

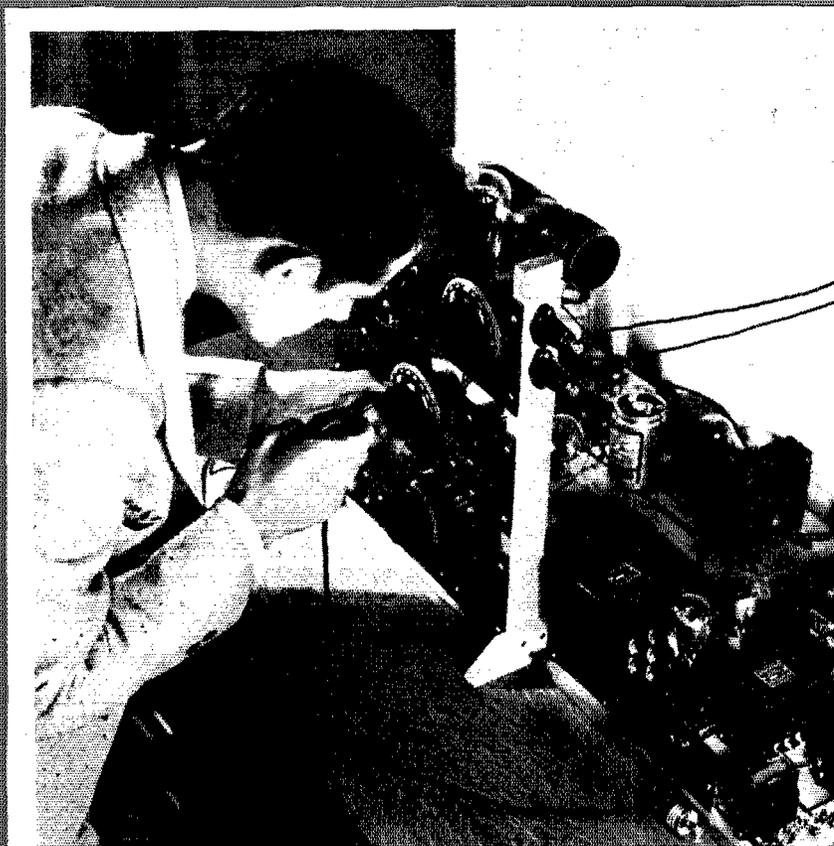
# QST

July, 1932  
25 cents

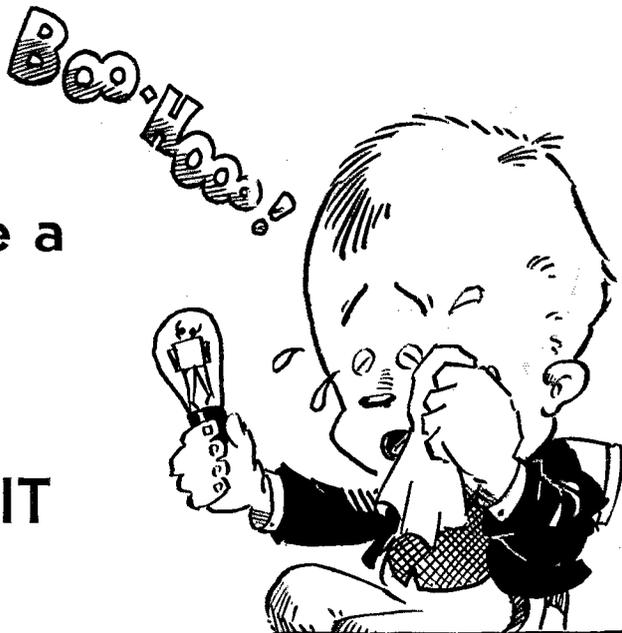
devoted entirely to

# amateur radio

**Building  
An  
Inexpensive  
Radiophone**  
*— In this Issue —*



All Because  
He Didn't Have a  
SQUIMDUFFIT  
On His  
WOTUMACALIT



The reason he didn't was because he didn't know any better. True, he should have known. He had read QST for years. But QST hadn't spoken of it recently—they thought everybody knew it. Of course it was in the Handbook. Everything about amateur radio is in the Handbook. But he was trying to get along without a Handbook.

DON'T WASTE YOUR MONEY ON MISTAKES

SEND YOUR DOLLAR TODAY FOR YOUR COPY

POSTPAID ANYWHERE

# The RADIO AMATEUR'S HANDBOOK

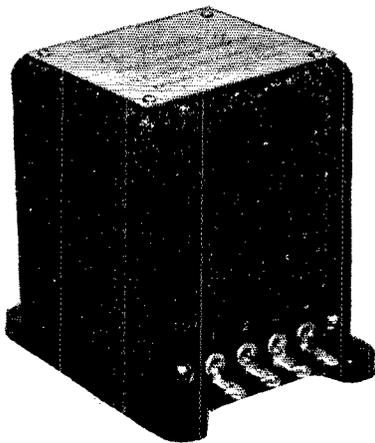
(TWO HUNDRED PAGES OF INVALUABLE DOPE)

● P.S. If you're feeling particularly gaudy you can have the Handbook in stiff buckram binding with solid gold lettering for two dollars

---

THE AMERICAN RADIO RELAY LEAGUE, West Hartford, Conn., U. S. A.

---



# DeForest

## Studio Type

### AUDIO TRANSFORMERS

DeForest Studio Type Audio Transformers are available as follows:

- Repeat Transformer — 500 to 500 ohms.
- Line-to-Tube Transformer — 500 to 100,000 ohms.
- Inter-Stage Audio Transformer — 3-1 ratio, for push-pull to push-pull, or from tube to push-pull.
- Output Transformer — tube to 500-ohm line.
- Push-pull tubes to 400-ohm line Transformer.
- Microphone Output Transformer — 25,000 to 500 ohms, step-down.
- 45 push-pull to 500-ohm line Transformer.
- 500-ohm line to tube Transformer, in two models: (1) 0 level to +27 DB modulator input; (2) tube to line input from -60 to 0 DB level.
- Microphone Transformer — two-button mike, 200 ohms per button.
- Line-to-line Repeat Transformer — 200 to 200 ohm.
- Speaker Transformer — for —45 push-pull.
- Any desired line-to-microphone output Transformers.
- High impedance choke for impedance coupled amplifier, 200 henries at 4 milliamperes.

SEEKING ultimate quality for its broadcast transmitting equipment, DeForest engineers have devoted meticulous attention even to such special details as audio transformers. To meet DeForest standards an entire line of studio type transformers has been developed. These components, now offered to other builders of quality equipment, feature:

#### Complete Shielding

Each transformer is protected by cast-iron case  $\frac{1}{4}$  inch thick, insuring complete magnetic and electrostatic shielding and eliminating any additional precautions at time of mounting.

#### Unique Windings

Primary in two sections, secondary in four sections, reducing distributed capacity to minimum and materially improving the coupling. Due to unique form of winding, coils can be impregnated without affecting distributed capacity. Negligible leakage reactance.

#### Thorough Impregnation

Coils are vacuum impregnated, eliminating all trace of moisture. Because of thorough impregnation and sealing, transformer is unaffected by tropical or damp climatic conditions.

#### Increased Core Area

Core area is considerably increased over corresponding types, while keeping copper losses and distributed capacity at minimum. Eddy current and hysteresis losses exceptionally low. Highest permeability core material, consistent with detrimental effects of D.C. and mechanical handling, is employed.

#### Superior Performance

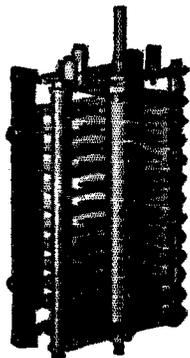
Foregoing refinements result in performance heretofore realized only with finest laboratory equipment. Frequency response curves tell the story. Primaries and secondaries of two or more transformers can be wired in parallel or series for any desired combination.

**Write** for technical data on DeForest Studio Type Audio Transformers. And remember, DeForest builds complete radio telegraph and telephone transmitters, crystal controls and monitors, rectifier units, audio amplifiers, and other units, as well as tubes of all types for every transmitting, receiving and special purpose.

**DEFOREST RADIO COMPANY**  
PASSAIC      “      ”      NEW JERSEY

... Today, yesterday  
and for Years ...

# CONDENSER SPECIALISTS



The T-183 designed for  
6000 volts.



Typical Midway Feather-  
weight Condenser. All  
aluminum-Average  
weight 5 oz.



Gang or Split Stator  
MIDWAY

## MIDWAY FEATHERWEIGHT SPLIT STATOR CONDENSERS

WHEN, eight years ago, CARDWELL put to practical use opposing spherical surfaces at points of electrostatic strain to prevent flashover between plates of transmitting condensers, an important contribution to variable condenser design was made and CARDWELL was the first manufacturer of a standard line of transmitting condensers to regularly furnish extra thick, highly polished plates with fully rounded edges.

All CARDWELL transmitting condensers designed for over 3000 volts breakdown, are now, and have been for the past eight years, so furnished.

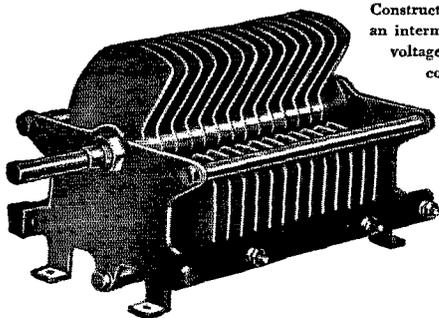
This design makes possible in 3000 volt transmitting circuits the use of the diminutive 413-B Midway Featherweight condenser of 150 mmfd. capacity and only 7 ounces in weight! Highly polished and fully rounded plates have been used in all Midway Featherweight transmitting condensers ever since this fine little instrument was first introduced to fill a long felt want for a high-quality, precision-built, small-size and light-weight condenser.

Construction design 16 B,  
an intermediate size high  
voltage transmitting  
condenser.

are regularly furnished in many standard capacities and to order and in other models up to the largest condensers for high powered transmitters.

The design of the CARDWELL condenser permits of many variations. We shall welcome inquiries for condensers not ordinarily procurable from stock.

Send for literature describing the CARDWELL condensers, receiving and transmitting, available for every purpose.



THE ALLEN D. CARDWELL MFG. CORP'N.  
83 Prospect Street ● Brooklyn, New York

*The supplier who tries to discourage you, or attempts to substitute, or refuses to supply CARDWELLS has not your interest at heart. He can get CARDWELLS for you if service means as much to him as a little more profit. Get what you want — insist on CARDWELLS. Order direct from us if your dealer will not supply, or let us tell you where you may buy.*

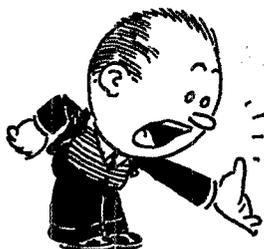
“THE STANDARD OF COMPARISON”

# QST

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

*devoted entirely to*

## AMATEUR RADIO



Editorials . . . . .	7
On the Beach . . . . . Edward R. Stevens, W7BB-K6CB	8
Building a Low-Cost 1750-Kc. 'Phone-C. W. Transmitter—Part I . . . . . George Grammer	9
Eliminating the 'Phone Monologue . . . . .	13
Automatic Break-In for 'Phone . . . . . M. F. Chapin, W9CJU	
The Break-In System at W6GM . . . . . George Ewing, W6GM	
"I Can't Be Bothered" . . . . . R. B. Bourne, W1ANA	15
The New 57 as a High Gain Audio Amplifier . . . . . L. C. Waller, W2BRO	17
The Greeks Had a Letter for It . . . . .	18
A Balanced Modulator Super-Regenerative Circuit . . . . . Walter van B. Roberts	19
The 1932 Meeting of the Board . . . . . K. B. Warner	21
Financial Statement . . . . .	25
How Electron-Coupled Oscillators Make Still Better Frequency Meters . . . . .	26
WIMK'S New Frequency Meter . . . . . R. B. Parmenter	
An All-A.C. Operated Model . . . . . G. Donald Meserve, W1FL	
Some Recollections of Early Radio Days . . . . . S. M. Kintner	31
New England Crew Out After 56-Mc. Honors . . . . . T. F. Cushing, W1OF	34
Compact C. W. and 'Phone Transmitter Assembly . . . . . William A. Swearington, W5AQO	35
Strays . . . . .	37
The Distribution of the Frequency-Conscious . . . . .	38
Bootleg! . . . . . George Cooper Tichenor	40
For the Experimenter . . . . .	42
AN INEXPENSIVE WAY TO OPERATE A CONDENSER MIKE—REDUCING HARMONIC RADIATION—BIAS—THE '47 AS A SPEECH AMPLIFIER—AN IMPROVED SYSTEM OF VOLTAGE FEED	
Amateur Radio Stations . . . . . W6GM, W9CNO	46
I. A. R. U. News . . . . .	48
Calls Heard . . . . .	51
Communications Department . . . . .	52
Correspondence Department . . . . .	72
Hamads and QRAs . . . . .	92
QST's Index of Advertisers . . . . .	94

**JULY**  
**1932**

**VOLUME XVI**  
**NUMBER 7**

Kenneth B. Warner (Secretary, A.R.R.L.), *Editor-in-Chief and Business Manager*; Ross A. Hull, *Associate Editor*; James J. Lamb, *Technical Editor*; George Grammer, *Assistant Technical Editor*; Clark C. Rodimon, *Managing Editor*; David H. Houghton, *Circulation Manager*; F. Cheyney Beckley, *Advertising Manager*; Ursula M. Chamberlain, *Assistant Advertising Manager*.

*Editorial and Advertising Offices*  
38 La Salle Road, West Hartford, Conn.

Subscription rate in United States and Possessions and Canada, \$2.50 per year, postpaid; all other countries, \$3.00 per year, postpaid. Single copies, 25 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.

Copyright 1932 by the American Radio Relay League, Inc.  
Title registered at United States Patent Office.



**P-2-KX**  
**60 cents**  
 3 1/2" x 1 3/4" x 4 1/2"  
 Weight 1 1/2 pounds  
 3 volts for "A"  
 circuit

**V-30-AA**  
**\$1.50**  
 Midget 45-volt "B" Battery for  
 Monitors, portables and ex-  
 perimental work.  
 3 1/2" long, 2 1/4" wide, 3 1/2"  
 high. Weight 1 pound 6 ounces.

**P-2-X**  
**35 cents**  
 2 5/8" x 1 3/8" x 4 1/2"  
 Weight 13 ounces  
 3 volts for "A"  
 circuit

# Three New Generals Midget Series

**D**ESIGNED by a Ham for Hams. Made in the most modern and progressive Battery Plant. Ideal for Monitors, Portables and general experimental work. The smallest and lightest Batteries on the market. Any one of them will go in your coat pocket easily. Two sizes for full voltage "A" circuits, and the Midget "B" will pack a punch of smooth, pure, quiet, sure-fire DC that will put "steam" into your Monitor or Portable. Every Battery moisture-proof. Buy direct. Use the coupon. Prices include postage anywhere in the United States.

W8GYR-7100 kc

W8GYR-7100 kc

**General Dry Batteries, Inc.**

13000 Athens Avenue

CLEVELAND, O.

General Dry Batteries of Canada, Ltd., Toronto, Canada

Ham Dep't, W8GYR

General Dry Batteries, Inc., 13000 Athens Ave., Cleveland, O.

Gentlemen: Enclosed find \$.....for which please send me at once, postpaid in the U. S.,  
 .....Type V-30-AA Midget "B" Batteries at \$1.50 each.  
 .....Type P-2-X Midget "A" Batteries at 35c each.  
 .....Type P-2-KX Midget "A" Batteries at 60c each.

(Print name and address in the margin)

Section Communications Managers of

THE COMMUNICATIONS DEPARTMENT, A. R. R. L.

Eastern Pennsylvania	W3GS	<b>ATLANTIC DIVISION</b> Jack Wagenseller	210 Main St.	Pennsburg
Maryland-Delaware-District of Columbia	W3NY	Harry Ginsberg	2305 N. Pulaski St.	Baltimore, Md.
Southern New Jersey	W35M	Robert Adams, Jrd	1302 Keswick Ave.	Haddon Heights
Western New York	W8DSP	Don Farrell	213 Hickok Ave.	Syracuse
Western Pennsylvania	W8CFR	Robert Lloyd	175 Allegheny Ave.	Emsworth (Pgh) Pa.
		<b>CENTRAL DIVISION</b>		
Illinois	W9APY	Fred J. Hinds	3337 Oak Park Blvd.	Berwyn
Indiana	W9BKJ	George Graue	824 Home Ave.	Fort Wayne
Kentucky	W9BAZ	J. B. Wathen, III	Mockingbird Valley	Louisville
Michigan	W8DMS	R. J. Stephenson	216 Florence Ave.	Highland Park
Ohio	W8BAH	Harry A. Tummonds	2073 West 85th St.	Cleveland
Wisconsin	W9VD	C. N. Crapo	2111 E. Newton Ave.	Milwaukee
		<b>DAKOTA DIVISION</b>		
North Dakota	W9DGS	Wm. Langer	612 First Ave., S.	Jamestown
South Dakota	W9DNS	Howard Cashman	121 N. Spring Ave.	Sioux Falls
Northern Minnesota	W9DOQ	Palmer Andersen	Route 1, Box 270	Duluth
Southern Minnesota	W9AIR	Herman Radloff	R. 2, Box 15	Sleepy Eye
		<b>DELTA DIVISION</b>		
Arkansas	W5ABI	H. E. Velte	4017 West 10th St.	Little Rock
Louisiana	W5WF	F. M. Watts, Jr.	1716 Park Ave.	Shreveport
Mississippi	W5AZV	William G. Bodker	208 W. Elm St.	Jackson
Tennessee	W4SP	James B. Witt	732 N. Fifth Ave.	Knoxville
		<b>HUDSON DIVISION</b>		
Eastern New York	W2ZLU	Robert E. Haight	1080 Helderberg Ave.	Schenectady
N. Y., C. & Long Island*	W2AZV	Edward L. Baunach	7823 10th Ave.	Brooklyn
Northern New Jersey	W2WR	A. G. Wester, Jr.	50 Princeton St.	Maplewood
		<b>MIDWEST DIVISION</b>		
Iowa	W9FFD	George D. Hansen	Box 27	Salix
Kansas	W9CET	J. H. Amis	915 Lincoln Ave.	Topeka
Missouri	W9RR	L. B. Laizure	8010 Mercier St.	Kansas City
Nebraska	W9FAM	Samuel C. Wallace	Green St.	Clarks
		<b>NEW ENGLAND DIVISION</b>		
Connecticut	W1CTI	Frederick Ellis, Jr.	19 Merrill Rd.	Norwalk
Maine	W1CDX	John W. Singleton		Wilton
Eastern Massachusetts	W1ASI	Joseph A. Mullen	16 Mercier St.	Ashmont
Western Massachusetts	W1IJV	Leo R. Peloquin	24 Arthur St.	Worcester
New Hampshire	W1ATT	V. W. Hodge	227 Main St.	Claremont
Rhode Island	W1AWE	N. H. Miller	25 Phillips St.	Providence
Vermont	W1BD	Roy Gale	41 Beacon St.	Barre
		<b>NORTHWESTERN DIVISION</b>		
Alaska	K7PQ	Richard J. Fox	Box 301	Ketchikan
Idaho	W7AKZ	Oscar E. Johnson	422 Antone St.	Sandpoint
Montana	W7AAT-7QT	O. W. Viers		Red Lodge
Oregon	W7ALO	Dr. Dolph L. Craig	701 First National Bank Bldg.	Salem
Washington	W7RT	John P. Gruble	1921 Atlantic St.	Seattle
		<b>PACIFIC DIVISION</b>		
Hawaii	K6COG	C. D. Slaten	Pearl City	Oahu
Nevada	W6EAD	Keston L. Ramsay	1151 Buena Vista Ave.	Reno
Los Angeles	W6HT	H. E. Nahmens	Box 903	Long Beach
Santa Clara Valley	W6NX	F. J. Quement	1348 Hanchett Ave.	San Jose
East Bay	W6ZM	S. C. Houston	2523 23rd Ave.	Oakland
San Francisco	W6WB	C. F. Bane	262 Castro St.	San Francisco
Sacramento Valley	W6AXM	Paul S. Farrelle	1326 P St.	Sacramento
Arizona	W6BJF	Ernest Mendoza	1434 East Madison St.	Phoenix
Philippines	KA1SL	I. S. Limer	Care Manila Bulletin	Manila, P. I.
San Diego	W6EOP	Harry A. Ambler	4401 Hamilton St.	San Diego
San Joaquin Valley	W6BVV	E. J. Beall	Box 246	Newman
		<b>ROANOKE DIVISION</b>		
North Carolina	W4DW	H. L. Caveness	State College	Raleigh
Virginia	W3AAJ	R. N. Eubank	2817 Montrose Ave.	Richmond
West Virginia	W8HD	C. S. Hoffman, Jr.	126 Washington Ave.	Wheeling
		<b>ROCKY MOUNTAIN DIVISION</b>		
Colorado*	W9BJN	Artie Davis	2459 South Sherman St.	Denver
Utah-Wyoming	W6DPJ	C. R. Miller	134 E. 2nd North St.	Provo, Utah
		<b>SOUTHEASTERN DIVISION</b>		
Alabama	W4KP	L. B. Elwell	1066 Waverly St.	Tarrant
Eastern Florida	W4NN	Kay Atkinson	329 East First St.	Jacksonville
Western Florida	W4MS	Edward J. Collins	1517 Brainard St.	Pensacola
Georgia-So. Carolina-Cuba- Isle-of-Pines-Porto Rico- Virgin Islands	W4PM	Chas. W. Davis,	668 Cooledge Ave., N. E.	Atlanta
		<b>WEST GULF DIVISION</b>		
Northern Texas	W5RJ	Roy Lee Taylor	1614 St. Louis Ave.	Ft. Worth
Oklahoma*	W5VQ	Emil Gisel	1st Ballouon Co.	Fort Sill
Southern Texas	W5ZG	H. C. Sherrod	2609 Ave. 0½	Galveston
New Mexico	W5AUW	Jerry Quinn	524 West Coal Ave.	Albuquerque
		<b>MARITIME DIVISION</b>		
Maritime	VE1DQ	A. M. Crowell	69 Dublin St.	Halifax, N. S.
		<b>ONTARIO DIVISION</b>		
Ontario	VE3HB	H. W. Bishop	49 Eastman Ave.	London
		<b>QUEBEC DIVISION</b>		
Quebec	VE2AC	Alphy Blais	Box 221	Thetford Mines
		<b>VANALTA DIVISION</b>		
Alberta	VE4HM	C. H. Harris	10806 125th St.	Edmonton
British Columbia	VE5AL	J. K. Cavalsky	4868 Blenheim St.	Vancouver
		<b>PRAIRIE DIVISION</b>		
Manitoba	VE4BQ	John L. Green	115 Furby St.	Winnipeg
Saskatchewan	VE4FC	W. J. Pickering	514 19th St., W.	Prince Albert

\* Officials appointed to act until the membership of the Section choose permanent SCM's by nomination and election.

# The American Radio Relay League

## DIRECTORS

<i>President</i>	
HIRAM PERCY MAXIM	..... W1AW Drawer 2102, Hartford, Conn.
<i>Vice-President</i>	
CHARLES H. STEWART	..... W3ZS St. David's, Pa.
<i>Canadian General Manager</i>	
ALEX. REID	..... VE2BE 169 Logan Ave., St. Lambert, P. Q.
<i>Atlantic Division</i>	
EUGENE C. WOODRUFF	..... W8CMP 234 W. Fairmount Ave., State College, Pa.
<i>Central Division</i>	
LOREN G. WINDOM	..... W8GZ-W8ZG 1375 Franklin Ave., Columbus, Ohio
<i>Dakota Division</i>	
LAWRENCE E. LINDESMITH	..... W9GKO 1055-85th Ave. W., Duluth, Minn.
<i>Delta Division</i>	
M. M. HILL	..... W5EB P.O. Box 274, Natchitoches, La.
<i>Hudson Division</i>	
A. LAFAYETTE WALSH	..... W2BW 220 West 42d St., New York City
<i>Midwest Division</i>	
H. W. KERR	..... W9DZW-W9GP Little Sioux, Iowa
<i>New England Division</i>	
G. W. BAILEY	..... W1KH 74 Webster Road, Weston, Mass.
<i>Northwestern Division</i>	
K. W. WEINGARTEN	..... W7BG 3219 No. 24th St., Tacoma, Wash.
<i>Pacific Division</i>	
CLAIR FOSTER	..... W6HM Carmel, Calif.
<i>Roanoke Division</i>	
W. TREDWAY GRAVELY	..... W3BZ Box 245, Danville, Va.
<i>Rocky Mountain Division</i>	
RUSSELL J. ANDREWS	..... W9AAB 169 So. Ogden St., Denver, Colo.
<i>Southeastern Division</i>	
J. C. HAGLER, JR.	..... W4SS 2424 McDowell St., Augusta, Ga.
<i>West Gulf Division</i>	
FRANK M. CORLETT	..... W5ZC 2515 Catherine St., Dallas, Tex.

• **T**HE AMERICAN RADIO RELAY LEAGUE, INC., is a non-commercial 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 non-commercial 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 world 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. Correspondence should be addressed to the Secretary.

## OFFICERS

<i>President</i>	..... HIRAM PERCY MAXIM, W1AW Hartford, Connecticut
<i>Vice-President</i>	..... CHARLES H. STEWART, W3ZS St. David's, Pennsylvania
<i>Secretary</i>	..... KENNETH B. WARNER, W1EH West Hartford, Connecticut
<i>Treasurer</i>	..... ARTHUR A. HEBERT, W1ES West Hartford, Connecticut
<i>Communications Mgr.</i>	F. EDWARD HANDY, W1BDI West Hartford, Connecticut
<i>General Counsel</i>	..... PAUL M. SEGAL, W3EEA 1010 Shoreham Building, Washington, D. C.

Address all general correspondence to the executive headquarters at West Hartford, Connecticut



# EDITORIALS



GET out your hammers, croquet mallets, beanshooters, sledges and bug-sprayers, all you fellows who think it's a crime when we start preaching against some rotten condition on the air, for here comes another load of it.

We speak of the not-so-good signals that continue to infest our air. If this be treason, then let's have less of it and there won't be so much to say. To our mind the worst obstacle to happy operating to-day is still the broad a.c. signal — you know, the thing that gives you that feeling of having been plumped in your pajamas into a cubic mile of cockle-burs. These signals take up more room on the dial than one man is entitled to. They show the existence of a thoughtless or an inconsiderate person at the other end. They bring their owner no joy of accomplishment and much less in actual results than a clean signal would. They gripe the life out of the rest of us.

Let's see where we are on this thing, fellers. The basic thought back of our regulations is that everybody has to have d.c. plate supply. "Raw a.c." is out; even bare rectification without the filter is out; the supply must be both rectified and filtered. At high powers, such supplies cost a lot of money. So we have the further regulation that in an oscillator-buffer-amplifier transmitter with d.c. on the oscillator and buffer, a.c. may be used on the amplifier. It will not cause wobble there; it will modulate the signal and give it the characteristic tone of the supply frequency, but at 60 cycles the side-bands will be narrow and the signal respectable. We are not talking about that kind of signal. Probably some day we shall come to pure d.c. for everybody, but meanwhile we have no quarrel with that regulation where 60 cycles or less is used. We speak of the use of a.c. in violation of regulation on other types of transmitters, where it wobbles the signal all over the landscape and produces the heinous effects aforesaid. The government hasn't money enough to send out an army of inspectors to compel us to comply. It's up to us; if we want things better, we must make them that way ourselves. Shall we clean up each other's notes? Well, sincere reports help, and if each of us would tell our acy friends that we simply don't like to work a.c. signals, it would be potent. But the thing isn't going to be licked until the individual ham with the offending signal wakes up to the realization of just how inconsiderate he is of the rest of his buddies, and does the necessary.

How about it, acy? Will you be a sport?

Most of to-day's amateurs, we imagine, know of the International Amateur Radio Union only through the heading *The I.A.R.U.* "I.A.R.U. News," under which *QST* prints each month reports on amateur activity from abroad. Formed in Paris in 1925 at an international congress inspired by President Maxim, it was first a world-wide association of individual members divided into national groups. In the first few years of its life it accomplished the tremendous task of bringing into being good sound representative national societies of radio amateurs in many nations where amateur associations had not previously existed. Its form of organization was then changed and it became an international federation of national societies like our A.R.R.L., coöperating in matters of mutual moment. Since that time the individual amateur does not hear much about it, but its work goes steadily on.

The Union selects one of its member-societies as its headquarters. That position has always been filled by your A.R.R.L., and it has given us splendid contacts abroad. In preparation for Madrid a great deal of correspondence is passing continually between Headquarters and the nineteen societies that make up the Union, providing a constant interchange of thought and a constant flow of data on national attitudes, proposals, delegation personnel, and so on. These things are of incalculable value at such a time. Thus, though the average amateur rarely thinks of its existence, the Union marches on. It is giving us internationally that same ability to work coöperatively that our League affords us nationally. It is an invaluable thing to all of us.

ALL amateurs capable of withstanding their rated plate voltage are interested in their hobby and their League, anxious to do anything they can to advance and preserve amateur radio. Since the first days of the sport in this country we have been a big team, all pulling for the common good; it's the way we have been brought up.

As we approach the opening of the Madrid conference there seems to be a belief on the part of some well-intentioned hams that it would be a good thing to write to their congressmen, and to get other amateurs to do the same thing, petitioning for the satisfactory continuance of amateur radio at Madrid, or for more frequencies, or for

this or that. This movement arises from the aforementioned impulse to do everything possible and to help the game along. It comes from honest desire to assist, and represents a species of initiative we must admire. But at the same time we feel it a duty to point out that the Congress doesn't have anything to do with the Madrid deliberations, nor can the views of a member of Congress or even of that whole body have any bearing upon the United States' proposals now or during the conference. Such efforts, then, are misdirected. At this stage these matters are the province of the Department of State. Next winter, when the treaty is signed, it will come before the Senate for ratification. Amateurs may be very sure that if a time comes when writing to senators is in order (and we're thinking of that

possibility should the U. S. delegation somehow get licked at Madrid), the League will promptly inform them as it has on at least two occasions in the past, and request their full cooperation. Meanwhile, let's avoid the danger of wearing out our welcome needlessly.

We're talking here only of such a specific thing as Madrid. This has nothing to do with the splendid practice of some amateurs who, having good personal contact with their Senators and Representatives, make it a business to tell them about amateur radio and keep them familiar with the subject. That is swell work, and we hope it will be kept up. It paves the way for a specific plea when we have one, and is consequently the finest sort of FB.

K. B. W.

## On the Beach

By Edward R. Stevens, W7BB-K6CB\*

**O**PERATING at an Alaskan cannery. Fish and more fish. Just around the corner — K7AD with a pet seal for a mascot. K7AOP in Petersburg with the local power house for a power supply. Back home and out again for the Orient. Yokohama with J9AA waiting on the dock. JOAK is visited — wonder what the announcer is saying? On to Shanghai, and AC8GO, AC8GG, AC8AG visit and are visited. AC1SN on the San Nam Hai, who gets real QRM from the river bandits, AC3JJ and the disappearing transmitter for "RI" visits.

At KAICY — some "tall cold ones" with X7XOT and some question as to the authenticity of the lizards on the receiver. Out to KA1DJ in Rizal. Into the cockpit of an Army bomber and there is KA1PW, 8000 feet below. The hardworking ops at KA1HR. San Francisco and W6AYC, W6RW, W6CIS, W6CXI.

Out on the Malolo and comes "Doc" of W9GV. Honolulu, and K6CB is set up. Payne of VK3PP is worked and "Doc" is happy. Pleasant hours at K6EVV. DX and a midnight swim at K6ED. At Waikiki — dinner with the GDVB gang. Frisco again and south to Mexico. X23A at Manzanillo who is thirteen years old. Panama — KDV5, KFR5. A chat with the planes from KFR6.

Back at 7BB, and comes the YL of J9AA. W7MB is enlisted and we show her the town.

\*915 N. 13th Ave., Seattle, Wash.

Wonder what the traffic cop thought of the wooden shoes and kimono? VK2BK is worked and he orders a Packard roadster — and gets it. Down to Salvador and YSIAP. W6JV, with "Mort" at the key, is worked — news from home. New York and to W2ALU. "BV" of W2ALU and his big remote control transmitters. The banquet in Jersey where old acquaintances are renewed. The Empire State Building — what a swell place for an antenna.

"WNY de WQDC — out, bound South Africa." St. Helena, Napoleon's place of exile — what, no hams here! Capetown and up Table Mountain with OM Struter, ZS1W. And Day of ZU1F dines aboard ship. Tea with ex-OA3X in Durban. North to Portuguese East Africa. Biera and CQE. Trying to explain a doublet to the Portuguese op. Undercover station PEX and W1MK, W3CXL, W4LL, W4FT, W6AM are logged.

Around the Cape of Good Hope and — listen to the sixes pour in — W6DRU, W6DPF, W6AMM, and so on, and on. QTP New York. Pittsburgh, St. Louis, Kansas City, Denver, Cheyenne and home again.

Wonder if the ol' heap still perks? CQ de W7BB, and back comes OM Harrison of VK7CH with a "where you been, OM?" At sea, OM, but on the beach for good now — but say, wouldn't it be great to visit the VK's! 73, OM . . . I may be seeing you some day.



# Building a Low-Cost 1750-kc. 'Phone-C.W. Transmitter

## Part I—Constructional Details of the Class B Modulator\*

By George Grammer, Assistant Technical Editor

**W**HENEVER a new development shows signs of being worth while amateurs are quick to adopt it. So it was with "100% modulation," first brought to the attention of the amateur world by *QST* in April, 1929, and so it is now with Class B modulation, featured in *QST* for November and December of last year.

Since the publication of the first practical information on small Class B audio amplifiers in *QST* last December, the tube manufacturers and broadcast receiver people have been busy in their own fields, with the result that we now have the Type 46 and 82 tubes.<sup>1</sup> Especially designed for the Class B amplifier, these tubes have simplified the construction of low-power radio telephone sets, and it is now possible to build a combined c.w. and 'phone transmitter of modern design for considerably less than \$100 at the prices amateurs are accustomed to paying for parts. Furthermore, such a transmitter will be equal in effectiveness to much more elaborate and costly transmitters built according to the best practice of a year or so ago.

This article is the first of two describing a complete and inexpensive c.w.-'phone transmitter for the 1750-kc. band. With the exception of the rectifier tubes in the two power supplies, Type 46 tubes are used throughout. The radio-frequency part of the set has a 46 high-*C* oscillator, tunable to any part of the 1750-kc. band, a second 46 as a

buffer amplifier, and two 46's in parallel in the final amplifier. Three more 46's are used in the Class B modulator.

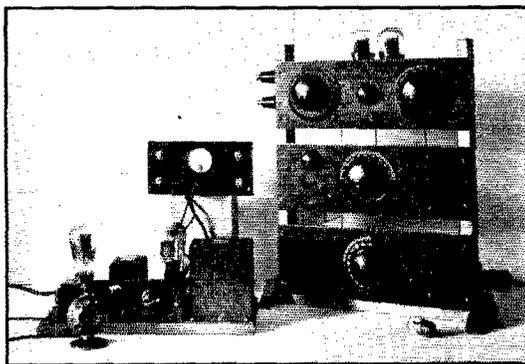
Although a part of the complete transmitter equipment, the modulator is equally applicable to any 'phone transmitter which has one or two Type '10's or tubes of equivalent rating in the r.f. output stage. It will deliver approximately 20 watts of audio power, which will fully modulate

an r.f. input of 40 watts. Greater output can be obtained if the tubes are "pushed" a little bit. Because of this adaptability to all low-power 'phone transmitters, and because of the interest in the 46 for audio work, we are describing the modulator unit first, even though it might seem that the logical place to start a story on a transmitter would be with the r.f. end of the set.

In the form shown in the photographs, the modulator is intended to work from a single-button microphone. Before

building the modulator, some measurements were made on representative microphones to see what order of voltage could be expected on the secondary side of the mike transformer. It was found that almost any microphone of this type has enough voltage output to swing a 46 to full output as a Class A amplifier. Obviously, then, a single 46 could be used both as speech amplifier and driving amplifier to supply the grid power needed for the Class B stage. If a double-button microphone is to be used at least one additional stage of speech amplification will be required; in such case we would suggest using a '27 or 56, transformer-coupled to the 46 driver.

The top view of the modulator shows the ar-



Including such up-to-the-minute features as Class B audio, 100% modulation, buffer amplifiers, etc., this 1750-kc. c.w.-'phone transmitter can be built for less than \$100, complete with the two power supplies shown in another photograph. It has a rated carrier output of 25 watts on both c.w. and 'phone. The modulator, the subject of the article in this issue, will deliver up to 25 watts of audio power and may be used with any 'phone transmitter employing one or two tubes of the '10 type in the r.f. end. With its associated power supply, its cost will be approximately \$40. The radio-frequency portion of the transmitter will be described in August *QST*.

\*The second section of this article will appear in August *QST*.

<sup>1</sup>"New Tubes for Class B Audio," *QST*, May, 1932, page 14.

rangement of apparatus on the baseboard, which measures 7 by 14 inches. The small panel at the front holds the on-off switch, gain control and a pair of tip jacks into which the microphone cord is plugged. The small transformer at the left is the microphone transformer, that in the center is the Class B input transformer and the one at the right is the Class B output transformer. The output transformer used in the modulator is one which has a tapped secondary to permit the use of different values of load resistance, a feature which was valuable to us in the experimental work with the set.

A tapped secondary is unnecessary, however, when the load conditions are predetermined.

The tube at the left rear corner of the baseboard is the speech amplifier or driver. The other two are, of course, the Class B amplifiers. Connections to filament and plate supplies are made by means of a plug and cable fitting into the five-prong socket at the rear right corner of the baseboard. Next to the socket are two Fahnestock clips which connect to the secondary

necessary to use battery bias in this case. The power pack, the wiring of which is shown in Fig. 2, is built up from ordinary broadcast receiver parts, and the transformers available at present have only two 2.5-volt windings. One of these

must be used for the 82 rectifier, unless one wishes to use the 5-volt winding and drop the voltage through a resistor. Most of these 5-volt windings are rated at 2 amperes, however, while the current rating of the 82 filament is 3 amperes.

The combination of the 30-henry choke and 16 microfarads of condenser results in sufficient smoothing to keep the hum

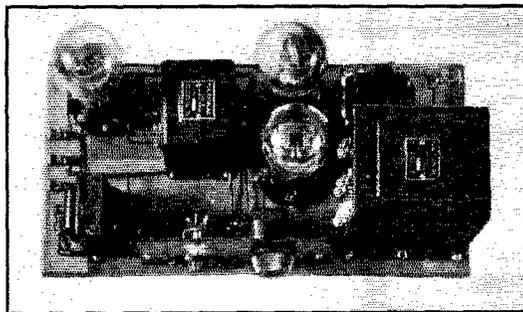
at a small level. The bleeder resistor is a tapped unit with the values shown; two separate resistors can be used for this purpose, of course. With the particular transformer used the output voltage is approximately 400 when the Class B amplifier is drawing its maximum current.

The driver tube is operated as a Class A amplifier, so the outer grid (connected to the "cathode" pin on the tube base) must be connected to the plate. When used for Class B work the two grids

in the 46 must be connected together. A connection between the "grid" and "cathode" posts on the ordinary five-prong tube socket will do the trick. Fig. 3 may help make this clearer.

At present there are no Class B transformers marketed for amateur use which are specifically designed for 46's. Several manufacturers are making them for the tube line-up described in December *QST*, however, which is a pair of '45's in push-pull feeding a pair of '10's in the Class B stage. Such transformers, fortunately,

will work quite well with a pair of 46's fed by a single 46. The input transformer usually is a 1:1 affair with both primary and secondary center-tapped, and this voltage ratio is not very far away from the optimum. In practical operation an input transformer designed to couple a pair of '45's to a pair of '10's works very well, and such distortion as may be introduced is not apparent to the ear. The two outside terminals of the transformer primary are connected in the plate circuit of the driver



A TOP VIEW OF THE MODULATOR UNIT  
The location and purpose of each of the parts is described in the text.

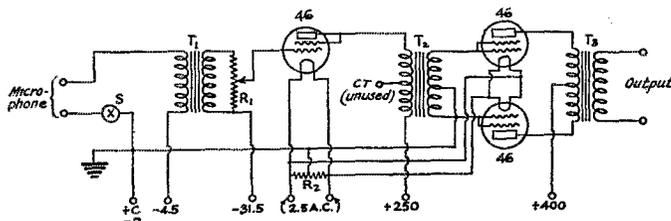


FIG. 1 — WIRING DIAGRAM OF THE CLASS B MODULATOR

- T<sub>1</sub> — Single-button microphone transformer.
- T<sub>2</sub> — Class B input transformer; turns ratio, total primary to total secondary, 1 to 1.
- T<sub>3</sub> — Class B output transformer; if secondary is not tapped the turns ratio from total primary to secondary should be 1 to 0.79.
- R<sub>1</sub> — 500,000-ohm potentiometer.
- R<sub>2</sub> — 20-ohm center-tapped resistor.
- S — Single-pole single-throw switch.

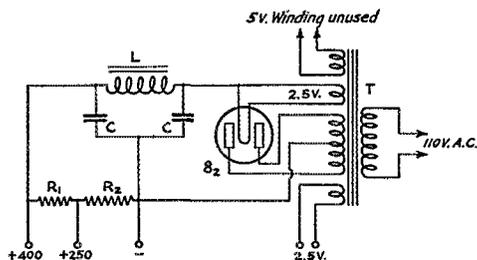
of the output transformer; these are the output terminals of the amplifier. The three Fahnestock clips at the left-hand edge of the board are for the bias and microphone battery connections.

A wiring diagram of the modulator is shown in Fig. 1. The connections are quite straightforward and need no particular explanation. Automatic bias furnished by a resistor could be used on the 46 driver tube, but because only one 2.5-volt secondary on the power transformer is available for lighting the filaments of all three tubes it is

tube—that is, the whole primary is used—and the center-tap is left open.

Some juggling of plate voltages and currents on the r.f. tubes may be necessary with available output transformers to get the right load conditions with 46's in the Class B stage. Those transformers which were built according to *QST* specifications—that is, with a turns ratio from total primary to secondary of 1:0.79, approximately—have a primary-to-secondary impedance ratio of 1:0.6. With the modulator unit described here the two operating conditions most likely to be used are the second and fourth in the table on page 15 of the May issue, the first of which requires a plate-to-plate load for the tubes of 6000 ohms and the second 5300 ohms. The power outputs are 19.5 watts and 26 watts, respectively. The plate voltage is 400 in both cases.

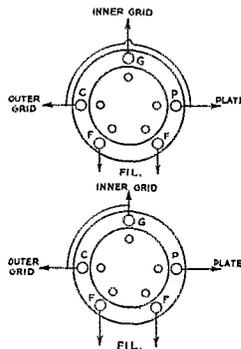
If the output of 19.5 watts is sufficient the carrier power input, for complete modulation, will



**FIG. 2 — THE POWER SUPPLY CONNECTIONS**  
**T** — Broadcast-receiver type transformer; one high-voltage winding giving 350 volts each side center-tap and two 2.5-volt windings. These transformers usually have a 5-volt winding which is not used in this diagram.  
**C** — Double-section dry electrolytic condenser, 8  $\mu$ f. each section.  
**L** — 30-henry choke to carry 100–150 milliamperes.  
**R<sub>1</sub>** — 5000 ohms.  
**R<sub>2</sub>** — 15,000 ohms.  
**R<sub>1</sub>** and **R<sub>2</sub>** may consist of a single 25-watt unit with a total resistance of 20,000 ohms, tapped at 5000.

be 39 watts. To get the right load conditions, then, the r.f. amplifier plate voltage divided by the plate current must be equal to 6000 ohms multiplied by 0.6 or 3600 ohms. This would call for an r.f. amplifier plate voltage of 375, with a plate current of 104 milliamperes, a combination which is easily obtained with two Type '10 or 46 tubes properly excited. This is the value of load which is used in the 1750-kc. transmitter, to be described next month. The 26-watt output should be fed into an r.f. load consisting of a pair of tubes drawing 128 milliamperes at 410 volts, which is also a reasonable figure for a pair of '10's. These specifications do not take into account losses in the transformer, which will reduce the actual percentage of modulation to some value below the 100% which is obtainable theoretically. Since the transformers are built to handle power, however, such losses should be small.

The best way to test the modulator is to connect across the output terminals a resistor equal to the load resistance to be used and to shunt a



**FIG. 3 — SOCKET CONNECTIONS FOR THE 46**

The outer grid goes to the cathode post on the ordinary '27 socket. To use the tube as a Class A amplifier the outer grid should be connected to the plate, as in the top drawing. The outer and inner grids are connected together for Class B work, as shown below. The markings above "C," "G," "F," etc., correspond to those found on most molded '27 sockets.

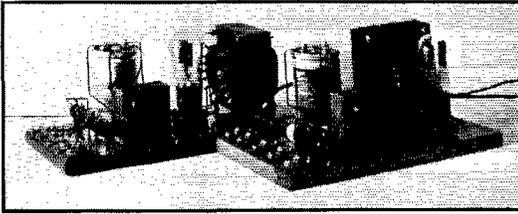
loud-speaker across a small portion of this dummy load. For example, a 3600-ohm resistor capable of dissipating 25 watts or so, tapped at about 600 ohms, could be used; or a 600-ohm unit might be connected in series with another of 3000 ohms. The microphone and bias batteries should be connected up, also the plate and filament supplies. A 22.5-volt battery in series with two 4.5-volt units will be sufficient with about 250 volts on the plate of the driver tube. One of the 4.5-volt batteries also supplies the microphone current.

The plate current to the driver tube will be approximately 20 milliamperes. With no speech input the Class B tubes together will draw 10 to 15 milliamperes, but when speaking into the microphone in a normal tone the plate current should go up to 100 milliamperes or slightly over on the highest peaks. The loud-speaker will give a fair indication of the quality to be expected. Probably it will be found that the speaker and microphone must be placed in different rooms to prevent acoustic feed-back, which will cause a loud howl when the gain control is advanced.

#### A FEW OPERATING HINTS

Mercury-vapor rectifiers used in power supplies for receivers sometimes set up a sort of "hash," caused by the sudden vaporizing of mercury at the start of each half-cycle, which the regular filter will not iron out. Usually this noise can be heard only when a sensitive receiving set is used. It could not be noticed with the modulator and power supply described here, so no steps were taken to eliminate it. If it should occur, a grounded shield-can for the rectifier tube and a radio-

frequency choke (about 1 millihenry) inserted in each plate lead right at the tube socket should cure it. If you have to put these things in make certain that all the high-voltage leads are well insulated.



THE TWO POWER SUPPLIES

Identical in construction, one supplies filament and plate power for the modulator and the other handles the radio-frequency part of the transmitter.

A 100-ohm resistor in the plate lead of each of the Class B tubes will have practically no effect on the operation of the amplifier and may keep the transformer insulation from blowing up if the mike is spoken into when there is no load on the output transformer. Under those conditions excessively high voltages may build up in the plate circuit unless something is there to dissipate the energy. Even with the resistors in it's a good idea to make sure the load is on before running up the gain.

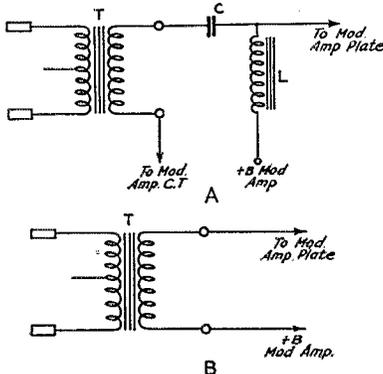


FIG. 4—TWO COUPLING METHODS

Shunt feed to the modulated amplifier is shown at A. This scheme keeps the d.c. for the modulated amplifier out of the output transformer windings, but necessitates the use of an extra audio-frequency choke and condenser. The choke, L, should have an actual inductance of 30 henrys, preferably more, with the 100-mil. modulated amplifier plate current flowing through it. Condenser C should have a capacity of at least 2  $\mu\text{f.}$ , and should be rated at 1000 volts.

The simpler direct coupling arrangement at B requires no extra apparatus, but may cut down the low-frequency response of the transformer. In addition, the transformer secondary must be capable of carrying the modulated amplifier plate current.

Transformer T in the above drawings is, of course, the output transformer of the modulator unit.

Make sure that the gain control potentiometer has a total resistance of 500,000 ohms or more. A low-resistance potentiometer will put such a

heavy load on the microphone transformer that most of the speech voltage will be lost. If the plate meter in the Class B stage won't kick up to 100 milliamperes or over when speaking into the microphone at normal speech intensity with the gain full on, try the amplifier with the gain control out of the circuit. Even with 500,000 ohms the voltage often is cut down quite a bit. A half-megohm resistor in series with the potentiometer — on the "ground" side — will help out considerably should this be the case. The range of control will be cut down, of course, but that does not matter particularly because the chief purpose of a gain control in an amateur 'phone transmitter is to avoid overloading, not to cut the volume down to a whisper. We've never yet heard anyone complain that signals were too loud; not with sincerity, at any rate.

The operating conditions — plate voltages, plate currents, loads, etc., — specified previously for the modulator, are those which the broadcast people have determined are satisfactory for audio amplifiers in receivers, which means that the tube distortion is negligible. The voice quality you get, therefore, will be that of the microphone and the transformers. From the standpoint of really faithful reproduction no single-button microphone is anything to brag much about, but it certainly will give perfectly understandable speech. The business of "sounding like a broadcast station" may be a source of satisfaction to the owner of the station, but it does not add a mile to his range nor does it make his voice a bit more readable than that of another station with much less elaborate, but properly operated, speech equipment.

The output of the modulator should preferably be coupled to the r.f. amplifier through a choke-condenser combination to keep the r.f. amplifier plate current out of the secondary winding of the output transformer, as shown in Fig. 4-A. If the transformer winding will carry the current safely, however, direct coupling may be used, as at 4-B. This may cause some loss at the lower voice frequencies, but should not do much harm to the voice quality if the output transformer is big enough for its job. With either coupling arrangement there should be a by-pass condenser and r.f. choke in the circuit to keep stray r.f. from getting into the transformer.

## Strays

Here's a chance for stamp-collecting hams to get some rather rare stamps. Mr. Greville C. Cawood, of Sandakan, British North Borneo, wants to get some radio texts published in this country and, because it is impossible to get International money order in Borneo, he is willing to exchange the value of the books in Borneo stamps. Drop him a line if you'd like to trade.

# Eliminating the 'Phone Monologue

## Two Workable Schemes for Break-In Operation

PRIVATE conversation would be a dreary thing if we didn't have the privilege of interrupting now and then, or if we had to take our remarks and questions in groups and answer them in the same way at ten- or fifteen-minute intervals; in other words, if we had to talk to each other in the same routine followed by the ordinary ham 'phone. Probably we'd adopt the same "er's" and "well, I don't know's" as fill-ins that now constitute a good 25% of the 'phone conversations on the air.

At the present time there are very, very few amateur 'phone stations equipped to carry on an actual conversation. Probably the total number of 'phones who can work break-in can be counted on the fingers of one hand. We've heard a few trying it now and then — some of the gang have receivers that are selective enough to permit working a station at the other end of the band without switching off the carrier. But this method is only a halfway solution at best; it won't work in a great many cases and it doubles the QRM to other stations. We present here two ideas for automatic break-in which fill the bill nicely. Both are arranged to switch on the carrier as soon as the op talks into the mike; the carrier goes off and the receiver comes on just as soon as the voice ceases. Could anything be sweeter? If we could get every 'phone man to install a scheme of this sort we'd have more and better conversations, more satisfactory contacts, less QRM, and possibly — just possibly — the alternating monologues would disappear entirely.

### Automatic Break-In for 'Phone

By M. F. Chapin, W9CJU\*

WHILE a lot of the gang is enthusiastically developing five-meter transmission, in which W9CJU has not been able to participate because of the more or less isolated QRA, a system of automatic break-in has been developed here for use on the 75-meter 'phone band.

The many advantages of an automatic break-in for 'phone are apparent. With the transmitter operating only when the microphone is spoken into and the receiver coming on during the intervals in speech, a QSO may be had in the same manner as on a land-wire telephone. Since the transmitter and receiver work alternately, there is no blocking of the receiver, and any trans-

mitter power may be used. Further advantages are that fading will be noticed while following each other's speech so closely, and no doubt will exist as to each other's reception as is experienced in the common type of transmission that takes from ten to twenty minutes before signing over. Also, QRM will be detected at once and give the stations being QRM'd a chance to get through a few words, at least.

The diagram of the system in use at W9CJU is shown in Fig. 1. The diagram is for the most part self-explanatory. The '27 acts much the same as a volume-level indicator tube. In spite of the fact that two relays are used, all reports on the air indicate that in most cases even the first letter of the first word spoken is not lost.

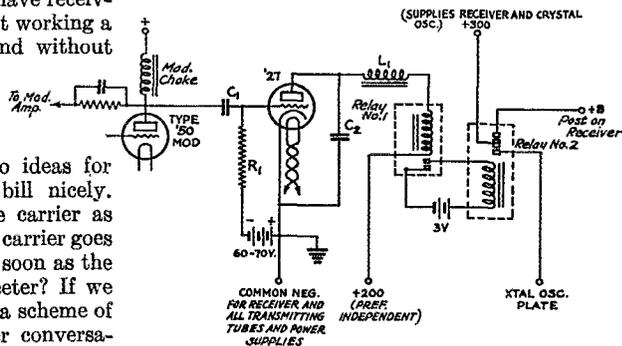


FIG. 1 — BREAK-IN SYSTEM USED BY W9CJU

- C<sub>1</sub> — .01 μfd.
  - C<sub>2</sub> — 1 μfd.
  - L<sub>1</sub> — 40 henrys.
  - R<sub>1</sub> — 50,000 ohms.
  - Relay No. 1 — 4000-ohm s.p.s.t. relay.
  - Relay No. 2 — Low-resistance relay, s.p.d.t., normally closed on the side connected to the plus B post on receiver. W9CJU uses an old telegraph sounder with contacts fitted on the armature and stop.
- The control tube may be coupled to the preceding speech amplifier stage instead of to the modulator plate if desired.

The speed at which the transmitter is thrown on the air depends for the most part on the adjustment of the relay in the plate circuit of the '27 control tube. The speech amplifier and modulator voltages are on continuously as are, of course, the voltages, both plate and filament, of all of the r.f. tubes. However, since the r.f. tubes are biased to cut-off or nearly so in most set-ups, no plate current will be drawn by them unless the mike is spoken into. With a linear r.f. amplifier, as used at this station, a heavier bleeder resistance across the linear stage power supply is necessary to prevent damage to the filter condensers while the carrier is off.

\*Brooklyn, Wisc.

It is necessary to use a crystal which goes in and out of oscillation readily, but no difficulty was experienced here with any of the several crystals available. In those cases where a separate power supply is not used for the crystal, this scheme will furnish one and perhaps lessen the tendency to frequency modulation. The lag or abruptness with which the crystal power supply (and carrier) is shut off is easily adjusted by varying the resistance in series with the "C" bias in the grid circuit of the '27 control tube.

Most every 'phone station contacted at W9CJU is very much interested in break-in and I'm sure the improvement and speed of QSO's would more than repay the small cost and trouble of installing the system.

## The Break-In System at W6GM

By George Ewing\*

A break-in system for 'phone must meet two requirements: The carrier should come on the air instantaneously when the mike is spoken into, and it must "hold on" long enough to take care of normal pauses between words and phrases, pauses which usually occupy but a fraction of a second, but which may be as great as one second. The arrangement used here, the diagram of which is shown in Fig. 2, is satisfactory in both respects. No words are lost, although there is a slight hesitancy on the start of the first word after a pause. "How's my modulation?" becomes "Ow's my modulation?" However, a slight emphasis on the "H" sound Americanizes the Cockney accent.

By checking over the circuit diagram one can see a Type '71-A tube whose grid is connected to the modulator grids. In the plate circuit of this tube is a relay  $S_1$ , which was made by rewinding an old Philco A & B power unit relay with 25,000 turns of No. 40 enamelled wire, 2 milliamperes being sufficient to close it. The plate voltage for this tube comes from a separate power supply, and this voltage is adjusted with the help of resistor  $R_2$ , so that, with 112 volts bias on the grid,  $\frac{1}{2}$  milliamperes flows in the plate circuit.

In operation all of the filaments and plate voltages to the rectifiers are turned on, but nothing happens yet since the oscillator B-circuit is open at  $S_2$  and the blocking out bias from  $R_5$  is applied both to r.f. amplifiers and modulators. To short out  $R_5$  and apply normal bias, it is necessary to have  $S_2$  close.

When the microphone is spoken into the '71-A control tube acts as a vacuum-tube voltmeter and current flows through  $S_1$ , closing its contacts and lighting the filaments of the '01-A and '71-A shown in the lower part of the diagram. The plate voltage for these tubes comes from the main power supply. The current through  $S_2$ , also a Philco relay rewound with 18,000 turns of No. 36

enamelled, opens the 2nd a.f. receiver B-plus lead, closes the oscillator B-circuit and shorts the blocking out bias. The current necessary to close this relay is 3.5 milliamperes. When the voice stops the contacts of  $S_1$  open, but the thermal inertia of the '71-A filament allows current to flow

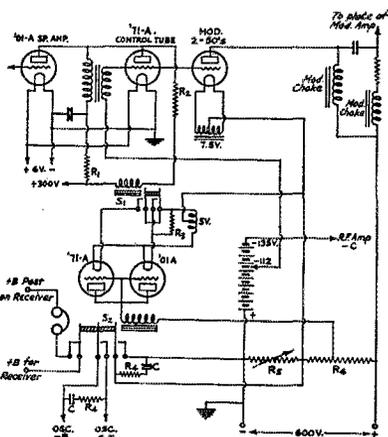


FIG. 2 — ESSENTIALS OF THE BREAK-IN SYSTEM USED AT W6GM

The actual arrangement used by Ewing is considerably more elaborate, being rigged up so the transition from 'phone to c.w. can be made with minimum of effort. All the parts essential to the 'phone break-in system are shown in this diagram, however. Values are given below. Condensers, etc., unmarked are to be found in every speech amplifier and modulator, and the values differ in no way from normal.

- $S_1$   $S_2$  — Relays described in text.
- $R_1$  — 50,000 ohms to drop voltage on speech amplifier.
- $R_2$  — 20,000 ohms to limit current in control tube; see text.
- $R_3$  — 20 ohms to drop voltage on '01-A filament.
- $R_4$  — 200 ohms.
- $R_5$  — Variable resistor for blocking bias; Bradleyohm.
- $R_6$  — 40,000 ohms, tapped at 8000.
- C —  $1\mu\text{fd}$ .

through  $S_2$  for an instant, holding the transmitter on the air for about one second or less.

When this system was first tried out the '71-A filament was too slow to start and an '01-A tube did not hold long enough, so they were placed in parallel. This improved matters, but it was still a little slow to start. It was found that by having about 2.5 volts on the '01-A filament all the time the plate current was too small to close the relay while starting was much quicker when the resistor  $R_3$  was shorted out, applying the full 5 volts. The '71-A, however, passed enough current to hold the relay closed with 2.5 volts on its filament. The final solution was to use two contacts on  $S_1$ , the other contact opening the '71-A filament circuit completely. Using this arrangement, the timing seems to be just about right since it starts quick enough so that nothing is lost and it holds on straight through a continuous sentence.

The separate B supply for the speech amplifier and voice control tube was necessary because the device would not shut the transmitter off when

(Continued on page 18)

\*201 E. 10th St., San Bernardino, Calif.

# "I Can't Be Bothered"

In Which One Radio Amateur Tells How He Has Kept His Interest  
in the Game for Over Twenty Years Without Be-  
coming a Slave to the Slide-Rule

By R. B. Bourne\*

**A**MATEUR radio is one of my hobbies and I want to keep it that. It has held a major place in my sphere of activities for a good many years but, like radio itself, the firmness with which it grips me and orders me around is a variable, and even oscillating, quantity. It has never made me its slave, at least for very long, and then only because I didn't know any better. I do confess to having gone through and survived certain periods when little else but "wireless" entered my mind. When in such a trance, I was often guilty of sneaking an Electro Importing Company catalog into church and being carried glamorously away to pinnacles of imagination by the oily language, irresistible arguments and convincing illustrations contained in that famous yellow-covered "bible."

Why a coherer cohered and what it cohered seemed easy enough to understand. What the man said about detectors seemed plausible. But I never really believed in that one-hundred-mile transformer coil, especially after seeing one. I distinctly remember frowning upon telephone receivers wound with German Silver wire in order that they might truthfully bear the magic legend "3000 ohms" because I knew, from certain experiences with toy motors, that resistance itself was not what made them work.

## THE CALL OF SCIENCE

Then came a period of serious study. Robison's Manual displaced the old catalogs and a firm idea of decrement (now a seldom-heard word) planted itself — so firm, indeed, that when, some years later, a professor asked me to define logarithmic decrement, I almost answered "two tenths maximum!" At that time, I tried to believe that wireless was an exact science and that if I were to get anywhere, I would have to become an exact sciencee. There were some drawbacks to this. The ultimate explanation of a lot of things soon bogged me down in the mire of mathematics, which, at that time was largely something to be "passed" in school. I came to earth again when I realized that I could and did communicate with another amateur across town without the aid of any mathematics of importance. I didn't

realize that a thing could be obeying perfectly definite physical laws even though the laws were not thoroughly understood, or were, perchance, even unknown. It seemed unnecessary to think very much about the ultimate explanation of the goings-on so long as a certain *feel* concerning the thing was had. This state of mind made wireless a pleasure to me, with always the thought in the background that the mysteries would ultimately dissolve, to be pleasantly replaced by deeper ones. In the meantime, I wouldn't worry too much about them.

## VECTORS AND THINGS

So, up to this time, mathematics did not seriously enter the picture. I had a good understanding of resonance phenomena, thanks to certain analogies, but my understanding was not a mathematical one. I had never heard of a vector diagram. It just seemed the most natural thing in the world for a circuit to respond more readily to some wavelengths than to others. Impedance and inductance? I didn't know exactly what these ponderous terms meant; I rather *felt* their import. I still do. Later study of alternating current phenomena and theory interpreted things in a different light. I still refused, nevertheless, to accept the mathematical as the only way of thinking. I now admit that there are some things which I can explain satisfactorily only with the aid of mathematics and with mathematics only. And plenty which I can't explain away, nohow!

As I progressed in the art, so the art itself progressed and, it seems, at a much faster rate. From time to time I found myself woefully behind the times. Technical papers began to appear on my horizon — papers which, to me, defied understanding. Once in a while, some brilliant and inspired author would come across with "the dope"; with diagrams I could understand — little or no math — a clear word-picture of what went on — what to do in order to make it perk. To me, such information was vastly more important than cumbersome technical papers. I shamelessly admit to having perpetrated at least one paper which probably scared off a lot of hams from the realization that the thing would actually work.

\* WIANA, 80 Hillcrest Ave., Wethersfield, Conn.

## THE OGRES AND BOGIES

And so, in recent years I have built up a certain philosophy regarding this hobby of mine. It is my Aladdin's Lamp, carrying me to far-off countries (provided the Kennelly-Heaviside layer is right!), my servant to call with the snap of a switch. Why be deprived of the *pleasure* hidden in amateur radio by allowing its ogres and bogies to hold the whip hand? A hobby mustn't be taken too seriously. Mathematics has its place in the scheme of things, but it shouldn't be allowed to become the master of hobby. If a fellow wants to think in terms of mathematics when he winds a choke coil, let him. Maybe he likes to. After a while we get so that we just *wind* it and it works, although maybe not the first time. We *know* about how many turns of copper tubing are going to be required for a given job. Even the mathematician gets that way sooner or later. Witness his solution of differential equations; what does he do? Why, he writes down the equation and takes a good look at it. He then says to himself, "It strikes me that the solution of this equation should be so-and-so." So he boldly *writes down* a good looking solution. Does he solve for it? He does not. He stifles any qualms he may have and justifies his rash act by putting in a proviso. He says "So-and-so *is* a solution provided such-and-such is the case." Simple, isn't it?

### LET'S MAKE A TANK COIL

This is just the kind of thing I do when I want to make a tank coil hit the forty-meter band. Oh, I don't pretend to go to the mat with some formula born in the Bureau of Standards having to do with the inductance of solenoids. I just take down the old roll of copper tubing, reel off a goodly length and wind it around the now well-polished piece of iron pipe. When I think I have enough turns — my solution of the problem or equation — I cut the rest of the tubing off and finish up the mechanical details. Can this be the right number of turns? It *is* the right number of turns, provided I use the right capacity in my tank condenser. Here is my proviso. Of course, experience is necessary. To get experience in this little matter, just wind a few coils for certain particular jobs. It is something you can't help acquiring unless you are a third-degree moron.

