dr. Harold E. Stricker, W8WZ — SEC: UPB. RM: RN. PAM: PUN. Congratulations to DAE, RN, and WRN for sending in reports every month during 1948. Quite a few others missed only one or two months. So let's see how many will bat 100 per cent this year. We are very happy that the South East Amateur Radio Club of Cleveland now is affiliated with ARRL. BAG, the club president, who is blind, is back on the air with a fine rig built by the members. A prize of $25 will be given to the first SWL member who gets a ticket. Our SEC, Carty, would like to organize an Ohio River Emergency Net for 'phone and c.w. This net would cover the area from Pittsburgh to Cairo, Ill. Ohio stations in Steubenville, Portsmouth, and Cincinnati are needed. However, any Ohio amateur located along the Ohio River interested in this net, is asked to contact Carty immediately. In this section the following OOs are active: BFB, EDX, EQ, JFC, JRG, and TJM. The following OBS are active: DZO, EQ, EFW, LBH, PR, PUN, SRF, TIH, and TZO. WRN is the only active OES. These appointees are doing a swell job and more power to them. The traffic report in itself speaks for the ORS and the OPS appointees. The Intercity Radio Club at Mansfield meets the first Friday in the month. New officers are WPF, pres.; YCV, vice-pres.; VTP, secy. and treas. JJM, TIH, YCV, and YGX form the Mansfield 144-Mc. Emergency Net. According to the Dayton Amateur Radio Association's bulletin, *DARA*, club officers are: AQT, pres.; ACE, secy.; KKH, publicity. DAL is working 7-Mc. mobile up to 1000 miles with ease. Columbus Amateur Radio Assn. officers, according to bulletin, *CARA*, are: EYE, pres.; MQG, vice-pres.; OWA, secy. WZK, BMR, and ZCK, directors; AOP, sgt. at arms. DWP won the CARA award in the WAS Contest for September. Through MDX, the club has a 2-cylinder, governor-controlled, 2500-watt 110-volt a.c. generator. This was turned over to IVC, the EC for Columbus and vicinity. BKE copied the Navy Day message for the twelfth time in as many years. The following is from the Central Ohio Radio Club bulletin, *CARA*. QCQ is running 75 watts to an HT-9 on 28-Mc. 'phone. DLQ is new ham on 3.85-Mc. 'phone with 30 watts. CRT is new ham on 28-Mc. 'phone with Meck T-60. MDR has a new rig using p.p. 8005s at 375 watts. ICD, BHE, and BZR are active in Bucyrus. NQF is on 3.5 and 7 Mc. with 250 watts. ERE is on the air again. News from the Cleveland Council of Amateur Radio Clubs: All clubs of the Council were asked to submit the name of a member to coöperate with the B.C.I. Coördinator. JNF, MXL, and AJH are a committee to set up a Ground Wave Contest (28 Mc.) for March. WDQ is new ORS. UZ and BAX report the 144-Mc. band is good. WRN is rebuilding with 24Gs in the final. RN moved his rig to the recreation room. UW worked Asia on 3.5 Mc. and is spending most of the time on 28 Mc. AQ made 3.5-Mc. WAC by working ZC8PM. SJF is XYL member of the Buckeye Net. PBX

(Continued on page 74)

ANNOUNCING . . .

"Three-Sixty" Hypex PROJECTORS



MODEL VR-11 "THREE-SIXTY" HYPEX
(above) *15 WATTS; 280 CPS CUT-OFF.*

MODEL VR-241 "THREE-SIXTY" HYPEX
(at right) *25 WATTS; 140 CPS CUT-OFF.*

TWO *new* Hypex* Projectors—designed for 360-degree sound dispersal—are now available. With sound distributed horizontally in all directions, these new models are intended for installations where coverage of relatively large areas and suspension from the ceiling are desired. Like all Hypex Projectors, these radial units incorporate the famous Hypex formula† which results in improved acoustic performance.

By the addition of the two radials to the four previously announced Hypex units illustrated below, the Hypex line now includes a model for every "sound" need, indoors or outdoors.

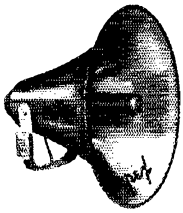
Jensen Hypex

JENSEN MANUFACTURING COMPANY
Division of the Muter Company
6611 SOUTH LARAMIE AVENUE, CHICAGO 38, ILLINOIS

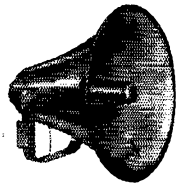
**Trade Mark Registered* *†Patent 2,338,262*

Write for Data Sheet 143

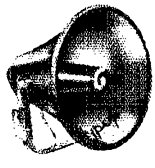
In Canada: COPPER WIRE PRODUCTS, LTD., 351 CARLAW AVENUE, TORONTO



MODEL VH-24 HYPEX
25 WATTS; 110 CPS CUT-OFF



MODEL VH-20 HYPEX
25 WATTS; 140 CPS CUT-OFF



MODEL VH-15 HYPEX
15 WATTS; 180 CPS CUT-OFF

MODEL VH-91 HYPEX
15 WATTS; 300 CPS CUT-OFF

has "V" beam under construction. Old SQE is now A1. YFJ has new Boomerang. CBI has moved the rig to his old revamped garage. LBH has new 14-Mc. two-element rotary beam and new VFO. JFC finally got his 28-Mc. beam up in the air, and in two weeks worked eight new countries on 28-Mc. 'phone. QAP and ZOK have 99 and 97 countries respectively on 'phone. Visitors this month were UPB, TKS, PNY, YBF, WZK, and WYH. Thanks to all of you for your swell coöperation in 1948. Traffic: W8EBJ 204, TKS 200, RN 183, CBI 153, UPB 107, HQX 98, WZ 72, PNY 70, GZ 67, PIH 60, TAQ 58, BZK 46, EQN 45, PMJ 41, SJF 37, VWX 31, ZAU 29, BEW 27, UW 27, WE 21, OUR 16, PUN 16, IVC 15, LJH 11, LBH 8, DAE 7, QIE 7, DZO 6, LCY 6, AQ 4, YFJ 4, BUM 3, EFW 2, JFC 2, WAB 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Fred Skinner, W2EQD — Very little news was received this month. How about some mail, gang? The slow speed section of NYS Net is a swell place to learn traffic-handling. CLL is Tuesday night NCS for the regular section of NYS Net. QDM is back from California where he was 6EIZ. TYC averaged over four hours a day on the air for the past year. Can anyone beat that? IXK's OES appointment was endorsed for another year. He is trying to make infra-red wavelengths practical for the rest of us to use! New ORS are CLL and WIK. LRW made BPL again and received the first of the new BPL Certificates for Eastern New York. EQD is using an ART-13 on 3.85-Mc. 'phone lent by BBI. Orange County AEC 144-Mc. Net needs a 3.5-Mc. c.w. or 3.85-Mc. 'phone station connection for out-of-County traffic. Write to PCQ or your SCM. Traffic: W2LRW 576, WIK 110, ITX 84, NHY 74, CLL 63, EQD 59, TYC 35.

NEW YORK CITY AND LONG ISLAND — SCM, Charles M. Ham, jr., W2KDC — After many years of faithful service and consistent reporting BGO's resignation leaves a hole in the AEC news. OHE, who will take over as SEC, will soon sparkplug things in his usual way and the Nassau gang and Suffolk under CJZ are prospering. So good luck, Vin, and welcome, Press. TUK finally bagged Utah for WAS, that is if Harry can "extract" a QSL. BO will take traffic to Germany and all Pacific Islands on a nightly schedule. YDG also is seeking a couple of cards to prove his recently-earned WAC. PF is seeking schedules on 7 and 14 Mc. Dave has Collins receiver and transmitter while HAE has new Signal Shifter. Long time no hear from you in this column, Art? HMJ has up to 156 countries with 250 watts to 66-ft. Zepp. KV4AF/2 is back from a short visit to the Virgin Islands. LGH is recording Northern Queens AEC roll call. VAF reports new officers of the Mid-Island Radio Club are KTF, WFL, UNS, and MFI. VNJ got the run-around on ORS because of the card mixup at KDC. He's busy as Asst. Mgr. of SSN and radio operator for T.W.A. RTZ sends regular message from Florida where Hope is in the Palmetto Net and manages to work SSN. Fifty members are reported interested in what may be named the Empire City Radio Club, says PRE. Others interested should contact Mike. WK is looking at the other side of things. Nat has slight QRM on his t.v. set. QBS lost a few elements from his ten-element 28-Mc. beam in a heavy wind. TYU is starting in again with new V.F.O. RQJ is converting his t.v. Wonder what it will be? He reports ZKV, now located in Elmhurst, is old CO from Cuba. DBQ joined the Civil Air Patrol. Now we've heard everything! OBU is so impressed by t.v. he's going on 'phone! WHB wants at least two mobile-portables to please contact him for Manhattan EC. YXI is almost ready to use BC-459. Officers of the UHF Club for 1949 are DKH, Nick Esposito, NAX, MNX, and QPQ. A 420-Mc. demonstration is scheduled shortly. Traffic: W2TUH 262, OUT 195, PRE 178, OBU 171, UNJ 158, TYU 105, BO 104, EC 103, VOS 95, RT2/4 65, QBS 50, YDG 47, DBQ 31, KV4AF 28, W2VAF 6, LGK 4, PF 2.

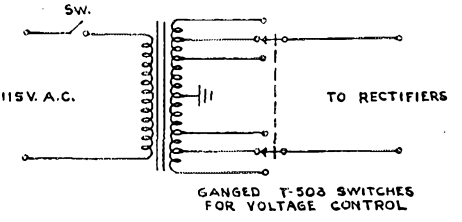
NORTHERN NEW JERSEY — SCM, Thomas J. Lydon, W2ANW — The N.N.J.C.W. Net meets daily except Sunday on 3630 kc. at 7 P.M. The J.N. Net meets Monday through Friday on the same frequency at 9 P.M. The 40-Meter Net meets Monday, Wednesday, and Friday on 7260 kc. at 7:30 P.M. This net will meet daily when activity warrants. QEM has moved out of the district and DRA is the new PAM for the 75-Meter 'Phone Net. BLS is keeping daily schedule with KV4AA on 7 Mc. LFR, during a lull in traffic-handling, worked DA5FF, KP4HU, and VP2LA on the low end of 3.5 Mc. KUS is doing an FB job as NCS on JN. N.N.J. and JN Nets are handling Formosa traffic. Union County is moving traffic via 144-Mc. nets. ZFU is operating on the Swing Shift and other morning nets. YYM is on 7 and 144 Mc. ECO and ZAL are on 3.5 and 7 Mc. ABX reports for the first time in years. He is at new QTH in Jersey City and is back on the air with a kw. GIN still likes 28-Mc. 'phone. NCY has new Collins station. TLJ is a steady visitor at the shack of KUS and uses the station for chasing DX on 14-Mc. c.w. During the recent flood in the Raritan River basin BAI alerted the Middlesex County AEC group and with mobile unit QW provided a link to the 80-Meter Section Net. VJN, a member of the Teen-age Net, is running 200 watts. The Newark Amateur Radio Club has recently been organized. Officers are SVX, pres.; NDM,

(*Continued on page 76*)

QSO's from OHMITE

SWITCHING TRANSFORMER HIGH-VOLTAGE TAPS

Because of the high-voltage insulation of the Ohmite T-503 Switch, this unit may be used to switch the high-voltage taps on power transformers. CAUTION! In this application, we recommend that the shafts of the switches be connected to ground for protection of the operator. The switch should be moved only when the power to the transformer has been disconnected.



GANGED T-503 SWITCHES FOR VOLTAGE CONTROL

HOW TO CONTROL TUBE FILAMENT VOLTAGE

Have you ever measured the filament voltage of your final amplifier tubes? Tube manufacturers state that a filament voltage above the specified voltage reduces the life of a tube. Ohmite rheostats provide the ideal control for filaments. We recommend that the rheostat control the primary of the filament transformer to avoid upsetting any balanced secondary circuits.

The resistance and power rating of the rheostat may be calculated as follows: Suppose that the transformer is designed to furnish a secondary voltage of 7.5 volts at 10 amperes when the primary is connected to a 115-volt line. The actual line voltage, however, may prove to be 120 volts. What, then, are the specifications for a primary rheostat of correct operation?

The calculations are made as follows:

Voltage drop in rheostat
= Line voltage minus primary voltage
= 120-115 = 5 volts

Approx. primary current (assuming 100% eff.)

$$= \frac{\text{Sec. volts} \times \text{Sec. current}}{\text{Primary voltage}}$$

$$= \frac{7.5 \times 10}{115} = 0.653 \text{ ampere}$$

Using Ohm's Law, we find that to produce 5 volts drop at 0.653 ampere requires 7.65 ohms.

$$\text{Ohms} = \frac{\text{Voltage}}{\text{Current}} = \frac{5}{.653} = 7.65$$

Now, turning to the Ohmite catalog, we note that a stock rheostat of 8 ohms and 1.77 amperes is made. This rheostat would be suitable, but to obtain a little greater control, the 10-ohm, 25-watt rheostat (No. 0145), rated at 1.58 amperes maximum, would be the best choice. Ohmite rheostats are available at most radio parts distributors. Note that if your filament voltage is low, a rheostat will not raise it for you. Other means must be used to increase filament voltage, such as using an auto-transformer or variable output transformer.

While on the subject of filaments . . . remember that Ohmite makes filament center tapped resistors for all common filament voltages. These resistors can be obtained at most radio parts distributors.

Write for Bulletin 137
"Ohmite Ham Hints"

OHMITE MANUFACTURING CO.
4865 Flournoy St. Chicago 44, Illinois

Be Right with OHMITE

RHEOSTATS • RESISTORS • TAP SWITCHES

vice-pres.; YRG, treas.; and YOC secy. EGM had an unfortunate accident. We hope he will be back on the air soon. BEI has been supplying the gang with BC-474 diagrams. This transmitter-receiver is the standard emergency equipment for the 'phone net. ECD is a proud father. DRA finally got the high power with modulation back on the air. The 'phone net is doing an FB job with traffic Sunday morning at 9 A.M. UMG looks good on T.V.I. CDU is on 14-Mc. 'phone and c.w. intermittently. OJC and QVA are on 144 Mc. again. Traffic: W2LFR 364, CGG 264, KUS 172, OEC 157, ZCL 157, NKD 109, NCY 69, OXL 48, MTV 39, VJN 32, BRC 12, EWZ 6, COT 5, CJX 2, CWK 2, NIY 2.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — Iowa LOs made a good showing on December LO-Nite. DEA, our Division Director, met with the Des Moines Radio Club on the 16th with a good turnout. YNW was in Chicago on business. FZO has new cyclemaster. UFL wore out the old mike. The North Iowa Amateur Radio Club has its order in for ARRL Training Aids, with movies scheduled for Feb., Mar., and April. PUE had a nice write-up on his part in the Northwest Iowa emergency of Nov. 19th and 20th. BBB is about to put his gallon on the air. AAL has a new rig using an ST-202-A. The Clinton Amateur Radio Club purchased the equipment of the Clinton Police Dept. and is installing it in members' cars for emergency work. TWX, a new addition to the c.w. net, is busy making cyclemasters. MTS moved to Riverside. IFB and NFM still are working the highs. YBI now is in Burlington. OHO is new licensee in Burlington. QVA sends in his EC application. The CBROC puts out a fine monthly bulletin called *Sparks*. It's a good news source for the SCM. SEE is working up the EC program in Council Bluffs. CJD is operating BC-610 on 28 Mc. FGW is Council Bluffs outlet for TLCN. LHZ worked EJT. EJT has worked 14 states on 144 Mc. WMU finally got his ORS from the SCM. PP has his harmonic troubles. SQQ is working DX on 3.85 Mc. TLCN is getting better and better. FP is just working. Traffic: WØHMM 1049, FP 193, SCA 129, WMN 119, YI 80, AUL 68, TWX 44, TIU 35, PP 33, NYX 31, FKB 30, SQQ 23, SQV 20, KSS 14.

KANSAS — SCM, Earl N. Johnston, WØICV — Members of Kansas Emergency Nets were on the job again this month during the ice storm and blizzard of December 4th and 23rd. FEE, CC, IYR, MVG, LOU, TYR, IFR, ICV, and many others moved traffic until wires were back in service. The KVRC of Topeka held its annual banquet and election of officers Jan. 7th with XYLs as guests. Officers for 1949 are: WGM, pres.; ICV, vice-pres. and treas.; and HMF, secy. The WARC of Wichita elected the following officers at its banquet Jan. 6th: OZN, pres.; BIX, vice-pres.; LSY, secy-treas.; DEB, publicity. EDP, a new station in Chanute, is now on 28 Mc. MVG is active in Kansas 'Phone Net and moved traffic for WU during the blizzards. CVX, Pittsburg, has new Hunter VFO and has schedules with Denver Mon. & Fri. DRB leads in traffic this month with TL activities. BDU, formerly QKS, Newton, now OK8A, heard AWP on 7 Mc. Bill Odum, the noted flyer, arranged with Wichita stations to monitor 6577 kc. while flying from Hawaii to New York in a single-motor Bonanza. ARZ, Pittsburg, is a new member of the Kansas 'Phone Net. TLT, Emporia, is working with 9-centimeter rig. OZF, Topeka, is on with new HT-19 'phone and c.w. 5VWU, ex-ØVWU, visited Topeka over the holidays as did 4OEW, ex-9OQP, who visited in Emporia. Traffic: WØDRB 240, OOT 232, KSY 84, NCV 84, NIY 72, OZN 55, AWP 54, OUU 54, CVX 32, IFR 29, ICV 25, MVG 21, ZUA 15, AHA 14, BNU 12, KXL 12, MAE 12, FRK 10, FON 9, IYR 7, FDJ 6, TVU 3, NSD 2.

MISSOURI — SCM, Ben H. Wendt, WØICD — All Missouri amateurs are requested to send in activity reports. Your experiments, traffic, and general activity make good copy. Keep the SCM informed. Many thanks to the numerous hams that report regularly. DEA, our Director is doing a swell job in promoting ham spirit and organization throughout the Midwest Division. If you have suggestions, ideas, or gripes write Len a letter. On the Kansas Traffic Net you will find NIY and OOT, both of Kansas City. The net meets Mon., Wed., and Fri. at 6:45 P.M. on 3610 kc. YSM is having receiver trouble and is replacing by-pass condensers by the handsful. It was a 342-N. IAC, in St. Joseph, reports code practice sessions on 28 Mc. each Wednesday night. A newly-organized Sunday night 28-Mc. net is very popular in the same city. At QFH it is a 100-watter VFO on 7.15 and 3.5 Mc. GCL cut the top out of a tree, replaced it with a long whip antenna plus the feed line to get a 52-ft. vertical antenna for 3.5-Mc. operation. OUD sent the old year out with a bang, working 51KC and 6UXF, both YLs. She had her brother, IGW, and GKT and JEJ as visitors while the transmitter sent the year out with a blown fuse. CGZ built a new receiver which surpasses the old one in selectivity. It uses 455-kc. I.F.s and has built-in BFO. His electronic keyer, modeled after the circuit in Oct. *QST*, is working fine. OMG has a BC-654A and a PE-103A 6-volt supplied emergency rig. AEC drills are being conducted on 144, 28, 3.5, 7, and 14 Mc., with 28 Mc. claiming the greatest activity. CKS is using a pair of

(*Continued on page 78*)

813s to the tune of 1 kw. A 3.85-Mc. converter has been constructed for the mobile unit. Appointments are CGZ and CKS as ORS and IAC as OBS. GNX added an FB beam rotator to his gear. Traffic: WØGEP 192, JSR 135, QXO 135, YSM 61, CGZ 59, CKS 46, OUD 41, KIK 36, NNH 36, QFH 34, WAP 26, ICD 8, ARH 6, IAC 5, OMG 4.

NEBRASKA — SCM, William T. Gemmer, WØRQK — During the recent severe storms Nebraska c.w. and 'phone nets were in operation. Coöperation between both nets was excellent and much traffic was speedily transmitted to its destination. JED is new OBS appointee. HSO is exhibiting an ORS Certificate. DMY and SAI renewed their ORS appointments. MLB is on with 32V-1 and HRO-7. BVR is trying 50 Mc. ILS built a 28-Mc. quad. BRO built a 28-Mc.-mobile rig. BXJ is running 50 watts into an 807 and using a TU5B VFO a la *QST*. OKI has TZ40s operating at 300 watts into a quarter-wave sky wire. VPR is mobile with BC-654. LRF has BC-696, TZ20 into push pull TZ20s running at 100 watts. TYG is loafing an 813 at 200 watts and feeding a three-element beam on 28 Mc. 6VRI/Ø is back in Oakland with a portable ART-13 and Collins 75A receiver. OKB and ODB are new hams in North Platte. MZG is new in Chadron and is on with a Hammarlund 4-20 transmitter and 4-11 modulator. Ex-GLF is now 5PCF. FLF rebuilt to p.p. 4-250A final and a 304TL modulator. DMQ rebuilt to 75TLs. An old-timer, 9DXY, is back on with ØAY on 3.5 and 7 Mc. with p.p. 852s and between rag chews is building a new 813 rig. EXJ incorporated bandswitching into his kw. rig. CMO is firing up a 20-watt 'phone. FHA needs some a.c. for his 32RA Collins transmitter. Traffic. (Nov.) WØTQD 541. (Dec.) WØTQD 719, HSO 552, FAM 217, KON 55, THF 42, KJP 36, RQK 35, SAI 30, CMO 29, FQB 27, GMZ 27, IXL 27, JLD 25, JED 19, WVE 18, DMY 16, KPA 13, GFI 10, AY 9, LJO 4.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Walter L. Glover, W1VB — QMI resigned his position at Headquarters and left for the West Coast on Dec. 31st, where he expects to resume his old call, 6JQB. Al will be missed by many in this section. DWP has a BC-696A working on 3.5 Mc. UGX is studying for his 1st-class commercial 'phone ticket, and has plans for new rig and antenna system. QIS puts 90 watts into p.p. 809s on 7 Mc. BDI gets a kick out of his portable gear and is busy getting a rig working for his son. BIH and NJM get the first new BPL Certificates for this section. QBO has moved to new QTH. BHM has new Collins 32V and claims 125 countries. NYC is on 3.85 and 14-Mc. 'phone. OPS is on 28-Mc. mobile. KYV is back on 28 Mc. APA schedules J2AAL. QAU was home for Christmas from Exeter, and QOT from Yale. QNV needs a W6 for all districts on 3.7 Mc. with 40 watts. IIN is bragging about CEN. Dick, of AW, has his new call, RUP, and is on the air with 400 watts to p.p. 813s on 3.5 and 7 Mc., also 20 watts to a 832 on 50 Mc. LHE checks into CN when possible. FTX is taking QMI's place on CN. AW schedules 6EVM Mon., Wed., and Fri. DJC has a new daughter. The University Radio Club of Storrs now has 40 members and has applied for its old call. The Hartford and East Hartford Emergency Corps was alerted during the floods of December under the direction of EC LKF and did a nice job, according to reports. ADW resigned the NCS job on CN because of changed working hours. Traffic: W1NJM 218, AW 168, BIH 153, LKF 146, DAV 123, QMI 112, ORP 100, IIN 91, BDI 51, ADW 47, CTI 45, HYF 41, EFW 38, CEG 28, KUO 27, FTX 26, NYC 19, BHM 18, LHE 16, APA 5, QIS 5, SJ 5, QNV 3, JTD 1.

MAINE — SCM, F. Norman Davis, W1GKJ — The new officials of the Portland Amateur Wireless Association are: QUA, pres.; QUI, vice-pres.; PIX, secy; JRS, treas.; LNI, chief operator. NGV is building a Monitone and a 7-Mc. VFO. RSB is Emergency Coördinator for Saco and is enjoying his new Signal Shifter which he bought in kit form. QQY also has one built up from a kit and is popping up all over the bands. DFC, QDV, and ROM, at Old Orchard Beach, all have three-element beams working on 28-Mc. 'phone which leaves GKJ out-dated with a 3.5-Mc. Zepp. AMR is busy working on Marine Radio. QIQ and GKJ were visiting NXX and LNI at their place of business when they were all driven out by a fire in the building; rapid QSY to the street was hastened by the blast from an automobile gas tank blowing up. CRP now has his rig on 3.85-Mc. 'phone. EFR, NGV, LKP, NXX, and OHT are the Net Control Stations on the Pine Tree Net Monday through Friday in the above order. All members of the Emergency Corps should take note of the date on their membership cards. If it has expired have your Emergency Coördinator endorse it. If you have no EC in your locality and you are interested in the appointment, drop a line to the SEC. Traffic: (Nov.) W1OHT 28. (Dec.) W1LKP 200, NXX 140, NGV 78, YA 60, OHT 42, JAS 34, EFR 26, KYO 26, ROM 4, RSB 2.

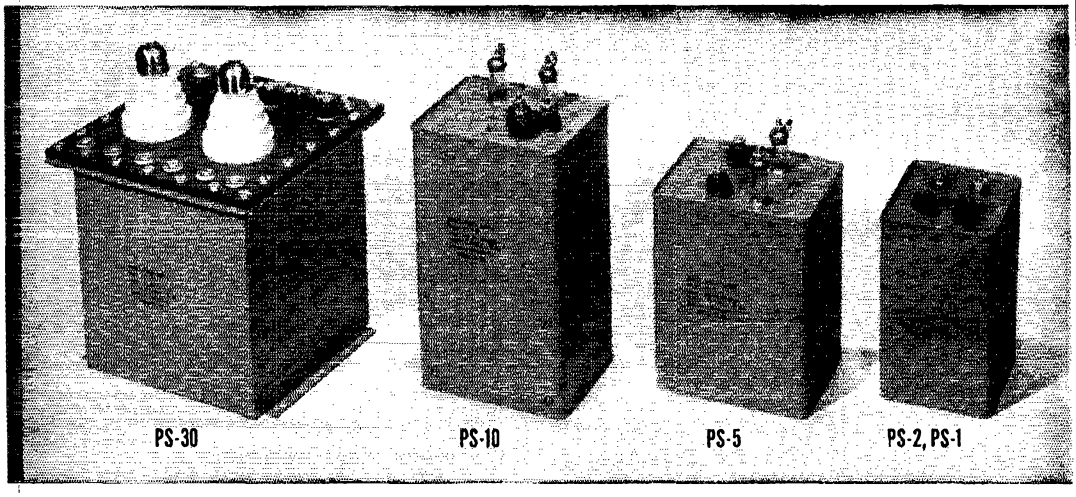
EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: HIL as OES, PU as ORS. Appointments endorsed: JSM, HIL, HUP, QMJ, and AWA as EC; JSM and CTW as OES; AAL, AR, GOU, HIL, and HUP as OPS; OJM, AAL, QHC, HA, AGX, WI

(Continued on page 80)

Introducing—

Another Plasticon Development

HIVOLT POWER SUPPLIES



HiVolt Supplies are self-contained in hermetically sealed metal containers. They are designed to transform low voltage AC to high voltage — low current DC.

PS-30 — 30,000 VDC; 1 Ma.; dimen. 7" x 7" x 7"
PS-10 — 10,000 VDC; 2 Ma.; dimen. 3¾" x 4 9/16" x 8'
PS-5 — 5000 VDC; 5 Ma.; dimen. 3¾" x 4 9/16" x 6"
PS-2 — 2400 VDC; 5 Ma.; dimen. 3¾" x 3 3/16" x 5½"
PS-1 — 2400 VDC — Capacitor load; dimen. 3¾" x 3 3/16" x 5½"

High Voltage – Low Current DC Power Supplies for Television – Radiation Counters – Photoflash Devices – Electrostatic Precipitators – Spectographic Analysers – Oscilloscopes, etc.

Write for descriptive literature

Plasticon Capacitors, Pulse Forming Networks and HiVolt Power Supplies are available at all leading jobbers.