### OR AN ANTENNA

Another class of, it seems to me, misled hams are those who are hidebound in their notions concerning physical details. Some of these fellows are prone to measure the length of their antenna to the fraction of an inch. Why do they do it? Probably because someone told them it was the thing to do or because they are using trick antenna and feeder arrangements for one reason or another. Some folks like to make things complicated. I've always felt that complexity bore

rather directly on possible trouble. In the case of my own antenna, don't ask me its exact length. I don't know it to the nearest five feet. Furthermore, I don't even care. The oscillations on a radiating antenna being of the standing wave variety, there will be a nodal point about a quarter-wave away from the remote end. It can't be anywhere else for that frequency. It only remains to choose and use the proper type of coupling between the antenna and transmitter to make the current at this point (or any other fixed point, for that matter) have a reasonable value. When the rig is tuned properly and the various circuits are functioning as they should, I *know* it. Not by exact instruments (though I admit a plate milliammeter is handy) but largely by the feel of the thing. Probably a lot of factors enter into this; the grunt of the homemade plate transformer, the color or lack of it in the plates of the tubes, sparking at the keying relay and other equally silly and dizzy things. Even with multi-stage crystal transmitters, I decline to make a hard job of it. A flock of plate milliammeters shows, among other things, how unstable radio circuits can be. They are therefore useful in detecting faulty design and crummy workmanship. But then again a neon tube and a flashlight bulb inserted in a single turn of wire will work wonders in lining up a set, once the frequency is determined.

Speaking of frequency, a precision frequency-meter is a thing of beauty and joy to use, providing the degree of accuracy is known. We are exhorted to keep checking its calibration, lest something shift on us unbeknownst. Personally, I haven't such a thing, never having felt the urge to flirt dangerously with the edge of a band. A calibrated receiver, with easily-made and frequent checks, serves for all practical purposes and has thus far steered my signals in the paths of righteousness. (If I have occasionally emitted signals outside the bands assigned to amateurs, I believe the errors were gross ones, such as catching the third harmonic of an amplifier instead of the second, as intended.)

### SLAVE OR MASTER?

And so it goes. When I become a slave to radio theory, then radio will cease to be the hobby that it has been and is. I am willing to accept (with reservations) the results of the seriously-minded experts in the laboratories. Let the experts worry over such matters as exact 100% modulation. It doesn't mean anything important to me because literally, it is a theoretical panacea only to be obtained with carefully-controlled laboratory set-ups, precision sources of sound at exact distances from expensive mikes, jealous scrutiny applied to generally inaccurate meters, faith in the published theory and in the constancy of tubes. I object to it because if the ham talks in

(Continued on page 18)



- Place the speech amplifier as far away from the r.f. power amplifier as conveniently possible.
- Use two .002 mica receiving condensers in series across the buttons of the microphone, the mid-point of the condensers being returned to ground with a separate lead.
- Use good short-wave r.f. chokes in supply voltage leads.
- Ground the core or shell of the filament transformer supplying the 57 and '10; and, if helpful, also that of the microphone input transformer, each with a separate lead. This applies mainly to unshielded amplifiers.

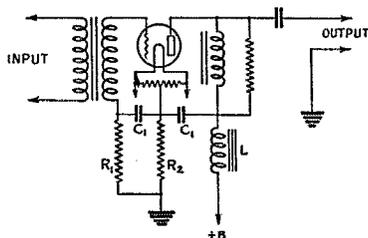


FIG. 2 — GRID AND PLATE DE-COUPLING TO ELIMINATE A.F. TROUBLES

$R_1$  — 50,000-ohm carbon resistor.  
 $R_2$  — Usual cathode biasing resistor.  
 $C_1$  — 4- $\mu$ f. 250-volt condenser.  
 $L$  — A.F. choke; may be primary of suitable audio transformer.

The elimination of trouble originating from a.f. sources may sometimes be accomplished by the following:

- Use grid and plate filters or "de-coupling" devices (see Fig. 2) in the grid and plate circuits of one or all audio stages, especially the high-level stages.
- Use separate "B" supply for preliminary and output stages. (This should, however, seldom be necessary.)
- Use non-inductive carbon fixed resistors of 100,000 to 500,000 ohms across transformer secondary windings, particularly on the high-level stage. The exact value of resistance for best results will depend upon the gain available and the gain desired. If too much voltage swing is delivered from any stage, the next stage may give trouble and require a resistance as low as 100,000 ohms across the secondary of its output transformer.

Radio servicemen interested in portable public address amplifiers should find the 57 well worth trying for the microphone input stage.

## The Break-In System at W6GM

(Continued from page 14)

using a tap on the main power supply, since the

voltage would suddenly go up as the load went off, giving the speech amplifier a kick which would turn the transmitter on again. It is also essential, since  $S_2$  opens very slowly, that the contacts which short out  $R_5$ , open slightly ahead of the contacts which open the B-lead to the oscillator, thus blocking the modulator and r.f. amplifier grids before the r.f. excitation cuts off.

## "I Can't Be Bothered"

(Continued from page 16)

anything except an electrically driven tuning-fork voice, shifts his position or even acts naturally, he either has less than 100% modulation or — horrible thought — that bogey, distortion. Personally, I can't be bothered.

## Strays

A defunct but intact storage battery makes an FB high-voltage condenser when it is drained and filled with transformer oil. The sections are connected in parallel, of course.

## The Greeks Had a Letter for It

Comes to gripe us again the sometimes unwarranted license, at best loose, at worst utterly confusing, that prevails in the choice of a letter abbreviation for the ever-recurring "micro" prefix to electrical terms — "microfarad" and its family being the worst abused. One place a feller sees "mfd." Then it pops up as "ufd." And in *QST* it's always " $\mu$ f." Which is right? Or are they all? Now the intent is to abbreviate "micro," meaning "millionth." And "micro" is derived from a Greek word that starts with the Greek letter " $\mu$ " (pronounced "mu"), whose English equivalent is "m." Hence " $\mu$ " makes the best case for itself — it's right from the original. Next choice would go to "m," its English equivalent. But how does plain little "u" get into the picture? Perhaps because it looks like the Greek " $\mu$ ," much more like " $\mu$ " than "m" does. Unfortunately, however, the Greek equivalent of English "u" is something looking like a " $\nu$ " — and its name is "upsilon"! Hence it would be more logical to pronounce "uufd." as "upsi-upsi-farad" (no baby talk intended) than to call it "micro-micro-farad." The same goes for the "mu" of a tube. If something pronounceable as "mu" is to be used to abbreviate "amplification factor," let it be the original Greek " $\mu$ " or English phonetic "mu" — or even "m." But it's no place for "u." Who ever heard of the "upsilon" of a vacuum tube?

Anyway, as *QST*'s printer seems to be one of the fortunate few having a Greek alphabet in his type box, we shall continue to use " $\mu$ ."

— J. J. L.

# A Balanced Modulator Super-Regenerative Circuit

By Walter van B. Roberts\*

THE super-regenerative circuits disclosed by Armstrong some ten years<sup>1</sup> ago were described by him as operating in one of three fashions: A variable amount of resistance was introduced into a regenerative circuit having a constant feedback; or a variable amount of feedback was introduced into a circuit having a constant resistance; or there was a combination of these two methods. When using any of these methods it is common experience that when the amplification of the system is pushed too far the circuit is likely to break into a sustained oscillation and cease to function in a super-regenerative fashion.

Fig. 1 shows a circuit designed to avoid the above-mentioned nuisance. In Fig. 1 we have a signal frequency circuit consisting of variable condenser  $V$  and a split inductance  $L_1-L_2$  with a signal frequency by-pass condenser  $K$  connected in the break between the two halves of the inductance. A source of interruption-frequency voltage is connected by way of a transformer to the two sides of condenser  $K$  and the secondary of the transformer is grounded through a bias battery. It is evident that equal bias is impressed upon the two tubes, while interruption-frequency and signal-frequency voltages are impressed upon the two grids in opposite phases. A feedback coil  $T$  (having about the same number of turns as the input coil) is coupled to the input circuit and a pair of 'phones may be included in the plate circuit. The action of the system is as follows:

In the absence of any interruption-frequency voltage the net feedback will be zero since the two grids are excited in opposite phase so that the sum of the two plate currents is constant. Suppose now that a half cycle of i.f. voltage is applied. Considering this as a means for varying the instantaneous bias on the tubes, we have the bias on one tube increased while that on the other tube is decreased with the result that the mutual conductances of the two tubes to signal frequency currents are not equal and some resultant feedback current flows in coil  $T$ . Upon the next half wave of i.f. voltage the amplifying powers of the two tubes are again rendered unequal but in the opposite sense so that the resultant feedback is of reversed phase from what it was before. Thus with continuously applied

i.f. voltage we have alternately a regenerative feedback and a degenerative feedback from coil  $T$  to the tuned circuit. If these two feedbacks are of equal magnitudes, then no matter how much current may be built up in the tuned circuit during the regenerative half-period of the interruption frequency, the degenerative action

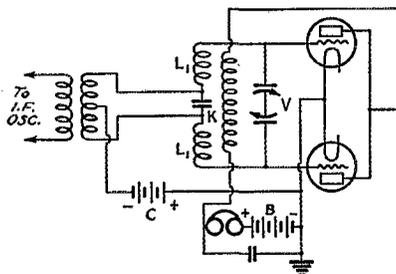


FIG. 1

during the succeeding half-period will, necessarily, undo all that has been done, with a little to spare, because resistance opposes the building up of the oscillations but aids their quenching. The theory of detection of signals in this circuit is essentially the same as in other super-regenerative circuits and may be stated briefly as follows:

The magnitude of current built up by regeneration depends upon the strength of some external exciting voltage such as a signal voltage. Therefore, the average amount of oscillation current flowing in a super-regenerative tuned circuit will depend upon the strength of incoming signals. Any detecting means arranged to produce direct current whose average strength is determined by the average oscillation strength in the tuned circuit will act to reproduce the modulation of the signals. In this case the tubes are operated preferably with a bias battery sufficient to bring the plate currents down to a very small value in the absence of the i.f. voltage and, hence, the average plate current increases in the presence of signals so that a pair of 'phones may be inserted as shown in Fig. 1 instead of a separate detector coupled to the signal circuit. It will be noted that due to the differential excitation of the tubes by the i.f., the amount of fundamental frequency current through the 'phones is very small.

It is interesting to notice that Fig. 1 may be looked upon as a balanced modulator. That is, if we think of the signal frequency circuit being

\* Radio Corporation of America, 570 Lexington Ave., N. Y. C.

<sup>1</sup> *QST* of July and August, 1922. — EDITOR.

supplied with carrier frequency current and consider the i.f. voltage as a modulating voltage, then the output circuit including coil *T* does not contain any current of carrier frequency but only the side-band frequencies produced by modulation. Therefore, since there is no frequency in coil *T* corresponding to the resonant frequency of the input circuit there can be no average feedback and, hence, no sustained oscillation produced. The amplification according to this view consists then in receiving signals of a certain frequency, splitting this frequency into

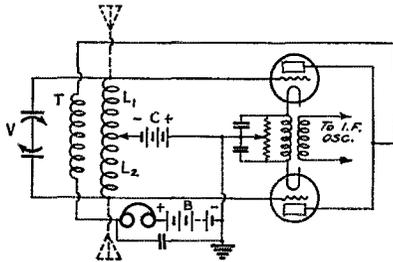


FIG. 2

two new frequencies, one higher and one lower, feeding these two new frequencies back into the input circuit where they each are again split up by the action of the balanced modulator arrangement, this process continuing until the frequencies have become so far different from the original frequency that the input circuit is too far out of tune to make the feedback arrangements any longer effective. In other words, the action is a sort of a regenerative circuit with a change of frequency at each round trip.

Fig. 1 has proven suitable except that it sometimes has been difficult to find a condenser *K* that really has low impedance to the signal frequency. In case separately heated cathode tubes are used, however, Fig. 2 is perhaps preferable since it does not require splitting the grid coil. The ground could, of course, be connected directly to the center of the coil shown shunted by the high resistance, and the resistance omitted. There are about a dozen characteristically different arrangements of this circuit that work the same way in principle. The one first used in 1922 and 1923 had the signal voltage applied in the same phase on the two grids while the feedback coil was connected differentially to the two plates. However, the general arrangement of Fig. 1 is probably the most satisfactory one so far tried. In any of the arrangements the i.f. may be produced by the two tubes themselves, but a separate source of i.f. is preferred because a much better control over i.f. voltage and wave form is then possible.

The control of amplification can be secured in a variety of ways: By varying any of the battery voltages shown; by varying the position of any

of the taps shown; by connecting the regenerative or degenerative tube plate, or both, to variable taps on coil *T*; by moving coil *T* with respect to *L*<sub>1</sub>, *L*<sub>2</sub>; by varying the frequency of interruption; or by varying the i.f. voltage. The last named seems to be as good as any and is the easiest of any of the more satisfactory methods. Selectivity is best when a rather low i.f. is used. From the balanced modulator viewpoint this is because more round trips can be made before the frequency gets too far off tune from the input circuit; while from the building up point of view, the negative resistance required to be inserted in the circuit to cause current to build up a given amount between interruptions is less the longer the period between interruptions, and the sharpness of tuning of the circuit is improved when the negative resistance is kept small just as it is when we are dealing with positive resistances. For a broadcast receiver the i.f. should be well within the audible range, but for a short-wave receiver a super-audible i.f. may be used.<sup>2</sup>

Screen-grid tubes would probably be preferable, but as I have not tried them in this circuit I cannot say whether the '24 or '35 would be the better. As for the antenna, Fig. 2 shows a short symmetrical antenna as a suggestion, although the loop effect of even a small tuning coil is enough for many purposes.

<sup>2</sup> For instance, the i.f. system used with the 56-mc. receiver described in *QST* for July, 1931. — EDITOR.

## Strays

We quote from a letter from "Monte" Douglas, W4ACB-W4PCN: "If you don't think the country is radio-minded, cast yore optics over the appended list of post offices which, in my more or less spare moments, I have compiled from Uncle Sam's latest and perhaps best Postal Guide. I am wondering how many of these towns have hams living in them. MIM, Bias, W. Va.; Bolt, W. Va.; Bug, Ky.; Cardwell, Me.; Mont., Va.; Cone, N. M.; Cut Off, La.; Cycle, N. C.; Dial, Ga.; Direct, Tex.; Drill, Va.; Due West, S. C.; Electric, Ark.; Energy, Ill.; Ether, N. C.; File, Va.; Flat Top, W. Va.; Guy, Ark.; Hartley, Ky.; Helix, Ore.; Hightowers, N. C.; Jack, Ala.; Key, Ala.; Knob, Cal.; Lead, S. C.; Loop, S. D.; Map, Mo.; Mast, N. C.; Meg., Ark.; Mica, N. C.; Micro, N. C.; Morse, Kans.; Node, Wyo.; O.K., Ky. (Walter Winchell must have had a hand in naming that one. Hi.); Peak, S. C.; Pie, W. Va.; Plus, W. Va.; Power, Mont.; Quartz, Ga.; Radio, Mont.; Relay, Md.; Remote, Ore.; Short, Okla.; Sky, Ky.; Signal, Ariz.; Sixes, Ore. (gess so at tt.); Skip, Ky.; Static, Tenn.; Steinmetz, Mo.; Telegraph, Tex.; Telephone, Tex.; Tower, Ind.; Volt, Mont.; Voltage, Ore.; Watts, Okla.; Wave, Ark.; and Wahoo, Neb."

# The 1932 Meeting of the Board

All Directors and Officers Attend Two-Day Session at Hartford—  
The Minutes of the Meeting

By K. B. Warner, Secretary

THE Board of Directors of the American Radio Relay League held its annual meeting at Hartford on May 13th and 14th, under the chairmanship of our founder and president, Hiram Percy Maxim. As is usual in our A.R.R.L. meetings, every director was present from every division, all primed with the latest thought of their members. They sat down with the officers of the League and for two days went over every aspect of amateur radio and plotted our course for the coming year. All of the knotty problems of policy which have come up at headquarters had been saved for the Board, and the directors brought to the meeting countless suggestions from their members. All these questions were thoroughly sifted and the results communicated to the officers as their instructions for the conduct of the League until the Board next meets.

An A.R.R.L. Board meeting is a very interesting spectacle. There are thirteen division directors, the Canadian general manager, the president and the vice-president; there are also present the three salaried officers of the League, the general counsel, and the assistant secretary — twenty-one in all. They have their meetings around a huge oval table in the Hartford Club. They start out in a morning, work until late luncheon time, and then recess briefly for luncheon in an adjoining private dining room. Then they go back to work until dinner time, take out another hour or so to eat, and resume for the evening. The next day goes the same way. It is strenuous work, two days of it. The directors may be as much different from each other as only radio amateurs can be, since ham radio is the meeting ground for people

from every walk of life, every vocation. Yet they have this in common: every one is a radio amateur, elected by his division membership as its spokesman, and fully informed on what's what back home. They travel thousands of miles to the annual meeting to merge their views and judgments, and when the officers have reported on their stewardship and each director has reported on affairs in his division, the whole Board has a

mighty good picture of the whole of amateur radio. It is in such an atmosphere that our A.R.R.L. matters are decided, on the one reliable basis of the greatest good to the greatest number. That it is a sound workable scheme of government is shown by the success and growth of our League down through the years.

The Board decided this year that the minutes of its meetings should be published in *QST*, and they are to be found, in somewhat smaller type, at the conclusion of this introduction. These minutes, it may be said, are the *only* record of the meeting. In recent years the Board has had prepared not only minutes of its meetings but an expanded narrative record for the confidential use of directors. Although the two records reported the same things, so many of the fellows acquired the impression that there were secret doings that were being "held out" on them that this year's meeting ordered the abandonment of the expanded account, the preparation of minutes only,

and the publication of these minutes in *QST* so that every member may read them.

Minutes are awfully dry reading, of course. They have to be put down in a certain fashion, to make a legal and permanent record of all the

## RE-ELECTED



HIRAM PERCY MAXIM

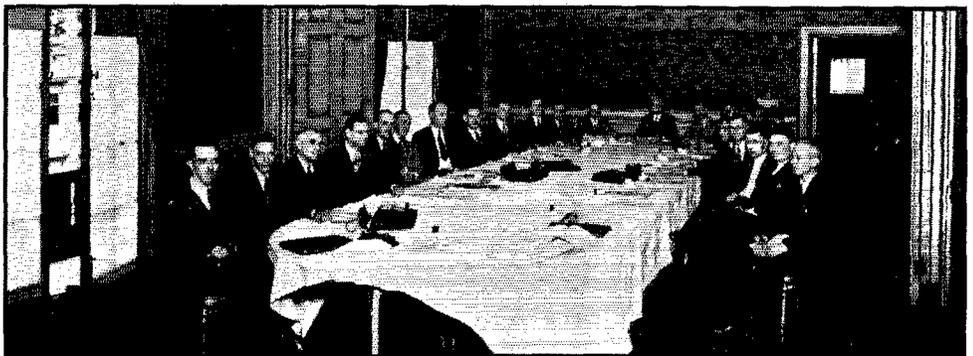
*"It is a great honor to be the president of this old League of ours for another two years. Away back in 1914, when a transmitter was a spark-coil, a key and an aerial (as long and high as possible) and fifteen miles was super-DX, a few of us got together and formed the American Radio Relay League. I was proud to be its first president, but little did I realize then that eighteen years later our organization would have attained its present size and standing and that I would still be occupying that office. To be the president of A.R.R.L. is a very real distinction, and the spirit that again prompted the directors to confer this honor upon me fills me with emotion."*

formal actions taken by the Board. It is impossible, and outside their intended scope, for them to give any picture of the liveness and vigor of the Board behind them. But they do report the subjects examined and the decisions reached and the vote of each director so far as there was record voting, so that every member ought to take off a few minutes and read through them.

Let us summarize a few of the high-lights. Mr. Maxim and Mr. Stewart, respectively our president and our vice-president for many years, were unanimously reelected for the 1932-33 term. Director Clair Foster, W6HM, was appointed to the A.R.R.L. delegation to the Madrid Conference, and we are, therefore, going to be represented at the big show by three men, Messrs. Foster, Segal and Warner. (The conference opens September 3d, and they will probably be sailing in middle August.) The delegates were given their instructions on many particular Madrid subjects, including orders to back up the Canadian Government's proposal to widen the "40-meter" band to 7000-7500 kc. Plans were made for a vigorous defense of our domestic message-handling rights. Proposals to reapportion A.R.R.L. divisions and to raise the dues were tabled without action. 'Phone again came in for a long study, particularly the 1715- to 2000-kc. band, but because the new regulations have just gone into effect and because the F.R.C. has announced that it will make no further changes until the present system is given a fair trial, no action was taken beyond instructing the Communications Manager to make a full survey of this band and report his recommendations to the Board. Request was made of the F.R.C. to permit modulated telegraphy on 10 meters and below, and to open up to amateurs new bands at  $2\frac{1}{2}$ ,  $1\frac{1}{4}$  and  $\frac{5}{8}$  meters, etc., if any assignments at all are to be made in such regions. The proposed fees for amateur licenses were studied at length, and the Board by unanimous vote instructed opposition to any fees

whatever on amateur operation. (By the way, the Senate returned that fee bill in middle May to the Committee on Interstate Commerce for further study. That means that it will not pass in its present form and that it is doubtful whether, after it has been studied anew by the committee, it will even be reached for consideration by the Senate at this session. Meanwhile A.R.R.L. has asked for a hearing, and will oppose any fees at all on amateurs.) Getting back to our story, the Central Division again asked for a national convention but the Board, adhering to its policy of many years to encourage division conventions but not to have national conventions, did not approve the request. Finally, the by-laws were amended to restore the Philippine Islands as a part of the Pacific Division, with voting rights, as they were prior to 1930.

These are the high-lights. These and many another formal action are recorded in the minutes. But a Board meeting is much more than a formal meeting, at least in A.R.R.L. In another sense it is a two-day conference between the officers, particularly the salaried officers, and their "big bosses," the directors from every division. In informal discussions, in thousands of small ways, the meeting of the Board serves to convey to the officers of the League the ideas, thoughts and desires of the Board, to take into account in discharging their duties during the coming year — and this is true of many topics on which no formal action occurred at the meeting to be recorded in a minute. As examples of what we mean, it is the feeling of our Board that there is a certain dampness about the recent change in regulations governing operating-license renewals, and the Executive Committee is taking the subject in tow; they feel that "Calls Heard" in QST have pretty well outlived their usefulness; that our technical information service and our QSL bureau might well be put on some self-supporting basis; that we want to preserve our



THE 1932 BOARD MEETING PAUSES TO HAVE ITS PICTURE TAKEN

Left to right: Communications Manager Handy, Division Directors Hill, Woodruff, Corlett, Bailey, Foster, Weingarten, Windom, Canadian General Manager Reid, Director Walsh, Treasurer Hebert, General Counsel Segal, President Maxim, Secretary Warner, Assistant Secretary Budlong, Division Directors Hagler, Kerr, Andrews, Vice-President Stewart (over Mr. Andrews), Division Directors Lindesmith, Gravely. All present!

present right to communicate with small vessels; that we want expeditions to continue to operate under non-amateur licenses and on non-amateur frequencies, so they won't be buried in our own QRM; that it would be wise now to abandon our policy of the last few years of publicizing in *QST* the penalties meted out to amateurs who have broken regulations; that we would like some day to see an arrangement in our A.R.R.L. government whereunder only licensed amateurs have a vote in our affairs; that the present requirement of personal appearance for 'phone certification is jake and we have no kick against it; that we don't believe in compulsory frequency meters; that there is no basis for getting anxious over the lack of uniformity between Canadian and U. S. 'phone regs. And so on and on, until there wouldn't be anything else in this issue of *QST*. We really summarize when we say that we had a fine incisive meeting of a Board that was on to its job, that went over all the ground, and that has given sailing directions for the next year on everything that anybody could think of.

Now for the minutes:

MINUTES OF REGULAR ANNUAL MEETING OF THE BOARD OF DIRECTORS THE AMERICAN RADIO RELAY LEAGUE, INC., HARTFORD, CONN., MAY 13-14, 1932

The Board of Directors of the American Radio Relay League, Inc., met at The Hartford Club, Hartford, Conn., in regular annual meeting on May 13, 1932, pursuant to a call issued by the President in compliance with the constitution, and was called to order by the President, Mr. Hiram Percy Maxim, at 10:10 a.m., d.s.t. At opening roll-call the following directors were present: Chairman Maxim, Messrs. Andrews, Bailey, Corlett, Foster, Gravely, Hagler, Hill, Kerr, Lindesmith, Reid, Stewart, Walsh, Weingarten, Windom and Woodruff. Absent: none. Also present: General Counsel Paul M. Segal, Communications Manager F. E. Handy, Treasurer and Fieldman A. A. Hebert, Secretary K. B. Warner, Assistant Secretary A. L. Budlong.

On motion of Mr. Reid, unanimously

VOTED, that the minutes of the last meeting of the Board are approved in the form in which they were distributed by the secretary, without reading.

The annual reports of the President, Vice-President, Secretary, Treasurer, Communications Manager, General Counsel and Fieldman were read by those officials, respectively, and in each case, upon motion duly made and seconded, it was unanimously

VOTED, to accept the report and to list recommendations therein as agenda.

On motion of Mr. Woodruff, it was

VOTED, to postpone the election of president and vice-president until after the consideration of the remainder of the agenda.

On motion of Mr. Walsh, unanimously

VOTED, that all acts performed and all things done by the Executive Committee since the last meeting of the Board, and by it reported to the Board, are ratified and confirmed by the Board as the actions of the Board.

After discussion, on motion of Mr. Bailey,

VOTED, that the Board, having considered its mail vote with reference to a schedule of fees for amateur licenses, and having examined same, now ratifies the same and as of April 29, 1932, votes to oppose the contemplated fee schedule, but to accept, if necessary, a schedule that will not cost the individual amateur in excess of \$2 per year, \$1 for operator and \$1 for station.

Messrs. Windom and Foster requested to be recorded as voting opposed on the above question.

After further discussion, on motion of Mr. Lindesmith, unanimously

VOTED, to make a special order to reconsider the question of fees for amateur operation after the consideration of the other items listed as agenda.

Mr. Reid read his annual report as Canadian general manager. Messrs. Woodruff, Windom, Lindesmith and Hill in turn read their respective reports as division directors, Mr. Woodruff also reporting as chairman of the Directors' Radio Chain. Mr. Stewart moved that the Board now recess for luncheon, which, being adopted, the Board did recess at 1:03 p.m. Reconvening at 2:10 p.m., all directors and officials were present at roll-call. Messrs. Walsh, Kerr, Bailey and Weingarten read their respective reports as division directors, Mr. Weingarten supplementing his report by reading letters received from affiliated clubs in his division. Mr. Foster requested permission to omit the reading of parts of his report. On motion of Mr. Hill, it was voted to allow Mr. Foster to select for reading such parts of his report as he wished. Mr. Foster read parts of his report, in the process of which, on motion of Mr. Andrews, it was voted that Mr. Foster read the entire remainder of his report; whereupon he did so. Messrs. Gravely, Andrews, Hagler and Corlett in turn read their respective annual reports as division directors. The Chairman directed each director to assume the initiative for bringing before the Board, at an appropriate time in the meeting, recommendations contained in the annual reports of directors but not yet listed as agenda and on which the Board's vote was desired.

On motion of Mr. Windom, unanimously

VOTED, that the sum of twenty-eight hundred dollars (\$2800) hereby is appropriated from the surplus of the League, as of this date, for the purpose of defraying the expenses of holding this meeting of the Board of Directors, any unexpended remainder of said sum to be restored to surplus.

On the question of A.R.R.L. representation at the international radiotelegraph conference at Madrid in September, after extended study and discussion, on motion of Mr. Bailey, unanimously

VOTED, that in addition to Messrs. Warner and Segal, previously appointed, there be a third member in the A.R.R.L. delegation.

And on the further motion of Mr. Bailey,

VOTED, that selection of the third representative goes over until the following day.

On the question of instructions to the A.R.R.L. delegation to Madrid, after discussion, on motion of Mr. Windom, seconded by Mr. Weingarten, without dissent,

VOTED, that the A.R.R.L. delegates are instructed to back up and lend support to the Canadian proposal to expand the 7-megacycle amateur band to read 7000-7500 kc.

After further discussion, on motion of Mr. Reid, unanimously

VOTED, to proceed to a consideration of the publication of minutes of the Board meeting, and thereafter to resume consideration of Madrid matters.

Considering the Secretary's suggestion that the minutes of meetings of the Board be published in *QST*, after discussion, on motion of Mr. Bailey, unanimously

VOTED, that the minutes of the meetings of the Board of Directors be published in *QST*.

After further discussion, on motion of Mr. Hill,

VOTED, that the 1930 instructions to the Secretary to prepare a confidential expanded record of Board meetings in addition to the minutes, are rescinded.

On motion of Mr. Walsh,

VOTED, to resume consideration of Madrid matters.

Further considering instructions to the A.R.R.L. representatives to the Madrid conference, after discussion: On motion of Mr. Stewart, unanimously

VOTED, that our delegates are instructed to oppose the specification of amateur power in the international treaty.

On motion of Mr. Stewart, unanimously

VOTED, that our delegates are instructed to oppose specification of technical details of amateur operating and licensing in the treaty, and that they endeavor to arrange to have such matters left to the discretion of each administration.

On motion of Mr. Stewart, unanimously

VOTED, that the definition of an amateur in the present international regulations is satisfactory.

On motion of Mr. Andrews, unanimously

VOTED, that the style of station call is of no importance.

On motion of Mr. Windom, unanimously

VOTED, that our delegates are instructed to endeavor to secure the exclusive assignment to amateurs of the bands of frequencies made available to amateurs.

On motion of Mr. Weingarten, unanimously

VOTED, to support the proposals of the United States government as to third-party message traffic.

Moved by Mr. Weingarten, that our delegates be instructed to oppose any change in the list of Q signals; seconded by Mr. Walsh. Two directors voted to adopt the motion, three voted opposed; so the motion was lost.

On motion of Mr. Gravely, it was unanimously voted that the Board resume session after dinner recess. On motion of Mr. Stewart, it was unanimously voted that the Board now recess for dinner. Whereupon the Board did recess, at 6:30 p.m. Reconvening at 8:02 p.m., all directors and officials were present at roll-call.

Mr. Segal was given unanimous consent to address the meeting. Speaking on behalf of himself and Mr. Warner, he reported their earnest desire that Mr. Foster be the third member of the A.R.R.L. delegation to Madrid, suggesting that the Board draft him as a delegate and emphasize to him the importance of his acceptance. On motion of Mr. Hill,

VOTED, that Mr. Clair Foster is the third member of the A.R.R.L. delegation to Madrid.

Mr. Foster asked time to consider and agreed to go if possible.

On the question of certain amendments to by-laws recommended by the Executive Committee, after examination, moved, by Mr. Corlett, that the following amendments be made to the by-laws:

*By-Law 23.* In opening sentence, insert the words "noon of," so that it reads "On any date not later than noon of the first day of November . . ."

*By-Laws 16 and 24.* In identic sentences relating to the date that ballots must be cast, insert the words "noon of," so that the sentence reads in both cases: "Ballots, to be counted, shall reach the Secretary not later than noon of the twentieth day of December of election year."

*By-Laws 16 and 24.* In identic clauses relating to Committee action when there is but a single nominee, replace the present requirement that the "Secretary cast one ballot" by simple instructions to the Committee to declare the nominee elected, so that the sentence reads in both cases: "If there be but one eligible nominee, the Executive Committee shall declare him elected without balloting by the membership."

The yeas and nays were ordered, and the said question was DECIDED in the affirmative. Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. Every director voted in the affirmative. So the by-laws were amended as proposed.

Mr. Corlett, being given unanimous consent, withdrew his recently-published proposal to amend Article VI of the constitution and By-Law 8.

On the question of Mr. Corlett's previously-published proposal to amend By-Law 33, after discussion, being given unanimous consent, Mr. Corlett withdrew the proposal. After further discussion, on motion of Mr. Corlett, unanimously

VOTED, that the Editor of *QST* is instructed to publish once every six months a directory of active affiliated clubs; and that the said list also be printed for free distribution and that its availability be advertised by a notice on the directory page of each issue of *QST*.

On the question of a course of action to protect the rights of amateurs to handle third-party message traffic, after extended discussion, on motion of Mr. Hill, unanimously VOTED, that the General Counsel is instructed to proceed to the full safeguarding of these rights.

On the question of establishing a Communications Department section in the Island of Guam, after discussion, on motion of Mr. Foster, unanimously

VOTED, to lay the subject on the table.

On the question of the reapportionment of A.R.R.L. Divisions, after discussion, on motion of Mr. Hill, seconded by Mr. Andrews,

VOTED, to lay the question on the table.

Messrs. Gravely, Reid, Walsh and Weingarten requested to be recorded as not voting on the above question.

On the question of certain resolutions adopted by the twelfth annual Pacific Division convention concerning the A.R.R.L. Standard Frequency System, after discussion, on motion of Mr. Windom, unanimously

VOTED, to lay the question on the table.

On the question of increasing the rate of membership dues, examination of which had been proposed by the Secretary, after discussion, on motion of Mr. Bailey, unanimously

VOTED, to lay the question on the table.

On the question of Federal Radio Commission practice in challenged cases involving amateurs, after discussion, on motion of Mr. Windom, unanimously

VOTED, that there be an educational program in *QST* for the instruction of amateurs receiving challenges; and that the General Counsel is instructed to endeavor to secure a relaxation of the governing regulations in such cases, as concerns amateurs, including notification to the League as *amicus curiae* when such cases are docketed for hearing.

On motion of Mr. Stewart, it was voted that the Board do now adjourn until 10:00 a.m., d.s.t., the following day. Whereupon the Board did adjourn, at 9:42 p.m. On May 14, 1932, the Board reconvened at the same place at 10:14 a.m., all directors and officials answering the opening roll-call.

On the Secretary's proposal that application be filed for the assignment to amateurs of the bands of frequency 112-120 mc., 224-240 mc., 448-480 mc., etc., after discussion, on motion of Mr. Corlett, unanimously

VOTED, that the Secretary is instructed to convey to the Federal Radio Commission the request that there be assigned to amateur operation the bands of frequencies 112-120 mc., 224-240 mc., 448-480 mc. and/or as many of such bands of frequencies, in harmonic relation to the amateur 28-30 mc. and 56-60 mc. bands, as may be contained in the range of frequencies in which the Federal Radio Commission makes any assignments to services.

On motion of Mr. Corlett, unanimously

VOTED, to proceed now to an examination of amateur radiotelephony allocations.

After extended discussion, during which the sentiment of each division was expressed by its director and many proposals were examined, on motion of Mr. Gravely, seconded by Mr. Hill, unanimously

VOTED, that the Communications Manager is directed to make a thorough study of conditions in the 1715-2000-kc. band and give this Board his recommendations at its next meeting, or earlier if he deems advisable.

On the Secretary's suggestion that it is desirable to regularize present amateur practice in the use of Type A2 transmission on ultra-high frequencies, after discussion, on motion of Mr. Windom,

VOTED, that the Secretary is instructed to endeavor to secure an amendment of the regulations of the Federal Radio Commission to authorize Type A2 emissions on amateur frequencies above 28 megacycles.

On the question of policy regarding alien operator bills S. 4289 and H. R. 11155, after discussion, on motion of Mr. Windom, unanimously

VOTED, that the Secretary is instructed to put the League on record as opposing the application of these bills to amateurs.

On the consideration of the Fieldman's proposal to standardize the dates of certain division conventions, within certain limits, in the interest of economy in headquarters travel, after extended discussion, on motion of Mr. Hill,

VOTED, that the plan proposed in the annual report of the Fieldman is adopted.

Mr. Hagler asked to be recorded as not voting on the above question.

On motion of Mr. Gravely, it was voted to recess now for luncheon. Whereupon the Board did recess, at 12:58 p.m. Reconvening at 2:00 p.m., all directors and officials were present at roll-call.

On motion of Mr. Kerr, unanimously VOTED, that the Board expresses its thanks and commendation to the management and personnel of each of the A.R.R.L. Standard Frequency Stations for the consistent and forward-looking work they have carried out for the betterment and protection of amateur radio.

Pursuant to special order, made the previous day, the Board considered the question of license fees for amateur stations and operators. After extended discussion, during which every director expressed the sentiment of his division, on motion of Mr. Hill, unanimously

VOTED, that the A.R.R.L. is opposed to any fees whatever for amateur operation.

On the question of card files of members for the information of directors and section communications managers, after discussion, on motion of Mr. Hill,

VOTED, that a director desiring membership cards of his division receive two sets from headquarters, one for himself and one to be divided amongst appropriate section communications managers.

After further discussion, on motion of Mr. Reid, unanimously

VOTED, that a director desiring cards may at his election have the second set sent direct by headquarters to the appropriate section communications managers of his division.

Mr. Windom moved that during the World's Fair in 1933 the League hold a national hamfest at Chicago, under the direction of A.R.R.L. headquarters, its loss or profit to be assumed by the League. The motion was lost for want of a second. Moved by Mr. Windom, that the Board of Directors will be glad to see an affiliated Chicago club promote a national hamfest at Chicago during the 1933 World's Fair, and the League will do all in its power to assist the club in conducting such a hamfest. But there was no second, so the motion was lost. Moved by Mr. Windom that By-Law 43 be amended by striking out the words "of any regular American Radio Relay League Division, as specified in By-Law 4 hereof." But there was no second, so the motion was lost.

Mr. Foster spoke in support of restoring the Philippine Islands to the Pacific Division, with the right of members there to vote for director. Moved, by Mr. Foster, that the by-laws be amended as follows:

*By-Law 4.* In the specification of the territory of the Pacific Division, add the words "and the Philippine Islands" so that the specification reads "PACIFIC DIVISION, the states of California, Nevada and Arizona, and the Territory of Hawaii and the Philippine Islands."

*By-Law 5.* Strike out the item "Philippine Islands — attached to the Pacific Division."

Mr. Weingarten seconding, the yeas and nays were ordered, resulting in the ADOPTION of the said amendments. Whole votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. Every director voted in the affirmative. So the by-laws were amended as proposed.

The question of possible salary reduction of the Secretary, Communications Manager and Treasurer being brought up, the Chair, on motion of Mr. Windom, appointed Director Foster to act as a committee to discuss this matter with those concerned and report back to the Board. Thereupon Mr. Foster conferred with them and reported back that, inasmuch as a voluntary reduction of 10% had been made on April 1st of this year, further reduction at this time was not advisable. On motion of Mr. Windom,

VOTED, that the Board accepts the report and adopts it as the act of the Board.

On motion of Mr. Bailey, unanimously

VOTED, to proceed to the election of a president and a vice-president.

The President retired from the meeting, the Vice-President assuming the Chair. Nominations for president being in order, Mr. Foster nominated Hiram Percy Maxim; Mr. Walsh seconded. No further names being put in nomination, on motion of Mr. Foster, unanimously

VOTED, that the nominations are closed.

The ballot was then taken, resulting as follows: Whole number of votes cast, 15; necessary for election, 8; for Mr. Maxim, 15; opposed, 0. The Chair thereupon DECLARED

Mr. Maxim re-elected president for the 1932-1933 term. Mr. Maxim returned to the meeting, spoke briefly in appreciation, and resumed the Chair.

Mr. Stewart retired from the meeting. Nominations for vice-president being in order, Mr. Bailey nominated Charles H. Stewart; duly seconded. No further nominations resulting, on motion of Mr. Bailey, unanimously

VOTED, to close the nominations.

The ballot was then taken, resulting as follows: Whole number of votes cast 15; necessary for election, 8; for Mr. Stewart, 15; opposed, 0. The Chair thereupon DECLARED Mr. Stewart re-elected vice-president for the 1932-1933 term. Mr. Stewart returned to the meeting and spoke briefly in appreciation.

(During its several sessions the Board, without formal action, discussed the scope of section communications managers' duties, section organizations, appropriations for Madrid, publication of a call-book, effects of short-wave  
(Continued on page 34)

## Financial Statement

BY order of the Board of Directors, the following statement of the income and expenses of the American Radio Relay League, Inc., for the first quarter of 1932 is published for the information of the membership.

K. B. WARNER, *Secretary*

### STATEMENT OF REVENUE AND EXPENSES FOR THE THREE MONTHS ENDED MARCH 31, 1932

REVENUE	
Advertising sales, QST.....	\$12,959.38
Newsdealer sales, QST.....	11,941.26
Handbook sales.....	11,386.01
Advertising sales, Handbook..	87.50
Beginners booklet sales.....	4,509.92
Membership dues.....	12,453.56
Membership supplies sales.....	2,525.64
Interest earned.....	838.78
Cash discounts earned.....	185.83
Bad debts recovered.....	25.00
	\$56,902.88
Deduct:	
Returns and allowances.....	\$ 3,556.72
Cash discounts on sales.....	272.33
Exchange and collection charges.	93.91
Provision for newsstand Book-	
let returns.....	1,652.35
Provision for newsstand QST re-	
turns.....	92.54
	5,667.85
Net revenue.....	\$51,235.03
EXPENSES	
Publication expenses, QST.....	\$11,335.01
Publication expenses, Hand-	
book.....	6,022.43
Publication expenses, Booklet	1,901.52
Membership supplies expenses	1,204.69
Salaries.....	19,454.54
QST forwarding expenses.....	587.63
Telephone and telegraph.....	384.96
Postage.....	489.97
General expenses.....	2,738.91
Rent, light and heat.....	1,181.98
Traveling expenses.....	97.54
Provision for depreciation....	341.53
Communic. Dept. field expenses	131.15
Headquarters station expenses	60.30
Bad debts charged off.....	229.50
	46,161.66
Total expenses.....	46,161.66
Net gain from operations.....	\$ 5,073.37

# How Electron-Coupled Oscillators Make Still Better Frequency Meters

## Constructional Details of Two New Models

**T**HESE are days of progress in frequency measuring equipment as well as in transmitting and receiving apparatus. Thus it comes to pass that even the old reliable dynatron oscillator, standard for amateur frequency meters for the past several years, has a successor in a still more stable and much more adaptable arrangement—a modified version of the versatile electron-coupled type of oscillator. Good though it is, the dynatron type frequency meter has always had several objectionable features. Screen-grid tubes, even when of the same type, do not perform uniformly as dynatron oscillators, for one thing; and even with a good tube the space current tends to run rather high, often as much as 7 ma., meaning shorter "B" battery life and in some cases shorter tube life. Decent coupling between the dynatron and receiver or monitor is difficult because the oscillator, while stable when left to itself, is touchy about having things tied to its

tuned circuit. This touchiness has made it necessary to leave the oscillator unshielded and to depend on radiation from the meter and stray coupling through common plate and filament supplies. One fault of this lack of shielding is that there is likely to be too much sock on the oscillator's fundamental frequency and not enough on the higher harmonics. Still another is that the meter is subject to stray r.f. from a nearby transmitter, often requiring complete disconnection of the meter when a powerful transmitter is on in the same room. Besides all this, the unshielded meter is likely to have its calibration affected by other apparatus, tools, etc., placed near it.



THE ORIGINAL DYNATRON TYPE FREQUENCY METER AFTER REMODELING TO USE THE ELECTRON-COUPLED CIRCUIT

*It is now completely shielded, uses a Type '24-A tube, has better stability and accuracy. The output post is to the left of the dial top.*

Of course some of these deficiencies can be overcome by fitting the oscillator with an output coupling stage and completely shielding the whole works—but this requires another tube and still leaves some chance of reaction on the oscillator from circuits coupled to it. Better results are obtained with less apparatus by using the single-tube electron coupled oscillator circuit as adapted for heater-type screen-grid tubes and described in April *QST*. It overcomes all the faults of the dynatron that have been mentioned and in addition has even better inherent frequency stability, a peculiar property of this oscillator being its ability to provide frequency compensation for changes in supply voltages.<sup>1</sup> Descriptions of two models of this newer and better type of frequency meter follow.

### WIMK's New Frequency Meter

By R. B. Parmenter \*

**T**HE electron-coupled oscillator is now used in the WIMK frequency meter that was originally wired up using a dynatron oscillator as described in February 1931, *QST*.

The panel is of 1/16-inch aluminum 12 3/4" by 6 7/8". Aluminum 1/8-inch thick is recommended, however, and is well worth the difference since it is more rigid. The old bakelite panel proved useful as a template, the same dial and tuning condenser being used. Referring to the front panel, the milliammeter is mounted at the top. At the left below the dial is the jack, connected as shown in Fig. 1, for connecting the meter to external circuits. To the right is a switch which is in the heater circuit. To the upper left side of the dial is the output terminal which is insulated from the panel. The space-current milliammeter is not essential but is useful and helps the appearance by filling an otherwise blank space in the panel. It shows that the oscillator is turned on and also indicates the condition of the plate battery.

Referring to the rear view, the grid condenser and leak are mounted with a brass angle at the grid end of the coil, thus making these leads as direct as possible. Filament and plate bypass condensers are all mounted together on the shelf beside the tube and rigidly supported by brass

\* Chief operator WIMK, 38 LaSalle Road, West Hartford, Conn.

<sup>1</sup> Dow, "Electron-Coupled Oscillator Circuits," *QST*, Jan., 1932.

angles. The panel is not used as a common ground connection, all ground points being wired together and then to the condenser and panel. The screen-grid bypass condenser is mounted directly on the socket terminal. The tube socket is turned so that the cathode terminal is near the tap on the coil, placing the plate terminal near the output terminal on the panel and farthest from the grid end of the inductance. This is desirable in order to avoid coupling between the plate and grid circuits. The fixed condenser back of the tuning condenser is the bypass to ground. Since the jack is mounted in contact with the metal panel, the millimeter will be short circuited if a direct ground connection is made. If a direct ground should be wanted, the jack should be insulated from the panel.

The two brass rods which carry the plug-in receptacle are reinforced by brass-strip supports that can be seen mounted between the rods and the back of the tuning condenser. This cured a bad feature of the old frequency meter. Without the extra supports there was some frequency change when the plug or the cord moved even slightly.

The output coupling condenser  $C_3$  should be small enough to avoid any resonance with the grid circuit when the plate is coupled to a receiver or any load circuit — or even grounded! A capacitance of a few micro-microfarads is sufficient. Shielding this condenser and making it

small physically prevent stray feed-back from output to grid circuits. In making up this condenser the actual connecting wires themselves were used, as shown by the sketch in Fig. 2. Two pieces of No. 14 insulated bus wire  $3\frac{1}{4}$  inches long do the trick, one being connected to the plate terminal on the socket and the other to the output terminal on the panel. They are shielded, as well as held together, by a short length of copper braid taken from Belden shielded wire. This is slipped over the two pieces of bus

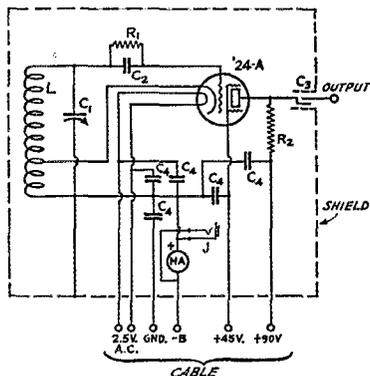
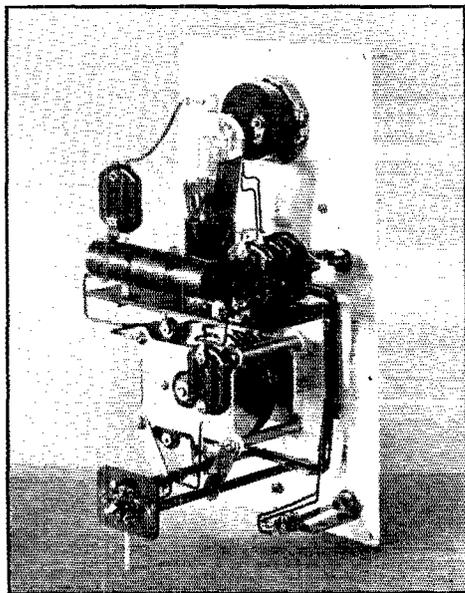


FIG. 1 — THE NEW FREQUENCY METER USES THE ELECTRON-COUPLED CIRCUIT

- $C_1$  — Band-spreading type condenser (G.R. Type 556).
- $C_2$  — 250- $\mu$ fd. mica grid condenser.
- $C_3$  — Output coupling condenser, approximately 20  $\mu$ fd. (See text and Fig. 2.)
- $C_4$  — Mica by-pass condensers, 0.005  $\mu$ fd. or larger.
- L — 1750-kc. band inductance; 83 turns No. 30 d.s.c. close-wound on 1-inch diameter bakelite tube. Cathode tap 31 turns from "ground" end.
- $R_1$  — 100,000-ohm grid leak.
- $R_2$  — 100,000-ohm 1-watt resistor.



THE ESSENTIALS OF THE NEW E.-C. FREQUENCY METER

All components are mounted rigidly, mechanical stability being just as essential as electrical stability in securing frequency stability. The complete assembly is supported on the aluminum panel.

wire, care being taken not to short on the connections at each end. To keep the open ends of the bus wire from grounding on the shielding, a small piece of spaghetti is put on the open end of each wire. The complete assembly is bent into an L shape and the shielding is soldered to a lug which is fastened to the panel. The largest exposed part of the plate circuit inside the cabinet is then the plate terminal on the socket.

The old 1750-kc. band coil from the dynatron was first tried out but was found to be too small. The coil now has 83 turns of No. 30 d.s.c. wire. It is a good plan to wind on 90 turns, give the winding a good coat of airplane dope, then take off a turn at a time until the correct frequency range is covered. Then another coat of "dope" should be applied. The cathode tap is not critical but should be approximately one third of the turns from the grounded end of the coil, the wire from the tap to the cathode being rigid.

#### STABILITY AND PRECISION

With this oscillator circuit one can cease to worry about most everything except mechanical

details and proper placement of the parts. This cannot be given too much attention. All parts should be mounted rigidly with brass angles and all wiring done with No. 14 insulated bus wire which is finally laced together with fishline.

A cabinet is also a source of frequency change

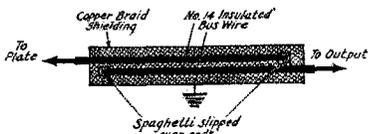


FIG. 2—HOW THE SHIELDED OUTPUT COUPLING CONDENSER IS MADE UP

Two scraps of insulated bus wire (round or square), two bits of spaghetti to slip over the ends, a short piece of braided copper shielding—and there you are.

in a frequency meter and thin flimsy aluminum cases are worthless and should not be used. An all-metal cabinet should preferably be made of  $\frac{1}{8}$ -inch aluminum with  $\frac{1}{4}$ -inch square brass pieces drilled and tapped to act as angles. In this particular case the original wooden cabinet was lined with No. 16 gauge copper. Actually, a box was made from the copper, with overlapping soldered joints, and then forced into the wooden cabinet. The edges were extended over the edges of the wooden cabinet so that the aluminum front panel makes contact with the inner copper box all the way around. The copper box should be made to fit snugly. (If it doesn't it can be fastened to the walls of the wooden cabinet with wood screws.) A hole must be cut in the back of the copper case to allow the plug to be inserted. This makes a nice job of shielding and is very good mechanically.

The two features that combine to make accuracy in a frequency meter are stability and precision—and the two should not be confused. Stability alone is not sufficient. An oscillator may be 100 percent stable, be able to stay on one frequency for a year, and still be lacking in accuracy because the calibration is shy on precision. Therefore the frequency meter must have a dial scale with enough divisions to allow precise setting and reading. Since it has been shown desirable to have overall accuracy to better than  $1/10$  of 1 percent in a good amateur type frequency meter,<sup>2</sup> the dial scale should be readable to 1 part in 1000. The dial shown, inherited from the dynatron, is the early National 6-inch type with a 100-division scale made readable to  $1/10$  division by the auxiliary vernier scale. (This dial has been succeeded by the improved Type NW.) In combination, the precision provided by this type of dial, the stability of the oscillator and the accuracy of the standard frequency transmissions used for calibration justify labeling this frequency meter as "accurate to  $1/10$  of 1 percent."

<sup>2</sup> For a discussion of this see page 80, *The Radio Amateur's Handbook*.

## PERFORMANCE

Although the dynatron frequency meter used a d.c. type tube, a '24-A was decided on for the new job after trying several different types. The oscillator is so slightly affected by small variations in either plate or filament supplies that the a.c. type tube might as well be used. Some of the tubes tried had bad frequency changes when the heater voltage was changed, while others would shift frequency for no special reason even when the heater voltage was constant. This was attributed to movement of the heater supports caused by temperature change. The '24-A, which has a quick heating filament, gave the best performance of the tubes that were tried. Several runs were made over a period of four hours, a curve of the frequency drift that was observed being shown in Fig. 3, a similar curve of the drift of a dynatron oscillator using a '24 tube being shown for comparison. The electron-coupled oscillator with the '24-A tube does not drift as far as the dynatron oscillator but both seem to settle down after about thirty minutes.

Next the heater voltage was juggled around to determine what effect variations in line voltage would have on the frequency. After the oscillator had been allowed to warm up for three hours and then tuned to zero beat with the frequency standard, the heater voltage was increased from 2.5 volts to 2.9 volts. The resulting frequency change was approximately 300 cycles (at 1750 kc.). A change in heater voltage from 2.5 volts down to 2.1 volts caused only a change of approximately 100 cycles. These voltage variations are much more than would be encountered in practice so that frequency changes from this source should be negligible.

During the above tests 90 volts were used on the plate and 45 on the screen, the combined plate and screen current being only 1.4 ma. By using  $67\frac{1}{2}$  volts on the plate and  $22\frac{1}{2}$  on the screen the combined current is further decreased to 6 ma., either of which is a big improvement over the dynatron oscillator. Since two batteries are necessary to get even the lower voltages, it is just as well to use 90 volts on the plate and 45 on the screen. Dropping the plate voltage from 90 volts to  $67\frac{1}{2}$  volts and the screen voltage from 45 to  $22\frac{1}{2}$  volts shifted the frequency only some 200 cycles; while with the screen voltage at 45, dropping the plate voltage from 90 to  $67\frac{1}{2}$  volts gave a frequency change of but a few cycles.

Changing the screen and plate voltages proportionately has very little effect on the frequency so

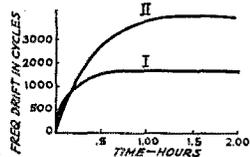


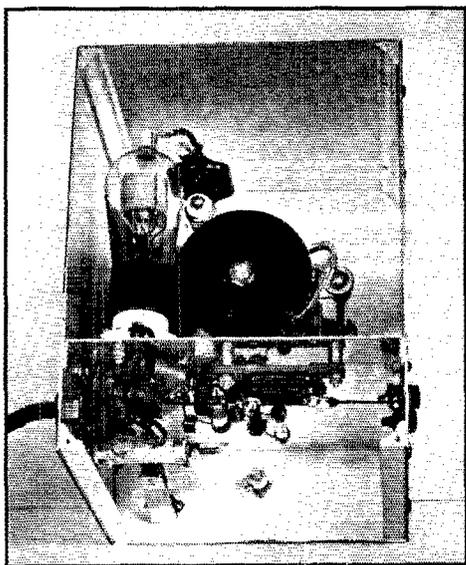
FIG. 3—FREQUENCY DRIFT WITH TEMPERATURE RISE

Curve I—E.C. Oscillator with '24-A tube.  
Curve II—Dynatron Oscillator with '24 tube.

either "B" batteries or an "eliminator" may be used. If a "B" eliminator is used for plate and screen supply, a voltage divider should be included inside the frequency meter case. This is the only change necessary to make the oscillator completely a.c. operated.

The oscillator was next tuned approximately 60 beats *per minute* off zero beat with the standard and the output terminal was touched with the hand — with absolutely no detectable change in the beat. Touching the panel and the batteries had no effect on the frequency with the ground connected, although when the ground was removed there was about a 500-cycle change in frequency when the battery terminals were touched. It was possible to run the oscillator a few cycles from zero beat and have it hang there although opening a window near the frequency meter caused a steady shift in frequency, indicating that about all the further improvement that would be possible would be to use temperature control.

The frequency meter covers from 1705 to 2010 kc., the harmonics of which will cover all the higher amateur bands. All the harmonics have a



W1FL'S METER WITH THE BACK AND BOTTOM SHIELD SECTIONS REMOVED

The inductance (hidden by the tube) is supported rigidly on the front end of the tuning condenser. The slot at the center of the bakelite disc is used in cooperation with an insulated screwdriver to set the minimum-capacity section of the tank condenser.

nice kick, even those picked up on 56 mc. showing plenty of strength. The stability of this oscillator circuit was strikingly demonstrated by tuning in a fairly steady c.w. signal on a receiver using a regenerative detector with one r.f. stage,

the frequency meter serving as a separate beating oscillator. Although the signal sounded only "fair" with the detector oscillating, the steady separate heterodyne brought forth "crystal control." It was hard to realize that it was the same signal. The effect was the identical on practically every signal — all of which indicates what an unstable thing our regenerative detector is.

## An All-A.C. Operated Model

By G. Donald Meserve, W1FL \*

**I**N THIS adaptation of the electron-coupled type oscillator particular attention has been given to mechanical features and circuit details that make complete a.c. operation completely satisfactory. Mechanical features are the rigid and complete shielding and sturdy components; stability with a.c. operation is provided by the "B"-supply voltage divider incorporated in the circuit and by the method used to keep the filament idling at reduced voltage when the meter is not in use.

The aluminum case measures 7 by 7 by 9 inches, is made of 1/16-inch stock and is assembled with solid triangular aluminum corner posts tapped to take 6-32 machine screws. (The slotted type of corner post should not be used.) The inside view of the meter and the schematic circuit show how the apparatus is distributed below and above the base plate. The scheme is to have the elements of the frequency generating circuit above this plate and the supply and output circuits below it.

The tuned circuit is decidedly high-*C*, thereby lessening frequency variations from temperature effects and improving frequency stability in general. The tuning condenser is of the type having a large adjustable minimum capacity and a smaller variable section in parallel. The adjustable section is set to spot the middle of the band covered (1715–2000 kc. in this case) in the center of the dial scale. It is also useful for restoring the calibration to fit the original curve in case there should be a slip (as, for instance, when a tube is changed); or to shift to an entirely different range if that should ever be desirable. This range shifting is accomplished by moving the rotor of the rear section of the condenser, made easy without opening the case by a small hole in the back plate through which an insulated screwdriver reaches the slot in the rear end of the rotor shaft.

The usual time required for the tube to reach a stable operating temperature, and to stop drifting in frequency, is considerably cut down by operating the heater at reduced idling voltage. This is accomplished by the 1-ohm resistor that is in series with the heater when the switch is in the "off" position, the resistor being shorted and

\* Box 252, Noroton Heights, Conn.

normal voltage applied to the heater when the switch is thrown to "on." The same switch, double-pole single-throw, switches on the "B" supply. In choosing this resistor make sure it has low-resistance connections. The 1 ohm should be in the resistor itself and not in the connecting leads. When it is right the idling voltage at the socket terminals should be 1.5 volts. The normal

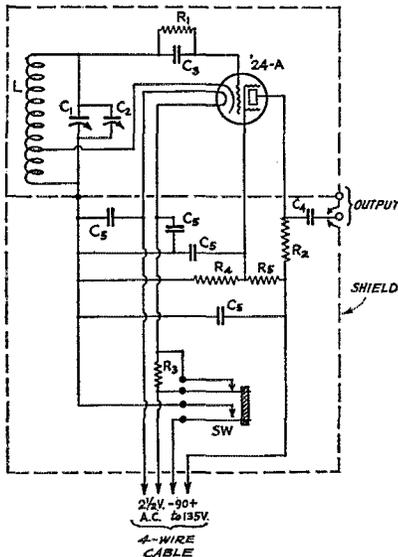


FIG. 4 — SCHEMATIC DIAGRAM OF W1FL'S VERSION OF THE E.C. FREQUENCY METER

- $C_{1-2}$  — Double-section band-spread condenser (R.E.L. No. 187-11); tuning section 70- $\mu$ fd. max., adjustable (rear) section 110- $\mu$ fd. max.
- $C_3$  — 100- $\mu$ fd. mica grid condenser.
- $C_4$  — 40- $\mu$ fd. mica output coupling condenser (may be smaller).
- $C_5$  — 0.05- $\mu$ fd. by-pass condensers.
- $L$  — 75 turns No. 36 enameled wire on 1-inch diameter bakelite form threaded 40 turns per inch; tapped 25 turns from "ground" end.
- $R_1$  — 100,000-ohm 1-watt size resistor (grid leak).
- $R_2$  — 50,000-ohm 1-watt plate resistor.
- $R_3$  — 1-ohm filament idling resistor (see text).
- $R_4, R_5$  — Voltage divider, each 15,000-ohm 2-watt.
- $SW$  — D.P.S.T. jack switch.

operating voltage, with the resistor shorted, should be 2.5, of course.

The dial of this meter is the new R. E. L. 292 "Micro-Vernier" type having the main scale divided into 200 parts and equipped with a vernier splitting each division into ten parts. Readability to 1 part in 2000 is further assisted by an adjustable magnifying glass, precise reading being possible from a distance of several feet.

Further constructional details are self-evident from the schematic diagram and specifications of Fig. 4 and from the inside view of the meter.

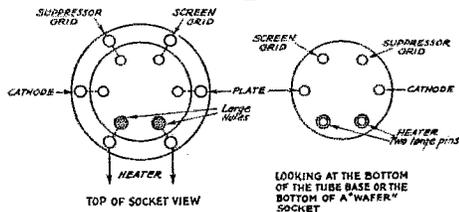
#### CALIBRATION HINTS

The calibration method for this type meter is exactly the same as for the dynatron or any

other type of oscillator. Just because the oscillator range is in the 1750-kc. band does not mean that "160-meter" standard-frequency transmissions are required. The meter can be calibrated just as well by beating its second harmonics against the regular 3500-kc. band s.f. transmissions. (Schedules given elsewhere in this issue.) The routine method of using these transmissions and plotting the calibration curve has been covered repeatedly in *QST* and is given in Chapter VI of *The Radio Amateur's Handbook*. Here are the high spots:

1. Be sure to warm up the freqmeter for a half hour or so before starting time of the scheduled s.f. transmission.
2. Tune in the signal with the receiver oscillating in normal fashion.
3. Back off the regeneration control to where the receiver stops oscillating.
4. Tune the freqmeter to zero beat with the signal, using the meter as a separate heterodyne. This permits a more accurate setting than with the receiver oscillating and also reduces the apparent QRM.
5. Read the dial for a setting made while the s.f. station is sending its characteristic letter, not when it is sending "QST," etc. The transmission is most accurate when the characteristic letter is being sent.
6. Write down the precise dial reading for that frequency before you have a chance to forget it.
7. Don't give up because there is a little QRM. Watch the clock. You can identify the station by the timing and repeated characteristic letters even when the call letters and frequency announcements are smothered.
8. Report every transmission received to A. R. R. L. Headquarters, using the s.f. report cards that will be sent to anyone on request.
9. Check the calibration of your frequency meter every week if possible.
10. Check the frequency of your transmitter every time you go on the air. This applies to crystal-controlled transmitters, too.

## Strays



THE PIN ARRANGEMENT ON THE NEW SIX-PRONG TUBES

In case some of you traffic-handlers may have forgotten it, the Government Call Book lists U. S. amateur stations by cities as well as by calls. This is useful information for the traffic man.

# Some Recollections of Early Radio Days

By S. M. Kintner

*At a joint meeting of the Institute of Radio Engineers and the American Institute of Electrical Engineers, at Pittsburgh on April 7th, Mr. Kintner, vice-president of the Westinghouse Electric & Manufacturing Co., delivered a very interesting paper entitled "Pittsburgh's Contribution to Radio." In it he sketched in entertaining fashion his association with some of the men and some of the events that have made radio history. Unfortunately the paper is much too long for us to reprint in full. We were struck by the thought, though, that the first part of the paper, recounting the experiences of radio pioneers in the days before the vacuum tube, would be very interesting reading in QST. So many of us have been in amateur radio but a few years, and there is so much to learn about the complexities of modern ham gear, that we believe this account of the old days will be found genuinely interesting. We present below the portion of Mr. Kintner's paper dealing with events up to the War.*

— EDITOR

IT HAS been my good fortune to be intimately associated with several individuals whose part in the development of this art has been of major importance. How real that claim is can best be appreciated when I mention that continuous-wave generation, heterodyne reception, the radio telephone, the radio broadcasting utility and short-wave long-distance operation are some but not all of the outstanding accomplishments of my associates.

In the year 1897, two of Professor Reginald A. Fessenden's senior students in electrical engineering at W.U.P., now the University of Pittsburgh, undertook a study of Hertzian waves as their graduating thesis. They followed quite closely in their first experiments the work of Professor Bose, as he described it in articles then appearing in the *London Electrician*. Hertz's work was still quite new and no very radical departures had been made from his original instrumentalities. The waves were always created by an oscillating discharge of a condenser and were always detected by some type of imperfect contact or gap. The two students, one now Professor Edward Bennett of the University of Wisconsin and the other Mr. William Bradshaw, manager of engineering of the Westinghouse Electric & Manufacturing Company's Newark works, followed the lead of the earlier workers. The great number of contrivances that they constructed and tested during their intensive five or six months' thesis work convinced these students as well as Fessenden and the writer — as a result

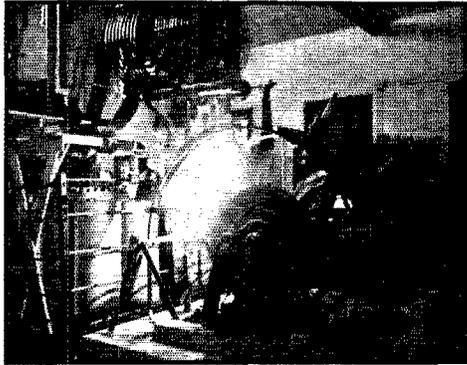
of the difficulties encountered — that such detecting means were thoroughly unreliable. Results could not be checked from hour to hour on account of the variations that the detecting means introduced. While the results of these students' studies of detectors were quite disappointing to them, they served at least one very useful purpose, in convincing Fessenden, when he later undertook the development of a radio system, that imperfect-contact detectors were ruled out.

While this account of Bennett's and Bradshaw's tests may not appeal to you as meaning much, to me it stands out clearly as the foundation upon which certain principles were based that were later to change completely the trend of development of the radio art.

Approximately two years later, as I returned home from my summer vacation, I was met by Fessenden on my front porch with a proposition that I join him in a plan to report, by radio, for the *New York Herald*, the yacht races that were to take place within a few weeks off Long Island. Fessenden had a new kind of detector which consisted of a minute silver ring mounted in the field of a coil connected in the circuit of the antenna.

The received signal currents caused the ring to move. The movement could be observed by changes in position of a spot of light or by listening to the effects produced by mounting the ring as part of a microphone.

We were unable to get the apparatus in condition in time to use for yacht-race reporting,



WHAM!!! AND SOME MORE WHAMS

*The old rotary gap at Arlington in 1910. Just the sound of it was good for appreciable DX.*

but the results of the early tests convinced us we had a method of operation that made quantitative results possible and that was of immeasurable service in studying the effects of various factors in the questions under consideration.

Fessenden was convinced that the successful detector of the future wireless art — if there was to be such a commercial activity — must be constantly receptive, instead of requiring re-setting as was characteristic of the coherer; it must have low resistance, so as to best take advantage of resonance; and it must give response proportional to the received energy. It is perhaps difficult for you to realize that these principles were not apparent to everyone. But remember the coherer was generally supposed at that time to have an order of sensitivity not even approached by any other known device. It was the very heart of the then young wireless system. It took real courage in the face of such conditions to hang on to the other type of detector — but Fessenden had it and did just that, even resisting my earnest pleas just to try the coherer out for comparative purposes.

Fessenden devoted his efforts to improvement of his detector and produced a hot-wire barretter similar in general arrangement to a miniature lamp of which the filament was made of Wollaston wire. From it he produced, as the result of

attached to the circuit of signals received from an automatic test sender making D's. An examination revealed that this one had a broken filament while the others were complete. A brief investigation disclosed the fact that this Wollaston wire dipping into the 20% nitric-acid solution was far more sensitive and reliable than any other known type. This detector was the standard of sensitivity for years — in fact until it was displaced by the vacuum tube about 1913.

This detector, when the operators listened by means of a telephone receiver in a local shunt circuit to the signals from various sending stations, gave such accurate reproductions that the several stations could be identified by different characteristic sounds just as a friend's voice is recognized by its peculiarities of tonal quality. This difference suggested to Fessenden that, if some means could be found to modulate the radiation by the voice, just as on a wire line the current is changed, radio telephony was possible. He tried to modulate the current in an antenna by placing an ordinary telephone microphone directly in the circuit; then, while Fessenden listened at a receiver, he heard the voice of his assistant as it came to him over the radio. Thus the radio telephone was born in 1901.

The first experiments were made with spark transmitters, but, of course, the crash and noise of the sparks were very disturbing, and it was useful only in proving the correctness of a principle. Higher spark frequencies improved the conditions, but even at frequencies of several thousand sparks per second there was a great amount of noise.

Fessenden had previously observed the desirability of more sustained wave trains to improve resonance selection and one would naturally think of 100% sustained waves if he had become convinced of the advantages of more sustained wave trains. That part had previously been thought out and published by Lodge and others, but how to make the continuous waves was not so apparent.

Fessenden boldly said, "Take a high-frequency alternator of 100,000 cycles per second, connect one terminal to the antenna and the other one to ground, then tune to resonance."

That looks simple now, but it wasn't then, I assure you. I remember very distinctly the impression I formed when Fessenden told me of his plan. First I asked how he could get sufficient voltage and he said, "Several hundred volts will be ample, as by resonance I can raise the voltage in the antenna one hundred times, which will be all I require." Even then I was skeptical



#### TWENTY-FIVE YEARS AGO

*A view of the Brant Rock, Mass., station where Prof. Fessenden did much of his development work. Tests from this station led to the erection of the Arlington station in 1909.*

an accident during the process of making his hot-wire barretter, a liquid barretter. The hot-wire barretter needed to have the silver coating removed from a very short length of the wire by a nitric-acid treatment. It was during such treatment that Fessenden observed that one of several of such barretters, in this silver-dissolving part of the process, was giving indications on a meter

because I didn't know of any 100,000-cycle machines. Neither did he but he was already working on it and after about five years of strenuous effort and considerable expense, his first machine was delivered to him at Brant Rock, Massachusetts, in September, 1906. From this machine he was able to get about 750 watts at 80,000 cycles.

Fortunately we don't have to rely on present recollections, because in J. A. Fleming's 1906 edition of his *Electro-Magnetic Waves*, in discussing Fessenden's patent No. 706,737 (Re 12168), August 12, 1902, he says there is no suitable high-frequency alternator of the kind described by Fessenden and it is doubtful if any appreciable radiation would result if such a machine were available and were used as Fessenden proposes. It is perhaps useless for me to add that this statement did not appear in subsequent editions of Fleming's book.

Judge Mayer, in his opinion upholding Fessenden's patent on this invention, says, in effect, "It has been established that the prior art practiced spark or damped wave transmission, from which Fessenden departed and introduced a new or continuous-wave transmission for the practice of which he provided a suitable mechanism which has since come into extensive use." These two references are cited because of the difficulty the younger radio engineers experience in properly evaluating this great contribution of Fessenden's.

The high-frequency alternator received by Fessenden in September, 1906, was immediately put to use in radio telephone experiments, and so successful were these that on Christmas Eve, 1906, the general call "CQ" was sent out from Brant Rock. Then followed a song, the reading of a verse, a violin solo, a speech and an invitation to report the results of the reception by all who heard. This was the first radio telephone broadcast. One can well imagine the feelings of surprise of the lonely ship operators — accustomed to the cold colorless dash and dot of the Morse code — when music suddenly burst upon their ears, to be followed by understandable speech. It would be quite a shock, and I don't doubt that some superstitious operators gave rather serious thought to their mode of living.

He received a number of letters from operators on ships all over the North Atlantic asking all about how it was done.

This experimental and development work of Fessenden's was made possible by the financial support and business guidance supplied to him by two other courageous Pittsburghers. These two men, Messrs. T. H. Given and Hay Walker, Jr., in wholesome contrast to the methods followed by most of the radio companies of the period prior to the war, dug down into their own pockets for the necessary funds to carry on. Mr. Given remarked to me several times, "If

this radio business turns out as I expect it will, I'll be satisfied with my returns on what I've put into it; if it does not, I, at least, will not have on my conscience the thought that I've wasted the savings of poor scrub-women, widows with dependent children or others who fall such easy prey to the high-powered stock salesmen."

The courage of these two men, who put more than \$2,000,000 of their own money into this radio company, is one of the most striking recollections I hold of genuine confidence in the future of radio. Unfortunately, neither reaped the benefits of his sacrifices, as Mr. Given, who bought Mr. Walker's interest during the war, died about one year before broadcasting raised radio to its full stature. It has always been a great regret to me that he could not have lived to see his dreams come true.

The company organized by Given, Walker and Fessenden was operated solely for the purpose of developing the latter's inventions. It was called the National Electric Signaling Company, and not one dollar's worth of stock was offered for sale to the public. Particular emphasis is laid upon this fact because those were the days when selling stock in a new wireless company was the "racket" of the time.

This particular company devoted its energies to developing a system to engage in the communication business. A number of stations were constructed for development uses. First there were three, one at Old Point Comfort, a second at Ocean View and the third one at Cape Charles. These were small stations with gasoline-engine-driven dynamos and plain spark-gap oscillation generators. Next a pair of stations, one at Jersey City and the other at Collingswood, N. J., were built. There was then erected a third station at Washington, D. C. These stations exchanged code messages at times, but were not sufficiently free from interference and fading to give a reliable service.

Then, with the experience gained in the operating of these several stations, an ambitious program was undertaken of erecting two stations for experimental transatlantic operation. One station was located at Brant Rock, Massachusetts, and the other at Machrihamish, Scotland. These stations were constructed in 1905 and were powered by 35-kw. 125-cycle alternators — with rotary spark gaps that gave a spark frequency of 250 sparks per second. The antenna systems consisted of a single straight tube, 36 inches outside diameter and 420 feet long. This tube was built in eight-foot sections, bolted together. It rested on a steel sphere at the bottom and was guyed at four points along its length. Both the guys and the tower were insulated from earth. At first the tube alone constituted all of the antenna. Later, a form of umbrella structure carrying an

*(Continued on page 90)*

# New England Crew Out After 56-mc. Honors

By T. F. Cushing, W1OF

**S**INCE April 9th five-meter working has been very much on the up-and-up in these parts.

W1AWW, located on the top of the Wilbraham Mountain range, at an elevation of 1200 feet above sea level, worked some 11 stations on the first day, including W1BDW, W1CBQ, W1CIV, W1CND, W1BIZ, W1SZ, W1AIY, W1ANC, W1CDN, W1OXB, and W9ZZF. Since then the station has been on every week-end and the results are continually becoming more interesting. On May 21st, the operators of W1AWW, Leroy Cheney, W1CVB and the writer, arranged with the members of the Springfield Radio Association and others of the five-meter fraternity in Massachusetts and Connecticut to hold a 56-mc. QSO



THE OPERATING ROOM OF W1AWW ON MT. WILBRAHAM—LEROY CHENEY, W1CVB HIDING BEHIND THE MICROPHONE

party. On that day 13 stations were worked and some 15 messages handled. Surprisingly good results were obtained in traffic handling. "Bill" Margerum, W1AQM, and "Lindy" Linn, W1CHU, at W1CVJ on Mount Wachusets, for the first time furnished a link through to Boston. Col. Boyden, W1SL, at Boston originated a message addressed to W1AWW. It was relayed through W1CID and W1CVJ, and an answer was back to W1SL in less than 30 minutes. Another message originated by W1HD in Waterbury, addressed to W1BRX in Dorchester, went through W1AIY, W1AWW, W1CVJ, and W1CID in about the same time.

Perhaps even more interesting was the making of several direct relays. At one time, for instance, W1ZJ in Worcester was able to talk to W1BDW in Springfield through W1CVJ and W1AWW as repeater stations. At another time, W1AIY and W1ANC were able to QSO quite nicely through W1AWW when some freak condition made a

direct contact impossible. The distance covered in this case was probably five times greater than it would have been directly.

W1AIY has been heard by W2AOL on Long Island. Richard Baer, W1VC, on Mount Grey-



BILL MARGERUM, W1AQM-W1CVJ OPERATING HIS 56-MC. RIG

lock (near Pittsfield) has not only worked most of the Springfield fellows but also W1CVJ — a distance of over 80 miles. Another fine piece of DX was put up by W1CVJ and W1ANC (about 90 miles apart). And as if that were not enough, news comes through of a message sent from Boston via W1CVJ, W1VC to an unidentified station in Albany, New York.

Present plans aim at the establishment of a relay route from Boston to Chicago to be working by Labor Day. Let's hear from those interested. Every ham around here who has had one QSO has gone five-meter crazy. Try it yourself!

## The 1932 Meeting of the Board

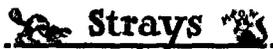
(Continued from page 25)

broadcasting, music transmission, mobile licenses, 10-meter 'phone, mail 'phone certifications, compulsory frequency-measuring equipment, Canadian-U. S. A. uniformity in 'phone regulations, communication with expeditions and small vessels, abandonment of "Calls Heard," charging for QSL forwarding and technical information service, affidavit requirement in license renewals, publicity on infractions of regulations, confining voting membership to licensed amateurs.)

There being no further business, on motion of Mr. Walsh, VOTED, that the Board do now adjourn.

Whereupon the Board did adjourn, *sine die*, at 5:30 p.m. (Total time of sessions, 15 hrs., 7 minutes.)

K. B. WARNER, Secretary



W4AQY wonders why a 210 won't put out more than a 204-A. He says the number is bigger!

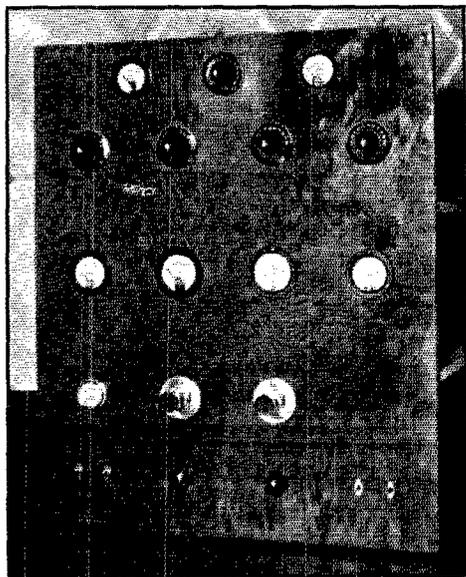
# Compact C. W. and 'Phone Transmitter Assembly

By William A. Swearingen, W5AQO\*

A 50-WATT combined 'phone and c.w. transmitter, crystal controlled, capable of operation on several bands, and all contained in a space 30 by 36 by 12 inches — that's a brief description of the outfit shown in the accompanying photographs. The construction is

watt Class C amplifier, a W.E. 211-D, the two W.E. 211-E modulator tubes, and, through a pair of resistors, the 210 oscillator and the 210 buffer, which is also a frequency doubler. The 400-volt supply to the left of this transformer furnishes plate current for the buffer tube, and also for the oscillator, through a dropping resistor. The 201-A speech amplifier also is fed from the 400-volt supply through a voltage divider. Behind the large filament transformer already mentioned are located the modulation reactor and the dropping resistor for the Class C amplifier, with its associated condenser. The rest of the modulating apparatus is located on the right-hand end of this same shelf. On its extreme right-hand edge are lined up the gain control, a filament rheostat for the 201-A and posts for the single-button hand microphone. A row of posts is at the back edge for all "C" and "A" battery connections.

On the top shelf, beginning at the right-hand end, are the plug-in crystal holder, the oscillator tube and coil, buffer tube and coil, final amplifier tube and coil, and the antenna coil. All coils are mounted on porcelain stand-off insulators, the first two coils being plug-in. All by-pass condensers are above the shelf. The final amplifier plate



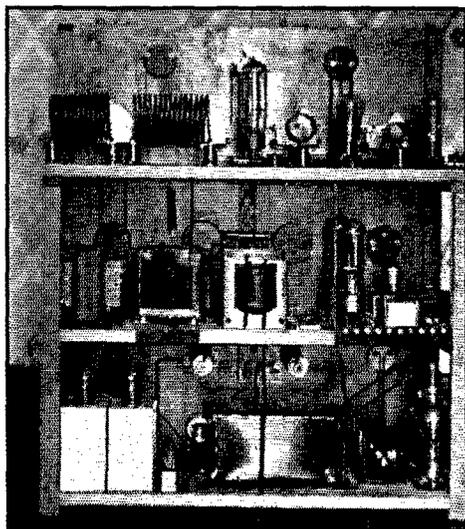
THE FRONT PANEL

*The panel, which measures 30 by 36 inches, is made of laminated wood. The purpose of the various controls and meters is pointed out in the text.*

in the typical rack-and-panel style, with three shelves behind the panel for holding the apparatus.

Looking at the rear-view photograph, on the bottom shelf are the 1500-0-1500-volt plate transformer, the two Rectobulbs, and two 2- $\mu$ fd. 2000-volt filter condensers. Behind the condensers (not visible in the photograph) is the two-section filter choke, arranged with inductance input to the filter. To the right of the condensers is a large 50,000-ohm bleeder resistance. This power supply, whose output is regulated by a rheostat in the primary of the plate transformer, is used to furnish current only to the final r.f. amplifier and the modulator tubes.

The large filament transformer in the center of the middle shelf heats the filaments of the 50-



— AND THE REAR VIEW

*Although a great deal of apparatus is contained in a comparatively small space, there is no crowding.*

\* Lockhart, Texas.

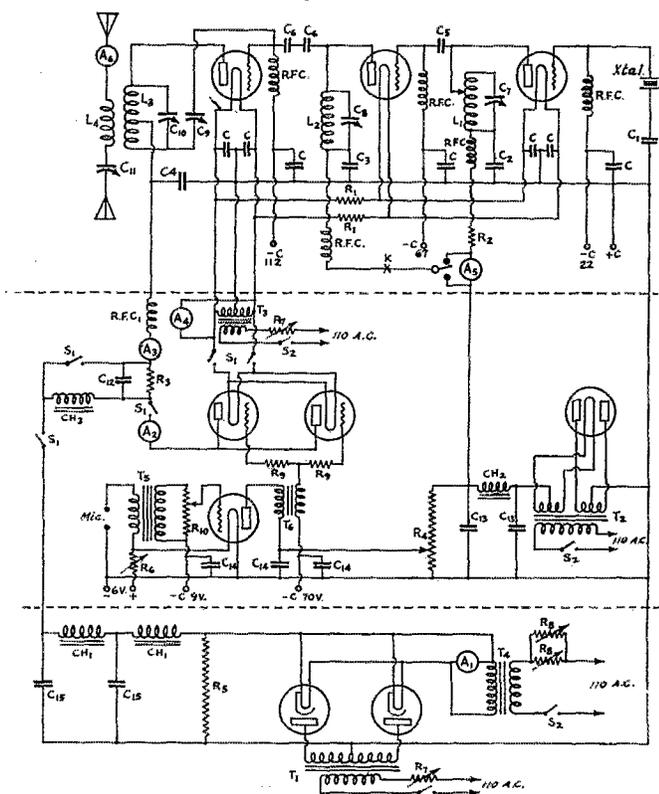
choke, a hand-wound affair, may be easily identified below the top shelf. All other chokes are above it.

Looking at the front of the transmitter, in the top row from left to right are a milliammeter for the oscillator and buffer, a small transmitting condenser to neutralize the final stage, and the antenna meter. In the next row down are the oscillator tuning condenser, the buffer tuning condenser, the final amplifier tuning condenser, and the antenna condenser, the last two being transmitting type condensers. In the center row are the meters; a milliammeter for the modulator plates, an unused 15-volt a.c. meter, a milliammeter for the final amplifier, and a filament voltmeter for all r.f. tubes and the modulators. The next row down has a cheap meter on the rectifier filaments, a rheostat in the power supply transformer primary, another in the filament supply transformer, and a blank space in which it is intended to locate a small grid meter for the last tube. The bottom row contains the primary switches and resistances in parallel to control the rectifier tube filament voltage.

The transmitter is entirely self-contained except for batteries, yet the placing of parts is such that no shielding has

been found necessary. Switches on the center shelf allow instant change from 'phone to c.w. Plug-in coils and crystal allow quick band changing.

The outfit has been in use for almost a year, yet no changes have been warranted.



THE W5AQO TRANSMITTER

- A<sub>1</sub>—0-10 a.c. rectifier filament meter.
- A<sub>2</sub>—0-150 ma. modulator plate meter.
- A<sub>3</sub>—0-200 ma. amplifier plate meter.
- A<sub>4</sub>—0-15-volt a.c. filament meter.
- A<sub>5</sub>—0-150 ma. oscillator and buffer plate.
- A<sub>6</sub>—0-5 r.f. ammeter in antenna circuit.
- C—0.0025- $\mu$ fd. grid and filament by-pass condensers.
- C<sub>1</sub>—0.005- $\mu$ fd. crystal blocking condenser.
- C<sub>2</sub>—0.002- $\mu$ fd. oscillator plate by-pass condenser.
- C<sub>3</sub>—0.001- $\mu$ fd. buffer plate by-pass condenser.
- C<sub>4</sub>—0.001- $\mu$ fd. 5000-volt amplifier plate by-pass condenser.
- C<sub>5</sub>—150- $\mu$ fd. buffer grid coupling condenser.
- C<sub>6</sub>—250- $\mu$ fd. amplifier grid coupling condensers.
- C<sub>7</sub>—350- $\mu$ fd. oscillator tank condenser.
- C<sub>8</sub>—350- $\mu$ fd. buffer tank condenser.
- C<sub>9</sub>—50- $\mu$ fd. Midway transmitting neutralizing condenser.
- C<sub>10</sub>—440- $\mu$ fd. transmitting type amplifier tank condenser.
- C<sub>11</sub>—220- $\mu$ fd. transmitting type antenna condenser.
- C<sub>12</sub>—1- $\mu$ fd. 1000-volt audio by-pass condenser.
- C<sub>13</sub>—4- $\mu$ fd. 600-volt filter condensers.
- C<sub>14</sub>—1- $\mu$ fd. 200-volt by-pass condensers.
- C<sub>15</sub>—2- $\mu$ fd. 2000-volt filter condensers.
- RFC—S-M type 277 radio-frequency chokes.
- RFC<sub>1</sub>—3 1/2 inches No. 30 d.s.c. on 1/2" diameter form.
- R<sub>1</sub>—1/2-ohm filament voltage dropping resistances.
- R<sub>2</sub>—6000-ohm oscillator plate voltage dropping resistance.
- R<sub>3</sub>—7500-ohm modulated amplifier dropping resistance.
- R<sub>4</sub>—40,000-ohm bleeder resistance.
- R<sub>5</sub>—50,000-ohm bleeder resistance.
- R<sub>6</sub>—Small filament rheostat.

- R<sub>7</sub>—Radiostat.
- R<sub>8</sub>—Power clarostats.
- R<sub>9</sub>—100-ohm grid resistances.
- R<sub>10</sub>—200,000-ohm gain control.
- L<sub>1</sub>—48 turns No. 22 on 1 1/2" diameter — oscillator tank coil.
- L<sub>2</sub>—17 turns No. 12 on 2" diameter — buffer tank coil.
- L<sub>3</sub>—15 turns 1/4" copper tubing on 3" diameter — amplifier tank coil.
- L<sub>4</sub>—12 turns 1/4" copper tubing on 3" diameter — antenna coil.
- CH<sub>1</sub>—18-henry filter choke.
- CH<sub>2</sub>—30-henry filter choke.
- CH<sub>3</sub>—30 henry, 160-ma. modulation reactor.
- T<sub>1</sub>—High-voltage transformer; 1000 and 1500 volts each side center tap.
- T<sub>2</sub>—Low-voltage transformer; 400 volts each side center tap and 5 volts center-tapped.
- T<sub>3</sub>—150-watt filament transformer, 12 volts a.c., center-tapped.
- T<sub>4</sub>—Rectifier filament transformer, 12 volts.
- T<sub>5</sub>—Microphone transformer.
- T<sub>6</sub>—Sangamo audio transformer Type AX, 3 to 1 ratio.
- S<sub>1</sub>—Knife switches on center shelf to change from 'phone to c.w.
- S<sub>2</sub>—Toggle switches on panel for operation of transmitter.
- K—Key and key filter connected here for c.w. work.

The dotted lines divide the apparatus in the schematic diagram exactly as do the shelves in the transmitter itself. The only exceptions are the primary switches and Radiostat to transformers T<sub>2</sub> and T<sub>3</sub>. All grid bias is supplied by batteries.



# STRAYS



Director Clair Foster announces the appointment of Sherer G. Culver, W6AN of Oakland, as assistant director of the Pacific Division. As far as we can recall, this is the first such appointment that has been made under the provision in our by-laws authorizing the directors to appoint committees or assistants to aid them in their duties. It should prove particularly convenient in view of W6HM's impending absence from the division as a member of A.R.R.L.'s delegation to Madrid.

booklets to two very raw but enthusiastic wireless amateurs, and at the end of the week I found that they had constructed the transmitter and receiver and were actually transmitting. An excellent performance after just reading the book! I had to stop the transmitting, however, for they had not waited to obtain a license."

HI! Well, we always said it was hot stuff.

Three days after he received his call letters W9IRQ received a card from a listener in Australia. Some service!

W2BDQ got so disgusted with a weak and jumpy crystal that he bit a piece off one corner — and now it works FB! However much good it may do the crystal, we imagine it must be hard on the teeth!

VK4FB nominates VK4GW for the H.A.M. club. His name is S. W. Ham, which certainly is appropriate enough.

QST has closed its New York office and moved the solicitation end of the advertising department, which has been stationed there the last several years, up to headquarters in West Hartford. So we're all under one roof again and there's just one address to remember.



THE QST SINGLE-SIGNAL RECEIVER IN THE DEVELOPMENT STAGE

Here we have QST's technical editor caught in the act of shaving off a few layers of "raw a.c." to drag out an "xial d.c." signal that would ordinarily be buried in the QRM. From this table-top layout was developed the final model whose description will come with our August issue.

Following up our June editorial, we have to report that the city of Altoona amended her blinking ordinance, just like we said she order. So chalk up one more for A.R.R.L.

Don't take the layout of the apparatus on this month's cover too literally — at least don't compare it with the illustration in the article. You will note that in being "artistic" we just had to reverse the negative, which makes everything opposite from its actual self. Pardon us?

Will someone kindly tell us why gridleak manufacturers don't mix in a little incense with the rest of the ingredients when the "goo" is molded? We have yet to see, or rather smell, a gridleak (under stress of operation) which did not have the most nauseating of odors. Get along, Nell.

The League's booklet for beginners has the real dope. If you don't believe it, give eye to this letter from one of our British distributors:

"I can now give you a testimonial for 'How To Become a Radio Amateur.' I gave one of the



DAVID HOUGHTON, QST'S CIRCULATION MANAGER, IS ABOUT THE ONLY ONE AT HEADQUARTERS NOT A HAM

Ten years of most intimate contact with QST has left him cold. Imagine it! The illustration shows one of the recent attempts at impressing "Dave" with the joys of ham 'phone operation. W9UZ made the attempt and the picture.

# The Distribution of the Frequency-Conscious

## W3BAN, the S.F. System's Star Reporter—Advance Schedules

THESE may or may not be something of a geographical distribution of frequency-consciousness among hams of the species. We are curious about it. We'd like to know whether the boys out Washout way, in the old Home State, grade 90 or 65, for instance. And we feel badly because we haven't any way of finding out definitely and all-conclusively just how they stand. But we have a picture that does show something or other. It's the one on next page. It is based on the number of standard frequency reception reports from each U. S. District and Canada, in proportion to the number of licensed amateurs in each, and covers a one-year period. It also might be representative of the distribution of frequency-consciousness. But then maybe it just shows that some parts of the continent have more skip distance or more QRM or more dates around s.f. schedule time—or something we haven't thought of. Statistics are that way. So draw your own conclusions.

Third District enthusiasts can thank J. Binford Thompson, W3BAN, Portsmouth, Va., for their outstanding position in the line-up. OM Thompson is the S. F. System's star reporter, bar none. He gets all three stations when others wail about inconsiderate QRM, weak transmitting stations and everything else. If a week-end passes that does not bring a report from W3BAN we begin to worry about total failure of the well-known layer or to fear that he has suffered a major catastrophe. Here's his record: Out of a total of 226 reports received from the Third District in the year, 93 of them, or 41%, came from him. Tie that!

During the one-year period the respective s.f. stations were reported as follows:

W1XP, 1042 reports; W9XAN 584 reports; W6XK, 175 reports. These figures do not include such unforwarded reports as may have been sent direct to the s.f. stations.

So much for past performance. Looking to the future, here are the s.f. schedules for the next two months. Note that W6XK has substituted a 3500-kc. "A" schedule for a 14-mc. "C" schedule, which should help things out Pacific way.

### DATES OF TRANSMISSIONS

Date	Schedule	Station
July 1, Friday	A	W1XP
	B	W9XAN
July 8, Friday	B	W6XK
	BB	W1XP
	B	W9XAN
July 10, Sunday	A	W6XK
	C	W9XAN
July 15, Friday	BB	W6XK
	B	W1XP
	A	W9XAN

July 16, Saturday	BX	W6XK
July 17, Sunday	BB	W9XAN
	C	W6XK
July 22, Friday	A	W6XK
July 24, Sunday	C	W1XP
July 29, Friday	A	W1XP
	B	W9XAN
Aug. 5, Friday	B	W6XK
	BB	W1XP
Aug. 7, Sunday	B	W9XAN
	A	W6XK
Aug. 12, Friday	C	W9XAN
Aug. 13, Saturday	BB	W6XK
	B	W1XP
Aug. 14, Sunday	A	W9XAN
	BX	W6XK
Aug. 19, Friday	BB	W9XAN
	C	W6XK
Aug. 21, Sunday	B	W1XP
	A	W1XP
Aug. 26, Friday	B	W9XAN
	B	W6XK

### STANDARD FREQUENCY SCHEDULES

Friday Evenings		Friday & Sunday Afternoons		
Time	Sched. and Freq. (kc.)	Time	Sched. and Freq. (kc.)	
(p.m.)	A B	(p.m.)	BB C	
8:00	3500 7000	4:00	7000 14,000	
8:08	3600 7100	4:08	7100 14,100	
8:16	3700 7200	4:16	7200 14,200	
8:24	3800 7300	4:24	7300 14,300	
8:32	3900	4:32		14,400
8:40	4000			
		Saturday Mornings		
		Time	Sched. & Freq. (kc.)	
		(a.m.)	BX	
		6:00	7000	
		6:08	7100	
		6:16	7200	
		6:24	7300	

The time specified in the schedules is local standard time at the transmitting station. W1XP uses Eastern Standard Time, W9XAN, Central Standard Time, and W6XK, Pacific Standard Time.

### TRANSMITTING PROCEDURE

The time allotted to each transmission is 8 minutes, divided as follows:

2 minutes — QST QST QST de (station call letters).  
3 minutes — Characteristic letter of station followed by call letters and statement of frequency. The characteristic letter of W1XP is "G"; that of W9XAN is "O"; and that of W6XK is "M."

1 minute — Statement of frequency in kilocycles and announcement of next frequency.

2 minutes — Time allowed to change to next frequency.

### ACCURACY

Although the accuracy of the transmissions is not guaranteed, those of W1XP are usually dependable to 0.001 per cent and those of W9XAN and W6XK to 0.01 per cent. The transmissions are checked frequently by the Department of Commerce monitoring stations; and the frequency standards used have been checked against

the national standard maintained by the Bureau of Standards at Washington.

**THE TRANSMITTING STATIONS**

W1XP: Massachusetts Institute of Technology, Round Hill Research, South Dartmouth, Mass., Howard A. Chinn in charge.

W9XAN: Elgin Observatory, Elgin National Watch Company, Elgin, Ill., Frank D. Urie in charge.

W6XK: Don Lee Broadcasting System, Los Angeles, Calif., Harold Peery in charge.

**REPORT BLANKS**

Blanks for reporting on the S.F. transmissions will be sent postpaid upon request. Just send a card or message to Standard Frequency System, QST, West Hartford, Conn., asking for s. f. blanks.

**WWV 5000-KC. TRANSMISSION**

The 5000-kc. transmissions of the Bureau of Standards station, WWV, are given every Tuesday from 2:00 to 4:00 p.m. and from 10:00 p.m. to midnight, E.S.T. The accuracy of these transmissions is now better than 1 cycle (one in five million). Information on how to receive and utilize the signals is given in pamphlets obtainable on request from the Bureau. Communications concerning these transmissions and reports on their reception should be addressed to Bureau of Standards, Washington, D. C.

— J. J. L.

**Strays**

W9RQ has a tip for the boys who copy their stuff on loud-speakers. Instead of having the speaker facing you, turn it at right angles. This gives the effect of cutting down the high frequencies, and since most of the extraneous noise in a receiver is pitched fairly high, the signal-to-noise ratio is improved.

W8DGW uses a pair of BH gas rectifier tubes in parallel to rectify the output of his 750-volt transformer. Rather a large order for a pair of "B" eliminator tubes, but they seem to stand the strain.

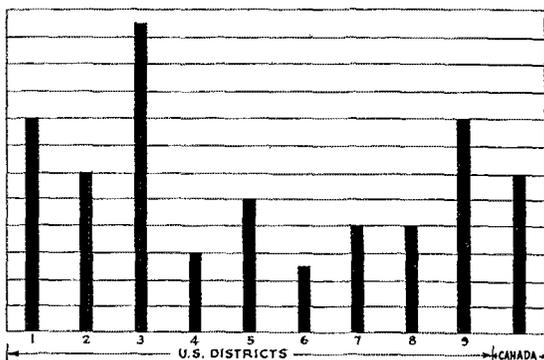
Some inside information: W1BXU says the power companies are getting ready to go after those hams who misrepresent their good 50 to 60-cycle juice with rotten 10 to 35-cycle notes. The guilty ones had better watch their steps!

W6BJC — How much is copper tubing? I want to make a 160-meter tank coil.

BCL Technician — What are you going to immerse it in?

The small polishing-head outfits that have recently been offered for sale in various parts of the country are fine for radio work. The complete outfit consists of a polishing head with 3-jaw chuck, holding drills up to 1/4-inch, saw table with guide, 5 feet of belt, 4-inch circular saw, wire brushes, buffers and a grinding wheel. The circular saw is especially useful for sawing bakelite panels, the cut being equal to a factory job. Any small motor has enough power to do the work. These outfits are handled by the large retail chain stores.

— G. Robt. Mezger



**STAR REPORTER W3BAN PUTS THE THIRD DISTRICT OUT IN FRONT**

Comparative utilization of the S.F. Transmissions, based on reports received in proportion to licensed amateurs in each U. S. District and in Canada.

To get down to that last hair in neutralizing, put a flashlight bulb in series with the tank inductance after no indication can be gotten on a pick-up lamp or neon bulb. The bulb must be taken out of the circuit before power is turned on, of course.

— W3AAJ

The so-called "double-protected" heating pads contain two thermostats in series, one of which can be taken out for that crystal temperature-control box. The thermostats operate at about 50° C. and can be adjusted by a screw contact. The heating pad is not harmed at all by removing one of the thermostats.

— W9CG

**Flash!**

**W6USA at Olympics**

Special stations erected on grounds of Olympic Village, Los Angeles, Calif. Operations start immediately to continue for 3 months— W6SN, Chief Op.

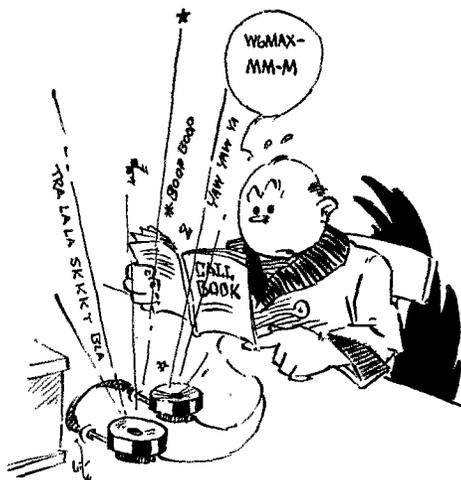
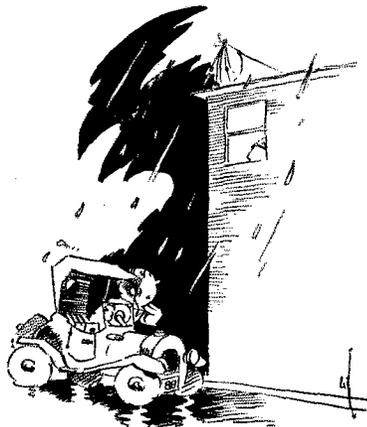
# Bootleg!

By George Cooper Tichenor

THE ringing of an alarm clock suddenly offered strong competition to the snoring of one Old Timer. The snoring ceased in terrific crescendo, the alarm was switched off, the lights on, and after a short struggle a sitting position was achieved. The first coherent thoughts were of more sleep, but the elusive "gnaw" that gets a fellow arising for some *maybe* "never-to-be-heard-of-again" DX is always too great.

"Hm-m," he mused, "three a.m. Well, the old band should be just right now — nothing on but DX." After rising the OT crossed the room, threw on a dressing gown and planked himself down at the receiver. QRM had been exceptionally heavy the evening before, so this early session was deemed advisable. Wondering whether to call a blind CQ or see who was on first were the thoughts playing around the headphones as the receiver was tuned up into the 'phone band. A frown changed to utter despondency after five minutes and the "cans" were returned to the table with a clatter. Strains of "Dardanella," then "Avalon," continued to increase the wrath of said OT who had no power whatsoever over this recital. A voice followed sounding as though the announcer were trying to talk and gargle at the same time. T.O.T. pricked up his ears at this as the voice continued — "hello, HELL-OOO! One, two, three, four — Hello-oh, this is W6MAX, of Los

the M's so soon? Right: The call book showed that W6FGT was the last call issued in three letters. About this time the raucous voice started up again with more testing and scratchy phonograph records. By this time daylight was breaking, no DX had been accomplished — in fact there had been no thoughts of this after the first few minutes — for it would have been impossible. Here was a local would-be amateur who was



Angeles testing; M, Montana; A, Alabama, X-X-Ray. W6MAX calling CQ and standing by."

Puzzled over this W6MAX, the call book was consulted. Calls had been increasing by leaps and bounds, but was it possible that they were up to

probably operating one of the "easy to build," "anyone can operate" transmitters that had been so prevalent in non-technical publications of recent months, transmitters which did not even mention licenses, not to say being necessary before operation should be attempted. The O.T. gritted his teeth and mused to himself that here was one series of grunts and groans over the air that was going to be stopped, or else his *bête noire* had appeared — sad but true. The strength of the transmissions indicated that the signal was not many blocks away, which was one consolation in the otherwise drab atmosphere.

After breakfast the R. I. was called and it was checked that the call W6MAX had not been issued.

A few nights later during an early morning vigil W6MAX broke into the middle of one of our hero's QSO's, but this time it was with the ringing of an alarm clock in the fashion of dots and dashes forming CQ's. This abruptly finished any thoughts of further contacts for the O.T. as "MAX" covered the band completely. After a moment's hesitation W6MAX answered a short call from the O.T. who, controlling his wrath, told W6MAX that "it was darned unhealthy to sign a fake call," and advised him to "stay off the air until he had a proper license."

This brought the reply from W6MAX to the effect that said dispenser of the "gospel" was not the radio inspector and, even if he were, he had no way of knowing who W6MAX was or where he was located — whereupon the contact was finished and W6MAX chirped merrily on.

The "cans" couldn't stand the treatment they



got this time — they simply collapsed — which didn't help O.T.'s temper — a kick put the ill-fated 'phones under the table and hat and coat jerked off the hook ended that morning seance.

A few minutes later our friend was seated at the wheel of his car with a small piece of apparatus at his side. Yep, a portable receiver. Turning out of the driveway into the street, the time was noted as 4:00 a.m. The cold drizzle which had started up did not make the "expedition" any pleasanter — however, it did not keep O.T. from his work at hand. W6MAX was informing some station that he was "using a Marconi type single-wire antenna. It seems to get out pretty well and doesn't look anything like a transmitting layout. Hi." The voice of W6MAX continued and increased in volume as the car was cruising about. Finally, after scouting about a certain block several times the car was brought up to a halt at the curb and the O.T. peered out into the rain at the "single-wire Marconi type antenna" stretched on top of an apartment block. Sure enough, directly under the antenna and a story below there was a lighted room. The number of the house and name of the street were noted and young Sherlock proceeded to put the car away and slip into bed until the usual rising hour.

During the afternoon of the same day the doorbell at W6MAX's apartment rang and the lady of the house was informed that a "representative" recalled as how the leak might have been made recently by the pole on the roof, and could he have the name and 'phone number of the occupants so that he might check up on this matter. This was glibly given and in addition the information was proudly offered that "the pole was placed there by my son who has quite a

sending set. Oh yes, he talks over long distances." That was enough; "it won't be long now," thought our hero in disguise.

Two days later a sad scene was being enacted at the home of W6MAX. In a chair sat a badly frightened boy while his father paced the floor. Upon the table was a letter with a heading "Department of Commerce, Radio Division." It instructed W6MAX to appear at the supervisor's office to explain, if possible, why he had been broadcasting music, why he had been operating without possessing either a station or operator's license, and why he had been using a fictitious call which was being heard beyond the boundaries of the State of California.

W6MAX is no more — his distraught father dismantled the equipment with no pains whatever.

\* \* \*

This true narrative has ended, but this is the sad side which is easily possible to whomsoever tries to skip formalities of first obtaining legal papers to operate an amateur station. This fascinating and instructive hobby of ours with its untold opportunities has no place for selfishness or lack of sportsmanship. If you cannot play the game squarely it is far wiser to refrain altogether, for running amuck of the law is certain to prove disastrous. There are too many "Old Timers" in every community to have their hobbies uprooted by such unlawful practices. Take heed, gang, but follow the ropes one at a time and find a hearty welcome from every "ham" when you're once inside the portals.

## Strays

### THE TYPE '34 VACUUM TUBE

An addition to the series of tubes for battery operation has just been announced. The new tube, a variable- $\mu$  r.f. pentode, will bear the type number 234. It is recommended for use as a radio-frequency amplifier, intermediate-frequency amplifier and first detector in battery-operated receivers, and is especially useful for portable sets. The new design incorporates the desirable features characteristic of the Type '39, described in *QST* for February, 1932.

Tentative ratings and characteristics of the Type '34 are as follows:

Filament Voltage		2.0 volts d.c.
Filament Current		0.06 amp.
Plate Voltage	90	180 volts max.
Screen Voltage, Maximum	67.5	67.5 volts
Grid Voltage, Variable	-3	-3 volts min.
Plate Current	2.7	2.8 ma.
Screen Current	1.1	1.0 ma.
Plate Resistance	500,000	1,000,000 ohms
Amplification Factor	290	620
Mutual Conductance	580	620 micromhos
Mutual Conductance at -22.5 Volts Grid Bias	15	15 micromhos

# for the EXPERIMENTER

## An Inexpensive Way to Operate a Condenser Mike

THE condenser microphone is usually considered to be a piece of equipment that has high initial cost as well as high operating expense. The depression was responsible for a new mike arrangement at W8FSC. It worked so well that it must be passed on to the rest of the gang. It isn't original, but what is?

An ordinary condenser microphone head is used as the tank capacity in a small oscillator circuit. When the mike is spoken into, the oscillator is frequency-modulated. (Don't get excited yet.) To obtain an audio signal it is only necessary to demodulate the output of the oscillator, which can be done by the oscillator tube itself with the aid of an additional absorption tank circuit. When this added circuit is tuned near resonance with the oscillator it absorbs power from it, causing a change in oscillator plate current. When the oscillator is modulated its frequency varies, resulting in a change in the amount of power absorbed by the coupled circuit. The oscillator plate current varies at audio frequency



greater than that of a W.E. 387. The use of a large bank of "B" batteries is unnecessary; in fact no batteries are needed at all. As used at W8FSC, a '27 is used as the oscillator, with a.c. on the filament and r.a.c. on the plate. The hum is surprisingly low. (A '24 was later substituted with a big increase in output.) A single 45-volt block of "B" battery does, however, make the

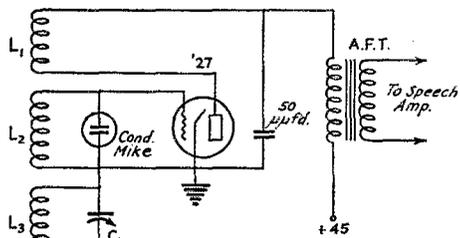


FIG. 1 — CONDENSER MICROPHONE OSCILLATOR CIRCUIT

*L<sub>1</sub>, L<sub>2</sub> and L<sub>3</sub> are all wound on the same piece of 1-inch tubing. The first two each have eight turns of No. 22, with a space of 1/2 inch between the two coils. L<sub>3</sub> has 20 turns of No. 30 wire, and is placed on the form 1 3/4 inches from L<sub>2</sub>. Condenser C is a 50-μfd. magnet.*

as it supplies this changing load. The primary of an ordinary audio transformer can therefore be placed in the oscillator plate feed line to pick up this audio current and feed it to the speech amplifier grid. Fig. 1 shows how it's done. The curve of Fig. 2 is typical of the operating conditions.

Now for the advantages of this scheme. First, the output of the oscillator and mike is a little

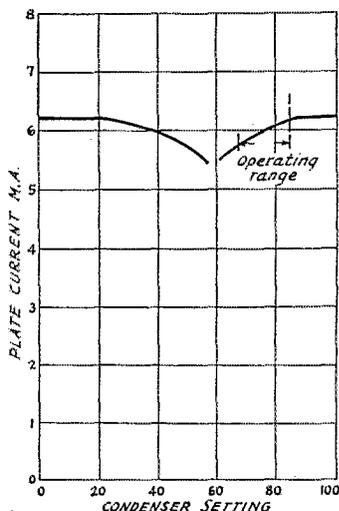


FIG. 2 — SHOWING THE EFFECT OF THE SETTING OF C ON THE OSCILLATOR PLATE CURRENT

*Choose an operating point on either side of the exact resonance point, but on a sloping portion of the curve.*

oscillator free from creeping because of voltage changes. The fidelity of the outfit is nearly as good as the standard condenser mike and its associated two-step amplifier.

When the scheme was explained to a 'phone

we worked, he promptly came back with a report that our carrier was being frequency modulated. This was of course untrue, because the transmitter was crystal-controlled and the microphone oscillator had nothing to do with the r.f. portion of the transmitter. This operator must have had a severe case of "frequency-modulation-fright." Would that more had!

The scheme makes condenser mike quality possible at low cost. Let's hear more of them.

— Robert L. Drake, W3CYE-W3FSC

## Reducing Harmonic Radiation

With increased activity in the new 3900-4000-kc. amateur 'phone band and also the higher frequency portion of the 7000-kc. band, i.e., 7200 to 7300 kc., and because of the fact that the second harmonics of both these frequency ranges fall in frequency assignments other than amateur bands, it is essential that harmonics be reduced to the minimum. While harmonic interference might possibly be tolerated when it falls within another higher frequency amateur band, it actually

Examination of the circuit will show that it is nothing more than the old familiar wave-trap used for a new purpose. The trap circuit may be used either directly or inductively coupled. Both methods are shown in the drawing.

The operation of this harmonic eliminator is quite simple. Since the feeder is aperiodic, tuning of the trap circuit has little or no effect upon the r.f. voltage traversing it except in the case where the trap is tuned either to the fundamental (first harmonic) frequency or to some higher harmonic of the fundamental frequency. In this instance the frequency to which the trap is tuned will be isolated from the antenna and all others will pass through the trap and feeder to the radiator part of the antenna.

Any one of the common methods of showing resonance, such as a neon tube, r.f. galvanometer, absorption type wavemeter and the like can be used to indicate resonance of the wave-trap circuit to some harmonic of the transmitted wave. One must be sure, however, that the trap is tuned to the harmonic frequency which it is desired to eliminate.

This arrangement can be used very easily to eliminate several objectionable harmonics. If it is found necessary to do this, place as many of the tuned trap circuits in series with the feeder as there are harmonics to be eliminated. Then tune each trap to one of the harmonics so that all have been trapped out.

Undesirable second harmonics can be minimized by the use of a Marconi type antenna. This type of aerial is not readily adaptable to 7000 kc., but could be used on the 1715- and 3500-kc. bands.

Class C amplifier operation produces generous harmonics, especially when the tank is operated with low  $C$ . While the efficiency will be lowered it sometimes may be found desirable to substitute a high- $C$  tank if harmonic troubles become too bothersome. This same thing is true of self-excited oscillators. Just another argument to change over to high  $C$  with its better note and less obnoxious harmonics.

With the amateur and commercial ranks increasing every day it is a very important matter to see that out-of-the-band harmonics are eliminated insofar as possible, and it is hoped that these suggestions will be of some assistance to those suffering from such troubles.

— Everett L. Dillard, W9BKO

**EDITOR'S NOTE.** — A push-pull output stage also is advantageous from the harmonic radiation standpoint because even harmonics are balanced out. Odd harmonics can be radiated, however. In general, with any antenna coupling scheme which utilizes *current feed*, that is, a system in which an antinode of the antenna or feeder current occurs at the antenna coupling coil when the system is tuned to resonance with the transmitter, chances of even harmonic radiation are lessened, particu-

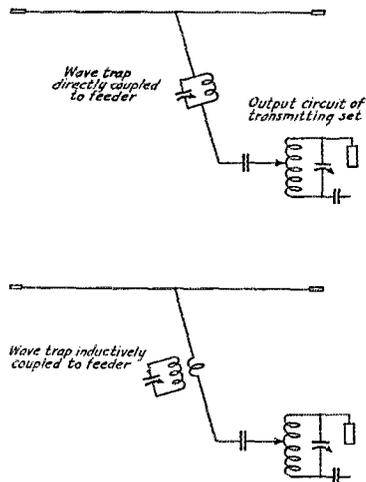


FIG. 3 — USE OF WAVE-TRAP TO ELIMINATE HARMONICS

The constants of the trap should be such that it will tune to the frequency of the harmonic which is to be eliminated.

amounts to illegal operation in somebody else's territory if interference is caused to commercial services. Strong harmonics at high frequencies are likely to cause interference with stations hundreds of miles away because of the effect of skip-distance and the well-known carrying power of the higher frequencies at low transmitter power inputs.

There are several simple ways of eliminating such interference. One system which is very easy to make work and is very effective when using single-wire feeder Hertz is given in the diagram, Fig. 3.

larly if the system is grounded at the antinode. Cases of this type are the grounded Marconi-type antenna mentioned above, and a Zepp feeder in which each feeder is a quarter wavelength long. These systems are often good radiators of odd harmonics, however.

### Bias

We read this letter from W6BPM with appreciation, having bumped into the same sort of thing on the first m.o.p.a. we built. Voltage dividers are extremely useful, but they have one fault — the resistors in them insist on following Ohm's law whenever current is flowing through them. Here's W6BPM's story:

"In the following I hope to bring out a point that may have been overlooked and may help some brother out of the haze that also surrounded me and caused the old soldering iron to work overtime. Simple and fundamental though the point may be, its simplicity is its veil.

"I decided to return to the air, after a lapse of over a year, in true *QST* fashion, namely m.o.p.a. I built up a 210 self-excited oscillator with the conventional capacity coupling into a neutralized 75-watt stage; 400 volts to the oscillator, 2000 to the amplifier and the necessary 200 volts 'C' bias to get cut-off. I went through the necessary motions of tuning the oscillator, neutralizing and adjusting the amplifier, etc., so that the plate current of the amplifier was around 30 mils. All set now to couple the antenna, but try as I might I could not get the old milliammeter to go a speck over 50. Immediately I suspected the antenna, so up to the roof with a steel tape and checked all measurements O.K. Next, I suspected not enough excitation, but no, with 400 volts the excitation should be ample; anyway, I tried inductive coupling but the same results were had. M'gosh, what's wrong?

"At this point let me inject a more definite description of my power supply and maybe you fellows who are way ahead of me can see my dumbness and dismiss reading the rest of this. The oscillator filament and power supply is entirely independent of the amplifier supply. The 'C' supply is independent of either, being made of modern b.c. power pack parts. The pack delivers 400+ volts and, as I only required 200, I nonchalantly hooked two 250,000-ohm resistors in series across the output, bringing the positive side to negative high-voltage and the midpoint (of the resistors) to the grid of the tube through the customary r.f. choke.

"To get back to the set, try as I might, putting r.f. chokes and what-nots all over the place I

couldn't get the antenna to take any power. By accident I left a voltmeter across the 'C' supply while testing around, and was surprised to see the needle jump from 200 to well over the 450-volt mark, when the key was pressed. Well, I finally got to scratching the dome and what with picking the splinters out of my finger tips I saw light. That 250,000-ohm resistor was directly in series with the grid circuit and the grid current is in such a direction as to make the voltage drop across this resistance cumulative in effect with the 200 volts already available. (I realize the internal resistance of the meter made some difference, too.)

"Immediately, steps were taken to reduce the resistance (and, incidentally, their current carrying capacity increased), and boy, oh boy, the difference. With two 20,000-ohm units in series, the 'C' voltage fluctuates only slightly and I'm able to make the antenna pull the milliammeter anywhere from 30 to 200.

"Just for fun, some of you who are using b.c. equipment and voltage dividers in your 'C' supply, hang a voltmeter across the output and see what happens when you press the key. If some of you have been wondering why you couldn't get your antenna to take the power, it might be useful to investigate the angle I've just illustrated."

— Kenneth Kiernan, W6BPM

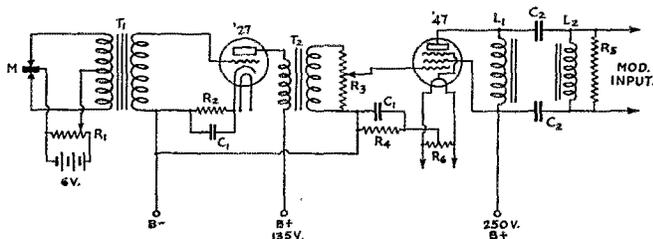


FIG. 4 — SPEECH AMPLIFIER WITH 47 PENTODE

- |   |   |
|---|---|
| R <sub>1</sub> — 300-ohm potentiometer.     | T <sub>1</sub> — Microphone transformer.  |
| R <sub>2</sub> — 1500 ohms.                 | T <sub>2</sub> — Audio transformer.       |
| R <sub>3</sub> — 250,000-ohm potentiometer. | C <sub>1</sub> — 1-μfd., 200-volt rating. |
| R <sub>4</sub> — 500 ohms.                  | C <sub>2</sub> — 5-μfd., 600-volt rating. |
| R <sub>5</sub> — 100,000 ohms.              | L <sub>1</sub> — 30 henrys.               |
| R <sub>6</sub> — 15 ohms, center-tapped.    | L <sub>2</sub> — 200 henrys.              |
| M — two-button microphone.                  |   |

"P. S. — The extra windings on the b.c. transformer in your 'C' supply can well be made to operate those keyer tubes for clickless transmission."

### The '47 as a Speech Amplifier

Fig. 4 is the diagram of a speech amplifier used by Basil Cutting, W1APK, for which he claims the advantages of high gain with a minimum number of tubes, and — because two amplifier stages replace the usual three for the same gain — lower cost, less chance for r.f. and audio feedback, and simplicity of construction.

The first amplifier tube is a '27, which is transformer coupled to the second tube, a Type '47

pentode. The output of the second stage is impedance-coupled to the grid of the modulator, an 845. The constants are given under the diagram. There should be little difficulty in getting an amplifier of this type to work.

In using the pentode in this fashion, it would be advisable to connect a resistor of suitable value in parallel with  $L_1$  to keep second-harmonic distortion at a minimum. The recommended value for this load resistor is 7000 ohms with 250 volts on the plate and 16.5 volts grid bias. Under these conditions the voltage gain in the '47 itself is about 11, the output being in the neighborhood of 180 volts, peak. The load resistance may be increased to 10,000 ohms or so without causing an objectionable increase in second-harmonic distortion if a somewhat higher voltage gain is desired. With a 7000-ohm load the output voltage will be sufficiently high to excite an 845 modulator to full output, however, provided the loss in the coupling impedances is small, and assuming the '47 is getting its full grid swing from the preceding '27. The load resistor should be capable of dissipating approximately 5 watts.

### An Improved System of Voltage Feed

This antenna coupling arrangement described below has been used successfully in my station for several years, and provides a method of feeding the antenna at maximum voltage. A Hertz antenna is used with one end brought into the station, and coupling is effected by a coil of such dimensions that no external capacity is needed. In other words, the coil consists of a half-wave antenna in concentrated form so that it has voltage loops at each end and a voltage node in

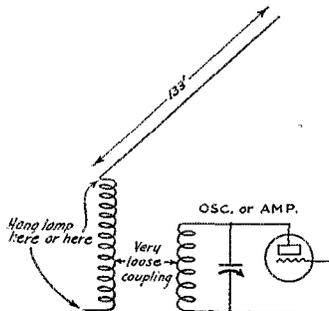


FIG. 5—USING A RESONANT COUPLING COIL WITH THE END-FED HERTZ ANTENNA

the middle. One end of this coil is connected directly to the antenna and the other end is left open, as shown in Fig. 5. Because of the relatively large number of turns a very high voltage is generated in the coil and the voltage end of a Hertz can be fed in great style.

The antenna used here is 133 feet long and works on the 80-, 40- and 20-meter bands. The coupling coils are of the pancake type. For the

40-meter band I use 21 turns of  $\frac{3}{8}$  inch copper ribbon, each turn spaced about  $\frac{1}{8}$  inch. The inside diameter is  $2\frac{1}{4}$  inches and the outside diameter 8 inches. For the 20-meter band I use 13 turns spaced  $\frac{1}{4}$  inch. An 80-meter coil would be too big for convenience, so I use the 40-meter coil with the voltage node grounded. In reality this makes a quarter-wave coil with voltage on the antenna end and current flowing to the ground. The inside end of the coils should be connected to the antenna. It is convenient to have the oscillator or power amplifier tank inductance of the pancake type also. The coupling between the tank inductance and antenna coil must be very loose or the system will be inoperative. For 40 meters 8 to 10 inches is used and the distance for 20 was so great that I had to hinge the coupling coil at considerably more than 90 degrees.

Now for tuning the system for maximum output. The cut-and-try method is the only way to arrive at the correct values for the coupling coils, but this will not be found very difficult. The essential part is to have an antenna of the correct length. The best resonance indicator was found to be a 5-watt 115-volt lamp such as can be purchased in any Kresge Store. Solder a hook on the center connection and simply hang the lamp on either the open end or the antenna end of the coupling coil. Adjust the frequency of the oscillator or power amplifier (keeping within the band, of course) and note where the lamp is brightest. Maximum output will be obtained only with very loose coupling. Once adjusted this method will produce a very stable signal and may clear up that r.a.c. note that has been so persistent on 20 meters.

— E. W. Lincoln, W1BNM

### Silent Keys

It is with deep regret that we record the passing of these amateurs:

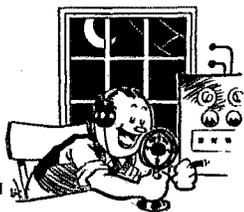
- John Fatsco, W8FTX, Detroit, Mich.
- R. P. Griffith, W9EJQ, Goldfield, Iowa.
- Maurice W. Hardy, W5FC, Dallas, Texas.
- Bert C. Hull, W9GEW, Great Bend, Kans.
- Clive Meredith, ex-8AQO, 8XH, Syracuse, N. Y.
- Jim S. Remsberg, Lakewood, Ohio.
- Clarence Schaffer, W8ANE, Toledo, Ohio.
- Edward A. Sullivan, W8GSZ, Cleveland Heights, Ohio.

### Strays

A newspaper clipping carrying the title "High-Power Radio in France," sent in by W4BDY, says that ten high-power stations of 60 to 80 watts each will soon be constructed in that country.



# Amateur Radio STATIONS



## W6GM, San Bernardino, Calif.

W6GM was assigned to George W. Ewing, 201 E. 10th St., San Bernardino, Calif., in January, 1920. The original spark outfit soon gave way to c.w. equipment; various types have been in use ever since. The interesting features of the present transmitter are the compact arrangement in the corner of the bedroom and the voice-actuated relay and lag device which switches on the carrier for 'phone when the voice hits the microphone and cuts off when the voice stops.

The r.f. portion of the transmitter consists of a TNT oscillator using two Type '45 tubes in push-pull as described in November, 1930, *QST*, driving two Type '10 tubes in push-pull as r.f. amplifiers. In the photograph, the coil next above the nickel-plated meter (a revamped auto ammeter) and the condenser above tune the plate circuit of the '45's. To the side are the extension handles of the neutralizing condensers and the two small knobs on the panel just above the oscillator plate tank condenser are variable excitation condensers, 23-plate Pilots.

Above this are the Type '10 tubes and the amplifier tank circuit, the coil of which can be swung in its switch jaw mountings in or out from the two antenna pick-up coils. The two condensers on the top panel are for series or parallel tuning of the antenna, one being connected between the pick-up coils and the other across their outer ends. Operation on the 14-, 7- and 3.5-mc. bands is possible by changing the oscillator grid coil, the oscillator plate coil and the amplifier tank coils.

The excellent frequency stability of the transmitter is attributable to an independent oscillator power supply, high-*C* circuit, plenty of power in the oscillator to supply the necessary excitation with small coupling condensers and — most important of all — very careful neutralizing

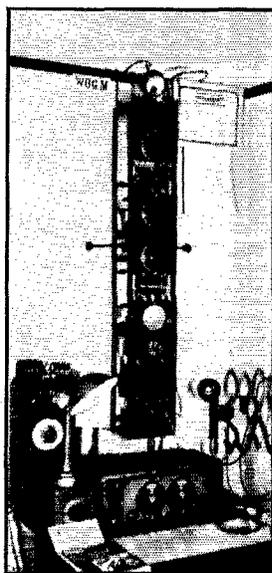
of the amplifier. Even at 14 mc. adjustment of the antenna circuit or a swinging antenna has practically no effect on the frequency.

The lower panel of the transmitter contains the microphone transformer, '01-A speech amplifier, '71-A control tube, and the two Type '50 modulators. The two lower jacks are for microphone and key, and the others are for the plug which transfers the meter to the oscillator, speech amplifier, control tube or modulator plate circuits. This meter has three scales and the jacks have individual shunts which adapt the meter to the circuit to be measured.

The power-supply equipment and control relays are built into two discarded Crosley Showbox metal cabinets, similar to the receiver case shown in the photograph, but larger. These cases rest on a shelf under the table. A 250-volt supply feeds the oscillator circuit and another larger unit supplies 600 volts to the Type '10 amplifiers alone for c.w. or 550 volts to the Type '50 modulators and about 450 through a dropping resistor to the r.f. amplifiers for 'phone work. All transformers and choke coils are home constructed. Switches are incorporated on the fronts of these metal boxes for shutting off the modulator filaments, shorting out the dropping resistor, and changing the bias for c.w. or 'phone operation. The modulation choke is left in the plate circuit and provides a lag to reduce key thumps.

The receiver consists of a '01-A regenerative detector with two stages of transformer-coupled audio amplification. One stage is arranged so a tuned audio unit can be plugged in. There is also an accurately calibrated dynatron frequency-meter visible behind the lamp on the operating table.

The antenna is a Zepp with 65-foot radiator, 50 feet high at the far end and 20 feet high at the near end, with 30-foot feeders. This handles the 7-mc. and 14-mc. bands nicely, and for 3.5 mc.



W6GM — AN UNUSUAL STATION ARRANGEMENT

Because space is limited, the transmitter has been built into an elongated frame which is suspended from the picture molding around the room, thereby eliminating the need for floor or table space. The transmitter is an m.o.p.a., with a pair of '45's in push-pull exciting a pair of '10's, also in push-pull. W6GM uses both c.w. and 'phone.

the open-end feeder wire is disconnected and a 45-foot counterpoise substituted.

Perhaps the most interesting feature about this station is the voice-actuated relay system which shuts the receiver off and turns the transmitter on when the microphone is spoken into (see article in this issue). Several other stations in this locality are interested in this system and some break in 'phone tests will be conducted as soon as they are ready.

This station is primarily an experimental one and is not on the air a great deal; however, traffic is never turned down. DX worked is PK, J, K4, 6, 7 KA, F30, VK2, 3, 4, 5, OA, CE, ZL, VE1, 3, 4, 5 and all W. 'Phone is used mostly for experimental local work, although the 7th and 9th districts have been contacted via the mike. This station started one of the Transcon 'phone messages in January, 1931, and in September, 1931, a schedule was maintained with F3OCK in Papeete, Tahiti, on 7 mc. keeping W6ALP, a local amateur who spent his vacation on the island, in touch with home folks.

### W9CNO, Chicago, Ill.

W9CNO, owned by Don Senesac, 1916 Cuyler Ave., Chicago, came on the air in May, 1930, as the result of building a short-wave receiver for pastime.