Come and see us at Booth No. 334 at the I. R. E. National Convention in New York, March 7-10th

Condenser Products Company

1375 NORTH BRANCH STREET • CHICAGO 22, ILLINOIS

and TY as ORS: LQQ and OJM as OO; LMU as OBS. AKY's brother in Sweden has a new call, SM5APF, and is on 7 Mc. Ed says he has worked 49 SMs. WK gave a talk on transmitter troubles at the South Shore Amateur Radio Club and DDO also gave a talk on taming an 807 final. CTW and JEL spoke on n.f.m. techniques at the Eastern Mass. ARA. Meetings are held the 3rd Wed. at the Cambridge YMCA in Central Square. The T9 Radio Club held a meeting at BVL's. RCQ/2 has moved to Lockport, N. Y. The Brockton Amateur Radio Club had a film on Westinghouse r.f. heating. GOU has first East Coast Pearl Harbor Radio Club certificate, all on n.f.m. PZG has moved to New York City. 3NYN and his XYL were in Medford for Christmas. NF is moving into new house. HWE is back home again. MCR had seven on his Dorchester Emergency Net the last Sunday of the month. He has a schedule on 7 Mc. with 2ZFT, Syracuse, N. Y., formerly MCT. OBZ has been appointed senior emergency radio operator at the local Naval Reserve Armory, Montauk Road, Brockton. The South Shore Amateur Radio Club is giving certificates to all those who work ten or more members of the Club (W.S.S.). This started Dec. 1st at 6 P.M. on all bands. Send your logs to PXH. AWA has an emergency set-up with two portable a.c. generators and plenty of gear for 144, 28, and 3.85 Mc. OJM has enough cards for DXCC and BERTA, but needs Alabama for WAS. QOI, QFO, and CTR are playing chess on 144 Mc. KLC and KLO are on 144 Mc. HDJ has quad antenna on 144 Mc. RKD helped to get some serum to a sick lady in South America through a ham in Miami and others on 28 Mc. QJF, in Malden, is on 144 Mc. HIL and DFS send in the news of the formation of a new radio club, the Quannapowitt Radio Assn. Officers are: GAG, pres.; DFS, vice-pres.; LVV, secy.; IN, treas. Meetings will be held at the Greenwood Hose House the 2nd Fri. of each month. All hams are welcome. HIL will be on 220 Mc. AGX is on 6 bands from 220 to 3.85 Mc. The Hi-Q Radio Club now holds meetings the 1st and 3rd Thurs. nights. The Club has a net each night on 29 Mc. at 7:45 P.M. HA, ALB, and KAE have new VFO's using Clapp oscillator. HY has a t.v. receiver. CMM is on the air after a long layoff. RNM is on 28 Mc. NVB worked Iwo Jima and Kwajalein on 28 Mc. OMM worked a J. LQQ has T.V.I. QRM. PU has Class A license and is on ESN. LMU says that NPA will be on 3.5 and 144 Mc. LMU will have 274-N RX for 3.5 Mc. WU is going to build a new rig with a pair of 304THs. A lot of the boys have worked ZC8PM (W2AIS). DMS has p.p. 807s VFO and crystal on 7 and 28 Mc. MDU is building QRP portable transmitter. BB got a Sylvania modulation meter from Santa. QMJ has 7-Mc. WAC. Traffic: (Nov.) W1JDP 13, BB 11, MRQ 4. (Dec.) W1QMJ 223, JCK 168, TY 104, EMG 100, AQE 40, DMS 39, OJM 28, BB 16, QJB 14, PU 14, MDU 11, BDU 10, OMI 8, JYC 6, WU 6, MRQ 4.

WESTERN MASSACHUSETTS — SCM, Prentiss M. Bailey, W1AZW — RM: BVR. SEC: UD. PAM: NY. Many thanks for the fine job during the recent near-flood disaster. The West. Mass. Emergency Net on 3760 kc. was opened by BVR at 3 P.M. on Dec. 31st and it continued to function until midnight. The 'phone net and local emergency nets were called into action and performed with precision. GZ leads the traffic with a very fine total. NES is NCS of SSN on Wednesdays. AMI can QSP to New Hampshire and all New England via several schedules. BDV rebuilt 807 buffer state and also a 6L6 portable job. BVR organized and kept West. Mass Net hopping during flood emergency. JAH was in operation to help Adams and North Adams if necessary. JGY renewed ORS appointment. RHU and RDB have joined the Teen-agers Net. UD, NY, and RRX are going 28-Mc. mobile. RLV and OUJ are new members of Hampden County Radio Club. COI is becoming fascinated with s.s.s.c. HNE was active during flood emergency. A new ham in Lenox is RUX. IBZ stuck 28-Mc. beam up 45 feet in the air. LLN has applied for ORS appointment. New officers of Worcester County Radio Assn. are: IHI, pres.; LTA, vice-pres. RPN won a turkey at Christmas raffle of the Club. EFQ is now working DX on 14 Mc. with new beam. MUN, not satisfied with a frequency measurement of 7.1 parts per million error, has ordered new crystal and built a new frequency divider. BKG made a nice score of 6.8 p.p.m. error in the F.M.T. RDB is building a new final. PYR put on a swell Christmas party for Pittsfield Radio Club. JUS, NH, JEJ, CCH, QXV, and JWV are active on 144 Mc. KZU and LRE have been heard by RRV at WMAS-f.m. on 420 Mc. LDE is doing a real service for the airlift boys by holding lengthy schedules with D4s almost every morning. Traffic: (Nov.) W1IHI 22. (Dec.) W1GZ 232, BVR 148, JE 145, NY 108, AZW 86, IHI 67, AMI 40, JAH 15, HNE 12, JGY 12, GVJ 8, DPY 7, RHU 6, BDV 5, MUN 4.

NEW HAMPSHIRE — SCM, Gilman K. Crowell, W1AOQ — QKK graduated from Massachusetts Radio School and is awaiting civil service appointment. CVK is rebuilding and will be ready for the DX Contest. GTY, LSN, and IP will be found nightly on 28-Mc. 'phone. EWF has a new Collins 310-B with a 4-250A in the final. QXP has a new rig on 28 Mc. QIZ is employed at WKNE. BWR is active from Saddleback Mountain. GMM is letting hunting interfere with his radio. RMY is active on the New

(Continued on page 82)


8224
8223
8222
8205
8209
8204
8216
8225
8235
TRANSMISSION LINE CABLES
Every Type for Every Service
Sold Exclusively Through Recognized Wholesale Distributors
8210
8226
8227
8229
8228
Belden
Radio WIRE

Hampshire Net. CRW is now manager of NTL. NAZ is now 9CEF. QCY and PKT were home from college over the holidays. OMZ has a portable rig on 28 Mc. QJE's new QTH is Niagara, N. Y. QJH, CNX, and APK have deserted our ranks in favor of t.v. QCZ and QJH are now attending radio school. NMB is now secretary of the Nashua Mike and Key Club. RSZ is a new ham in Concord. New officers of the Concord Brasspounders are: JNC, pres.; IJB, vice-pres.; PFU, secy-treas. FN gave the local boys a deer supper which was enjoyed by all. Congrats to AVL on a new jr. operator. Traffic: W1CRW 576, QJY 53, CVK 35, BWR 33, MXP 33, PFU 24, EWF 23, GMM 20, ANS 14, AOQ 4.

RHODE ISLAND — SCM, Roy B. Fuller, W1CJH — The previously reported Newport Emergency Net has added another feature, code practice after the sign-off by ROF. For those interested, the frequency is 28,688 kc. on Thursdays at about 9:30 P.M. The holidays apparently affected activities for reports were few and far between this month. NAARO held a Christmas party for its members, XYLs, and friends with an exchange of presents, dancing, and eats featuring the evening. The Rhode Island Net (3540 kc.) is sorely in need of contacts in all parts of the State. RM BTV is bearing the brunt of incoming traffic with few outlets except by mail or telephone. New hams are cordially invited to get into this interesting phase of amateur radio. Net activity will improve your operating ability. For further information contact RM BTV or your SCM.

VERMONT — SCM, Burtis W. Dean, W1NLO — CUN is building a sixteen-element beam for 144 Mc. MEP is converting BC-788 for 420 Mc. BLC has new final with p.p. 826s. AVP and TJ visited NLO recently. FN was one of the lucky ones to get a deer this last fall. AAK, AHN, BYC, ELJ, EMQ, EWF, GNF, GTY, HEV, JNC, RPK, and SP gathered at FN's home Dec. 6th to swap tall tales and partake of a venison dinner cooked by FN's better half, Edith. Members of the BARC have been doing some interior decorating on the club headquarters. They constructed an operating table, installed three-element plumber's delight for 29-Mc. 'phone and have applied to FCC for a club station call. QHD has quit WVM and is working for CAA. MMV is experimenting with t.v. LYD is operating mobile on 29-Mc. 'phone with TBS-50. Traffic: (Nov.) W1PSD 120, RNZ 34. (Dec.) W1PSD 67, BJP 27, IT 19, RNZ 17, AVP 15, AEA 14, QVS 4.

NORTHWESTERN DIVISION

IDAHO — SCM, Alan K. Ross, W7IWU — Reports were rather slim this month. Moscow: MRL and MVA visited me at WU and we had an FB talk. They are on 7 Mc. A nice letter was received from MAS, assistant chemical professor at the University. He has been asked to consider the EC job for Moscow. BEO writes of the illness of his father. Bad weather has kept him too busy to get on the air. American Falls: DMZ has separate kw. finals for all bands. His 75A-1 receiver is getting a good workout on the FARM Net. Fellows, we must have more AEC members in Idaho. I ask the amateur in the more remote areas to write me for a copy of the ARRL's *Emergency Communications Manual* and Idaho's plan. We MUST obligate ourselves to emergency preparedness. The Boy Scout's motto, "Be Prepared," might well be our own, too. Let's hit this thing hard and possess a rig capable of operating away from commercial power. Traffic: W7DMZ 72, EMT 24, GTN 15, MAS 5, IWU 3.

MONTANA — SCM, Fred Tintinger, W7EGN — The Livingston gang is preparing emergency gear for portable and mobile use on all bands from 3.85 to 28 Mc. KVU has worked 43 countries since the war on 3.5 Mc. The Southern Montana Amateur Radio Assn. of Billings sponsored an "XYL" Party with an evening of entertainment followed by a buffet lunch. More than 50 guests attended and Mrs. Leslie Crouter and Lloyd Hagaman won prizes in a "get acquainted" contest. HU is temporarily with the CAA at Lewistown. BYX has broken years of silence by appearing on 3.5-Mc. c.w. HBM has new FB c.w. break-in system. FTO plans a new Panadapter. BSU recently worked three ex-Montana hams, 6EBG, ex-7AOD, 6SYX, ex-7EGM; and 4JDL, ex-7BVE. Ex-Montana hams that have dropped in on 3520 kc., the Montana State Net, are: 7FL, 7JC, and KL7KB, ex-7KHH. The Butte Amateur Radio Club held a Simulated Emergency Test. Members taking part were LNS, LNU, LER, FLB, CJN, EMF, JFR, and Les Blewett. The test was very successful, however members agreed that regular drills with a Net Control Station should be held at least once a month to perfect operating procedure. Traffic: W7CT 249, KGJ 149, EGN 88, KVU 75, FGB 64, EWR 27, KIY 24, COH 22.

OREGON — SCM, Raleigh A. Munkres, W7HAZ — The entire Northwest mourns the death of Jay Gould, W7HKI/W7IHA. Since suffering a stroke some six years ago Jay probably has been the most active amateur in the Northwest on 3.85 and 14 Mc. Consistently active on the Dipsy Net, Jay was always more than ready to lend a helping hand. Especially did the new-comers find this true as he was never too busy to give a boost to the younger hams. The report from KGR, at Redmond, was the only report

(*Continued on page 84*)

received this month so I'm going to leave it up to you fellows as to what you wish to do about this column. I receive plenty of gripes when it doesn't appear but very little help to see that it does appear. You clubs especially could take it upon yourselves to appoint someone to drop me a card once a month (by the sixth, please). Traffic: W7HVD 8.

WASHINGTON — SCM Clifford Cavanaugh, W7ACF — RM: CZY. SEC: GP. PAM: CKT. DGN says building antennas and mixing Christmas cheer for the boys doesn't work at the same time. EAU lost another antenna mast in the big wind. That makes three, and a record for these parts. ZY, an old-timer, is getting back in harness again on 7 Mc. Both ZU and APS are out for the No. 1 BPL Certificate. May the best man win. CZY handles piles of traffic. He reports 2HAQ from New York dropped in New Year's Day to pick up a QSL card that Larry had forgotten to mail, and as HAQ was a big man he got the card. Better watch this QSLing as this could happen to you too, fellows. FRU says snow, ice and skip are raising heck with his schedules. FIX says that his rig doesn't bother the t.v. set a few feet away so he has no more worries except as to how to get news for his bulletin from WSNET members. IOQ sends in a very FB report. Most of his schedules are overseas and he does a lot of folks a lot of good. RAO is out hunting for paper for *VICS Bulletin*. LEC has finally gotten that roaring 500 watts going. Notes from Puyallup Valley: JJK is busy on his antenna farm but divides his time between pounding and pitching. MPH, new EC for the Valley, is laying plans for AEC work. The Valley Radio Club is purchasing a portable power plant for the emergency "that couldn't happen here." KHL has been plagued with late shift work at the Post Office. KWC is having trouble keeping his 'phone out of the land line. We hear that DRD, at Colfax, broadcasts CQ all over town via the Congregational Church chimes system. HGC is building new Clapp VFO. CWN bought a new BC-457 to use on WSN. MYO and MVR are new hams at Bellingham. KCU sends in a nice traffic report and says her OM, EQN, is building VFO for all bands. FWR is giving her OM lots of competition in the traffic-handling department. ETO says his signal is frozen up and that is the reason for the slight squeak. FWD is doing a fine job with his OBS appointment. MCW and LVB are doing a good job of handling traffic between the State's two nets. We hear that CKT is getting his chickens all roosted now and will be back on the air soon — hold onto your chairs, gang. Traffic: W7CZY 1873, IOQ 1215, FRU 773, KWC 663, ZU 283, KCU 251, MCW 128, LEC 91, FIX 85, FWD 63, AMZ 49, ETO 41, FWR 33, LVB 23, ACF 17, EAU 17, EVW 14, DGN 11, CWN 1, HGC 1.

PACIFIC DIVISION

SANTA CLARA VALLEY — SCM, Roy E. Pinkham, W6BPT — Asst. SCM, Geoffrey Almy, TBK. RM: CIS. ECs: TFZ, JSB. ISQ has been in the hospital for the past month. Jack had an operation on his back. He is up and around and on the 28-Mc. band now. ZZ is using HT-18 VFO and likes it very much as he has no key clicks using it on c.w. Miles also reports that his beam is back in use again so that he is working some DX now. VIQ has his feed line to the beam free of standing waves with a better signal out now. AVJ can be heard on 3.85-Mc. 'phone as he has received his Class A ticket. GD gave his talk on feed lines and eliminating standing waves before a large gathering at the SCCARA meeting. J2JRG was a visitor at the shack of BPT while en route from Japan to his new assignment at Fort Scott. HC reports keeping a schedule with MUR on 7 Mc. The 114-Mc. Net of San Mateo County is going full blast now with about fifty stations planned in near future. VHE is QRL watching t.v. programs on a new receiver since Christmas. ZUJ has been heard here in San Jose from Chico on reflected skip on 28 Mc. EI is installing a p.a. system in the Civic Auditorium in San Jose. Traffic: W6WJM 127, JSB 100, VZE 42, ZZ 18, ISQ 1.

EAST BAY — SCM, Horace R. Greer, W6TI — Asst. SCM, C. P. Henry, 6EJA. SEC: OBJ. ECs: AKB, EHS, NNS, IT, IDY, QDE, WGM. Asst. EC u.h.f.: OJU. RM: ZM, FDR. The following are some of the officers for the clubs in the East Bay section for 1949. The Oakland Radio Club Inc.: YMO, pres.; ARM, vice-pres.; ELW, secy.; ZKX, treas.; YDP, chief op.; CHT, sgt. at arms; OBJ, member at large; BLG, public relations; and AKB, Emergency Coördinator. The SARO: BEZ, pres.; KQQ, vice-pres.; CMZ, secy.; QWX, treas.; KMQ, communications officers. Northern California DX Club, Inc.: WB, pres.; UZX, vice-pres.; TI, secy.-treas.; RBQ and RM, directors. North Bay Amateur Radio Assn.: MLZ, pres.; KZB, vice-pres.-treas.; WXU, secy.; WGM, Emergency Coördinator; BPC, program chairman. Richmond Amateur Radio Club: NJX, pres.; VQV, vice-pres.; EJA, secy.; ELJ, treas.; EWF, sgt. at arms; VYJ, public relations. East Bay Radio Club: JZ, pres.; NJO, vice-pres.; EEI, secy.; JK, treas.; KEK, CJI, and JK, executive committee. JZ has new Mon-Key. DNX is back on the air again. CA is getting to be a man-about-town. CMY is on 28-Mc. 'phone. ODD, the world traveler, is now settling down in W3 Land. DVX has new jr. operator. AFC, YHI, BPC, and WMG are active. ELW is getting to be very

(*Continued on page 88*)

Complete with AMPLIFIER

$99.95

(Slightly higher west of Rockies)

AIR KING WIRE RECORDER "Know-How" *opens the door to new and thrilling experiences.*

What Ham can resist the thrill of replaying for his friends *absolute proof* of an exciting DX contact? Where is the amateur who can keep his seat when you repeat his signal *exactly* as it came in? With an AIR KING wire recorder only the limits of your imagination can limit the interesting possibilities. Be one of the first to work this *new, exciting field.* Do it today . . . just fill in and mail the attached coupon. No cost, no obligation, of course.

THE AIR KING WIRE RECORDER
"Engineered" for use in the Ham Shack

★ Complete with amplifier ★ Records directly from your rig ★ Automatic shut-off at end of play or rewind of wire ★ Rewind speed: 6 times forward speed ★ Plug for cable to record from radio or phonograph ★ Erases automatically when recording over used wire ★ Safety lock prevents accidental erasure ★ Covered in leatherette ★ One-piece chassis ★ Luggage-type carrying case ★ 5" Alnico V P.M. Speaker ★ TUBES: 2—50L6, 1—1280, 1—6AQ6 plus selenium rectifier ★ WEIGHS: 21½ pounds ★ MEASURES: 13¾" long by 12" wide by 9" high

Only "know-how" can build fine wire recorders. AIR KING, a pioneer in the magnetic recorder industry, has it!

FREE INFORMATION

AIR KING PRODUCTS COMPANY, INC.
170 53rd Street, Brooklyn 32, N. Y.

At no cost or obligation to me, please send additional information about the AIR KING Wire Recorder.

NAME.....

ADDRESS.....

CITY.....ZONE....STATE.....

FOR QUICK ACTION—MAIL TODAY!

AIR KING

GIANT SAVINGS ON TUBES AT THE RADIO SHACK!

1¢ TUBE SALE

Buy ONE TUBE at our regular low price . . . Get ANOTHER for only 1c extra!

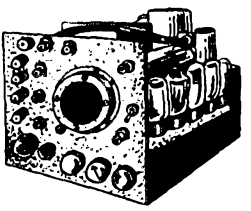
3C24/24G	1 for $ .69	2 for $ .70	304TH	1 for .49	2 for .76
826	1 for .75	2 for .50	VR150	1 for .49	2 for 2.96
1625	1 for 2.95	2 for .70	314	1 for .69	2 for .50
211	1 for .49	2 for .30	2X2	1 for .29	2 for 3.96
12A6	1 for 3.95	2 for 3.96	VT227A	1 for 3.95	2 for 1.70
830B	1 for 1.69	2 for 3.96	815	1 for 3.95	2 for 1.70

This amazing 1c sale LIMIT: 2 tubes each of any of the above listed tube types. EXPIRES March 24, 1949. Please — no dealers!

MORE RADIO SHACK TUBE VALUES!

6L6	$1.25	832A	$2.65	866	$ 98
316A	.49	6AK6	.89	6J5	.60
6AG7	1.06	807	1.15	5T4	1.25
872A	1.75	813	7.95	VR90	.49
836	2.25	805	4.95	837	2.25
811	1.79	8000	5.95	3B24	1.95
2D21	.98	809	1.65	884	1.25
802	2.15	810	6.95	816	.98
1626	.49	958	.49	6AC7	.99
RK25	3.00	955	.49	3E29	3.49

BC-929-A 'SCOPE $9.95



This 3-inch radar-type scope is readily modified to use as a modulation indicator or a panadapter. You can run it on 60 cycles by hooking a 150-watt lamp in series with the input to the 400-cycle power supply. Handy size—8 x 9 x 14 inches. Complete with 3CP-1 CR-tube, 2—6H6GT, 2—6SN7GT, and 1 each 6G6G, 6X5GT, and 2X2. Good used condition.

PE-103 DYNAMOTOR BRAND NEW—only $5.95 (less base)

Here's your opportunity to get one of these popular units at a rock-bottom price. Operates from 6 or 12 volts d-c; delivers 160 mils at 500 volts d-c.

H-23U RADIO PHONE HANDSET ONLY $2.95

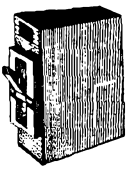
A Brand new high-impedance phone, low resistance mike, complete with 6-ft. cord and PL-55 and PL-68 plugs. Ideal for portable work.

AAF HAND MIKE 89¢

Type T-17 mike with push to talk switch, cord, and plug. "Ideal carbon mike for mobile installations."

HEINEMAN CIRCUIT BREAKERS $1.19

Worth 4 times our low selling price of only $1.19.



Replace fuses in your new rig with these brand new circuit breakers. 115 VAC ratings. Can be tripped manually and used as on-off switches, specify 4 amp or 10 amp.

RAYTHEON TRANSFORMER SPECIALS!

Bias Transformer Type U8383 — ONLY $1.39

For that bias pack you need, provides 200 volts DC at 300 ma. after filter, also 5 volts at 6 amps. Size 5½ x 6 x 4. Weight 9½ lbs.

Bias Transformer Type UX9112A — ONLY $1.39

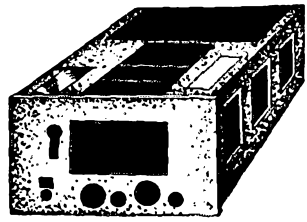
Can be used as a 100 watt isolation transformer or a super bias supply since it furnishes 1200 ma. at 140 volts after filter. No filament winding. Size 4½ x 5⅜ x 6⅛. Weight 15¾ lbs.

BENDIX COMPASS RECEIVERS

- **Model MN26Y (150-325kc, 325-695kc, 2.4-7mc)**
- **Model MN26C(150-1500kc)**

$39.95 Each

These sturdily built units are in use in thousands of standard aircraft. If you want to roll your own AM rcvr for these frequencies you can't do better than convert to 115VAC operation. CW men like the low frequency coverage for marine work. One of the best pieces of surplus to reach the amateur or industrial market. Either model is a tremendous value.



BUY YOUR NEW MAST AT THE RADIO SHACK!

YOU CAN STILL GET EASY TERMS ON NEW GEAR

Deposit only 20% . . . and take a year to pay the rest.

CHECK CHOICE HERE	LIST PRICE	SEND US ONLY
COLLINS		
75A rcvr	$ 375.00	$75.00
30K xmtr	1450.00	290.00
32V-1 xmtr	475.00	95.00
310B-1 exctr	190.00	38.00
310B-3 exctr	215.00	43.00
310C-1 exctr	85.00	17.00
310C-2 exctr	100.00	20.00
70E-8 exctr	40.00	8.00
HALLICRAFTERS		
S38 rcvr	49.75	9.95
S40A rcvr	99.50	19.90
S47 rcvr	229.50	45.90
S51 rcvr	149.50	29.90
S53 rcvr	89.50	17.90
SX42 rcvr	275.00	59.00
SX43 rcvr	189.50	37.70
SP44 Panadapter	49.50	9.90
T-54 TV rcvr	139.50	55.80
HT9 xmtr	350.00	70.00
HT18 xmtr	110.00	22.00
NATIONAL		
NC-33 rcvr	57.95	11.59
NC-57 rcvr	89.50	17.90
NC-173 rcvr	179.50	35.90
NC-183 rcvr	269.00	53.80
NC240D rcvr	241.44	48.28
HRO-7 rcvr	279.00	55.80
HFS	125.00	25.00
HAMMARLUND		
HQ129X rcvr	189.15	37.83
SP400X rcvr	450.00	90.00
R. M. E.		
HF-10-20 rcvr	77.00	15.40
VHF-152A rcvr	86.60	17.32
DB22A	77.00	15.40
RME-84	98.70	19.74
RME-45	198.70	39.74
MILLEN		
90800	42.50	8.50
90881	89.50	17.90
90281	84.50	16.90

- **IMMEDIATE SHIPMENT of the gear you want is assured by our complete stocks of receivers, transmitters, instruments and other amateur apparatus.**
- **EASY, MONEY-SAVING TERMS require only a small service charge on time payments.**
- **WHATEVER YOU NEED for full enjoyment of amateur radio is ready for you at the Radio Shack. C. O. D. orders filled promptly with 20% deposit.**

SAVE 60% on this 50 Ft. HAM MAST

Brand new plywood mast made to sell for $100 . . . a "steal" at only $39.50!

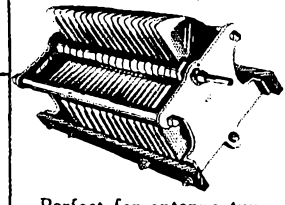
Designed for UHF or VHF antennae and easily adapted for FM and TV beams. Comes complete with all guys and collars, plus 9-foot boom to lift the assembled mast! Two men can erect this 4-section dandy in 15 minutes. It is weather-proof, portable, non-metallic, and cheap to maintain (no paint required). No concrete foundation required. Mast weighs 29 lbs., fittings 41 lbs., erection kit 15 lbs. Yes — BRAND NEW. Yes — the BIGGEST BARGAIN in masts since Homer was a pup!

CO-AXIAL DIPOLE

Was $12.50 now only **$6.50**

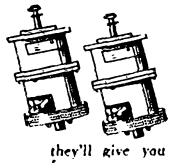
For 2 meter fixed-station or mobile use. Matches 50-55 ohm coax cables. Easily mounted on auto. Rhodium-plated brass and poly Brand new!

CARDWELL 440mmf CONDENSER $2.25



Perfect for antenna tuning or networks. Can be easily revamped to make a split-stator condenser. Lists at $11.30

BRAND NEW GE SELSYNS $3.95 PER PAIR



Ideal for beam position indicators and many other uses. You can run these splendid selsyn control transformers at 35 volts 60 cycles and they'll give you permanent, efficient performance

HT-17 HALLICRAFTERS XMTR SALE!

A splendid performer for the beginner, and equally acceptable as a standby or portable for the experienced amateur. Employs a 6V6GT in a combination straight and tritet oscillator driving an 807 to an honest 10-20 watt out. put over the complete range. Built-in Pi Section Antenna Coupler provided. Hallicrafters original low price with only 1 coil *was* $49.50. We give you 5 *coils* for 10-15-20-40 and 80 meters!

SALE PRICE $39.50

Brand new! Save over $20!

Send now for FREE 128 page 1949 Catalog

The RADIO SHACK Corp.

CABLE ADDRESS · RADIOSHACK

167 WASHINGTON ST., BOSTON, MASS., U.S.A.

(*Continued from page 84*)

active on 14-Mc. 'phone and 7-Mc. c.w. OT's Official Bulletin schedules are now at 8.15 P.M. on 7097 kc. daily except Sun., 9.18 P.M. 14, 125 kc. on Wed. and Sat. QXN is using a GF12 VFO. VDR is pretty QRL these days. FDR reports the Pioneer Net has changed time to 7 P.M. effective Jan. 1st. IXH is knocking over the traffic. ZUI has new f.m. VFO Meissner kit built up and worked FB. YDI has new 14-Mc. beam on telephone pole. EJA is looking over the bands for DX. BF is pretty QRL with work. WII has Official Bulletin schedules on 7020.2 kc. at 10 P.M. PB is rebuilding a three-element beam. RCC is on with high power. LDD lost his 7-Mc. antenna in wind storm. YI, with all his new poles, is finding competition keener since the war. TT is always looking for new countries. UPV and IKQ bought t.v. sets. FXX is back on the air after being out of town for a few months. ZM is getting along FB. TI replaced the ropes on his two poles. AED is knocking over DX on 14-Mc. 'phone. OBJ likes all-band operation. CDA still is pounding commercial traffic. ITH is home from Mexico. GEA is QRL projects. Anyone interested in OO work, please contact yours truly. Traffic: W6FDR 848, QXN 335, OT 102, ZUI 58, VDR 29, BF 24, YDI 11, TI 7.

SAN FRANCISCO — SCM, Samuel C. Van Liew, W6NL — Phone JU 7-6457. SEC: DOT. CEC: BYS. CWR is rebuilding the rig to accommodate a 304TL final. AUB is engineer at KHUM. AEY, YPI, and EQQ are new hams in Eureka. EQQ is a c.w. man for the time being. AEY is rebuilding the transmitter. AGY is building a new rig. IYN is looking for DX. SLX is working c.w. and getting out well with rebuilt surplus gear. NAO is trying to find time for hamming. There is a new baby girl in his family. Congratulations. FYY is working plenty of DX on 'phone. QCB is taking time off from hamming. NP is the owner of KHUM. BOT is working the 'phone bands. EGY is overhauling the receiver. BYS has gone in for antenna repair business after the last storm. He has put up a new 7- and 14-Mc. skywire. ATO is putting the finishing touches to his new rig. EXD is experimenting with new type quad antenna. DCH is holding solid weekly schedules with Guam on 28 Mc. He runs about 400 watts to a Globe King transmitter on 28 Mc. with a three-element beam. ZVW is off the air temporarily and is at new location. NL is accumulating material for a new shack. CHP is going strong on the American Legion Net. VW is the new Control Station for the Net. The local Visitation Valley Net has been operating eleven months. The Net has twenty members meeting Wednesdays at 9:00 P.M. on 29.3 Mc. Although rag chewing is their specialty they handle considerable traffic. Their score as a group totals 190 this month. The Pioneer Net, along with the rest of California, has rejoined the Union and now is operating on PST. The time has been changed to 7:00 P.M. PST nightly, Monday through Friday. Phone in your traffic to JU 7-6457. All the clubs in the area held their usual Christmas parties with eats, lots of fun, and big raffles. Let me wish you brother hams all the DX luck in the world this coming year. The following news on Guam amateurs was reported to your SCM by KG6DI: With the arrival of the New Year the Guam Amateur Radio League is again anticipating a very active operating program. The initial meeting of the year, held on Jan. 7th, brought forth an excellent turnout of members. As the main business of the season an election of new officers was held, with retiring president, Capt. A. H. Erickson, KG6CI, presiding. New officers of the club are: KG6ED, pres.; KG6DI, vice-pres., and KG6AD, secy.-treas. With the return to the States shortly of 5MDX, the Club will lose one of its most active members. Bill, who hails from Forth Worth, Tex., is now in his 26th year of hamming and has been on Guam since July, 1946. A farewell party was combined with the January meeting at the operating location of KG6AD. Business meetings are held the first Friday and social meetings the third Friday of each month. Traffic: KG6DI 523, W6NL 191, JWF 66.

SACRAMENTO VALLEY — SCM, Ronald G. Martin, W6ZF — Asst. SCMs: Northern Area, Ray Jensen, 6REB; Central Area, Willie Van De Camp, 6CKV. SEC: KME. EC: BVK. RM: REB. The Sacramento Valley Emergency Net, 146.5 Mc. Thurs. 8 P.M. has LVW and CHP in San Francisco and VNI at Oakland reporting in regularly affording contacts with Regional Headquarters of American Red Cross. MYL, NCS of Valley Net, has completed 3.85-, 28-, and 144-Mc. mobile rig. LYQ, NCS Northern California Net, reports increased net attendance since publicizing new 144-Mc. propagation theories. The Valley Ten Meter Net (29.4 Mc.) with ZYV as NCS, reports good attendance on drills. The Mother Lode Emergency Net, 29.3 Mc., meets Thurs. evenings, with ITJ as NCS. Northern Area: JDN has gone to 3.85 Mc. Central Area: AF consistently handles OBS on 14,085 kc. The Golden Empire Radio Club held its Christmas party at WVR's QTH. ZUJ, Chico, is new section member. KUI, Willows, has broken down the 144-Mc. path to DWG, Sebastopol with consistent 100 per cent QSOs. CKV reports the gang followed KME in flight on 144 Mc. from Sacramento to Marysville, Fairfield, Stockton and return with excellent signals. Southern Area: BVK did a swell job organizing the Valley Ten-Meter Emergency Net. WTL schedules 8KJ and 9GVL nightly. FW and AK attended the Buzzards Con-

(*Continued on page 90*)

vention. LNN mobiles daily on 29.23 Mc. and has worked 20 states with 15 watts. TXL is putting up a new 14-Mc. three-element beam. ZY has new 34-ft. tower for his 14-Mc. three-element wide-spaced beam. IKH is rebuilding with ET-127As on 14 Mc. MWM has Millen 807 exciter and new 28-Mc. rotary beam. JN and XYL attended the Sacramento Amateur Radio Club's Christmas party. AP is using cubical quad. CLV uses clothes line and 6L6 on 3.5 Mc. with good results. KME and AP assisted WVS in recent emergency when a plane was lost in Northern California. AUO is rebuilding his receiver to improve signal-to-noise ratio. PIV (OES) consistently works AJF, Sonoma, who is surrounded by 2000-ft. hills. ZF moved the big rig into new QTH. MIW is building new unitized transmitter with 257 final. Traffic: W6REB 686, PIV 69, JDN 23, WTL 7, ZFI.

PHILIPPINES — SCM, Stanley J. Cier, KA1A1/W7JKJ — January 1, 1949 marked the entry of the new call prefix "DU" for the Philippine Islands. The event of the month was the opening and operation of KA1PAR at the "Boys Town Benefit Carnival," Luneta, Manila. The display was very attractive and credit goes to RTI, CT, RP, TK, JS, and ABU for the installation, while many others gave an assist in the operation. The QRN/QRM was terrific. KA1ACF has returned to the States to W7HUI. RP soon will go to the States on an extended business and pleasure trip.

SAN JOAQUIN VALLEY — SCM, Ted R. Souza, W6FKL — Asst. SCM, James F. Wakefield, 6PSQ. SEC: JPS. ECs: PHL, KUT. The following is gleaned from the SARC *Flysheet:* OYF resolves to finish the new final he started three years ago. RFN had the gang out to help him put up a new skyhook. WHB is back on 3.85 Mc. between t.v. installations. VPV is also a t.v.er. WQR says t.v. down Oakland way is hot stuff. ZJQ is in Missouri with the Army. GJO has a new Collins 32-V. VKR has been building a new Hi Fi audio amplifier. UWY has a new whip antenna on his car. NDJ is still rockbound on 3.5 Mc. QUE is back on 3.5 Mc. The SARC has a room at National Guard Headquarters, thanks to the efforts of WBZ and his committee. There's a new pole in back of the building, too, thanks to the efforts of SAH. Up in Merced, PHL is busy with police and taxi radio but manages to get on occasionally. OHB coaxes a good signal out of his rig when he's not coaxing Grade A milk out of his cows. KBP is still on 14 Mc. PSQ is busy fixing up the shack. JPU has n.f.m. on 3.85 kc. and likes it fine. KMI has a new 28-Mc. beam up. DVL and JPS very ably assisted in the erection. TFH has his Panadapter working very nicely. Just a reminder — don't forget to get your reports in by the first of the month. Anyone wishing to contact the SCM can do so by checking 3665 kc. on Wednesday evenings at 8 o'clock.

ROANOKE DIVISION

NORTH CAROLINA — SCM, W. J. Wortman, W4CYB — At least one guy started off the New Year with a few lines of dope for the column. Now won't more of you take the old bull by the horns and give us some dope for this space? MR finally got the big beam airborne aided by AIT, HEH, and KYR. GXB is sporting a new dual job on top of a 50-ft. tower while AIT has taken his down for repairs. OON, a new ham in Greensboro, started off on 14-Mc. c.w. CS plans changes around the shack exchanging a 14- for a 28-Mc. beam. KYR bought a new home and now has plans in the making for a big shack in the back yard. The OW run you out of the house, huh? GQU moved his gas burner out of his garage and took over the entire space for a shack. GG sticks to 14-Mc. c.w. with a Lazy H which incidentally he pulls up with twine thrown over the supporting member. HEH is busy with repair work but can be heard on 3.85-Mc. 'phone. Kinston has elected the following new officers: Dr. Dupree, pres.; Dave Hardison, secy.-treas. The rig is coming along and will be heard shortly. 'Phone and c.w. nets are still operating five nights per week. Why don't you check in, gang? Listening tells us that lots of rigs are being rebuilt, lots of the gang are putting up new antennas, much DX is being worked, and considerable experimentation is being carried on. But if you won't report it no one can read about it here. Traffic: W4CFL 168, KJS 84, JQO 82, DLX 33, MR 5.

SOUTH CAROLINA — SCM, Ted Ferguson, W4BQE/ANG — BSS reports activity in the 75-Meter 'Phone Net and reports good attendance. MSN is active on 28-Mc. 'phone. DFC reports activity on 14 and 28 Mc. CZN operates on 7-Mc. c.w. Thanks to ANK for the report from Charleston. The Charleston Club enjoyed the visit of 1IIN, National Emergency Coördinator. The 80-Meter C.W. Net is improving all the time and the following are reported as members: ANK, AUT, BJE, BR, DAW, FXH, IYA, HMG, HTR, MCY, MRJ, MTW, MYM, and NRC. This Net meets on 3525 kc. every week-day night and takes traffic for anywhere. HTR operates 28-Mc. 'phone with n.f.m. CZA has become active again. I hear that NRC and IYA have new 3.5-Mc. sky wires. BIZ is building portable emergency rig for 3.5 and 7 Mc. MAQ has just been installed as Worshipful Master of his Lodge. He was installed by BQE, the District Deputy Grand Master. This is the

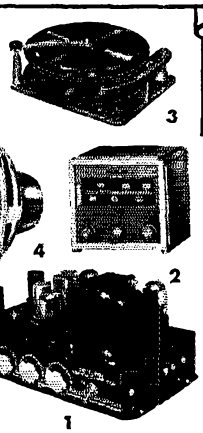
(Continued on page 92)

Sound Values! AT TERMINAL!

Our newly enlarged Sound Department enables you to conveniently see, hear and compare before you buy. We carry all best quality lines of sound equipment—in stock at lowest prices!

RECOMMENDED FOR HIGH QUALITY, ECONOMICAL CUSTOM INSTALLATION

This group of equipment has been carefully selected in our laboratory for coordinated high quality LP and standard phono and FM reproduction. When installed and interconnected, this radio-phonograph equipment surpasses the quality of instruments selling for three times our price!



Terminal group TR-20A consists of: **1.** Bell model 2122 high fidelity radio-phono amplifier. 10 watts output, 15 watts peak. With bass and treble controls set for flat response, frequency range is 30 to 15,000 cps ± 1 db. Hum level is —65 db. below rated output. **2.** Howard model 482 FM tuner, compact in attractive mahogany cabinet. Covers 88-108 Mc. FM bond smoothly, with excellent sensitivity and stability. **3.** V-M model 400-C duo-speed changer, 78-33⅓ r.p.m. Plays 10 and 12 inch discs intermixed; record changer and motor shuts off automatically after last record is played. Single tone arm adjustable for both type records. Up to 4 hours on LP. Dual needle reversible cartridge also adjusts for proper needle pressure. **4.** General Electric model 1201-D heavy duty high fidelity PM speaker. Frequency response is 45 to 11,000 cps, handles 25 watts. **5.** Terminal's own 12" bass reflex cabinet. Supplied unfinished, wood smoothly sanded, ready for finishing. Power requirement for items 1, 2 and 3 is 115 v., 60 cycles AC.

Your cost, complete

128.50

This equipment should be heard to be appreciated. On demonstration in our newly enlarged Sound Department.

NEW! UNIVERSITY COAXIAL TWEETER ADAPTER #4407

A new convenience for extending response range of any 12" PM speaker to 15,000 cps. Supplied with mounting ring and hardware. Net **14.70**

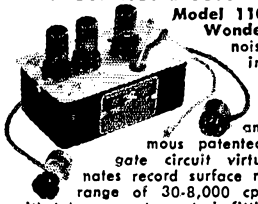
4405—Proper dividing network with variable level control for balancing 4407 tweeter with 12" PM speaker. Net **5.88**

NEW CINAXIAL SPEAKERS BY CINAUDAGRAPH

Frequency response 50 to 15,000 cps. 8 ohm input. Supplied complete with balanced bridging network. Use in same manner as a standard speaker, but enjoy the wide range performance of a dual speaker system.

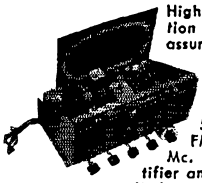
CIN-12A	12", 10 w., 3" tweeter.	**16.17**
CIN-15B	15", 15 w., 5" tweeter.	**27.93**
CIN-15C	15", 18 w., 5" tweeter.	**36.75**

SCOTT NOISE SUPPRESSOR



Model 110-A "Little Wonder" dynamic noise suppressor installs easily in most phono combinations and amplifiers. Famous patented electronic gate circuit virtually eliminates record surface noise in the range of 30-8,000 cps. Supplied with tubes, remote control, fittings, cables, adaptors and complete instructions for simple installation. Your cost **49.50**

ESPEY AM-FM TUNER CHASSIS — MODEL 511

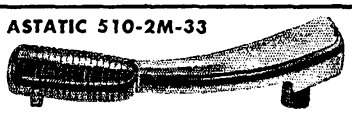


High fidelity reproduction on FM and AM is assured through well-engineered circuits and use of high quality parts. AM covers 535 to 1720 Kc., FM covers 88 to 108 Mc. 12 tubes plus rectifier and tuning eye. Supplied ready for installation with tubes, antennas, escutcheon and hardware for mounting in table cabinet or console. For 105/125 volts AC, 50/60 cycles. Net **91.14**

2% cash discount has been deducted where applicable.

NEW LP (LONG PLAYING) PHONO EQUIPMENT

ASTATIC 510-2M-33



Equipped with variable reluctance pickup for LP records. Response to 12,000 cps. with minimum distortion. Net **5.50**

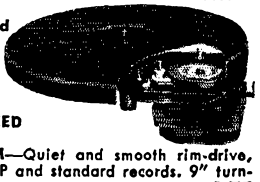
ASTATIC EA-2 EQUALIZER-PREAMPLIFIER

2-stage deluxe preamplifier for reluctance phono cartridges. Variable turnover frequency control for precise equalization. Variable bass boost, 4 position calibrated treble attenuation. Self-contained power supply. A "must" for best results with standard and LP recordings. Net **23.22**

GENERAL INDUSTRIES MOTORS

33-1/3 and 78 RPM

SMOOTH DUAL SPEED



Model DM—Quiet and smooth rim-drive, ideal for LP and standard records. 9" turntable. Net **6.75**

Model DR—Heavy duty 2-speed for more exacting requirements. 10" heavy turntable. Net **11.70**

G.E. RPX-041 — New variable reluctance cartridge specially designed for LP records. Has sapphire stylus. Net **5.82**

CLARKSTAN 201—Wide-range pickup cartridge with .001" replaceable needle for LP records. Net **15.00**

Clarkstan replacement needles (specify LP or standard). **2.40**

PICKERING D-1405 — Wide-range magnetic cartridge for LP records. Equipped with diamond stylus, outlasts sapphires by 10 times. Net **36.00**

TERMINAL RADIO CORPORATION

85 CORTLANDT ST.—NEW YORK 7, N. Y. • Phone—WOrth 4-3311 • Cable—TERMRADIO

first report your SCM has made on his seventh term of office. In order for me to carry on the office of SCM as it should be I need the support of all you good fellows. The activity reports of you ORS, OPS, OES, and other appointees are needed. Traffic: W4ANK 283, HMG 32, MRJ 31.

VIRGINIA — SCM, Victor C. Clark, W4KFC — Starting Jan. 15th, VN became a two-session affair on an experimental basis. The first session operates from 6:30 to 7:00 P.M., under the general guidance of RM LAP. The second session begins at 7:00 P.M. and lasts until all traffic has been cleared, and continues under the management of RM IA. Frequencies are: VN — 3680 kc., VFN — 3880 kc. PVRC held a banquet on Jan. 11th in Falls Church. Guests included MRP, first president of Falls Church Club; OJL, Arlington Club president; and 2IOP, of *CQ*. Our deepest sympathy to IA, whose mother passed away in December. JAQ is on 144 Mc. with a five-element beam and SCR-522. JVU reports a new ham, OQK. ML, VE, and DHZ are new DXCC members. VE WACed on 7 Mc. using 100 watts. LPP's 807 has chalked up 45 countries so far on 14 Mc.; he also landed a VK9 on 28-Mc. 'phone. KAO, our PAM, contacted the office of Governor Tuck to obtain a message for delivery to President Truman in the Governors-President Relay. CLD is building new emergency-powered rig. CQW is rebuilding to higher power. KMS reports ONV is getting started on 28-Mc. 'phone with a Collins exciter, n.f.m. KYD is building a modulator for use on VFN. FF garnered his FB traffic total through visits to VN, National Trunk Line, and Palmetto Net. IUU has been checking in on VN, WVN, Indiana Net, TLAP, NJN, Rebel Net, and Md.-Del.-D.C. Net. IWO's main power supply went kaput! From the PARC *Word*, JXH editor, we learn that OLK worked Cape Cod on 144 Mc. using horizontal polarization, MXY schedules New Jersey on 144 Mc., MT has a new shack, AKN is constructing a 144-Mc. converter. Traffic: (Dec.) W4KVM 134, KYD 127, FF 109, IA 108, LAP 92, KFC 74, JDL 56, FV 50, ITA 48, IUU 24, II 16, LPP 13, CLD 6, JVU 6, CQW 4, JAR 3, KRX 3. (Nov.) W4LPP 35, KMS 4. (Oct.) W4LPP 8.

WEST VIRGINIA — SCM, Donald B. Morris, W8JM — The Huntington Radio Club received a visit from Doc Hayes, National EC. ALR is on 3.85 Mc. with increased power. Our sympathies to GBF on the death of his father. LQR and CMU, in Elkins, are active and interested in EC work. BOK keeps weekly schedules with 4JUR, formerly from Clarksburg. DFC visited BTV during the holidays. YBQ worked England with 75 watts on 3.85-Mc. 'phone. PZT, new OO, has recovered from an illness. FMU, our SEC, is lining up State EC program. If interested in EC work, please contact FMU. Ex-SGO is en route to Guam and plans 28-Mc. activity. ESQ and YGL are active in CAP work. Net activity helped AUJ's traffic total. EHA is DXing on 28 Mc. with low power. RGP, DHT, KXY, OFD, and NTV have a Grafton round table each night on 28 Mc. WSL still is confined to his home but he maintains schedules on 7 Mc. and DXes on 28 Mc. OXO has increased power with converted surplus gear. CSF originated Governors-to-President message for West Virginia. Ex-YCK, now at 1AW, visited West Virginia while on vacation. QG reports FB results with new 28-Mc. beam. HUK, as NCS for West Virginia 'Phone Net on 3890 kc., has an excellent net with good procedure. Traffic: W8GBF 350, CSF 86, OXO 62, AUJ 36, JM 14.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, WØIQZ — RM: IC. There were all kinds of emergencies the past month! First the big blizzard of Kansas, Nebraska, and Eastern Colorado. Then on Dec. 28th there was another blizzard over most of the same area. Those who took part in the Dec. 28th fracas were the following Colorado hams: UGD, MOM, GDC, OWP, and IQZ. On January 3rd, 4th, and 5th another blizzard stranded many people in cars and trains with 30-ft. drifts in some localities! The areas affected this time were Wyoming, Western Nebraska, Northeastern Colorado, and Western South Dakota. Colorado hams in the Wyoming Net for emergency traffic were the following: IZA, PNK, GDC, FPG, CUG, AML, OWP, KVD, and IQZ. LZY is NCS for Interstate Utility Net. He also schedules New Mexico Net, TLS, and Colorado Nets. RM IC is getting things whipped up in great shape on the IUN, as well as the Colorado Net. IC has new VFO. DDM is in Oklahoma City and has a pronounced nostalgic tone in his voice when working the Colorado gang. ZIX is trying out skyhooks. OWP schedules the Coffee Club and is on call for the Nebraska Net when needed. Yours truly got a couple of golf clubs for Christmas, use of which is confined to putting on the parlor floor. Only three cards were received in December. Guess everyone was full of turkey, all stuffed with stuffing and stuff, and didn't have the ambition to get out a card. IC is high man in traffic-handling this month. Traffic: WØIC 195, LZY 150, IQZ 23, OWP 8.

UTAH-WYOMING — SCM, Alvin M. Phillps, W7NPU — Asst. SCM, Charles M. Conley, W7UOM — Extra work necessitates the appointment of Charles M. Conley, 7UOM, Box 261, Clearfield, Utah, as Assistant

(*Continued on page 94*)

SCM. Send all activity reports to him. Thanks, fellows. DTB is now a Clearfieldite. JVU is keeping J schedules. LRR now is in his own home. BED makes BPL. Congratulations. UOM is active on 3.85-Mc. 'phone and will take reports via radio. HDS started GPR message. All appointment holders, check expiration dates and send in for endorsements when required. Casper Radio Club officers are: MQO, pres.; IJW, vice-pres.; IDO, secy. MWR is a new-comer in Sandy. NPU has new exciter, all bands. The GPR message for Utah was originated by LKM. New OARC officers are: BQJ, pres.; LXX, vice-pres.; and KOZ, secy. From Salt Lake the UARC reports election of the following officers: MFQ, pres.; JBA, vice-pres.; and TVL, secy. Traffic: W7BED 616, UTM 479, RPX 27, UOM 21.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — JYB has a new Taylor super modulated kw. rig on the air. JYB and JYK visited Editors & Engineers and 6GT, who heads Armed Forces Radio Services, while in California. The Tri-States Club of Dothan puts out a good bi-monthly bulletin. Write for it. Ex-AHQ now is 3AHK. CYL airs OBS on 3.85 Mc. tri-weekly. IMK continues as NCS of AENB on 3715 kc. nightly at 7. BFM submits his first report and expects to participate in AEN. He works all bands. KIX continues as the Old Reliable on AENB and Rebel Nets. MXU has changed QTH and will be on 3.5 Mc. and in AENB again soon. MGD is now in Japan. Formerly of Craig Field, he leaves YET the only ham on the base. NSV, also formerly of Craig Field, has departed for D4 Land. GYD is rewinding his plate transformer to get out of the low power class. BCU addressed the Alabama Chapter of the American Chemical Society on "Ham Radio as a Hobby." The Anniston Club is already formulating plans for the Annual Field Day. Other clubs are invited to participate in these plans. All the fellows at the University are back on the air after the holidays. NUB is the call of Mrs. Anna Loys Hand of Bay Minette. Traffic: W4KIX 12, GJW 8, IMK 6, CYL 1.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — DQW, the SEC, JQ, the PAM, and ye SCM suggest that now is the time to clean up the portable and mobile gear and start planning on local field days with a view toward overhauling the Emergency Corps. Area picnics like that held at Orlando and a Field Day like that held by the Dade Club are needed stimulants. An inter-area QSO competition can be held. Club officers, Net Controls, and others, send your ideas to the SCM for a section bulletin. Brookesville: MNT now is on 3910-kc. Emergency Net in addition to both c.w. nets with 100 watts. Clearwater: AYX pleads for more interest on 144 Mc. AYP is active again on 3.85 and 28 Mc. AYX is on 144 Mc. at 3 P.M. and 7 P.M. daily. Coral Gables: IYT has 129 up on DX with 95 cfmd. Andy clears traffic with 1NUP each Tuesday and is on 14 and 28 Mc. Lake City: IQV has p.p. 35Ts and 811 modulators, but has been working 14 Mc. with a 4-watt VFO. Jacksonville: EIH knows how to get plenty of stuff on 28 Mc. with low power and folded dipole. Lake Placid: BYR reports rediscovery of NMO, in Waucula, AFZ, in Avon Park, and AMW on 28 Mc., and says a "Cow Country" emergency net is underway. Tampa: The Tampa Club knows how to get State Fair traffic out efficiently. Miami: AAR reports that GHP is running a full gallon now. BYF and his XYL went to Cuba and presented the Radio Club of Cuba with a Dade Pennant. New Port Richey: KJ reports NYB is on 7 Mc. Orlando: DPM and ZU have been doing some serious work on 420 Mc. The SCM offers his humble apologies to the Orlando Club for indulging in a little fun-poking (in this column) over the fact (as reported in the club bulletin) that Florida oranges could not be shipped into certain states even when won in a contest. St. Pete: New Club officers and trustees are EWS, PT, FPC, and IYO. IYO really brags on the virtues of 3.85-Mc. phone. FPC is one of the enthusiasts in the Tampa Bay 144 Net. MCA has been rebuilding. Most active ham is 15-year old NOJ. IK is active on 28 Mc. Traffic: W4AAR 135, MNT 104, IQV 53, AYX 38, DES 34, MKP 27, PEI 20, IYT 13, KJ 6.

WESTERN FLORIDA — SCM, Luther M. Holt, W4DAO — NGS visited friends in Texas. BKQ built a new beam. CNK, EQR, and NDB are now Class A. MS made a trip to New York. DXQ worked all CE districts. LRX sold all surplus gear and bought a Globe Trotter. NFM moved to W2 Land. HJA bought a mobile transmitter. UC works for JNP. SAA moved away from Pensacola. DZX moved his station to the Belmont Theater Building. DAO worked 3.85-Mc. 'phone for a short while. LT promises a visit to Pensacola. DLO wants schedules with the Pensacola gang. GTJ works 7 Mc. EZT bought out SAA. Our deepest sympathy to NDB on the loss of his father. NYZ/NOX plan 'phone. FHQ operates late hours. CQF tried 14-Mc. 'phone. OHJ and OHS keep 7 Mc. hot. NFN is a doctor. MEN built a larger shack. Traffic: W4AXP 130, CNK 8, DLO 8, NOX 4, LRX 3, LT 3.

GEORGIA — SCM, Clay Griffin, W4DXI — The following stations reported their number of contacts in the Georgia QSP Party held Dec. 12th: DXI 13, GGD 11, AAY

(Continued on page 96)

EMERGENCY

A.E.C. **C.A.P. Nets** **Local Nets** **Field Day Tests** **Vacation Use**

ALLIED'S Terrific "Buy" in an All-Band All-Purpose Auxiliary Transmitter

HALLICRAFTERS HT-17 ONLY $39.50

WITH COILS FOR ALL BANDS

You can stop looking for that auxiliary transmitter you've always wanted for emergency use—for your annual Field Day week-end tests—for Net tie-in—for vacation use! Here's the ideal CW job at a whopping saving of over $30! Originally priced at $71.50—now yours at ALLIED for only $39.50 *while they last.* Now—have what you want without construction, labor or worries. The HT-17 has conservative 10 watts output on 80, 40, 20, 15 and 10 meters. Uses 6V6GT crystal oscillator driving an 807 final; matching network for any antenna or for driving high-power amplifier. Controls: Plate Tuning, Antenna Loading, Standby, Meter Switch, Power on-off. Rear terminals for antenna, ground, key, external modulator. Satin-black metal cabinet, 12⅞ x 6⅞ x 7¼". For 105-125 v., 50-60 c. AC. Complete with tubes and coils for all bands. Less crystal. Shpg. wt., 25 lbs. *Quantity Limited—Order Now!*

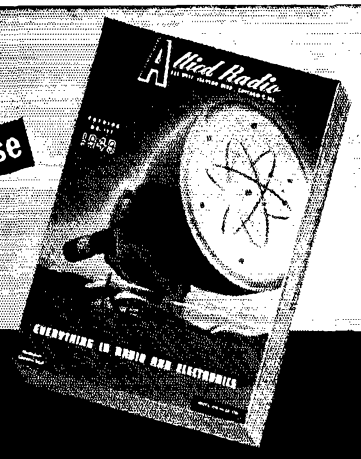
97-580. F.o.b. Chicago, ONLY..... **$39.50**

Beginners — Get on the Air for Less Than $100!

Yes—you can get a complete station at ALLIED for less than $100! Includes: HT-17 Transmitter complete with coils for *all* bands; Hallicrafters S-38 Receiver; a quality handkey; headset; Bliley 40 meter crystal; antenna wire and insulators; ARRL station logbook; Amateur Radio Callbook—everything you need to get on the air—at amazingly low cost!

97-636. Complete Low-Cost Ham Station, f.o.b. Chicago, ONLY.. **$97.50**

Terms: $19.50 down, $6.89 month for 12 months



Send for the Leading Amateur Buying Guide

You'll find *everything* you want in receivers, transmitters, instruments, parts and station equipment in our up-to-the-minute 180-page Catalog. Get it today. And get *every* buying advantage at ALLIED—fast shipment, money-saving values, top-quality equipment, ideal easy-payment terms, square trade-in deals and down-to-earth help from ALLIED's old-time Hams. For full satisfaction, get and use the ALLIED Catalog!

Have Every Buying Advantage

- *World's Largest Stocks*
- *Top-Quality Gear*
- *Money-Saving Prices*
- *Ideal Time Payments*
- *Square Trade-In Deals*
- *Speedy Shipment*
- *Ham-to-Ham Service*

Keep Your ALLIED Catalog Handy

FREE

ALLIED RADIO

Everything for the Ham

ALLIED RADIO CORP., D. L. Warner, W9IBC
833 W. Jackson Blvd., Chicago 7, Ill., Dept. 15-C-9

☐ Send FREE 1949 ALLIED Catalog
☐ Enter order for HT-17 ☐ Low Cost Ham Station
Enclosed $..... ☐ Full Payment
☐ Part Payment (Bal. C.O.D.)
☐ Send Time Payment details and order blank.