The first attempt was with a 210 in a Hartley circuit, but numerous improvements have resulted in the present rig. The transmitter is built into an old victrola cabinet, the back of which is sanded and finished with black insulating paint to give it the appearance of bakelite. This is used as the front. The shelves were taken out and two power supplies were installed. One of these has a pair of 281's and a home-made plate supply transformer rated at 150 watts, with taps at 400, 500 and 600 volts each side of the center tap. This feeds the three small stages. The other supply has a 700-watt plate transformer, also home-made, with voltages from 1000 to 3000 each side of the center, with a pair of 866's for rectifiers. The filament transformers are also home-made.

The space in the cabinet previously taken up by the horn and motor is now occupied by the transmitter proper. This is a three-stage affair with a 245 crystal oscillator with 200 volts on

the plate, a 247 frequency doubler at 500 volts, and a 210 at 500 volts used as a buffer stage. When working on 20 meters the buffer is used as a 20-meter frequency doubler.

The final amplifier, an 860, is mounted on the lid. By means of a pin jack the excitation from the buffer stage is fed to the last stage and the lid can be raised to work on the lower stages.

A temperature-control box is mounted on the side of the cabinet.

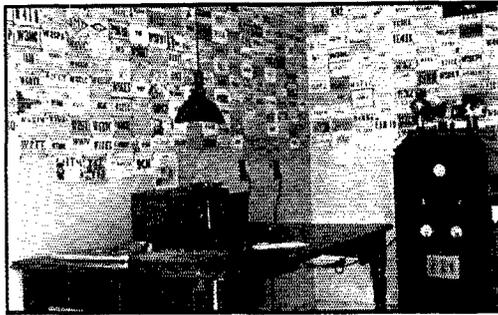
Bias is obtained from a specially made "B" eliminator with five 5000-ohm potentiometers connected in series across the output. The arms supply all voltages desirable. Each arm has a 1- $\mu$ f. condenser by-passing it to prevent feedback, and the results are the same as with batteries.

The receiver is an all-a.c. affair with a 224 T.R.F. in one can and a 224 detector in the other can. The audio amplifier consists of a 227 resistance-coupled stage and a 247 transformer-coupled stage with output transformer and volume control. It is mounted breadboard fashion to permit easy access for changes.

A Reinartz frequency meter is used, but a dynatron is in the course of construction.

The antenna has two 50-foot steel poles for support and is a 66-foot flat top with 33-foot feeders, using a combination of series and parallel tuning.

Rag chewing, DX, and some traffic comprise the activities. Forty-seven states and twenty-one countries have been worked.



W9CNO

Note that the transmitter is built into a phonograph cabinet. A.C. receiver, of course.

### Strays

W7BUK was interrupted in a rag-chew recently by thunderous blows on the wall of the shack. Rushing outside, he discovered two small boys of the neighborhood throwing rocks at his lead-in bowls. The remarks are not quoted.

Recent notices of fatalities resulting from erecting antennas over power lines spurs us to sound a word of warning. No antenna location is possibly worth the chance one takes by stringing it over power wires of any description. Not only is this against public ordinances but it is sure to result in serious trouble during the first storm. From recent antennas we have strung up we've come into the habit of mentally figuring out how easy it will be to re-string the antenna after it blows down. If all took that pessimistic attitude the mortality would be less.

# • I. A. R. U. NEWS •

Devoted to the interests and activities of the  
**INTERNATIONAL AMATEUR RADIO UNION**

*President:* H. P. MAXIM

*Vice-President:* C. H. STEWART

*Secretary:* K. B. WARNER

*Headquarters Society:*

THE AMERICAN RADIO RELAY LEAGUE, West Hartford, Conn.

## MEMBER SOCIETIES

American Radio Relay League  
Asociacion E. A. R.  
Associazione Radiotecnica Italiana  
Canadian Section, A. R. R. L.  
Deutscher Amateur Sende- und Empfangs  
Dienst  
Experimenterende Danske Radioamatører

Lwowski Klub Krotkofalowcow  
Nederlandsche Vereeniging voor In-  
ternational Radioamateurisme  
New Zealand Association of Radio  
Transmitters  
Norsk Radio Relas Liga  
Radio Society of Great Britain  
Rede dos Emissores Portugueses

Reseau Belge  
Reseau Emetteurs Français  
South African Radio Relay League  
Sveriges Sändareamatörer  
Union Schweiz Kurzwellen Amateure  
Wireless Institute of Australia  
Wireless Society of Ireland

## Conducted by Clinton B. DeSoto

**A**MATEUR societies in all the world are girding their loins in preparation for the Madrid Conference. Letters have been received at Union headquarters from nearly all national member-societies, outlining plans, making suggestions, and announcing the steps being taken with their own governmental representatives to ensure successful consideration of amateur affairs.

The A.R.R.L., as is being reported elsewhere, is sending a delegation of three amateur representatives, one of whom, it is likely, will also represent the Union. We hope to have more to say next month on the matter of Union representation at the conference. The R.S.G.B. plans to have a representative in attendance, as does the R.E.F., and, of course, Spanish amateurs will be represented.

In the other countries the amateur organizations are bending their efforts to impress on the selected governmental emissaries the importance of adequate allocation of amateur privileges. In South Africa the Postmaster General is to have a special audience with the S.A.R.R.L. The other countries of the British Empire are following suit, throughout Europe similar plans are under way.

All in all, there is a great stir in amateur ranks that will swell through the summer. Personal contacts, conferences, organized strength, public opinion — all are being introduced into the amateur issue in all countries as never before. If they control the outcome, our success at Madrid is well on the road to being assured.



The number of WAC amateurs marches steadily along with the number of amateurs in all parts of the world. An approximate 2%; this group of amateur radio's most active DX men always remains in the same numerical relationship with the big body. At this writing their number is well over 750, with a dozen or more on the way.

The B.E.R.U. Challenge Trophy Contest, held during the four week-ends in February, resulted in a magnificent win for Great Britain, reports J. Clarricoats, Hon. Secretary of the R.S.G.B. Mr. Fred Miles, G5ML, of Kenilworth, Warwickshire, led with the huge total of 5060 points (506 points; 10 zones). Mr. Miles thus succeeds Mr. Trevor Evans, VK2NS, as the holder of the most coveted British Empire amateur radio award.

Second place was won in splendid style by Mr. G. Todd, VS7GT, of Colombo, Ceylon, who totalled 3080 points with an input of only 30 watts. Mr. L. H. Thomas, G6QB, of Thornton Heath, England, finished third with 2970 points.

Other zone awards were won by Mr. Connerton, VU2FX (India); Mr. McKenzie, VK4GK (Australia); Mr. Chorlian, SU1CH (Egypt); Mr. Archer, V1YB (British West Indies); Mr. Turner, VE2CA (Canada); Mr. Auret, ZU6W (South Africa); Mr. Laver, VS3AC (Malaya); Mr. Merriam, VS7AH (Hong Kong); Mr. Martin, YI2DC (Iraq); and Mr. Manson, VQ3MSN (Tanganyika).

Continuing, G6CL's report states that congratulations are extended to all the above and

thanks conveyed to every entrant in this, the most successful contest so far organized by R.S.G.B.-B.E.R.U. Nearly 100 transmitting amateurs took part in the contest, while a large number of reception reports were sent in.

-----  
Newspaper readers and American broadcast listeners among amateurs will undoubtedly recall the excitement surrounding the location of a plane forced down in the Sahara desert by fuel shortage for eight days in March of this year. We have received from P. Godfrin, F8BJ, a highly interesting account of the work done by R.E.F. members in connection with this incident.

The airplane, the "St. Didier," was flying toward Madagascar when the fuel gave out in the middle of the Sahara desert, forcing it to descend. The radio equipment of the plane, operating under the call FAHLG, consisted of both long- and short-wave transmitters. An arrangement had previously been made whereby all messages from the plane, should it be in distress, would be received by those R.E.F. members who were on watch, and so the 27-meter equipment was promptly put into use.

While the crew had to wait eight days before they were finally found, F8KW, F8CR, F8IH, F8MD, F8MI, and F4AB maintained constant communication with them for seven days, connecting them at all times with the authorities and the Air Ministry in particular. A great deal of good to amateur radio in France was accomplished by this spectacular demonstration, and those amateurs as well as the R.E.F. are to be congratulated on a splendid piece of work.

-----  
The D.A.S.D. has regretfully decided that, on account of the awkward economic situation and general depression, no annual convention will be held in 1932 as has been done for the past six years. Instead of this convention, a formal business meeting will take place in Berlin on the occasion of the annual wireless exhibition, toward the end of August, 1932.

We hope to present the details of this meeting in a future issue. The D.A.S.D., through Dr. Curt Lamm, D4AFA, cordially invites the attendance of any visiting foreign amateurs at this meeting.

-----  
Plans have been completed by the R.S.G.B. for the third annual loyal relay, to take the form of Empire greetings to their Patron, H.R.H. The Prince of Wales, on the occasion of his 38th birthday on June 23rd.

-----  
The first part of 1932 found the N.R.R.L. principally engaged in the construction and operation of their new headquarters station, and the organization of an inland network of relay lines to work in connection with it. The new station uses the call LA1C.

The number of transmitters in Norway as well

as N.R.R.L. membership is growing steadily. A large general meeting to be held in Oslo during the first half of August is now being prepared for, and foreign amateurs visiting Norway during that time are extended a hearty invitation to attend. It is suggested that prospective visitors



D4UAO, STATION OF THE LEHR UND ERZIEHUNGSANSTALT ETTAL

*in Ettal near Oberammergau, Germany. All continents have been worked with a maximum input of 25 watts; Oceania with 12 watts. The operator of D4UAO is Henry Haffmans.*

-----  
communicate with the president, G. H. Petersen, LA1D, before arriving.

-----  
If these open invitations continue, it begins to look as if an amateur could spend a pleasant summer in Europe doing nothing but travel from one amateur general meeting to another. Could there be any more pleasant way of spending a summer?

-----  
Recent reports on the operation of the new Experimental Section of the R.E.F. indicate that the extensive organization of this new French venture is producing excellent and diversified results. The section comprises eight groups, each specializing in the study of a particular field of high frequency technique. P. Godfrin, F8BJ, writes that foreign amateurs are welcomed into the membership of the various sections, and requests all interested to write him at the address: 80 rue Thiers, Boulogne sur Seine (Seine), France. No dues are required.

F8BJ is particularly anxious to enter into communication with foreign amateur organizations having similar aims, especially with a view toward the arrangement of international tests.

Accounts of the work being done will appear regularly in the official organ of the R.E.F., "Radio R.E.F." To become a member of the French society and receive this publication, address: President, Réseau des Emetteurs Français, 19 rue Claude Vellefaux, Paris, 10<sup>e</sup>, France.

-----  
Owing to the fact that the National Radio Exhibition is scheduled to commence in London on August 19th, one month earlier than usual, the R.S.G.B. has found it necessary to arrange the

Seventh Annual Convention for the last week-end in August, the 26th and 27th. Overseas amateurs are asked to keep these dates in mind if a visit to England is planned this summer.

The Northern Tests between OZ, SM, OH, and LA during January were well supported by amateurs in all these countries, but none of the societies in these countries has as yet communicated full details regarding the outcome.

The general consensus of reports received on DX working during the past winter is to the effect that 14 mc. has failed miserably in providing satisfactory, consistent long-distance working, while 7 mc., on the other hand, has become enormously popular once more for nearly all phases of amateur activity. 3.5 mc. has proven itself capable of excellent DX work, but, owing to rather intense QRM in nearly all countries, has been usually to purely local or national work. It is anticipated, however, that during the summer months and the winter to come, 1715 kc. will remove a great part of this more intimate load from the next higher band.

We present this month the first part of France's contribution to our series of stories of the national society members of our Union. Lack of space prevents inclusion of the entire article; the second part will follow next month.

## The Transmitting Amateurs of France and the R.E.F.

By J. Lefebvre, President-Fondateur

**B**EFORE the war, only a very small number of experimenters were interested in the science of radioelectricity, and they were principally gathered from among the professors and engineers of the time, who succeeded in establishing more or less regular communication over short distances.

In 1907, Mr. P. Louis of France, employing a simple Ruhmkorff coil, established the first two-way radio communication with his friend Mr. Joseph, located three kilometres away.

At the beginning of 1912, a small organization was instituted at Orleans, consisting of Messrs. Louis, Germond, Dubreuil and Margottin. These amateurs made use of automobile spark coils for transmission, and galena crystals for receiving.

At the end of 1913, the longest regular two-way communication was between Dr. Corret at Versailles and Mr. P. Louis at Orleans, using on the one part a spark transmitter and on the other part a 600-watt Moretti arc.

In April, 1914, using the same type of arc, a successful attempt at radiotelephony was effected

and a distance of 70 kilometres (Chartres) was achieved.

At that time, the amateur desiring to construct transmission equipment was able to secure only a small amount of information from current publications, and there was little available in the way of commercial apparatus for reception.



M. JACK LEFEBVRE, FRGL,  
PRESIDENT-FONDATEUR  
OF THE R.E.F.

With the coming of the war, transmission was forbidden, and most amateurs ceased their activity. From 1914 to 1919, as a result of the necessity created by the national defense, great advances were made in the apparatus used in telegraphy, and in 1920 there appeared the first commercial French three electrode vacuum tubes,

which served to veritably revolutionize the entire art.

In January, 1921, when the preliminary attempt at communication between the United States and England was attempted, Mr. Deloy of Nice was located at Chelmsford with a 200-meter transmitter and receiver.

During this same year the French Government, through the Department of Posts and Telegraphs, established the first regulations governing amateur transmission. A maximum power of 100 watts was permitted, wavelengths between 180 and 200 meters were to be used, and only communications relating to the tests being conducted were authorized. Calls consisting of the figure "8" followed by two letters were given to each station.

During the first of April, 1922, Mr. Deloy (whose call was 8AB) accomplished the principal achievement of French amateurs, and communicated regularly with English amateurs, for some time holding the distance record of Europe (Nice-Aberdeen).

Mr. P. Louis (8BF), in August and September of the same year, using the longer wavelength of 200 meters, also successfully established numerous contacts with English amateurs.

A new series of transatlantic tests was held in December, 1922. Three English and one French station, that of Mr. Deloy, were heard in the United States, the reception being verified through the code messages transmitted.

In January, 1923, Mr. P. Louis was received in England on telephony and, in the spring of that same year, Mr. Deloy received signals from the military post in Paris of 45 meters wavelength, a remarkable result for the short wavelengths which had never before been used in France for communication over such distances.



# CALLS HEARD



*A. H. Hooper, Mile Seven, Alaska*

3500-kc. band

k7asm k6aja k6baz v5sag v5fal v4bb zllcd zllck zllcl zllce zllfg cl3hs wllza w6abf w6aif w6aiv w6aie w7avl w8avo w8bar w8bfm w8bjp w8blk w8bma w8bre w8brx w8bvz w8bxc w8bxg w8cbf w8ccf w8ceu w8cfj w8cge w8cjj w8coj w8csa w8cus w8dej w8dkt w8dqa w8dtx w8dvn w8eav w8edw w8ec w8efp w8ejs w8eme w8emx w8eqr w8etm w8exb w8exe w8fac w8fet w8fex w8fiw w8fkl w8fls w8flg w8fmq w8fld w8fng w8fny w8fof w8frr w8ftu w8fkj w8kl w8coq w8uo w8vs w8yan w8ztl w7aax w7ads w7aem w7ajs w7ana w7anp w7apd w7ape w7atx w7auq w7avq w7avz w7awh w7aww w7axw w7azk w7bau w7bcc w7bhv w7biw w7biv w7bjz w7bgl w7blx w7bnc w7bsi w7bsh w7bud w7buf w7buw w7bvi w7bwg w7cab w7cde w7ten w7fp w7if w7kd w7mm w7mq w7nl w7no w7vk w7wo w7wp w8az w9hg w9iew w9ika w9lqz

3500-kc. phones

v5ef w4oc w6agd w6agg w6ant w6apv w6ave w6axq w6ber w6bgi w6bmn w6cgr w6cjj w6clh w6crs w6cx w6eaw w6enq w6eoo w6eov w6eqv w6ffn w6fk w6fv w6ig w6ut w6va w6lg w7ae w7aoo w7agq w7anq w7aqx w7arw w7bbq w7bec w7bek w7bin w7bsb w7bzo w7ia w7imn w7jq w7ts w7vs w7wq w9bzf w9eal

*VU2AY, H. F. Miller, Kaurapukur, Tollygunge P. O., Calcutta, India*

7000-kc. band

(February)

ac8go ac8js ac8zz auice auide auidu aulkab aulkac aulcj au3ea au8kal aux2drj jlet jldm jldq jlep jlej jles j3de kalcm kalhs kaljr kalne kalup kaljrk kalzo ka2cm ka8vk ka8arb oz2tu pa3ja pk1ab pk1ac pk1lr pk3bq pk3jip pk3pv pk4ev pk4dr pk5da v8ab vk1dh vk2wl vk2jc vk2fy vk2hg vk2xb vk2hm vk2bq vk3cv vk3dw vk3km vk3bl vk3wl vk3zw vk3zw vk3ge vk3km vk3gt vk3da vk3gj vk3cr vk3aj vk3vs vk3md vk3bf vk3xj vk3bx vk3xi vk4gh vk5aw vk5fw vk5nx vk5gy vk5yk vk5vh vk5ml vk5ju vk6gf vk6vl vk6ki vk6vd vk6jj vk6ad vk6lf vk6va vk6vm vk6lx vk6dh vk6fv vk6hu vk6lj vk6jt vk6im vk7cf vs1ad vs1ac vs2aj vs2ac vs2rl vs2af vs3ac vs3jb vs3ab vs6ih vs6ah vs6ag vs6ac vs6am vs7ai vs7ap vs7ue vs7ae vs7gt vs7ux vs7af vs7af vs8ab vu2bg vu2jp vu2fx vu2cs vu2ac vu2kt vu2ue vu2lj xs3j xx1yj zsf2 zsu5 zt6k

*G6YL, Miss B. Dunn, Felton, Northumberland*

7000-kc. band

w2erg w3la w5axy w8cir ct3ab fm4ab fm8er fm8ih fm8yj k4bu k4ry su8ma au1ec au7de un7vv vk2jf vk6gf yi6wg zl2ci fnbh xfnfh xoz3w7k xeu6am sm8ua xsm6ub sm6vr xx1y xzn2a

14,000-kc. band

wlcmx w2bhv w2dma w3bbb w3wg w8cjr w8zy ct2aw fm4ab fm8eg fm8ih en8ma pk1ac pk3bq vs3ac vu2bg yi6wg yv3lo xx1yj xzn2a

*W5CT, James N. Barclay, 1001 Riverside, Austin, Texas*

7000-kc. band

(April 15th to May 1st)

ce3ag cm1pw cm2fn cm2lc cm2mg cm2op cm2rz cm2ss

cm2sv cm2wd hh7c k4acf k4bu k4rk k5ae k5ad k6ain k6aja k6alm k6auq k6baz k6dyc k7bmc kalhr kaljr nedf ny2ab os4u obga om2tg ti3la ve3be ve3bm ve3bp ve3bv ve3cf ve3dd ve3gf ve3gk ve3hc ve3ib ve3nn ve3wa ve3wx ve4dk ve4dt ve4jz ve5gf ve5oc vk3zw vk5hg x1mc ynlno zl2ci zl2cu

*VK5MY, Harry M. Roberts, 58 Fourth Ave., Alberton East, South Australia*

7000-kc. band

(February 21st-26th, 1010-2015 G.M.T.)

ac8zw j1ct j1dm j1px vs8ao vs8ag ear227 g2xd hb9h hb9q w1ae w1cek w1lz w2ag w2anx w2bkw w2bsr w2ko w4abo w5bmi w5fw w8adk w8ahz w8am w8bc w8bbm w8bq w8cuh w8cxw w8egc w8egh w8so w8vq w8yb w8yo w7aat w7dl w7vt w8ley w8yx w9bnt w9bvi w9cme w9eve w9fur w9gex w9gv w9jz ve2be ve3hm xlax oa5p

*Eric W. Trebilcock, Moonta, South Australia*

120-130-meter band — overtones of 7-mc. band

(January 1st to April 10th)

fm8wz j1ee k6baz dmltb om2tg pk3bq wlben wlmk w3cef w5ah w5ew w5ux w6am w6ahz w6aor w6bc w6coe w6cuh w6cxw w6egh w6so w7bb w9bnt x1lj xvk2wp (on yacht)

*W7LD, Nilo and Hans Koski, 5822 E. Green Lake Way, Seattle, Wash.*

14-mc. c.w.

ce1ai em2mm j1dp j1ec k5ae k6alm k6auq k6cmc k6eru k7tf lu2ca oa4v oa4z om1tb ve2be ve2ch ve2cl ve3ll ve3qs ve4ev ve4ed ve4ha vk3jr vk4gk vk5hg wiarb wifh w1mg w1xp w1zz w2amr w2atf w2bfe w2cjm w2djo w3buy w3cep w3di w3md w4adl w4aji w4ajx w4ajy w4auw w4bba w4mk w4pai w4to w4zh w5aea w5aoc w5aot w5avj w5hbb w5brd w5bg w5caw w5it w8ade w8alb w8anr w8aty w8bjx w8bkp w8bpu w8bsf w8bys w8cew w8cir w8cte w8dbc w8djj w8dla w8dmk w8dv w8ekh w8em w8ew w8ex w8fco w8fey w8fxa w9np w9wo w9yz w9abd w9adn w9aeh w9afn w9akw w9ag w9azi w9azm w9bhh w9bvi w9cex w9cgu w9cjj w9cjj w9dct w9deg w9dku w9dqv w9drd w9drn w9ebk w9egk w9en w9faw w9fhr w9gai w9gba w9lqz w9ghh w9hfd w9hfw w9hvj w9iup w9mm z1lar zl2bx

14-mc. 'phone

w5abo w5ql w5za w6cjq w6clh w6dgl w6zq w8aws w9brx w9cjj

*Launse A. Deane, 40 Tusmore Ave., Tusmore, Adelaide, South Australia*

7000-kc. band

w1azi w2bxj w2doy w2uz w3cdk w3md w4ajo w5ahw w5aoo w5bbc w5ms w6adk w6ahz w6be w6bi w6bpt w6bk w6bam w6bgb w6cwx w6cuh w6czq w6dep w6dwa w6edw w6evl w6flz w6ma w6sn w6so w6ty w7bb w8ano w8cir w8eve w8fhz w8ib w9bko w9fno w9fyz w9hbc w9mc kalco kalcm kalhr kaljr kalsp kalxa om1tb om2tg k6fab vs6ae vs6am ear224 xlax zsu5 pa0qq pa0pf pk1vh pk1cx pk3bq eu2pk eu2pw g2oq g2zq fm8ih j1ek j1do j1dh j1ck j1ee j3cl ct1dx ct1bx f8la f8cs f8tx f8ca sp3om et8fa haf3d hb9q fnfh rllk rkm rpk

# THE COMMUNICATIONS DEPARTMENT

F. E. Handy, Communications Manager

E. L. Battey, Asst. Coms. Manager

## Changes in Regulations

THE Radio Division, Department of Commerce, announces several changes in the issuance of amateur operators' licenses, effective July 1.

(1) **Amateur Extra First Class.** Examination for this license will now be sufficiently wide in scope to authorize the holder of this class of license the unlimited radiotelephone privileges set forth in paragraph 377 of the F. R. C.'s Rules and Regulations.

(2) **Temporary Amateur Operator Class.** Application for this class of license will be accepted only from applicants residing more than 100 miles from examining point, which may be the district headquarters, a suboffice, or a city visited by an examining officer. This does not invalidate licenses now in effect. The applicant must submit a sworn statement attesting to his ability to transmit and receive at a speed of not less than 10 words per minute in Continental Morse Code, and complete a questionnaire pertaining to the operation of an amateur radio installation. Applications for examination for unlimited amateur phone privileges will not be accepted from holders of Temporary Amateur Class Operator License. Applicants for this examination must appear personally before an examining officer and pass a written examination.

(3) **Renewals.** Amateur Extra First Class and Amateur First Class Operator Licenses may be renewed without examination provided proof is submitted indicating frequent use of the Continental Morse Code during the license period. An affidavit indicating at least three amateurs with whom applicant has communicated by code within the last three months of the license term will constitute ample proof; lacking such proof, a code test will be required.

(4) **Renewal of Temporary Amateur Class Licenses.** These are *not renewable*. Holders of this class of license will be expected to pass the regular amateur examination during the license term, which is for one year only. Failing to appear for examination when given an opportunity, or failing to pass examination, the temporary amateur class license held will be cancelled and holder will not be issued another license of this class upon subsequent application.

(5) **Amateur stations may be operated only by persons holding amateur operators' licenses.** Under the new ruling governing this, the operator must have a proper license posted in both the commercial and amateur station he operates. The difference between high frequency amateur and ordinary commercial stations is now so great, it is considered desirable for a commercial operator to pass an examination on the equipment he will use.

As mentioned editorially in June *QST* the Radio Division reserves the right to waive such portions of the regulations as may be necessary from time to time in exceptional individual cases, as in the case of a disabled amateur, such as a member of the Chair Warmers' Club.

Several changes are also announced in the issuance of Commercial Operators' Licenses. (1) The Commercial Extra First Class now covers both radiotelegraph and 'phone. (2) The Commercial 1st and 2nd Classes have been dis-

continued, and are replaced by the Radio Telegraph Operator's License. This license will be used for any kind of commercial radiotelegraph work, covered previously by the Commercial 1st and 2nd classes. (3) The Aeronautics, Broadcast, and Radiophone classes of licenses have been discontinued and are replaced for the following: (a) Radiotelephone First (may operate A, B, R), (b) Radiotelephone Second (may operate A & R), Radiotelephone Third (may operate A only). The examination requirements for the new classes of licenses will remain similar to those for the several previous grades of licenses.

## Canadian 'Phone Bands

WHILE the frequency bands open for c.w. operation in Canada are identical to those in the United States, there are several differences between the Canadian and U. S. 'phone privileges. Below is a tabular comparison of the portions of each band open to 'phone in both countries. The entire bands as shown in the first column are open to c.w. operation in both countries.

Amateur Band	Open to 'Phone in U. S.	Open to 'Phone in Canada
1715-2000 kc.	1875-2000 kc.	1715-2000 kc.
3500-4000 kc.	3900-4000 kc.*	3500-3550 kc. and 3900-4000 kc.
7000-7300 kc.	None	None
14000-14400 kc.	14150-14250 kc.*	14100-14300 kc.
23000-30000 kc.	None	None
56000-80000 kc.	56000-80000 kc.	56000-80000 kc.

\* Use of 'phone in these bands of frequencies requires the operator to pass a special examination in accordance with paragraph 377 of the Federal Radio Commission's Rules and Regulations.

## Traffic Briefs

At last a Chinaman has been found with a name that means something. W3BCX has located a Chinese laundryman named *Kee Klit* — and he is a short wave fan, too!

W9DKA offers a suggestion regarding procedure in calling a "directional CQ." His idea is that in using the directional CQ an operator should give some indication of his own location. For example, a "W9" calling "CQ West" might proceed as follows: "CQ CQ CQ West de W9XYZ Illinois." Or a "W8" might similarly send "CQ CQ CQ West de W8XYZ N Y." This eliminates the necessity of thumbing through the call book to see whether you should answer the call. Of course where a specific city or state is being called (CQ Texas, for instance), this procedure would be superfluous, but in a broad use of the directional CQ, such as "CQ West," W9DKA's suggestion might prove very helpful. Give it a try.

Speaking of automobile licenses W8BR figures that the county clerk must know he is a ham for when his markers arrived they carried the numerals "73-80" — next year "BR" hopes to land "73-88."

## PRIZE ARTICLE

The following contribution by Mr. Roy Gale, W1BD, wins the C.D. article contest prize for this month. The contribution by Mr. Hall, W8AYI, is presented in addition, and receives honorable mention. Your articles on any phase of amateur communication activity are likewise solicited. See page 46, June 1939 QST, for more data on the article contest. Send yours to-day.

— F. E. H.

## Disciples of Ananias

By Roy L. Gale\*

"HELLO, Shrimp, how's that old spark-coil o' yours comin' along?" With this encouraging thrust the Old-Timer planted himself in the most comfortable chair in the shack, and cast an inquiring glance at the Young Squirt.

"Spark-coil, eh? I guess you don't know what a real set is when it stands before you! Why, I'm getting swell reports from everybody I work. Look at this card from W2——. 'Ur sigs QSA5 hr in Toonerville, stedi es PDC, vy FB note OM.' And here's another from W1—— up in Slab Hollow, Vt. See, it says 'Ur DC sigs R9 hr OM. Wat kind of tube do u use fer ur xtal oscillator?' Well, I guess those will hold you for a few minutes, but keep yer shirt on; let's get some evidence that you can listen to. No, I ain't gotta monitor; what's the use of going to all that trouble when a fellow can get all the dope he wants over the air? 'N' besides, y'know monitors don't always tell the truth anyhow."

So saying, the young Squirt threw in the switch and was off on a grand CQ. When at last the key stalled, he and the OT donned a pair of cans each, the one confidently, but the other skeptically. Sure enough, the SOS was a success. It was W8——, who had just finished eating a wonderful supper and was feeling charitable toward the world in general and toward young squirts in particular. Through the fones came this birdseed, "GE OM ur NDC sigs R8 hr in Woodchuck Center — one of the best sigs I ever hrd OM — much above the average es vy easy to oopi."

The Old Timer threw the fones on the table; they weren't his anyway. "Well, I guess you're OK after all, youngster, I take it all back — er, what's this? 'Official Observer's Notification Form. Dear OM. Your signals were QSA5 at 6:20 p.m. March 20 when you were calling W3——. You were using a frequency of 3750 kc., OK in the band, but ur sigs were terrible A.C. Sincerely, W1——, Official Observer."

As the Old Timer finished reading, and looked up with a peculiar smile on his face, the Young Squirt said defiantly, "Aw, that's nuthin'; just one of those OO's that wants to show his authority. He's gotta do something to make Mr. Handy think he's on the job, y'know. Just a lot of hot banana juice. I don't pay any attention to tough guys like that."

The Old Timer lit a fresh cigarette and took his leave, muttering to himself something that sounded like "Anna Nyas," whoever that strange YL might be. In the meantime the Young Squirt fell to soliloquizing on the arrogance of Official Observers, and cursed some of them inwardly.

All went well for a few days. More QSL cards arrived, and the reports were invariably the same, always good; the kind of reports that makes a fellow proud of his junk heap, and especially proud of the buy that threw it together.

And then — something dropped! It dropped lightly into his mailbox, but it landed more heavily on his mind.

"What's all this! 'Radio Supervisor's Office, Boston, Mass. W1XYZ: Sir: Signals signing your call letters, and of a character which is in direct violation of the rules laid down by the Federal Radio Commission, were logged here at 7:15 p.m. on March 20th. Unless you comply with the re-

\* W1BD, SCM Vermont, 41 Beacon St., Barre, Vt.

quirements of the Commission at once, your license will be cancelled and prosecution will follow."

The Young Squirt sat down suddenly; the strength seemed to have gone out of his knees somehow.

"Gosh! I guess that Official Observer wasn't such a bad scout after all. I'll sit right down and write him a letter of apology and thanks before I do another thing. And then — I'll build a monitor and get a lawful peep out of this wreck before it ever has a chance to clutter up the ether again!"

And that, little hams, is the end of this yarn — which isn't made out of whole cloth either.

## Frequency Observance Simplified

By W. D. Hall\*

THE measuring apparatus herein described is designed to either measure the frequency of a transmitter or a station heard over the air. The accuracy depends chiefly on the quality of parts used as well as the construction of the apparatus. If the apparatus is well constructed with quality parts it will be highly accurate and reliable.

A harmonic monitor is employed which works on the 160-meter band. A 45-volt "B" battery, a dry cell '99- or '30-type tube, three flashlight batteries, a fixed and a variable condenser, a grid leak, rheostat and phones are the necessary parts. A rheostat is used to control regeneration. The apparatus need not be shielded except for hand capacity. The receiver is equipped with a good dial for tuning and a plain dial for tuning a small variable condenser which is placed in parallel with the main tuning condenser.

Select several broadcast stations with harmonics in the ham bands you wish to calibrate. With your receiver oscillating tune in the best of these stations and beat the harmonic monitor with it. Now in the ham band adjust the main condenser to a convenient place and with the small condenser previously added tune in the harmonic of the monitor. If from this place you cannot cover the whole band easily with the main condenser vary the small one until you can. Record this dial reading and from then on with the monitor tuned to the beat of that BC and the receiver getting the beat of the monitor on the right dial number the ends of the band will remain intact provided that the coils and condensers are solid and well built mechanically. From day to day the setting of the small condenser will vary from the point originally required to beat the monitor to the right point and also changing the oscillation point will cause a change but as long as the monitor (which is tuned to the BC beat) is on the proper setting the calibration is right.

Some night of a Standard Frequency Transmission,† with the dial set correctly calibrate every 100-kc. points and check the monitor on the BC for every point and adjust the receiver to the monitor for each point. Since there is a six minute transmission on each point several BC can be run down for each point. By adjusting the small condenser each time so the SFT comes in at the same place for each BC used the harmonics of the BC can also be used as points and if the one station is not on, the others can be used with the same curves. If at some time you are in doubt as to whether the calibration is holding, measure a steady commercial station with all of the broadcast stations as standard points. If the calibration is right the different frequencies should be approximately the same. If the station is of good stability its frequency may be compared with the assigned frequency. Consistent checks with the SFT will show the accuracy of calibration and stability of the system.

The frequency of the transmitter can be measured by listening to it in the monitor and then measuring the monitor's frequency in the receiver. It is best to listen to the monitor in all cases possible in preference to listening to the receiver thru the monitor. Let's hear the results you get. OM's!

At W8TI a crystal standard is used in preference to monitoring BC and the more accurate ones are monitored

\* W8AYI, 527 Davis Ave., Elkins, W. Va.

† Every Friday night is standard frequency night. See full SFT schedules each month in QST.

now and then but I have tried the above system and it is accurate as compared to the average ham's outfit. In less than two months W8TI (A.R.R.L. Official Observer) has heard about 375 off-wave stations. Hoping to see still more articles on frequency observance in *QST* and also that some hams (of the 375 and others) can find room for a monitor or frequency meter.

## On Making Traffic Work Reliable

ONE thing about our message-handling, there seems to be a sad lack of true appreciation of what this message-relaying really amounts to. We accept messages, and while not guaranteeing delivery, we state that there is such a high percentage of deliveries that delivery is practically certain. This is true to a certain degree, but this same percentage could be raised if each man would do one thing. *Appreciate the time and effort of the man who originates a message, and those who will relay and deliver, AND ACCEPT YOUR RESPONSIBILITY. DO YOUR PART* to deliver when possible, or to place relayed messages in the hands of reliable stations to be forwarded within the shortest time possible (*always* within 48 hours). Of what use is it for us, who regularly handle traffic to the best of our ability, to have it end on the hook of a man who doesn't care whether it is delivered or not? It is no use. Suggested solution:

First — Consult the lists of reliable traffic handlers which appear up-to-date in *every QST*, at the end of the Sectional reports. These men are practically all ORS, and by quick reference to a call book for the location, and *QST* for indications of whether a reliable traffic total is reported you can be sure your message will be properly handled.

Second — ORS and RMs should use "ORS" or "RM" after their station "sign" regularly to enable those who hear them to recognize them as "reliables" on the lookout for messages to QSP with the best of service. This method of "sign" and the 3 x 3 "CQ ORS" calls are coming into more regular use since they have been more or less popularized by the ORS Parties of late.

Third — Too many hams accept messages from others because they hate to refuse QSP. It should be remembered that fellows who have messages to handle are seriously interested in seeing these handled rapidly, accurately and delivered *reliably* and that they will appreciate a tactful refusal to take a message as a greater contribution to the service than any hypocritical attitude in taking a message with the possibility of delay or loss. Refuse traffic when it cannot be handled properly, as you know it *should* be handled. Unless you do this you are likely to get "hung" with a tracer that shows up any disgraceful performance, anyway.

But most hams handle messages for the fun of clean-cut, snappy, *worthwhile* radio work. Most hams do accept the fact that in taking a message they are promising to see it quickly and properly handled, 85% of the gang, if we are to judge from the average 85% "national" delivery figure. The solutions above ought to place our work nearer to the 100% mark. Let's go, gang, and make A.R.R.L. mean real dependability to the whole wide world.

— W1B0F

## Improving Frequency Observance— Do Your Part

By E. W. Mayer\*

MR. TERRELL, Chief of the Radio Division, in his annual report, gave us amateurs a mighty good word, in regard to our self-policing policy. Mr. Terrell is justified in his opinion of us, and we can be duly proud of it. At the same time, those who stop to think the matter over, will find some things which cannot do other than detract from an otherwise perfectly just pride in our amateur radio.

Never before in our history has it been necessary for the government to suspend, revoke, or cancel as many licenses as in the past twelve months. Even in the dark ages of ham radio this was not necessary. Proper use of modern day

\* K4KD, C.R.M. USNR, Box 103, Ensenada, P. R.

amateur radio equipment and methods should eliminate the necessity for such government action. There should be no offenders to begin with. Carelessness, neglect of precautionary measurements, and other human traits, bring about the present condition. That is where you and I and the other fellow come in. You and I may be operating in strict compliance with the regulations. Those who view our precious kilocycles with envy, are altogether too willing to discredit the whole amateur fraternity for the violations of a very small group. Consequently, we would be included in any drastic restrictions of amateur privileges, regardless of our innocence or guilt in causing that restriction.

Of course you and I have a dynatron. If not our "improving of frequency observance" should begin right at home. Properly equipped we can regularly check our own transmitter.

It is also up to each of us as individuals to assume personally the responsibility of protecting our interests in amateur radio. The present off-frequency conditions should be viewed with alarm by every right-thinking amateur, and we should be ever mindful that each conviction of off-frequency operation further weakens our status. To prevent disaster you and I should be willing to sacrifice some time regularly from our personal enjoyment of the game, to devote to help those who err and correct this general situation.

Call the fellow you hear off-frequency, and if you succeed in getting QSO, stick with him and help him get back in the band. Practically every operator will thank you for your help. If you should not be able to QSO the operator of the off-frequency station, spend a cent and drop him a card calling his attention to his delinquency. More than likely he will drop you a line thanking you for your trouble and courtesy. (The "cent" will help end the depression anyway. — Ed.)

If it's a case of a broad or "wobulated" signal, call attention to the difficulty in a nice way. Tell him where he can get information on how to remedy the trouble. Above all, be courteous in giving criticism and advice. Convince the other fellow that you are sincerely trying to help him. Helping the other fellow to help us uphold the status of amateur radio will pay all of us big dividends as time goes on.

## ORS QSO Party

THE third ORS QSO Party on April 23rd and 24th was an even bigger success than the two preceding, with more participants and larger scores all around.

Ohio Route Manager, W8DFR, offered to the ORS appointee making the best score an X-cut, one inch, power type quartz crystal. With flying colors and a score of 9216 W5BMI steps forward to claim the prize! This is just one more added to W5BMI's long list of victories and we extend our congratulations — W8DFR will extend the crystal.

The ten highest scorers are shown below together with a complete record of their accomplishments. The scores of all other participants and a full account of the Party will appear in the July ORS Bulletin, mailed exclusively to A.R.R.L. Official Relay Stations, affiliated clubs, and field organization officials.

Call	TEN HIGHEST SCORES				
	Score	ORS Worked	Traffic With	Other ORS Heard	Sections Worked
W5BMI	9216	78	78	54	32
W9TU	7590	69	64	52	30
W81A	5252	45	45	67	26
W9BWJ	4992	45	31	71	26
VE3CT	4686	56	35	66	22
W9AUH	3784	39	38	56	22
W9FUT	3654	42	32	58	21
W8BYD	3400	42	33	53	20
W9AOG	3060	36	36	45	20
W9BMA	3036	30	28	34	23

ORS — remember the dates of the next ORS QSO Party — July 23rd and July 24th. Plan now to take part. Scoring rules will be the same as for the April Party.

Non-ORS — write your Section Communications Manager (see page 5 this issue for address) for an application form for Official Relay Station appointment. Get in on the fun at future ORS QSO Parties.

— E. L. B.

## About Call Bootlegging

WHAT excuse for *any* individual using another man's call in a country where licenses are as readily granted as in the U. S. A.?

What more despicable than to "steal" another person's *identity*, with the possibility that he may be blamed for improper, illegal, illegitimate operating, in or out of the amateur bands?

True handom has slight sympathy with persons who so trespass on the high standards and fraternal spirit of amateur radio. The honest indignation of the amateur whose call is "stolen" dictates that individuals with the desire to help amateur radio and purge the fraternity of the curse of the unworthy will lead them to deal summarily with men who "bootleg" the calls of brother amateurs.

Let's be tolerant, helpful, and kindly, where tolerance, assistance and understanding are due—but a "call bootlegger" knows enough to know he is doing wrong, and deserves the benefit of none of these virtues. Let's drive such a pernicious practise as call-stealing out of amateur radio.

### COÖPERATE WITH THE N.P.R.R.

The Northern Pacific Railway will welcome coöperation from amateurs in preparation for any communication emergency that might arise at points along the company's lines. All amateurs living near any station of the N.P., please file your name and telephone number with the station agent so that in case of wire failure he can get in touch with you to assist in handling railway traffic by amateur radio until wire service is restored.

Mr. I. V. Iversen, W7AW, 6054 18 Ave. N. E., Seattle, Wash., writes: "N.P.R.R. is notifying all its superintendents that it will expect them in case of wire failure to attempt to get in touch with amateur radio men to keep traffic moving. Test messages will be sent from various places along the line from time to time—a chance to try out the emergency system and boost your traffic total!" W7AW will be pleased to hear from anyone with suggestions to offer on this organization plan.

### 'PHONE MEN ATTENTION!

Amateurs observed by the Radio Division (or reported to the Division and investigated) operating on the frequencies assigned to amateurs for unlimited 'phone operation, *without first having obtained proper authority*, are likely as a result of such violation of the regulations to have their operator's licenses suspended, according to a letter just received from a U. S. Supervisor of Radio. See page 21, March 1932 *QST*, for information on the 'phone operator's examination for "unlimited" amateur 'phone operation, required for 3900-4000-kc. and 14,150-14,250-kc. 'phone work. As mentioned editorially in May 1932 *QST*, this examination is no longer given by mail, but requires a personal appearance before an examining officer.

### Traffic Briefs

Henry Lee Carter, Jr., W8FTB, Rochester, N. Y., age ten years, is believed to be the youngest holder of an Official Relay Station appointment.

W9ZT quotes from an advertisement for a short wave receiver: "The Bud Police Thriller enables you to tune in on short wave reception; it enables you to hear Police Calls, Riots, Fights and Amateur Stations . . ." W9ZT says, "I have heard some rotten notes but I didn't know they were that bad. Hi."

And W6BHP tells of the BCL who wanted to know why all the hams have ladders going up to their aerials!

Here's some interesting first-hand dope from Alberto Ravelo, CM8BY, regarding his work in establishing the first radio communication following the earthquake, which destroyed Santiago de Cuba in early February, 1932:

He writes: "About 1:12 a.m. on the 3rd of February, everything began to move, the walls, floor, doors and windows opened with such terrific force that we were almost thrown out of our beds. There were twelve seconds that seemed as years. As a result of this quake our home is almost completely wrecked. At six o'clock the same morning I went to my radio room and took out my code transmitter and a portable receiver. This was done in less than a minute—the quakes were repeating frequently, and, when you have a tall brick wall looking at you with a bad face, you must have pep! Hi. All apparatus was put on a little table in the open air at the back of our garden. The antenna was pulled out of the radio shack and connected to the emergency rig. My first CQ raised CM8YB, the Naval Station at Guantánamo Bay, who informed us that two destroyers were coming to Santiago from that base with first aid. Also, HE7C, Port Prince was worked, and HI7X. At 3:00 p.m. Havana was contacted—CM2SV and CM2OP—and messages were sent to our relatives there. The following day at 2:15 p.m. we hooked up with K5AB at France Field, Panama, who offered to help us. The first radio signals to go on the air from Santiago de Cuba after this terrible earthquake were amateur signals, those from my station. The government and commercial stations were not on the air until late afternoon."

## Beginner-Advice From a Real Old-Timer (An Open Letter)

The 22nd

Dear Claudius:

You old punkin do you think I am going to write two or three letters all the time to get an answer? Glad you are going to get your station started soon. No, I do not suppose I will be any better than you, maybe not so good. I haven't anyone to practise with so am just picking it up on the commercials and the hams that I find around loose.

Say, for gosh sakes when you get to hamin' right do not make the mistake that 7 out of 10 make in the beginning. I suppose you have read pro and con in the *QST* and others about lids and fellows trying to send before they learn the alphabet. It isn't that they do not know the alphabet but entirely the way they send.

What I mean is this; they start off slowly and smooth enough making a few words, then they come to a couple or three that are very common and they have them down pat, and they will jam them all together. It doesn't make any difference how practised the receiving ear is he sets his receiving ability at the rate the operator is sending, and if he jams something out of tune he is stuck for a second; maybe he'll be all straightened out in two seconds, but minus a word and that will make an old operator madder than a hornet, hence the beeping.

Whatever pace you start, if it is only 5 or 6 words a minute, keep it up; that is, do not jam the easy letters together and space the more or less unfamiliar ones. Of course no one objects to raising the speed if it is done smoothly and everything is spaced in proportion. I caught one some time back, I do not know what call as I dropped in in the middle of the *QSO* or somewhere along the line. Evidently it was a very new beginner; this is the way it came in: "to make a s k ed with you and will lyou send a card on this I have so mefiat ha ven t I Hi."

Unless the other guy wanted practise pretty bad I doubt if he got his sked. Hi. Keep the proportional space and if you have to catch your breath, do so between words. If you do these little tricks you will not have trouble in mixing in the general rag chewing. Of course there are some that stick up their noses and throw out their chests at slow sending, or in other words at any beginner. They are the same guys who in ordinary conversation use the pronoun "I" rather more than is necessary. Thank goodness you find them in like proportion.

Well this has turned out to be something of a lecture and I guess I had better quit. Yes, I got the handbook; thanks. Come again and tell me all about it.

—Doc.

# Relative Traffic Standings

(APRIL-MAY)

Messages Per Station (25%)	Stations Reporting Traffic (25%)	Gain or Loss (Traffic Reports) (25%)	Traffic Total (25%)	Standing Based on Average of All Four Ratings %	Leading Section in Division
Atl. 99.9	Gen. 302	Pac. † (+31)	+18	Gen. 19166	Central 82.1
Dak. 72.6	Pac. 213	Roa. †	+11	Atl. 13489	Atlantic 80.3
Mid. 68.4	Atl. 135	R. Mt. † (+15)	+4	Pac. 12496	Pacific 80.3*
W. G. 64.	N. E. 133	N. E.	u	N. E. 8169	New England 75.1
Gen. 63.4	Roa. 102	Hud.	- 1	Mid. 5688	Hudson 64.3
N. E. 61.4	Hud. 87	Delt. † (+11)	- 2	Hud. 5328	Roanoke 59.0
Hud. 61.2	N. W. 84	Gen.	- 3	N. W. 5091	Midwest 53.7
N. W. 60.6	Mid. 83	Can.	- 8	Dak. 4652	Dakota 53.7
Pac. 58.6	Dak. 64	Atl.	- 9	Roa. 4557	Northwestern 46.5
Delt. 54.5	W. G. 59	W. G. † (+1)	-14	W. G. 3777	West Gulf 46.5
Roa. 44.6	Can. 57	Dak.	-15	Can. 2048	Delta 33.9
Can. 35.9	S. E. 54	N. W.	-16	Delt. 1692	Canada 32.1
R. Mt. 23.	Delt. 31	S. E.	-17	S. E. 1126	Rocky Mt. 28.5
S. E. 20.8	R. Mt. 27	Mid.	-43	R. Mt. 623	Southeastern 14.2

## THE TEN HIGHEST SECTIONS

S. C. M.

M.-D.-D.C. 291.5	Mich. 111	Los Ang. 105	+36	Mich. 6915	Los Angeles 65.	Nahmens, W6HT
P. I. 213.7	Los Ang. 105	Conn. 62	+12	M.-D.-D.C. 5539	Ohio 55.	Tummonds, W8BAH
Ark. 110.3	Ill. 62	Ohio 60	+7	Ohio 4763	Michigan 50.	Stenspergen, W8DMS
Ariz. 105.6	Va. 60	Alaska 59	+6	Los Ang. 3934	Md.-Del.-D.C. 47.5	Ginsberg, W3NY
Mo. 105.4	Ohio 59	N.Y.C.-L.I. 47	+5	Ill. 3754	Connecticut 37.5	Ellis, W1CT1
N. Mex. 102.8	W. N. Y. 47	N. Mex. 46	+5	W. N. Y. 3333	Illinois 35.	Hinds, W9APY
No. Dak. 101.9	Conn. 46	N. C. 39	+4	Va. 3169	Virginia 30.	Eubank, W3AAJ
S. F. 100.2	Wash. 39	N. C. 34	+4	So. Minn. 2722	West. N. Y. 25.	Farrell, W8DSP
Alaska 96.7	N.Y.C.-L.I. 34	W. Va. 30	+4	Conn. 2603	New Mexico 22.5	Quinn, W5AUW
So. Minn. 90.7	So. Minn. 30	Va. 30	+3	E. Mass. 2568	Alaska 22.5	Fox, K7PQ



LOS ANGELES makes a come-back and carries the Banner this month for the first time since 1930! Every one will recall Los Angeles' performance when she carried the banner month after month a couple of years ago. Watch out, you other Sections, L. A. is at it again! The four "rating" columns are headed as follows: "MPS" by Md.-Del.-D.C.; "Number Traffic Reporting Stations" by Michigan; "Gain or Loss in Traffic Reports" by Los Angeles; and "Traffic Total" by Michigan. Attention is called to the fact that both Michigan and Los Angeles have over 100 stations reporting traffic. #2.

During the traffic reporting month April 16th-May 15th, 1431 stations originated 19,660; delivered 15,787; relayed 52,455; total 87,902 (80.4% del.) (61.4 m.p.s.).

## Invitation

All live amateurs: If you do not already do so, start sending your reports (DX, traffic, phone, r.c.c., experimenting, etc.) to your S.C.M., address given on page 5, on the 16th of each month for the preceding thirty days' work. Get your report in QST. Make and keep your Section a leader by regular reporting!

## Traffic Briefs

The following is quoted from a letter from W3GS: "To overcome the skip difficulty on local schedule with W3ZF I put a type '10 on the 1750-kc. band. That sure is a fine band. My second QSO was with W9BJA in Missouri, and he gave me R6. I hear 'phones as far west as Colorado, Nebraska and Kansas with good volume every night. And the best of it is there is no QRM! If I were a 'phone man, I'd be glad to work on the 1750-kc. band. That would solve the QRM problem and I'd be well satisfied."

Here are some "miles per watt" records for you low-power enthusiasts to think over: W2AIS worked VK3NQ on 14 mc. while the latter was using "5 watts input to an '01A." The distance was approximately 10,400 miles, or about 2080 m.p.w. W2AIS was also QSO G5QY on 14 mc., the latter using 2½ watts input. The m.p.w. for this one are about 1440.

\* No report was received from the Hawaiian Section this month.

† The "Gain or Loss" standings for the Divisions containing the San Diego, Colorado, Louisiana and Oklahoma Sections are determined by comparison with the February-March figures since no traffic reports were received last month from the SCMs of those Sections. Actual "gain or loss" figures from March-April are given parenthetically and are used in computing the "gain or loss" for the whole field organization.

## Official Broadcasting Stations

(CHANGES AND ADDITIONS)

Local Standard Time

W1BZI	3893 kc. Wed., Sat., 7:15 p.m.
W3NY	3845 kc. (app.) Sat., 7:30 p.m. and such other times as will be open.
W5AUC	3518 kc. (c.c.) Daily except Sat. and Sun., 10:00 p.m.
	7036 kc. (c.c.) Daily except Sat. and Sun., 7:00 p.m.
W6CVZ	7062 kc. Daily except Sat. and Sun., 7:30 p.m.; Sat. and Sun., 6:00 p.m.
	14124 kc. Daily except Sun., 4:30 p.m.
W8GPS	3750 kc. Daily, 8:45 p.m.
W9DGE	3750 kc. Mon., Wed., Fri., 7:00 p.m.

From a Waterbury (Connecticut) newspaper: "The decibel, we are told, is a unit of sound, and there is a cat in the neighborhood of our back fence that can yodel up to 10,000,000 decibels." W1HD says he'd like to get hold of that marvelous beast and hook him in the antenna circuit of his 56-mc. receiver!

W4UX reports a QSO on March 18th with FNFH, S.S. Djebel Dira, docked at Oran, Algeria. Mailing address for QSLs is Compagnie Mixte, Nr. 1 La Canebiere, Marseilles, France. For those who want to try a QSO, W4UX says FNFH may be found quite regularly on about 6970 kc.

Another marital knot has been tied, this time with "Felix" Johnson, W5LS, author of numerous QST fiction stories and operator of "FX" in South America, as the lucky man. W5NW says "Felix" is working on an article covering the exploits of "FX" and "PK5NW."

## Traffic Briefs

A rather unique record is claimed by Dr. E. A. Cyriax, 219 East 71st Street, New York, who within a few months will have had an amateur station with the call "2DI" at one location for twenty years. How many old-timers can boast of a similar record?

W6BAX, Ormsby Taylor, has for the second consecutive year been awarded the Wouff Hong Trophy of the Modesto (California) Amateur Radio Club. This trophy is awarded each year to the best all-round amateur station in the sixth district. The award is based on DX in miles per watt, traffic handling, operating ability, and amount of home-made apparatus. The trophy will remain in W6BAX' shack throughout 1932, after which it will again be awarded to the next to qualify. The M.A.R.C. invites all sixth district amateurs to compete for this novel trophy.

Postcard albums is the latest suggestion for a means to keep QSL cards in convenient, orderly form. The real QSL hounds might even start an album for each district, each continent, each country, or use any other system which appeals to them.

Walter G. Darrall, RM2C, U.S.N.R., W8CPE, Springdale, Pa., is winner of the "Navnet Trophy," a silver cup awarded the highest scorer in a contest conducted by W. B. Martin, U.S.N.R., W3QV. The contest lasted six months, and the award was made on the basis of the greatest number of contacts made during that period, all contacts taking place on the second Friday of each month. The second prize, which went to the contestant making the greatest number of contacts on any one day, also went to W8CPE.

David Scholes, Secretary of the Victoria Short Wave Club, writes that a gold-mining expedition is leaving shortly for Northern British Columbia. They are taking an amateur station with them and will use the call VE5DZ. A tentative schedule has been arranged with VE5CB. Other general amateur contacts are requested. Watch for VE5DZ daily on the 7000-ke. band between 1200 and 1300 P.S.T. QSLs should be sent to VE5CB, 2704 Belmont Ave., Victoria, B. C.

**SPECIAL TO FLORIDA HAMS:** W4AEA suggests the use of the following abbreviations for corresponding cities in order to save time, effort and current when mentioning these cities. They will be found especially valuable in sending "directional CQs," giving QRAs, etc.: AP, Apalachicola; BA, Bartow; BR, Bradentown; CL, Clearwater; Co, Cocoa; DB, Daytona Beach; DL, Deland; FL, Fort Lauderdale; FM, Fort Myers; GA, Gainesville; JAX, Jacksonville; KW, Key West; LA, Lakeland; LW, Lake Worth; MM, Miami; NS, New Smyrna; OR, Orlando; PB, Palm Beach; PE, Pensacola; PC, Plant City; SD, Sanford; SA, St. Augustine; SO, Sarasota; SP, St. Petersburg; TE, Tallahassee; TA, Tampa; WPB, West Palm Beach. Pin up this list in front of your operating table, and make use of W4AEA's suggestion.

WIASF recently worked his 37th country, Siberia. Who can beat his record for number of countries worked?

Ask for only "WA . . . K" instead of the usual line of "Dah-dee-dah-dee-dah R R all OK except please fill from . . . to . . . rest all OK OM Hw?" Originating stations: Put a check on your messages as a courtesy to the other operator, who often has a limited time before another schedule. It enables him to know AT ONCE if the message he copied agrees with the one on file at the other end. Cutting out all unnecessary transmission from YOUR station during the peak operating hours will make operating more enjoyable for everyone and will help your station to become known as "well operated." Speed up traffic, gang!

— Art Bates, W9FO

VE3JW says, "A frequency check a day keeps the R.I. away!"

Remember the movies "Trader Horn" and "White Shadows," the photographing of which was supervised by Clyde DeVinna, "DA" of W6OJ? Well, DeVinna has again

## BRASS POUNDERS' LEAGUE

Call	Orig.	Del.	Ret.	Total
W3CXCL	424	279	1780	2483
W3ASO	229	109	1093	1431
KA1HR	365	266	730	1361
W1VS	94	112	876	1082
W6ALU	197	466	398	1061
W7BB	217	335	490	1042
W5ALD	42	5	852	899
W3AGH	31	23	804	858
W9YB	419	158	291	778
W9FGD	5	5	746	756
W8PP	34	43	676	753
W5YG	710	—	—	710
W6BMI	96	65	540	701
W3BWT	118	154	386	658
W6PQ	291	96	266	653
W5DGS	38	52	544	634
W8PQ	7	12	614	634
W8DDS	90	107	432	629
W9EPJ	149	96	370	615
W8BAH	239	124	223	591
W9EYG	142	122	324	588
W1GTD	31	48	482	561
W8BZZ	20	22	496	538
W8BYD	200	64	273	537
W3MC	69	90	370	529
VE3GT	66	81	380	527
W8EMW	68	122	336	526
W8BN	30	85	410	525
W8GB	269	13	232	415
W9FUT	44	30	435	509
W5AOD	12	4	492	508
W9FLG	149	37	321	547
W6NF	204	179	64	447
W2ADQ	167	270	—	437
W9NP	39	310	80	429
W1BDI	106	138	146	390
W9VS	101	130	151	382
W8AXV	48	165	162	375
W8AAJ	40	112	195	347
W9CX	54	138	140	332
W2WP	52	118	125	295
W9GBP	117	144	18	279
W8AJE	15	109	138	262
W9GUZ	112	137	6	255
W8ZG	30	135	10	225
W9CUE	80	108	30	218
W6AMM	78	138	—	216
W7ASQ	80	109	21	210
W7AAT	64	122	10	196
W6YAU	20	113	4	137

Month of April 16-May 15. Note the stations responsible for above one hundred deliveries. Deliveries count!

A total of 500 or more *bona fide* messages handled and counted in accordance with A.R.L. practice, or just 100 or more deliveries will put you in line for a place in the B.P.L. Why not make more schedules with the reliable stations you hear and take steps to handle the traffic that will qualify you for B.P.L. membership also?

left on a filming trip, this time to northern Alaska, where he will be engaged for a year in photographing "Eskimo." Watch for K7UT, which call "DA" will use "way up north" on about 7300 kc. with crystal, 500 cycle supply.

W2DPU received a message addressed to W1CIG, Watertown, Conn. Utilizing the directional CQ for good relaying he called "CQ Conn." Then the impossible (it would be for most of us) happened — W1CIG himself answered the CQ! This probably won't happen again in a hundred years, or, will it?

Section Manager Limer, KA1SL, has coined a new word "HAM-O-GRAM" (meaning, of course, amateur radiogram). Like it? He is using it on new message forms he is having printed up.

Operator "TG" of W8YA tells of receiving a QSL card on which was the following notation: "Hope we can chat sometime when no QRN and I don't have to study. 73. . . P.S.: Please to not QSL, as my wife will know that I was not studying if I get QSL." Hi.

Looking back. W7IG sends a clipping from the "25 Years Ago" column in his local paper. It reads, "Count Arco of Berlin, in his wireless telephone experiment, has succeeded in obtaining distinct exchanges of words in a tolerably natural tone at a distance of two miles, by using poles 80 feet high." Now, by careful calculation, W7IG figures that he ought to get about five miles with his two 80-footers!

## Traffic Briefs

### RADIO PENTATHLON

On March 15th the San Francisco Playground Commission and the Palama Settlement Boys' Club of Honolulu conducted a "Radio Pentathlon" via amateur radio. The athletic events were high jump, broad jump, hop-step-jump, pull-up on horizontal bar and basketball shooting. The competition was held simultaneously, i.e., 7:00 p.m. Honolulu time and 9:30 p.m. P.S.T. The results were transmitted to and from San Francisco and Honolulu as they were completed. At Honolulu K6CIB, K6EM, K6COG, K6ARB, W6AIU and K6CCS were on the relay. At San Francisco W6BAX, W6BVL, W6ADA, W6NK and W6NU handled the coast schedule. W6NU was installed at the gymnasium to act as a "central transmitter" for the San Francisco stations. Results were sent via W6NU to the local stations and from there relayed to the K6's. W6BAX scheduled K6COG at 10:30 p.m. P.S.T. and succeeded in handling the messages despite poor conditions. At midnight all the results were transmitted and both cities were informed of the outcome of the competition. The Honolulu boys defeated the San Francisco champions 243-142 points. The events were coded in double alphabet and the numbers in single alphabet to facilitate transmission. One hundred and fifty sets of messages averaging seven letters per message were handled by W6BAX and K6COG in two hours. Had the results of the competition been forwarded by mail it would have taken six days; by the use of amateur radio, the results were known the same night and Honolulu and San Francisco newspapers carried the story the following day.

The Miami Amateur Radio Club announces the results of its "All States QSO Contest." W4BT was winner of the first prize — a silver loving cup, and if you think it's easy to work 45 states in three months, try it some time. W4KK made second place by working 39 states, and won a special copy of the Handbook, autographed by the A.R.R.L. HQs staff. An interesting sidelight is that W4BT, this year's first prize winner, was winner of second prize last year. Awards were made at the M.A.R.C. annual banquet. About thirty were present at the banquet, and everyone had a thoroughly enjoyable time.

Drop a word of cheer to W9BUN, who will be confined in the hospital for a long period of time, because of an unfortunate accident. While at work he fell 25 feet, fractured his back in three places and broke his right leg. He will be unable to pursue his hobby of amateur radio, and W9HTF suggests that it would cheer W9BUN and help him pass away the long hours if some of the gang would send him a QSL, letter or message expressing their sympathy and hopes for a quick recovery. Address Henry Pribbenow, Care of Wichita Hospital, Wichita, Kansas.

W9IQK gives, as an example of that "old Kentucky hospitality," the fact that there is a town in Kentucky named "Eighty Eight."

## DIVISIONAL REPORTS

### ATLANTIC DIVISION

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Harry Ginsburg, W3NY — These non-ORS reported: W3HT, W3ADO, W3JK, W3AFF, W3CDG, W3AMI, W3AJX, W3BVL, W3BCS, W3WN, W3AHT, W3AVD, W3CJS. The Baltimore 56-mc. gang are negotiating to use the roof of our tallest building for a real 56-mc. test. Write W3DG for particulars. The Frederick Amateur Radio Assn. are putting a three-band 'phone and C. W. station atop the mountains west of Frederick. W3CGO will be at Mount Lake Park the week July 18th-25th, and wants the Baltimore and Washington gang to look for him on 3550 kc. for traffic. The RMs and SCM send out the Official Broadcast every Saturday at 7:30 p.m. EST. Maryland: W3AOO and W3NY tied to lead the Maryland gang. W3AHT wants a Baltimore Hamfest. W3LA scored about

5000 points in recent ORS contest. W3ADO is handling traffic for Oceanographer WTEP, on the Chesapeake Bay. W3JK will continue to help with traffic. W3BGI is changing to Series Feed TNT. W3BVL is rebuilding his receiver. W3ZD is putting 500 watts into a pair of '60s. W3CJS has YL QRM. W3AFF goes on once in a while. W3AJX is doing lots of QSYing. W3BKC is using crystal on 3525 kc. W3CDG pulled down the 'phone rig. W3AVD is off due to expiration of license. W3AHT is using crystal MOPA. W3BCL is QRL with work. W3WN got his first European QSL. W3AMI promises his shack will be the best in the Section. W3SN is having trouble getting started. District of Columbia: W3CXL certainly ran up a stack to lead our Section. W3ASO has rebuilt to use any band, and any of seven crystals. W3BWT is now running 51 fifteen minute schedules weekly. W3NR is still very busy with work. W3CDQ is working hard on Convention plans. Delaware: W3BAK is certainly sticking to his schedules to keep traffic moving.

Traffic: W3CXL 2483, W3BWT 658, W3ASO 1431, W3NY 241, W3AOO 241, W3HT 140, W3LA 77, W3BAK 53, W3ADO 62, W3JK 61, W3BGI 18, W3BVL 15, W3ZD 14, W3CJS 13, W3AFF 12, W3AJX 9, W3BKC 5, W3CDG 4, W3NR 2.