Name.....

Address.....

City.....*Zone*.....*State*.....

10, CBR 8, BOL 6. BOL and DXI contacted ZC8PM for the long-awaited 3.5-Mc. WAC. JTD, IEN, GDQ, KXT, MMB, MZO, and MNZ planned and did most of the work for a Christmas Party, held at the Methodist Children's Home in Decatur, Christmas morning. MNZ played Santa Claus. Presents were donated by Atlanta and Decatur hams and others. Thanks to all who contributed toward this very successful event. Another is planned for next Christmas. IWP, of Jonesboro, is now 5NU. LYG visited KXX. IMQ reports a new Harvey-Wells TBS-50 emergency rig. KGI, of Valdosta, has started a 3.5-Mc. South Georgia slow-speed net with the following stations signed up: KGI, OMN, GFF, OAL, OAT, IPV, and OIL. Any South Georgia stations interested are urged to contact KGI. GFF, of Tifton, has finished a kw. rig and reports that FCW has 500 watts, NYA has 200 watts, and FGH is on 7 Mc. Also CCA is on 28 Mc. from Bainbridge. Savannah: DEJ and CJE have been appointed Assistant ECs. MMQ plans to put a National Guard station on the air. Moultrie: OAL has been building a 250-watt 813 rig for 3.5 through 28 Mc. NIV now is on 7 Mc. Traffic: W4MMQ 10, MA 6, AAY 4, DXI 4, OAL 4.

CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — 1949 officers of CZARA, Atlantic Chapter, are: MB, pres.; NM, vice-pres.; BL, secy.; AX, act. mgr. MB is building a 500-watt rig. AX had a 599 signal all over the Isthmus on 7 Mc. until he blew his power transformer. PA is mending it for him now. In anticipation of OA contacts, AY, GT, and NB are converting BC-625s for 50 Mc. New-comer DC skippers a local ferryboat with an overpowering urge at times to head seaward and become a mobile marine in the Pacific Ocean. Other new KZ5s are DA, DB, EA, RV, TS, WD, and WJ. Nearly 500 of the old "Ten KZ5" Certificates were issued. With a background depicting an aerial view of the Pedro Miguel Locks the new "25 KZ5" Certificate bears the official seal of the Canal Zone. SEC GD piled up a score of 93 KZ5s worked but found time to qualify as OO, Class 1. MX is building a rockcrusher to get back in the traffic-handling business. MZ will be our first OBS.

SOUTHWESTERN DIVISION

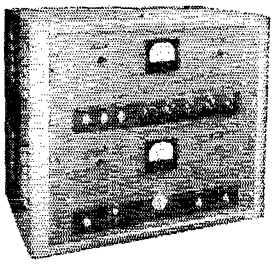
LOS ANGELES — SCM, Vincent J. Haggerty, W6IOX — Asst. SCMs, William J. Schuch, 6CMN, and Irvin O. Hege, 6FYW. SEC: UXN. Three members of the section made the BPL during December. Topping the list was our latest ORS appointee, CE, with a whopping total of 1154. DDE and UXF made the BPL on deliveries. QAE is working portable in Arizona. NZP gave a luncheon at the December meeting of the YLRC of Los Angeles. The Club received a nice write-up with pictures in the *Los Angeles Times*. NAZ complains that business curtails her time for traffic work. ZQV works with the Border Patrol Net. DGA has a new VFO for 3.5 Mc. and he is itching to get back into traffic work after a layoff of some 20 years. BYT is trying for 3.5-Mc. DX. RFS is on 3.85-Mc. 'phone. BNN is reported to be on 7 Mc. with a one-watt rig. AM is pleased with the performance of his 1380-ft. East-West rhombic. CMN has been working 28-Mc. 'phone recently. MU has been working DX on 28.7 Mc. and is still waiting for a QSL card from any of the ZS stations he has worked. AAE resolves to spend more time with amateur radio in 1949. FYW expects to increase his activity in the New Year. HFY has a new Signal Shifter. YCZ has switched to 7 Mc. The Two Meter and Down Club of Los Angeles sponsored a VHF QSO Party in January. YSK is operating EAJ/6 at Mt. Wilson, where he has almost completed work on a 1900-ft. antenna. VAQ has his ORS Certificate endorsed and reports some nice DX work on 7 and 3.5 Mc. 3RAT, from Pittsburgh, has moved to Los Angeles and plans to be on the air soon. ESR is EC for Centinella Valley and is actively engaged in AEC organizational work. ZUX recently received appointment as OPS. CE and IOX alternate on a 7-Mc. transcontinental traffic schedule with 4PL. Traffic: W6CE 1154, DDE 315, UXF 304, ZMZ 102, QAE 34, HFY 23, DGA 16, NAZ 16, ZQV 16, ZOL 14, FMG 13, AM 8, EYH 8, BUK 6, CMN 6, MU 6, IOX 4, AAE 2, FYW 2.

ARIZONA — SCM, Gladden C. Elliott, W7MLL — Attention all hams formerly of Arizona. April 10th will be Arizona Reunion Day. Arizona hams throughout the State will be looking for you. Get on and call CQ Arizona. The 3515- and 3865-kc. gangs coöperated to get congratulatory messages from public officials to the new Governor. MWZ, in Phoenix, made the delivery. MPE is putting in a nice 3.5-Mc. c.w. signal from Herford with a single 304TL. UPR lost his kw. rig in a fire that completely destroyed his shack. The Radio Club of Arizona is running a code class as well as practice code sessions over the air. KHN reports working a W1 and W9 on 28 Mc. with 1 watt. PEY reports 106 countries. ACD has a new Collins 32-V. LSK has a new antenna on 3.85-Mc. and has a good signal all over the State. MGM is on 28-Mc. n.f.m. AYB is on 14-Mc. c.w. and 28-Mc. 'phone. MOI won the Tucson Sweepstakes with 35 contacts. RJN is new Net Control for 3515 kc. SMZ is back in Tucson and on 28-Mc. 'phone. LON and LFK have their Class A tickets. JGZ has a pair of 8005s on with cathode modulation. SXP suggests a 7-Mc. net on 7090 kc. for Sun. A.M.s. All who are interested, drop me a card.

(Continued on page 98)

Fellows... LET'S GET ACQUAINTED!

SEND FOR MY *NEW* W.R.L. CATALOG—the most complete listing of Ham equipment ever assembled!



WORLD FAMOUS GLOBE CHAMPION

R.F. Section a complete 150 watt XMTR—Provisions for ECO—Automatic Bias on Final & Buffer—Voltage regulated Oscillator and Buffer—Class B Speech modulator—150 Watt input from 10 thru the 80 meter band—complete with tubes and meters including 1 set of coils—Specially crated for safe shipment.

KIT FORM $279.00 **WIRED** $299.00

NBFM MODEL $199.00

LEO I. MEYERSON
WØGFQ
CU ON 10-20 & 75 METERS

WRITE FOR COMPLETE DETAILS

GIANT RADIO REFERENCE MAP

Just right for your control room wall. Approximately 28" x 42". Contains time zones, amateur zones, leading shortwave stations, monitoring stations. **25c**

E-Z PAYMENTS

WRL offers the **lowest** E-Z Payment Plan in the country. Any responsible person with a steady job can buy on time from Leo. **No red tape—no** delays! Financing our own paper saves you money!

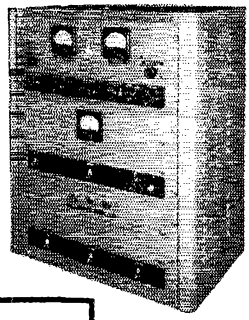
LIBERAL TRADE-INS

Leo offers more—use your present equipment as a trade-in. Tell me what equipment you have—what equipment you want—let's trade.

PERSONAL SERVICE

WRL is the World's Most Personalized Radio Supply House for the amateur. Getting acquainted with Leo will help you get on the air **faster** and for less money.

WORLD FAMOUS GLOBE KING



Unconditionally guaranteed 275 Watts phone and CW. An advanced design XMTR giving efficient performance on 10 - 11 - 15 - 20 - 40 and 80 meter bands.

Ready to go— Kit form **$379.45**

Wired **$399.45**

Save Money On Reconditioned Equipment—Write For Our Big List!

WRITE TODAY

FAST SERVICE ON FOREIGN ORDERS

WRITE—WIRE
PHONE 7795

World Radio LABORATORIES INCORPORATED
EVERYTHING IN RADIO
COUNCIL BLUFFS, IOWA

WORLD RADIO LABORATORIES
744 West Broadway
Council Bluffs, Iowa

Q-3

Please send me:
- ☐ Radio Map
- ☐ New Catalog
- ☐ 40 Watt Globe Trotter Info.
- ☐ 150 Watt Globe Champion Info.
- ☐ 275 Watt Globe King Info.

Name .....

Address .....

City ..... State .....

Look for the Arizona gang on 3515-kc. fast c.w., 3757-kc. slow c.w., and 3865-kc. 'phone. Traffic: W7RJN 123, MWZ 68, JPY 57, LPA 44.

SAN DIEGO — SCM, Irvin L. Emig, W6GC — Asst. SCMs, Gordon W. Brown, 6APG, and Shelley E. Trotter, 6BAM. RM: BGF. SEC: DUP. BGF comes through with the highest traffic score for the section. New meeting time for the Southern Border Net is 8 P.M. PST on 3550 kc. This frequency will be monitored from 7 until 10 P.M. for traffic. LDJ checks in on this Net, either from Santa Barbara or Santa Ana, depending upon his whereabouts! FMZ had a real workout with Christmas traffic but forgot to send in the score. PG is scheduling 4LEV, ex-6YOT/C6, twice daily on 7 and 28 Mc. New officers for the Orange County Club are: CGF, pres.; CDV, vice-pres.; FCT, secy.; BAM, act. mgr. Current rumor is that 1QMI, ex-6JQB, soon will become a W6 again. MI sends in a nice traffic score and reports he is working all bands from 3.5 to 28 Mc. BAM is working DX when he's not on 3.5 Mc. handling traffic. RMG pops up in San Diego again after eight years away as 5INU. He is currently on 7 Mc. until he can add 14 and 28 Mc. along with a new receiver. 50-Mc. activity is still of interest to WNN. KW, WNN, and GC participated in the November FMT. T.V.I. is becoming a problem for amateurs in the section, especially since all programs originate from transmitters in or around Los Angeles. Correspondence with the SCM is requested from amateurs who have been successful in eliminating T.V.I. in areas where the signal is low. QOV is the call of the new station at the Scripts Institute of Oceanography at La Jolla. New officers of the Palomar Radio Club are: VTS, pres.; VJQ, vice-pres.; BLV, secy.; and DWE, treas. The Helix Radio Club is planning a hamfest to be held in April. VTS has a new Collins 32V-1 transmitter. Traffic: W6BGF 204, K6MNC 38, W6VTS 26, BAM 24, MI 24, WNN 17.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Joe G. Buch, W5CDU — BKH has resumed activity in Abilene and is working NTX, 'phone and c.w., plus Naval Reserve nets. We welcome new El Paso members, PCO and his XYL, OVH. Dale works 3.85 and 14 Mc. and the XYL takes care of 28-Mc. 'phone and 7-Mc. c.w. BTU works 7150 kc. mostly. DSV, BFF, and MHM, of La Mesa, are ganged up on 3.85-Mc. 'phone. BFA is the new NWT Assistant NCS. AAO is doing a commendable job as SEC and NWT Net NCS. OGQ is jr. operator of AAO and is active on 7-Mc. c.w. LWZ received his Class A ticket and joined the NWT Net. OEE is working fixed portable from A. & M. College. IZW and JAD report in from White Deer. LGY is building a grid dip meter and making antenna improvements. IHG maintains activity with the NWT Net. GZU and LSN lead in NTX traffic. LNK is moving to Kansas City. NPU has increased power to 300 watts. HBE has his kw. going. AQN is now in Dallas. OUS has a BC-696 on 3.5-Mc. c.w. HB and Lt. Cavnor are recovering from injuries incurred in a traffic mishap while en route to present outline of CAP Net program to Dallas Radio Club members. BAM threatens to resume activity. BKH is new OO. JIH is on 3.85-Mc. 'phone. Monthly activity reports are requested from members having League appointments. ECE, our PAM, has a kw. working into antenna suspended between two 70-ft. telephone poles. Traffic: W5GZU 742, LSN 644, CDU 200, ARK 102, AAO 38, GUD 30, FMZ 24, ILZ 17, ASA 16, BTU 11, PCO 10, IHG 5, OGQ 3, BKH 2, LGY 2.

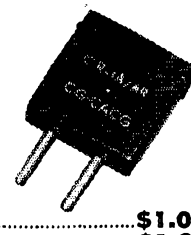
OKLAHOMA — SCM, Frank E. Fisher, W5AHT/AST — The following was reported by Retiring SCM, HXI — JO has moved to Frederick from Dallas. He resumes his several activities with OBS and OPS appointments. LGI received EC appointment. There is need for a number of EC throughout the State. How about it, fellows? EGA's long absence from OLZ might have something to do with the fact that he is now married! PA kept his net schedules in spite of a broken foot. OLZ missed its Rebel outlet, FMF, during his hospitalization because of pneumonia. Owen is back in harness again, apparently no worse for wear. Active traffic outlets are needed for several trunk lines. Here is a chance for some real traffic work and AST would like to hear from someone interested in such activity. AST and AGM are looking into the possibilities of teletype. Are there others in the State who are interested? How about reports from the 144-Mc. fellows over the State on their activities? This is your column, fellows, and we can't publish news unless it is reported. Traffic: W5NMM 173, MBV 117, KDH 104, AST 99, HXG 66, IOW 48, FRB 44, OWV 39, ADC 11, ADB 6, EAK 4.

NEW MEXICO — SCM, Lawrence R. Walsh, W5SMA — SEC: ZU. PAM: FAG. RM: NXE. This month's daily scheduled contact was made between Albuquerque and Los Alamos by ASO and SMA. Plans are being made to extend this net to Belen, Los Cruces, Roswell, and Silver City. Santa Fe joined the net while MYI was home on vacation. PKI has a new ticket and is on 28-Mc. 'phone with 60 watts to a pair of 807s. MMX is on 3.5, 7, and 28 Mc. from Belen. NVR is rebuilding his cubical quad. MYA has been having trouble with the telephone company over the use of its ground wires. 6PSJ/5 finds his cubical quad made

(*Continued on page 100*)

HARVEY has TV-FM-SSSR es xmittrs rcvrs

XTALS



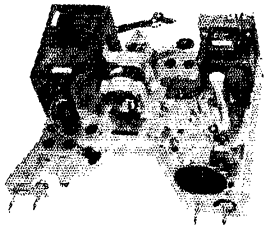
20 meter xtals for a buck! Mounted in holder with ½" pin spacing. Also 40 and 80 meter and 6 and 13 mc bands at the same low price.
Specify your frequency.....**$1.00**
5 mc precision xtal, many uses.....**$1.95**
Special 8 mc xtals for 2 meter xtal control.. **1.50**
Lucite adapter for ½" xtal holders..... **.35**
Include 10¢ postage with your crystal order.

1616 TUBE

Half wave, high vacuum rectifier. Filament 2.5 volts, 5 amps; peak inverse 5500 volts; peak current .8 amps; surge current 2.5 amps; average plate current .130 amps. List price $7.50, Harvey Special Price, *while they last*.....**95¢**

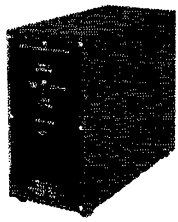
NEW 1949 TECHMASTER TV KIT

All parts mounted as shown



Exactly the same as the RCA 630TS chassis, complete kit of parts, including pre-wired and aligned RCA front end, punched chassis, with all major components and sockets mounted, etc., all RCA tubes including kine, complete manual with service notes, all RCA. New, simplified instructions. (Free circuit and parts list on request.) *Shpg. Wt. 85 lbs.*

$198.50



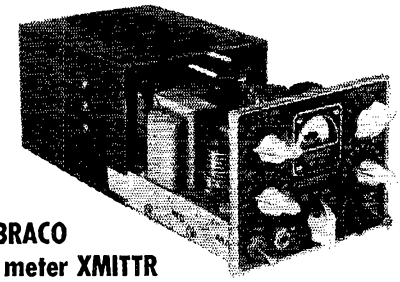
MILLEN 92105 SSSR

Selectable single sideband reception will remove 95% of your QRM difficulties. Use with any rcvr having 455/456 IF. Other IF by changing crystals to your IF. *Shpg. Wt. 10 lbs.*

$75.00

All in stock for immediate delivery.

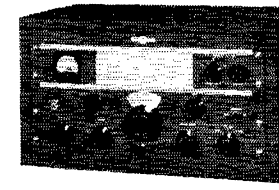
NOTE: All prices are Net, F.O.B. N.Y.C. and are subject to change without notice.



SUBRACO 10 meter XMITTR

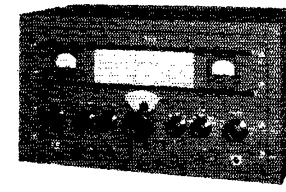
Compact mobile xmittr for "dashboard" mounting. Measures only 5½" x 4½" x 6½", weighs only 6 lbs. Designed to operate at 30 wts. input. Uses 6V6 Tritet xtal osc. quadrupling from 7 to 28 mc driving 2E26 Class C mod. amp. High level Class B modulator capable 17 watts audio. Built-in Coax antenna relay; p.t.t. switch. All controls front panel including illuminated meter, xtal jack, etc. Plate requirements: 300-400 volts at 140-180 ma. *Shpg. wt. 8 lbs.* Less tubes **$79.95**; including complete set tubes.....**$87.50**

Collins 75-A $375.00

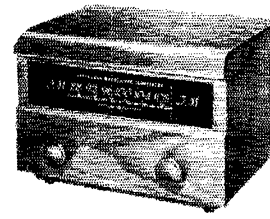


80, 40, 20, 15, 11 and 10 meter ham receiver. Automatic noise limiter, high sensitivity, double conversion. With speaker in matched cabinet. *Shpg. Wt. 93 lbs.*

COLLINS 32V-1 $475.00



Desk transmitter, 150 watts cw, 120 watts phone. Built-in VFO covers 10, 11, 15, 20, 40 and 80 meter bands. Built-in power supply. *Shpg. Wt. 128 lbs.*

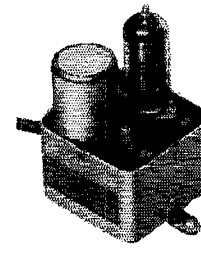


GE FM TUNER

Only a few left of this unusual buy. Covers 88-108 mc range, uses guillotine tuning. Designed for export and tropicalized, has power inputs for 110 to 250 volts 60 cyc. *Shpg. Wt. 30 lbs.*

HARVEY SPECIAL PRICE

$49.50



Hammarlund FS-135C Frequency Standard

Makes your receiver an accurate frequency standard with marker signals every 100kc. Includes low drift 100kc crystal, 6AU6G tube, complete instructions. Brand New. Only a few left.....**$6.95**

Order one or more spare tubes, 6AU6G....each **65¢**

Telephone: LUxemburg 2-1500

HARVEY RADIO COMPANY INC.

103 West 43rd St., New York 18, N. Y.

of 300-ohm line to be very satisfactory. 5NAS is rebuilding and is going to higher power with 812s. IGO is now on 3.5 and 7 Mc. from Albuquerque. Traffic: W5ZU 165, NXE 124, MYA 48, NJR 44, PEJ 44, OCK 39, IGO 27, HSO 14, SMA 14.

CANADA

MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — RM: GL. SEC: FQ. Top DX this month is FQ's four-way on 14-Mc. 'phone: he, a VK, and a CR9. LY schedules 7ABJ, his brother, on 28 Mc. UF, now on 'phone, wants to meet some of the OMs he met on c.w. OD bought the rig from RA. LA and DQ are on 27 Mc. a lot. UF has worked some nice DX with 20 watts. NZ is on 28-Mc. 'phone. QK is building another 28-Mc. receiver. GK has been working lots of VE3s on 14-Mc. 'phone. XK is on 28-Mc. 'phone with 6L6-807 combination. XL is building a rig for 28 Mc. MT, strictly c.w., can raise only Gs. KN is on 14- and 28-Mc. 'phone. St. John, N. B.: JN's new folded dipole uses Toni spreaders. JO has special Navy-type VFO. MW is in the Trans-Canada Net. JD is out for WAS, WAC, and ETC, all on 3.5 Mc. IW still is the old 40/40 combine — 40 meters, 40 watts. KQ is representing CAROA here. EW has new 14-Mc. beam. LI likes the 811s. AG will be on with 200 watts. ES is in RCAF Net weekly on 3625 kc., and does his DX on 28 Mc. with a folded dipole antenna. DB sends greetings on 14 Mc. The "VE1GR 75 Meter DX Trophy," in memory of the late Harold Ward, will be awarded annually to the ham with the most confirmed foreign station contacts. Traffic: VE1GB 45, MK 43, HT 40, DB 11.

ONTARIO DIVISION

ONTARIO — SCM, Thomas Hunter, jr. VE3CP — Asst. SCM, M. J. McMonagle, 3AWJ. SEC: KM. RMs: ATR, AWE, BUR, DU, GI, TM, WX. PAMs: DD, FQ, RG. BUR leads with an FB traffic total. Hamilton district hams had a swell time at BNQ's open house. FQ is on with a new rig and is working 3.8 and 14 Mc. with AJP. ADB is on 144 Mc. DC and AWB are back on 7 Mc. AWK is using n.f.m. on 14 Mc. ATF is on all bands, having returned to his home after a year in Windsor. The Sudbury Club now has 33 members and its own club house. AZN is using HT-18 as VFO. BBQ is using p.p. 813s. EAA is the first graduate of the Kirkland Lake High School Club to receive his ticket. The Club is sponsored by the Kirkland Lake Amateur Radio Club. AZF and BBQ do a fine job of reporting for their respective clubs. BC and AOH are again active and working on 3.8 Mc. NX schedules VE8PH, Nottingham Island. The Air Force Net is now on 3815 daily at 8:00 P.M. and membership is growing steadily. The Hamilton 50-Mc. Emergency Net meets each Wed. at 7:30. QE, BQF, CJ, ABP, BKR, and SP are active on 28-Mc. 'phone from Hamilton. FT has WAS and 20-w.p.m. tickets. ALU continues to work all bands, 'phone and c.w., regularly. PA schedules VE8PO in Baffin Island and did a nice piece of emergency work between the Island and Ottawa when the power units failed at 8PO. AQW has new rig on 28-Mc. 'phone. BGI and BNI are on 7 Mc. from Kirkland Lake. WI is running 500 watts on 14-Mc. 'phone. DAD is a newcomer to Kirkland Lake. ALL, API, AOI, AA, and BBM on 7 Mc. each night. AZF is secretary for the Sudbury District Radio Club. TM is enjoying 3.8-Mc. 'phone after many years on c.w. The Frontier Club has its Field Day committee appointed. Traffic: VE3BUR 278, ATR 208, APS 142, GI 129, DU 110, IA 86, CP 82, AWE 78, RG 77, AZZ 65, BME 40, DH 36, WY 31, AIL 27, WK 26, BMG 24, AZW 20, VD 20, AWJ 19, DD 18, IL 18, YJ 18, BBM 15, LA 12, YS 12, OT 6, BC 6, HK 5, KM 5, HI 2, BQI 1, FM 1.

QUEBEC DIVISION

QUEBEC — SCM, Gordon A. Lynn, VE2GL — SEC: QQ. ECs: BB, TA, ZZ. RMs: BB, GM. PAM: DX. EC reports Quebec 'Phone Net continues very active with EI, JAM, VH, EV, JZ, ZG, AEM, ABJ, AIM, and ACD. TI and ZG (Trois Rivieres and Grand Mere) have hooked up on 144 Mc. ABB is a new-comer in Grand Mere. XB has had a lot of difficulty with power supply for new rig but continues to handle lots of traffic with low power. PQN has made a fine start and is handling a good volume of traffic with GM as NCS and XR doing an FB job as his alternate. AFC reports for some of the Quebec gang. MZ is very active on 14 Mc., both 'phone and c.w. AAX is doing a swell job on 28 Mc. with a single 807. PC is building p.p. 814s. AFC is very active on 28 Mc. 'phone and 14 Mc. c.w. during the night with p.p. 807. LO continues his net schedule. KG has bugs in his 50- and 144-Mc. rig but continues to send Official Bulletins on 28 Mc. BE, BG, and CA are occasionally heard on 14 Mc. XA is on 3.85- and 14-Mc. 'phone from his new QTH, Dorval. AIE is ex-VE1GT. QQ is new president of the Montreal Amateur Radio Club; NB is vice-president. LP has been experimenting with

(Continued on page 108)

HENRY

HAS

COLLINS

Henry Radio stores in Butler, Missouri and 11240 West Olympic Blvd., Los Angeles, California have complete stocks of all Collins amateur equipment for immediate delivery. Also complete stocks of all other amateur receivers, transmitters, and parts. I promise you that you can find nowhere else lower prices, more complete stocks, quicker delivery, easier terms or more generous trade-ins. I give you 10-day free trial and 90-day free service. I promise that you will be satisfied on every detail. Write, wire, phone or visit either store today.

Bob Henry
W6ARA

A FEW ITEMS I STOCK ARE:

National NC-33	*$ 57.50*
National NC-57	*89.50*
National NC-173	*189.50*
National NC-183	*268.00*
National HRO-7	*292.50*
National HRO-7C	*372.45*
National HFS	*142.00*
Hallicrafters S38	*49.95*
Hallicrafters S53	*89.50*
Hallicrafters S40A	*99.50*
Hallicrafters SX43	*189.50*
Hallicrafters SX42	*275.00*
Hallicrafters SX62	*269.50*
Hallicrafters HT18	*110.00*
Hallicrafters HT19	*359.50*
RME HF-10-20	*77.00*
RME VHF-152A	*86.60*
RME DB22A	*71.00*
Hammarlund HQ-129X	*177.30*
Signal Shifter EX kit	*49.75*
Telvar T60-2	*150.00*
Harvey-Wells TBS-50	*99.50*
Harvey-Wells TBS-50A	*121.25*
Hunter 20A Cyclemaster	*169.50*
Subraco MT-15X	*79.95*
Hallicrafter & National TV sets	

Gonset, Silver, Meissner, Millen, Sonar, Stancor, Bud, Mon-Key, Vibroplex, B & W, Johnson, RCA, Gordon, Amphenol, Hy-Lite, Elincor, WorkShop, Premax; I have everything for the amateur.

Some prices higher on west coast

FOR EXAMPLE:

Collins 75A-1 receiver	**$ 375.00**
Collins 32V-1	**475.00**
Collins 30K-1	**1450.00**
Collins 70E-8	**40.00**
Collins 310C-1	**85.00**
Collins 310C-2	**100.00**
Collins 310B-1	**190.00**
Collins 310B-3	**215.00**

COMPLETE STOCKS

Henry has *everything* in the ham field.

QUICK DELIVERY

Shipments *4 hours* after receipt of order. Send $5.00 with order and shipment will be made at once C.O.D.

TRADE-INS

You can't beat Bob Henry for trade-ins. Write, wire or phone today about your equipment and Bob Henry will make you a better offer than you can get anywhere else.

TIME PAYMENT

Because Bob Henry finances the terms himself you get a better break. Save time and money, deal with Bob Henry on his personal, profitable time payment plan.

Butler 1, Missouri

HENRY RADIO STORES

11240 Olympic Blvd.
LOS ANGELES 25
CALIF.

"WORLD'S LARGEST DISTRIBUTORS OF SHORT WAVE RECEIVERS"

controlled carrier 'phone on 3.85 Mc. and is pleased with the results. KS continues to work DX on 14-Mc. c.w. WW has changed QTH to St. Johns. TH finds his four-element 14-28-Mc. beam too sharp to work anything except those beamed directly on! Traffic: (Nov.) VE2KG 8. (Dec.) VE2BB 176, GM 146, XR 101, EC 96, XB 96, LO 85, XO 55, AEH 11, VA 8.

VANALTA DIVISION

ALBERTA — SCM, Sydney T. Jones, VE6MJ — QS has increased power to 200 watts using T40. YD is active on 3.8-Mc. 'phone using 811. VX now is on 14-Mc. 'phone. KC puts out a good signal on 3540 kc. LQ, HM, FK, and OD kept communications open during a recent storm. Nice going, gang, the AEC really works. QF is a new call at Medicine Hat. MJ announces the arrival of a new jr. operator. TK, JJ, and EL are doing good work in AEC organization. Contact your EC for membership. LZ was prepared for the Frequency Measuring Test. EY has a prospective ham under instruction. NARC meets the third Friday of each month at the YMCA. FQ is again active on 3.8-Mc. 'phone, having built a new house during the summer. Suggestions will be welcomed by your SCM for formation of a 3.8-Mc. 'phone net. Traffic: VE6QS 83, BN 39, NA 28, MJ 6.