EASTERN PENNSYLVANIA — SCM, Jack Wagenseller, W3GS-W3BF — W3MC is about three laps ahead of everybody else. We send our delayed sympathies to our old friend W3OK, whose father passed away. W3BEY runs up a nice total with good schedules. W8CVS is certainly stepping out. W8FCB keeps 21 schedules a week. W3AED is at a new QRA. W3AKB handled 40% Army traffic. W3BKQ reported by radiogram. W8CFF cut his hands in three places and knocked the top off a '10 while installing glass sides on his transmitter. W8AXH joined the AARS net. W8VD reports a nice total. W3NA reports fine progress at Quaker-town Radio Club. W8CFI will be off for the summer. Look for Windes at W9EWV. W8AFV is arranging schedules for station to be located at Mt. Gretna and operated by 109th infantry. W3AAD had bad school QRM. W3EO handles all his on 14 mc. W8FLA wants to be an ORS. W3MG chewed the rag 98%. W3AIP had '66itis and 56-mc. fever. W8DPQ and gang bought an old car to go to Washington Convention. W3NF has moved down to the farm. W3BOL is experimenting with telephone wire for feeders. W3BUH desires ORS. We are pleased to acknowledge first report from W8EUL. W3ANZ keeps up the fine work. W3AMR says watch his smoke after he has AC down at the Farm. W3QP expects to do more now that the opera season is over. W3BTP is on 1750 kc. 'phone. W3AQN now has a new QRA. W3BF has been forced to QRT due to 24-hour QRM from a neon sign. W8EU reported direct to HQs.

Traffic: W3MC 529, W3OK 189, W3BEY 142, W8CVS 140, W8FCB 139, W3AHD 115, W3AKB 94, W3BKQ 85, W8CFF 78, W8AXH 54, W8VD 54, W3NA 50, W8CFI 40, W8AFV 38, W3AAD 28, W3EO 27, W8FLA 20, W3MG 17, W3AIP 17, W8DPQ 16, W3NF 16, W3BOL 15, W3BUH 15, W8EUL 14, W3ANZ 13, W3AMR 6, W3QP 4, W3BTP 4, W8EU 1.

SOUTHERN NEW JERSEY — SCM, Robert Adams, 3rd, W3SM — W3ARV and W3ARN reported fine totals. W3AWV and W3ZI were also active. W3ACJ, W3BPT and W3ADL qualified for their ORS. W3ARV was appointed Route Manager for the northern half of the section. He will cooperate with W3QL in assisting members to obtain schedules, etc. W3SY is getting out well. W3BPD is having trouble with his crystal. W3AEJ is heard consistently. W3BFH is keeping four good schedules. W3BEI is rebuilding his transmitter. W3QN and W3BSX are both working for their ORS. W3SM has actually had the same transmitter for a period of sixty days. W3ASG is in charge of Army Amateur work in the state. South Jersey Radio Association will now meet twice a month at the American Legion Hall in Audubon. The Delaware Valley Radio Association and the Cumberland County Radio Club are both active. Your SCM will donate a prize to the station handling the most traffic for the period of July 16th to August 15th. May the best man win.

Traffic: W3BQN 17, W3BSX 26, W3SY 12, W3ARN 250, W3AWV 38, W3ACJ 9, W3AEJ 30, W3ASG 19, W3ADL 16, W3ZI 23, W3ARV 222, W3BFH 16, W3BPD 8, W3SM 74, W3APN 24.

WESTERN NEW YORK — SCM, Don Farrell, W8DSP — W8DBX is changing his QRA. W9HEC is a new ham in Cobleskill. W8DES reports the following new hams in Oneida; W8GZM, W8BEX, W8FWY. W8BEN lost his antenna system in a recent fire. W8BFF says the big glider meet will be held in Elmira from July 11th to 24th and the gang there are all set for duplex 'phone on 56 mc. W8AGS reports a new call in Amsterdam, W8GBS. W8AOW has been making extensive tests on ground to plane 'phone and C.W. transmissions. W8AED and W8FXX have assisted. W8DHU reports receiving conditions terrible. W8DSP is building 56 mc. transmitter and receiver. W8DQ is building 56 mc. tests with W8CMM. W8FDY, W8DGR and W8FBH are new ORS. W8ECF is a new traffic man. W8CSW is working duplex 'phone on 56 and 1.75 mc. W8EFV and Tom Jarvis are W8CSW assistant ops. W8CPC has a new 3500-ke. 'phone. W8DEQ has some nice traffic. W8DME is QRL with Naval Reserve. W8DXF is off for the summer. W8FFL is rebuilding. W8BWW, W8EWE, W8BHK and W8CJJ are QRL business. W8EUY has his new c.c. push-pull job on the air. W8DHQ built a new super-regenerative receiver. W8DQP is busy with Drum Corp and Army Amateur work. W8AHK has a bunch of schedules. W8FOL is building a new a.c. receiver. W8DEJ made a trip to Watertown. W8FTB reports weather conditions bad. W8BGN has new c.c. 14 mc. 'phone. W8BLP works his regular amount of DX. W8BR is busy with his rifle club. W8BLH, W8JE and W8AFM are rebuilding. W8AYM is moving to Atlanta, N. Y. W8AFY has a commercial op's job on a yacht. The Western New York Section Convention will be held in Syracuse on September 10th and 11th. Plan to come and bring your friends. Attend the New York State Fair at the same time! W8EMW makes the BPL. W8EAC handles a lot of traffic. W8CSE is on the air at Tully. W8GYV is the SCM's new portable call. W8AOW sent out 34 off-frequency notifications. W8AON reports the first time from Binghamton. W8AOR can't get his 7-mc. zepp perking. W8DMJ took a vacation trip to Va. and Washington, D. C. W8AWX wants ORS. W8JV has a new push-pull MOPA. W8AWM reports that the Jamestown club will have a treasure hunt in the near future. W8FME has a portable call, "W8ZZAD." W8AKX is going to CMTC at Plattsburg. W8FOY has new 56-mc. transmitter and receiver. W8CIL is trying out new beam antenna. W8GJ reports for the first time. W8BQV will operate W8ZZV during the summer. W8FYF will handle all traffic for Hamilton. W8GYQ is using a type '10. Allen L. Stratton reports that the north-country gang had an FB hamfest in Potsdam on May 3rd. W8FXC wonders why there is no dope in QST about the gang in the southern part of the state. Well, OM, if no one reports the SCM doesn't know about it and can't put it in. W8BKZ is working for commercial license. W8BOC is using a type '10. W8CGW is rebuilding for 1750 kc. 'phone. W8DHO is on 1750 kc. 'phone. W8BQX has a wicked wallop. W8LM has a new MOPA. New hams in Binghamton are W8GPV, W8FXC, W8GIE, W8GFM and W8CVB. W8EWT will operate at W8BDO during the summer. W8ARX is back handling traffic. All men who are interested in traffic handling, please write your SCM at once regarding ORS appointment.

Traffic: W8DBX 331, W8DSS 214, W8BEN 147, W8BFF 146, W8AAGS 129, W8AOW 128, W8AED 101, W8DHU 97, W8DES 78, W8DSP 65, W8QL 54, W8FDY 45, W8ECF 42, W8CSW 38, W8CPC 32, W8DEQ 32, W8DME 30, W8DXF 30, W8FFL 27, W8BWW 25, W8EUY 24, W8DHQ 19, W8DQP 18, W8AHK 17, W8DGR 17, W8FOL 17, W8DEJ 11, W8FTB 10, W8BGN 12, W8CJJ 6, W8BLP 6, W8FBH 3, W8EMW 526, W8EAC 214, W8JE 160, W8CSE 44, W8GYV 44, W8AON 33, W8AOR 18, W8DMJ 15, W8AWX 10, W8JV 5, W8AWM 5, W8EWE 5, W8FME 4, W8AKX 5, W8EWT 294.

WESTERN PENNSYLVANIA — SCM, R. M. Lloyd, W8CFR — W8YA was on the air to open up its Western Pennsylvania Rag-Chew Contest. W8AJE reports W8GII and W8GUX are new hams. W8DLG is started up again. W8DKL is building a new receiver. W8CUG and W8DXI had plenty of fun in the rag-chew contest. W8KD advises exams will keep his total down. W8EDG blew up his power supply. W8DZP asks what to do when your schedules forget

they're schedules. W8ELZ has a push-pull TNT on 3.5 mc. W8CQA reports that the Warren Amateur Traffic Association is building a club station. W8FKU is getting out fine. W8BUC is rebuilding for crystal. W8WQ turned in his first report. Two new stations, W8CGF and W8GEM, are reported by W8APH. W8DRO complains that traffic is scarce. W8CMP, our Director, says when the 'phones changed hands, no one seemed certain of their frequency! W8CRK reports his crystal is jumping from one to another frequency. W8CTE tells of fifteen stations in Johnstown who are on CW now. W8AVY may go to the Central Division Convention in September. W8VI is going again from a new location with W8DOQ and W8AGG as ops — this from W8DVZ. W8CB expects to be on soon. W8AGG has a portable call, W8ZZAI. W8DYV and W8ETK keep a daily schedule. W8AGO reports after a few months' absence. W8AZG is back in town. W8CEO can work on 1.75, 3.5, and 14 mc. W8ECH is putting in crystal. W8FFR and W8CAF are working on 7 mc. W8BFZ is putting in a new rectifier. W8GNH is a new station in Pittsburgh. W8GI blew up a '68. W8DLI and W8AAQ reported via radio. W8CFR finally got his new pole ready.

Traffic: W8YA 390, W8AJE 262, W8DLG 200, W8DKL 191, W8CUG 152, W8KD 130, W8EDG 120, W8DZP 89, W8ELZ 55, W8DXI 53, W8CQA 51, W8FKU 40, W8WQ 34, W8APH 19, W8DRO 19, W8CMP 11, W8CRK 11, W8CTE 11, W8AVY 8, W8GI 8, W8DLI 6, W8DVZ 6, W8DYV 5, W8AGO 2, W8AZG 2.

#### CENTRAL DIVISION

KENTUCKY — SCM, J. B. Wathen, III, W9BAZ — W9BWJ is again high man. BAZ wishes his YL could shimmy like his car does. W9OX is building new speech amplifier. W9EDQ reports a junior op. W9JL is keeping schedules. W9AUH took active part with ORS Contest. W9BAN — get reports from Western Ky. if you have to dynamite. W9CIM rebuilt transmitter. W9HAX is putting in '03As pushpull on 1750 kc. W9ICE chipped off another report. W9DMN gives complete dope on Glasgow gang. W9CRJ handled important Derby message of Assoc. Px. W9CNE will be off the air awhile. W9CDA is building a new monitor. W9CEK will report regularly. W9ESQ advises W9BRQ is leaving for Gulf Radio School. W9ENA has YL QRM. W9ABV will soon have better totals. W9BOZ has the ole ambush. W9ERH is still busy working for Uncle Sam. W9FZV must be scared of traffic. W9IQM adds his help. W9GJZ has '10 push-pull on 7 mc. W9FKM wants to know — "Why is it, when he CQs on 3.5, he gets replies on 14 mc.?" W9IXL came back from Atlanta with Amateur First, unlimited 'phone, and B.C. licenses. W9HCO is sporting a new mike. W9EDV and W9HCD have unlimited 'phone tags. 56 mc. holds W9GON's interest. We hope W9JDS stays with us awhile longer. How many of you are going to the Central Division Convention? W9AQV dropped in on the SCM. W9ETT promises to visit Louisville hams. W9DGN is using couple '10s. W9HNV put in a 50 watt in last stage. W9IQK has new AC receiver. W9EPI is heard regularly. W9JBI is new one in Madisonville. W9EQO and W9QT are in new QRAs. Zimmie says the OW has operators license but no call. W9BBO will be on soon.

Traffic: W9BWJ 285, W9BAZ 160, W9OX 105, W9EDQ 102, W9JL 83, W9AUH 61, W9BAN 58, W9CIM 44, W9HAX 26, W9ICE 20, W9DMN 15, W9CRJ 13, W9CNE 12, W9CDA 8, W9HCO 8, W9CEK 6, W9ESQ 6, W9ABV 4, W9BOZ 3, W9ERH 3, W9FZV 3, W9IQM 3, W9GJZ 2. WISCONSIN — SCM, C. N. Crapo, W9VD — W9FSS leads again. W9FDI works on 3547 CW and 3944 kc. 'phone. W9DKA is busy in garden. W9DXV is on 3588 and 7176 kc. W9ZY-AZN has trouble working Milwaukee after 7 p.m. W9AKY has daily schedule with Canal Zone. W9HSV applies for ORS. W9EYX will be on from W9ITM for the summer. W9BXZ is using MOPA. W9GFL finds it necessary to resign as RM, ORS and OBS. W9GVL is working on 56 mc. and 1750-ke. 'phone. W9FAV reports via radio. W9FAF blew power supply on crystal oscillator. W9HTZ is experimenting with super-regenerative monitor. W9EOX reports series grid feed to amplifier works FB. W9HMS made score of 500 in ORS QSO Party. W9CJU says quality of 'phones rapidly improving. W9RH has new

crystal job on 14 and 7 mc. W9SO will install crystal on 7 and 3.5 mc. W9DXI reports good results on 3.5 mc. 'phone. W9FAW is still hunting DX. W9IQW tried 7000 kc. W9IUUZ is operated by W9AUX at Sheboygan High School. W9DNU is teaching school at Dubuque. W9ESZ cancelled all schedules. W9AQU sends first report. W9ATO is on 3503-kc. crystal. W9FLX is installing crystal. W9AVG is gradually getting over the Milwaukee QSO Party. W9DJQ is on regularly. W9BFM is a fireman. W9GGI received renewal of station license. W9ELQ is new station at Kenosha. W9IQB keeps schedule with brother at Reedsburg. W9JEW and W9HDP are on 7000 kc. W9IEA has '45s on 7000 kc. W9HFL has new zepp. W9BIB wasn't quite so noisy at QSO party this year. W9DUX rebuilt power supply. W9ASQ is rebuilding transmitter. W9ERV is rebuilding to crystal. W9FII is off the air. W9DPR is again getting the bug. W9VD has been busy painting his house. Remember the Convention coming in Cleveland!

Traffic: W9FSS 345, W9FDI 148, W9DKA 114, W9DXV 86, W9ZY-AZN 58, W9HSV 50, W9EYX-ITM 33, W9BXZ 38, W9GVL 22, W9FAV 19, W9FAF 21, W9HTZ 18, W9EOX 17, W9HMS 17, W9CJU 15, W9AKY 12, W9RH 12, W9SO 10, W9DXI 9, W9FAW 8, W9IQW 7, W9AUX 6, W9DNU 3, W9ESZ 3, W9AQU 3, W9IUZ 2, W9AVG 1, W9ATO 1, W9VD 12.

INDIANA — SCM, George Graue, W9BKJ — W9YB leads in traffic — and what a total! FB. W9FUT also makes the BPL. W9FAK has "CL." W9EGE reports tough sailing on 7 mc. W9DHL won't be on much this summer. W9EXL reports 56-mc. tests almost a reality. W9TE will take on a better half in June. W9GGJ is still active. W9EPT works Vks. W9GYB installs '66s. W9IOB is a new ham in Richmond. W9HPQ has applied for ORS. W9CHA is the new RM for southern Ind. W9CKB has changed to crystal. W9AKJ's dynatron went haywire. W9AEB has a 211 in final stage. W9ELU will do some testing on 56 mc. W9HDS reports for the first time. W9BOS resigns as ORS. W9FKI's antenna blew down. W9HUO is building an AC receiver for 56 mc. W9IQU is a new station in Frankfort. W9BXT is rebuilding. W9FQ expects to have new rig completed by July. W9ABW has hopes of getting back soon. W9FYB received renewal. W9QG will operate the home rig. W9CKG, for the summer. W9HHI wants to meet all hams of the National Guard when at Camp Knox this summer. W9AGG says DX FB on low power. The Indianapolis Club has several outings planned for the summer. The Ft. Wayne Club will send a delegate to the Central Division Convention at Cleveland in Sept.

Traffic: W9YB 778, W9FUT 509, W9FAK 204, W9EGE 19, W9DKJ 17, W9EXL 14, W9AXH 12, W9TE 9, W9GGJ 8, W9EPT 7, W9GYB 6, W9HPQ 6, W9CHA 6, W9CKB 5, W9AKJ 4, W9HIU 3, W9BOS 2, W9AEB 1.

ILLINOIS — SCM, F. J. Hinds, W9APY — RM, E. A. Hubbell, W9ERU — 56 mc. seems to be taking the center of the stage this month with the following all "hot after it." W9AFF, W9ALA, W9CLM, W9SX, W9ADG, W9GYO and W9CUC. The Mercer Radio Club is doing 56 mc. experimenting. They call W9HQH the "Chicago Owl" in Texas as he is reported to be the most consistent station in the AM down there. W9DF is working on his MOPA. W9BSA is looking for a power supply. W9FDN has gotten away from the creeps with a new MOPA. W9FOD is hitting the "6s" and Hawaiian fellows with a rubber crystal. W9HSG is now an ORS. The new '01A is getting down to business at W9IEP. Low power at W9AAR. W9ACU is proud possessor of an unlimited 'phone ticket. W9IXF says — way back in 1923 he was 9AFQ. W9ILY is becoming traffic minded. W9FGN likes his new ORS sheet. W9JO has rebuilt the transmitter. W9IEP is breaking BCUs into the ham game. W9DBO is one of our three-QSO boys. W9CNY has things humming. W9BON worked both coasts on 3.5-mc. 'phone. W9BTU is trying DX. W9CTP is building an '04A outfit. W9CYT's receiver fell apart. W9EZN is back again. W9AAE received three crystals and a Westinghouse 50-watt at a wedding anniversary present from the OW. W9IUF has a fine TPTG '10. W9GAI is building up a nice 'phone. W9BYZ is taking a shot at 14 mc. W9HOS is going to 1750 kc. W9BSR expects an '03A soon. W9GVX is making a 1750-kc. portable for "Forest Preserve" work this summer. W9BRX is experimenting with grid modulation on

14 mc. W9CSB says traffic is sliding along. W9VS, W9DOU and W9CGV are taking over W9IU's Trunk "A" schedules. W9IU is off for the summer. W9EMN enjoyed the ORS contest. W9HPK says schedules have gone "summer haywire." W9NN is experimenting with photo-electronic devices. W9PG is a new ham in Geneva. The crystal rig at W9RO went on the Fritz. W9KA installed the "W9GY system" of keylock filters. W9FGD did splendid traffic work in QSP from Rose Show at Terre Haute, Ind. W9JCK is a new ham in Peoria due to W9DDP's help. W9RO and W9KA are working hard to get our new friend W9IUF going. W9EAJ was hit by lightning. W9OQ is vacationing in Denver, Colo. W9EBL has been ill with appendicitis. The boys at Oregon, Ill., are planning a hamfest soon. W9FDQ received his extra first license. W9PK wishes he had been on the air when they used horse drawn buggies and street cars. W9AFN is certainly knocking down the DX. W9ERU is repairing meters. W9CUH is proud possessor of a pair of '04As. W9FCW says the license has at last arrived. A new Zepp at W9GEP. W9FRA has been experimenting with transmitters. W9HUX has been grinding crystals. W9FJB is overloading a pair of '10s. W9GFU is working on his new crystal rig. W9FDN is playing around with 1750-kc. 'phone. W9CEO is in Rochester, Minn. W9DZG says the gang around East St. Louis is working hard on the Convention. W9BTT reports a very fine hamfest held at Rock Falls on May 15th, with 35 present, including Fred Schnell.

Traffic: W9FGD 756, W9VS 382, W9CGV 306, W9BTT 296, W9AND 203, W9CKM 177, W9FO 170, W9APY 164, W9FXE 132, W9CRT 131, W9ALA 97, W9ERU 95, W9DOU 93, W9ACU 67, W9CUH 58, W9GVX 47, W9AMO 41, W9NN 34, W9CSB 35, W9DBO 33, W9CZL 30, W9HSG 30, W9GFU 29, W9FGN 24, W9AFN 24, W9HQH 18, W9CTP 17, W9FJB 16, W9JO 16, W9AD 15, W9GAI 15, W9IXF 15, W9HPK 15, W9EMN 14, W9FRA 14, W9GEP 14, W9FTX 13, W9DZG 12, W9GFY 12, W9IEP 11, W9AAR 8, W9KA 8, W9SX 8, W9BRX 6, W9BTU 6, W9WR 6, W9HNK 5, W9HUX 5, W9BSR 4, W9DPT 4, W9FI 4, W9BON 3, W9FCW 3, W9FDQ 3, W9HOS 3, W9BYZ 2, W9CNY 2, W9FDN 2, W9PK 2, W9RO 2, W9CEO 1, W9CLM 1.

MICHIGAN — SCM, Ralph J. Stephenson, W8DMS-W8GTH — Another big month with 110 traffic reports for a nice total. Eleven other stations reported, although handling no traffic. Thanks, and we surely appreciate it. W8PP heads the list again with W8PQ and W9HK following in usual order. W8FX gets another home-run to the B.P.L. on deliveries. W8COW says he will have to furnish "Tate" with a W.U. messenger uniform. W8EVC gets a 257 yard drive. W8GUC is a newcomer from Missouri. W8AAF and W8CFZ are new ORS. W8BMG has his district well organized. W8EHD surprises us all with his total. W8DA is getting the Saginaw gang pepped up. The Saginaw crowd is organizing a new club. W8DYH claims he is still an unwilling man of leisure. Here's one for Ripley: W8GFL's M.A. meter stuck. He tapped it and a spider crawled out onto the scale under the glass. Only opening in meter was a 3/4" screw hole. W8FTW and W8BJS are scheduled for ORS appointments. W8GBB and W8GVA are qualifying. How about you other traffic men? Four consecutive reports of traffic qualifies you. The D.A.R.A. "Bull" goes to every reporting station so let's hear from you whether any messages or not. W8JK was a victim of misdirected enthusiasm when someone stole his A.R.R.L. emblem from his car. W8ECN sends in Mt Clemens news. W9HK the dope from Marquette and vicinity. W9EGF the doings of the copper country crowd and W9FSK for the Escanaba hams. FB, fellows. These letters are necessary for the "Bull" which has ALL THE MICHIGAN NEWS. W8RF ruined six tubes and two M.A. Meters playing with 56 mc. Lightning wrecked W8CEU. The "Bull" artist, W8AKN, should be a golfer; he can't add. W.M.A.R.L. at Niles staged a hamfest. Seven of the Michigan "nines" attended the Duluth hamfest. W8AJG claims a 211 won't stand 4000 volts. W9EVI sends in report after three years on air. Mich. State College has enough hams for a good club. W8NR will start U.S.N.R. drill schedules immediately. QSL E. D. Glatzel, 2000 Second Blvd., Detroit for schedules. National Guard camp July 5th, and will have two hams stations. If interested in two-week vacation, QSL the SCM. Chair Warmer's Club staged another dance at

Detroit Masonic Temple, May 20th, which was well attended. The Pontiac gang have organized a club and have bought some lake front property. W8PP expects to get a club going in Monroe shortly. The flu put W8DCT off A. A. net for ten days. W8GHF just returned from his honeymoon. The Copper Country Radio Amateurs is name of new U. P. club with W9EGF President, W9ANT Y. P., W9BWU Secy. and W9GQS, Treasurer. W8CAT and W8DEH are helping "win the war" at Battle Creek and Camp Custer May 21-28.

Traffic: W8PP 753, W8PQ 634, W9HK 386, W8FX 332, W8EVC 257, W8BMG 247, W8EHD 202, W8BTK 202, W9VL 177, W8DA 165, W8QT 162, W9EGF 150, W8GBB 142, W8CUX 129, W8BIU 115, W8AZQ 113, W8BMZ 109, W8FRW 108, W8CPH 106, W8DYH 105, W8DSF 103, W8DED 102, W8AAD 95, W8CEU 88, W8DLX 86, W8CST 86, W8AKN 86, W8AYO 78, W9CE 73, W9FSK 68, W8FTV 60, W8FIY 56, W8DZ 56, W8FTW 54, W8JX 46, W8CFZ 44, W8GUC 43, W8DCT 42, W. D. Stewart 42, W9DAB 41, W8ECN 39, W8DM 35, W8GQB 31, W8DHA 31, W9CWR 29, W9HIS 28, W8COW 25, W8EGI 25, W8CFM 25, W9GQF 24, W8GJX 24, W9HSX 24, W8BJG 23, W8BAW 22, W8DOI 21, W9GDJ 21, W8CTH 20, W8DMS 20, W8LU 19, W8ZV 17, W8ESA 15, W8WR 14, W9EVI 14, W8BXJ 14, W8AJL 13, W9FBC 13, W8ALL 11, W8VS 11, W9IEM 10, W9JH 9, W8BJT 9, W8CQS 7, W9CGR 9, W8EVQ 8, W8FXB 8, W8CSR 8, W8AJG 7, W8DEH 7, W8GP 7, W8BY 6, W9DPQ 6, W8DOS 6, W9CEX 6, W8FRI 6, W8DLT 5, W8HN 5, W8MV 5, W8SN 5, W9EEM 5, W8GZD 4, W8EYH 4, W8BTP 4, W8ARR 4, W8GWA 4, W8EYH 4, W8GHP 4, W8ATO 3, W8DU 3, W8CSX 3, W9ADV 2, W8BUH 2, W8FWT 2, W8DWB 2, W8EBQ 2, W8DFS 2, W8BWR 2, W9IAD 1, W8PQE 1.

OHIO — SCM, Harry A. Tummonds, W8BAH — Ohio reports show improvement and nine Ohioans make the BPL this month. District No. 1. RM W8DVL: We welcome the following new Cleveland reporters: W8FGC, W8GQU, W8FJX, W8GUL, W8EM, W8DQI, W8EFG, W8BGC, W8FAZ, W8FMB, W8CQF, W8AGL, W8DGV and W8GME. A real total from W8ACZ. W8FFM reports Lakewood Radio Club going strong. General Ohio RM, W8DDS, as usual leads Ohio totals. W8BYD has lots of dope on his reports. W8DVL moved across street from the SCM. W8ML reports W8GTO Secretary of the Garfield Heights Short Wave Assn. New transmitter at W8EJO. W8EYI will try for commercial ticket. W8EXA, W8CIO, W8DDS, W8AXV, W8DVL and W8BAH are on committee for Central Division A.R.R.L. Convention at Cleveland September 2nd and 3rd. W8FFM is putting in crystal. New Zepp antenna at W8EXA. W8RN is now on KFMK. W8BNC has schedule with HJIAK. W8CIIY is back again. W8EM and W8CIO are handling traffic on 56 mc. W8ENJ and W8CUW report. W8BMX is handling traffic. W8BON wants OBS. Nice schedules at W8EEW. New Zepp at W8UC. W8BFT is organizing Ham orchestra for Central Division Convention. W8CIO says 56 mc. tests successful. Spring fever at W8EBT. District No. 2. RM W8BKM: W8EJ schedules NDS. W8BKM is SNCS for AARS. District No. 3: W8ESN reports for Maumee Valley Radio Assn. at Toledo. New frequency meter at W8BTT. W8APC has lots of schedules. District No. 4. RM W8EEQ: W8OQ and W8QQ report. W8DTW is QRL on farm. New rig at W8HT. W8AFU is new reporter. School plenty tough says W8ATV. W8UW schedules W8BBH, W8EEQ, W8DTW and W8CZR. RM W8EEQ is busy on schedules. W8PO makes the BPL. District No. 5. RM W8DFR: W8LI and W8BSR report. W8CKQ sends nice report for ONG schedules. W8EXI says W8GIK is new Akron Ham. BCL QRM at W8DTV. District No. 6. RM W8BBH: RM W8DFR was QRL night work the last month. New QRA at W8ARW is 827 Spring St., Greenville. W8CNM is waiting for job on Great Lakes. W8ZG worked on ONG mine strike schedules. We welcome W8BBH as new RM of this district. His QRA is Columbus. District No. 7. RM W8VP: W8CXF and W8FA report. W8ANS has been sick. We welcome a report from W8CKX. RM W8VP is busy with schedules. District No. 8. RM W8CGS: New crystal rig at W8ENH. W8ALQ is taking Cincinnati traffic. RM W8CGS has cleared bugs in Buffer stage. District No. 9: Nice report from W8PQB.

Another new reporter is W8BPI. Members of Cleveland Amateur Traffic Assn., West Tech. Radio Club, Lakewood Radio Club, W8ACZ and W8EBT are busy on Central Division Convention programme. W8BAH makes the BPL. Last call to all ORS. Look at your ORS certificate. Has it expired? If so, better send it in at once for renewal. New reporters welcome. Send message, letter or QSL to the SCM the 16th of each month. Ohio claims the honors for having the first regular RM for 56-mc. work, W8AXV, with a transmitter and receiver in operation and schedules being arranged.

Traffic: W8DDS 629, W8BAH 591, W8BYD 537, W8AXV 375, W8CKQ 365, W8BBH 316, W8PO 277, W8EEQ 256, W8ZG 225, W8VP 112, W8DFR 134, W8BKM 91, W8BMX 76, W8EBY 70, W8UW 53, W8EXA 53, W8ACZ 49, W8CGS 45, W8APC 45, W8EXI 40, W8EQB 30, W8CNM 27, W8RN 25, W8BNC 23, W8CIIY 23, W8FGC 21, W8ENJ 21, W8ATV 19, W8FFM 17, W8EJ 16, W8BON 14, W8DVE 14, W8BSR 13, W8CUW 12, W8EEW 11, W8GQU 10, W8FJX 10, W8AFU 9, W8GUL 8, W8EM 8, W8HT 8, W8UC 8, W8ARW 7, W8CKX 7, W8DTW 7, W8BTT 7, W8BFT 7, W8DQI 6, W8EFW 5, W8ALQ 5, W8BGC 5, W8FAZ 4, W8OQ 3, W8ENH 3, W8QQ 3, W8ANS 2, W8LI 2, W8CIO 2, W8FA 2.

#### DAKOTA DIVISION

NORTH DAKOTA — SCM, Wm. A. Langer, W9DGS — W9IFW — Thanks for the support in the recent election. I will do my best to carry on the duties of the office. The FARC puts N. Dak. on the map with 62 present at their very successful First Annual Hamfest. Latest converts to CC include W9ENM, W9FPQ and W9EGL. Sorry to lose W9DFF who will eventually sign W6 —. W9IK will soon use 200 watts. W9GCB and W9HIS are active on 1750 kc. 'phone. W9HJC wins the free QSLs twice in succession. W9DHQ is winding a dynamotor. W9DXE, an old timer, is on the air at Upham. W9CRL is using a new '10. W9EVQ is new ORS. W9DYA's new QRA is McLeod. W9EGI reports that, as a result of W9EED's visit, eight U.S.N.R. recruits, including W9BVF, were enlisted. W9GNS is applying for, and W9IGR writes that his ambition is to earn an ORS ticket. W9DGS makes the BPL thanks to W9BPM's celebrating Engineers' Day. The QSL card offer for the highest 60-day traffic totals will end September 15th.

Traffic: W9DGS 634, W9HJC 235, W9IK 48, W9CRL 33, W9GNS 33, W9DFF 13, W9EVQ 8, W9IGR 7, W9DHQ 5, W9DYA 3.

SOUTH DAKOTA — Acting SCM, Stanway Gough, W9DNS — W9DKL reports that an amateur radio club has been organized at Redfield. W9IEK is a new station at Aberdeen. W9FDD is putting his '45s in push-pull circuit. Most of W9EJY's time is spent on convention details. The Sioux Falls Amateur Radio Club has discontinued their meetings for the summer. W9HZZ is leaving for the west coast. W9IQD went away on his vacation. W9CFU received a visit from W9DKI. W9BAE received his unlimited 'phone license. W9FLO is going to visit some European hams this summer. W9BLZ and W9DNS did a little unsuccessful fishing. W9HHW will be back on the air as soon as a new antenna can be erected. W9BLZ and W9ALO are planning some 56 mc. experiments. W9DKL suggests an Amateur Radio Show at the State Fair this fall. How about it, gang? Let's have your opinions.

Traffic: W9DKL 339, W9FOQ 131, W9FDD 23, W9EJV 32, W9DTZ 18, W9IEK 12, W9DNS 5, W9BLZ 4, W9HZZ 2, W9ALO 1.

SOUTHERN MINNESOTA — SCM, H. Radloff, W9AIR — W9EPJ won grand prize at the Milwaukee banquet. W9BN is reported heard on 3.5 and 7 mc. at Straits of Magellan. W9BKK tours the country listening to his 56-mc. signals. W9BKX is constructing a h-station for next season's AA work. W9BNN tearfully (?) leaves the junk for the summer's work. W9YC held open house on Engineers' Day. W9HRH thinks he could do better if summer wasn't coming on. Hi. W9CTB applies for ORS. W9CKU's total increases rather than decreases with the arrival of a junior op. W9EPD is in deep experiment with tourmaline crystals. W9JBA wants to see static take summer vacation. W9ELZ keeps several FB schedules. W9DEI

experiments with a view to eliminating skip in 14 mc. W9DH reports a FB time at Duluth banquet, with W9AQQ, W9DCM, W9BIS and others representing So. Minn. at that event. W9CSJ is developing a wind driven power supply. W4CE and W9FNIH visited at W9HFF. W9EYL plans regular activity this summer. W9COS is taking naval training at Great Lakes. W9FJK is once more going full blast. W9BQJ enjoys schedule work. W9FNK reports the Commander, Section Seven, visited Rochester to enlist more men in the Naval Reserve. W9FCF vacations on north shore of Lake Superior. W9GLE is ORS No. 25. W9IAK has moved into this section. W9HCW leaves us for No. Minn. W9FBV-W9IXQ recommend v.t. relay to squeelch key clicks. W9GUX reports mostly ragchews. The Minneapolis Radio Club went to visit W9DGE-WRBN when the tow-boat James Good was in port. W9EYS has the 56-mc. bug. W9AFR's pal got commercial minded and left for Noo Yawk to board the S.S. *Empire-Arrow* as sparks. W9EJZ gets crystal performance from an electron coupled oscillator. W9BGG visited the gang with his public address truck. W9GZQ is trying every type of antenna. W9DMC built MOPA. W9FPY reports W9IRT a new one at Luverne. Other new hams: W9IYJ, Jackson; W9IYD, New Ulm; W9JBA, West Concord; W9JES, New Prague; W9IRH, Montgomery; and W9DLP, W9JFH, W9JEG, W9JHS, W9JHG in Minneapolis. W9HKI left for San Diego, Calif. W9EFK puts his ORS on inactive list. W9FAD, W9FAJ and W9IYQ attended hamfest at Ruthven, Iowa. W9GBZ has a pair '11 modulators. W9FFY is muchly QRL finals. W9EGG is experimenting. W9DBC and W9LJN are on 1.7 mc. W9EAT has Unlimited 'phone ticket. W9FCS is interested in U.S.N.R. W9EXR has a rack and panel job. W9GIA's '81 went west. W9DGH, W9EKU, W9HXS and W9BBV are on 56 mc. W9BTZ finally has an oscillator tickling the '04A PA.

Traffic: W9EPJ 615, W9BN 525, W9BKK 401, W9BKK 248, W9BNN 199, W9YC 139, W9AIR 125, W9HRH 101, W9CTB 58, W9CKU 77, W9EPD 29, W9JBA 26, W9ELZ 25, W9DH 25, W9DEI 22, W9CSJ 21, W9HFF 17, W9AFR 8, W9EYL 8, W9COS 7, W9FIK 7, W9BQJ 7, W9FNK 8, W9FCC 6, W9GLE 5, W9IAK 5, W9FBV 4, W9GUX 2, W9DGE 1, W9EYS 1.

**NORTHERN MINNESOTA** — SCM, Palmer Andersen, W9DOQ — The Arrowhead Hamfest went over in great style, with an attendance of ninety-six from three states. W9HIE comes through with a nice total. W9EOZ is still on 3500 kc. 'phone. W9GYH is building a 'phone. W9BCT is looking for schedules on 7 mc. W9HZV is looking for traffic on 3.5 mc. W9BHH is busy picking out off-frequency stations. W9HRB is rebuilding. W9BBL's house is being remodeled. W9BAR was the winner of the lar's contest at Hamfest. W9DOQ finds little time for air. W9HZ is working at marine station now. W9HCW of Lambertson is now in Paynesville. W9BRA is your new Route Manager. Support him, gang, and write for schedules or list your time available with him. W9HDN is fooling with 56-mc. 'phone. W9IJS is a new man reporting. W9BVI has been active in 'phone-C.W. contest. W9AVZ, W9AEL and W9EGN keep Brain-erd on the map.

Traffic: W9DOQ 10, W9HIE 113, W9EOZ 3, W9BBL 6, W9BRA 44, W9BAR 20, W9HZV 2, W9BCT 8, W9GYH 29, W9IJS 19, W9HZ 50, W9HDN 8, W9BVI 22, W9AVZ 10.

#### DELTA DIVISION

**LOUISIANA** — SCM, Frank Watts, Jr., W5WF — W5CCF, W5WJ, W5CW, W5BEI, W5CGC and W5CFG are new stations in Shreveport. W5AQC is taking pilot training. W5CBT is working on his 'phone. W5CDQ will have the call W5ARY at Texas A. & M. W5APA is working with 150 watts. W5BZR and W5BBW attended the convention in Monroe. W5BZ-W5AZA paid a visit to the Minden gang. W5BMM and W5CEW are new stations in Plain Dealing. W5BSR is trying ham radio. W5UQ in Oak Grove will soon be on the air. W5KC reports traffic. W5AXD has moved to Bunkie. W5BVP is new station there. W5ML reports for the gang in his vicinity. W5AKI is still perking. W5AYZ pounds brass. W5BYQ and W5ASJ are on spasmodically. W5BJA is still trying to get going consistently. W5RR is on. W5WF-W5VT has been off for a couple months.

Traffic: W5BZR 57, W5BMM 20, W5KC 12, W5AKI 6, W2BSR 6, W5ML 4, W5APA 3, W5AXD 3, W5BBW 1, W5AQC 1.

**MISSISSIPPI** — SCM, William G. Bodker, W5AZV — W5VJ is building a 7-mc. c.c. job. W5AWP is on 7 mc. W5BGU and W5CFL are new stations. W5ANX has an all-district portable call, W5ZZAB. W5AAY is installing a 500 watt 1975-ko. 'phone job. W5BUI is selling out. W5ALZ is getting out fine with 3-watts input to a type '45. W5BNW has a new MOPA.

Traffic: W5ANX 27, W5AWP 18, W5AZV 3.  
**ARKANSAS** — SCM, Henry E. Velte, W5ABI — As usual W5BMI is high traffic man. W5CCY is on 14 mc. W5CR will be heard from W9FVM this summer. W5YM is located at the U. of A. W5SI is working U.S.N.R. and A.A.R.S. schedules. W5BDR is building a '52 rig. W5BRI worked a K6. W5JK has worked all states on 1.7 mc. except forty-seven. Hi. W5AAJ is inactive. W5VK was QSO two VKs and a K6. W5PX is grinding crystals. W5UI has a new push-pull rig. W5BDW has transformer trouble. W5DI is active on 3.5 mc. W5AKB is using two type '10s. W5IQ keeps the A.A.R.S. gang pepped up with his "Nertzler." W5FM is on 3.5 mc. W5LK will soon have his 'phone on the air. W5BED is collecting cards from all the "BEDs" he can. Hi. W5ABL is going strong on 7 mc. W5ABI is awaiting new rectifier tubes.

Traffic: W5BMI 701, W5PX 250, W5ABI 172, W5IQ 67, W5BED 54, W5CR 36, W5SI 35, W5BDR 29, W5JK 25, W5CCY 25, W5FM 16, W5BRI 13, W5VK 11.

**TENNESSEE** — SCM, James B. Witt, W4SF — W4AAD sends in a nice report on his 'phone work. W4FX received several reports from OO on his crystal's frequency. W4EX is getting out FB. W4AXO has moved back to Knoxville.

Traffic: W4RO 35, W4EX 33, W4OV 10, W4SP 1, W4AAD 18.

#### HUDSON DIVISION

**EASTERN NEW YORK** — SCM, R. E. Haight, W2LU — W2BZZ: BPL is yours again. W2BLU reports spring fever. W2UL is proud owner of an SW3. W2BJA desires good western schedule. W2BVR works W2AUE in Indiana. W2ANV is using crystal on 3579 kc. W2CFU revamped for remote control. W2BZW reports via radio. W2KWK needs a good team of horses to put up antenna masts at Radio Hill. For more pep W2ATM rebuilt. W2BLL has tough job relaying traffic for NYC. W2BKM and W2DEL are new members in Naval Reserve. W2ZZBF is back home. W2BJP is new OO. The ENYS. Net was cited for FB work by Chief Signal Officer reports W2OP. W2BWF tries 'phone. W2SZ desires traffic schedule starting Sept. W2DUG makes many contacts. W2ACY is still active. W2DQT reports new transmitter perking FB. Daylight Saving Time troubles W2CJS. W2BER is back with the boys. W2CTC reports FB record for DX contacts. W2SJ takes unto himself a YF. Section's heartiest congrats. W2CGO brings home the Fish. W2BSH is QRL planting garden. W2CJP is not heard on the air lately. W2ATA is on with crystal. W2AEQ hasn't hit the key in months. W2DKP and W2BYV is getting FB results with 1750-ko. 'phone. W2CGT works FB DX on 14 mc. W2COY and W2CDM, 'phone men, are going on CW. W2BGB is listed in "Unheard" calls. W2BYF rebuilt his outfit. W2AQT is QRX for license renewal. We all sympathize with W2BWG in the loss of his wife. W2BJX received first European QSL cards. W2AGZ is working 7 mc. W2CVT works all bands. W2BKL has trouble getting crystal perking. W2AJD installed Whitaker crystal oscillator circuit. W2BFB knows how to put the crystal in action. W2BXH reports working on all bands. W2FJ reports new YL ham in Peekskill, W2QJ. Our Section has had the honor to lead the Division for the past four months. Let's continue the good work, gang.

Traffic: W2BZZ 538, W2BLU 230, W2LU 196, W2BJA 199, W2LU 140, W2BVR 84, W2BKM 81, W2ANV 67, W2CFU 36, W2BZW 25, W2KW 22, W2ATM 20, W2BLL 19, W2DUG 19, W2EJP 17, W2OP 16, W2DEL 15, W2BWF 14, W2SZ 8, W2ACY 6, W2DQT 6, W2CJS 4, W2BJX 2.

**NEW YORK CITY AND LONG ISLAND** — Acting SCM, E. L. Baunach, W2AZV — The Hudson Division net

is going along fine with all men on at 11:00 p.m. every evening on 7 and 3.5 mc. W2NO takes care of 7 mc. while W2AZV handles 3.5 mc. Manhattan: W2AWT is a new ORS. W2ANQ finds early evening good for traffic. W2BNW and W2BDJ are running the Manhattan Radio Club. W2BUS has a new bus. W2CGA is rebuilding. W2AEC, W2BOY and W2IS are off for a rest. Bronx: W2QM is all pepped up over his new call. W2CWP welcomes back the summer heat and QRN. W2DJP is out for an ORS. W2ASK teaches but enjoys ham radio. W2CR burns up 7 mc. W2CYX reports traffic. Ex1VV of 1915 is back on as W2EAF, working on 7 mc. Brooklyn: W2BRB is organizing a 56-mc. field day for the Radio Club of Brooklyn. W2PF is again the M.C. of the R.O.W.H. held at the 7th annual A.R.R.L. Hudson Division Convention. W2DBQ is now on 7 mc. W2CCD boasts being a member of the bar. W2BXJ's fifty went to tube heaven. W2BAS has a new two-tube deluxe. W2ASG has BCL, QRM. W2AZN worked his first "six." W2AZV is sweating over 56-mc. receivers. W2BEG is trying floating power. W2AEN and W2CLC are rivals for the best crystal note. W2AF shows them how to do it with half wave rectification. W2NO sends in a nice report. W2CRB says DX is dead. W2AVC is a new man in the net. W2DUE is due for a big report. W2AGC was a Wouff-Hong victim. W2DPV put in crystal. W2LB is busy fighting old man depression. W2CWF is too busy for hamming. Queens: W2ADQ makes the BPL. W2KG is taking a vacation in Colorado. W2BDR and W2COI handle his schedules. W2AUS finds 7 mc. poor for DX. W2AIQ is now an A.A.R.S. man. W2DQK wants a schedule with someone in Ithaca starting in September. W2DIS is very active on 7 mc. W2AC is back to TGTP. W2DHN is getting activity in his section. W2VB is a new ORS. Staten Island: W2AHO will soon be an ORS. W2WT says DX on the island is FB. X-W9AMP is now W2AAB. W2WP again makes the BPL on deliveries. W2DHK and W2CEP are handling traffic. Long Island: W2OT is having success on 56 mc. W2AKL remounted his transmitter on a rack. W2BFG has the new transmitter perking FB. W2CHK takes traffic for St. Johns College. W2DOG will soon be an ORS. W2CJF has some nice schedules. W2VL wants to become an ORS. W2AXV tried a new Zepp. W2AST is rebuilding. W2CJA likes experimenting.

Traffic: Manhattan — W2ANO 74, W2AWT 15, W2BHL 15. Bronx — W2BGO 104, W2CWP 33, W2QM 52. Brooklyn — W2AZV 80, W2PF 68, W2BQ 69, W2CCD 19, W2BXJ 7, W2BAS 11, W2ASG 9, W2AZN 9, W2NO 171. Queens — W2ADQ 437, W2AIQ 172, W2KG 121, W2AUS 123, W2DIS 28, W2DHN 62, W2DQK 35, W2BDR 26, W2COI 45. Staten Island — W2AHO 28, W2CXYK 46, W2WP 295, W2DHK 23, W2CEP 10. Long Island — W2OT 7, W2AKL 6, W2CHK 4, W2DOG 27, W2CJF 16.

NORTHERN NEW JERSEY — SCM, A. G. Wester, Jr., W2WR — W2WR regrets to announce that he will not run for SCM in the July balloting. W2CWK wants his ORS put on ice for the summer. W2AGX has relocated. W2CJX is going back on 3500 kc. W2CNL would like to go with the Antarctic expedition. W2AGO has 8 fine schedules. W2CFY handled a group of messages for the Lions Club. W2AIF has the rebuilding fever. W2AMT has a new 50-watt crystal job under construction. W2CLX handled a fine total. W2CIM and W2DPB have been appointed ORS. W2BJZ has been fooling with 56 mc. W2ALD says the U.S.N.R. still needs good stations and operators. W2CIZ handles fine traffic. W2ABT is at new QRA. W2DQU telephoned in his report. W2DQQ handled some important traffic for the races in Indianapolis. W2AKW closed down for repairs. W2DQH made a fast relay for the RM. W2BPY is graduating from high school.

Traffic: W2CWK 10, W2AGX 4, W2CJX 14, W2AMR 4, W2CNL 10, W2AGO 332, W2BPY 357, W2CFY 12, W2AIF 54, W2AMT 10, W2CIZ 115, W2CLX 104, W2CIM 9, W2DPB 10, W2BJZ 1, W2ALD 16, W2CZY 39, W2ABT 10, W2DQU 12, W2DQ 33, W2AKW 46, W2DQH 1, W2GO 10, W2CPR 6, W2AEY 3, W2DZY 3, W2BTZ 9, W2BRP 15, W2ACL 4, W2BQT 28.

#### MIDWEST DIVISION

IOWA — SCM, George D. Hansen, W9FFD. W9BPG, RM; W9EIV, RM — Let us pause a moment in rev-

erence to one of our number who has passed on. R. P. Griffith, W9EJQ, our former RM, our friend and coworker, passed away May 20th. His accomplishments will long be remembered. W9BPG again leads in traffic. W9FFD is second. W9DNZ reports a new ham, W9IGH. W9BJP takes the lead again in his race with W9ACL, who reports spring fever. W9FZO is putting in crystal. W9CWG was bitten by the 56-mc. bug. W9ABE is QRL school work. W9IO reports 56-mc. activity. W9FYC got in his lick. W9BWF is rebuilding crystal. W9IFI is a first reporter. W9HMM keeps one schedule. W9DMX expects to be on 'phone and CW. W9AFQ reports new dynatron. W9ANO comes through with a few. W9EOE QRL farm work. W9AYC claims record for burning out tubes. W9BFL is on 7 mc. W9GWT will soon have crystal. W9ABH is off the air for station improvements. W9ERY is having trouble with power supply. W9GPL reports activity on 56 mc. W9DFK is experimenting on 56 mc. and duplex communication with W9FFD. The Ames Convention was a DANDY, a very good crowd, lots of very interesting subjects discussed and a successful demonstration of 56-mc. 'phone. GP was there and gave us a very thorough report on his trip to the Directors meeting at Headquarters.

Traffic: W9BPG 135, W9FFD 124, W9DNZ 103, W9BJP 89, W9ACL 66, W9FZO 83, W9CWG 79, W9ABE 58, W9IO 46, W9FYC 42, W9BWF 36, W9IFI 31, W9HMM 28, W9DMX 18, W9AFQ 11, W9ANO 11, W9EOE 9, W9AYC 8, W9BFL 6, W9GWT 5, W9ABH 2, W9ERY 2, W9GPL 1.

NEBRASKA — SCM, S. C. Wallace, W9FAM — W9DMY is still going strong. W9FUW is doing FB on 'phone traffic. W9EHW is experimenting with portable. W9EEW is on 7 mc. for the summer. W9DI is busy with school work. W9EWO has lots of shop work now. W9DGL says traffic slim. W9BBS has lots of time to ham. W9DHA is graduating this year. W9BQR and W9DTH report. W9HYR is experimenting with low power. W9FGS has FB traffic total. W9FXQ is doing well with code class. W9HTU says weather conditions very bad. W9FAM has been working on 1750-ke. transmitter.

Traffic: W9DMY 134, W9FUW 100, W9EHW 71, W9EEW 44, W9DI 17, W9EWO 16, W9FAM 15, W9DGL 13, W9BBS 10, W9DHA 6, W9BQR 5, W9DTH 2, W9FGS 4, W9FXQ 4, W9HTU 9.

MISSOURI — SCM, L. B. Laizure, W9RR — St. Louis: W9GDU says new P.P. rig on 14 mc. FB. W9HVJ turns in another blanket report. W9GHH is having antenna-itis. W9HWE is going to 1.75-mc. 'phone. W9HUZ is Ex-W9AMR. W9HEL is on 3.5 mc. W9ENI is on 14 mc. W9EBY says conditions poor. W9IJJ is building a new transmitter. W9PW can't see why he can work both coasts but ND on contacting NDP. Some old-timers coming back in St. Louis according to dope from W9FTA on the Dredge *Selma* — W9ECI is setting up again. W9HHK is a new one. W9DHE has a 250 watter going as last stage of crystal rig. W9EKY has new 250 watter c.c. rig on 7 mc. Ex-W9ACI is back as W9FMK. W9GTK is rebuilding. W9IL is a new one. W9CCZ has had some outside attractions. W9GSO is practicing up as a painter. W9HVP has 50 watter going on 7 mc. State news: W9BJA is handling traffic again. W9TJ has been appointed Route Manager for Mo. W9BGS wants some schedules for traffic. W9EYG-HCP handled record traffic for the state. W9AOG was in on ORS contest. W9DEN is back in the traffic column. Sullivan hams coming in for first time with reports from W9FLD and W9EET. W9ASV kicked in a good score. W9JBS is a new station in Joplin. There is a new ham club in Joplin. W9ENF kept three schedules. W9BGW is awaiting license renewal. W9IJW is a new St. Louis station. W9AIJ did extensive remodeling. W9BWX is trying to break out with low power on the farm. W9CQY kicks on message delivery results. Hannibal hams have organized a new club and intend affiliation — W9FGJ is Secretary. Kansas City: W9FHV is laboring with Trunk Line "B". W9RR was out of town some on U.S.N.R. trips. W9CVT is handling traffic. W9DAE is coming to K.C. next month looking for BC job. W9AQX is keeping U.S.N.R. schedules. W9ELS reports going on U.S.N.R. cruise. W9FJV reports at the last minute.

Traffic: W9PW 22, W9GTK 67, W9FHV 159, W9AIJ 16, W9IJW 4, W9ASV 79, W9ENF 87, W9FLD 8, W9EET 10,

W9DHN 5, W9AOG 69, W9EYG 588, W9TJ 157, W9BJA 17, W9RR 25, W9NR 429, W9FVJ 50.

KANSAS — SCM, J. H. Amis, W9CET — Four stations make the BPL — W9FLG, W9GPB, W9CUF and W9GUZ! Let's have more stations in the BPL. W9FRC received a request for one of his royal QSLs from So. Africa. W9GCL rebuilt. W9CKU is saving his money for the Division Convention in September at Topeka. W9HL has lots of business. W9CXW has been QRL. W9GXD was first in April S.A.R.A. QSO Contest. W9IFC, W9JCV, W9IRW and W9IXE are all new calls. W9DSI has sold his 1.75-mc. 'phone. W9DDV has joined the AA net. W9BNU is moving to Rosedale. W9DJZ is the Topeka U.S.N.R. unit station. W9BGL operates W9ELY at Lawrence during school. Tennis is taking a lot of W9CFN's time. W9GXV promises more activity. W9ESL is having trouble with Class "C" amplifiers. W9CET has been out of town. W9COA is using a pair of '45s. W9IEW is on 1.75-mc. 'phone and 3.5-mc. CW. W9FKD blew all of his tubes. W9KG sends in a nice report. W9HNU wants some reliable schedules. W9SE, W9HWW and W9NI report a nice bunch of traffic. Don't forget to start saving your cash for the Midwest Division Convention at Topeka in September.

Traffic: W9GBP 279, W9CUF 218, W9HNU 34, W9SE 48, W9HWW 88, W9NI 78, W9KG 268, W9FLG 507, W9FRC 107, W9GCL 15, W9CKU 37, W9HL 37, W9CXW 7, W9GXD 72, W9DDV 72, W9FMX 3, W9DJZ 34, W9BSK 5, W9BGL 10, W9CFN 21, W9ESL 2, W9GUZ 255, W9COA 30, W9IEW 19, W9CET 27, W9FKD 1, W9HLE 2, W9HSN 139.

#### NEW ENGLAND DIVISION

CONNECTICUT — SCM, Fred A. Ellis, Jr., W1CTI — Thanks, gang! Traffic and the number of traffic reporting stations increased considerably over last month. W1CGD hopped into the BPL and leads the section. W1BGO is selling out. W1AEV is back on the air. The M.C.A.R.C. are planning a boat trip down the Conn. River. The "Middlesex Bloopster," official organ of the Amateur Radio Club of Middlesex County is a live wire sheet. W1YU is second high. The license at W1YU expired so W1FJ was used until the renewal came through. WYU-W1FJ is Conn. net control station for the Army Net. W1AYR and W1BOD were awarded a prize at the AIEE convention for their paper on 56 mc. W1BDI makes BPL on deliveries. RP is out to put W1MK in the BPL next month. W1AMG says traffic good on 3640 kc. From the looks of his report traffic is still W1ES' pet hobby. W1QV is moving to a new location. W1BQS hands in a nice report. W1BHM is working 56 mc. W1BEO went to Boston and passed his operator's exam. W1BFS reports a new station in Mystic, W1EFU. W1BVW is QRL service work. W1AJB is getting some good schedules lined up. W1ATW has been appointed OO. New stations in New Milford are W1EFD, W1DVX, W1DWP and W1EDN. W1CIG played chess with W1DNG. W1FL has portable call W1EHC. W1CTI was entertained by the New London Club at their annual banquet. W1APJ has an auxiliary '10 T.P.T.G. perking. W1APW seems to be the only active station in Bridgeport. W1BNB rebuilt his plate transformer. W1DGG is using two '10s in push-pull TNT. W1CVL sends in his first report. W1COA is using two '45s in push-pull TNT. W1APZ keeps W1CBA on the air. W1AZK got his commercial ticket. W1AOK is as active as possible. W1CLG wants ORS. W1BGJ reports his traffic. W1TD has been bitten by the crystal bug. W1BNP has 150 watts input to a '60. W1AZH sends code lessons on 1989 kc. every Monday and Tuesday 8-9 p.m. Contact W1EAO for accurate QRG service. W1DOW sent 23 "CQ ORS" during three days to get out one message. W1CNU reports W1EER, ex ITAC, in Noroton Heights, and W1DXZ in Belltown. W1DCM is building an AC receiver. W1BAX reports his traffic. W1HD is very active on 56 mc. W1ASP just returned from a cruise on a Navy boat. W1AQF is on 7280 kc. nightly. W1AFB reports "QRT." W1AVB requests that his ORS appointment be placed on the inactive list. The Hartford County Amateur Radio Assn., Inc., holds meetings every two weeks at 203 Ann St., Hartford, Wednesday evening at 7:30, and cordially invites anyone who are able to come and meet the gang. They issue a monthly

bulletin and are running a traffic contest for member stations. Drop E. C. Tracy, W1APJ, Secy., a line if this information interests you. W1EWF in Milldale just recently received his license. W1CDDR is moving. If you're not mentioned in this department it is because we don't hear from you. Drop W1CTI a line on the 16th of each month reporting traffic activities and any interesting news for the preceding 30 days.

Traffic: W1CJD 561, W1YU 408, W1BDI 390, W1MK 332, W1AMG 202, W1ES 141, W1QV 84, W1BQS 76, W1BHM 55, W1BEO 35, W1BFS 42, W1AJB 34, W1ATW 20, W1CIG 19, W1FL 18, W1CTI 18, Unknown 17, W1APJ 16, W1APW 10, W1BNB 9, W1DGG 9, W1CVL 9, W1COA 9, W1APZ 8, W1AOK 8, W1AZK 7, W1CLG 6, W1BGJ 5, W1TD 5, W1BNP 5, W1AZH 4, W1EAO 4, W1DOW 4, W1CNU 4, W1CBA 3, W1DCM 2, W1BAX 2, W1HD 2, W1ASP 1, W1BVW 20.

VERMONT — SCM, Roy L. Gale, W1BD — W1DHX, of Windsor, sends his first report. W1EHB is another new Windsor station. W1AXN has moved his outfit to Lake Irroquois. W1DAJ has a vibroplex and monitor. W1CBW visited WCAX and W1BRJ. W1CBE has a new shack. W1BNS visited W1ATF, W1BLJ, W1BEZ, and WCAX. W1CGW called on W1BNS. W1CGV shoots messages off the top of the mountain with a flea-gun and they land everywhere. W1CGX and W1BJP are going strong. W1ATF reports that out-of-band offenders are becoming more scarce. W1AHN is bothered by high-tension QRN. W1AAG called on the SCM.

Traffic: W1ATF 39, W1BNS 31, W1CGV 29, W1BD 27, W1CGX 26, W1BJP 21, W1CBW 10, W1AXN 4, W1AHN 3, W1DAJ 1.

MAINE — SCM, John W. Singleton, W1CDX — W1CFG leads the list. W1BOF says conditions have been punk. W1BEU has been busy rearranging his station. W1BWS sends in his usual good total. W1BTC is in line for ORS. W1BOZ was at NAB for two weeks. W1BUO is going strong. W1BEZ is busy teaching 'phone men to push traffic. W1EF reports W1EFT and W1EFX as new stations at Stonington. W1APX took the SCM to the hamfest in his flivver. W1AJC is new S.C.S. in the Army Net. W1DJJ joined the Army Net. W1DPR will soon be ORS. W1CGG reports new ham in Caribou. W1EFL. W1AXJ says W1AUW has moved to Belfast. The Kennebunk gang put on one of the finest hamfests ever held in the state. W1CEQ, W1BWB, W1CNN, W1MN, W1DMX and W1DAY were responsible for the splendid time. W1EEX is a new ham in Farmington. W1BWB has promised to make a classy wall sign for the Maine station handling the most traffic each month. W1CRP has been experimenting on 56 mc. W1ANX got the "50" going on 3750 kc. W1AQL is busy. W1BZS had trouble with his transmitter. W1DOZ is on the air at Farmington. W1BWB had a new c.c. transmitter (3618 kc.) presented to him by the Kennebunk gang.

Traffic: W1CFG 277, W1BOF 264, W1CDX 161, W1BEU 119, W1BWS 117, W1BTC 95, W1BOZ 91, W1BUO 66, W1BEZ 61, W1EF 60, W1APX 59, W1AJC 46, W1DJJ 36, W1CEQ 19, W1ABQ 18, W1DPR 16, W1BTG 4, W1CGG 7, W1AXJ 6, W1DSJ 1.

EASTERN MASSACHUSETTS — SCM, Joseph A. Mullen, W1ASI — W1VS has the best traffic report the Section and all New England has seen in many moons. Congrats, OM. W1ASI has renewed his power supply. W1ABG says traffic is slowing down. W1CFI shares his views. W1AAL says traffic is FB with him. W1WV and W1LM have cancelled all schedules. W1KH got his first "baptism of fire" at the Directors' meeting in May. W1LQ has returned to 3500 kc. W1AGA has been doing fine work on 1812 kc. W1BZQ has finished his work on the Arlington Police transmitter. W1BNJ and W1CHR are sporting new transmitters. W1ATX and W1CQN are concentrating on school work. W1ACH returned from the Naval Reserve cruise to Portland. W1ME found out that you have to "KNOW HOW" when you grind crystals. W1CUCO has a new job. W1BER attended the ORS party. W1NC is our latest ORS. W1AFP lost his ORS. Non-ORS reporting this month are: W1CGB-W1BWM, W1CFU, W1CUCY, W1BBY, W1BEF, W1DWD, W1ABF, W1BJM and W1MX. You fellows who are looking for Cape sch dules get hold of W1BMW or W1AGA.

Traffic: W1VS 1082, W1ABG 194, W1WV 183, W1LM 113, W1BBY 101, W1DWD 96, W1BEF 80, W1NC 80, W1ASI 70, W1KH 62, W1ACH 55, W1MX 53, W1AGA 46, W1ME 44, W1CGB 42, W1BFR 38, W1BJM 35, W1AAL 33, W1CHR 32, W1BZQ 28, W1BNJ 24, W1ATX 20, W1ABF 17, W1CQN 11, W1CUO 8, W1BMW 7, W1CUI 5, W1CFI 5, W1LQ 2, W1CFU 2.

NEW HAMPSHIRE — SCM, V. W. Hodge, W1ATJ — W1IP is still holding up his end, and reports two new hams in Manchester, W1EDK and W1EES. W1BBF says his 50-watt outfit is perking fine. W1UN worked up a nice traffic total. W1APK gave W1IP a little competition in traffic. W1DNC is keeping a bunch of schedules. W1AEF reports a new ham in Hampton, W1EEA. W1BAB is handling traffic 100%. Golf and fishing kept W1DMI from his key. W1CCM has been trying 1750-kc. 'phone. W1BAC is experimenting with 56 mc.

Traffic: W1IP 325, W1APK 106, W1UN 90, W1BBF 71, W1DNC 31, W1DMI 13, W1BAB 10, W1BAC 6, W1AEF 1.

WESTERN MASSACHUSETTS — SCM, Leo R. Pelouquin, W1JV — The SCM's two year term is up and he regrets that due to other work he cannot be a candidate for reelection. I wish to thank the gang for the fine cooperation given me and I shall continue to take interest in amateur radio, particularly in Western Mass. W1ASY and W1AZW have announced that they are candidates for the office of SCM. All ORS should continue to report to the present SCM until further notice. W1AZW takes traffic honors this month. W1ASY is building a new transmitter for W1DCF. W1CCS and W1AFI belong to both the ARMY and NAVY Reserves. W1APL reports traffic competition keen in Springfield. W1BVP drops in traffic totals. W1AUQ does much experimenting on 56 mc. W1ARH worked a new ham in Amherst, W1DVW. W1BYR plans to put in a crystal. W1OIF gave an interesting talk on 56 mc. at a meeting held jointly by the Radio Club of the Worcester Polytechnical Institute and the Worcester Radio Association on May 16th at W.P.I. The gang at W1BKQ are all interested in 56 mc. W1AIF is coming on with portable call W1DGW. W1BWW is now on Trunk Line "G."

Traffic: W1AZW 95, W1AJD 31, W1CCH 30, W1ASY 29, W1CCS 26, W1AFI 23, W1APL 22, W1BVP 19, W1AUQ 18, W1ARH 17, W1BYR 15, W1BNL 12, W1OIF 11, W1ATK 8, W1BPN 7, W1BKQ 6, W1APP 4, W1BWW 34.

RHODE ISLAND — SCM, N. H. Miller, W1AWE — W1AWE is going on 15 days' duty at Navy compass station in Newport. W1CAB has changed QRA to 73 Clarence St., Providence. W1DBA is building a new transmitter. W1DQP, W1DQR, W1DRY, and W1DTZ are all new hams in Providence. W1AQ, The Associated Radio Amateurs of Southern New England, are building a new transmitter. The Providence Radio Association has gone 56-mc. crazy. W1FU and W1AXS uphold the Navy standards in Cranston. W1AMU-W1ZZB, W1GV, and W1BCR are active on 56 mc. W1BML pushes out a good signal on 3540 kc. W1AMU and W1AMD keep busy at WPRO. W1DDY and W1BGM cover all the bands. W1H-W1ZS-W1BZI is new OBS and OO. W1BES and W1ID still QSO the world on 3500-kc. 'phone. W1BTP, Pawtucket High Radio Club, has a new ORS ticket. W1ASZ has three schedules. W1CGO built a new AC receiver. W1BOY is high traffic man this month. W1BDZ lost his license. W1AAD and W1BGA are going strong. W1DOT is a new ham in Pawtucket. W1CPV is working fair DX. I would appreciate any reports from Newport, Westerly, or Woonsocket. Please send in your reports on the 16th of each month.

Traffic: W1BOY 138, W1CAB 44, W1ASZ 14, W1BTP 13, W1AWE 12, W1DOT 4.

#### NORTHWESTERN DIVISION

MONTANA — SCM, O. W. Viers, W7AAT — W7ASQ bounced into the BPL this month. W7CU is busy. W7AHE reports W7CEG as new station in Somers. W7AHE's brother is operator now. W7ASB will be off until fall. W7BBS is building an experimental MOPA. W7BGC has crystal control on 3546 and 7092 kc. W7BW sends in a nice total. W7AFS worked G5BY. W7BYR has a '10 in

Hartley. W7AKD has a new MOPA. W7AYG has QRM from planting garden. W7AST is working on his house. W7AIR is on inactive list until fall. W7BNU has a new crystal outfit. W7BKM's '10 Hartley is OK. W7BII has a pair of 211s in push-pull. W7BZA, W7CCR, and W7BVI are new Missoula stations. W7BVI worked K6VG on 3500 kc. W7AQN worked New Zealand. W7AOD is our newest ORS. W7BGM has portable W7CDM. W7AOD has portable W7BPS. W7ASB has organized a traffic chain through Montana which goes, W7BCV, W7BW, W7AOD, W7ASB, W7BCE and W9DGS. W7BXX has a pair of '04s in PP. W7AAT finds conditions very bad on 7 mc. Let's keep the reports coming like this month, OMs.

Traffic: W7ASQ 210, W7AHE 58, W7ASB 35, W7BBS 3, W7BGC 70, W7BW 82, W7AAT 196, W7AOD 101, W7AFS 6, W7BYR 19, W7AKD 14, W7BKM 1, W7BII 18, W7BVI 5, W7BPQ 30.

OREGON — SCM, Dr. Dolph L. Craig, W7ALO — Wow, what a convention! The Eugene gang sure did show us a grand time. W7WL, W7APE, W7IF, W7AHJ-W7AJX, W7AWO, W7AVT and W7BLN, W7BCCZ and wife made up a fine delegation from Marshfield. W7MY is on ship-board again. W7BWD has a new Zepp. W7BUF says DX FB on 3.5 mc. W7BCZ-W7AZJ-W7APE-W7QO are experimenting with 56-mc. 'phone. W7QO now has a charming wife. W7CDU is a new ham in Klamath Falls. W7AHZ is putting in a 50. W7ALM sends a blank card. W7MFF is with us again. W7AUL sends a fine list of DX time on 14 mc. W7ZD wants to be an OO. W7AYV has been moving. W7SY is doing fine work in Eugene. W7WR misses W7ACH to move traffic to. W7ED has little time for radio. W7BMR wants to be ORS. W7AMF says 'phone in same block now. Hi. W7AEM reports 1750 kc. very good. It is with sincere regret that business reasons, which necessitate less time being given to the office of SCM and radio in general, compel my resignation effective July 1st. I will continue to act as SCM until my successor is elected.

Traffic: W7WR 103, W7ALO 101, W7SY 57, W7AMF 56, W7ZD 54, W7AUL 65, W7AEM 52, W7MFF 45, W7PL 44, W7ED 25, W7PE 16, W7WL 14, W7AHZ 8, W7AYV 7, W7BMR 2.

ALASKA — SCM, Richard J. Fox, K7PQ — K7BLI is still rebuilding. K7BKU is back on the air. K7BWQ has moved to Chicago. K7BVI is going to Circle. K7BCK, K7BYL, K7BYN and K7BXZ are new hams at Ketchikan. K7BXZ has a crystal outfit on 7162 kc. K7FF threatens to make the BPL. K7ATF is going north for several months. Let's have more reports, fellows. Send yours on the 16th of each month.

Traffic: K7FF 352, K6BND 242, K7AAC 136, K7BUI 90, K7PQ 80, K7ATF 37, K7TF 11, K7BWQ 8, K7BNI 6, K7BNC 5.

IDAHO — SCM, Oscar E. Johnson, W7AKZ — W7AVP wants to become an ORS. W7BAU has 'phone on 1.75 mc. W7AJQ is suffering from QRM. W7BEO is back on the air. W7BWX has new mast. W7ACO, W7AJQ and W7AYH are interested in 56 mc. W7ATN is building portable crystal outfit. W7AFT worked his first K7. W7ACP has difficulty in finding traffic. The wind wrecked W7AKZ's antenna. W7QD is rebuilding. W7UQ handled a swell bunch of traffic.

Traffic: W7UQ 266, W7ACP 15, W7AFT 7, W7AJQ 2, W7BAU 7.

WASHINGTON — SCM, John P. Gruble, W7RT — W7BB leads the state with the second highest traffic total he's ever had! W7GN gets better signal with new '66 rectifier. W7APR is new ORS. W7BCV handled important death message to California. W7BDD and W7BBD are reporters from Walla Walla. W7BRE is collecting equipment for a c.c. job. W7AJS is the sole reporter from Centralia. According to W7AHO, the Spokane boys are experimenting extensively with 56-mc. 'phone. Golf keeps our OBS, W7AVM, busy. W7ACB is playing with 1.75-mc. 'phone. W7BHH is now Navy Net Control for Seattle Area. W7BNI plans to increase traffic total through A.A.R.S. W7JF visits Alaskan stations as op on the S.S. Queen. W7TX is still the principal outlet for K7 traffic. W7BMU keeps Everett going. W7CES is newest ham in Yakima. W7AEX is not doing much. W7BUX visited Seattle. The new portable call of W7BXX is W7CEN. W7HS had 100%

QSO with ZL3BA. W7APS handled important traffic for Colorado. V.C.R. keeps W7AZI busy. W7AZA helps W7BJX work the DX with their single '10. W7BQO does fine for a new ham. W7AYY and W7AYX have joined the Navy. W7AFC reports new ham at Spokane, W7CFY. W7AQB is awaiting station license renewal. W7ANP is leaving for California, and may use portable W7ZZJ. W7QE is reported to have YLitis. Nice report from W7AIT. W7IC is working on the coming Convention. W7AYO and W7BCS have portable calls, W7CFZ and W7CED respectively. W7SL likes the new 'phone band. Broken schedules lowered W7WY's total. W7ANF blew a pair of '12D tubes. W7BZB has FB high-power 'phone. We understand W7BTX contacted the U.S.S. Akron while at Portland. W7RL reports that the Vancouver Amateur Radio Club, W7AIA, possess full crystal-grinding equipment. W7ABU, W7BFR and W7ATB are trying 56 mc. W7BTV joined Navy Net. W7BSX schedules W7AIE, Moran School, also have call W7ZZK. W7AF is now using K7AIF at Nelson Lagoon, Alaska, and would appreciate QSP for his Decatur Island home. W7AHQ had trouble with traffic due to wrong addresses. W7IG carries on at Eatonville. W7MM, Bremer-ton's XYL, is thinking of starting a YL-OW Club. W7JT and W7KO do their bit. W7FP and W7CCF of Renton dropped in on the SCM recently. We are pleased indeed to get news from Puyallup gang through their YL op, W7BZC. W7PC booms through nicely. W7BYG handles traffic between Canada and California. An old-timer, W7PA, comes back after an absence of four years. W7BG, North-western Director, just completed work with A.R.R.L. Annual Board Meeting. W7HE does his share on 7 mc. W7AET heard G5VL on 14 mc. recently. We'd like to hear from W7BOF at Prosser and W7BIW at Pasco. W7DL experiments with field strength indicators. W7CGN is new ham at Seattle. W7FP applies for ORS. W7AFP is now located at Bainbridge Island. W7BAC worked ON4FE, Belgium, on 14 mc. W7TS aided in handling rush traffic to Los Angeles for a Seattle YL via 'phone. W7AJI is to be appointed OBS for Spokane. W7AZL is the champion high school mile runner in the United States. Keep in mind the coming Yakima Convention, gang!

Traffic: W7BB 1042, W7BSX 175, W7BCV 166, W7BHH 157, W7TX 133, W7BDD 103, W7WY 72, W7AJS 58, W7HS 43, W7SL 39, W7ANP 35, W7GN 30, W7APR 25, W7AIT 41, W7HE 22, W7ACB 22, W7APS 16, W7BMU 15, W7IG 15, W7RT 14, W7AZA 13, W7AIE 11, W7BNI 10, W7AVM 10, W7BJX 8, W7AHQ 8, W7BQO 6, W7BTX 5, W7ABU 5, W7BBD 5, W7AZI 5, W7BAC 4, W7JF 4, W7AFC 3, W7KO 3, W7BRE 2, W7RL 2, W7JT 2, W7LD 1.

#### PACIFIC DIVISION

**S**AN FRANCISCO — SCM, C. Bane, W6WB — W6PQ sends in a beautiful total. W6EKC is rapidly hitting his old stride. W6BNA is new OBS. W6NK says Naval Reserve activity going great. W6ERS blossoms forth with a surprise report. W6CIS reports his Trunk schedule east still going strong. W6ERK sends in a creditable report. W6DHE says W6EYY and W6BXB dropped in on him. W6CZK reports traffic handled with five countries. W6BVL is moaning about his pet power leak. W6CAL placed high in the W-VE Contest. W6KJ took a batch of traffic during Naval Reserve drill. W6FPE, Ex-W3BKE, reports for the first time. W6ND wants an ORS. W6ADK is the proud owner of a new super het. W6IU is trying to get more output out of his rig. W6AZX says things are going fine. The Associated Radio Amateurs of San Francisco held a big one-day get-together and radio show on April 24.

Traffic: W6PQ 653, W6BNA 159, W6NK 101, W6ERS 195, W6CIS 81, W6ERK 71, W6DHE 37, W6EKC 186, W6CZK 34, W6BVL 30, W6CAL 16, W6KJ 14, W6FPE 6, W6ADK 9, W6IU 6, W6AZX 6.

**SACRAMENTO VALLEY** — SCM, Paul S. Farrelle, W6AXM — RM, Bernard F. Herzog, W6AIM. W6AIM leads the Section. W6TM has three reliable schedules. W6DVE is a new ORS — OBS. W6FRP is a newcomer. W6AK has been busy. W6EJM is teaching aeronautical radio. W6AID has a 56-mc. rig. W6EOC ground too many by-cycles off his crystal. W6CMA and W6FMX have joined the National Guard. W6DGS is QRL college. W6CUM is building '10 rig. W6FBS is building MOPA. W6FKM is

pounding away on 3.5 mc. W6CDU has turned to the YLs. W6CRN is off until final exams at school. W6BHM is using a 211E on 14 mc. W6EOU does not like horseback riding. W6DKW is QRL U.S.N.R. W6AHN is building. W6CGJ is busy with Army-Amateur system. W6APJ made WAC on 7 mc. W6EJC is on once in a blue moon. W6CCB is back in Sacramento. W6QT is fooling with auto radios. Ex-W6JB has the call W6GDA. W6UM has trouble with his antenna. W6EBW is trying to learn to run a bug. Ex-KAIAW is now signing W6SG at Mill Valley. W6CFB and W6EDV are pounding away on 7 mc. W6CCE is at Colfax. W6FYU is a new call at Yuba City. W6FPH is using '10 on 7 mc. W6FEJ is still on 3.5 mc. W6CKV, W6DFT and W6FOD are at Susanville. W6DVD is in love with 3.5 mc. W6AXM is still waiting for rectifier tubes. Remember to report on the 16th of each month.

Traffic: W6AIM 370, W6TM 131, W6DVE 33, W6FRP 6, W6AK 2, W6EJM 48, W6CMA 6.

**EAST BAY** — SCM, S. C. Houston, W6ZM — W6PZ leads the section this month with W6RJ a close second. **OAKLAND** — CRM Ken Ross, W6ATJ — W6PZ now has a good schedule with K6BOE. W6RJ says Trunk Line "F" is going FB. W6BIS has several schedules each day. W6ATJ has been QRL with work. W6BGR sends in a good report. W6AF has pentode receiver. W6CDP, W6EVQ and W6BKM get on deck with nice totals. W6ZM had a few messages. W6DUB sends in a good report. W6EDA has an FB schedule with OM2TG at midnight daily. W6ACD and W6EDZ turned in traffic reports. **BERKELEY** — W6DWI has schedules with NY1AB and OA4U. W6WX turned in a good report. **ALAMEDA** — W6CBE has been having trouble with antennas. **CONTRA COSTA COUNTY** — W6EJA worked his first K6. W6FZS is a new ham. W6CSV says W6DKJ is very proud of a QSL card from W1MK. **NAPA COUNTY**, RM J. Claussen, Jr., W6AUT — W6BYS is hoping someone will donate him a receiver. HI. W6CZN says that bridge is finished now. W6FII and W6AUT were visited by W6BXB. **SOLANO COUNTY** — W6DLT says a new club has been organized in Vacaville. **SONOMA COUNTY**, RM C. Jackson, W6FBH — W6FBH and W6AFQ have been busy building a big 'phone rig. W6BWD is building an engraving machine. W6FTQ and W6FNW are new hams in Sebastopol. W6FYU is a new one in Santa Rosa. W6AOH now has portable call W6AQL. W6BTW will soon be active again. W6CKL is building 'phone rig. W6CAN and W6EUL are experimenting on 56 mc. W6EMO is still at Radio School. W6ADM and W6EDA are on the air again. W6AFQ and W6FBH are having code classes each evening at their station. A bunch of League members have started a new club in Oakland under the name of the Radio Research Association. W6RJ is President.

Traffic: W6PZ 211, W6RJ 201, W6BIS 108, W6ATJ 85, W6WX 68, W6BGR 66, W6DLT 57, W6AF 33, W6AUT 34, W6CDP 31, W6DWI 29, W6BKM 29, W6EVQ 29, W6CSV 19, W6EJA 19, W6ZM 16, W6DUB 14, W6CDA 10, W6DKJ 9, W6ACD 6, W6EDZ 4, W6CBE 1.

**SAN JOAQUIN VALLEY** — SCM, E. J. Beall, W6BVB — W6BIP reports 7 South African contacts. Fresno reports new radio club formed with W6FFP president. W6FRH has frequency creep. W6CLP is still using '52 on 14 mc. W6FFU and W6AME are still active on 1750 kc. W6DQV has a nice crystal job. W6DVI reported for W6CJA and W6EMX. W6EPQ uses a '52 in final stage. W6CYU has a 50-foot stick. W6CLU has 60-foot masts. W6FFY worked Z1, J, VK on a clothes line antenna, 9 feet high. W6EPQ keeps daily schedules with OM1TB. W6EBH has a new crystal rig. W6EHD is trying to get '52 output from his '45s. W6AL uses two '52s in final stage. W6A V is trying pentodes. W6CUL is fishing for his WAC. W6FLS is rebuilding. W6BRV is getting places with 56 mc. W6ASV, an old timer, is on with crystal. W6BIL, and Ex-6AB, who has been operating his station, turned in a bunch of foreigners. W6CCW and W6EMI are inactive. W6BRP is building nice crystal job. W6DZN is high traffic man in the section. W6BXB while touring keeps in touch with home via ham radio. W6BBC has an exclusive 3500 kc. transmitter. W6BTF finally got married. W6DZN won first place in Army Net contest. W6AOZ has temperature controlled crystal. W6SEF reported for the Stockton gang. In a Red Cross Emergency test held on May 3rd, the Naval Reserve

hams in this section won the trophy offered by the Reserve Commander. The Bakersfield Unit with W6WA, (CRM Dickinson) in command won the big cup.

Traffic: W6BIP 30, W6AME 44, W6CLP 2, W6FFU 61, W6DQV 11, W6DVI 20, W6CJA 6, W6EPQ 40, W6AV 10, W6FLS 15, W6AOA 91, W6DZN 207, W6DXL 10, W6BTF 6, W6SF 18, W6BBC 83.

SAN DIEGO — SCM, H. A. Ambler, W6EOP — W6FQU, a new ham, leads the section this month. W6BAM is grinding crystals. W6AXN was in the ORS party. W6EPW and W6CNK are building new receivers. W6AYK built new transmitter. W6BAS has new equipment. W6BCF is getting ready for traffic. W6CTR is building 56 mc. 'phone. W6DDJ handled Red Cross Emergency drill message. W6BZE is applying for an ORS. W6EFD received unlimited 'phone license. W6EAB joined the Army Net. W6AYQ expects to move soon. W6QA and W6CTP are QRL work. W6EOP will be glad to hear from all the new hams in this section now.

Traffic: W6FQU 18, W6BAM 15, W6AXN 13, W6EPW 6, W6EOP 5, W6AYK 3, W6AKY 2, W6BCF 3.

ARIZONA — SCM, Ernest Mendoza, W6BJF — W6ALU makes a new high total of 1061. W6BJF has received a membership certificate of the Trans-Pacific Traffic Association. W6DOW has moved from the kitchen to his own back yard "shack." W6EFC is back in Phoenix. W6CVW lost one of his 57-foot lattice towers. W6CAP works W5OY on schedule. W6BVN made 83.5% on her green ticket. W6AND worked Japan, Guam, Chile, Brazil, Venezuela and Panama on 14 mc. W6CQF worked two Aussies. W6DRE finally contacted W1MK. W6CVR spends 80% of his time on the air ragchewing. W6AYW is getting acquainted with 14 mc. W6EFN is on a trip to Shreveport, La. W6EBF is a new man in Flagstaff. W6DKF is heard on 3500 kc. 'phone. W6DVJ is still servicing BCL sets. W6AEK is on 3500 kc. 'phone again. W6BCD blew his '81s. W6DSA is building a high-frequency super-regenerative receiver. W6BLP is having W6FKX build him a 50-watt crystal job. W6DCQ is on 3500 kc. 'phone. W6DJH, W6GZ and W6DRE are employed at the Nielsen Radio Store. W6CEC-W6BCC is working CW. W6BRI, XYL, has contacted XYL W6BVN and YL W6EK. W6BYD, W6CEC, W6FKX, W6EKP, and W6BJF are seriously considering going gold prospecting. W6DPS says his heap refuses to get out of town. W6EBP is busy working. W6FLI is rebuilding receiver. W5ZZB is the loudest W5 in the state! W6EKU is on 7 mc. CW. W6DIE spends much time out on the desert with his auto-radio. W6FGO has a sweet AC portable. W6PZ is heard occasionally on 7000 kc. W6FIP is junior op at WUQ, Yuma. W6FGG is using p.p. with '10s. W6CPF is back in Scotland, having worked Herbert Hoover, Jr., W6ZH, from W9HAA (old 6DGN) Chicago, Ill., on his way to New York! W6AM was in Phoenix on business. Charles Spitz, of old W2API fame, is now W6FQZ in Phoenix.

Traffic: W6ALU 1061, W6BJF 161, W6DOW 31, W6BVN 27, W6EFC 22, W6AND 18, W6CVW 17, W6CAP 10, W6CQF 9, W6DRE 7, W6CVR 5, W6AYW 4, W5ZZB 2.

PHILIPPINES — SCM, I. S. Limer, KA1SL — Mr. John R. Schultz, KA1JR, offers to feed the gang at his hacienda on July 3rd. This will be Philippine Ham Convention. All comers invited. KA8AA called on the SCM. KA1NA worked as KA3AA while in Baguio. KA1CO is on quite steadily. KA1XA and KA1WR are on at intervals. KA1LG has good schedules. KA1SP is so QRL he has little time on the air. KA3AA is still QRX his high power stuff. The "OM" stations have nice notes.

Traffic: KA1HR 1361, OM1TB 362, KA1CO 116, KA1LG 71, KA3AA 65, KA1XA 60, KA4HW 48, KA1NA 34, KA1SL 16, KA1SP 4.

LOS ANGELES — SCM, H. E. Nahmens, W6HT — Boy, oh Boy! What a report! ORS report 100% for the first time! ONE HUNDRED FIVE STATIONS report traffic, representing a 100% gain in three months! Now that we've passed the 100 mark let's set our goal at 200! Did you get a DOPE SHEET last month? Report your traffic to the SCM on the 16th, even if only ONE message, and the DOPE SHEET will be mailed to you. LOS ANGELES COUNTY: Chief RM, W6ETJ again rates high man. W6ETL, who has a dilly sked with OM2TG, offered good competition. W6EBK promises more next month. W6CVZ

took traffic from OA4Z for L.A. W6DEP is installing pair of '60s. W6AVJ held 6 1/4 hour QSO with Japan. Another good report from W6EKZ. W6ACL overhauled his sky-wire. W6OJ has left for Alaska with MGM to spend a year or more filming an epic of the far north. W6BJA dropped schedules. W6AKW is very QRL. W6AOR is increasing power. RM W6BPU, editor of the DOPE SHEET, reports the local net progressing FB. W6ETM reports W6CKD has gone crystal. W6BPO is back on the beach. W6CVF is now ORS. W6UJ gets p.d.c. reports. W6DKM reports new ham in L.A., W6FMK. W6BOB, operated by W6BSW, at Pasadena J. C. carnival shot traffic to W6YBB, operated by W6BMQ, on 56 mc. 'phone. W6FGT and W6ADH cover Pomona and vicinity on new delivery net. W6FEX now lives in Pasadena. W6DH now has crystal. W6TE going 60 per, crashed, turned over three times and came out without a scratch. W6RZ is anxious to obtain schedules. W6BIS had to QRT account license renewal. W6AM had to ditch his commercial ticket and take ham exam to comply with new regulations. W6CZT takes all L. A. traffic on new delivery net. Alternates are needed. Drop a card to RM W6BPU. Final exams at USC caused traffic slump at W6EUV. W6DWP is going strong at new QRA. W6EAA is really getting out. W6FVX is a new ham at Clearwater. W6DJC has schedule with K6BAZ. W6DZI enjoyed last ORS Party. W6EXQ worked Java for his 38th country. Portable W6ZZA is NG in Chicago due to d.c. in hotels there. W6HT is using separate rigs for 3.5 and 7 mc. W6CUH is running couple of '52's stone cold with 1000 watts input! W6CUU is tied up with power leak. W6DSP is trying to organize 56-mc. club in Glendale. W7BQI is now located in Glendale. W6ERL has new 50-watt MOPA. W6ZH worked OM1TB for two hours on 14-mc. 'phone! W6BCK is new President of A.R.A.L.B. W6DEL has new MOPA. W6ANN graduated from Cal. Tech. W6TN says an ORS "sign" on end of CQ surely gets results. W6AFU is working up some FB schedules. W6WO received portable call W6ZZAJ. W6AGF has received ORS appointment. W6CCF has reliable schedules. W6BVI has entirely revamped his outfit. W6DOZ is helping boost the Section. W6EHO claims best DX time is between 4:00 and 5:00 a.m. W6FGQ, W6SN and W6CUU are installing ham station at Olympic Village. W6FAL inquires as to chances for passing law against power leaks. W6ON, Secy., of P.S.W.C., says over 100 in attendance at recent meeting. W6FVW is brand new ham in Glendale. W6BVZ installed his transmitter on five foot upright panel. W6EVE says lots of fellows on 1.75 mc. 'phone. W6FJT might never have got his rig on air if he hadn't lost his job. W6AIQ is rebuilding to crystal. W6ESA is going back to 14 mc. W6EHZ is off due to blown rectifier. W6EGH has signed off indefinitely. K.V.R. Langsingh, W6QX, is new A.R.R.C. President. W6BHP is struggling with new MOPA. W6CXW says new QRA at Long Beach sure FB. W6BUP is back from Berkeley. Power leaks have W6CGP up a stump. W6DPB is constructing 56-mc. outfit. W6FAV and W6BXX are having fine QSOs on 56 mc. New reporters: W6AAN, W6CCF, W6FVW, W6YAS, W6YBB, W6BOB, W6EYJ, W6ZH, W6ADP, W6FXL, W6FSF, W6FGS, W6BSW, W6DVV, W6EXX, W6BXL, W6ELU, W6FWN and W6DQ. RIVERSIDE COUNTY: W6NF-CFN is high traffic man for the entire section; W6BNP and several others are doing considerable work on 56 mc. A Riverside man logged W6BGL sending CQ 184 times before signing. W6DZC is active in USNR. W6EYF covers Riverside and Redlands on delivery net. W6DZF and W6DLV are off rebuilding. SANTA BARBARA COUNTY: W6YAU made BPL on deliveries. W6EZX, W6DJS and W6BZF have all made the grade for ORS appointment. W6ZBJ is back on air. W6EDZ has daily schedule with Oakland. W6CNO is doing excellent work. W6EMY is a new reporter. The new officers of the S.B.R.C. are: W6DJS, Pres.; W6LC, Vice-Pres.; and W6DFG, Secy. Meetings are now held every Tuesday night in rear of 2726 Hollister Ave., Santa Barbara. SAN BERNARDINO COUNTY: W6CUJ promises some real totals. W6BIK has shifted to 3.5 mc. W6CVV helped W6FYT get his 50-watt crystal job on air. W6FTV reports traffic. W6FTH, ex W6EHF, is getting excellent results with Pentodes. W6DGL is on 3.5, 14 and 56 mc. 'phone. W6GM is experimenting with 56 mc. 'phone in conjunction with W6EOO. SAN LUIS OBISPO

COUNTY: W6DWW's OW got her ticket. W6ALQ is back on air. W6EGC is off air account blown rectifier tubes. VENTURA, MONO AND INYO COUNTIES: Won't some man drop the SCM a card and give his station the distinction of being the first to report from these counties? Let's have every inch of the ol' L. A. Section represented!

Traffic: W6NF 447, W6ETJ 385, W6ETL 260, W6EBK 150, W6CVZ 138, W6YAU 137, W6DEP 134, W6AVJ 131, W6EKZ 112, W6ADP 93, W6ACL 89, W6OJ 87, W6BJA 80, W6AKW 79, W6AOR 77, W6EZK 74, W6BPU 70, W6ETM 62, W6BPO 54, W6EQW 52, W6UCU 52, W6CVF 47, W6BIK 45, W6YBB 43, W6UJ 42, W6BVD 42, W6DKM 39, W6BOB 37, W6BZF 36, W6FGT 35, W6FER 50, W6DH 34, W6ADH 30, W6TE 29, W6ZBJ 26, W6RX 26, W6BLS 26, W6AM 25, W6CZT 23, W6DZC 21, W6EUV 21, W6DWP 20, W6AAN 20, W6EEA 19, W6CZZ 17, W6DJC 17, W6DZI 17, W6EFY 16, W6EXQ 16, W6DVV 14, W6ZZA 14, W6HT 14, W6DJS 13, W6CVV 12, W6CUH 12, W6CUU 12, W6FTV 11, W6FGS 10, W6EGL 10, W6DSP 10, W6DQ 10, W6BNP 10, W6AMA 10, W6ERL 9, W6AKD 9, W6DLI 9, W6FDE 8, W6DWW 8, W6AIF 8, W6ZH 7, W6BCK 7, W6BXL 7, W6DEL 7, W6ANN 7, W6EJZ 6, W6TN 6, W6FTH 6, W6AFU 5, W6W 5, W6AGF 5, W6EDZ 5, W6DGL 5, W6CNO 5, W6CCF 4, W6BVI 4, W6DOZ 4, W6EHO 4, W6BSW 4, W6FGQ 4, W6EYQ 3, W6FAL 3, W6DLV 3, W6ON 3, W6EYJ 2, W6EMY 2, W6EXX 2, W6FWN 2, W6ELU 2, W6FSE 2, W6FVW 2, W6BVZ 2, W6FXL 1, W6EVE 1, W6YAS 1, W6FJT 1.

SANTA CLARA VALLEY — SCM, F. J. Quement, W6NX — W6YG tops the Section with 361. W6NJ handles his usual consistent amount. College QRM hampered W6AMM this month. W6HM left for the Board Meeting during the month. W6ACV keeps schedules with Alaska. W6FBW spends his time on 3500 kc. W6CEO keeps daily schedules with PIs. W6YL has daily daytime schedules. W6DNY is keeping the Watsonville end up. W6BMW was busy at the Akron air base. W6BRW is new ORS. W6FBU tells us that W6DJZ is back in Los Angeles Section. W6NX — W6AZF is on 1750 kc. The new officers of the SCCARA are: Willis Clayton, Jr., Pres.; Mrs. Mae Amarantes, W6FBW, Secy.; Jack Gilleran, Treas.; John Kellihier, Vice-Pres. A big A.R.R.L. banquet was given by this Section on June 4th in honor of Colonel Clair Foster, just returned from the Board Meeting. It was one of the best hamfests ever held in San Jose.

Traffic: W6YG 361, W6AMM 216, W6HM 66, W6ACV 55, W6FBW 48, W6CEO 51, W6YL 27, W6NJ 36, W6DNY 23, W6BMW 21, W6FBU 21, W6NX 20.

NEVADA — SCM, Keston L. Ramsey, W6EAD — W6AJP is high man again. W6UO visited Reno. W6EGA and W6EEF jointed the Army Net. W6AAX is active in Army Net. W6BYR is installing 50-watt 'phone. W6CRF has a new 'phone. W6FUP has a nice crystal transmitter. W6EAD built a portable receiver.

Traffic: W6AJP 54, W6EAD 25, W6AAX 23, W6UO 6.

#### ROANOKE DIVISION

WEST VIRGINIA — SCM, C. S. Hoffmann, Jr., W8HD — W8OK, W8HD, W8MN, W8CZ, W8TI and W8EL make up the first A.A.R.S. Net to use crystal on one frequency, 3700 kc. W8OK is moving to old location, Anderson-Newcomb Co. W8GB leads state in traffic. W8BWK, W8CSF and W8ELO hope to take cruise with Navy Reservists. All ORS in Wheeling passed Amateur Class exams on RI's recent visit, W8CDV getting an Amateur Extra First. W8CHM, W8HI, W8LS and W8CXR have unlimited 'phone endorsements. W8AZD worked X2LN on 3.5 mc. Some experimenting with portable W8FJS was done by W8CDV and W8ELO while camping. W8BKG reports 56 mc. 'phones going strong. W8DJD is building MOPA. M8FFO is doing farming between QSOs! W8EJZ is experimenting with an electron coupled oscillating receiver. W8BTV, W8BOW and W8TI are wrestling with final exams. The SCM had for visitors during month W8DNX and W8IB. The SCM has new crystal set completed, using 3700 and 3620 kc. and would appreciate reports. New Hams reported: Wheeling, W8GHB; Moundsville, W8HBQ.

Traffic: W8GB 514, W8ATT 32, W8TI 25, W8DPO 23,

W8BWK 15, W8CA 15, W8CSF 15, W8ELO 12, W8EJZ 10, W8AZD 9, W8CKE 6, W8CDV 4, W8DJD 4, W8BKG 3, W8AKZ 7, W8FFO 1, W8HD 3.

VIRGINIA — SCM, R. N. Eubank, W3AAJ — Any ham or would-be ham in Virginia who is not getting Virginia Bulletin, write to SCM. W3CA has new outfit. W3AGY works early mornings. W3WO won 2nd prize in Virginia Contest. W3BAD visited SCM. W3AKZ, W3BNH, W3BIB, W3AOW, W3AZU, W3CCK and W3AZI send first traffic reports. W3BBE is off due to lack of power. W3AYB is new station at Bassetts. W3BPZ is active. W3ACN is QRL WLVA. W3BPE is awaiting license renewal. W3BSE is now c.c. W3BEV will be inactive for awhile. W3AHQ is making plans for American Legion Convention traffic and wants schedules. W3FZ is on 56 mc. W3AVR handled a "Missing Man" message. W3GY is going to rebuild. W3BRY is now OO. W3BJX has new 50 foot antenna poles. W3BZ is on 56 and 3.5 mc. W3RS is going back to Mass. W3CDW sends first report. W3OM is moving shack. W3AGH won 3rd prize in Virginia Contest. W3CAH added 50 W. to crystal. W3EJ wants ORS. W3AKN is W3AHW. W3ATY is Ex-KA1AF. W3BSB is QRL QSL. W3BAG and W3BWA report regularly. W3APT has nice crystal rig. W3AJA-W3AKN had visit from Dr. W8DMJ. W3APU is a real old timer. W3RL is with us after experiments. W3WX is now up at W3AOW. W3LY is active on 7 mc. W3BBS and W3FE are QRL school. W3NE and W3BPR are on 14, 7 and 3.5 mc. W3BAI is experimenting with 1.75 and 56-mc. 'phone. We are sorry to hear that W3BGS' wife is ill. W3BRA has SW3 receiver. W3HJ is now on 3.5 mc. W3CCU is moving to Wilmington, N. C. W3BUO's QRA is Norfolk. W3AUG is experimenting. W3BAN is a fine OO. W3WM moved shack. W3HL expects to move. W3MQ, our PB Supervisor, says 39 took exams at Richmond. W3ZU won Feb has Com'l 2nd ticket. W3AAJ is keeping schedules in Virginia. W3BEN visited SCM. W3FJ won 1st prize in Virginia Contest. W3GE has new Dynatron. W3BFZ is building portable rig. W3BSM had 56-mc. outfit at Club. W3BMN is building shack. W3CGR is on daily. W3QN helps club plenty. W3BKJ has crystal now. W3ADJ is on all day. W3AEW has low power. W3JT is active on 3560 c.c. W3AGW has c.c. on 3615 kc. W3CHE has bunch of ops. W3ALL is back on air. Traffic reports were received from the following: W3CXM, W3NT, W3BTM, W3JG, W3CHR, W3MT, W3BBA, W3BTR, W3AEI, W3ANM, W3BRY and W3AMB. Thanks for all the reports, fellows. Please keep them coming.

Traffic: W3AG 858, W3AAJ 347, W3CAH 218, W3YD 179, W3FJ 171, W3EJ 165, W3WO 155, W3AHQ 137, W3AZI 87, W3BNH 50, W3BAI 47, W3AKN 36, W3BUO 33, W3HJ 31, W3GE 29, W3ATY 25, W3BJX 24, W3ZU 22, W3FZ 20, W3AGY 15, W3BSB 15, W3ACN 14, W3AVR 12, W3CCK 11, W3BSM 11, W3GY 10, W3BWA 9, W3BAG 8, W3APT 8, W3AUG 7, W3BAD 6, W3AKZ 6, W3BMN 9, W3BUR 6, W3BAN 4, W3AJA 3, W3BIB 3, W3NE 3, W3WM 3, W3BZ 3, W3BPR 3, W3AZU 3, W3APU 2, W3RL 1, W3JG 1, W3AOW 1, W3HL 1, W3CHE 37, W3AMB 4, W3ANM 1, W3BRY 2, W3AEI 14, W3BTR 1, W3CXM 247, W3NT 68, W3BTM 4, W3CHR 1, W3MT 2, W3BBA 4, W3CFL 2.

NORTH CAROLINA — SCM, H. L. Caveness, W4DW — "A Report from Every North Carolina Amateur" is our slogan, fellows, and we have a few more reports this month than last. FB. Write our new Route Manager, W4AVT. He has some ideas that will be of value to you if you want to handle traffic and enjoy the fun with us. Grapevine telegraph rumors have it that there's a live bunch of hams in Charlotte and a FB club. Clubs also in Greensboro and Asheville. We understand that the Winston-Salem club has purchased some land on which to build a real club house. W4OG gives the dope each month on himself and W4BIU, W4ABT, W4RA, W4AHF, W4PA, W4ZN, W4IY, and W4IF. W4IY is adding crystal. The young OW at W4AIS is learning code. W4TS is on occasionally. W4VB worked some EAR's. W4TO is putting signals into DX territory. W3CCU has moved to Wilmington. W4ABO is using W4AEW's 75 watt c.c. transmitter. W4APL and W4AIW are interested in YLs. Influenza put W4MR in bed. We now have an Official Observer, W4TR, whom you may ask for your QRG. W4AVT built a push-pull transmitter for 14

mc. W4BCG is building a push-pull outfit. Five continents in 48 hours is W4ATS' record. The 3500-kc. 'phone at W4ACY is working after a fashion. A new ham in Greensboro is W4BEA. W4AAE, with his commercial ticket, expects to go places before long. W4ZB is back on the air. W4AAU and W4ALU are active. W4ADK is a new ham in High Point. A unit of the U.S.N.R. is in process of formation at Tarboro, headed by W4RE. W4AGF moved to 3550-kc. c.c. W4JR is busy at W5OC. W4AEH in Graham sends in his first report. W4BER is another new ham in Graham. W4AXZ is on 1750-kc. 'phone. W4BJY is a new ham in Asheville. W4MI has been working DX on 14 mc. A winning baseball team has been W4ZH's goal for the past month. W4ATC has closed down for the summer.

Traffic: W4AIS 165, W4TR 128, W4DW 76, W4JR 57, W4AVT 52, W4BCG 49, W4TO 29, W4AGD 22, W4ANU 21, W4AEH 12, W4AAE 11, W4AGF 10, W4VB 8, W4ACY 7, W4AOE 7, W4ALK 5, W4ATS 5, W4RE 5, W4IF 4, W4MR 4, W4RA 4, W4ABT 3, W4GA 3, W4OG 2, W4ADK 1.

### ROCKY MOUNTAIN DIVISION

**COLORADO** — Acting SCM, Artie D. Davis, W9BJN-W9ZZH — We are very sorry to report that our SCM, E. C. Stockman, has been very ill, but we are all thankful he is on the road to health again. W9AAB, our Director, attended the Board meeting in Hartford. W9GBQ has been tied up with work. W9EAM, W9EKK, W9EPC, W9JB and W9APR are holding up the Army Net. W9BQO is holding the heavy load of the Navy Net. Our Police radio station is manned by W9BXQ, Chief Op., Art Harrison, Fred Schirk and Joe Fury, all hams. W9FRP and W9CJJ are doing nice 56-mc. work. A new club has been in Denver for some time, known as the Colorado Experimenters Association. W9FCK, W9HPY are working plenty of 14-mc. DX. W9DSB is building a 14-mc. 'phone. W9CEX-CXG is on with MOPA. W9GNK keeps up traffic. W9CKO reports for the whole gang as follows: W9IFD-W9JBD is on 3500 kc. W9CRK, W9CKO and W9HZP want to try 56 mc. W9FRQ is building 14-mc. 'phone. W9DRQ is pushing a 50. W9HWR is on 3500 and 14,000-kc. 'phone. W9HPR-W9FQK is raising a nice bunch of hams. W9FYK, W9FQK and Chuck Mosier from Boulder visited W9CKO and W9JBD. W9YL, a Prof. at Boulder, is on 3500-kc. 'phone. W9DQD is on with low power. W9APZ is going the rounds with BCLs. W9EHC increased power to two '45s. W9CDE is going strong. W9HEP is on at Sedalia. W9EHZ has all the QRM. W9DNP is rebuilding. W9CWA complains about W9GNK's crystal outfit. W9BRZ says the wind took his beautiful Zepp for a trip. W9FPZ is going to work this summer. W9ESX moved. W9EJW is finishing his last year at college. W9BJN is making and breaking crystals.

Traffic: W9EAM 82, W9CWA 14, W9BRZ 4, W9FPZ 2, W9DNP 5, W9EHZ 95, W9CDE 7, W9EHC 2, W9APZ 3, W9DQD 2, W9GNK 49, W9CKO 1, W9BJN 2.

**UTAH-WYOMING** — SCM, C. R. Miller, W6DPJ-W6ZZZ — W7AWG is installing a dynamotor. Now that W6BTX has resigned as ORS his traffic total goes way up. Hl. W6DAM blew his receiver tubes. W6DEU joined the A.A.R.S. W6APM requests the gang watch for his portable, W6ZZAP. W7NY has been busy with work. W7ADF has a new 7-lb. YL. Not to be outdone, W7ACG has a new 8½ lb. YL op. Hl. W7BXS, W7AMU, W7BTE, W7ADF and W7ACG have blue tickets now. W7AMU is moving. W7BTE burned up his transformer. W7BXS keeps the early morning air hot. W7ADF assays Casper will probably have six new stations soon. W8AVW is going OK now. W6AHD gets out well on 3.5 mc. Nothing new at W6DPO. W6BSE has been working DX on 14 mc. W6DTB increase plate voltage.

Traffic: W6DPJ 118, W7AWG 75, W6BTX 64, W6DAM 32, W6DEU 14, W6APM 10, W7BXS 10, W7ADF 8, W6DPO 8, W6FAE 6, W7AMU 5, W6AHD 2, W7NY 2, W7BTE 1.

### SOUTHEASTERN DIVISION

**ALABAMA** — SCM, L. D. Elwell, W4KP — W4RS is high traffic man. W4AKM has a rather complex crystal arrangement. W4AG says being the only ham in his town is a bit lonesome. The new ham near Mobile is W4NU.

W4BDH has left 'phone for CW. Some traffic was handled by W4AP. Due to BCL interference W4APU is confined to 14 mc. W4AJY returns to Georgia Tech. The Alabama National Guard station, W4PAL, expects to handle more traffic during the summer encampment. W4BBA has gone to 3500 kc. QRM is hard on DX complains W4ADJ. The SCM was visited by W4ALA, W4VV and W4ASW. W4AHU's '45 is getting the DX. W4BAT's portable call is short, W4ZZAA. Hi. All VK districts have been contacted by W4AJP and W4AGI. YLitis has W4AYK QRL. W4AUP is headed for 56-mc. 'phone. A 50-watt c.c. is perking at W4APJ. W4DS has a nice traffic total. The chief engineer of WAPI, W4FI, wants some 56-mc. stations in Birmingham. KP says that less voltage means more tubes. Hi.

Traffic: W4RS 110, W4KP 84, W4AGI 21, W4DS 13, W4AP 11, W4BBA 7, W4APU 4, W4AZH 2, W4AWM 2, W4ADJ 2.

**WESTERN FLORIDA** — SCM, Eddie Collins, W4MS-W4ZZP. Route Manager, S. M. Douglas, W4ACB-W4PCN — New hams this month are W4BJF, De Funiak Springs; W4BMJ, Freeport; W4BKD, Marianna; W4BKQ, Pensacola. W4AUA has been doing FB with U.S.N.R. W4QR has been sick. W4ACB is having trouble with his crystal rig. W8BGX is getting acquainted with all the "YLe" in this Section. W4BCB has a FB 1932 DC signal. W4BMJ is getting out nicely. W4AXP went back to 3500 kc. W4AOO rules supreme on 1750 kc. W4AQY has been planning on trying a Zepp antenna. W4BJF promises to show us some real low power work. W4AGS-W4PCK has been stepping on it. W4KB reports keeping five daily schedules. W4AWJ and W4ADV are planning to move into Pensacola. W4ARV still pounds out with low power. W4ART and W4BGB is another brother station. W4BGA is rebuilding to push-pull. W4ASV-W4ZZW has already done so. W4ALJ-W4CV has been having trouble with his note. W4VR is changing over to push-pull. W4MX threatens to get on the air again. W4BKQ is being helped along by W4ALJ. W4QU has also been spending quite a bit of time getting W4BFD started out properly. W4QK is back on again. W4PDS is the portable call of W4AQY. W4AUW is pounding out some real signals. W4AUU has been carrying on some interesting experiments with antennas. There is a faint spark of life left in W4ASG. Hi. W4BKD has a push-pull rig. W4UW-W5NO is on a sea going tug at present. W4SZ is seen but not heard. W4HQ-W4PBW has been conducting some real FB U.S.N.R. drills on Sunday afternoons. W4ATN has been active on 14,000 kc. W4AXF is thinking of letting her call go. W4OE is kept busy. W4FV-W4ZZR is packing up to leave for Annapolis. W4AFI keeps things humming with his '52. W4ML keeps his mike hot. W3ADO has been transferred to the Naval air station for flight training. It's about time for W4ABJ to get home. W4BEW is busy at the W. U. office. W4MS-W4ZZP has moved to a new QRA, 1517 East Brainerd St., Pensacola. Please send your reports to that address from now on.

Traffic: W4AGS 11, W4KB 9, W4AQY 6, W4AXP 2, W4FV 27, W4ACB 10, W4QR 3, W4AUW 15, W4AUU 4, W4BFD 1, W4BGA 7, W4ML 3, W4AFT 8, W4ATN 16, W4UW 45, W4ARV 6, W4QU 14, W4ASV 9, W4ALJ 4, W4AUA 8, W4MS 23.

**EASTERN FLORIDA** — SCM, Ray Atkinson, W4NN — Flash! The Wouff-Hong Trophy is won by the "JAROCS" at Jacksonville. They were the first club to win the traffic contest for Florida clubs three times in succession. Congratulations, "JAROCS." Your SCM has moved to 329 East First St., Jacksonville. Please send all reports to this address. Who will offer to organize an All-Florida Net? W4GS leads in traffic. From Daytona Beach comes a report from W4VP. W4ASR and W4VP had to show the city's radio interference men some new tricks. W4BF is a new ham in Jacksonville. W4AMQ, W4DU, W4ACZ, W4ASQ, W4MF, W4UH, W4WS, W4BN and a host of others are active on 'phone. The Knights of the Kilocycles still have a real meeting every Sunday at 7:00 a.m. W4OT has the bugs out of his MOPA. W4AEM is again in Jacksonville. W4AZB is putting in a 250 watt. W4UX is using crystal. W4HY built a peachy AC receiver. W4BDN uses '10s in PP. W4BJS is a new station in Plant City. W4ZV and W4ZU have been very busy this month. The Plant City Radio Club has discontinued meetings until after school closes.

W4AKH and W4DE are active. W4AII was heard on the air again. W4EY reports traffic. W4BFR is busy training in the Jax Life Saving Corps. W4AGB is busy trying to keep W4NN from stealing all her transmitting apparatus. Hi.

Traffic: W4NN 147, W4GS 65, W4BDN 31, W4UX 30, W4AOT 33, W4AZB 22, W4AGB 15, W4HY 12, W4AKH 9, W4AEM 9, W4DE 8, W4VP 4, W4BFR 1, W4EY 28.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES-PORTORICO-VIRGIN ISLANDS — SCM, Chas. W. Davis, W4PM — Thanks for the SCM job, gang. I will do my part. Let's have some cooperation. SEND IN YOUR TRAFFIC REPORTS! Let's put this section up where it belongs! The SCM would like to have applications from acceptable stations for RM, OO, ORS and OBS. CM2WW reports increasing activity in Cuba. CM2XR has 14-mc. 'phone. CM2SV is on with MOPA. W4AAY won Augusta traffic contest. W4KV is on 3500 kc. W4AVR puts a good signal into Atlanta. The Atlanta Radio Club met with W4YC May 19 and is planning 56-mc. 'phone work.

Traffic: W4SM 74, W4AAY 49, W4SS 8, W4AZT 29, W4BW 7, W4MA 9, CM8AZ 20, CM2WW 6, W4PM 23.

#### WEST GULF DIVISION

OKLAHOMA — SCM, Emil Gisel, W5VQ — I wish to express my appreciation to members in the Oklahoma Section for my election as SCM. I will do my best to cooperate with you to make this section better each month. W5ALD heads the list with a fine total. W5OJ is QRL Army Amateur system. W5PP and W5AJO were favored with a visit from W9EDW. W5AA is rebuilding. W5ASQ took exam for Aeronautical radiophone. W5PZ is a new ham in Ponca City. W5BMS and W5ABK are active on 7 mc. W5ASW has a dynatron. The Key Clickers Club of Ponca City is taking extensive study of 56 mc. W5AVR promises more activity. W5BMU is playing with crystal. W5ALI is on crystal 'phone. W5BMT, W5AOW and W5AND are QRL School. W5AEL-W5BXD claims not a battery in the station, all a.c. W5ATB and W5AWG are building condenser mikes. W5BPM reports much QRN. W5AND got a QSL from RX1AA. W5BOE has been QRL school. W5VQ has been rebuilding. W5BQA is trying to get crystal to work. W5KX is getting out FB on 'phone. W5BIW is playing with television. W5ARU has a new baby. Congrats, OM. Let's have some more reports, fellows, and help put this Section up towards the top.

Traffic: W5ALD 899, W5OJ 120, W5BPM 19, W5AA 9, W5ASQ 8, W5AVR 2, W5BMT 2, W5AND 1, W5AUA 1, W5BMU 141.

NEW MEXICO — SCM, Jerry Quinn, W5AUW — W5AOD still leads in traffic. W5AUW has been using portable call W5ZZQ. W5BVC has a new 3500-kc. rig. W5AGP reports for the first time. W5AAX is a new ham in Albuquerque. W5AOP has acquired a new bug. W5AOE is studying for a pink ticket. W5MP is a new ham in Clovis. W5ASR is QRL due to pickup in the grocery business. ExW5AGU and W5AOH were visitors at the SCM's shack.

Traffic: W5AOD 508, W5ZZQ 239, W5AUW 153, W5BVC 38, W5AGP 31, W5AAX 19, W5AOP 18, W5AOE 9, W5MP 7, W5BUY 6.

SOUTHERN TEXAS — SCM H. C. Sherrod, Jr., W5ZG — Let's get together, men, and get behind the Route Managers. To maintain an organization, cooperation is imperative. Communicate with the nearest RM, keep a schedule or two, and handle some traffic. College Station: W5BWB has been having good luck with VKs lately. W5RBZ is planning to be on shortly. W5AEB is on occasionally. Kerrville: W5BKE, Route Manager, is working on 7010 kc. Bay City: W5BZO is using a 211-D in a T.P.T.G. circuit. W5ABH worked OA4U. W5CAZ operates W5BZO or W5ABH. W5FT is inactive. W5CHO is a newcomer. El Paso: W5NT is quite busy with OO work. W5DE, Route Manager, is trying to get a trunk line through to El Paso. W5AAQ is out of town. W5AFN sends Official Broadcasts at eight p.m. MST. W5BAD is suffering from school QRN. W5BCD still has no antenna. It is with regret that we learn of the illness of the mother of W5BNJ. W5BOD is rebuilding. W5BQU has been visiting W8DHR and W6DFE in Arizona. W5CCQ uses a couple of '45s in Push Pull. W5ES gave away his '45 push-pull rig. W5GI will be on one end of the 56-mc. 100-mile tests planned by the El Paso gang.

W5CGD, Ex-W5BO, is on again. W5CFI, Ex-W5NB, is another of the old timers who has returned. W5BKM is using a '10. Austin: Route Manager, W5CT, sends Official Broadcasts daily except Sunday on 7295 kc. at 5:30 p.m. Galveston: W5BTK is on 7000 kc. regularly. W5AUX operates on 7128-kc. c.c. W5CDH is on consistently. The Galveston Amateur Radio Club is rapidly approaching the completion of the station at the clubrooms. Houston: W5LP has been handling a little traffic. W5EK is a newcomer. W5YG turns in a good sized traffic total due to the operation of the station as a feature of the biennial engineering show held at the school. The Houston Amateur Radio Club rendered valuable assistance to W5YG in organizing relay routes for this traffic. W5BHO works the Army Net on 3591 kc. on Mondays. W5EI is second operator at W5BHO. W5ON is now using a pair of '10s. W5QW. Ex W5BOC, is rebuilding. W5BRC has moved to Houston. W5CBV is rebuilding for c.c. W5AFV is getting out well. W5BGG is on 1750-kc. 'phone. W5AMX is on CW. W5AQH is heard intermittently. Corpus Christi: W5MS works on 7294 kc. W5BZW is a new OW. W5ALY is on 3500 kc. W5TO will shortly be crystal controlled. W5HP is a newcomer. W5CHL has just received his license. W5ZN finds time to pound brass. W5QO is working in the 7000-kc. band. W5AB has been transferred to the M.S. Santa Barbara which runs between New York and the West Coast of South America. W5BRY will be on shortly. W5FH is working VK and ZL. W5AQK and W5BKG are building a super het. W5BXX is the Corpus Christi Radio Club. Brownsville: W5PR sends in a nice report. W5BIG is the farthest south amateur radio station on the United States Mainland. W5BQI uses '50 tubes in his push pull rig. San Antonio: Muller reports for himself and Smith at W5AUC. W5PF is a new amateur in the Alamo City. W5MN works on 3660 kc. for the Army Net. W5CCF-W5BWM comes through with the usual chatty report. W5BQH has a crystal rig. It is with great regret that we learn of the death of Mrs. Downs, mother of W5CS. W5YL is handling traffic.

Traffic: W5DS 48, W5YL 20, W5MN 26, W5PF 4, W5BKG 10, W5MS 41, W5BHO 20, W5LP 50, W5YG 710, W5CT 114, W5AEC 20, W5AOT 11, W5BQU 7, W5CAU 4, W5DE 12, W5GI 5, W5CGD 2, W5BWB 7, W5BKE 20.

NORTHERN TEXAS — SCM, Roy Lee Taylor, W5RJ — Many thanks, gang, for the wonderful support shown in the recent and much talked of SCM race. I will endeavor in the future to make even a better job out of this position than I have in the past. W5BKH heads the list with a fine report. W5JA is busy with Naval Reserve. W5AUL is changing to crystal. W5WW is off to Ft. Sam Houston for active training in the Army. W5BJX advises the W.F.A.R.C. and Radio Station KGKO of Wichita Falls are having a series of broadcasts each Saturday afternoon at 3 p.m. CST for the benefit of amateurs. KGKO's frequency is 570 kc. Crystal Control. W5AYX and W5BAH are on 3.5 mc. The meeting nights of the WFARC has been changed to the 1st and 3rd Tuesday of each month. W5CFW is a new call at W.F. W5CEE is a new ham at Electra. W5AYX ran up his total in U.S.N.R. work. W5BII will be on more now that school is out. W5AJG is using blocked grid keying. He reports the passing away of our old friend W5FC, Maurice Hardy of Dallas. Our sympathy is extended Mr. Hardy's bereaved folks. W5BCW is now on 3.5 mc. W5AVF reports a new crystal job under construction. W5IT has a schedule with W2AIX at Schenectady, N. Y. W5ANU now uses remote control. W5BIV says the depression has finally put him off the air. W5BTU is working CW 100%. W5ARV is simply running away from himself with DX. W5AZC succeeded in getting the Akron in touch with the American Airways station in Dallas when the Akron ran into inclement weather while over West Texas. FB. W5AAO is DNC of 2nd District 8th Corps Area A.A.R.S. W5QA took his portable to Camp Tonkawa. W5CAM reports his house burnt up Friday, May 13th. W5AXT is planning on an '03A job. Two new stations will be active in Dallas after June 7th, namely W5CHJ and W5CHK owned by F. R. Kennedy, who is now using W5CHK, portable at Rice Institute. W5SH is starting his 14-mc. 'phone rig. W5HY has given up his ORS. Too bad, OM, we hate to see you give up the FB work you have carried on. W5RJ is making several changes in the transmitter.

Traffic: W5BKH 116, W5JA 85, W5AUL 80, W5WW 50, W5AYX 83, W5BJX 16, W5BII 63, W5AJG 30, W5BCW 24, W5AYF 15, W5IT 14, W5ANU 12, W5BIV 9, W5BTU 9, W5ARV 7, W5AZC 5, W5AAO 3, W5QA 45, W5SH 3, W5NW 50.

## CANADA

### MARITIME DIVISION

**NOVA SCOTIA** — SCM, A. M. Crowell, VE1DQ — VE1BV furnishes all service stations in his town with A.R.R.L. message blanks for tourist traffic. VE1DI handled a nice bunch. VE1DM worked two-way 'phone with PY. VE1DW reports for the Cape Breton gang. VE1DL fell off the roof while putting up his new 14-mc. antenna. VE1DR says things very quiet. VE1AB visited VE1DF. New man in Glace Bay is VE1CZ. VE1BR is going strong on 14 mc. VE1DQ rebuilt crystal. VE1AX is kicking out well. VE1CW says things have stumped. VE1DH climbed (?) to 14 mc. VE1ER sends in nice total. VE1AE reports summer depression taking hold. VE1AU is working DX on 14 mc. VE1CL, the old 'phone man, expects to get new ticket soon and move from 1.75 mc. to 3.5 mc. VE1BQ reports the R. I. having just made a visit to St. Stephen. VE1DC motored to Halifax from Moncton. VE1CX is on 3.5. VE1BO keeps Fredrickton on the map. VE1CY is chasing DX.

Traffic: VE1BV 239, VE1ER 89, VE1AE 78, VE1DI 73, VE1DC 11, VE1DP 10, VE1DM 3, VE1CX 2, VE1DW 1.

**NEWFOUNDLAND** — Acting SCM, James Moore, Jr., V08AW — V08WG and V08Z are doing very fine work. V08O has a nice PDC signal and a good fist. V08LC is having trouble with BCLs. V08MC has a schedule on 28 mc. with a station in Chicago. V08K complains of poor location. V08AW handled a few.

Traffic: V08Z 133, V08K 15, V08LC 22, V08MC 3, V08AW 7.

### ONTARIO DIVISION

**ONTARIO** — SCM, H. W. Bishop, VE3HB — VE3GT left for the North to operate VE9DG for the Ontario Forestry Branch. VE3IR and VE3AU are taking over his schedules. VE3DG is back on the air. VE3AQ is home from Varsity. VE3IG worked G2XH with his pair of '45s. VE3HV has good results on 1.75 mc. 'phone. VE3DD has left for the QFB. VE3BV worked ZL and VK on 7 mc. VE3BQ has a new crystal job. VE3AD paid a visit to VE3GT. VE3DB is QRMed by golf. VE3DW has some luck on 7 mc. VE3AP is a newcomer at Niagara Falls. VE3SA has been coaching new hams. VE3QB will soon be home. VE3TT is QRL exams. VE3HM is QRMed by the farm. VE3IR is shielding his MOPA and power supply with the ice box. Hi. VE3GK says all traffic was handled by the OW this month. VE3HA reports a new ham, VE3DX, at Ft. William. VE3HU is on with a 75 watt. VE3FW is on 14-mc. 'phone. VE3FW wants to increase power. VE3GS is very enthusiastic about 56-mc. 'phone. VE3FQ will be on soon. VE3FS is dying out. VE3IP is a new ham. VE3RA pounds away on 7 and 14 mc. VE3CH did a little dental work for VE3HA. VE3GD is putting a new call on with high power. VE3ZZ has a new receiver. VE3HB has been sick.

Traffic: VE3GT 527, VE3GK 46, VE3AD 40, VE3IR 31, VE3HB 25, VE3DW 23, VE3HV 17, VE3TT 10, VE3IG 7, VE3AQ 6, VE3DB 5, VE3BV 5, VE3DG 3, VE3HM 2, VE3HA 1.

### QUEBEC DIVISION

**QUEBEC** — SCM, Alphy L. Blais, VE2AC — The Canadian General Manager, VE2BE, went to Hartford for the Directors' meeting. VE2BG is working most of the 'phone stations in Canada on 3.5 mc. VE2BE and VE2HV have their share of luck. VE2BB had his first EI and RX contacts this month. VE2AH, W. H. Oke, is a newcomer. VE2CL has returned to the air. VE2CA is experimenting. VE2EL, VE2DI and VE2BI are plugging away. VE2DW is planning MOPA. Heard on the air regularly are VE2AB, VE2DL and VE2EB. The SCM, VE2AC, is on 7120 kc. until new crystals arrive when he will use 'phone and CW on 3520 kc. Shortly we expect to announce an all VE2 QSO contest with prizes for the winners. Suggestions are welcome.

Traffic: VE2BB 65, VE2BG 22, VE2DW 3, VE2AC 5.

### VANALTA DIVISION

**ALBERTA** — SCM, C. H. Harris, VE4HM — VE4DT retains the high traffic total for this Section. VE4EI and the OW are sure missed. VE4FJ and VE4JK were visitors to the Edmonton gang. VE4EA hooked a ZL. VE4FR gets good reports on 14 mc. VE4IZ hears plenty of DX. VE4HM is getting ready for 'phone. VE4HA worked Peru. VE4BV is working on crystal transmitter. VE4EW and VE4BJ are heard occasionally. VE4EC expects to go north again this summer. VE4DQ reports traffic. VE4GM is putting out a fine 'phone signal. VE4HQ is the most consistent 'phone heard. VE4JI is building receivers. VE4GD is on 3.5 mc. 'phone and 7-mc. CW. Every member of the Alberta gang is urged to report to the SCM each month on the 16th.

Traffic: VE4DT 54, VE4HM 23, VE4DQ 19, VE4HQ 10, VE4FJ 2.

**BRITISH COLUMBIA** — SCM, J. K. Cavalsky, VE5AL — VE5HP deserves credit for the number of schedules held. VE5FF has added power. VE5AM is putting in crystal. VE5FG was a big shot in the recent DX contest. VE5AC is working east coast with low power on 3.5 mc. VE5BR holds all his schedules on 1.7 and 3.5 mc. VE5HR wants to know how to get traffic. VE5AL has crystal. VE5EC got a job! VE5BC holds hope of a model transmitter. VE5DX is on every time he gets in port. The Skeena Amateur Radio Club has a soft ball team. VE5GT wants a schedule with Vancouver.

Traffic: VE5HP 128, VE5HR 8, VE5FG 45, VE5AG 48, VE5AL 30, VE5FF 15, VE5AC 5, VE5EC 22, VE5DV 1, VE5BR 15, VE5GT 8.

### PRAIRIE DIVISION

**MANITOBA** — SCM, J. L. Green, VE4BQ — VE4AC visited several of the gang. VE4DJ worked five Aussies and a K6. Ex-VE4EY-2EY has returned from the east; his new call is VE4FU. VE4IS is QRL. VE4FT worked LU-CM-K5-TI-ZP-ZN and PY. VE4IU is moving near VE4DJ. VE3AW was a visitor at VE4BQ. VE4GG will be on 7 mc. soon. VE4GC is on 3.5 mc. using QRP 'phone. VE4AG is QRL a la garden. VE4BQ was QSO G6, ON4 and ZN2. VE4DK is linking up with a new North-South trunk line. VE4DL is heard on 14 mc. VE4GB is taking his outfit to Churchill this summer.

Traffic: VE4AC 21, VE4DJ 9, VE4DK 8, VE4FT 2, VE4BQ 2.

**SASKATCHEWAN** — SCM, W. J. Pickering, VE4FC — VE4EL suggests: Get on 3.5 mc. Saturday and Sunday afternoons 1 to 6 p.m. for local QSOs. Log weather conditions and results for 4 or 6 week-ends and report to VE4EL by August 15th. VE4ES has two new 50-foot sticks. VE4HX has rebuilt. VE4IE expects to be on 3.5-mc. 'phone soon. VE4CN is plugging along. VE4BB rebuilt his receiver. VE4GR says, "How about schedules?" VE4BF built an MOPA. VE4EM changed to TPTG. VE4FD blew his power pack. VE4FH is mourning transformer and condensers. VE4EJ is looking for W6s. VE4JV has BCL trouble. VE4AT is thinking of moving to 3.5 mc.

Traffic: VE4BB 27, VE4GR 11, VE4EL 6.

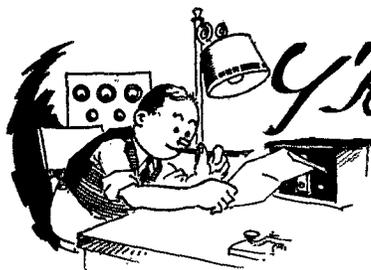
### LATE AND ADDITIONAL REPORTS

VE3CA reports four licensed stations in Brockville, Ont.: VE3CA, VE3JE, VE3EJ, VE3AM, W8DI of Cleveland, Ohio, reports someone illegally using his call on 3.5 mc. VE5EZ, station of the Victoria Short Wave Club, is going strong with a pair of '10s in push-pull.

Traffic: VE3CA 2.

### Traffic Briefs

W9DZD says, "Just out of curiosity the other evening I listened to each station from 7000 to 7300 kc. without once looking back. There were exactly fifty (50) stations with raw a.c.; both half and full wave rectification; all sorts of modulated d.c.; wobbles; and plenty of thumps and key clicks. There were thirty-two (32) stations with decent d.c. signals. I'm coming on with a d.c. crystal job and will join 'Pre-historic Signal Reporters' Club.' Yes, and I'll build me a dummy antenna. It will keep me from getting just as bad a black eye."



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

## Ten-Meter 'Phone?

433 E. Gregory Blvd., Kansas City, Mo.  
Editor, QST:

The writer has just finished listening to some round-table 'phone work in which five, twenty and eighty-meter 'phone all played a part. It was indeed interesting to listen to W2TP, W9LD, W9DRD and the others all working break in with two- and three-way conversation coming from each of the stations involved. These boys are making history, and this most unusual experiment of to-day may be quite commonplace within a year or so.