BRITISH COLUMBIA — SCM, J. T. Hepburn, VE7HP. SEC: ID. ECs: LK, CN, ACW, TG, US. RM: AEU. ALE is new ORS in Victoria. AC is new president of BCARA. ND can handle traffic to Kelowna. AJP is building a mobile rig. US handled traffic for the railways during the recent storm emergency. AKV, along with several others, lost his beam in the big storm. XW conducts the VARC code class which is bringing in many new members. JB has a new shack. AFC had his call changed to WM. APK has a new VFO. AGU is using series modulation with good results. FV is using n.f.m. on 28 Mc. YL gets compliments on her new bug. SW turns in a nice traffic total. ES finds that an 829 works better with both plates connected. XW, LT, EW, TE, and AV are building t.v. rigs. GB has his working. AMH is rebuilding with an RK20. I would ask all clubs publishing bulletins to put me on their mailing lists so I can obtain information for this report in *QST*. Traffic: VE7SW 231.

PRAIRIE DIVISION

MANITOBA — SCM, A. W. Morley, VE4AM — IW was presented with a daughter recently and is trying to get her on the air already. MC joined the ranks of the benedicts. He says eating in restaurants costs too much these days. GB, at Seven Sisters Falls, is heard on 3.8-Mc. 'phone with an 813. FP, at Minnedosa, is on 3.5-Mc. c.w. TM is settled in new QTH and is heard on with a new rig. Ex-PK is now in Hamton, Sask., and is signing VE5PK. BD is heard on 3.5 Mc. again after getting married. AM-JM have a new antenna and no B.C.I., thanks to the help of SS and Jock Blackwood, a potential ham. YW, of Brandon, is on 3.8-Mc. 'phone. A new call in Brandon, KN, is that of Fran Haddon, a YL. LM, also new in Brandon, is ex-3LM. LN is on 14 Mc. after having decided to QRT radio. AP is on 28 Mc. after a building spree. 7OT and his new XYL visited IF-GE. The Brandon Radio Club had a talk on "The History of Communication," by C. E. R. Collins. SW and QU, of Rivers, attended the meeting. YW, in Brandon, ended 1948 with 15 states on 50 Mc.; GQ had 20. HS is building n.f.m. modulator and a bigger rig. BE is on 50 Mc. FU, Winnipeg EC, has moved to 35 Linden Ave. Get in touch with him for an AEC card. How about a few more reports this year? Traffic: VE4AM 205, JO 12.

Strays

The annual joint meeting of the American Section, International Scientific Radio Union, and the Institute of Radio Engineers will be held in Washington on Monday, Tuesday and Wednesday, May 2nd, 3rd and 4th. The first two days will, as usual, be devoted to the presentation of papers bearing on the more fundamental scientific and research aspects of radio and electronics. May 4th will be reserved for meetings of the National Commissions on Radio Standards and Methods of Measurement, Terrestrial Radio Noise, Radio Waves and Circuits, and Electronics. A booklet listing the program of titles and abstracts will be available for distribution before the meeting. Correspondence should be addressed to Dr. Newbern Smith, Secretary, U.S.A. National Committee, URSI, National Bureau of Standards, Washington 25, D. C.

THE MOBILE SEASON IS HERE!

Now that the low frequency bands have been opened for portable mobile operation, you'll want to get your equipment in shape for plenty of top-notch activity. And Newark is a good place to get every type of gear. Take your pick from the largest stock in the country . . . Get Immediate Delivery at Lowest Prices!

Premax Antenna Equip't

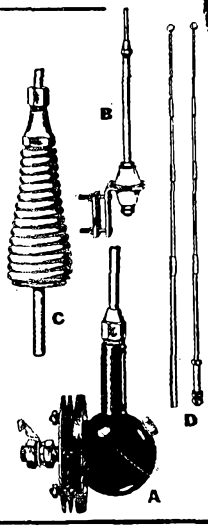


Fig. A. Type R Universal Antenna Mount—Used in most police installations. Bronze, split ball universal joint bolts to car panel thru heavy plastic disc, waterproof gasket and steel back plate. Adjusts to any angle. Split-sleeve antenna locking clamp takes any ¼" whip. May be used with spring adapter below. Shpg. Wgt. 4 lbs.
No. 23422 Each **$7.35**

Fig. B. Type K Bumper Mount. Securely locks ¼" whip in place. 10" adjustment in hgt. Ceramic cones. All hardware incl.
No. 23420, Wgt. 4 lbs. ..... **Each** **$4.20**

Fig. C. Type SA Spring Adapter Mount for protecting whip when passing under obstruction. Fits between mounts above and base of ¼" whip. Base dia. 1⅝", 4¾" H. Shpg. Wgt. 2 lbs.
No. 23424 ..... **Each** **$7.06**

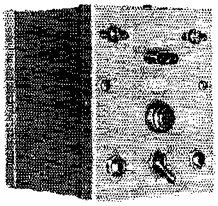
Fig. D. "Whip" Rods. Widely accepted by police and commercial users. Practical and rugged. Stainless steel rods with ¼" base to fit above mounts. Ideal for 10 meters. Wgt. 5 lbs.
No. 23412, Type AS-190, 90" Long ..... **Each** **$3.38**
No. 23413, Type AS-196, 96" Long.. **Each $3.53**

BY-LINES . . . by Bob Gunderson W2JIO

Using tetrodes and pentodes as class C amplifiers presents a problem of high screen current when the tank is tuned to resonance with no load. Should a separate supply for the screen be used? We think a screen dropping resistor is preferred, since it is a current limiting device. Is it not better to have the screen voltage vary with rapid changes in plate voltage than to have a fixed supply which will cause the screen to burn out if the plate supply fails? Where a single modulation transformer secondary is used, it seems better to apply modulation to plate and screen, using the series dropping resistor. With this resistor, the screen bypass condenser will be more effective, since the screen supply impedance is high in contrast to the low impedance offered by the associated screen bypass condenser.

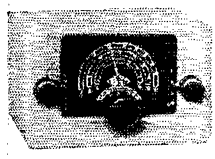
SEND FOR YOUR FREE COPY OF THE 1949 NEWARK CATALOG

TWO NEW PORTABLE MOBILE RIGS



LYSCO MOBILE XMITTER

A very desirable new rig. Only 4 x 5 x 5½" high Power output 8 watts. Requires 6.3 V, AC/DC, 110 Ma. Provision for metering PA stage. Uses 3-6AG7's for xtal. osc., mod. and final amp. Built-in antenna changeover relay—antenna termination for 50 ohm coax line. Requires T-17B mike or equal. Model 129 covers 27-29.7 Mc and Model 175 covers 3750-4000 Kc, with 7 or 9 Mc xtal. Complete, less tubes and accessories.
No. A17100, Model 129 }
No. A17101, Model 175 } **Net Each** **$23.95**
T-17B Mike, **No. S-467** **$1.49**
Kit of 3-6AG7 tubes **$4.95**



NEW GON-SET 3-30 CONVERTER

Continuous coverage from 3-30 Mc in 3 bands. High sensitivity and stability. Four tubes. Current drain is only 10 Ma. Connects easily to your BC receiver. Only 3½ x 5½ x 5½". Complete with tubes. Wgt. 6 lbs.
No. A3064 ..... **Each** **$39.95**

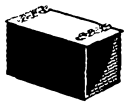
TRANSMITTING and SPECIAL PURPOSE TUBES

TERRIFIC REDUCTIONS—UNTIL MARCH 31st ONLY!

E1148	$ .39	3E29	$3.29	WL677	$6.95	826	$ .49	1616	$ .69
EF50	.29	5BP4	1.95	705A	1.59	830B	3.95	1619	.19
VR105	.49	6AC7	.79	717A	.49	832A	2.49	1624	.79
VR150	.49	6AK5	1.39	801A	.49	836	.69	1625	.19
2C40	.49	6C4	.19	803	3.65	838	2.85	1626	.19
2C44	.79	6J6	1.15	804	8.95	845W	2.95	2050	.69
2D21	.98	10Y	.29	805	3.65	866A*	.79	2051	.39
2X2A	.59	12A6	.19	807	1.15	872A	1.25	7193	.49
2X2/879	.27	211	.29	809	1.59	931A	2.39	8005	1.95
3AP1	1.95	285A*	.75	810	4.39	954	.19	9001	.19
3CP1	.99	286A*	.69	811	1.29	955	.19	9002	.19
3CP1/S1	.89	304TL	1.39	813	7.95	957	.19	9003	.19
3C24/24G	.29	316A	.29	814	2.95	958A	.19	9004	.19
3EP1†	1.39	331A/805*	4.95	815	1.39	959	.19	9006	.19

*Available from New York only. †Available from Chicago only. Quantities Limited!

High Voltage, High Current Plate Transformer

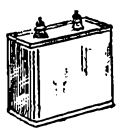


Swell for a medium power phone or CW Xmtr. Delivers 1345 volts AC, each side of CT at 500 ma. Heavy construction designed for continuous operation from 105 to 125 V AC. Heavy screw terminals, inverted type mtg. Size: 6"W x 9⅝"L x 8⅞"H. Shpg. Wgt. 65 lbs. A rare Value! Act Now!
S-877 ..... **Special** **$14.95**

Multi-Filament Transformer

An ideal filament supply for most medium power transmitters. Used with Plate X former No. S-877 (above) provides basis of swell power supply. Tapped primary 105/125 VAC. 6 separate secondary windings, all CT as follows: Three at 6.4V at 8 Amps., Two at 2.6V at 2.5Amps., One at 2.6V at 10 Amps. Will easily handle a pair of 866 Rect. in addition to all tubes in audio and RF sections of your rig. Inverted flange mtg. 4¼ x 5 x 5¼" H. Shpg. Wgt. 14 lbs
S-880 ..... **Special** **$5.95**

NEWARK OIL FILLED TRANSMITTING CONDENSERS



These new Newark Oil Condensers are just the thing for the power supply in your rig. Conservatively rated. Rectangular can—Glass insulators. Brand New—Not War Surplus.

No.	Cap. Mfd.	WVDC	Size	EACH
S-858	2	2000	1¾x1 x3⅞"H	$1.50
S-859	8	2000	3¾x1¾x3⅞"H	2.75
S-860	4	3000	2½x1 5/16x4⅝"H	3.75

NEWARK ELECTRIC CO., INC.

NEWARK RADIO & TELEVISION

3 GREAT STORES! Uptown at **115 West 45th Street** and Downtown at **212 Fulton Street** in **NEW YORK** **323 West Madison Street** in the heart of **CHICAGO**

MAIL ORDER DIVISIONS: 242 West 55th St., N.Y. 19 and 323 West Madison Street, Chicago 6, Illinois

Include Postage
All Prices F.O.B. New York or Chicago
Enclose 20% Deposit with C.O.D. Orders

Parasitic-Array Patterns

(*Continued from page 15*)

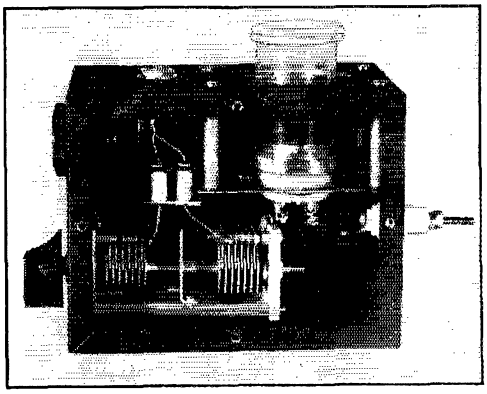
ratio, not even a partial explanation can be given. However, whether the amplitudes of the various patterns are in exactly the proper proportion to one another or not, the series does show how the shape of the pattern changes with the length of the parasitic element. Note that the parasitic-element lengths given do not have general significance because of the relatively large diameter-to-length ratio of the elements, and the varying magnitude of end effects with frequency. The physical length of a half-wave of the tubing used for elements was found to be only 89 per cent of an electrical half-wave at the frequency used.

The writer wishes to express his deep appreciation to Dr. Vincent E. Parker and Mr. Bruce C. Lutz of the Physics Department of the University of Delaware for their support and guidance in the conduct of these experiments.

Field-Strength Meter

(*Continued from page 20*)

four-pin 1¼-inch forms. Winding L_2 is divided into two equal halves spaced slightly on the form to leave room for the single-turn pick-up coil, L_1. The accompanying table gives dimensions for L_2 for various frequency ranges.



In this view one of the sides of the box has been removed to show internal placement of the few simple components of the field-strength meter.

When using the field-strength meter, a vertical length of stiff wire, such as busbar, attached to the antenna input terminal will suffice as a pick-up antenna on all frequencies. The meter may be calibrated in frequency from a signal generator.

Sideband Filter

(*Continued from page 26*)

double sidebands work against each other unless this carrier has exactly the correct frequency and phase. With a single-sideband signal this isn't the case. Suppression can be used to advantage at the receiver by making the b.f.o. the largest AØ signal at the second detector and arranging the tuning such that it is within about 40

(*Continued on page 106*)

or 50 cycles of the correct frequency. It's amazing how effective this arrangement is in mashing down QRM, while the loudest howling carrier remaining can usually be "notched out" with the crystal filter.

However, no one with operating experience on single sideband will claim that it can't be QRMed! One of the worst cases occurs when a husky carrier is right in the middle of the sideband. Also, too often interference is serious because the b.f.o. is not the biggest AØ signal at the receiver. This is frequently caused by too much r.f. and i.f. gain, as from a hot converter or a Q5-er, and a weak b.f.o. signal. This is a tricky barometer on receiving-operator proficiency, but it is almost a dead giveaway when they come back and recite a list of the stations causing the QRM! When using a Q5-er, the b.f.o. should definitely be at the *last* detector and strong enough to smear a.m. signals to obscurity when off zero beat, if maximum QRM reduction is to be obtained. Unfortunately, not too many of the present commercial receivers achieve this sufficiently, so unless some needed modifications are made it will be necessary to reduce the r.f. gain for the weak b.f.o. All in all, the experience with single sideband has been very interesting and instructive; if the construction information in this article can assist more stations to get on with single sideband it will have been well worth the time spent to compile it.

Using the "Cascode"

(Continued from page 29)

may be made slug-tuned also, and adjusted to the proper value by feeding a signal into the stage with no heater voltage applied, and then adjusting for minimum signal. Radio service men whose experience dates back to the days of triode r.f. stages in broadcast receivers will recall this technique! The plate coil, L_2, is also self-resonant, but is extremely uncritical.

Results

If your location is quiet, and your receiver is completely stable, with or without an antenna connected, the cascode will make a considerable improvement in your reception. It contributes very little noise, by itself, and the gain will be 15 db. or more. If your receiver is low on gain it will be particularly helpful. If you already have quite good performance, or if your location is one where *external* noise is already a limiting factor, you will not gain much from the addition of a cascode. If the noise that bothers you comes in on the antenna all the r.f. gain in the world won't help you. And if your receiver is already on the verge of oscillation in the r.f. stage, addition of the cascode will only make matters worse. Regeneration is great stuff for high S-meter readings, but bad medicine for signal-to-noise ratio.

The original discussion of the cascode by its designers states that it has been used effectively on frequencies as high as 180 Mc., so it should be of interest to 2-meter workers who are striving for improved receiver performance. — *E. P. T.*

Our 26th Year

LEEDS

The Home of RADIO

QUALITY—PRICE DEPENDABILITY

STEP DOWN TRANSFORMERS

Input 220-250 Volts 60 cy.
Output 110-125 Volts 60 cy.
Primary cord and plug, Secondary, Receptical

80 watts, P-61	$4.80
150 watts, P-62	$6.45
250 watts, P-63	$8.25
500 watts, P-64	$10.65
1000 watts, P-65	$20.25

OIL FILLED CONDENSERS

4 Mfd	600 V	$ .49
7. Mfd	330 VAC	$ .69
2 x 0.1 Mfd	7000 V	$2.00
8 Mfd	600 V	$ .98
8 Mfd	1000 V	$1.69
.05 Mfd	2500 V	$ .95

SPECIAL OFFER:—Add $1 to any order you send and get 10 boxes of R.C.A. Parts.

TRANSFORMERS

POWER P-3165—Pri. 117 V. Secs.; 350-350 V. rms. @ 200 ma. DC., 6.3 V. @ 0.6 amp., 6.3 V. @ 7 amp., 5 V. @ 2 amp., 5 V. @ 3 amp. $8.67

P-3059—Pri. 117 V. Secs.; 360-360 V. rms. @ 250 ma. DC., 6.3 V. @ 0.6 amp., 6.3 V. @ 8 amp., 5 V. @ 2 amp., 5 V. @ 3 amp. $12.05

P-3166—Pri. 117 V. Secs.; 400-400 V. rms. @ 300 ma. DC., 12.6 V. @ 10 amp. c.t., 5 V. @ 3 amp., 5 V. @ 6 amp. $14.55

HIGH VOLTAGE P-3170—Pri. 117 V. Secs.; 1750 V. rms. @ 2 ma. DC., 6.3 V. @ 9 amp. tapped at 2.5 V. @ 2 amp., 2.5 V. @ 2 amp. $5.14

P-3171—Pri. 117 V. Secs.; 2500 V. rms. @ 5 ma. DC., 6.3 V. @ 3 amp. tapped at 2.5 V. @ 3 amp., 2.5 V. @ 2 amp. $6.76

VERTICAL OUTPUT A-3035—Turns ratio pri. to sec. 10:1, unshielded type A . . . $3.09

VERTICAL BLOCKING OSC. A-3000—Turns ratio pri. to sec. 1:4.2, unshielded type A. $1.18

A-4000—Turns ratio pri. to sec. 1:4.2, shielded type J $1.62

HORIZONTAL BLOCKING OSC. A-3002—Turns ratio pri. to sec. 2:1, unshielded type A. $1.32

A-4002—Turns ratio pri. to sec. 2:1, shielded type J $1.76

FILTER CHOKE C-2991—2 henries @ 250 ma. DC. 53 ohms $1.62

C-2974—2 henries @ 200 ma. DC. 50 ohms. $1.92

PLATE TRANSFORMERS

For Small Transmitters. DC Voltage Ratings are Approx. Values Obtained at Output of a 2 section Choke input Filter. Using Mercury Vapor Rectifier Tubes Pri. is for 115 V. 60 cy.

Type No.	Sec. Rms. Volts	Sec. DC Volts	Sec. DC MA.	Dimensions H.	W.	D.	Price Each
P 57	660—660†	500	250	4⅝	3 1/16	4⅜	$ 6.76
	550—550	400					
P 58	1080—1080	1000*	125	4⅝	3 1/16	5	8.23
	500—500	400	150				
P 59	900—900	750	225	4⅝	3 1/16	5⅛	7.94
	800—800	600					
P 67	1450—1450	1200	300	5¾	6⅛	4	19.84
	1175—1175	1000					
P 68	2100—2100	1750	300	5¾	6⅛	4¼	24.99
	1800—1800	1500					

* For dual operation with simultaneous use of both sec ratings. † Has 40-volt bias tap.

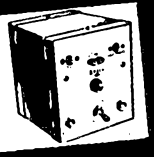
ISOLATION TRANSFORMERS

All 117 Volts to 117 Volts 60 Cy.

P-96, 40 watts.. $3.60 P-98, 100 watts $9.30
P-97, 80 watts.. $5.10 P-99, 250 watts $17.70

MERIT Since 1936 FINE RADIO PARTS

LYSCO TRANSMITTERS



Model 129-10 Meter Model 175-75 Meter Designed for mobile or fixed operation in the 10 or 75 meter phone band. Dimensions 5"x 4"x5½". Tube compliment 6AG7—oscillator, 6AG7—power amplifier, 6AG7—modulator. Power output 8 watts. An exceptional buy (less tubes) at $23.95

CHOKES

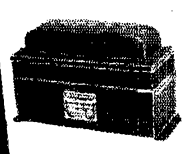
SMOOTHING TYPE	Hy	SWINGING TYPE	Hy	PRICE EACH MA	Price
C-80	10	C-87	4—16	150	$3.09
C-81	10	C-88	4—16	200	$3.82
C-82	10	C-89	4—16	250	$5.29
C-83	8	C-90	3—14	300	$5.59

All above 3000 Volts Insulation

RAYTHEON VOLTAGE STABILIZERS

Positive Stabilization ±½%

Input 95-130 volts, 60 cycles single phase; output 115 volts stabilized to ±½%. *Output 6.0 or 7.5 volts stabilized ±½%.



Catalog No.	Output Watts	Net Cap. wgt. lbs.	Net Price
VR-6110	15	4	$15.00
VR-6101*	30	5	$17.00
VR-6111	30	5	$17.00
VR-6112	60	8	$24.00
VR-6113	120	14	$31.00
VR-6114	250	25	$48.00
VR-6115	500	45	$75.00

STANDARD STEEL CHASSIS

Black Crackle

4 x 4 x 2	59c
6 x 14 x 3	$1.06
10 x 14 x 3	$1.44
10 x 17 x 3	$1.44

STEEL CASES

Black Crackle

4 x 4 x 2	67c
4 x 5 x 3	79c
6 x 6 x 6	$1.03
12 x 7 x 6	$1.91
15 x 9 x 7	$2.65

GREENLEE PUNCHES—

Cuts to 1/8" thick metal.

½"	$1.94
⅝"	$1.94
1"	$2.12
1⅛"	$2.25
1-3/16"	$2.25
1½"	$2.88

We carry a complete line of all sizes of punches up to 3½" diameter.

POWER TRANSFORMER

Primary	Filament Windings
115 Volt 60 Cycles	5 Volts @ 3 Amps.
Secondary	
435-0-435 Volts	2.5 V.C.T. @ 10 Amps.
At 250 Ma. with	2.5 V. @ 3 Amps.
80 Volt Bias Tape	6.3 V.C.T. @ ½ Amp.
Dimensions	Net Weight 11 Lbs.
H. 3¾"xW. 4½"x D. 4¾"	Priced Right At—Each $5.88

ALUMINUM CHASSIS—

Heavy Duty

7 x 7 x 2	94c
7 x 9 x 2	$1.06
5 x 10 x 3	$1.00
7 x 11 x 2	$1.15
7 x 13 x 2	$1.23
10 x 17 x 3	$1.88

BIAS TRANSFORMER TYPE KS8779

Completely shielded, Insulator Terminals. Primary: 115 Volts 60 cycle @ 500 Ma.
Secondaries
180 V. @ 20 Ma.
300 V. @ 20 Ma.
6.3 V. @ 1.2 amps.
5.1 V. @ 7 amps. C.T.
Special $1.95

POWERSTAT VARIABLE TRANSFORMERS

Type 20: 115 V. input, O-135 V. output @ 3.0 amps. 0.4 KVA $12.50

Type 116: mounted; 115 V. input, O-135 V. output @ 7.5 amps. 1.0 KVA $23.00

Type 116U: unmounted; 115 V. input, O-135 V. output @ 7.5 amps. 1.0 KVA $19.00

Type 1126: 115 V. input, O-135 V. output @ 15.0 amps. 2.0 KVA $46.00

Type 1226: 230 V. input, tapped at 115 V. O-270 V. output @ 9.0 amps. 2.4 KVA $46.00

Type 1156: 115 V. input, O-135 V. output @ 45.0 amps. 6.1 KVA $118.00

If not rated 25% with order, balance C.O.D. All prices F.O.B. our warehouse New York. No order under $2.00
We ship to any part of the globe.

LEEDS RADIO CO.

75 Vesey Street
COrtlandt 7-2612

Dept. QS 3
New York City 7

Reducing Key Clicks

(Continued from page 80)

which had a calculated cut-off bias of 27 volts (at the low plate voltage being used) actually had a bias of 150 volts. When this bias was reduced to around 60 or 70 volts, roughly twice cut-off bias, the extreme transients disappeared from the 'scope and the clicks disappeared in the receiver.

Pursuing this still further, the effect of dividing the bias between fixed and grid-leak sources was investigated. It had been the practice to use a self-regulated bias supply to maintain bias voltages "constant" with varying grid current. Key-click measurements were made with various values of fixed and resistance bias, with fixed bias values of from half to five times cut-off. These showed that the clicks were about equal up to about 1½ times cut-off and increased above that. It was further found that resistance bias added to any fixed bias did not increase the amount of click, up to as far as 10 times cut-off, the limit of the tests.

A further comparison was made between the amount of clicks that would be introduced by having a frequency doubler follow a keyed stage and having an amplifier follow a keyed stage. It was found that clicks were the same for either the doubler or amplifier when the fixed bias did not exceed 1½ times cut-off and the additional bias was obtained from resistance bias. It was thus established that, *for minimum clicks, the fixed bias should not be more than 1½ times cut-off, with any additional bias* (for purposes of efficiency in amplifying or frequency multiplying) *to be obtained from resistance bias.*

Following this rule, it is now possible to do all of the initial work of adjusting the keying circuit for clickless keying without going on the air, with the assurance that when subsequent stages are added there will be no clicks contributed by these stages (provided, of course, that there are no parasitic oscillations in these doublers and amplifiers). The keyed circuit should be adjusted so that the keying sounds very "soft" without "ringing," and it will then be satisfactory at any speed that can be copied aurally.

Checking the Keying

Owners of 'scopes will find the task of adjusting the keyed stage for clickless keying much easier than those who must do so by ear. These guides may be followed by 'scope users:

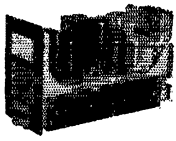
1) With plate and screen voltages removed from all following stages, connect the 'scope to the headphone output of the receiver (b.f.o. on) and check the envelope shape. This is done by making dots with the bug key and synchronizing the 'scope sweep until the pattern stands still.

2) Adjust the keying-circuit time constants so that there are no parts of the 'scope pattern that are absolutely vertical. The sides should be sloping and the corners rounded. Whenever the sides have too little slope or the corners become sharp, the clicks are increased.

3) When the above adjustments have been

(Continued on page 110)

HOT RADIO VALUES at Sun Radio



SPERRY AMPLIFIER

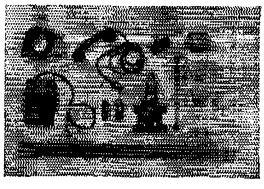
Brand new servo amplifier containing two beam power output tubes (1632) similar to 25L6, two twin triodes (1633 and 1634) similar to 65C7, two mica condensers, dozens of color coded half watt resistors, two dual and four section bathtub condensers, three transformers, two wafer switches, one volume control, four octal sockets. Easily convertible. **$3.95**

RADAR RECEIVER BC1068A

Guaranteed excellent condition. It is a "Hot" receiver for the "Ham" and short wave experimenter covering the 174 to 210 MC Television band. Has individually slug tuned antenna R.F., Detector and oscillator circuits resulting in maximum sensitivity; contains 2 R.F. and 5 I.F. stages detector and video amplifier. Complete with 110 volt AC power supply and 14 tubes..... **$39.50**

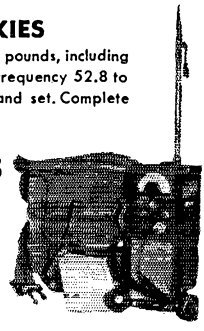
SCR-195 WALKIE-TALKIES

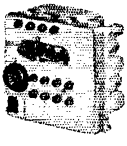
SCR-195 Walkie-Talkies, brand new, weight 27½ pounds, including knapsack. Range up to 25 miles in open country. Frequency 52.8 to 65.8 MC. Transmitter and receiver with regular hand set. Complete ready to operate with spare parts.



$59.95

Price per set of 2 **$115**





2-6 MC PB RECEIVER

6 tubes (3–1T4, 1–1R5, 1–1S5, 1–3S4). 2–6MC in 4 bands. Easily converted to Broadcast band with instructions furnished by us. Has R.F. stage and audio output stage to drive speaker. As pictured, less case, with speaker..... **$9.95**

ATTENTION! CLOSEOUT SPECIALS

PART KITS!

KIT 1 Asstd Mica Condensers—Unmarked. 100 for..	**$1.50**
KIT 2 Asstd Resistors ½W–1 W. 100 for.....	**1.00**
KIT 3 Asstd Condensers—Tubular Bypass. 25 for...	**1.00**
KIT 4 Asstd Condensers—Electrolytic. 25 for.....	**2.00**
KIT 5 Asstd Potentiometers—with or without switch. 10 for.....	**1.00**
KIT 6 Asstd Ballast Tubes—Line Ballasts. 10 for....	**1.00**
KIT 7 Octal Sockets—Wafer. 25 for.....	**1.00**
KIT 8 Octal Sockets—Plastic with Flange. 20 for...	**1.00**

SPECIAL!! All 8 Kits for $8.00

MAGNETIC HEADPHONES

Brand new SC 4000 ohm Magnetic phones with 8' cord and standard phone plug. Headphones are adjustable to size. A $14.50 value.... **$2.49**

PANEL METERS

ALL BRAND NEW AND GUARANTEED

West 3" square 0–150 AC-V. **$3.49**

Triplett 2" square 0–40 DC-V. **$2.97**

Simpson 2" round 0–15 DC-V. **$2.97**

Sun 2" round 0–300 DC-V. **$2.97**

★

CRYSTALS!

All crystals have Army MC harmonic ratings but Sun encloses directions for deriving the correct fundamental frequency in kilocycles.

CRYSTALS WITH A MILLION USES

Fractions Omitted

kc	kc	kc	kc	kc	kc	kc	kc	kc	kc	kc	kc
412	422	431	441	451	474	487	496	502	507	512	519
413	423	433	442	453	475	488	497	503	508	515	522
414	424	434	443	462	477	490	498	504	509	516	523
415	425	435	444	466	479	491	501	506	511	518	
416	426	436	445	468	481	492					
418	427	437	446	470	483	493					
419	429	438	447	472	484	494					
420	430	440	448	473	485	495					

49¢ each

Crystal Frequency Standards 98.356kc

Easily altered for 100kc Standard. Mounted in low loss 3 prong holder.

$3.89 each

For Crystal Controlled Signal Generators 525kc

526,388	533,333	537,500
527,777	534,722	539,888
529,166	536,111	
530,555		
531,944		

99c each

I.F. Frequency Standards

kc	kc
450	461,111
451,388	464,815
452,777	465,777

99c each

200 KC CRYSTALS

Without holders $2\frac{1}{32}$ x $2\frac{3}{32}$" **each 69c**

3 for $2.00

Assorted Miscellaneous Crystals
Fractions Omitted

370kc	377kc	384kc	387kc
372	379	386	388
374	380		
375	381		
376	383		

39c each

priced at a fraction of the cost of their holders alone.

For Ham and General Use
Fractions Omitted

390kc	396kc	404kc	408kc
391	397	405	409
392	398	406	411
393	401	407	
394	402		
395	403		

79c each

CRYSTALS FOR SCR 522

5910kc	7480
6370	7580
6450	7810
6610	7930
7350	

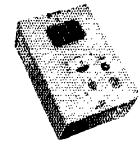
$1.29 Each

Crystals from BC 6 10
¾" Spacing—2 Banana Plugs

2045	2282	2435	3250	3570
2105	2300	2442	3322	3580
2125	2305	2532	3510	3945
2145	2320	2545	3520	3955
2155	2360	2557	3550	3995
2220	2390	3202		
2258	2415	3215		
2260	2430	3237		

$1.29 Each

- Payments must accompany order. Enclose 20c for postage and handling. Minimum order—$2.00 plus postage.
- Crystals are shipped packed in cloth bags inasmuch as they are shock mounted. All shipments guaranteed.



NAVY VHF TRANSMITTER

Battery operated (67½ V "B" and 1½ V "A") 80–105 MC. complete with 2–1G4 tubes, battery box holder and full instruction manual. Brand new.

$6.95

ANTENNAS

(A) Small four-section telescopic aerial ideal for portable receivers, transceivers or test equipment.

99c

(B) 22" tapered high frequency aerial covering 150 to 200 MC. Ideal for mobile or fixed station use.

$2.69

TERMS All items F.O.B., Washington, D. C. All orders $30.00 or less, cash with order. Above $30.00, 25 per cent with order, balance C.O.D. Foreign orders cosh with orders, plus exchange rate.

completed, check with the b.f.o. off. If the job has been done correctly, keying peaks that extend to dizzy heights will not be seen. This check should be made with the receiver audio gain control open enough to give good S9 signals when the b.f.o. is on, and the a.v.c. should be off.

When the keying of the controlled stage is satisfactory, as indicated by the above tests, the plate and screen voltages can be applied to the subsequent stages. If the fixed bias on any of these stages does not exceed 1½ times cut-off (any additional bias can be provided by grid resistors), the resultant signal on the air should be clean and something to be proud of (if these amplifiers have no parasitics or serious regeneration).

As an alternative to the use of the 'scope, the operator can listen closely in the headphones to slow dashes, noting carefully the clicks on "make" and "break" with the b.f.o. on and off. The problem here is to judge correctly the degree of click, however, and that is why the 'scope is so useful.

The keyed stage used in all of the tests was an RK20A pentode amplifier, using a tube keyer on the suppressor grid. The tube keyer allows a wide range of keying rise and decay times by adjusting only resistors and condensers, as opposed to the necessity for correct iron-core chokes in direct cathode and plate-supply keying. Grid-block keying of any low-drive stage is also a simple type to adjust.

"Capital X" Array

(Continued from page 45)

Now you are ready to erect the array in its permanent position. A space about 40 feet square is required, though the greater the clearance in all directions the better, of course. The bottom dipoles should be a minimum of a half-wave (about 16 feet) above ground for best results.

The idea in back of this arrangement is, of course, the old familiar "X-H" array, with the difference that the phasing is done with relatively-flat lines. The dipoles are fed at their centers, and all, in turn, are fed from a common central point, insuring uniform current distribution. The 20-foot separation of the dipoles, a mechanical accident resulting from the length of the phasing sections, spreads the dipoles out over a larger area than they occupy in the conventional "H" configuration. This tends to improve the performance of the system, as the optimum spacing for four dipoles is something more than the commonly-used half-wave arrangement. Remember the positioning of the dipoles in the bedspring arrays used for early warning-radar service?

Because of the distribution of the power four ways it will be found that the amount of r.f. in any one of the dipoles is relatively low. Do not expect that this array will show the fire one becomes accustomed to in working with parasitic systems. The same is true of the phasing sections; it may be that, with moderate amounts of power, a neon bulb or fluorescent light will light on the main transmission line but not on the phasing sections,

(Continued on page 112)

The theoretical gain of this array is about 7 db., and it shows at least that much in actual practice. The cost and difficulty of erection of the two systems provides an even more favorable comparison.

Single Sideband

(Continued from page 48)

VFO allows you to be on either 20 or 75 simply by using the sum or difference beat. With all of the dirty work accomplished in the low-level (receiving tubes and components) exciter, the high-power problems become only those normally associated with high-power linear amplifiers, and they aren't tough at all. It doesn't matter much whether you use a filter or the phasing method to get the single-sideband signal at 5 Mc. — that's a choice you have to make just like you have to decide for yourself what big tubes and condensers and transformers to use. Either system will give you 30 db. or more attenuation of the undesired sideband if you build it right, and either system can be bad if you don't know what you're doing, just like an a.m. or n.f.m. 'phone can be.

So, to anyone who wants to try the stuff but hasn't yet made up his mind how to go about it, we suggest that you review all of the articles that have been written. Pick out the system you understand better or the one you think you can build and align easier, and then build it with all receiving tubes and components to come out at around 5.2 Mc. From there on all you will need is a 9-Mc. VFO, a 6SA7 mixer and some linear amplifiers to build up the level.

There isn't much need to discuss amateur single-sideband receiving techniques. Just ask anyone who is using a phasing or filter selectable-sideband adapter, or even a Q5-er — and then see if he would enjoy operating without it! — *B. G.*

50 Mc.

(Continued from page 53)

Massachusetts, and Rhode Island on 220 Mc. He missed two-way with Connecticut because of your conductor's inability to hear him on two occasions when W1HDQ was being heard at W1CTW. Yet, on another occasion, a crossband contact 220-144 Mc. was made the other way around. If the 235-Mc. contacts made with New York and New Jersey, prior to the change to the new band, are added, W1CTW has a total of 7½ states worked on 1¼ meters!

Shall We Decide the Polarization Question?

It has been suggested in several quarters that the question of horizontal or vertical polarization for 144-Mc. work be decided on the outcome of a vote of active 2-meter operators. Good idea — but will it take? Our experiences with polls are very disappointing, to say the least. Unless you send every individual a stamped self-addressed reply card, on which he merely marks an X to indicate his preference, it is impossible to get anything like a majority opinion. And if we *did*

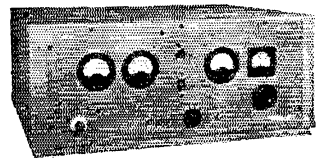
(Continued on page 114)

BIGGER and BETTER than EVER!

GIGANTIC REPEAT SALE!

of Used, Reconditioned, "Good-as-new"

COMMUNICATION EQUIPMENT

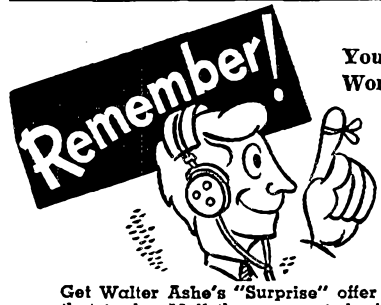


By popular demand Walter Ashe repeats his drastic midwinter clearance of first quality Communication Equipment at terrific mark-downs! Rigid inspection, expert repair, tube check and alignment, insures A-1 operating condition. Quantities listed are available at date this publication goes to press. Every item represents a value you'll find it hard to resist. So hurry! Avoid disappointment. Order today by phone, wire or letter (or mail handy coupon), indicating 1st, 2nd or 3rd choice!

All Prices F. O. B. St. Louis.

Quantity	Make and Model	Regular Price	Our Low Bargain Price
4	Hallicrafter HT-9 Xmitter with tubes	$380.00	$190.00
1	Hallicrafter HT-18 Xmitter	110.00	85.00
2	Hallicrafter S20R		60.00
3	Hallicrafter SX25 No. Spk.		89.50
1	Hallicrafter S29 Portable	110.00	60.00
1	Hallicrafter S-36A UHF receiver, less speaker	307.50	120.00
5	Hallicrafter S-38	49.95	37.50
2	Hallicrafter S41W	37.50	26.00
1	Hallicrafter SX43 No. Spk.	189.50	160.00
2	Hallicrafter S53	89.50	75.00
3	Hammarlund HQ129X & Spk.	189.15	145.00
4	Meck T-60-1 Xmitter*	150.00	95.00
3	Meissner 9-1090 Shifter	120.00	50.00
4	Millen 90700 VFO Variarm	42.50	29.95
3	Millen 90800 Exciter*	42.50	27.50
2	Millen 90810 & Tubes*	78.39	55.00
4	Millen R9'er, tube and coil for 10 meters No. 92101	24.75	12.50
3	National 1-10 UH Recvr, coils and power supply	89.39	37.50
1	National NC33	65.95	47.50
2	National NC57	89.50	75.00
2	RME HF10-20 Converter	77.00	67.50
4	RME DM-36 Converters		29.50
3	RME VHF-152 Converters	86.60	55.00
1	RME-45 and Speaker	198.70	98.70
3	RME-45A & Speaker with Calo-matic dial	198.70	125.00
1	Silver 703 Freq. Meter	59.94	42.50
2	Sonar MB611 10 meter mobile transmitter	72.45	37.50
1	Sonar VFX-680 Exciter less cabinet*	87.45	49.50

*—Includes 1 set coils

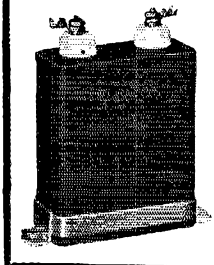


Your Trade-In's Worth More at the

WALTER ASHE STORE

Get Walter Ashe's "Surprise" offer before you make that trade. Mail the coupon today!

Time Payments available on new equipment purchases



FILTER CONDENSER BARGAIN

Last chance on these Aerovox 2 Mfd. X 2500 VDC transmitting filter condensers. A real value at only

Shpg. Wt. 3 lbs. **$2.95**

FREE

Big, new 1949 Catalog of Radio, Electronics and Television. The treasure chest of values.

ORDER YOUR COPY TODAY!

WALTER ASHE RADIO CO.
Bill DuBord, WØQDF, Mgr., Amateur Div.
1125 Pine St., St. Louis 1, Missouri Q-49-3

☐ Rush my order for used equipment as follows: 1st choice: ....., 2nd choice: ....., 3rd choice: ..... Remittance for $..... is enclosed.

☐ Rush bigger-than-ever "surprise" trade-in allowance on my ..... for

(describe used equipment)

.....

(show make, model of new equipment desired)

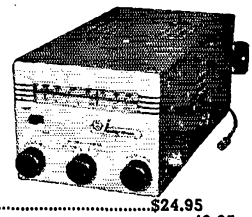
☐ Send list of additional used equipment.
☐ Rush Big New 1949 Catalog.

NAME .....

ADDRESS .....

CITY..... ZONE..... STATE.....

Phone CHestnut 1125



HARVEY WELLS RADIO EQUIPMENT

AR-3-A Receiver $24.95
ATR-3 Tranceiver 49.95
AT-3-B Transmitter 24.95

See January and February QST for complete description.

SHIPPED PREPAID ANYWHERE IN U. S.

Walter Ashe RADIO CO.

THE HOUSE OF "SURPRISE" TRADE-INS
1125 PINE ST. ST. LOUIS 1, MO.

get a majority opinion, would the minority go along with the decision? We believe that if it were possible to poll every active 2-meter operator the result would be overwhelmingly for vertical — simply because of the greater occupancy in the vertical East and Far West. Would the horizontal DX gang in the Middle West and elsewhere accept such a decision, and would they be doing right by themselves if they did? Conversely, can it be believed that the Boston, New York and Los Angeles areas, and many other localities where vertical predominates, would change over to horizontal if the outcome of the poll went that way?

Hundreds of city-dwelling v.h.f. enthusiasts will argue that DX is unimportant; that they work on 2 meters (or any other band) mainly for the local chats they enjoy during the evening hours. There is little question but that vertical is the logical choice of such operators. Activity does not exist by virtue of DX alone, that's sure. Should polarization be standardized on horizontal, even if it could be proved more effective for long-distance work? We seem to hear some shouts of "No!" and we doubt that the outcome of a poll would change the minds of everyone.

In any case, a poll is scheduled to be taken. If you have pronounced feelings for either side, send a card indicating your preference, either to the writer or to Bill McNatt, W9NFK, of *The V.H.F. News*, who has offered to take on the thankless task of arbiter.

The World Above 420 Mc.

As a result of more than a year of work on 420 Mc. W4ZU and W4DPM of Orlando, Fla., have drawn some conclusions which may be of assistance to others of the 420-Mc. gang who are getting started the hard way. W4ZU had trouble

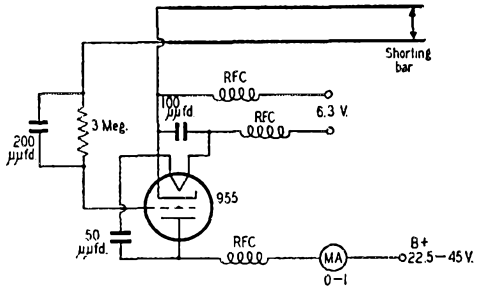
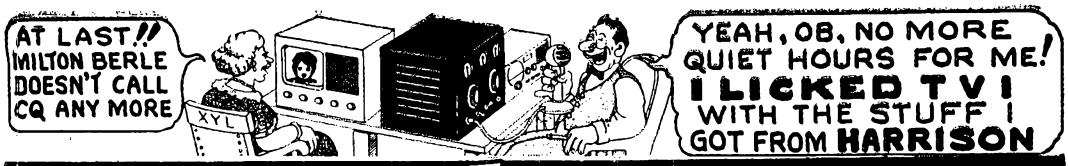


Fig. 1 — Schematic diagram of the 420-Mc. frequency-measuring device used by W4ZU.

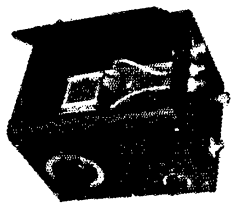
getting his acorn superregen (November, 1947, *QST*) to operate satisfactorily until he made some modifications. R.f. chokes were added to the heater leads, at the socket, and the tap on the hairpin loop in the plate-grid circuit was brought off at right angles, instead of down between the sides of the loop.

After having indifferent results with 6J6s he is now using a pair of 316-As with a half-wave line. Instead of being mounted at one end, as shown in

(*Continued on page 116*)



ANTENNA COUPLER



Will greatly reduce harmonic radiation and increase transfer efficiency to untuned feeders such as coaxial cable, ribbon, twisted pair or spaced line. Has series capacitor to tune out reactance of line. Perfectly couples balanced lines to transmitters with unbalanced output such as the 32V-1, etc.

Handles up to 500 Watts output, 6,000 Volt RF peak. connections for coax and line. Plug-in coils, with adConnect to xmitter with any coaxial cable. Dual output justable plug-in taps, simplify band changing. In compact, shielding metal cabinet, 7¼"x10"x8". Completely wired, with coax connectors, instructions, and coil for any one band. (Specify) Cat. AN-4 **$24.75**

(Just about what you would pay for the parts alone!) Additional coils, with plug-in taps $4.95 Each

STEEL FOR SHIELDING!

Put your rig in a modern enclosed rack cabinet – keep the spurious radiations in (and the fingers out).

Cat. No.	Height	Panel Space	Price
De Luxe Cabinet Racks			
CR-1741	10 9/16"	8 3/4"	$10.14
CR-1742	14 1/16"	12 1/4"	12.00
CR-1739	15 13/16"	14"	14.90
CR-1743	19 5/16"	17 1/2"	16.43
CR-1744	28 3/16"	27 1/4"	18.93
CR-1745	38 13/16"	35"	21.14
De Luxe Enclosed Relay Racks			
CR-1774	42 1/16"	36 3/4"	$29.40
CR-1771	47 5/16"	42"	35.61
CR-1772	66 9/16"	61 1/4"	43.61
CR-1773	82 5/16"	77"	50.71

Cabinets 14 3/4" deep. Relay Racks 17 1/2" deep. Both fit standard 19" panels offered below in steel, almuinum and non-shielding masonite.

Height	Steel	Aluminum	Masonite
1¾"	$ .59	$ .65	$ .47
3½"	.67	.73	.59
5¼"	.82	1.02	.73
7"	.91	1.34	.85
8¾"	1.06	1.52	1.03
10½"	1.29	1.81	1.18
12¼"	1.56	2.08	1.32
14"	1.76	2.35	1.47
15¾"	2.06	2.65	1.62
17½"	2.23	2.94	1.88
19¼"	2.41	3.24	2.03
21"	2.71	3.53	2.26

NEW JOHNSON INDUCTORS

Greater tank efficiency, less harmonic radiation, and better energy transfer from final to antenna is possible with these JOHNSON PLUG-IN LINK inductors. These factors reduce BCI/TVI! Type HCS for high voltage, low current tubes (DC Plate Voltage more than 5 times Plate MA) or Type LCS for low voltage, high current tubes.

SWINGING LINK COILS

1000HCS80	–	1000LCS80		$6.04
1000HCS40	–	1000LCS40		5.44
1000HCS20	–	1000LCS20		5.00
1000H/LCS14	$4.70	1000H/LCS10		$4.41
500HCS80	–	500LCS80		3.38
500HCS40	–	500LCS40		3.09
500HCS20	–	500LCS20		2.65
500H/LCS14	$2.06	500H/LCS10	or 6	$1.91 Each
150HCS80	–	150LCS80		2.94
150HCS40	–	150LCS40		2.65
150HCS20	–	150LCS20		2.35
150H/LCS14	$1.91	150H/LCS10	or 6	$1.76 Each

JACK BAR ASSEMBLIES

1000W –	$1.76	500W –	$1.18	150W – $.86

SWINGING LINK ARM ASSEMBLIES

1000SLA (1-KW)	$1.23	150/500SLA (150 or 500W)	$1.00

PLUG IN LINKS

1000SL10	10 Turn	$1.82	150/500SL2	12 Turn	$1.76
1000SL5	5 Turn	1.41	150/500SL5	5 Turn	1.12
1000SL2	2 Turn	1.06	150/500SL12	2 Turn	.92

DUAL STATOR TRANSMITTING CONDENSERS

Buy now at these low prices!!

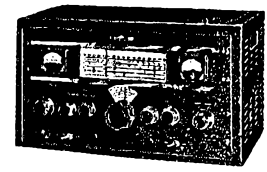
Max. Cap.	Per Section Min.	Gap	Peak V.	Cat. No.	Price
104 –	9	.045"	2,000	155-503	$5.26
66 –	7	.045"	2,000	155-502	4.79
99 –	10	.075"	3,000	154-505	5.38
52 –	8	.075"	3,000	154-503	4.62
100 –	15	.125"	4,500	154-510	6.38
52 –	10	.125"	4,500	154-508	4.91
52 –	15	.175"	7,000	153-508	7.35
52 –	19	.250"	9,000	153-513	8.53
50 –	18	.350"	11,000	152-507	10.29
51 –	24	.500"	13,000	152-510	11.76

COLLINS TRANSMITTERS

Perhaps the answer to your problem is a compact, well shielded, commercially built, transmitter such as the 150 watt 32V-1.

$475.00

. . . Or for higher power, it's the 30K – $1450.00



HAVING ANTENNA PROBLEMS?

Install a broad band Amphenol Twin Lead Folded Dipole! No loading problems—perfect match! High strength copperweld antenna section withstands wind, ice, birds, etc. Rated to handle 1 KW of RF. Ready to use with 75' of 300 ohm lead in. Just trim to your operating frequency.

BAND	Antenna Length	Our LOW Price
28 Mc	18 feet	$ 4.53
14 Mc	35 feet	5.64
7 Mc	70 feet	7.94
3.5 Mc	135 feet	12.20

AC LINE WAVE TRAPS

FOR RECEIVER — BC, TV or FM

New Bud Wave Trap plugs between receiver and AC line and traps out your RF. Simple – no need to tamper with receiver! Compact – 4" x 2" x 2". Tunable.

For 80 and 40 Meters Model WT-501
For 20, 15 and 10 Meters Model WT-500 **$3.00** EACH

FOR TRANSMITTER

OHMITE POWER LINE CHOKES prevent RF from getting into the power lines.

Z-20	14 Microhenries	5 Amperes	$1.26
Z-21	15 Microhenries	10 Amperes	2.08
Z-22	18 Microhenries	20 Amperes	3.03

MODULATION CONTROL

Don't splatter all over your neighbors' reception!

LAMBDA MM-2 — Scope type Modulation Monitor provides a continuous visual check of your signal. Complete with all tubes, calibrated trace intensifier window, and instruction book. Size 3"x5"x10". $24.95

SIMPSON WAVEMETER — MODULATION INDICATOR — Direct reading percent modulation meter – SWR indicator – field strength meter – phone monitor – calibrated coils for 80, 40, 20, and 10 – can also be made to cover 3 to 420 Mc – just the thing to locate harmonics and parasitics! Model 380. $37.85

GONSET "100%'r" — Peak flash type modulation indicator shows average speech level and overmodulation. You'll like the low price – $19.95

OPEN NIGHTS New York – Wednesdays, Jamaica – Fridays **UNTIL 9:00**

The Current Issue of **THE HARRISON HAM-A-LOG** has some swell hints on BCI/TVI reduction. Also some FB bargains, club activities, etc. A postcard will put you on our mailing list without obligation!

EXPORT DEPT. CABLE ADDRESS "HARRISORAD"

HARRISON RADIO CORPORATION
12 WEST BROADWAY, NEW YORK 7, N. Y.

January, 1949, *QST*, the tubes are at opposite ends. This way one tube has to be in an inverted position, but the doorknob doesn't seem to mind working upside down. Quarter-inch welding rod is used for the lines, and for the filament terminals as well.

Various antenna systems and methods have been tried, and they find little to choose from between Twin-Lead and coaxial lines. Using a 16-element array W4DPM was able to produce standing waves on his feedline by reflections from near-by objects. This worked so pronouncedly, in fact, that he flashed a 316-A over by aiming his antenna at a flat metal plate across the room!

One of their first major obstacles, that of measuring frequency accurately, was overcome by using a 955 detector in the circuit shown on page 114. This is sufficiently sensitive so that it may be used across the room from a low-powered oscillator, eliminating the need for coupling Lecher wires directly to the oscillator, with resultant possible detuning effects.

The doorknob oscillator described by the writer last month in *QST* has been tried out by quite a number of the 420-Mc. fraternity. W3NWJ duplicated it, but with 316-As in place of the 703-As used at W1HDQ. He says that the lines had to be shortened a bit to get the larger tubes to work in the band.

W2QNZ reports that there is some 420-Mc. activity in northern New Jersey, with some of the gang using 832 triplers and crystal control. K2AH, West Orange, has a converter feeding into a BC-348, which he says works fine on stable signals. W2BAV, Rye, N. Y., is reported to be on 420 with 100 watts and a 32-element array. W2JND, Syosset, L. I., is on 430 Mc. He says that he's been heard as far away as W2UCD, Belmar, N. J., and has worked W2FQW on several occasions.

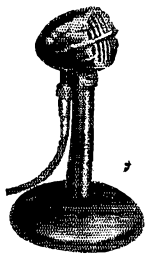
On the subject of polarization, W2VSA votes for vertical, on the grounds that it is simpler for the fellow who must use a nondirectional antenna. From our experience to date, however, anyone who uses a nondirectional antenna on 420 is doomed to failure, except on pure line-of-sight hops; that is, if the nondirectional antenna is a dipole. Stacked turnstile arrays for 420 Mc. should be within the capabilities of almost everyone, so we would rule out that consideration in discussions of polarization on 420 Mc. It has been suggested that horizontal be made the standard for 420-Mc. work, simply on a toss-up choice. Why change?

Out in Los Angeles, W6NLZ has transmitters working on 420, 1200, 2400 and 3300 Mc., leaving only 3 bands to go for complete coverage of the u.h.f.-s.h.f. amateur assignments.

Your conductor is working out on 420 Mc. every Wednesday night at 8 P.M., operating the rig continuously for 15 minutes, retransmitting the 8 P.M. W1AW bulletins, or otherwise modulating the January *QST* doorknob rig. A 16-element horizontal array is aimed at the Hartford area, but the direction will be changed for others on

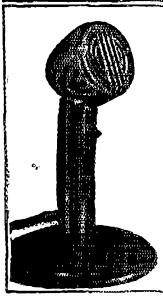
(*Continued on page 118*)

Now... ALL these popular Astatic microphones are available in models with CERAMIC ELEMENTS



JT CRYSTAL OR CERAMIC MICROPHONE

Quality performance in a handsome yet inexpensive instrument. Opalescent gray and chrome, complete with cable connector, detachable handle and interlocking base.



VELVET VOICE CRYSTAL, DYNAMIC OR CERAMIC MICROPHONE

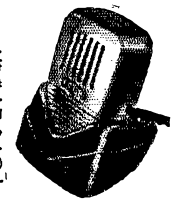
- Sparkling beauties in gold-finished case and handle, with dark brown, detachable base for convertibility to desk stand, floor stand, hand use.

- Interest has been rapidly spreading in Astatic's first two Mikes available with the amazing new piezoelectric ceramic elements. Countless amateurs have written for complete details on these new units, which are unaffected by extreme heat, humidity, cold or dryness. Consequently, Astatic has gone all-out in making available a complete range of choice in microphones with ceramic elements. In addition to their immunity to climate and the elements, the ceramic models parallel the performance qualities of Astatic crystal types, except for slightly lower output. Write for additional information.

THE Astatic CORPORATION
ASTATIC CONNEAUT, OHIO

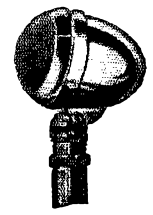
Astatic Crystal Devices Manufactured under Brush Development Co. patents

CARDINAL, CRYSTAL, DYNAMIC OR CERAMIC MICROPHONE



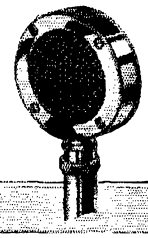
- A major new accomplishment in terms of quality performance at modest cost, has die-cast case in bright gold finish, compact to fit the hand, rests in streamlined CB case (as shown) or lies flat on felt-covered back.

T-3 CRYSTAL OR CERAMIC MICROPHONE



- An all-time Astatic favorite, still as modern in design as ever. A sparkling beauty in bright chrome, with tilt head. Available with Type S On-Off Switch.

D-104 CRYSTAL OR CERAMIC MICROPHONE



- First practical crystal microphone developed, with few changes still the top favorite of amateurs.

Wanted

... TRC1 equipment, T14 transmitters, R19 receivers, AM 8 amplifiers, PP13 power units.

Box 141 QST

RADIO and TELEVISION

Thorough Training in All Technical Phases
APPROVED FOR VETERANS
WEEKLY RATES — DAYS—EVENINGS
RCA GRADUATES ARE IN DEMAND
For Free Catalog write Dept. ST-49
RCA INSTITUTES, INC.
A Service of Radio Corporation of America
350 WEST 4th ST., NEW YORK 14, N. Y.