This type of work goes to show what can be done when conscientious experimenters get together. The thing that impressed me most of all, however, was the ability to do things in a hurry and to make changes rapidly when needed. This was, no doubt, due to the use of the radio telephone and the advantage of quicker and faster communication when handled by voice.

All of which brings up the subject in mind. What has happened to the ten-meter amateur band? Is it lifeless and has interest waned? True enough, we do know that for DX it is highly erratic, i.e., insofar as the sky wave is concerned. But how much do we actually know about the ground wave at this frequency? It is quite possible that it would behave similarly to five meters. Why not, since some of the properties of the five-meter ground wave actually show up at twenty meters. Maybe the ten-meter ground wave offers some remarkable possibilities for short-range communication, with some real DX thrown in occasionally when conditions are right and the sky wave comes back to earth.

We might learn a lot of interesting things if only more amateurs were on this frequency, even though they were working primarily with the idea in mind of developing the short-distance communication possibilities. Even though development was along this line, if a large number of amateurs were working in this band, we would soon find out the possibilities of this band even for DX. A few hundred amateurs could do in a short time what it has taken a few faithful pioneers years to accomplish. It is very apparent that if we desire this band to be commonly used

and developed interest and activity on it must be increased.

I do not believe that telegraph communication over a short distance is attractive to the average amateur. Somehow or other we have learned to think of the code type of communication as more adapted for longer range transmission. This is readily understood. Code communication, say across a town, is slow and inefficient when compared to land or radio telephone. 'Phone work with friends and other amateurs is very fascinating, especially over short distances where it is reliable and gives good signal strength.

The recent activity on five-meter 'phone is indicative of the intense interest shown in developing this frequency. Yet in reviewing past accounts of history making five-meter experimental work we find that had it not been for amateur 'phone this band would not be as well known as it is to-day. This proves that radiophone, even over minor distances, is extremely interesting.

If ten meters is to be developed we need more amateurs interested in this frequency, more amateurs actually using it. Apparently there is little inducement for the average amateur to work on this band. It seems that for DX work it is too erratic — so little code work has been done over ranges from one to one hundred miles that we know very little of the properties of the ground wave. The writer has actually listened for days at this frequency and not heard a signal. All of which means one of two things — either the band is no good for regular DX or nobody is on it. Either fact shows that we are going at the band in the wrong way.

With these conditions in mind would it not be a wise idea to allow amateur 'phones to operate in all or a part of this band? Certainly from the present activity at this frequency it is apparent that nobody would be interfered with, since hardly anybody is on this band.

Amateur radio telephone could use a few more kilocycles but the big problem has been from where to get it. Giving a slice of the ten-meter band to the 'phones might be a happy solution for their problems.

It is quite possible that if ten-meter 'phone were granted many amateurs would immediately

# Values that Prove Our Slogan of 36 Years—"M. & H. Sell It for Less"

New Martin Vibroplex's in original cartons. . . . . \$12.00  
 National SW3 AC or DC wired by factory less coils and tubes. . . . . \$20.88  
 National Power pack for above AB5880. . . . . \$20.29  
 National SW5 DC for either 2 or 6 volt tubes wired by factory. . . . . \$38.22  
 We carry a complete line of coils for National receivers from 9 to 2000 meters.

## Flechthelm Transmitting Condensers

Type TC100. 1000 Volts DC working voltage 1 MFD. . . . .	\$1.88
Type TC200. 1000 Volts DC working voltage 2 MFD. . . . .	\$3.25
Type TC400. 1000 Volts DC working voltage 4 MFD. . . . .	\$5.50
Type T100. 1500 Volts DC working voltage 1 MFD. . . . .	\$2.25
Type T200. 1500 Volts DC working voltage 2 MFD. . . . .	\$4.00
Type T400. 1500 Volts DC working voltage 4 MFD. . . . .	\$7.00
Type TH100. 2000 Volts DC working voltage 1 MFD. . . . .	\$5.00
Type TH200. 2000 Volts DC working voltage 2 MFD. . . . .	\$7.50
Type TH400. 2000 Volts DC working voltage 4 MFD. . . . .	\$12.50
503A. 50 watt oscillator, RF amplifier or general purpose tube. . . . .	\$15.00
545. 50 watt audio frequency amplifier or modulator tube. . . . .	\$15.00
511. 50 watt audio or radio frequency amplifier also general purpose. . . . .	\$15.00
510. 15 watt oscillator or RF power amplifier an oversized '10 type. . . . .	\$4.20
566. Mercury vapor rectifiers real high quality tubes long life. . . . .	\$4.00

## Cardwell Transmitting Condensers

<i>Midway size</i>		<i>Midway Receiving size</i>		<i>Regular size Xmitting</i>	
408B — .000022 MFD	\$1.46	401B — .000026 MFD	\$1.18	T183 — .00011	\$6.86
409B — .000035 MFD	\$1.57	402B — .00005 MFD	\$1.23	T199 — .00033	\$6.86
410B — .00005 MFD	\$1.80	403B — .00007 MFD	\$1.29	147B — .00044	\$6.86
411B — .00007 MFD	\$2.02	404B — .000105 MFD	\$1.35	123B — .00048	\$3.43
412B — .0001 MFD	\$2.39	405B — .00015 MFD	\$1.40	141B — .00025	\$2.91
413B — .00015 MFD	\$3.08	406B — .00026 MFD	\$1.54	137B — .00096	\$4.12
		407B — .000365 MFD	\$1.78	156B — .0005	\$4.80

New Type REL 50 watt sockets Isolantite bases. . . . . \$1.60  
 New REL Vernier dial with micrometer readings and magnifying glass. . . . . \$7.35  
 New REL 5 Meter transmitter type No. 297. . . . . \$27.75  
 New REL 5 Meter receiver type No. 296. . . . . \$20.50  
 New Western Union telegraph hand key 1/8th inch Tungsten contacts. . . . . \$0.95  
 Bliley Crystals, over 150 Crystals to select from. . . . . \$5.50  
 Holder for above crystals. . . . . \$2.50

## M. & H. Unusual filament transformers all filament windings on one transformer

Type 2210. 2 1/2V at 10 amps, 7 1/2V, 7 1/2V at 3 amperes each winding. . . . .	\$6.48
Type 2211. 2 1/2V at 10 amps, and three 7 1/2V at 3 amps each winding. . . . .	\$7.05
Type 2212. 2 1/2V at 10 amps, and 7 1/2V at 3 amperes. . . . .	\$5.88
Type 2213. 2 1/2V at 10 amps, 7 1/2V at 3 amps, and 10 volts at 7 amps. . . . .	\$7.05
Type 2214. 2 1/2V at 10 amps, 7 1/2V, 7 1/2V at 3 amps and 10V at 7 amps. . . . .	\$9.42
Type 2215. 2 1/2V at 10 amps, 2 1/2V at 10 amps and 7 1/2V at 3 amps. . . . .	\$6.48

## M. & H. Plate Supply Transformers Heavy Duty

Type 2115. 550 volts each side center tap at 200 milliamperes. . . . .	\$7.64
Type 2116. 550 and 750 volts each side center at 200 milliamperes. . . . .	\$9.41
Type 2117. 750 and 1000 volts each side center at 300 milliamperes. . . . .	\$11.76
Type 2118. 1000 and 1500 volts each side center at 300 milliamperes. . . . .	\$14.11
Type 2119. 1500 and 2000 volts each side center at 300 milliamperes. . . . .	\$17.10
Type 2120. 2000 and 3000 volts each side center at 500 milliamperes. . . . .	\$39.20
Type 2250. 500 and 1000 volts each side of center tap at 200 milliamperes. . . . .	\$10.58
Type 2251. 500 and 1000 volts each side of center tap at 600 milliamperes. . . . .	\$22.35
Type 2252. 500, 1000 and 2000 volts on each side center at 300 milliamperes. . . . .	\$37.62
Type 2253. 500, 1000 and 2000 volts on each side center at 600 milliamperes. . . . .	\$39.98
Type 2254. 500, 1000, 2000 and 3000 volts each side center at 300 milliamperes. . . . .	\$43.51
Type 2255. 500, 1000, 2000 and 3000 volts each side center at 600 milliamperes. . . . .	\$47.04

WE MAKE NUMEROUS OTHER TYPES OF TRANSFORMERS. WRITE FOR QUOTATIONS.  
 ALL TRANSFORMERS ARE GUARANTEED FOR FIVE YEARS.  
 THEY ARE REAL HE MAN JOBS.

36 Years  
of  
Service

**M. & H. SPORTING  
GOODS CO.**  
512 MARKET STREET PHILADELPHIA

Specialists  
in Radio  
Equipment

# Jewell Radio Company

**POWER AMPLIFIERS PACKS SUPPLIES A SPECIALTY**

Exclusive Eastern Distributors for  
**PURADYNE PRODUCTS**

Reg. U. S. Pat. Office

## Buy the Best!! It Pays!!

After years of experience in making transformers, choke coils, condensers of the highest quality and the most careful workmanship; PURADYNE has developed a new line by incorporating features learned by studying the needs of the laboratory, the radio amateur, the radio transmitting station, and the commercial application of the vacuum tubes.

The PURADYNE Power Transformers are designed for continuous operation at full load. The insulation test at a potential of 10,000 volts insures satisfactory operation under all possible conditions.

No.	Out Put Voltage	Filament Voltages	Watts	Price
80	2500-0-2500	-----	850	\$12.50
	1500-0-1500			
	1000-0-1000			
50	1000-0-1000	-----	500	9.00
	1500-0-1500			
	1000-0-1000			
40	1000-0-1000	-----	400	7.50
10	750-0-750	7 1/2 V. c.t.-7 1/2 V. c.t.	325	5.00
10A	600-0-600	7 1/2 V. c.t.-7 1/2 V. c.t.	200	4.00

Shielded with stand-off insulators:  
No. 80.....\$14.00 No. 40.....\$9.00  
No. 50.....10.50 No. 10.....6.00

PURADYNE filament transformers, 10,000V. insulation in metal cases with stand-off insulators: All guaranteed for six months against any defects.

### ALL CENTERS APPLIED:

2 1/2 V. — 12 amps for 866's.....	\$3.50
2-2 1/2 V. c.t. 10 amps each winding, for four 866's.....	4.50
5V. — 20 amps for 872's.....	6.00
7 1/2 V. — 7 amps for 210s, 250s, 281s.....	3.50
7 1/2 V. c.t. at 6 amps each.....	4.50
10V. — 7 1/2 amps for 203As, 211s, 852s, 860s, 845s.....	4.00
12V. — 10 amps for 204As, 212Ds.....	4.50
14V. — 12 amps.....	5.50

PURADYNE microphone transformers, single button \$1.75  
— double button \$3.50. Mike stands, table model \$2.00,  
floor model..... \$4.00

PURADYNE 30 Henry 125 mil. choke 260 ohms d.c. resistance..... 1.00

PURADYNE 250 mil. choke 30 Henrys 110 ohms d.c. resistance in metal case with stand-off insulators..... 3.00

PURADYNE 30 Henry 250 mil. double chokes..... 5.00

PURADYNE 500 mil. choke 30 Henrys 110 ohms d.c. resistance in metal case with stand-off insulators..... 7.50

PURADYNE guaranteed transmitting filter condensers, metal cased with stand-off insulators. All condensers rated at a continuous working voltage:

Capacity	1500V.	1500V.	2000V.	3000V.	4000V.
1 Mfd.	\$1.25	\$2.00	\$3.00	\$6.00	\$10.00
2 Mfd.	2.00	3.00	5.00	11.00	18.00
3 Mfd.	2.50	4.25	6.50	18.00	27.00
4 Mfd.	3.25	5.50	9.00	22.00	36.00

PURADYNE 200 Watt center tapped transmitting grid-leaks in metal cases with stand-off insulators:

5,000 Ohms.....	\$1.75	20,000 Ohms.....	\$2.50
10,000 Ohms.....	2.00	30,000 Ohms.....	2.75
15,000 Ohms.....	2.25	50,000 Ohms.....	3.75

PURADYNE Portable Microphone and Pre-amplifier for Public Address Systems and Transmitting Phone Work. All compactly installed in neat metal case..... \$9.50

NOTE: JEWELL carries the most complete line of power amplifiers and PA Systems in the city. Send for literature.

PURADYNE heavy duty 50 watt sockets, porcelain base, metal shell, double contacts. Very Special..... 1.00

PURADYNE Mercury Vapor AAA Heavy Duty 866 Rectifying Tubes..... 3.50

### SUPER SPECIALS!

SANGAMO 5000V. Condensers .002..... .75

MURDOCK 15,000V. Condensers .002..... 1.50

AMERTRAN 250 P.P. POWER TRANSFORMERS 700-0-700 Volts 7 1/2 V. c.t., 7 1/2 V. c.t., 225 MILS. 325 WATTS..... 4.75

SPLITDORF Fil. Transformers 1 1/2 V., 2 1/2 V., 7 1/2 V. c.t., 7 1/2 V. c.t. tapped primary..... 1.95

300-0-300 Trans. with 5V. winding, socket mounted on top of trans. for 280 tube..... 1.00

THORDARSON Fil. Trans. 1 1/2 V., 2 1/2 V., 5V..... 1.25

W. E. Shielded three wire microphone cable per foot..... .06

MERSHON electrolytic Condensers, metal cases, 8 Mfd. 450 Volts..... .45

MAGNAVOX single button carbon microphones..... .75

AMERTRAN T. 250 RESISTORS 41,000 OHMS..... 1.25

Voltage Dividers, 18,000 ohms for 245 P.P. 5 Taps..... .35

W. E. 21AA — 1 Mfd. Condenser..... .25

We Can Supply Anything — At Jewell's Prices — Ask For It. Write for Catalogue. It is free. Include postage with all orders and 20% deposit against C.O.D. Shipments

# Jewell Radio Company

New Address: 110 Chambers St., N. Y. City

Phone Barclay 7-8937

Dept. S

seek to use these new channels for new fields of experimentation and relief from the present 'phone QRM. And as mentioned before, even though these experiments were concentrated upon short distances, the facts about the sky wave would also come to light if only the proper number of amateurs were actively engaged in the work.

As a closing thought would it not be best that, since this band is still in such an experimental state, to get all types of experimenters work in it until it has been determined for what particular use the band is best fitted? Instead of having our ten-meter band still the one of which we know the least, let us by proper and intensive experimentation classify it for that service best adapted to it.

— Everett L. Dillard, W9BKO

## To Central Division Members

1375 Franklin Ave., Columbus, Ohio

Editor, QST:

I desire to take this opportunity to thank each and every A.R.R.L. member of the good old Central Division for their letters of recommendations and suggestions regarding the annual Board of Directors meeting of the A.R.R.L. Although it is impossible to answer even a small part of the hundreds received, they nevertheless have proved very helpful in preparation for the meeting.

If there are any members of the Central Division who desire information on any of the matters covered at the annual meeting, I will be pleased to hear from them.

— Loren G. Windom, W8GZ-W8ZG,  
Director, Central Division

## Can Anybody Help?

847 Prospect Ave., N. W., Warren, Ohio

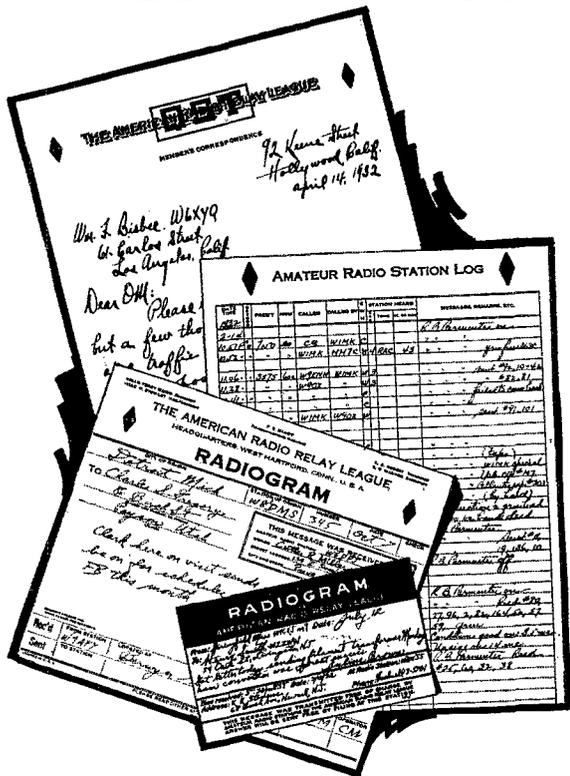
Editor, QST:

Listening on 14 mc., Sunday, May 1st, I noticed an unusual thing. The day was rather cloudy but now and then the sun would come out and as it did I noticed a loud smooth a.c. hum in the receiver. When a cloud would pass over the sun the hum would disappear entirely. At first I was using an indoor antenna; then later I hooked on the Zepp antenna used for transmitting and when the sun shown brightly the hum was quite a bit louder than with the indoor antenna, although the strength of signals did not increase. When the sun was hidden by a cloud the hum disappeared entirely. I watched this performance for a period of three hours and never once did it fail. However, this is the first time I have ever noticed such action.

Can someone give an explanation of this?

— J. R. Magee, W3CNC-W3GEN

# THE TRIMMINGS



Here are the TRIMMINGS you need to be a real, full-fledged, blown-in-the-bottle AMATEUR

## OFFICIAL A.R.R.L. MESSAGE BLANKS

The proper and most convenient form. Designed by the A.R.R.L. Communications Department to make speedy and accurate handling easy. A great aid to good operating practices which reflect credit on your station. Bond paper, size  $8\frac{1}{2} \times 7\frac{1}{4}$ . Put up in pads of 100 sheets. One pad 35c or three pads for \$1.00. Postpaid.

## OFFICIAL A.R.R.L. LOG BOOK

A well-kept log is an essential part of a well-run station. This book, with 39 pages for operating records and 39 blank pages for miscellaneous notes, forms a complete history of your station — your most valuable radio record. Contains list of Q signals, etc. Size  $8\frac{1}{2} \times 10\frac{3}{4}$ , bond paper, bound in heavy paper covers. One book 40c or three books for \$1.00. Postpaid.

## MEMBER'S CORRESPONDENCE STATIONERY

Write your radio letters on this A.R.R.L. stationery. It identifies you. Used by most old-timers and prominent amateurs. Excellently lithographed on  $8\frac{1}{2} \times 11$  bond paper. Now using heavier 20-lb. stock instead of 16-lb. as heretofore. 100 sheets — 50c; 250 sheets — \$1.00; 500 sheets — \$1.75. Postpaid.

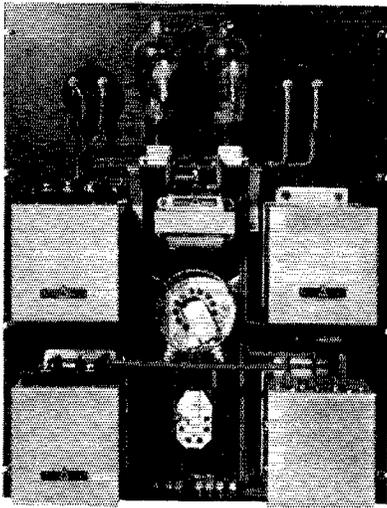
## MESSAGE DELIVERY CARDS

Neatest, simplest way to deliver a message by mail. Good looking and easy to use. Saves writing an explanation of method in which message was handled. On U. S. stamped postals, 2c each; on plain cards (for Canada, etc.) 1c each. Postpaid.

# THE AMERICAN RADIO RELAY LEAGUE

WEST HARTFORD, CONNECTICUT

Say You Saw It in QST — It Identifies You and Helps QST



## NEW DELTA POWER SUPPLY UNIT FOR THE YANKEE NETWORK

This is one of several complete rectifiers made by Delta for the Yankee Network. Input 110-220 v. 60 cycle single phase. Output 350 v. 0.2 amps. D.C. and 135 v. 0.001 amps. D.C., ripple 60 millivolts which is 0.017%. Designed for mounting on standard relay rack.

Delta makes similar equipment up to 3 phase units with 5500 v. output, 1.25 amps. D.C. for excitation of high powered transmitters; also others with copper oxide rectifiers for replacing batteries for amplifier filament current and other applications requiring smooth, low voltage D.C.

QUOTATIONS PROMPTLY FURNISHED. Advise D.C. requirements and permissible ripple or applied load.

NEW 20-PAGE DELTA CATALOGUE. Describes standard Delta Vacuum Tube Transformers and Chokes. Contains valuable technical data and information on complete power supply circuits, filters, rectifier voltage regulation, discussion of ripple and description of duplex rectifier system.

Sent free on receipt of coupon below.

F. S. Dellenbaugh, Jr.  
Pres. &  
Chief Engr.



G. E. M. Bertram  
Treas. &  
Gen. Mgr.

*Send in This Coupon Today*

**DELTA MANUFACTURING COMPANY**  
39 Osborne Street, Cambridge, Massachusetts

Gentlemen:

Please send me your new Bulletin No. 200-A on Vacuum Tube Transformers and Chokes.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

76 QST 紙上ニテ御覽ニナリシ事ヲ仰セラレタシ一然時ハ讀者ヲ證明シQSTヲ補助致シ候

Snobs

Tallapoosa, Ga.

Editor, *QST*:

There seems to be a growing tendency among some of the higher-powered, broadcast-station-quality type of radio-phone stations to evidence contempt for their less fortunate brethren who are not financially able to incorporate every up-to-date feature used by them. We are not all able to purchase every little gadget that means the difference between "ham" and "broadcast" quality; and I think the struggling, poverty-ridden amateur who is able to get fair results from equipment composed largely of miscellaneous junk, bought piece by piece over a period of years from various mail-order houses, or manufactured himself from raw material, deserves more credit for fair performance than the purse-proud 'phone man who is able to buy everything new—perhaps everything already assembled—from one manufacturer or dealer, and put out a perfectly modulated carrier.

Of late there has been a plenitude of this supercilious, snobbish, better-than-thou attitude. Some of the remarks have been made to me, others I have merely overheard. My station belongs to that class that "just grew up"—a piece bought here and there since 1925; something else traded for; another part rescued from the junk pile. The input to the final stage is about 100 watts. My microphone is of the single-button type. I use crystal control, a buffer stage and my carrier is unquestionably d.c. A few nights ago I was QSO with a Yankee 'phone station with an R9 signal and modulation that was as near perfect as anything I ever heard. He told me that he was receiving me 100%, but asked me if I didn't know that single-button mikes were out of style, and cheerfully informed me that no operator who had any regard for the other fellow's ears would use "one of the damn things." "Throw that tinny thing out the window," he said, sneeringly, "and get one that will reproduce frequencies from 15 to 7,000 cycles, like mine. I paid sixty-eight bucks for it."

Night before last I heard a "nine" talking to a "four." The "nine" was coming in like nobody's business, his signal perfectly modulated, and he boasted that he was using a one-kilowatt modulator tube, a condenser mike, and several intricate stages of speech amplification. The "four" came back and timidly inventoried his meager equipment. When the "nine" boomed in again, he uttered a nasty laugh and said, "Well, I don't see how you can get out at all, with that dinky outfit. I am putting more watts into my speech amplifier than your whole outfit uses. This is a real station, up here. Why, I have worked the Pacific Coast 38 times this season, and received four reception reports from Australia. Your carrier is weak, your modulation punk and you're interfering with W9-So-and-So, with whom I have a sked in a few minutes. Please keep that thing off the air until I work W9-So-and-So."

And this thing of being ordered off the air,

# UNCLE DAVE

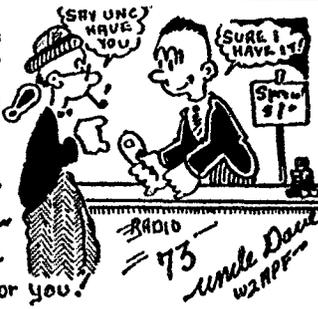
356 Broadway

Albany New York

We buy, sell and trade Ham stuff!

24 HOUR SERVICE SHIP ANY PLACE

If we have not got it we will get it for you!



- 2 New W.E. condenser mike heads, sealed cartons, each. \$39.00
- 1 RCA at. . . . . 35.00
- National SW5 AC wired with power pack, list \$124.00, net. . . . . 54.00
- UX 250's, each \$.65; 15-watt 210's, each. . . . . 1.20
- Unmounted manufacturers' model relays, follow 40 wpm. . . . . 59
- G.E. 0-500 milliammeters, used, \$1.50; new. . . . . 2.75
- Presto completing recording outfit and playback, special. . . . . 32.50
- Pilot Universal Super Wasp. . . . . 32.50
- All Universal microphones in stock
- Write for lowest prices
- Shielded microphone transformer, single button \$1.95; double button. . . . . 2.95
- RCA UX-200A, UX-240, SPECIAL, each \$.75; Recto-bulb K3 \$5.90; K81. . . . . 3.40
- Silver Marshall Round the World, four. . . . . 17.50
- National 4-tube Thrill box. . . . . 17.50
- Weston 0-50 mill meter \$3.75; 0-1 R.F. amp meter. . . . . 6.00
- W.E. 211E tubes \$3.89, Roller Smither 0-4 amps. R.F. meter. . . . . 2.89
- Arco 5-meter receivers \$17.95; in kit form. . . . . 12.00
- Arco 5-meter transmitter \$8.95; in kit form. . . . . 5.00
- D.C. Dynamic Speaker. . . . . 2.75
- Spaldorf 1 mfd. 1000 v. metal cased cond. . . . . 4.45
- Signal Corps one-half inch spark coils, heavy duty, complete. . . . . 2.10
- Signal Corps Army Bugs. . . . . 8.75
- Mercury Vapor 866 heavy duty, each. . . . . 1.79
- Standoff insulators, 75c per doz.; 50-watt sockets. . . . . 75
- Heavy duty 2 1/2 volt 10 amp. fil. trans. for 866. . . . . 1.69
- W.E. Polarized 1000 ohm D.C. Relays 3 mills at 3 volts, adj. shielded, will follow 40 wpm. . . . . 1.95
- Calibrated monitors with batteries, tube, etc. . . . . 9.35
- Cal. wavemeters \$6.25; 40-meter xtals. . . . . 8.50
- 80 or 160 meter xtals, guar. with adj. bakelite holder, complete. . . . . 4.50
- Telexplex with three rolls tape \$13.00; 5-dial omnigraphs. . . . . 6.50
- Arco 1000-1500 volts each side C.T. 375 watts. . . . . 8.00

- Arco 1500-2000 volts each side C.T. 850 watts. . . . . 11.00
- ARCO TRANSMITTING CONDENSERS
- One year unconditionally guaranteed
- 1500 volt 2000 volt 3000 volt 3500 volt
- 1 mfd. \$1.75 1 mfd. \$3.50 1 mfd. \$7.25 1 mfd. \$8.00
- 2 mfd. 3.00 2 mfd. 6.00 2 mfd. 10.50 2 mfd. 12.00
- 4 mfd. 4.50 4 mfd. 10.00 4 mfd. 18.75 4 mfd. 22.00
- Very sturdily built, finest material, all cont. working d.c. voltage.
- 600 volt 800 volt 1000 volt
- 1 mfd. \$.20 1 mfd. \$.30 1 mfd. \$.45
- 2 mfd. .35 2 mfd. .50 2 mfd. .70
- 3.5 mfd. .35 3.5 mfd. .50 3.5 mfd. .70
- 4 mfd. .40 4.5 mfd. .60 4 mfd. 1.00
- The above are unmounted but sealed in paraffin.
- Guaranteed 90 days
- 2500 volts M.G. sets, 3 unit. . . . . \$50.00
- Pilot A.C. Super Wasp, slightly used, with pack. . . . . 26.50
- New Pilot Wasp D.C. kit. . . . . 21.00
- Your present phone crystals exchanged for new bands. . . . . 2.00
- Your pet crystal ground to any higher frequency. . . . . 2.00
- Arco finished and oscillating crystal blanks, guar. . . . . 2.00
- Arco unfinished blanks, guar. . . . . 1.20
- Arco bakelite dustproof adjustable crystal holder. . . . . .89
- Arco, same as above, but plug-in crystal holder. . . . . 1.15
- Arco comm. precis. plug-in xtal holder, beautiful job (G.R. plugs). . . . . 1.50
- New Samson Pam 16-17 amplifiers \$25.00; Samson Pam 19-20. . . . . 46.50
- Extra heavy duty MV 866 tubes, 1000 hrs. uncond. guar. . . . . 3.35
- Arco socket for 212A or D tubes. . . . . 3.50
- ARCO FILAMENT TRANSFORMERS
- 2 1/2-volt 10 amp. . . . . \$2.25 10-volt 6 1/2 amp. \$2.25
- 5-volt 10 amp. . . . . 2.25 11-volt 6 1/2 amp. 2.25
- 7 1/2-volt 7 amp. . . . . 2.25 12-volt 3 1/2 amp. 2.25
- Duraluminum .001" and .002" thick, SPECIAL 80c per 6" square for condenser mikes.
- Arco fully mtd. 1500-2500 volts each side of C.T. 850 w. \$14.20
- 25,000 ohm 100-watt bleeders. . . . . .79

INCLUDE POSTAGE WITH ALL ORDERS AND 20% DEPOSIT AGAINST C.O.D. SHIPMENTS. We carry everything for the Ham in stock. More foreign trade solicited. We also carry a tremendous stock of used parts, etc. Write in on special requirements and we shall be pleased to take care of you.

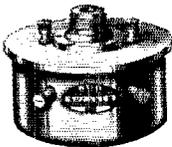
## UNCLE DAVE'S RADIO SHACK

356 Broadway

Long Distance Phone 4-5746

ALBANY, NEW YORK

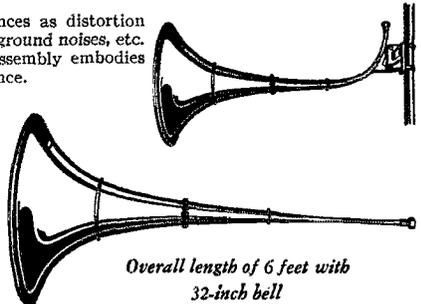
## DEPENDABLE - PERMANENT - EFFICIENT



Improve your present equipment with a BUD SPEAKER

BUD LOUD SPEAKERS eliminate such disturbances as distortion under pressure, overheating, unbalanced tone, background noises, etc. The new and exclusive diaphragm and voice coil assembly embodies every essential for positive and permanent performance.

BUD ALUMINUM TRUMPET HORNS cannot be over-estimated. Clear, bell-like and astonishingly realistic in tone — light in weight and free from the damages of exposure and atmospheric changes. Ideal for in- and out-door P. A. installations. Write for descriptive literature.



Overall length of 6 feet with 32-inch bell

### BUD SPEAKER COMPANY

625 Board of Trade Building

Toledo, Ohio, U. S. A.

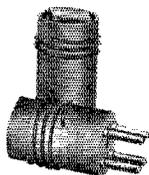
Say You Saw It in QST — It Identifies You and Helps QST



# NEW NATIONAL

## Parts Designed Especially For Ultra H. F. Work

In addition to the parts shown below, National Company, Inc., makes a full line of Transmitting Condensers, Dials, and other parts for every Amateur use. Write for new 16-page 1932 Catalogue just printed, using the coupon below.



**MIDGET H. F.  
R-39 COIL FORMS**

Give stability, maintain calibration and insure maximum efficiency in ultra H. F. circuits. Made of R-39, the mica-bound Bakelite low-loss dielectric, developed by Radio Frequency Laboratories especially for NATIONAL CO.



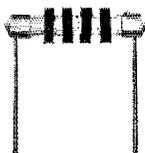
**TYPE SEU  
DOUBLE SPACED  
CONDENSER**

Isolantite insulation, extremely heavy 270° plates, double spaced, insulated front bearing, constant low impedance pigtail. Standard size 25 mmf. For ultra H. F. tuning or neutralizing in low power transmitters.



**NATIONAL ISOLANTITE  
SOCKETS**

Reduce losses to a minimum — suitable for either standard or sub-panel mounting. Made in standard 4, 5 and 6-prong styles as well as in special 6-prong for NATIONAL Standard R-39 coils.



**TYPE NO. 100 R. F. CHOKE**  
The No. 100 R. F. Choke is designed especially for high frequency receivers. Extremely low distributed capacity. Consists of four narrow spaced sections, each universal wound, on Isolantite form. Supplied with stiff leads for mounting but fits in grid-leak clips if desired.

D. C. Resistance 50 ohms. Distributed Capacity 1. mmf. Inductance 2½ millihenries. Will carry 125 milliamps without heating.

# NATIONAL PRECISION RADIO PARTS

**NATIONAL COMPANY, INC.**

61 Sherman Street, Malden, Massachusetts

Gentlemen: Please send me your new 16-page 1932 Catalogue.

Name .....

Address .....

Q7-32

either politely or otherwise, is not at all uncommon.

Once, I listened in on a QSO between two "nines"; Big "Nine" and Little "Nine." Big "Nine" had such a doggoned good station that the Little "Nine" asked for advice. "I'm using a double-button mike," Little "Nine" said, "but I don't get such good quality. I have three stages of speech amplification, and a gain control on the first stage. But no matter where I set the dial, there seems to be some distortion. Can you tell me what's wrong?" Big "Nine" came back and said something like this: "How in heck do you expect to get decent quality with no more control over your amplifier than that? My gosh, you fellows who don't know the first principles of audio amplification ought to confine your experiments to the 160-meter band. I haven't time to give you a free lesson; besides, you wouldn't understand me if I did. W9-So-and-So signing off."

I wonder if Big "Nine" could have told Little "Nine" anything he didn't already know. I have contacted Big "Nine" myself a few times, and know that he can't receive five words per, and that he bought his 'phone station already assembled less than a year ago, and his license is only a year old.

Another time I heard a "nine" giving a poor little non-crystal-controlled 'phone operator the works. The self-excited fellow called CQ — and drew the "nine," who promptly launched into the most insulting harangue I ever listened to. He told the self-excited fellow that he was forty kilocycles out of the band, on the c.w. side; that he was deliberately outside the band; that he had a terrible a.c. hum on his carrier and that his modulation was the worst he had ever heard; also that his frequency wobbled 10 to 20 kilocycles during his CQ. He added, after a five-minute tongue lashing, that he was going to write the offender up to QST, and possibly to the R.I. He used a few cuss words in a nice, refined way; he referred to the radio fraternity as a whole as "you damned amateurs." This fellow has gone to school quite a lot; his vocabulary is remarkable. Possibly he knows more words of a stinging, supercilious, derogatory, sneering, insulting nature than any other radio operator in the United States. Perfect, polished English, he used — but it couldn't have taken any of the sting out of his denunciation. Of course, the little fellow had no business outside the 'phone band — but neither did the other have any right to insult him. It wouldn't have been so bad, however, if the "nine" had stuck to the truth. The little fellow was not 40 kilocycles outside the 'phone band; there was no noticeable hum on his carrier, and his modulation was better than the average. His frequency did not shift more than a few cycles. I was QSO with him a few nights later, and he told me that he had received letters and cards from half a dozen stations in his district condemning the snobbish "nine." One of the writers owned a dynatron frequency meter calibrated by the R.L.'s office, and he found that the offender was only 5

# NEVER BEFORE, SUCH VALUE!

COMPLETE POWER SUPPLY PARTS for 5- to 30-WATT TRANSMITTER

WILL deliver 150 M.A. at 550 volts of pure D.C. plate supply completely filtered with full wave rectification, including filament current for one or two 210 or 510 tubes.

Economical means to equip your multi-stage transmitter with individual power supply for each stage.

Brand new with simple wiring instructions. Also ready to operate as a high grade wired audio power amplifier, with dynamic speaker. Complete unit built by KOLSTER.

All parts are of excellent design and conservatively rated. Mounted on a rugged steel chassis 11 x 19". Ample space is available for a complete Push-pull R.F. circuit when the speaker and audio transformers have been removed.

## HERE ARE THE PARTS YOU RECEIVE WHICH CONSTITUTE THE COMPLETE ASSEMBLY

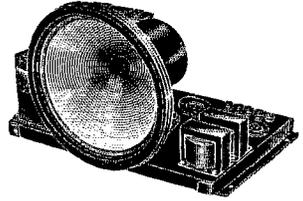
- 1 — KOLSTER Power Trans. 1150 V. C.T. and Fil. for two 281's and extra winding for two 210's C.T.
- 1 — DUBILIER Condenser Block, total capacity 11¼ mfd.
- 1 — KOLSTER 18 Henry Filter Choke
- 1 — WARD LEONARD Voltage Divider and Bleeder Resistor
- 5 — EBY Binding Posts
- 1 — 11 x 19 inch Steel Chassis
- 1 — KOLSTER Interstage Audio Transformer, plate to grid
- 1 — KOLSTER Output to Speaker Matching Transformer
- 1 — KOLSTER 10" Heavy Duty Auditorium type Dynamic Speaker

Have you received our FREE Big 136-page Wholesale Radio Catalogue? It's full of amateur items at low prices. Send for your copy today

**American Sales Company** 44 WEST 18TH STREET  
NEW YORK CITY

The oldest Amateur Supply House, since 1919

Model K5



**\$5.95**

COMPLETE

## LOW RANGE FUSES

- Littelfuses for Instruments: Amps.: 1/100, 1/32, 1/16 — 20c ea. 1/8, 1/4, 3/8, 1/2 — 15c ea. 1, 2 — 10c ea. For milliammeters, ham rectifiers, etc. Use 1/8 for radio B circuits. High Voltage Littelfuses: 1000, 5000, 10,000 volt ranges in 1/16, 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1½, 2 amps. Renewable. Price 35c to \$1.25 ea. Write for instructive bulletin #35.

● LITTELFUSE LABS. 1772 Wilson Ave., Chicago

"Quicker than a Short circuit" **LITTELFUSES**



## Transformers — Chokes

All Types Made to Order  
One Year Guarantee

World's Pioneer Radio Mfrs.  
Lowest Prices in Ham History

**MIGNON**

Transformers and Condensers  
735 Main St., Buffalo, N. Y., U. S. A.

## Compare These Values . . . Special Introductory Prices in "Odeon's New Supply Department"

Ward-Leonard Heavy Duty Resistors rated 100 Watts 5-6-7 Ohms	\$ .30
Aerovox vitreous enameled Resistors rated 15 Watts, all sizes	.39
Midget Power Transformer 700V CT 350V each side, 65 amperes	1.65
Victor Input and Output Transformer in 1 case	1.25
Atwater-Kent Audio Transformer, ratio 3-1	.75
Philco Input Transformer	.75
Philco Output Transformer	.95
SPECIAL — RCA-Victor hand microphone	2.25
GENUINE WESTERN ELECTRIC 30 Henry Chokes, 100 Mills	1.50
Westinghouse 15 Henry, 40 Mil, 500 Ohm Filter Chokes	.35
Victor 30 Henry, 125 Mil Chokes	.95
Majestic Double 30 Henry, 100 Mil Chokes	.95
Single R.F. Chokes 40 and 85 Millihenrys	.15
Second & Third I.F. stage tightly coupled	.35
Acme push back wire, 25 ft. coils	.25
Cutler Hammer long neck toggle switches	.35
Heavy Duty 75 Watt Soldering Iron	1.00
Super-Het I.F. Trans. Coils 1st stage loosely coupled	.45
Genuine Western Electric 250 Volt Condensers, 1 Mfd \$ .39, 2 Mfd .59	
Odeon — RCA 1000 volt Fully guaranteed Filter condensers.	
1 MFD \$ .39    2 MFD \$ .59    4 MFD \$ .95	
Odeon High grade 866 Filament Transformer (Compare)	3.95
2 Odeon Heavy Duty 866 tubes with filament transformer	9.95
2 Odeon Regular 866 tubes with filament transformer	8.45

## REMEMBER ?

We were first to offer quality 866 type tubes at a fair price then others followed. When good 866 tubes can be sold for lower prices we will never hesitate to do so.

ODEON'S quality 866 **\$2.45**  
Guaranteed for 90 days

ODEON'S Genuine Heavy Duty 866 **\$3.95**  
Guaranteed for six months

## ODEON'S New 888

Has met with tremendous response and approval.

"THE BIG LITTLE TUBE"

Half Wave Mercury Vapor Rectifier		
Fil. volts	Fil. amps.	
2.5	2.0	<b>\$2.00</b> Each
Plate volts	Plate amps.	
7500	.3	

Special Dealer Quantity Discount

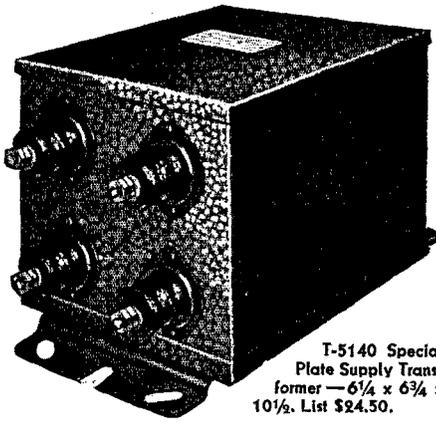
20% With Order — Balance Shipped C. O. D.

Send Postage or Express Charges

Mail Orders to:

30 CLINTON STREET **ODEON MANUFACTURING CO.** NEWARK, N. J., U. S. A.

Say You Saw It in QST — It Identifies You and Helps QST



T-5140 Special  
Plate Supply Trans-  
former — 6¼ x 6¾ x  
10½. List \$24.50.

# DO YOU REALIZE

THE IMPORTANCE OF  
ADEQUATE POWER SUPPLY



For Class B operation **THORDARSON** has developed a special and entirely new transformer No. T-5140 (illustrated above) for use with 210's. This unit has practically a linear output characteristic, an exclusive feature. And since the power output is greatly limited by the regulation of the power supply you need this unit for satisfactory results. And to improve the quality of your transmission **THORDARSON** offers T-5100 and T-5101 special coupling transformers to make a perfect hook-up.

Consistent coast-to-coast records with 210 tubes have been made with **THORDARSON** apparatus. Let our engineers work with you. No obligation. Thordarson Electric Manufacturing Company, 500 West Huron Street, Chicago, Illinois.



kilocycles out of the band. And the poor wretch mailed his last cent to a crystal-grinder, ordering a crystal. He was out of a job, and couldn't afford the crystal. He told me that he had been operating a 'phone for four years, and this was his first time to get outside the band. He'd simply made a mistake in calibrating a new frequency meter, and had played too close to the edge of the band.

Amateur radio is amateur radio — not a snobbish clique of rich men's sons able to buy the best, nor a group of radio engineers who know everything about the subject and never make a technical error. I have more respect for the more-or-less haywire outfit that performs creditably in spite of defects and limitations than I have for the commercial-looking job that can't help but perform efficiently. I have more of a brotherly feeling for the poverty-stricken ham who "gets by" with inferior equipment until forced by absolute necessity to sacrifice a new pair of shoes or an overcoat in order to replace a burned-out tube or filter condenser, than I have for the fellow who speaks nonchalantly of his having just ordered five hundred dollars worth of new and up-to-the-minute equipment from RCA or Westinghouse.

Cut out the snobbishness — it is neither good operating practice nor good sportsmanship.

— *Randal Julian Carnes, W4QZ*

## That "DX Hour"

117 Springfield Park Rd.,  
Chelmsford, Essex, Eng.

Editor, *QST*:

I have just re-read that letter from W4ABR headed "The DX Hour," in February, 1932, *QST*, and I would like to thank him heartily, and also ZU6A, for hitting the proverbial nail a QSA whack on the "flat-top."

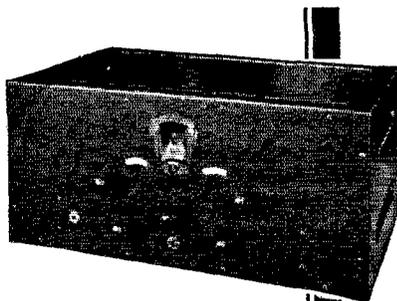
Seriously, I think that a pre-arranged hour or two each Saturday and Sunday when inter-W QSO's on 7 and 14 mc. would be banned would surprise a lot of the W boys! Lately, I have been logging the W's on 7 mc. from 2300 G.M.T. onwards at week-ends, all QSO each other, and usually in neighboring states. The point is that nearly all are QSA4 to 5, lots are R6 and 7, and not a few can be copied on the speaker R8 — this on straight detector and one audio! That's fine, but it would be a lot more gratifying if some of them would give an ear to the G's that call them frantically by the hour!

The other night, when the W4's, 3's, 2's and others were waking my brother up (he was sleeping in the same room) I called 'em by the page-full. Not a QSO! In desperation I went back at a rapid-fire CQ from K4AAN. Believe it or not, he OK'd that call with QSA5 R6 d.c. for my log! That proves my 7-mc. sigs, like lots more G's, do get over the Pond.

Well, how about it fellows? The boys over here sure would appreciate the scheme.

# COMET 20,000 to 1,500 K. C.

NEW Custom-Built "PRO"  
Hammarlund A. C.  
PROFESSIONAL Superheterodyne



Handsome walnut ventilated cabinet. "PRO" Power-Amplifier Unit, including dynamic speaker, built to match the receiver. A team that yanks 'em in.

**H**IGH-FREQUENCY globe-girdler that has set tongues a'wagging. Ship operators, airport and broadcast engineers, police and "Hams" who know their stuff admit that it outperforms even their specially-designed pets.

Eight tubes. Humless. Low noise level. Hair-splitting selectivity. Band-spread easy tuning system. Long-wave oscillator locates phone signals and puts snap into C.W. Quiet "227" output. Phone jack, speaker and external amplifier connections. Mail coupon for 16-page folder of complete details.

HENGER-SELTZER CO., Pacific Coast Representatives  
711 E. 14th Street, Los Angeles, Cal.  
1264 Folsom Street, San Francisco, Cal.

HAMMARLUND-ROBERTS, INC.  
424 W. 33rd St., New York, N. Y.

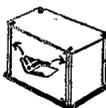
Please send 16-page folder describing COMET "PRO" and "PRO" Power-Amplifier.

Name.....

Address.....

Q-7

For Better Radio  
**Hammarlund**  
PRECISION  
PRODUCTS



### ALUMINUM BOX SHIELDS

Genuine "ALCOA" stock, Silverdip finish  
Phonograph Needle test prods.

5 x 9 x 6 ..... \$1.75

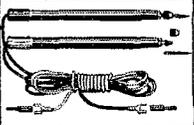
5 x 5 x 5 Shield.. \$1.00

7 x 7 x 9 Frequency meter shield..... \$2.50

Always sharp pointed using Phonograph needle

des to puncture insulation, corrosion, etc. \$1.00 a pair.

We specialize in radio parts exclusively.  
BLAN, The Radio Man, Inc.  
Dept. Q7 89 Cortlandt St., N. Y. C.



### EXPERIMENTAL RADIO

(255 pages, 168 figures, 128 experiments.)

By R. R. Ramsey, Prof. of Physics, Ind. Univ. The experimenter's manual: Measurements, Tests, Calibrations, with ordinary radio and physical apparatus. "Measure and know."

### FUNDAMENTALS OF RADIO

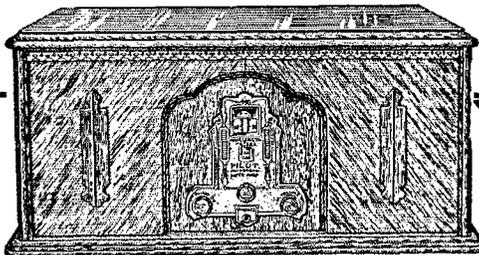
(372 pages, 402 figures.)

Modern radio explained with a minimum of thematic radio. "You find it in Ramsey's." Experimental, \$2.75. Fundamentals, \$3.50 postpaid.

RAMSEY PUBLISHING CO.  
Bloomington Indiana

## ACT QUICK—GET BIG BARGAIN!

Universal Super Wasp  
PILOT A. C.



While They Last—ONLY

Comes in Kit Form About  
35% Assembled and  
Wired—Get Thrill of  
Finishing Yourself!

**\$28<sup>95</sup>**

Snap up this unusual bargain! Get thrill of finishing set yourself. Easy to complete in 3 evenings with few simple hand tools. Power Transformer, Filter Chokes, Condenser Block and Audio Transformers already mounted in place. Entire Coil Assembly completely wired at factory. All parts factory prepared and packed; and go together without trouble. Operates with any Magnetic or A. C. Dynamic Speaker. Tubes required: two 224, one 227, two 245, one 280.

**Cabinet, as shown, included**  
Gets Ship Calling Waves — Sweeps whole wide spectrum between 15 and 650 meters. Its coverage of ship calling waves thrills thousands of ex-operators and amateurs who like to hear a little good operating as a change from the C Q parties or amateur bands. Radio signals will never be lacking on Universal. Get this bargain! They won't last long. So order today!

**25%** with Order  
Bal. Shipped C.O.D.

No Plug-In Coils — 15 to 650 Meters by the Turn of a Knob!

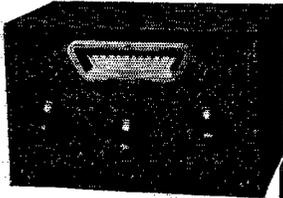
**FREE**—  
Write for Our New "HOT SHOT" BARGAIN CATALOG!

BURSTEIN-APPLEBEE CO., 1408 McGee St., Kansas City, Mo.  
"The House of a Million Parts"

# A KNOCKOUT!!

## Royal Short Wave Receiver

### Screen Grid Power Pentode



ROYAL MODEL RP  
List Price \$25.00

Letters from our customers verify RECEPTION OF ALL CONTINENTS with amazing volume! Using only two of the new 2 volt tubes this remarkable receiver represents the height of economy without any sacrifice of efficiency. Sturdily built on a heavy metal chassis. High ratio, full vision vernier dial makes tuning exceptionally easy. The "Regular" model covers from 14 to 200 meters. The "Ham" covers the 20, 40, and 80 meter bands with a wide spread. (State choice when ordering.)

Also in KIT FORM with complete instructions \$11.95

Special Price \$14.95

Set of Matched Tubes . . . . . \$2.55

Full sized Burgess Batteries . . . . . \$5.45

SET COMPLETE \$21.75

Guaranteed to Give Better Results than Others Selling for Higher Prices!

## 5-METER RECEIVER

An improved, up-to-date three tube super-regenerative model guaranteed to give superior results. Uses the new 6 volt tubes. Power pentode output. Full vision dial. All aluminum chassis. Requires 6 volt filament and 135 volt plate supply. Automatic C bias.

Model RE \$17.95 Kit \$12.95

## PUSH-PULL XMITTER

A compact, highly efficient 56 Mc transmitter. Only 10" x 6". Uses 8 ft. antenna. Provision is made for use as phone transmitter. Any UX tubes up to 210's may be used. Highest grade parts such as Cardwell Condensers, Isolantite sockets, vernier dial, etc., insure best results.

Model TE \$11.95 Kit \$7.45

SEND FOR FREE CATALOG

"Everything in Radio"

## JULY SUPER-SPECIALS

- THORDARSON Type T-3773 Power Transformer. Delivers 1100 volts at 150 MA, 7 1/2 volt — 4 Amp, 7 1/2 Volt — 4 Amp, and 2 1/2 Volt at 7 amps. All center-tapped. Shielded with leads to terminal board. 200 Watts. 9 lbs. . . . . \$2.95
- BOSCH Power Supply. Delivers 500 volts DC at 120 MA and 7 1/2 volts CT for two 210's. Tapped primary. Uses two 281's. Metal base. 22 lbs. . . . . \$6.45
- Brand new CUNNINGHAM CX-350. One to a customer. While they last! . . . . . \$2.45
- DEFOREST 27's and 45's . . . . . \$4.4c
- First Grade specially tested 281 and 250 Tubes. Guaranteed for 90 days. RCA licensed . . . . . \$1.59
- FRESHMAN Power Transformer. 375 Volts and two 7 1/2 V. CT windings. 125 watt. Compound filled case. 7 1/2 lbs. . . . . \$9.5c
- Special Filament Transformers. Completely mounted in neat metal cases. All windings Center-tapped. Insulated for 2,000 volts. . . . . \$1.40
- 2 1/2 volts at 4 amps. . . . . \$1.10
- 2 1/2 volts at 10 amps. and 2 1/2 volts at 4 amps. . . . . \$1.75
- 7 1/2 volts at 3 amps. and 7 1/2 volts at 3 amps. . . . . \$1.95
- ELKON (Genuine) Bone dry Electrolytic Condensers. 500 volt peak. Metal case with mounting clamp. 8 Mid. 49c Eight for . . . . . \$3.60
- THORDARSON double choke. Two 30' Henry, 150 MA power chokes in a metal case. 7 lbs. . . . . \$1.95
- AMERTRAN POWER BLOCK. 1200 volt transformer with filament windings and two 25 Henry, 150 MA chokes. (See our ad June QST) . . . . . \$6.45

20% Deposit required with all Orders

VISIT OUR NEW SALES ROOMS WHEN IN TOWN!

# HARRISON RADIO CO.

142 Liberty St. Dept. T-7 N. Y. City

Anyone like a QSO sked with G5RV on 7 or 14 mc. any Saturday or Sunday?

Cheerio and 73, QSK.

— R. L. Varney, G5RV

## "CQFX"

Sacramento, Cal.

Editor, QST:

I can contain myself no longer, so I'm going to bust loose. It seems that every time I let out a CQ for DX, either a "9" or "4" comes back. It happens invariably and I'm getting tired of it. If I want a "W," I let out a plain CQ, but when I CQ DX, I don't want to be bothered by W's coming back and spoiling my chances of hearing some real DX. This may sound rather high-hatty, but it's the truth. I can work W's anytime I want them, but not foreigners. Of course I realize that a 6 may be good DX for easterners or even 9's, but out here on the coast no W is considered DX.

Hence the following suggestion: Why not use "FX" instead of "DX" when contact outside the United States is desired. We have WX meaning weather, PX meaning press, and DX meaning distance. Why not FX for "foreign"? Of course DX can still be used for work in the U. S. if desired. Personally, I'm going to try FX. I don't know how it will go, but here's hoping.

— Leon M. Becker, W6AID

## Another Favoring the "DX Hour"

410 N. Green St., Tupelo, Miss.

Editor, QST:

In regard to the idea submitted by Mr. Herrick Brown, W4ABR, in the February issue of QST, I think nothing could be better. Having received about a gross of QST's, this idea is about the best thing I have seen regarding "A DX Hour."

As to Mr. Miller's letter in the May issue, I personally believe it could be accomplished, after a while. It is true that all the fellows would not observe the rules at first, but after a short period of time and, too, seeing the possibilities of non-interrupted foreign QSO's, the balance would see what they were missing and obey its purpose.

I hardly think a fellow has to be a DX hound to enjoy a good rag-chew with a distant station. We all like some foreign contacts, and a good time set aside each week on the 14- and 7-mc. bands would allow those who do not have the time for special hours to do a little international work, as well as allowing surer traffic handling between W and foreign countries.

All in all it's only a suggestion that comments arise from and could only be accomplished by the help of all, but still it's a pretty good idea at that. I'm sure that foreign stations would like to know that once a week they would have a chance to

# QST HAS BACK-COPY VALUE

In the ham-ad section of March QST \$12.00 was offered for a back copy. The offer was for the very first issue of QST (and how rare it is!) but all back copies are valuable. Moral: You should have a binder for each twelve issues — and the yearly index. You'll like the new binder, too.

A Dupont fabrikoid material of waterproof and oilproof imitation leather in a rich wine color, which matches the color of your present binders. Instead of metal wires, it has well-designed strong metal strips to conveniently place your copies in the binder — 13 such strips, too — 12 for the yearly supply of QST and one for your QST index. It doesn't cost any more either.

Holds 12 issues of QST and index  
\$1.50 each, postpaid



## AMERICAN RADIO RELAY LEAGUE

38 LaSalle Road, Hartford, Conn.

## The early bird catches the worm—and the ham-ad

Many amateurs tell us they are always too late to take advantage of bargain apparatus offered in the Ham-ad section of QST. Why? Generally because such gear is quickly taken up — first come, first served, you know.

Use the application blank on page 94 of this issue of QST and cash in on some of those Ham-ad bargains. Membership copies do arrive very promptly.

# QST

### CHARACTERISTICS OF THE WUNDERLICH TUBE

by

Frederick E. Terman, Sc.D.  
Professor of Communication Engineering  
Stanford University

"The Wunderlich tube can be thought of as a triode to which there has been added a second grid that is wound between the meshes of the usual grid. This tube has been developed for grid leak power detection purposes, and gives full wave grid rectification in a balanced circuit in which negligible radio-frequency current flows in the plate circuit."

"When compared with the triode type of grid leak power detector, the Wunderlich power detector has about the same efficiency, introduces less distortion because the balanced input circuit prevents simultaneous grid and plate rectification, and develops approximately twice as much output voltage."

"When compared with the plate rectifier commonly employed in broadcast receivers, the Wunderlich detector has the advantage of a somewhat greater rectification efficiency, particularly when the signal voltage is in the order of several volts."

"The Wunderlich tube has ample power capacity to excite the power amplifier of any broadcast receiver now on the market, and supplies a voltage which can be used directly for automatic volume control purposes."

# WUNDERLICH

The BLUE TUBE with the RED BASE

Manufactured by

ARCTURUS RADIO TUBE CO., NEWARK, N. J.



# QST Oscillating Crystals

"SUPERIOR BY COMPARISON"

Does the frequency of your monitor comply with the new regulations of being within the plus or minus 50-cycle limits? If not, we are at your service to adjust your monitor to within those limits. SHIP YOUR MONITOR TO US for either adjustment or grinding a new crystal if necessary. Our charge for this service is right, and will require but SEVEN to TEN days to perform this work. ASK ANY BROADCAST ENGINEER what HE thinks of our service.

## CRYSTALS ✓ CRYSTALS ✓ CRYSTALS

Prices for grinding POWER CRYSTALS in the various frequency bands are as follows:

### FREQUENCY RANGE

100 to 1500 Kc.....	\$40.00
1501 to 3000 Kc.....	\$45.00
3001 to 4000 Kc.....	\$50.00
4001 to 6000 Kc.....	\$60.00

Above prices include holder of our Standard design. If crystal is wanted unmounted deduct \$5.00 from the above prices. Deliveries can be made within two days after receipt of order. In ordering please specify type tube, plate voltage and operating temperature. *Special prices will be quoted in quantities of ten or more.*

### POWER CRYSTALS FOR AMATEUR USE

The prices below are for grinding a crystal to a frequency selected by us unmounted (if wanted mounted add \$5.00 to the price list) with a calibration accurate to BETTER than a tenth of one per cent. Immediate shipments can be made and all crystals guaranteed.

1715 to 2000 Kc. band.....	\$12.00 each
3500 to 4000 Kc. band.....	\$15.00 each

### LOW FREQUENCY STANDARD CRYSTALS

We have stock available for crystals as low as 13 Kc. Prices upon receipt of specifications.

## SCIENTIFIC RADIO SERVICE

124 Jackson Ave., University Park  
Hyattsville, Md. "Crystal specialists since 1925"

# WUXTRY

(See the inside back cover)

have a 100% QSO with a W, without the prevailing QRM that makes half the foreign contacts a failure.

— J. S. Huffman, W5AUB

## 160 Meters

Provo, Utah

Editor, QST:

About your article in March QST concerning 160 meters and the low-power transmitter described in that article. I built this transmitter with the junk I had around the shack; nothing in the transmitter is what it ought to be. Hi. Well, to get down to business, on April 4th at 2210 I sent out a ZLAA (CQ Army Amateur) and lo and behold here comes back W3CXM at Washington, D. C. It about knocked me cold! He was about R3-5 here and he didn't report my signal strength, but got everything ok the first time I sent it.

I hope this will encourage other hams to get up to 160 for it is an FB band. This is not the first good QSO nor the last one, either, for me on 160 meters.

— Archie Madsen, W6APM

## Law Infractions

1100 Glendale Blvd., Los Angeles, Calif.

Editor, QST:

I have just finished reading an article by Mr. W. D. Terrell of the Department of Commerce, concerning amateur violations.

Two violations predominate, he says. They are the bootlegging of call letters by amateurs who wish to avoid detection while adjusting their transmitters and the indiscriminate playing of phonograph records.

Fellows, a radio transmitter isn't a toy, but is capable of emitting a carrier wave which may be either useful or a general nuisance. It is also subject to government regulation and we should consider and respect the many privileges granted us. Continued law infraction will eventually result in further loss to amateur radio, and the penalty will affect both innocent and guilty.

Let's erase the handwriting on the wall now before it's too late. What say, gang?

— Maurice E. Kennedy, W6BGC

## From the Original H.A.M.

"Killiney," Worsley Bridge Rd.,  
Beckenham, Kent

Editor, QST:

As the innocent starter of all this "H.A.M." business I feel that I must reply to W8AXF's letter in April QST. To start with, my claim to being the only Ham in the world with initials H.A.M. was to find the others! We now have W3UO, W4KZ, W4LC and H.A.M. Clark,

# Your A.R.R.L. EMBLEM

The League Emblem comes in four different forms. Its use by Members is endorsed and encouraged by the League. Every Member should be proud to display the insignia of his organization in every possible way.

**THE PERSONAL EMBLEM.** A handsome creation in extra-heavy rolled gold and black enamel, 1/2" high, supplied in lapel button or pin-back style. The personal emblem has come to be known as the sign of a good amateur. It identifies you — in the radio store, at the radio club, on the street, traveling — you can spot an amateur by it. Wear your emblem, OM, and take your proper place in the radio fraternity. Either style emblem, \$1.00, postpaid.



**THE AUTOMOBILE EMBLEM.** 5 x 2 1/2", heavily enameled in yellow and black on sheet metal, holes top and bottom, 50c each, postpaid.

**THE EMBLEM CUT.** A mounted printing electrotpe, the same size as the personal emblem, for use by Members on amateur printed matter, letterheads, cards, etc. \$1.00 each, postpaid.

**THE "JUMBO" EMBLEM.** How about the shack wall or that 100-footer? Think of the attention this big yellow-and-black enamel metal emblem will get! 19 x 8 1/4", same style as Automobile Emblem. \$1.25 each, postpaid.

**The American Radio Relay League**  
West Hartford, Conn.

## UNIVERSAL

2-Button  
Handi-Mike

\$15.00  
List



Maximum volume, minimum hiss, scientifically damped. Truly natural in tone and the most rugged microphone yet devised. No delicate parts to be damaged if dropped, jarred or roughly handled. For announcing, transmitting or home recording. Our Engineering Department is at your service. New catalog covers twelve models from \$5.00 up.

UNIVERSAL MICROPHONE CO., Ltd.  
424 Warren Lane Inglewood, Calif., U.S.A.

## PANELS

BAKELITE  
RUBBER  
ALUMINUM  
All Sizes Cut to Order  
BAKELITE TUBING & RODS

Drilling, Engraving & Special Work

### ALUMINUM CANS

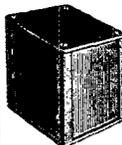
6 x 5 x 9, \$1.80 — 6 x 10 x 7, \$2.90 —

7 x 9 x 14, \$4.60 and many other sizes

Special sizes to order

### ALUMINUM CHASSIS

Threaded brass studs for 6/32 screws  
Lengths from 1/2" to 6" — price 5c to 30c



Insulating bushings  
for all size shafts  
from 75c to \$1.90 per  
dozen



Couplings in  
brass or bakelite  
— 15c



Transmitting frames and racks

Mail orders filled same day.  
UNITED RADIO MFG. CO.  
191 Greenwich St., N. Y.

Established 1922

If you want to be a High Speed, Expert  
Operator write **CANDLER** for Free Advice

GET YOUR **SPEED** where the

Champions got theirs  
**CANDLER**  
Scientific Method, High  
Speed Telegraphing

3 Times World Champion  
Operator Candler Trained

"By applying Candler System methods I won the Radio Telegraphic Championship of the World 3 consecutive years at 50, 55 1/10 and 56 3/4 wpm. I say to all Commercial and amateur operators, by all means take Candler High Speed Telegraphing and 'Mill' Courses."

THEODORE R. McELROY,  
Official Radio Champion of  
the World, Retired, Boston.

If you want to copy press — send perfectly at 35 wpm or more with bug or key — copy 3 to 5 words behind — O. K. instantly — write Candler for free advice. **THE CANDLER SYSTEM** of High Speed Telegraphing trains your Brain, Muscles and Nerves to COORDINATE in doing fast, accurate work. It gives you CONFIDENCE, natural CONCENTRATION and banishes Nerve Strain. Original **CANDLER METHODS** have developed over 45,000 of world's fastest Morse and Radio operators including the champion.

TELEGRAPH-TOUCH-TYPE-WRITING — only method for operators. Shows how to use "mill" in receiving.