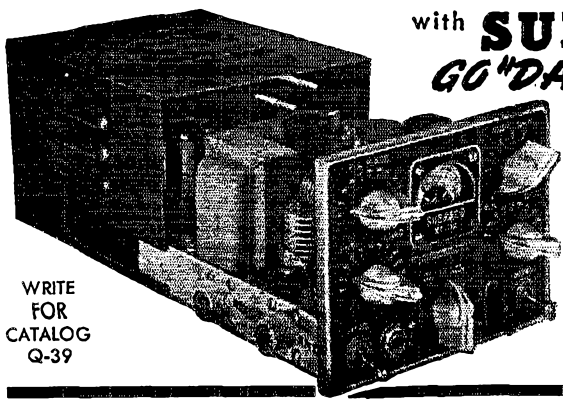
CRL

RADIO • ELECTRONICS • TELEVISION

ENGINEER FACULTY — Excellent Laboratory and Technical Facilities. *Limited Classes—Unlimited Opportunities.* DAY—EVENING CLASSES. CRL is Sponsored and under Technical Supervision of CRYSTAL RESEARCH LABORATORIES, INC. Licensed by Connecticut State Board of Education. Approved for Veterans.
Write today for Catalog and copy of Telecaster

SCHOOL OF ELECTRONICS, INC.
29 ALLYN STREET • HARTFORD, CONNECTICUT

EVERYTHING AT YOUR FINGERTIPS
with **SUBRACO MT-15X**
GO "DASHBOARD" MOBILE-



WRITE FOR CATALOG Q-39

ONLY **79.95** LESS TUBES

... with this completely new, compact, efficiently designed, 30 watt AM phone transmitter, small enough to mount in most glove compartments or under any dash. For complete details write or see the full page ad in August QST

SUBURBAN RADIO COMPANY
158 CENTRAL AVE. ROCHELLE PARK NEW JERSEY

request. Crossband schedules will be arranged with interested parties who may not be able to work two-way on 420. So far the only contact has been with W1HDF at Elmwood, 12 miles distant, over high intervening hills.

I.A.R.U. News

(Continued from page 54)

mandated territories and to British occupational forces operating properly-authorized stations, who are fully paid-up members of either the *R.S.G.B.* or one of the British Empire societies.

CHILE

Back in 1938 Chile was without a national amateur society, although there was a group known as the "Radio Club Friends of the Air." A national assembly of Chilean hams that year organized the society known as the *Radio Club of Chile.* In 1943 they received full government recognition and in 1947 the *Radio Club of Chile* became a member of I.A.R.U. Thus, they have just recently celebrated their tenth anniversary.

Their bulletin is growing, and now presents a good bit of technical information in excellent detail, even though the publication is in mimeograph form. The most recent copy received at I.A.R.U. headquarters, for example, contains a discussion of the "Transistor" and complete data on the design and construction of a rotary beam.

Hinks & Kinks

(Continued from page 56)

30 Mc., sharp tuning peaks in the mixer stage are regained without disturbing the oscillator frequency, and the receiver can be peaked for maximum sensitivity with decidedly less need for readjustment. In addition, the buffer presents a constant load to the oscillator, eliminating the trouble encountered in some receivers of oscillator failure in certain parts of the tuning range. No longer are dead spots encountered as the receiver is tuned through its range.

No doubt there is room for more experimentation on this subject, and it is hoped that others will be stimulated to make similar investigations along this line. — *Clyde P. Brockett*

Correspondence

(Continued from page 57)

it, because you didn't transmit it; and you didn't forget, because you didn't intend to give it. But since it is routine to send RST, QTH, and name, he actually thinks that he failed to copy correctly or that you forgot to transmit your name.

Now, from my standpoint, the term "OM" is every bit as personal and endearing as "Joe," "Tom," "Dick" or "Harry." When I call a ham "OM," it includes all the intimate feeling and consideration one ham can have for another. It is traditional in amateur radio to call each other "OM." It is one of those niceties peculiar to our group. It is a composite "handle" but, more important, includes the basic spirit of ham radio. It's an all-inclusive greeting to a fellow human who has common interests with you in the best hobby on earth. I'm proud to be called "OM." How about you?

— *Everett L. Battey, W4IA*

M.A.R.S.

(*Continued from page 55*)

quarters at San Antonio, Texas. Headquarters 4th Air Force, Hamilton Field, Calif., and 6th Army Headquarters, San Francisco, Calif., are arranging schedules for the Pacific Coast MARS broadcasts.

Constructive criticism of these broadcasts is invited by the Chiefs, MARS, and direct correspondence concerning the above by military personnel of any command is authorized. For Chief, MARS, USAF, the address is 4-C-1067 Pentagon, and for Chief, MARS, Army, 3-B-337 Pentagon Building, Washington 25, D. C.

The WAR broadcasts originate in the Pentagon with the option to use transmitters and accompanying rhombics at Ft. Myer or Battery Cove up to the operator. The keying is over a v.h.f. link with landlines as a stand-by.

For AF4AF, the transmission takes place from 701 Columbia Pike (on the Pentagon grounds) using a Collins 30K-1 or Millen 90810 with 500 watts input. The sky wires on 40 and 80 are Zepps and the 20-meter transmission is via a 3-element close-spaced beam oriented at 270 degrees.

Happenings

(*Continued from page 57*)

Heard W1RNT on 80 or 40 c.w. recently? She's the only YL ham at Hq., Eleanor Lyder, steno in the Advertising Dept. Eleanor applied for a job with us in November, 1947, completely unaware of what this "radio league" thing was. But the bug bit deeply and soon she was boning up for her license exam, which she passed last July. Right now she's showing her bosses, W1GS and W1VG, a thing or two about operating. She intends to get into traffic work, which she thinks is one of the best ways an amateur can perform in the public interest.

A.F.C.A. ANNUAL MEETING

The third annual meeting of the Armed Forces Communications Association will be held in Washington, D. C., March 28th and 29th, featuring the Navy's communications and photographic activities. Navy leaders and other distinguished Government figures will be the principal speakers at the banquet, following the first-day business meeting. The second day and perhaps part of a third will be devoted entirely to exhibits and demonstrations planned and directed by the Navy at its stations and aboard ships in the Washington area.

Strays

For the amateur and SWL who like to listen occasionally outside the amateur bands, the *World-Radio Handbook for Listeners* is an excellent international radio guide, with its listings of practically all of the broadcast stations of the world studded with interesting program and technical notes. U. S. representative is Ben E. Wilbur, 32 Whittlesey Ave., East Orange, N. J.

It Seems to Us

(Continued from page 10)

quencies is going to depend in large measure on our willingness to comply with these restrictions in letter and spirit. This initial arrangement is to test out an idea. If it works, we may expect it to continue and perhaps even to be modified further in our favor as time goes on. If it doesn't work, it will have to be modified the other way or abandoned entirely. It is up to us, therefore, to avoid crowding our luck by trying to sneak up on the power limitation and to take every precaution to see that we don't accidentally do anything which would have an unfortunate effect. Third, it seems to us that the availability of only 50 kilocycles in any given part of the country indicates the need for some intelligent application within amateur ranks. These frequencies should be used only by the fellows who simply can't put ten meters or six meters or two meters to use to accomplish the same result, or in some cases, perhaps, by the amateurs now on ten who are plagued with unusually severe TVI problems. Fourth, do not overlook the fact that at the time this is being written, the arrangement is *not in effect* but is only proposed. Do not "jump the gun" in getting on these frequencies but wait until you have conclusive evidence that it is permissible. W1AW will carry the facts in its official bulletins and information will be sent to all affiliated clubs, etc., when the authorization is granted.

— *A. L. B.*

An Arizona Kilowatt

(Continued from page 19)

herein won't give you a shoe box full of cards from choice DX, not all by itself, it won't. It takes operating skill, patience and know-how; and most of all you have to hear 'em before you can work 'em. The above-described rig won't do any of those things for you. But if you have all those things, and a full-grown 100-per-cent guaranteed cool-running legal-maximum-input one-kilowatt transmitter, what do you think you could do with it?

Yes, sir, you're right. You sure can!

Strays

Allen B. Du Mont Laboratories, Inc., has announced an informative 64-page publication, "The Cathode-Ray Tube and Typical Applications," which is available to instructors and those professionally engaged in the electronics field. Written in nontechnical language and profusely illustrated, the book's five chapters are devoted to c.r.t. history and development, construction, test-equipment applications, TV applications and radar uses. Copies are available without charge from the Technical Publications Office, Allen B. Du Mont Laboratories, Inc., 1000 Main Ave., Clifton, N. J.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, *in our judgment*, is *obviously non-commercial* in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

QSLs. 100, $1.50 up. Stamp for samples. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore 29, Md.

AMATEUR radio licenses. Complete theory preparation for passing amateur radio examinations. Home study and resident courses. American Radio Institute, 101 West 63rd Street, New York City.

QSLS? SWLS? "America's Finest". What's your desire? Samples, 10¢. QSL-Printer Sakkers, S8DED, Holland, Mich. "Made-to-order QSL Cards!"

CRYSTALS: Precision low drift units. Type 100A in 80, 40, and 20 meter bands. Two units plug in one octal socket. Plus or minus 5 Kc. One dollar each. Exact frequency. $1.95 ea. Rex Bassett, Inc., Ft. Lauderdale, Fla.

10-METER Beams, $19.50. Send card for free information. Riverside Tool Co., Box 87, Riverside, Illinois.

QSLS. Samples. Albertson, W4HUD, Box 322, High Point, N. C.

SURPLUS: Deluxe crystal finishing kits containing holders, quartz blanks, abrasive, etching fluid, complete instructions. $2.00 each postpaid. Formerly sold $8.75. Vesto Company, Parkville, Missouri.

QSLS! Quality cards priced right. Samples. Ferris, W9UTL, 1768 Fruitdale, Indianapolis, Ind.

QSLS! Kromkote cards at a fair price. Dauphinee, W1KMP, Box 219, Cambridge 39, Mass.

QSL'S, SWL'S. Finest stock. Fairest prices. Fastest service. Dossett, W9BHV QSL Factory, 857 Burlington, Frankfort, Ind.

LAPEL pins: your ham call letters engraved in white on black plastic, 1¼" by ⅜" with white border. 35¢ each, postpaid. G. Lange, W2IVQ, 34 Union Ave., Belleville 9, N. J.

PANELS, dials made to order. Gilpin, Box 638R4, Mt. Clemens, Michigan.

BEAM control cable, *new material*. Two #16; six #20 rubber insulated, coded, tinned conductors. Weatherproof rubber jacket. Heavy armor shield. ¼" diameter. Price 10¢ foot. F.o.b. Chicago. Trans-World Radio-Television Corporation, 6639 S. Aberdeen St., Chicago 21, Illinois.

FOR Sale: Prewar: 25-watt transmitter, Skybuddy receiver, many parts. Library. War surplus electronic keyer. Write for detailed list. Sold to highest bidder. Robert Butler, Box 147 Sta. A, Ames, Iowa.

OUR business: Buying and selling amateur radio transmitters. Transmitter Exchange, Wakefield, Rhode Island.

FRITZ QSLS, always excellent, all ways. 1213 Briargate, Joliet, Ill.

WANTED: Wireless equipment and literature prior to 1925; List ARRL Member Stations, Pink Sheet Supplement "Ban off" Oct. 1919 QST. Franklin Wingard, Rock Island, Illinois.

QSLS: Enamel finish cards, priced reasonably. Samples sent by return mail. The Rainbow Press, 816 Maple Ave., New Philadelphia, Ohio.

CHANGING frequency? Fine commercial units for ARC-3's, SCR-522's, police, taxi, aircraft, marine, geophysical, and other services, except amateur. Commercial regrinding; many crystals can be economically reground to new frequencies. Inquire. Over twelve years of satisfaction and fast service! Try us first. Eidson Electronic Company, 1802 North Third St., P.O. Box 31, Temple, Texas.

PERSONALIZED book matches. Call letters or name and address. Samples with prices. Miss Amanda Martin, Box 1123, Rochester 3, N Y.

WANTED: Teletype 1/40TH HP synchronous motor. W6ITH Moraga, Calif.

QSLS, SWLS. For distinctive cards, write to McEachron, 1408 Brentwood, Austin, Texas.

P.P. 4-125A Kw automatically tuned transmitter described in January-February 1948 CQ. Best offer. WØHMS 5217 44th Ave. S, Minneapolis 17, Minn.

FOR Sale: Gordon rotator complete with direction-finder, in perfect condition. Used 8 months. Lists over $300.00. Will sell for $125.00. W2MWV

HQ-129X, in perfect condition: $130.00 complete, with matching speaker. Millen exciter never used, complete with 10-meter coils, $30.00. H. Robison, 106 Pinecrest Drive, Pawtucket, R. I.

SELL: BC-312M with speaker, RA20 power supply, less dust cover, $65.00; BC454A receiver, AC operated, less power supply, $7.00; General Industries combination record changer and recorder, $24.00; Cinaudagraph 12-inch dynamic speaker, PE12-20A with T-58S72 output transformer, $15.00; Abbott TR-4, not converted to 2 meters, with tubes $20.00; new UTC S-41 power transformer, $8.00; One TU-5-B and TU-6-B tuning unit, $4.00 each; new T-20, $2.30; new 5-20 Henry swinging choke, 5000 volt insulation, $7.95; new filament transformer, 5 volts, 15 amps. 5000 volt insulation, $4.00. F.o.b. Charlotte, N. C., C. Merrell, W4EPA, 2019 Crescent Ave.

ALUMINUM tubing, angles, channels and pipe. Write for list. Willard Radcliff, Fostoria, Ohio.

SUPREME AF-100, like new, AM-FM, 150 w. input worth $550, will sell $350.00, F.o.b. Dallas. W5DA, 4425 Bordeaux, Dallas 5, Texas.

WANTED: Used HT-18. State condition, age, price, etc. Harold F. Cushing, 169 Mayflower St., Elmwood 10, Conn.

SELL: New G-C Gardiner code sender with ten tapes, for $14.00. W9EJS, Crossville, Illinois.

PE103 Dynamotor wanted. Will pay $12.95 if it works and is complete. W7MKL, 2110 Park Place, Cheyenne, Wyoming.

SWAP: Plate transformer Electro Engineering dry type with Hipersil core. Secondary 3000 or 2500 volts Dc at 2 amps or 5000 volts, 1 amp bridged. *Primary 230 volts 60 cycle.* Also pair of 782A's and pair of 450TL's used a few hours. Sell all for $150.00 or swap for good used communications receiver. All letters answered. A. J. Schwemin, 5415 Holland St., Oakland 1, Calif.

WANTED: Teletype machine for amateur use. Willing to pay premium price in order to have immediate delivery. Please state model number and price. W1CVC, 446 Anson St., Bridgeport 6, Conn.

FOR Sale: Collins 75A receiver 6 months old, and in excellent condition. The first check for over $300.00 gets it. Howard Klingbeil, WØFPW, Bottineau, N. Dakota.

HEY Fellas! Got any parts you're not using? Such as revrs, complete xmitters, parts, etc. Why not sell them to us? This may be your chance to get some needed cash. Don't delay. Send for our catalog listing the parts we are buying. Kindly remit quarter (refundable) to cover cost, handling, and mailing of lists and equipment blanks. Your info is waiting. May we serve you? Radio Exchange, Box 215, Bayonne, N. J.

TRADE or sell miscellaneous dark-room photo equipment for Hallicrafters SM-40 S meter. Write: Larry Pyle, Chappell, Nebraska.

QST from '35 to '42 most complete. Also Radio, 1937 through March 1942. KH6DU.

NO more wires! Be first in your city to build and repair rigs by new Printed-Circuit methods. Kits of air-drying conducting and resistance paints and manual; Standard $3.00; Super $5.00 (with silver paint). Manual separately, 25¢. Free literature. Microcircuits Company, Dept. 3F, New Buffalo, Michigan.

MAKE AN OFFER: Two power supplies, complete, practically new parts, 1500 volt 300 Ma., 500 volts, 200 Ma. New all bands Bud antenna and final coils, 500 watts with condensers. Six new meters, bug, straight key, BC458A, five dials, variable bias transformer, ten spare tubes, accessories. Walter Berke, 378 Alphonse St., Rochester, N. Y. W2OZB.

VFO September 1946 QST model with gray steel rack panel, ACN dial, stable. $45.00. Leo Liebl, W9NVS, Medford, Wisconsin.

WANTED: Harvey UHX 10 transmitter, all coils, 160 to 10, in good condition and working order. State price and write J. A. Seividge, WØOMG, 1103 Gardner St., Poplar Bluff, Mo.

FOR Sale: Brand new Hallicrafters S-36. Will accept best offer. Wunderlich Radio Co., 1337 Fargo Ave., Chicago 26, Illinois.

BARGAINS: New and used transmitters, receivers, parts. Globe King, $299.00; New 150 watt phone, $199.00; 60 watt phone, $99.00; Globe Trotter, $57.50; 10 Meter (Ac.) beam rotator, $23.97; Abbott TR-4 $24.50; HT-9, $295.00; MB-611, $49.00; Silver 701, 800, 801, 802, $29.50 ea.; NC-173, SX-28, $149.00 ea. HQ-129X, HRO, $139.00 ea.; RME-45, SX-25, $99.50 ea.; RME-9D, $39.50; SX-24, $75.00; BC-348, S-40 $65.00 ea.; S-20R, $49.00; NC-44, S-38, $35.00 ea.; many others. Large stocks, trade-ins. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Labs, Council Bluffs, Iowa.

SELL S-40A revr perfect condition, used less than 10 hours, $75.00. W. A. Eubanks, K2AJ, 1941 East 29th St., Brooklyn 29, N. Y.

COLORTONE OSLS. Snappy! Bright! Different! Modernistic designs! Cartoons! Rainbows! Photographic! A Big Variety. Samples Free. "No junk". Colortone Press, Tupelo, Miss.

SELL PE-103 dynamotors, six new, complete, sealed in original overseas moistureproof crates, $14.50 each. Six new BC-223-AX transmitters with diagrams, good for commercial and pleasure marine transmitters when converted, $18.50. HRO receiver and power supply 1.7 to 30 Mc. general coverage and ham band spread coils, $95.00. James Millen frequency standard, $45.00. Hallicrafters HT-7 frequency standard, $15.00. Howard 437-A communications receiver .55 to 43 Mc., $35.00. Eight 2000 volt 8 μfd. oil condensers, new, $3.90 each. WØKEG, 1124 Parkway, El Monte, Calif.

SELL: S-40A, needs work, $50.00. J. S. Hurst, 5369 Bancroft Hall, U. S. Naval Academy, Annapolis, Md.

CASH for a good receiver and commercial transmitter. Sell good 300 W modulation, driver, speech, power supply, from WHIZ, complete, $130.00. Good kilowatt phone final, power supply, 810's, five HDVL, five BVL coils, $130.00. Ten transformers, two new 1800–3600 volt D.C., 8A, $70; six foot sectional cabinet, new panels, two chassis, $35.00. Good HQ-120X, with speaker, $100. Bargain box, hundreds of parts including 18-inch G-E electric clock, 9 new xmttg tubes, many variables, coils, condensers, six Triplett meters, modulated signal generator, new BC457A, converted, BC455, converted six volts, etc. $50.00. Write for details. Harold Ramsey, W8TGU, Bethesda Hospital, Zanesville, Ohio.

SELL complete Kw station including near new NC-240D with BC453 QSer, $195.00. Never used D104 mike and stand, $12.00. Two high voltage supplies 3000 v. 3500 v, 4000 v. @ 600 Ma., $80.00. 1750 v. @ 300 Ma., $25.00. BC221 VFO exactly as in March '47 QST, $55.00. 25 watt speech amplifier (Atomite), $25.00. PP805's modulator unit (Transformers KW RCA surplus modulation, 500 ohm input and HD filament) extra pair 805's new $30.00. Well built exciter unit 6L6–807–811 including dual 500 v. and 1000 v. supply plus 117Z6 bias supply, only $40.00. Final amplifier 304TH, input tank, National HD condenser, National NC800 neut. condenser, B&W HD swg. link and 20 meter coil; Sangamo 12000 v. bypass condenser, 3 meters, $35.00; Antenna tuner unit HD National and B&W, $10.00; PP motor and 2 small sylsyn motors plus four 12" x ⅛" and eight 12" x ¾" aluminum tubing, $25.00. Details by mail, all guaranteed. Take all @ $500 and get many extras. Don Sarin, WØZFK, McCook, Nebraska.

SELL: KW plate transformer, 100-watt all-band transmitter. Butterfly tank condenser. Q5er, 808's, 829B; Miscellaneous parts. W5FSS, Box 184, Tylertown, Miss.

FOR Sale: Allied 20 watt Hi-Fi amplifier, $40.00; HT-19 transmitter, $250.00; SP-400X receiver, $270.00. This equipment is practically new. Box 5851, Cleveland, Ohio.

HEARING Aids: Brand new, latest printed circuit nationally distr. aid, $49.50 complete. 7-day money back trial. Used 2 PC working condition, $14.95. Others complete but needing minor repairs. $4.95. Payless, 19 South 4th, Minneapolis, Minn.

TRANSATLANTIC link-up! Britain's top radio monthly, "Practical Wireless", keeps you informed on British-European radio-television developments. Experts contribute regularly. Latest details "ham" activities. Special television features. Detailed analyses transmitters, receivers, etc. For annual subscription (12 issues direct to your address from London) send only $2.00 to publishers American office: George Newnes, Ltd. (PW31), 342 Madison Avenue, New York 17, N. Y. Two years, $3.75.

MILLEN Exciter, coils for all bands, $32.00. Power supply for exciter (rack mounting), $35.00. Senior Instructograph, 10 tapes and built-in oscillator for 110 V AC, $22.00. Wilcox CW-3, converted 6V6 final, coils, $12.00. All like new condition. What am I offered? George Miller, 415 MacArthur, Warner Robins, Georgia.

24 Hour service on QSLS, SWLS. W1HJI, Box 32, Manchester, N. H.

FOR Sale: Hallicrafters SX-25 complete with speaker, excellent condition. Best offer. W. Charin, 312 Garden Lane, Chickasaw, Ala.

SALE: Super-Pro 1946 SP-400 SX 1.25–40 Mcs, excellent condition, Grey $225.00. W3KFA, Mechanicsburg, R.D. #1, Penna.

QSL'S, SWL'S. Quality stock W5OXL, 1417 No. 36, Fort Smith, Arkansas.

HALLICRAFTERS S-40A for sale, in excellent condition. $65.00. Edward B. Perry, 85 Mechanic St., Westbrook, Maine.

VHF-152A for sale. Four months old and in fine condition. $65.00. W1RNJ/1, Box 490, Holy Cross College, Worcester, Mass.

SELL: 2000 v. 450 Ma. complete power supply, mounted on 17 x 13 x 3 chassis and including 19 x 19 standard rack panel. Also have Meck T-60 xmttr, complete with coils, 810 tube (new), S40-A receiver with "S" meter. For further details phone or write Don Baker at 926 Francis, Jackson, Mich. Phone 2–8593, W8CVA.

SELL: Used tubes: 833's, $5.00; 845's, $1.50; 872's, 50¢; 805's, $2.00. W5AQC, c/o KFRO, Longview, Texas.

NEW YORK City and suburban area, Hallicrafters SX-25 with matching speaker cabinet new condition, bought in 1946 for sale: $70.00. H. I. Griffiths, 39–82 65th Place, Woodside, L. I., N. Y. Illinois 7–1549.

CRYSTALS: 100 Kc. Guaranteed perfect. Manufactured by nationally known company. Complete with holders. ½" pin spacing. $2.95, postpaid. Art A. Johnson (W9HGQ), 1117 Charles St., Rockford, Ill.

SELL: DB20, pre-war model; Q-5'er (BC453-A), with power supply. W1VG, 99 Bentwood Road, West Hartford 7, Conn.

DYNAMOTOR: Electric Specialty Co. 1/5 horsepower AC input, 400 volts, 250 Ma output. Peak preselector, (2-stage.) Best offer takes it. A. Lukach, 292 Madison Avenue, New York City, N. Y.

SUPREME #589 tube and battery tester, also Abbott MRT-3 transceiver for sale or trade, plus cash for amateur transmitter or receiver. G. H. W. 91 Lexington Ave., Providence 7, R. I.

SELL QSTs 1943 through 1947, five year run. Make offer. Joseph B. Milgram, 952 East Nineteenth, Brooklyn 30, N. Y.

SELL: Temco 75GA, 100 watt transmitter complete with microphone, stand and Vibroplex key for $325.00. Also Hammarlund SP40X Super-Pro, rack mounting complete with power supply and speaker for $250.00. All items like new. Rimsky, 1952 North Madison, Pasadena, Calif.

OLD copies of QST for sale: November 1926; March, June, September, 1927; January, February, March, April, June, July, August, Oct. Dec. 1928; January, February, March, April, November 1929. For sale 25¢ each. James F. Hanratty, 38 Fountain St., S.F., Calif., W6FHX.

WANTED: National HRO-7 or NC-183. W8WFV.

LONG ISLAND Hams! Harrison's Jamaica Branch. Easy parking. Hank Fank, W2KYV, to assist you!

FOR Sale: Hammarlund Super-Pro model SP-400-X, less speaker, like new. $265.00. W1ALW.

COMPLETE station at W1QEU. HQ-129X, 450 watt fone and cw rig; all like new for $400.00. Write for details: P. B. Forget, W1QEU, 11 Wayne Street, Manchester, N. H.

SURPLUS: Deluxe crystal finishing kits containing holders, quartz blanks, abrasive, etching fluid, complete instructions. $2.00 each postpaid. Formerly sold $8.75. Vesto Company, Parkville, Mo.

FOR Sale: Half-kilowatt CW and phone transmitter. Seven 12 x 20 chassis; two power-supplies, modulator, crystal exciter, buffer, final, antenna tuning unit, all in vertical stack, and separate speech amplifier. Built just before war. Disassembled in 1942. Needs rewiring between units. All high-grade components. Offered as is to anybody who can come and look at it and make an offer. W1GS, 53 Westwood Road, West Hartford, Conn.

DON's QSL's. "The finest". Samples. 2106 South Sixteenth Avenue, Maywood, Illinois.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Millen, Sonar, Meck receivers, transmitters, etc. Reconditioned S-38, $35.00; S-40, $59.00; S-53, $59.00; NC-46 $59.00; DB-20, $29.00; VHF 152A, $69.00; RME-45, $99.00; HQ-129X, $139.00; Meck T-60, $89.00; DB22A, HF-10–20, RME-84, SX-43, SX-42, S-20R, SX-25, SX-28A, HT18, HT9, BC610, NC57, NC173, NC183, HRO7, NC240D, other receivers, transmitters, VFO's. Easy terms. Shipped on approval. List free. Write. Henry Radio, Butler, Mo.

SELLING out ham equipment: Two 1 Kw 'phone transmitters, complete with tubes; four smaller transmitters, 200 to 500 watts; 500 watt speech amplifier, and modulator unit; 750-watt AC generator; spare plate and modulation transformers. All must go. Bargain prices. W5HXC, Box 109, Blackwell, Okla.

WESTINGHOUSE 18A mobile transmitter, 18B receiver, dynamotor, $25.00 plus postage. C. Sleeter, 11 Saratoga Drive, Schenectady, N. Y.

PRESTO K-8 recording equipment in A-1 condition. Turner 211 mike. Best offer over $175.00. F.o.b. Pasadena. W6ZBV, 1439 Topeka St., Pasadena, Calif.

REVOLUTIONARY copyrighted principle. "Rhythmic Sound Sending". Relieve strain, increase speed, develop "tape-like" fist. $1.00 postpaid. Richard D. Thayer, 32 Merrick St., Worcester, Mass.

AN/ART 13, complete good used condition, less dynamotor and low frequency unit. Best offer. W6RWS, 26 East Selby Lane, Redwood City, Calif.

LATEST Meissner signal shifter, all bands with FM added. Same as new. Eighty dollars. Come and see. W1OCL, Herb Cooper, 431 Walnut Ave., Roxbury, Mass.

HAMMARLUND HQ-129X, month old, used but a few hours. Perfect, with matching speaker, $149.00. Al Williams, W7HYA, 31d Victory Heights, Spokane, Wash.

SELL Super-Pro 1.75–40 Mcs. Grey finish. Cooke standard and Millen R9ER. What is your offer? J. Ditmer, Mechanicsburg, R. D. #1, Penna.

SHURE Unidyne dynamic microphone and 25 ft. cable, new, $30.00. Trim featherweight earphones, $4.00. New HK354E, $4.00. W7FTO, 401 West Evelyn St., Lewistown, Montana.

FOR Sale: QSTs, Aug. 1924 through 1948. First 2½ years bound without ads. Next 5 years stripped for binding adless; balance complete copies. Clean. Two months missing. Fine run. Best cash offer, plus shipping. Homer Davis, 1125 Madison St., Evanston, Ill.

WANTED: BC342, 312, or 348. Larry Hardin, W2YWG, 302 Stewart, Ithaca, N. Y.

FOR Sale: QST 1931 to 1948 inclusive. Jan. 1933, 1936, missing. $2.00 per year, plus postage. C. C. Gorauch, 2158 W. 122nd St., Blue Island, Illinois.

WANTED: To correspond with amateurs having information concerning instruction for a transceiver. Walter Miller, 189 Maple Ave., Blairsville, Penna.

FOR Sale: HT-9 transmitter, postwar model, coils, xtals 10, 20, 40 meters, and Millen VFO, $250.00. W8QPV, E. Blazy, 11908 Dove Ave., Cleveland, Ohio.

BC221 frequency meters with calibration book, spare tubes, $35.00 with modulation, $45.00. Hays Sneed, W5RY, 643 Eagle Ave., Jackson, Miss.

QSLS? SWLS? Glossy, distinctive. Samples. Narvestad, Granite Falls, Minnesota.

WANTED: Panadaptor. State condition and price. Cash or trade. D. W. Rowe, W9BPU, Box 73, Bloomington, Ill.

WANTED: Electro-Mechanical EM-100 modulator. W1BVR, 37 Broad Street, Westfield, Massachusetts.

SELL: Millen Variarm VFO, like new, complete, $30.00. Also Hallicrafters R-42; bass reflex speaker, $20.00. All letters answered. W2HTA, 17 Poplar Street, Ridgefield Park, N. J.

CRYSTALS: Precision, low drift, mounted units: 3500 to 9000 kilocycles ± 5 kilocycles, $1.00. Exact frequency, $1.50. Specify mounting. Quotations available for other frequencies. Breon Laboratories, Williamsport, Penna.

SELL: BC-342-N in good condition. W1MUW, 510 South Quaker Lane, West Hartford, Conn.

RECEIVER: NC-100ASD, new 10-tube super 200–400 and 1300–30,000 Kc with speaker, $80.00. Instructograph, new electric, 10 tapes, oscillator with speaker, $28.00. W2ZPM, 28 Bancker St., Albany 3, N. Y.

SELL: 2 Kw 115-volt 60 cycle power plant, six horse Briggs motor, voltmeter, frequency meter, watt-hour meter, overload breaker and field rheostat. In perfect condition, $200.00. F.o.b. Daytona Beach, Fla., W4ASR.

QSLS, SWLS, quality cards. Jaggi, W5FAY, 6117 Goliad, Dallas, Texas.

HT-9 transmitter, complete with all coils, crystals and extra tubes like new. Best offer over $250.00 takes. WØBOG, 3818 Pleasant, Des Moines, Iowa.

THREE element ten-meter beams. $10.95. Mark Products, Box 814, Evanston, Illinois.

QSL's: former W7JPX QSL cards again available from new location and enlarged plant with same top quality at same low prices. Stamps for samples. Leonard's Print Shop, 854 View, Hagerstown, Md.

SELL: 1946 Hallicrafters S-20R, with audio jack, FM tuner, $55.00. Andrew J. Billingsley, Box 711, Norwich, Conn.

BC610 and speech amplifier, in perfect condition, modified for all bands, $550.00. Spare set of tubes, $50.00. Gasoline generator 110v 2500 watts, perfect condition, $150.00. W4FZN, Fairhope, Ala.

FOR Sale: HQ-129-X, complete with Hammarlund matching speaker. In excellent condition, $105.00. John H. Johnson, 914 12th St., Lawrenceville, Illinois, W9IAR.

RCA AR88 communications receiver. Navy model like brand new. Want offer around $200.00. Jack Kaiser, 817 Forest Ave., Los Angeles, Calif.

SELL: 500-watt cw rig, commercial Millen exciter (6L6-807), pp 813's, all cets metered, B&W coils for 80, 40, 20 in 40 inch Par-Metal cabinet, $125.00. HQ-129X with spkr and FS-135C, $125.00. WØOXH, R. W. Crain, 1217 East Burlington St., Iowa City, Iowa.

3D23 (TB 35) beam tetrodes, 180 watts input on cw with 5 watts drive. 250 watts input to pr on phone with 5W drive, full ratings to 250 Mc; $7.00 pr. Al Williams, W7HYA, 31-D Victory Hts, Spokane, Washington.

WANTED: Used equipment cheap. Recorders, wire, tape, perforator, good receiver. Test equipment also. W. H. Burkhalter, 5749 Craner St., North Hollywood, Calif.

BC-375 100-watt transmitter, complete with all seven tuning units and instruction book. Brand new, in factory cartons: $42.50. David Carson, 316 Lee, Iowa City, Iowa.

SALE: Five Super-Pro receivers: $125.00 and up. RCA Marine rcvr., 70 to 515 Kc; make an offer. Teleplex code machine with five tapes, $20.00. Prop-pitch rotator, $15.00; Rotator motors, $5.00. Riders manuals, $12.00 each. BC696, $15.00. Alfred Livingstone, W2QPN, 12-01 Ellis Avenue, Fair Lawn, N. J.

TRADE Collins 75A receiver for best deal on Leica or Contax outfit, or best cash offer, or jeep. W4AIS.

GON-SET 10-11 meter converter, $25.00. In new condition. W2TG/1, Route No. 1, Newport, New Hampshire.

COMPLETE Station for sale: NC-240-D, HT-9, 1 crystal mike; 1 key, 1 bug; 1 three element 10-meter beam; 1 Boomerang monitor; assorted small parts. Sacrifice: $630.00. F.o.b. Manhattan, Kansas. WØZZL. Mrs. Oliver Ward, 427 Colorado St.

BC-610-D converted for 10. Tuning units and coils, speech amplifier, complete complement of tubes, spare 250TH. Has approximately 50 hours on it. A good buy for the first $450.00 presented. Hank Carey, ex-OA4CC, 3612 S. W. 3rd Ave., Miami, Fla.

SELL or Swap: Army Super-Pro .540 to 20 Mc. Best cash offer or television receiver. W2QQV, 1806 Sterling Place, Brooklyn, N. Y.

SELL: S-40A, $60.00; DB-20, $30.00; RME MB-3 Boomerang, $15.00. All in good condition. F.o.b. Ness City, Kansas. WØHYF, Keith Dannofer.

WANT stamps and camera for radio gear. What do you need? WØFUB, Grove, 3430 E. Ave. NE, Cedar Rapids, Iowa.

SELL: Collins 75A-1, $300; Collins 310B-1 exciter, $150; F.o.b. Miami, Fla. In perfect condition, used only a few days. Bought directly from the factory. In original cartons. W4FNQ.

HRO for sale: complete with power supply and National speaker, 6 coil sets (2 broadcast, 4 band spread), recently realigned by National, $175.00. W2YOJ, Vic Crawford, 34-09 83rd St., Jackson Heights, L. I., N. Y. or phone Newtown 9-2304.

WEBSTER 80 wire recorder, in perfect condition. A sacrifice at $100.00. W2VHO, 71 Crosshill St., Staten Island, N. Y.

MEISSNER Deluxe shifter, all bands, $40. Will swap for BC221. WØMTM, J. Mitchell, 434 Edmund, St. Paul 3, Minn.

SELL new 2-meter beam, TBS-50 xmttr, 10-meter mobile rcvr, BC-348 converted, VHF-152, and TV boosters. Best offer. All letters answered. Milt, W5KIE, 713 Woodland Court, Hattiesburg, Miss.

SELL: HQ-129 X with speaker, excellent condition, $125.00. Fred Weimann, 28 Center Drive, Franklin Square, L. I., N. Y.

HAMS! Your call embossed on aluminum plate 2¼" x 6", highly polished letters 1¼" high, black background. Exact fit in place of front panel insert on BC-348. Suitable for mounting on panel, auto, desk, etc. Save: order two or more. One $1.50, additional order 50¢ each. R. West, W8APY, R. 3, Box 295, Urbana, Ohio.

NATIONAL 1-10 recvr, factory spkr and power supply, $60.00; Ansco Speedex camera, F4.5 lens, 1/250 sec shutter comp. with carrying case and sun shade in perfect condx. $30.00. Trade or sell the following: BC-645, xfrmrs, chokes, and filters. L. M. Blum, 2661 Dibblee Avenue, Columbus 4, Ohio.

SELL: BC-348P receiver, converted Ac, BC-375E xmttr, 7 tuning units, dynamotor, antenna unit. All for $85.00. 14571 Round Valley Dr., Sherman Oaks, Calif.

SWAP or sell: Scott SLRM receiver, perfect condition, for 7" or 10" television set or cash: $100.00. Mitchell M. Rosenbaum, 2314 Enright Rd, Far Rockaway, L. I., N. Y.

FOR Sale: 1 Sonar VFX 680, $50.00. W2MIE, P. O. Box 365, Seaford, L. I., N. Y.

USED open frame relay racks. W. E. drilled, 6 ft. high, 100 lb. shipping weight, $8.50 F.o.b. Boston. Also NC-101X, in excellent condition, $60.00. W1IBY, H. Gordon, 12 Sunnyside Ave., Wellesley, Mass.

500 WATT Fone 600 watt CW rack and panel xmttr, $350.00. New Hickok 288X signal generator, $139.50. Inquiries desired from surrounding area. WØZHJ, 3119 Que St., Lincoln, Nebraska.

NATIONAL NC-173, less speaker, condition perfect, $100.00. New Simpson 2-inch square, one ampere RF meter, $3.00. W5AVO, 401 Dryades Street, New Orleans, La.

Subscriptions, Radio publications a specialty. Earl Mead, Huntley, Montana. W7LCM.

OSCILLOSCOPE: Dumont 224. Sell or swap. T. M. Conte. W4JRL, 2117 Ginter Street, Richmond, Va.

QST — Complete file from January 1932 through December 1947. Sold only as a unit. Make best offer. Mrs. Elmer Sweeney, 401 South Kensington Ave., La Grange, Ill.

SALE: Hickok Model 195 oscilloscope. Used 2½ hours. Guaranteed new. $125.00 or best offer. W7IYD, P. O. Box 475, McCammon, Idaho.

COLLINS for sale: no time to operate. Collins 32V-1, $400.00. Collins 75-A receiver, $300.00. Also, VHF152-A for $65.00. Dr. M. L. Redman, WØENK, Fargo, North Dakota.

SELL: NC-240CS complete, excellent condition, $175.00. W. Gago, W9FVU, 743 S. Highland Ave., Oak Park, Ill.

SELLING out: Send for complete list. W8WDR, 202 E. Philadelphia, Flint 5, Mich.

DIGNIFIED QSL's! G. L. Taylor, Sumrall, Miss.

FOR Sale: QSTS: $2.50 per year plus postage. 1921; 1925 through 1929; 1931 through 1943; 1939; 1940 through 1945; 1948. Mrs. T. Hoffmann, 47 Lynwood Ave., Wheeling, W. Va.

BARGAINS: For sale, HT-9 transmitter complete with four frequency channels: 80, 20, two 10-11 meter with seven crystals. On air at present. Three years old; used intermittently; perfect condition. Priced for immediate sale: $200.00. You pay the freight. W4IOQ, 1314 College Avenue, Fredericksburg, Virginia.

COLLINS 75A receiver, $300.00. 60-watt fone/cw transmitter with Meissner VFO. Completely enclosed and metered, $115.00. Leaving country. W2TWK, 61 Hart St., Brooklyn 6, N.Y.

SELLING new National HFS receiver complete with power supply, costs $162.00 sell for $110. New Harvey-Wells TBS50A transmitter complete with factory power supply, costs $160.00 sell for $110. New National TV-7 receiver with antenna $135.00. Model MJ-9 Browning frequency meter, $40.00. Sonar XE-10 FM exciter, $25.00. Butler 10-11 converter, new, $25.00. Butler 10-11 mobile transmitter complete, tubes, antenna, and PE-103 dynamotor, $50.00. Navy RBL-3 receiver $40. ARR-5 receiver with power supply and speaker, $70.00. RCA 1-Kw modulation transformer $10. BC-1068-A receiver, $25. Write Joe Tabor, W8AES, 20420 Riopelle, Detroit, Michigan.

SELL or swap: 4 new ceremonial swords in sheaths, from Java and Siam. Nice souvenirs to hang on shack wall. What's offered? WIKX.

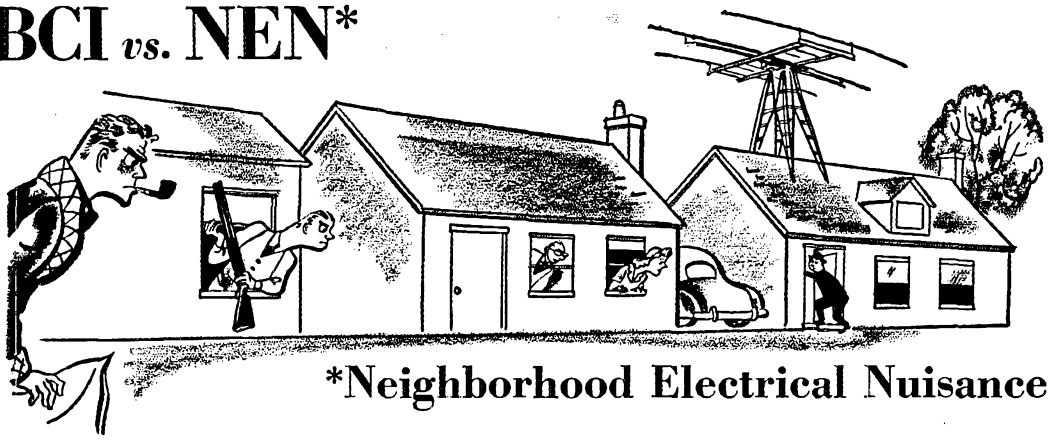
OREGON only. Our radiotelegraph code practice machines, model RCM-1, now available on monthly rental basis. Tapes designed for FCC preparation, Advanced, Beginners. Oswego 2-5011 or write Ultradyne Electronics, Oswego, Oregon.

QSLS: Enamel finish cards, priced reasonably. Samples sent by return mail. The Rainbow Press, 816 Maple Ave., New Philadelphia, Ohio.

Index to Advertisers

MALLORY HAM BULLETIN

BCI *vs.* NEN*



*Neighborhood Electrical Nuisance

Unfortunately, it only takes one case of BCI for the neighborhood Ham to become the scapegoat for every complaint of electrical disturbance in his neighbor's radio set.

It seems to be human nature, as soon as the sky-wire goes up with its distinctive zepp feeders, or the beam is seen with its multiple elements, to blame the amateur for every neighborhood electrical nuisance, whether it be the air compressor at the corner filling station, the diathermy machine at the hospital down the street, or the oil burner next door.

This is a sad state of affairs, as most of us have found through bitter experience. It not only subtracts considerably from the enjoyment of our hobby, but also, it may result in strained relations with the non-technical BC set owner who lives next door or across the street.

Generally, under such circumstances, the burden of proof lies entirely with the amateur. It is usually up to him to initiate action for elimination of the interference, or he must be prepared to suffer the indignities of blame for its generation regardless of its true origination.

As an aid to the ham who is confronted with a problem involving a neighborhood electrical nuisance, Mallory has available for the asking an informative technical booklet entitled "Practical Radio Noise Suppression", which takes up in detail the generation, transmission and suppression of electrical noises resulting from the operation of motors, electric signs, fluorescent lights, oil burners and appliances. This booklet is a worthwhile addition to the amateur's library and may be had by addressing a card to P. R. Mallory & Co., Inc., Box 1558, Indianapolis 6, Ind.

Your copy of "Practical Radio Noise Suppression" is another example of the thoroughness with which the Mallory Engineering Staff operates . . . not only as a technical information bureau, but also as a designer of Precision Radio and Electronic Parts.

Watch future Mallory Ham Bulletins for useful and practical technical information. In the meantime see your Mallory Distributor for Mallory Precision noise-filters, ham band switches, controls—rheostats —potentiometers—pads, tubular capacitors, transmitting capacitors, dry electrolytics, dry disc rectifiers, vibrators, and vibrator power supplies—practically every component you need to keep your rig in A-1 shape.

P. R. MALLORY & CO., Inc.
INDIANAPOLIS 6 INDIANA

P. R. MALLORY & CO. Inc.
MALLORY

Make Your Hobby Into a GOOD PAYING JOB

Do you know over 50% of Broadcast Station Engineers started as hams? You can become a Broadcast Engineer *easily* — if you hold an FCC 1st class *Commercial* operator's license. Many other new jobs now open to FCC *Commercial* license holders. I can train you to pass your FCC *Commercial* License Exams in a few short weeks. My time-proven plan can help put you, too, on the road to success. I'll send you the entire story free of charge. Mail coupon for full information today.

EDW. H. GUILFORD, *Vice-President*

YOU, too, may EARN $3,000 to $7,500 yearly

ADD TECHNICAL TRAINING TO YOUR HAM EXPERIENCE AND

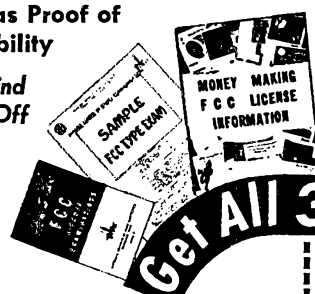
Get Your FCC COMMERCIAL RADIO OPERATOR LICENSE *in a Few Short Weeks*

It's EASY if you use CIRE Simplified Training and Coaching AT HOME in SPARE TIME

Get your license easily and quickly and be ready for the $3000 to $7500 jobs that are open to ticket holders. CIRE training is the only planned course of coaching and training that leads directly to an FCC *Commercial* license.

Your FCC Ticket Is Always Recognized in All Radio Fields as Proof of Your Technical Ability

CIRE Graduates Find FCC License Pays Off



"I now hold ticket P-10-3787, and holding the license has helped me to obtain the type of job I've always dreamed of having. Yes, thanks to CIRE, I am now working for CAA as Radio Maintenance Technician, at a far better salary than I've ever had before. I am deeply grateful." *Student No. 3319N12*

"I was issued License P-2-11188 on November 4. The next day I was signed on board a tanker as Radio Operator-Purser. Besides radio operating, I handle the payrolls, etc., which is all over-time and brings my monthly pay up to between $500 and $650." *Student No. 2355N12*

CLEVELAND INSTITUTE OF RADIO ELECTRONICS
Desk QT-3 • 4900 Euclid Bldg. • Cleveland 3, Ohio

Get This Amazing New Booklet

1. TELLS OF THOUSANDS OF BRAND-NEW, BETTER-PAYING RADIO JOBS NOW OPEN TO FCC LICENSE HOLDERS.
2. TELLS HOW YOU WILL BENEFIT BY HOLDING AN FCC COMMERCIAL LICENSE.
3. TELLS HOW YOU CAN GET YOUR FCC COMMERCIAL RADIO OPERATOR LICENSE IN A FEW SHORT WEEKS—EASILY AND QUICKLY, BY USING CIRE SIMPLIFIED TRAINING AND COACHING AT HOME IN YOUR SPARE TIME.
4. TELLS OF HUNDREDS OF OUR SUCCESSFUL STUDENTS WHO NOW HAVE LICENSES AND NEW, BETTER-PAYING JOBS.
5. TELLS HOW WE PREPARE YOU TO PASS THE NEW FCC COMMERCIAL LICENSE EXAMINATIONS, WHICH NOW INCLUDE FM AND TELEVISION.
6. TELLS HOW WE GUARANTEE TO TRAIN AND COACH YOU UNTIL YOU GET YOUR LICENSE.
7. TELLS HOW WE HELP YOU TO GET A BETTER-PAYING, LICENSED JOB, WITH OUR FREE AND EXCLUSIVE SERVICE, WHICH PREPARES YOUR EMPLOYMENT APPLICATION FOR MAILING TO HUNDREDS OF EMPLOYERS, INCLUDING FM, AM AND TELEVISION BROADCAST STATIONS, RADIO MANUFACTURERS, POLICE RADIO STATIONS, AND RADIO EQUIPPED TAXI, BUS AND PUBLIC UTILITY COMPANIES.

Get All 3 FREE Send Coupon Now!

CLEVELAND INSTITUTE OF RADIO ELECTRONICS
Desk QT-3 • 4900 Euclid Bldg., Cleveland 3, Ohio
(Address to Desk No. to avoid delay)

I want to know how I can get my FCC *Commercial* ticket in a few short weeks by training at home in spare time. Send me your FREE booklet, "Money Making FCC License Information," as well as a sample FCC-type exam and free booklet, "How to Pass FCC *Commercial* License Examinations." (does not cover exams for Amateur License.)

Name .....

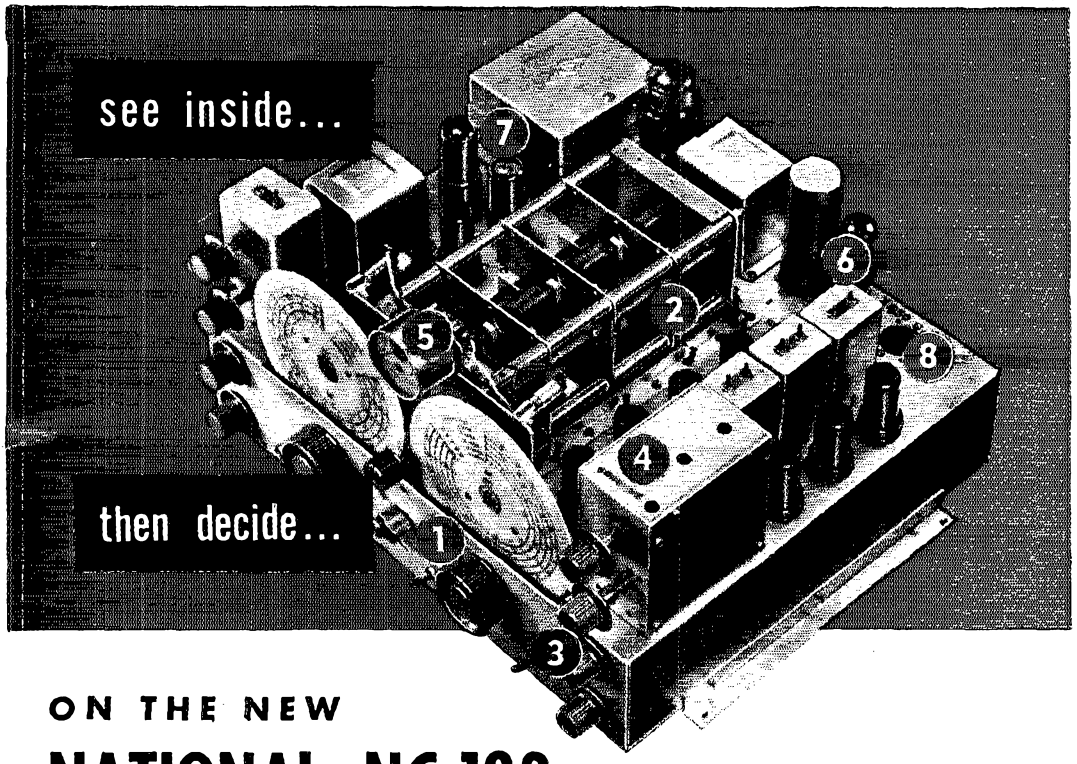
Address .....

City .....*Zone*.....*State*.....

NO OBLIGATION — NO SALESMEN

☐ Veterans check for enrollment information under G.I. Bill

PRINTED IN U. S. A.
RUMFORD PRESS
CONCORD, N. H.



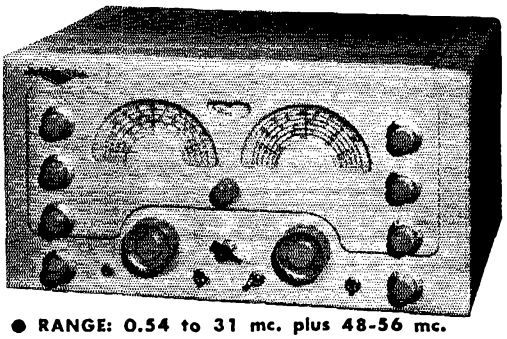
ON THE NEW

NATIONAL NC-183

1. Calibrated amateur bandspread for 6, 10-11, 20, 40 and 80 meter bands. Gear drive tuning dials.
2. Two RF stages on all bands! Image rejection 40 db at 28 mc!
3. New "double-diode" noise limiter, effective on both phone and CW!
4. New crystal filter provides 6 steps of selectivity!
5. S-meter with adjustable sensitivity for both phone and CW!
6. Temperature compensation and voltage regulator provide outstanding stability!
7. High-fidelity push-pull audio output! Ideal for phonograph attachment. Tone control.
8. Accessory socket for NFM adaptor!

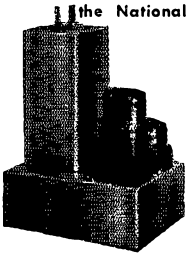
National

NATIONAL COMPANY, Inc.



- **RANGE: 0.54 to 31 mc. plus 48-56 mc.**
- **TUBE COMPLEMENT: 14 plus rectifier and voltage regulator.**
- **AUDIO OUTPUT: 8-watts undistorted**

The brilliant new National NC-183 incorporates the latest in circuit design. Check its 8 outstanding performance features. Note the rugged, heavy-duty quality of the National-designed, National-built components at your dealer's today. When you see inside, you'll decide on the National NC-183.



$268 *(less speaker)*

Also available in rack model at same price. (Prices slightly higher west of Rockies)

NFM-83 adaptor makes the NC-183 a top-notch NFM receiver. Instant selection of AM or NFM from front panel.

$16.95

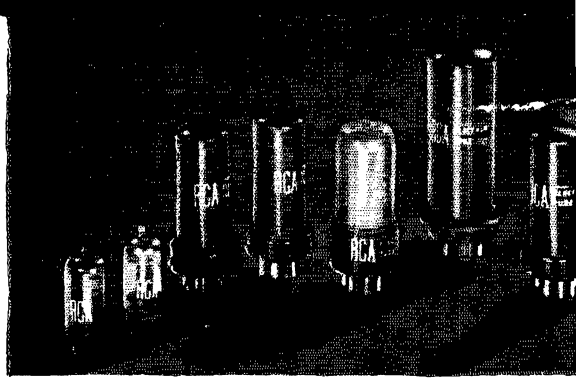
RCA RECEIVING TUBES — All Ratings

Tube Type	Max. Plate volts	Max. Screen volts	Max. Grid volts	Max. Plate Ma.	Max. Screen Ma.	Max. Grid Ma. (Note 1)	Max. Plate Dissipation (watts)	Max. Screen Dissipation (watts)	Power Output (watts) (Note 2)	Max. Freq. in Mc. (Note 3)	Grid Bias Calculator Factor (approx.) (Note 4)
RCA-6AG7	375	250	—75	30	9	5	9	1.5	7.5	30	22
RCA-6AK6	375	250	—100	15	4	3	3.5	1	4	60	9.5
RCA-6C4	300	—	—100	25	—	8	5	—	5.5	60	18
RCA-6F6	400	275	—100	50	11	5	12.5	3	14	30	7
RCA-6L6	400	300	—125	100	12	5	21	3.5	28	30	8
RCA-6N7	350	—	—100	30 (per plate)	—	5 (per grid)	5.5 (per plate)	—	14.5 (total)	30	35
RCA-6V6GT	350	250	—100	47	7	5	8	2	11	30	9

Note 1: 100,000 ohms maximum grid resistor
Note 2: Based on 70% plate efficiency
Note 3: Maximum frequency for full power output and input
Note 4: For pentodes, this is the grid-screen amplification factor

**Absolute maximum ratings for amateur use exclusively*

Use *RCA Receiving Tubes* in your new transmitter



These seven RCA receiving tubes are tops for r-f driver applications in amateur transmitters.

THE HIGH-FREQUENCY cw ratings for the seven popular RCA receiving types given above, mean that you can now obtain plenty of r-f power *inexpensively.*

These ratings are your guide to greater receiving-tube performance and maximum life in r-f service, such as crystal oscillators, buffers, doublers . . . and even low-power finals!

To get maximum performance from the tubes *you* pay for—buy RCA. For information on any RCA tube, see your local RCA tube supplier, or write RCA, Commercial Engineering, Section 48CM, Harrison, New Jersey.

THE FOUNTAINHEAD OF MODERN TUBE DEVELOPMENT IS RCA

TUBE DEPARTMENT

RADIO CORPORATION of AMERICA

HARRISON, N. J.