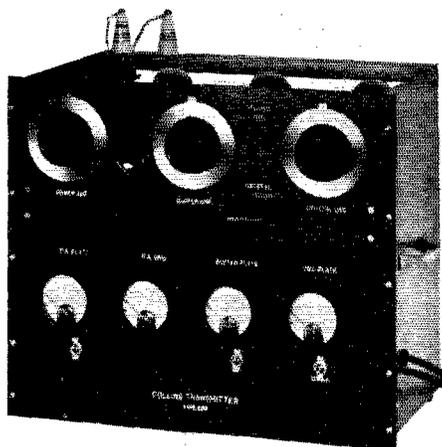
FREE advice. If you are a beginner and want to learn code the scientific way, or if you want to become a real EXPERT, write Candler and receive the benefit of his 20 years' experience in developing EXPERTS. Your questions will be answered promptly and personally. No obligation.

WALTER H.  
CANDLER  
World's Only  
Code Specialist,  
Instructs  
You Personally



**Candler System Co., Dept. 5-B**  
6343 South Kedzie Ave. Chicago, Illinois

## Collins Transmitter TYPE 30W



The 30W is designed to meet the requirements of the amateur who wants a modern crystal controlled transmitter ready to go on the air. It is a commercial type transmitter at a price the amateur usually pays for "just the parts."

### Specifications:

**Output:** 30 Watts, **Frequency Range:** 20, 40, 80 and 160 meters. Coils for one band standard equipment.  
**Tubes:** 247 Oscillator, 247 Buffer, 510 Output Amp.  
**Power:** Self contained heavy duty unit.  
**Keying:** Grid-Block. **Meters:** Weston surface type.  
**Construction:** Engraved Formica panel. Aluminum and cadmium plated steel chassis. Highest quality material throughout.

(Technical data on request)

The 30W can be 100% modulated by the Collins 9C Unit employing type 46 tubes in Class B, making a phone that really does things.

**30W Transmitter, complete \$95.60**  
less tubes and crystal

### ORDER BLANK

Collins Radio Transmitters  
Cedar Rapids, Iowa

Please ship at once one Type 30W Transmitter.

Enclosed find \$95.60.

Enclosed find \$25.00, balance C.O.D.

Name .....

Address .....

## BLILEY CRYSTALS / Quartz and Tourmaline

Nationally recognized for their high standard of quality.

Quartz crystals supplied by your dealer close to specified frequency in 1750 and 3500Kc bands, \$5.50. Mounting, \$2.50.

Tourmaline Discs within 7,000Kc band, \$12.00; 14,000Kc, \$14.00. Special mounting, \$2.50.

Send for literature.

**BLILEY PIEZO-ELECTRIC COMPANY**  
Masonic Temple Bldg., Erie, Pa.

G6OT, claiming equal rights. Well then, let's start a club. "The H.A.M. Club" with a pig as an emblem, and only the very elite may enter; after all, by right of name we represent the only genuine hams in the world!

W8AXF's arithmetic is perfect, but beyond W3UO as far as I can see there are no more H.A.M.'s. His mathematics do not appear to work out in practice.

Long live the five of us, and if there are any more then let's hear about it!

— H. A. Maxwell-Whyte, G6WY

## Calling Procedure

525 E. Wadsworth Ave.,  
Mt. Airy, Phila., Pa.

Editor, *QST*:

Mr. Taylor's letter in April *QST*, regarding calling procedure has opened a subject which I have been brooding over for some time. I think it will be found that Mr. Taylor has quite a following and I am inclined to agree with him regarding the "three times three" practice.

It takes one and one-half to two minutes to cover the band from 3500 to 3900 kc., listening for an answer to a call. A "three times three" call sent at 20 words per minute would take about one minute, and at 15 words per minute it would take about one and one-third minutes, while at 10 words per minute it would take two minutes.

Whether the answer was heard or not would depend, among other things, on the speed and frequency used by the answering station.

Let us assume that it takes one and one-half minutes to cover the band from 3500 to 3900 kc., and that the receiving operator, after calling CQ, turns his dial at a uniform speed throughout the band, starting at one end. The answering station should make his call so that when the receiving operator is listening at the answering station's frequency, he is calling. If the answering station sent at 12 w.p.m., calling four times and signing three times, repeating this three times, he would be calling when the receiving operator was listening in the sections of the band between 3500 and 3580, 3660 and 3740, and 3820 and 3900 kc. If the answering station was in one of these sections of the band the receiving operator would hear his own call being sent. If, on the other hand, the answering station's frequency was between these sections of the band he should wait about 15 seconds before starting to call and in this case call 4 and 2 only 2 times, to cover these sections.

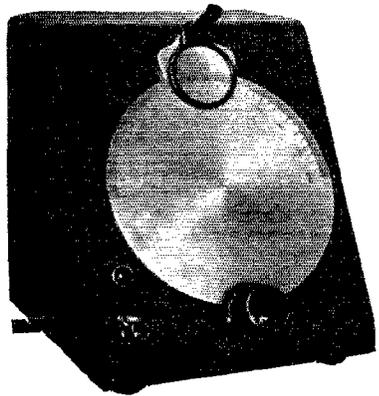
For other bands and sending speeds, similar combinations could be worked out. A 4 and 2 combination sent 3 times, as Mr. Taylor suggests, would cover the band in a similar manner, if sent at about 10 w.p.m.

I am afraid I must disagree with him, though as regards calling CQ. If I hear a station call CQ more than 10 or 15 times without signing, I turn

# E. C. FREQUENCY METERS



The REL Cat. No. 291 e.c. (electron coupled) frequency meter is the most accurate available. Many times better than the best dynatron. It's built like a battleship and has to be to maintain the accuracy. The most necessary and most handsome single piece of equipment in the shack.



Accurate to .025 percent.  
 Run down batteries do not effect calibration.  
 Extremely rich in strong harmonics.  
 Ideal for every amateur band 1.7 to 56 m.c. inclusive.  
 Uses the famous REL Cat. No. 292, 6" dial. The finest available. (See April QST ad page 87.)  
 Any load may be coupled to the meter without affecting calibration.  
 Accuracy not affected by temperature changes.  
 Stability absolutely approaching crystal control.  
 Reasonably priced. Furnished uncalibrated or calibrated. When calibrated we supply either a type —24 or —36 tube as desired and a curve on cross section paper 16" x 20".  
 Inquire at your local radio dealer or write direct to REL.

◀ BY THE BY — ▶

the best band to operate in during these dog days is 56 m.c. REL is leading the field in the line of reasonably priced equipment for the amateur. Drop us a card requesting literature covering 5 meter transmitters and receivers.

**RADIO ENGINEERING LABORATORIES, INC.**  
 100 WILBUR AVENUE LONG ISLAND CITY, N. Y., U. S. A.  
 Export Dept. — 116 Broad Street, N. Y. C.

Everything that you've wanted  
 in a log is in the Official  
**A. R. R. L. Log Book**

◆ AMATEUR RADIO STATION LOG ◆

DATE	TIME	FREQ	MODE	CALLER	CALLED BY	STATION HEARD		MESSAGES, REMARKS, ETC.
						BY	IN	

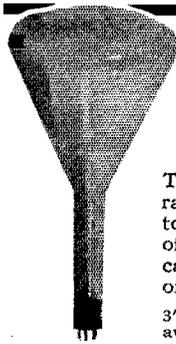
**T**HERE are 39 pages like the one above, 8 1/4" x 10 3/4", carefully designed to incorporate space for all the essential information you want and need to record about your station's operation. Thirty-nine blank pages (backs of the log pages) to be used for notes, experiments, changes of equipment, etc. Durable covers of heavy stock with space for your station call and dates over which the log entries extend. On the inside covers and first two pages are complete instructions on maintaining your log, convenient tabulations of the most-used Q signals, miscellaneous abbreviations, operating hints, amateur prefixes and signal-strength scales. Number sheet (C.D. Form 3) is included in each Log Book at no extra charge — to simplify and systematize the numbering of messages. The information you want, always at your finger-tips.

40 cents each, 3 for \$1.00, Postpaid

**A. R. R. L.**

38 LaSalle Rd.

West Hartford, Conn.



## Cathode Ray Tubes

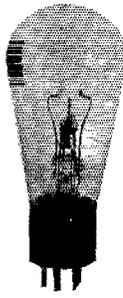
The untold possibilities of cathode ray technique are now thrown open to you. For the first time there is offered a line of practical, efficient cathode ray tubes well within reach of any pocketbook. For example:

3" Deflecting Plate Type (above) makes available cathode ray principle at low cost. Six-prong base. Price: \$15.00.

S-14 Type in glass envelope similar to usual 45 power tube. Single set of deflecting plates. Useful as voltmeter, ammeter and resonance indicator or any form of wave analysis. Price: \$7.50.

Globe line also includes 5" and 9" deflecting plate tubes, and 5" and 9" silver anode tubes. Special types and sizes built to order.

Write for literature on Globe cathode ray tubes, as well as television receivers, lens discs, crater lamps, plate lamps and motors.



**Globe Television & Phone Corp.**  
 185 Devonshire Street, Boston, Mass.

He made it himself—*easily*—from our instructions.



*"I saved over \$200 in 1931 by building my own test equipment with your resistors."*

—Excerpt from letter from Serviceman.

You can do the same. Write for FREE CHARTS giving complete instructions. Address Dept. Q.



International Resistance Co.  
2006 Chestnut Street, Philadelphia

AND PRECISION WIRE WOUND  
**RESISTORS**

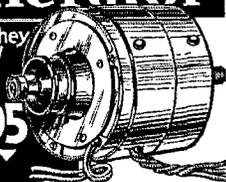
## Power Generator

FOR SHORT WAVE BROADCASTING

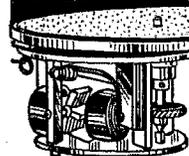
Reg. Price was \$75  
U. S. Gov. power generator for radio transmitting made by Westinghouse. Ideal for Amateur Broadcasting. Limited quantity purchased from U. S. Gov. Signal Corps. 900 cycles. 200 watts. 110 Volt. 4500 r.p.m. Can be connected direct, belt driven or wind propelled for Aeroplanes. Guaranteed new and perfect. Worth \$75.00, but while they last, only \$4.95, plus shipping charges. Send check or money order.

While They Last!

**\$4.95**



## G.E. PHONOGRAPH MOTOR



Synchronous 110 Volt, 60 Cycle, 30 r.p.m. Motor.

Can be installed in place of old fashioned hand winding spring motors. Also many other uses. These G. E. Manufacturers and dealers write for Special Quantity price.

Only  
**\$3.95**  
\$12.00 VALUE

Electric motors are all brand new in original factory cartons. Fully guaranteed. \$12.00 value only \$3.95 including 12 in. turntable. Shipped Prepaid. Manufacturers and dealers write for Special Quantity price.

**NATIONAL JOBING & EXPORT COMPANY**

109 W. LAKE ST.

DEPT. 226

CHICAGO, ILL.

to another station, and usually when I am listening for a CQ I spend more time and listen to those who might be signing after a CQ, in order not to miss anyone. Perhaps some of the fellows do otherwise, but on this basis, however, I would suggest 6 and 3 or 6 and 2 repeated 3 times when calling CQ.

— Louis W. Moxey, 3rd, W3BFL

## QRP

Williamsport, Pa.

Editor, *QST*:

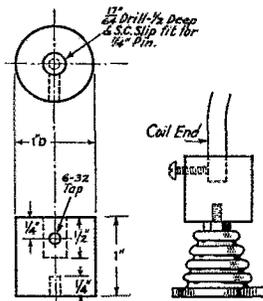
W7MF has the right idea, as he suggests in the Correspondence Section in April *QST*. Let's all get back of this QRP business and rid our bands of a lot of unnecessary QRM. Why should I, or any one else, be bothered with the signals from a station who is located a hundred or so miles from me when he is only working a friend ham in the same town? Yet this is just what happens in many cases.

Just before I sat down to write this I heard two prominent stations working each other in Philadelphia. Their signals were both QSA5 R6-8 here in Williamsport. Now why in the name of common sense should I be QRM'd by such a QSO? Of course when one is testing or feels the DX fever coming on he should put in all the power he's got, but when it's a waste of power and causes unnecessary QRM and is not needed for satisfactory communication then it's time to QRP.

— A. Stanzione, W3CDT

## Mounting Bushing for Transmitting Coils

The usual method of mounting copper tubing transmitting coils on G.R.-type wall insulators by flattening and drilling the ends of the tubing is somewhat unsatisfactory in some respects. With



the special bushing shown in the illustration, flattening and drilling of the coil ends is unnecessary.

The bushing is made of one-inch round brass stock, and is drilled and tapped on one end to fit the 10-32 screw furnished with the insulator. On the opposite end a slightly oversize quarter-inch hole is drilled to a depth of a half inch to

# FOR BETTER QUALITY PHONE

Any old transformers in your speech input equipment will give you understandable speech. But if you want more than understandable speech, if you want quality to be proud of, if you want to hear "like a broadcaster" from those whose opinion counts — nothing less than General Radio transformers will satisfy you.

They are designed, built and tested by the strictest engineering standards. Yet you pay at most but a few cents more, frequently you pay less for General Radio.

Write for a copy of our amateur catalog and see for yourself how much frequency range you can buy for your money.

## GENERAL RADIO COMPANY CAMBRIDGE A, MASSACHUSETTS

Pacific Coast Warehouse, 274 Brannan Street, San Francisco, California

### Bigger Reduction IN PRICES!

Genuine Baldwin phones, type C..... \$3.95  
 Transmitting keys, without switch..... .85  
 45-volt "B" batteries, standard size 95c; H. D. size \$1.75; 4½-volt "C" 25c.  
 Crystal holder, dust-proof, plug-in type..... \$1.50  
 Hammarlund Isolantite S.W. Coil Forms..... .58  
 G.E. elec. turn-table with induction motor..... 6.45  
 Mershon Elec. (wet) Condensers stocked — low prices.

#### CANS FOR ALL USES — KNOCKDOWN

Size — inches	Electralloy	Aluminum
8 x 8 x 6	\$1.71	\$2.28
6 x 6 x 6	1.57	2.00
9 x 5 x 6	1.43	1.71
10 x 8 x 6	2.00	2.57

Write for prices on other sizes we stock — and on any other item that you may require.

LOWEST prices quoted. Send in your request for new bulletin.

Deposit against all C. O. D. shipments — orders must include sufficient postage. Personal checks must be certified.

MAURICE SCHWARTZ & SON, 710-712 Broadway, Schenectady, N.Y.

### Laboratory and Kit Equipment for Service Men



Shallcross Resistors have many uses in Multi-Range Meter circuits and modern set analyzers. Our Bulletin 150-C contains many valuable charts and wire diagrams completely describing their use.

Send now 4¢ in stamps for your copy of this valuable booklet.

Resistors required for linear electronic voltmeters (Page 18, May QST) carried in stock.

**Shallcross Mfg. Company**  
 ELECTRICAL SPECIALTIES  
 700 PARKER AVENUE  
 Collingdale, Pa.

ALWAYS SUPER-ACCURATE AKRA-DHM  
 Accurate HIGH INDUCTIVE WIRE WOUND RESISTORS



Here is **REAL**  
**HELP**  
 for  
**SERVICE**  
**MEN**  
 and  
**EXPERIMENTERS**

"GREAT" — they all say about the **ELECTRAD** Resistor Replacement Hand Book.

An accurate guide to resistor and volume control values in all types of circuits.

Loose-leaf pages. Durable genuine Fabri-koid flexible cover. Kept up-to-date by supplements four times a year.

Mail \$1.00 (check, currency or money-order) for YOUR copy, including four supplements, as issued.

Mail Your  
 Order TODAY  
 To Dept. Q-7

175 Varick St., New York, N.Y.  
**ELECTRAD**

## COLUMBIA STILL LEADS

**COLUMBIA MONITOR.** Accurately Calibrated. Completely shielded in a metal case, black crackle finished, with a hinged cover. Equipped with Vernier dial. Real hand spread. Three coils suited for 20, 40, and 80 meter bands. Complete with tube and batteries. **\$9.00**  
Extra 160 meter coil, **\$1.00**

### RCA Licensed TUBES

Real good tubes, made to stand the gaff. Unconditionally Guaranteed for 90 days!

UX112A.....	55c	280M.....	1.50	238.....	90c
UX120.....	70c	UX226.....	45c	240.....	90c
UX171A.....	55c	UY227.....	45c	245.....	50c
UV199.....	65c	230.....	70c	247.....	85c
UX199.....	65c	231.....	70c	250.....	1.45
UX201A.....	45c	232.....	85c	551.....	85c
UX210.....	1.35	233.....	90c	280.....	50c
UX222.....	1.10	235.....	85c	281.....	1.25
UY224.....	60c	236.....	90c	866.....	2.75
871 (888).....	1.75	237.....	75c	281M.....	2.50

**COLUMBIA CLASS B MODULATION TRANSFORMERS** for 210's, Pair, \$6.50

### COLUMBIA POWER TRANSFORMERS

A quality line of transformers. All mounted, with leads brought out to lugs on terminal boards. Guaranteed for One Year!

Type	Wattage	Volages	Price
A	200	600-0-600, 7½ ct. & 7½	\$3.75
B	250	750-0-750	4.95
C	350	1000-0-1000	7.00
D	500	1500, 1000-0-1000, 1500	9.35
E	800	2000, 1500-0-1500, 2000	12.85
F	250	750-0-750, 7½ ct. & 7½	5.75
G	400	750-0-750, 7½ ct. & 7½	7.45
H	150	350-0-350, 5, 2½ ct, 2½ ct	3.75
K	100	285-0-285, 5, 5 ct, 2½ ct	3.45
L*	250	350-0-350, 5 ct	4.45
M	150	400-0-400, 5, 2½ ct, 2½ ct	3.95
N	150	300-0-300, 5, 1½, 5 ct, 2½ ct	3.75
R	750	2500, 1500-0-1500, 2500	14.35

\*Type L is specially built for the 280M tube.

### STAND-OFF INSULATORS, Each 9c, Dozen 85c.

**COLUMBIA FILAMENT TRANSFORMERS.** An efficient sturdily constructed job. All secondaries center-tapped. Deduct 10% from these prices if no center tap is desired. **10,000 VOLT INSULATION!**

Volages	12 watts	25 watts	50 watts	100 watts
2½	\$1.25	\$1.95	\$2.50	
2½ & 2½	1.50	2.25	2.75	\$3.75
7½	1.25	1.95	2.25	4.45
7½ & 7½	.....	2.25	3.95	4.95
10	.....	.....	3.20	4.50
5	.....	.....	3.25	4.00

**SPRAGUE ELECTROLYTIC CONDENSERS, 8 mfd.**, peak voltage 500 volts. Each, 65c.

**GENERAL ELECTRIC 30 henry, 150 mill chokes, \$1.50.**

**COLUMBIA 30 henry chokes.** Very efficient, ruggedly built. Mounted. Special, 200 mills, \$2.40; 120 mills, \$1.30.

Send for our new catalogue. It's free!  
TERMS: Cash or C.O.D. No deposit required.

### COLUMBIA SPECIALTY CO.

925 Westchester Avenue New York, N. Y.

make a slip fit for quarter-inch tubing. At right angles to this hole a third hole is drilled and tapped to take a 6-32 screw which acts as a set screw when the coil end is in place.

Using a bushing of this type coils can be changed rapidly and easily, with the certainty of always having good electrical contact.

— Harold V. Flood, Providence, R. I.

## Some Recollections of Early Radio Days

(Continued from page 33)

additional spread of wires at the top of the tube was added.

On New Year's Night, 1906, the first exchange of messages took place between these two stations. The power was not sufficient to insure reliable communication and for weeks at a time it was not possible to get messages across. In July, 1907, the tower at Machrihanish blew down in a wind storm. The station was so badly damaged that it was never rebuilt. Subsequent attempts to secure a license from Great Britain to operate a radio station in a commercial service were unsuccessful and that ended transatlantic operations.

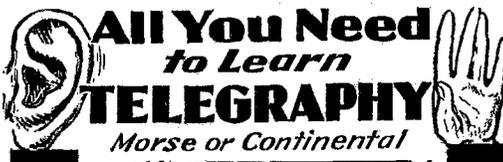
However, in the interval between the time of the first trials, which proved the power available insufficient, and the destruction of the Machrihanish Station, a larger equipment was designed and was in process of construction. This was a 100-kw. 500-cycle rotary spark set. This outfit was completed and installed at Brant Rock and gave such wonderful results that the companion one was completed and sold to the U. S. Navy.

It was expected that this outfit would enable the Navy to keep in touch with the North Atlantic Fleet at all times. It was the result of an elaborate series of tests between this set installed at Brant Rock and a set on a Navy cruiser, detailed on this test, that formed the basis of the Austin-Cohen formula of transmission. This formula was the accepted one for years and gave reasonably good results over the range of wavelengths tested in securing the data.

The 100-kw. set was not installed in its final station, erected by the Navy at Arlington, for about three years. Its final acceptance test was made in March, 1913.

Another invention made by Fessenden in 1905 takes rank as one of the outstanding ones in this art. That was the heterodyne receiving system. This was another bold stroke in which he departed radically from methods practiced by others. Like his other great inventions, it was made before he had suitable equipment with which to practice it. He required a source of local oscillations of adjustable frequency and a high-frequency alternator or oscillating arc was all that was available. These could be made to work, but with considerable inconvenience and a high degree of unreliability.

The discovery of the oscillating tube provided the principal need of this great system to make it what it has proven to be, the best method of reception thus far devised.



# All You Need to Learn TELEGRAPHY

Morse or Continental  
with **Teleplex**

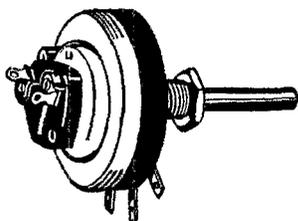
Learn Telegraphy — the most fascinating profession — by hearing real messages — sending them. Interesting — simple — you learn quickly — at home.

**TELEPLEX** — the Master Teacher is used by U. S. Army, Navy and leading radio and telegraph schools. Entirely new code course in 12 rolls of tape.

During last ten years, **TELEPLEX** has trained more operators than all other methods combined.

Write for Folder Q-7  
**TELEPLEX COMPANY**  
76 Cortlandt Street New York





## Order 5 Centralab Replacement Volume Controls

and get the new 50¢ Centralab Volume Control Guide

**FREE**

The new QUICK REFERENCE WALL CHART showing resistance combinations at a glance is Free with every order of a service carton of 10 Centralab Fixed Resistors (lists \$3.00). Special for only ..... **\$1.75**

# CENTRALAB

CENTRAL RADIO LABORATORIES  
MILWAUKEE, WIS.



## R.T.I.C.

### Filter-Pack Microphone

Model F: Most highly developed carbon microphone with self contained filter pack for protection against r.f. pick-up and accidental abuse. Finest of R.T.I.C. carbon microphones — features:  
Two button design. Polished carbon buttons. Specially treated carbon granules. Case machined from solid bar stock. Static and dynamically balanced diaphragm of gold-plated duralumin — no adjustments required. Outstanding fidelity, sensitivity, minimum hiss and long service life. Uniform response from 30 to 7000 cycles.

RADIO TELEVISION INDUSTRIES CORP.

130 W. 42nd St. Dept. Q-3 New York City



## AMATEURS West of Rocky Mountains

We can supply all parts for the new circuits

Send for your Catalog of Nationally Advertised Transmitting and Receiving Parts at **LOWEST PRICES**

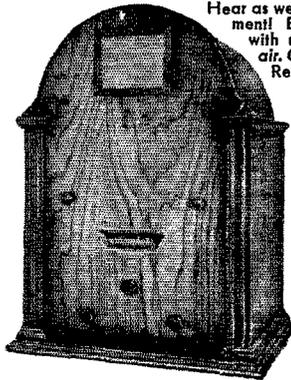
*Amateurs' Headquarters of the West*

### RADIO SUPPLY CO.

H. A. Demarest, President  
912-914 So. Broadway Los Angeles, California  
(W6FBI located in Building)

## Living-Room Television

Hear as well as see your radio entertainment! Entertain family and friends with movies snatched out of the air. **Globe Midget Type Television Receiver features:**



Complete receiver and television combination. A. C. operation. No extras to buy. Costs no more than good radio set.

Simple to operate. Self-synchronized on A. C. system common with transmitter. No fussing.

Clear, brilliant images on 4 x 5 inch screen, entertaining up to a dozen persons. Flickerless.

Television includes lens disc, crater neon lamp, and silent synchronous motor.

Eight-tube receiver designed solely for best television results. Single-control tuning.

Globe also offers precision lens discs, motors, crater lamps, plate lamps, television receivers and cathode ray tubes for the experimenter.

**WRITE** for literature describing Globe line of television equipment for living room, experimental and laboratory uses.



**GLOBE TELEVISION & PHONE CORP.**  
185 Devonshire St. Boston, Mass.

## HANDBOOKS

### EXCHANGED!

In exchange for your old handbook and the small sum of Bucks 1 we will send you a copy of the new supervaluable 9th edition of

## The Radio Amateur's HANDBOOK

and let you keep the old copy yourself — so you can see how vastly better the new one is. Seize this remarkable opportunity to-day!

A.R.R.L.  
38 LaSalle Rd.  
West Hartford, Conn.

Rush Ninth Edition Handbook!

.....  
(Name)

.....  
(Street or Box)

.....  
(City and State)

# 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 15c 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 7c 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 7c rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and takes the 15c rate. Provisions of paragraph (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

PLATE power for your set, the very heart of its performance, for quietness, DX ability, lifelong permanence, absolute dependability, lowest ultimate cost, no other plate source even approaches the achievement of an Edison steel alkaline storage B battery. Built painstakingly; every joint pure nickel, upset electrically welded. Genuine Edison Electrolyte. Our list describes complete batteries, construction parts, enameled aerial wire, silicon steel. Available immediately, filament and plate transformers for the new 872-866 rectifiers, complete plate power units. Rectifier Engineering Service, 4837 Hockwood Road, Cleveland, Ohio.

THE finest in radio for amateur, broadcast and marine. The most modern short-wave receivers. Four to ten tube designs. Radiophone cw transmitters of any power or type. We make a complete line of apparatus, including speech amplifiers, filter coils, inductances, power units, etc. Any special apparatus, designs, built to order, using your parts if desired. Prices on request. New bulletin lists complete line of apparatus. Write for copy. Ensell Radio Laboratory, 1527 Grandview St., S. E., Warren, Ohio.

QUARTZ — make your own crystal oscillators. Write us for full details. Direct importers from Brazil of best quality pure Quartz suitable for cutting into Piezo electric crystals. The Diamond Drill Carbon Co., 720 World Building, New York City.

SEND 50¢ postage. We'll send over six pounds radio data, bulletins, circuits, Kladag, Kent, Ohio.

GOOD crystals — fair prices. Hollister Crystal Labs., Merriam, Kans.

GUARANTEED Microphone Repairs — Any make or Model — 24 hour service. Stretched diaphragm double button repairs \$7.50. Others \$3.00. Single button repairs \$1.50. Write for 1932 Catalog with diagrams. Universal Microphone Co. Ltd., Inglewood, Calif.

QSL cards, send 15 cents for samples, new ideas, good printing. Exchange, P. O. Box 607, El Monte, Calif.

TRANSFORMERS and chokes built or rewound. Moderate prices. Boston Transformer Co., 886 Main St., Cambridge, Mass.

CASH for complete xtal, c.w. and phone outfit. Give best price, description, and photo first letter. S. F. Sapp, 601 Pine St., Albany, Ga.

NEW RCA 210, \$3.50, 865, \$10, 852, \$20. No. 20 solid enamel 75¢ hundred. National apparatus 40% off, Jewell 25%, Cardwell 30%, Ward Leonard 40%. Buy or trade for other equipment. W5RJ, 1614 St. Louis, Ft. Worth, Tex.

TWO color QSLs, 100, 75¢, 150, \$1. Free samples W9GOF, D. Maxham, Mishawaka, Ind.

POWER transformers, a.c. 110 volts, 1000-1000 200 watts, 4-7½-0-7½, 2-2½-0-2½, 3-1½-0-1½. \$12.50. Write us your needs. Eston's Radio Service, Hazleton, Penna.

LET us engineer and construct your sound equipment, transmitters or receivers. Mabbott and Chapman, Stevensville, Montana.

WANTED — RCA filter reactor, model UP1627. R. A. Crain, 2528 Creswell St., Shreveport, La.

SELLING out complete station from key to antenna. Everything needed to go on air and spare parts for one hundred dollars. E. J. Narfeh, 514 S. Amalia Ave., Los Angeles, Calif.

BROADCAST station condenser microphone with blueprint of circuit for three stage head amplifier and instructions for assembling. \$30. W1DZU, South Portland, Maine.

CRYSTALS, Brazilian quartz, c.o.d. unfinished blanks, 95¢, finished oscillating blanks, \$1.95, finished crystals, \$2.95. X or Y cut, one inch all guaranteed. R. F. choices, three slot 50 MA, 20¢, five slot 250 MA, 30¢. Wm. Threm, W8FN, 68 E. McMicken Ave., Cincinnati, Ohio.

VIBROPLEXES, \$17 all models, Rebuilds, \$8 up. Guaranteed. Lydeard, 28 Circuit, Roxbury, Mass.

SELL Wagner ¼ hp. 32 v.d.c. motor, 1725 r.p.m. heavy duty, slightly used, \$5. Grebe CR-9 150-3000 meters, \$5. W1ATJ, Claremont, N. H.

W5BHY selling out. What do you need? Stamp for list.

UX852 Radiotron tubes — unused and in original cartons. Shipped express collect, \$15. each. Send money order to J. H. Webb, Radio Stockroom, Pan American Airways, Inc., Miami, Fla.

FOR sale — REL 278, 4 coils, brand new, \$15. M. d'Amore, 1506 Ocean Ave., Brooklyn, N. Y.

WANTED — Grebe receivers. W6NH.

WANT National sw receiver. Oliver Smith, Telephone Bldg., Seattle, Wash.

SILVER Marshall No. 690 amplifier, \$50. Film Speaker Co., Oklahoma City, Okla.

SELL Western Electric 212D, twenty-five dollars. Kemp, 99 Boulevard West, Mountain Lakes, N. J.

QSL cards, message blanks, stationary, snappy service. Write for free samples today. W1BEF, 16 Stockbridge Ave., Lowell, Mass.

TRADE crystal controlled xmtr, extra crystals, parts for typewriters, broadcast receiver. W9GKH, Milledgeville, Ill.

TELEPLEXES, Omigraphs, receivers, tubes, meters, Vibroplexes, transformers, converters. Bought, sold, traded. Ryan Radio Co., Hannibal, Mo.

SELL 150 watt converter, \$30; 275 volt dynamotor, \$5; mimeograph, \$30. Description. W9AIR, Sleepy Eye, Minn.

FOR sale — 500 watt phone transmitter. Cost over \$2000. Practically new. Will sell for \$1750. Excellent for police department or private school. Write for particulars. W1CWH.

QSLs, samples for stamp. W9GQH, Java, S. D.

1000 watt transformers, 1100-2200-4400 volt each side c.t. Mounted on marble, \$13.50. F. G. Dawson, 5740 Woodrow, Detroit, Mich.

CRYSTALS — 1" sections, fully guaranteed. 0.1% calibration, \$4.50. Pledger Bros., 3248 Lyndale, Memphis, Tenn.

ODD parts and tubes cheap. W9DWA.

HOWARD tubes: 280M, \$1.19; 888, \$1.65; 866, \$1.95; 210 (15 watt) \$1.50; 211E's used, \$3.25. Power tubes. W9DWA, Chicago.

CRYSTALS — Best Brazilian Quartz — Guaranteed strong oscillators. Calibrated 0.1% accuracy \$3.50. Oscillating Blanks \$2.00. Ross Roberts — W5ID, Canton, Mississippi.

FOR sale — crystal controlled transmitter. Write W8PV- (W9YB), Robert M. Booth, Jr., 6463 Grandvista Ave., Cincinnati, Ohio.

QSLs, SWLs, stationary, radiogram and station cards. Free samples. W8DED, Holland, Mich.

CRYSTALS — 1750 Band \$3.50; 3500 Band \$5. Blanks one finished side \$2. A-1 Blanks \$1.25. Crystals unconditionally guaranteed. Holders \$1.50. QSL's 2-color 200 — \$1.50. Send for Samples and price list. Tested and guaranteed 245s, 247s, 50r. State your needs we have it. M-K Radio Supply, Riverdale, Ill.

SELL or trade: RCA 203-As, 852s, 204-As; WE211Ds, 212Ds; National, Pilot, Sargent receivers; MGs; transformers; Omigraphs; WE387W mikes; other apparatus. Write. W9ARA, Butler, Mo.

REL278s \$25.65; Thermionic 866s \$2.85; two 866s and filament transformer \$7.75. Complete stock of National, REL, Cardwell, Thordarson, Jewell, Biley, Leach, Vibroplex, other high quality new and used apparatus at lowest prices. List free. Inquiries welcome. Henry's Radio Shop, Butler, Mo.

VIBROPLEXES — new and used. For lowest prices write Lee Gravel, 206 S. Marshall, Hartford, Conn.

"4MOST" — that distinctive, new QSL. Have you ordered yours yet? "4most" is now introducing a sensational, new system of QSLING — the biggest advancement in years. Hams all over the U. S. are accepting it with great enthusiasm. We're swamped with orders and inquiries now so the sooner you get your order in the sooner you can enjoy being foremost. Address, "4most" Drawer E, Camden, N. Y.

ECONOMICAL crystal control. Finished crystals 0.1% accurate, \$3. Oscillating blanks, \$1.50. Absolute guarantees. W8AKU, W8CTN, W8BBV, 407 S. Aiken Ave., Pittsburgh, Pa.

FREE QSLs for June won by W8GLY, Syracuse, N. Y. Get our new offer for July. W8BVE, Ben Franklin Press, Franklin, Pa.

STANDARD Radio Silvered Crystals sealed in improved plug-in mountings and guaranteed for one year — 1715 Kc band, \$6.50; 3500 Kc band, \$7.50, complete. Entirely new type sealed, shockproof mounting gives increased power and works in any position. Order direct or write for details. Standard Radio Laboratories, P. O. Box 877, Fort Worth, Texas.

ALUMINUM box shields and panels. Write for prices. John R. Skronald, 80 Mt. Vernon St., Ridgefield Park, N. J.

ALUMINUM shields, improved construction. Write for prices. John R. Skronald, 80 Mt. Vernon St., Ridgefield Park, N. J.

NEW photo QSLs. Ham printing. Hillcrest, Cranesville, Pa.

**PHOTO QSLs** — Make from present QSL — gummed stamp photos, 25¢ — \$2.50. Southern Products, 664-Y, University, Alabama.

**RECEIVERS \$18.90** — complete with 4 tubes, powerpack, speaker, cabinet. Screen grid detector — band-spread — post-paid — guaranteed. Southern Products, 664-X, University, Alabama.

**XTALS** — .1 of 1% your specified frequency, \$3.50 ea. special discounts on two or more. Plug-in holders, \$1.50 ea. Joe DuPre, Beachwood, N. J.

**WESTERN Electric 25B** amplifier with four 205D tubes, \$15. 540 loudspeaker, \$5. Four 211Ds, \$6. ea. or all for \$22.50. Weston model 269 0-15-75-300 d.c. milliammeter, \$10. Tungar 2 amp. complete, \$3. Everything guaranteed best condition. A. M. Elliott, 3827 221 Street, Bayside, L. I., N. Y.

**QSLs** — Highest in quality. Lowest in price. **WSAKY**.

**CRYSTALS:** Your approximate frequency 80 or 160 meters, \$1.25. Guaranteed excellent single frequency oscillators. Rough blanks, 65¢. Plug-in holders, 75¢. Fisher Lab., 210 Taylor St., Sandusky, Ohio.

**203As** brand new, Westinghouse or GE \$12. Tested WE387 mikes \$15. Class B transformers pair 210 — \$7.; for 203As \$10. 10,000V heavy duty 866 — \$3. 10amp. ct. fl. transformers for 866s — \$2.50. New RCA 210s — \$3., 250s — \$2.25. .002-5000V Sangamos .45 ea. Weston type 301 milliammeters \$3.75 (some new, all new condition most all ranges). Perfect RCA 204As \$35., 204s — \$20., 845s — \$11. List. E. Ewing, Jr., 1057 Pratt Blvd., Chicago, Ill.

**SELL** spare parts for complete 75 watt xmtr. crystal control and power supplies. List sent. D. C. Akers, 181 Greenwood Ave., E. Orange, N. J.

**QSLs** — First hundred 90¢. Scores of satisfied hams acknowledge our superior products. Samples! QSL Service, 2220 Linden Ave., Baltimore, Md.

**SPECIAL** transmitting and receiving equipment custombuilt to your requirements, using your parts if desired. Careful engineering; adequate shop facilities; good workmanship; reasonable prices. Let me quote on your job. Holmes C. Miller, Radio Engineer, Box 105, Palo Alto, California.

**CONVERTER** RCA special WE 211Ds, \$8. list. W9HSP, Yankton, S. D.

**QSLs, W6DOU**, 1562 B St., Hayward, Calif.

**PORTABLE** receiver vy fb, \$12.50. W9DKF, Peoria, Ill.

**U. S. STAMPS** wanted. Will swap radio gear for old or rare United States stamps. What apparatus do you need?; what stamps have you? K. B. Warner, o/o QST.

**POWER** crystals: Guaranteed. Highest quality quartz crystals scientifically ground for maximum output. X cut, one inch square carefully ground to your specified frequency accurate to within 0.1%. 3500 and 1750 kc. bands — \$5.50. Super special this month; 7000 kc. band crystals — \$5.50. Calibration 0.1%. Dustproof holders — \$1.75. Plug-in, dustproof holders — \$2.50. Type 866 rectifier tubes — \$2.50. Type 888. Preheating not necessary. — \$2. 2.5 volt filament transformer, 10,000 volt insulation — \$4. Prompt shipments. Precision Piezo Service, 427 Asia St., Baton Rouge, La.

**RECTIFIER.** Use Taurex and convert your own d.c. milliammeter into alternating current multivoltmeter. Price: \$3.00 postpaid. Circular freq. Leo Taussig, 3245 37th Street, Long Island City, N. Y.

**QSLs 904 a 100.** 2 colors. W9DGH, 1816 5th Ave., N., Minneapolis, Minn.

**THE** latest and best in d.c. and a.c. receivers, \$14.95 and \$17.95 respectively. C. O. D. Edbern Radio, 1340 Merriam Ave., New York City.

**CLIPS** — for your transmitting inductances. Throw away your old inefficient battery clips making poor contacts and messy appearances. Replace with the new 100% contact-making clips immediately; improves efficiency and appearance. 3 for 50¢ postpaid. Gerald Mathison, 1009 Eastman Rd., Midland, Mich.

**CRYSTALS 1" square X or Y cut** 80-160 m., \$4. 40 m. \$9. Precision ground power oscillators. W6DCV, 2729 Independence, South Gate, Calif.

**FILAMENT** transformers any voltage or current rating, \$1 up. W9DKF, Peoria, Ill.

**QSLs** — satisfaction guaranteed. Free samples. W9DGS, Jr., Jamestown, N. Dak.

**NEW** stand-off insulators, just out. Write for bulletin. Harvey Robey, E. Lansing, Mich.

**ORIGINAL** cartoon QSLs by W1CJD, also other styles. T. Vachovetz, Elmsford, N. Y.

**SELL** — GE 750-watt transformer 4400-2200 c.t., \$8.50. Kellogg hand microphone, \$2.50. Write H. O. Barschdorf, 171 No. Summer St., Adams, Mass.

**CARTOON QSLs.** W8DWV, Ellwood City, Pa.

**SACRIFICE** — Two R3 rectobulbs, \$4 ea. filament transformer for same, \$4. Aero wavemeter, \$5. Philco a.c. converter, \$18. s.w. tuned peak receiver \$15. mercury arc, \$7. All practically new and guaranteed. W9DXX, Chicago.

**QSLs.** Request our samples and prices before ordering. Maleco, 1512 Eastern Parkway, Brooklyn, N. Y.

**WANTED** — Power supply for '10 tubes. Also other equipment. Raymond McNeil, Fairfax, Mo.

**SELL** or swap — New RCA short wave converter complete with tubes and coils. Want 1500 volt power pack complete or what have you. W1DQK, No. Troy, Vt.

A. C. or d.c. s.g. and pentode recvr \$14. W9DKF, Peoria, Ill.

## Q R A SECTION

50c. straight with copy in following address form only:  
W2DYJ — Michael Solomon, 3521 DeKalb Ave., Bronx, New York.

W8GYQ — Walter S. Nusky, Youngstown, N. Y.

W8GXQ — H. E. McCallister, 711 W. Bucyrus St., Crestline, Ohio.

**W1MK, A.R.R.L. Headquarters**  
R. B. Parmenter, Chief Op. "rp"

The following calls and personal sines belong to members of the A.R.R.L. Headquarters gang:

W1AKW-W1KP Clyde J. Houldson "ch."

W1BAW R. T. Beaudin "rb."

W1BDI F. E. Handy "fh."

W1CBD-W9ZZF Clinton B. DeSoto "de."

W1AL J. J. Lamb "jim."

W1DF Geo. Grammer "hg."

W1EH K. B. Warner "ken."

W1ES A. A. Hebert "ah."

W1SZ-W1BIZ C. C. Rodimon "rod."

W1UE E. L. Battery "ev."

## GULF RADIO SCHOOL

COURSES IN

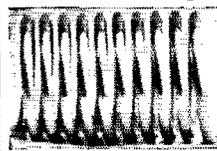
**RADIO OPERATING**

AND

**RADIO SERVICING**

Second Port, U. S. A.

844 Howard Avenue NEW ORLEANS, LA.



## SILVER

plated copper inductances wound and ends drilled free. 1/4" dia. tubing piece per turn. 2 1/4" inside dia. 12c; 1 1/4" inside dia. 11c.

Any size to order, write for prices

CURTIN ENG. CO., N. 4707 Addison St., Spokane, Wash.

## NEW CORNELL CATALOG READY



It describes the new Cornell line of PAPER DIELECTRIC CAPACITORS for radio, television and ignition, and RESISTORS for radio and television. The data and information in this catalog are of interest to all radio men. Write for your free copy today.

Ask for Catalog A

**CORNELL ELECTRIC MFG. CO., Inc.**  
Long Island City New York



## Crystals

Precision ground, powerful oscillators

**Unconditionally Guaranteed**

80 and 160 meter bands, "X" or "Y" cut, stated calibrations guaranteed accurate to 1/10th of 1% or better — adjusted to within: —

5 Kc. of frequency specified	.....	\$7.50
1% of frequency specified	.....	6.50
1% of frequency specified	.....	5.50
40 meter band with 1% of frequency specified	.....	\$10.00
1-inch oscillating blanks	.....	\$3.75
holders	.....	\$2.50
175 Kc. Stenode Crystal	.....	3.50
Unfinished blanks	.....	2.00
100 Kc. Standard Freq. Bar, including mounting	.....	\$12.50

**TOURMALINE CRYSTAL and BLANKS**

Frequencies up to 15 Mgs. Quotations on request BROADCAST CRYSTALS, highest accuracy — write for prices

**PREMIER CRYSTAL LABORATORIES, Inc.**  
74 Cortlandt Street New York City

# To Our Readers who are not A.R.R.L. members

WOULDN'T you like to become a member of the American Radio Relay League? We need you in this big organization of radio amateurs, the only amateur association that does things. From your reading of *QST* you have gained a knowledge of the nature of the League and what it does, and you have read its purposes as set forth on the page opposite the editorial page of this issue. We should like to have you become a full-fledged member and add your strength to ours in the things we are undertaking for Amateur Radio. You will have the membership edition of *QST* delivered at your door each month. A convenient application form is printed below — clip it out and mail it today.

*A bona fide interest in amateur radio is the only essential qualification for membership*

AMERICAN RADIO RELAY LEAGUE  
West Hartford, Conn., U. S. A.

I hereby apply for membership in the American Radio Relay League, and enclose \$2.50 (\$3 in foreign countries) in payment of one year's dues, \$1.25 of which is for a subscription to *QST* for the same period. Please begin my subscription with the ..... issue. Mail my Certificate of Membership and send *QST* to the following name and address.

.....  
.....  
.....  
.....  
Do you know a friend who is also interested in Amateur Radio, whose name you might give us so we may send him a sample copy of *QST*?

Thanks

## For Your Convenience QST'S INDEX OF ADVERTISERS IN THIS ISSUE

American Sales Company .....	79
Arcubus Radio Tube Co. ....	83
A. R. R. L. Emblem .....	85
A. R. R. L. Handbook .....	85
A. R. R. L. Log Book .....	87
A. R. R. L. Special Offer .....	87
A. R. R. L. Supplies .....	87
Bian, The Radio Man, Inc. ....	81
Biley Piezo-Electric Co. ....	86
Bud Speaker Company .....	77
Burstein-Applebee Co. ....	81
Candler System Company .....	85
Cardwell Mfg. Corp., Allen D. ....	2
Central Radio Labs. ....	91
Collins Radio Transmitters .....	86
Columbia Specialty Company .....	90
Cornell Electric Mfg. Co. ....	93
Curtin Engineering Co. ....	93
DeForest Radio Company .....	1
Delta Mfg. Company .....	76
Electrad, Inc. ....	89
General Dry Batteries, Inc. ....	4
General Radio Company .....	89
Globe Television & Phone Corp. ....	87, 91
Gross Radio Company .....	98
Gulf Radio School .....	93
Hammarlund Mfg. Company .....	81
Harrison Radio Company .....	82
International Resistance Co. ....	88
Jewell Radio Company .....	74
Leeds .....	95
Littelfuse Laboratories .....	79
M & H Sporting Goods Company .....	73
Mignon Transformers and Condensers Co. ....	79
National Carbon Company .....	Cor. 11'
National Company .....	78
National Jobbing & Export Co. ....	88
Odeon Mfg. Company .....	79
Premier Crystal Labs. ....	93
QST Binder .....	83
Radio Engineering Labs. ....	87
Radio Supply Company .....	91
Radio Television Industries Corp. ....	91
Ramsey Publishing Company .....	81
Schwartz & Son, Maurice. ....	89
Scientific Radio Service .....	84
Shalleross Mfg. Company .....	89
Teleplex Company .....	90
Thordarson Electric Mfg. Co. ....	80
Uncle Dave's Radio Shack .....	77
United Radio Manufacturing Co. ....	85
Universal Microphone Company .....	85



# —Leads Again

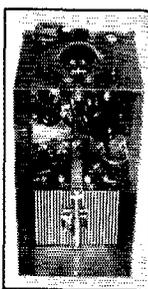
In Prices On  
Quality Merchandise

## Improved 5-Meter Super-Reg. Receiver



The result of 6 months of intensive experimentation. Greater audio output and a full coverage of the band from 70 to 45 megacycles without deadspots are features of this sturdy compact aluminum chassis receiver. 7" x 5" x 7", weight 2 lbs. Operates on 6 volts D.C. or A.C. "B" eliminator or "B" batteries without changes. Wired and tested. . . . . **\$12.45**

## Monitor Frequency Meter



At Last a Band Spread Monitor Frequency Meter employing 230 tube; electrostatically and magnetically shielded in a crystalline finished steel box, with an easily removed cover; 80 division spread on 80; 3.5 on 40 meters; 50 spread on 20 meters. Complete with batteries and DeForest tube. **\$9.95**

## A New 5-Meter Transmitter

Simplified push pull oscillator — it certainly is a dandy. Described fully in our May advertisement.

Complete Kit — **\$6.00**  
Special...  
Wired and Tested... **\$9.75**



Amplion imported, large, type A.R. 19 brand new magnetic horn unit. Bought from Custom house. Regularly sold for \$15. Special. . . . . **\$1.00**  
Small short wave R.F. honeycomb choke, 60c list. Now each. . . . . **.19**  
R.F. detector plate choke. . . . . **.25**  
Plug-in coil forms, 4 and 5 prong; fits standard sockets, marked with different colors at top, each. . . . . **.20**  
Amrad Midget variometer as described in Short Wave Craft, each. . . . . **.50**  
Black Crystalline finished steel monitor can with removable cover. . . . . **1.25**

National factory wired S.W. 3; A.C. or D.C. Less coils. . . . . **\$20.88**  
National factory wired S.W. 5; D.C. Less coils. . . . . **38.22**  
National factory wired S.W. 5; A.C. Less coils and pack. . . . . **40.87**  
All type National coils can be bought singly or in pairs at lowest wholesale prices. Write for Details

R.E.L. No. 278, Band Spread Receiver—The loud speaker signals this set brings in clearly from everywhere are almost unbelievable. Contains 18 important features. Complete with 20-40-80 meter band spread coils. Specially priced. . . . . **\$26.45**  
Other coils available. Write for complete data

Two DeForest No. 436 tubes — One DeForest No. 438 tube. List \$2.75 each. Now \$3.72 net for 3 tubes.



## Navy Type Telegraph Key

List **\$3.60**. Navy knob— $\frac{1}{4}$ " Tungsten contacts. While they last. . . . . **\$1.25**

Genuine Type C Baldwin Phones  
\$12.00 List — Mica diaphragm. Limited quantity — **\$3.95**  
fit — only 2 pair to a customer. Special.

Erpe imported 4000 ohm feather weight phones. **\$1.35**  
Special.  
\$5 Eiseman Head phones; 2500 ohms; brand new; complete with head band and cords. . . . . **1.00**

## LITTLEFUSES — Complete assortment of sizes at Special Prices

Leeds 888 — A tremendous response to our introduction of the new 888 rectifier described in our April advertisement indicates a general change to this remarkable rectifier tube in all but the largest power supplies is in order. Sold at \$2.00 each with a 30 day guarantee. . . . . **\$2.00**  
LEEDS 866 Mercury Vapor Tube. . . . . **2.25**

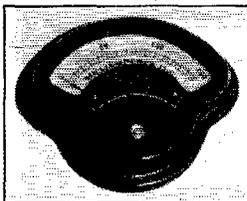
Dubilier Dry Electrolytic Condensers  
8 mfd. Special. . . . . **\$ .60**  
8-8 mfd. Special. . . . . **1.10**  
8-8-8 mfd. Special. . . . . **1.60**

## Two Wonderful 5-Meter Jobs Made by R.E.L.

No. 296 — 5-meter receiver. . . . . **\$20.50**  
No. 297 — 5-meter transmitter. . . . . **\$27.75**  
Described fully June issue, page 63.

## DeForest Tubes

410 } **\$2.25** | No. 510 — 15 watt oscillator **\$3.95**  
450 }  
481 }  
All other DeForest receiving tubes at 50% and 10% off list price.



## WESTON METERS Model 267 — List \$16.25

Front panel mount. There are only a few of the following numbers left. . . . . **\$3.95**  
0-15 V.D.C. . . . .  
0- 20 M.A.D.C. . . . .  
0- 30 " " " " } **\$5.00**  
0-150 " " " "

Other sizes at \$16.25 net



## Franklin Transmitting Key

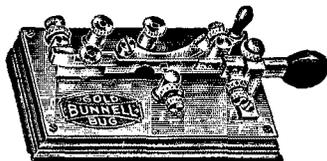
Mounted on base without switch. Big special. . . . . **85c**

## LEEDS TRANSFORMERS

for 5-meter mixing panels. These transformers are flat from 100 to 5000 cycles, tube to line — universal line to line — and universal line to grid. List \$5.50. Any **\$3.30** one of the above . . .

## Flechthelm Condensers

See our April 1932 advertisement for sizes and prices.



## No. 398 Gold Bug Automatic Transmitting Key

\$12.50 List. Simple in construction, correct mechanically, and electrically rugged and durable 3/32" contacts, complete with cord and plug. Brand new in original cartons. While **\$4.45** they last. . . . .  
No. 10202 Extra heavy 3/16" **\$5.45** contact. . . . .

Filament Transformer 2 1/2 v. 10 amp for 27 and 24 tubes only. Special. . . . . **\$1.25**  
Leeds mounted 866 filament transformer; 2 1/2 v. at 10 amps, 10,000 volt insulation. . . . . **2.95**  
Leeds mounted filament transformer; 7 1/2 v. center tapped; 5 amps. . . . . **2.95**  
Leeds special 866 filament transformer; our latest model; steel encased with Bakelite panel at top; tapped primaries; 2 1/2 v. 10 amps. 10,000 volt insulation. . . . . **3.95**  
For other transformers see April issue.

Hundreds of other items at Big Special Prices. Constant changing of prices and merchandise makes it impossible for us to issue a catalog. Let us quote you on your needs.



45 Vesey Street, New York City  
New York Headquarters for Transmitting Apparatus  
WHEN IN TOWN VISIT OUR STORE

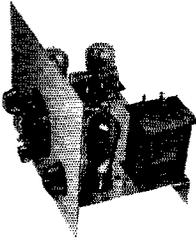
MAIL ORDERS FILLED SAME DAY

10% Cash  
Must Accompany All  
C. O. D. Orders

# VACATION SALE for July only!

Jerry makes it worth your while to drop in and save

## 5-Meter Receiver



At Last! you can buy a 5-meter receiver of better quality, better construction and at lower price than any offered you yet. A beautifully constructed compact job enclosed in crystalline black *Hinged Cover Cabinet*. Uses

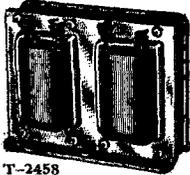
2-237's and 1-238 tube — Employs QST super regenerative circuit.  
Complete kit of parts. . . . . \$12.50  
Completely wired and tested. . . . . \$16.50

### 5-METER TRANSMITTER

with 2 6Hv7 milliammeters, Heising modulation employs 2-245's and 2-247's enclosed in same type cabinet as receiver.  
Complete kit of parts. . . . . \$17.50  
Completely wired and tested. . . . . \$22.50

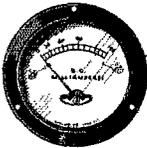
## THORDARSON Heavy Duty DOUBLE FILTER CHOKE

consists of two 18 Henry 250 mil chokes, D.C. resistance only 108.5 ohms. Size 3" x 7" x 5 1/4". BRAND NEW. Ideal for choke input



T-2458

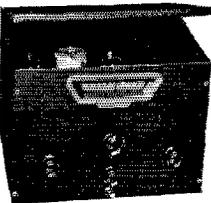
filter systems. Saves the price of an extra choke. Especially suited for use with that class "B" power supply to give better regulation and pass heavy current. Only. . . . . \$6.75



HOYT perfectly damped meters at a price. These are not to be confused with the usual meter "bargains." 2" mounting hole, flange 2 3/4" diameter, supplied in following sizes: 10 m.a., 50 m.a., 100 m.a., 150 m.a., 250 m.a., 300 m.a. 15 volt A.C.  
10 Volt D.C. . . . . \$1.60  
Three for. . . . . 4.50

WESTINGHOUSE UNIVERSAL METER Bakelite case 0-1 m.a. double scale for either A.C. or D.C. price includes rectifier. A real bargain at Jerry's price. . . . . \$8.75

**TUBES FREE** with the Gross "HAWK" detector. Pentode audio. Complete spread on Ham bands or continuous range from 17 to 110 meters. Employs 2-236's and 1-238 tube. Write for descriptive circular. Completely wired and tested with a set of matched tubes. \$22.00



INCLUDE 20% DEPOSIT WITH ALL C. O. D. ORDERS

## LOOK THESE OVER!

ALL GUARANTEED

- 866 Heavy duty tubes. . . . . \$2.50
- 888 or 871. . . . . 1.75
- 281-M. . . . . 1.75
- 280-M. . . . . 1.15
- 282. . . . . .70
- 210. . . . . .1.40
- Enamel solid copper antenna wire, any length No. 14 per 100 ft. \$ .30
- Enamel solid copper antenna wire, any length No. 12 per C ft. \$ .30
- Enamel solid copper antenna wire, any length No. 10 per 100 ft. \$ .90
- Barrel type ribbed antenna insulators. . . . . 6 for 35c
- Isolantite Zepp spreaders 2- or 3-inch. . . . . 10 for 40c
- 5-meter midget stand off insulators, 2-hole mount. . . . . 10c
- Double spaced Neutralizing cond. 50 mmf. . . . . 25c
- Kurz-Kasch 2 3/4" black dials. . . . . 40c
- Kurz-Kasch 4" black dial. . . . . 50c
- Frost Bakelite 50,000 potentiometer. . . . . 65c
- Screen grid clips. . . . . 4 for 10c
- Extra heavy tinned lugs, per doz. . . . . 20c
- Mica .002 fixed cond. . . . . 6c
- Eby bakelite 4 or 5 prong sockets 15c
- Eby Isolantite 4 or 5 prong sockets. . . . . 17c

- Well known high grade variable .0005 condensers. . . . . \$1.85 (Brand new) (Very limited quantity)
- Cardwell T-199 .00011 cond. . . . . \$5.70
- Cardwell T-183 .00033 cond. . . . . 5.70
- Cardwell 164-B .00022 cond. . . . . 2.70
- Cardwell 123-B .0005 cond. . . . . 2.85
- Extra high grade 2 mfd 2000 V working filter condensers. . . . . \$4.75 (limited quantity)

- Franklin transmitting key. . . . . 75c
- Pyrex low loss V.T. sockets. . . . . 25c
- Red Devil Wall Insulators. . . . . 5c
- Brown bakelite coil forms, 4 and 5 prong. . . . . 15c
- Yaxley battery switches. . . . . 15c
- Eismann headphones per pr. . . . . 90c
- Filament transformers 2 1/2 & 5 V. \$1.25

- Filament transformers 2 1/2-2 1/2 & 7 5V. . . . . \$1.35
- Filament transformers 7 1/2-7 1/2 & 2 1/2 V. . . . . \$1.50

R.C.A. brand new single button hand mikes ideal for 5 meter phone work, fine quality. . . . . \$1.95

MIKE TRANSFORMER for single button mike, very compact size will give nice output. . . . . \$3.85

10 Volt Filament Transformer at 7 1/2 amps. to be used with a C.T. resistor for accurate work. Get them while they last — only . . . . . \$1.10 (include postage for 6 lbs.)

## Power Supply Kit only \$10.75



A lucky "buy" enables us to give you the biggest bargain in power supplies you have ever heard of. Here's the dope —

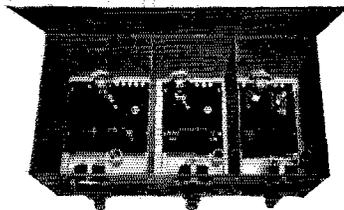
The pack will deliver 525 volts at 175 m.a. or 550 volts at 125 m.a. The transformer weighs 14 1/2 lbs. The choke weighs 9 1/2 lbs. The condenser weighs 7 lbs. (cap. 4-2-2-1 mfd sections) Pack completely wired and tested. \$3.50 extra

Every item brand new in matched dull black finished steel containers. Transformer has two 7 1/2 V. windings and a 2 1/2 volt winding besides the high voltage winding. For maximum output you can use 2-281's or 2-281-M's or 2-888 or 871's or even a single 282. Due to the different windings you have a considerable choice.

The kit consists of power transformer, condenser block, filter choke, bleeder, two sockets, terminal strip and metal chassis neatly finished. Ideal for the GC-30 or any crystal transmitter or self excited job. Prices of units purchased separately Transformer. . . . . \$3.95 Condenser block. . . . . 2.00 Choke. . . . . 1.75

## The GC-30

a real transmitter bargain  
CRYSTAL CONTROL  
FREE—2-210s & 1 Pentode  
This Month only



your choice 210 oscillator 210 buffer 210 amp or Pentode oscillator 210 buffer 210 amp. Completely assembled ready for you to wire with three Readrite meters. . . . . \$29.50 with three Weston meters. . . . . \$42.50

Write for descriptive circular

Include Postage

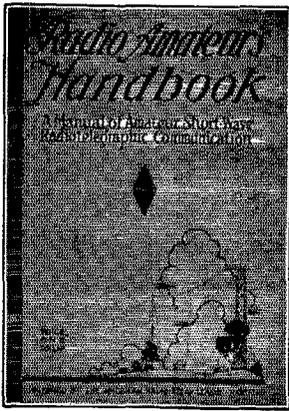
A COMPLETE LINE OF STANDARD AND "HARD TO GET" PARTS

# "JERRY'S PLACE"

25 WARREN STREET, N. Y. C. TELEPHONE BARCLAY 7-6698



ALL THE LATEST DEVELOPMENTS OF THE NATIONAL CO. IN STOCK



# SPECIAL OFFER—during July and August only . . . a Year's Subscription to QST

(either new or renewed)

and a copy of the latest (ninth) edition of the

## RADIO AMATEUR'S HANDBOOK

By the Headquarters Staff of the A.R.R.L. (in its 160th thousand) **\$3.00**  
In United States, its possessions and Canada

(Other countries, \$3.50)

**FOR NEWCOMERS IN THE GAME** — the Handbook is an eminently practical manual of amateur radio in all its phases, published by the American Radio Relay League, the amateur's own organization. It starts at the beginning and tells the whole story: What amateur radio is; How to be a radio amateur; How to obtain your license; How to build the simple apparatus of a simple station; How to build the best known equipment for the most modern station; How to operate your station. Anyone who is at all interested in the technical side of radio can ill afford to be without the Handbook.

**FOR PRACTICAL AMATEURS** — the Handbook is the daily working guide of successful amateurs the world over. Technical and operating matters treated in every form, from the simplest to the most elusive and complex. Not only all sorts of modern transmitters and receivers but solid chapters on power supplies, antenna systems, keying methods, frequency measurement and monitoring, crystal control, radio-telephony. Not only apparatus but operating procedure, traffic handling, reports, how the Communications Department works. *Everything you want to know.*

**Special Offer:** A copy of the \$1.00 edition of the HANDBOOK; a year's subscription to QST and a year's membership in the American Radio Relay League.

**ALL FOR THREE DOLLARS!** (Other countries, \$3.50)

**NOTE:** If you want your copy of the Handbook in stiff buckram binding add \$1.00 to your remittance.

*Even if you are already a member of the League and a subscriber to QST, you may avail yourself of this offer. Simply mention that fact and instead of entering it as a new subscription we will extend your present subscription for another year, and send a copy of the Handbook at once.*

AMERICAN RADIO RELAY LEAGUE, 38 LaSalle Rd., W. Hartford, Conn., U. S. A.

AMERICAN RADIO RELAY LEAGUE, West Hartford, Conn., U. S. A.

Dear Sirs: I want to take advantage of your Special Offer and enclose remittance.

I  am  
 am not a member of the League.

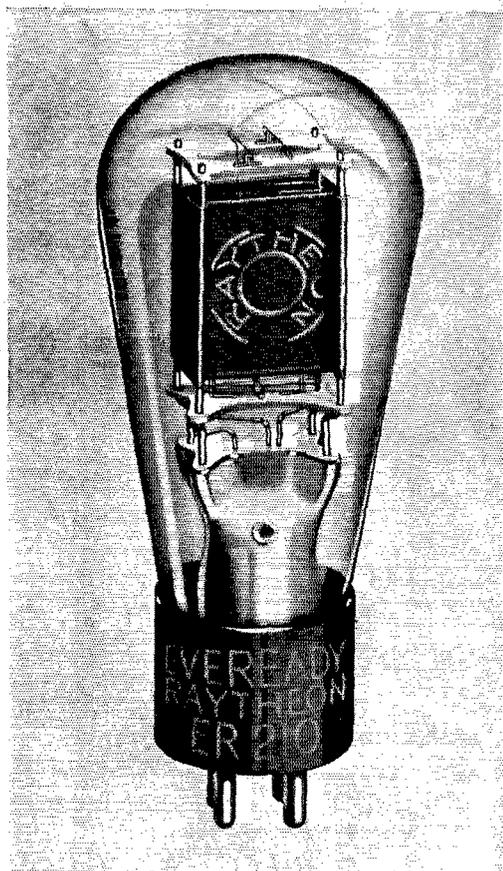
# 4-Pillar Construction

## WHAT IT MEANS TO THE AMATEUR

**VIBRATION PROOF...** Eveready Raytheon Radio Tubes have been chosen by the Police Departments of a number of cities (such as New York, St. Paul, Minneapolis, Pittsburgh, Detroit, Buffalo and others) as equipment for police car radio receivers and also in aircraft receivers by such national air lines as the Transcontinental Western Airway (Lindbergh Line); because the 4-pillar construction withstands the jolts and jars of such severe service.

The Eveready Raytheon Type ER-210 has this same *exclusive* 4-pillar construction, which makes it ideal for amateur transmitters. As can be seen, the elements are securely braced at top and bottom by low-loss isolantite bridges. In addition, the ER-210 has been designed in such a manner that its "drift" at high frequencies is extremely small.

For further details write the nearest branch office.



TRADE MARKS

**NATIONAL CARBON COMPANY, Inc.**

General Offices: New York, N. Y.

Branches: Chicago, New York, San Francisco

Unit of Union Carbide  and Carbon Corporation