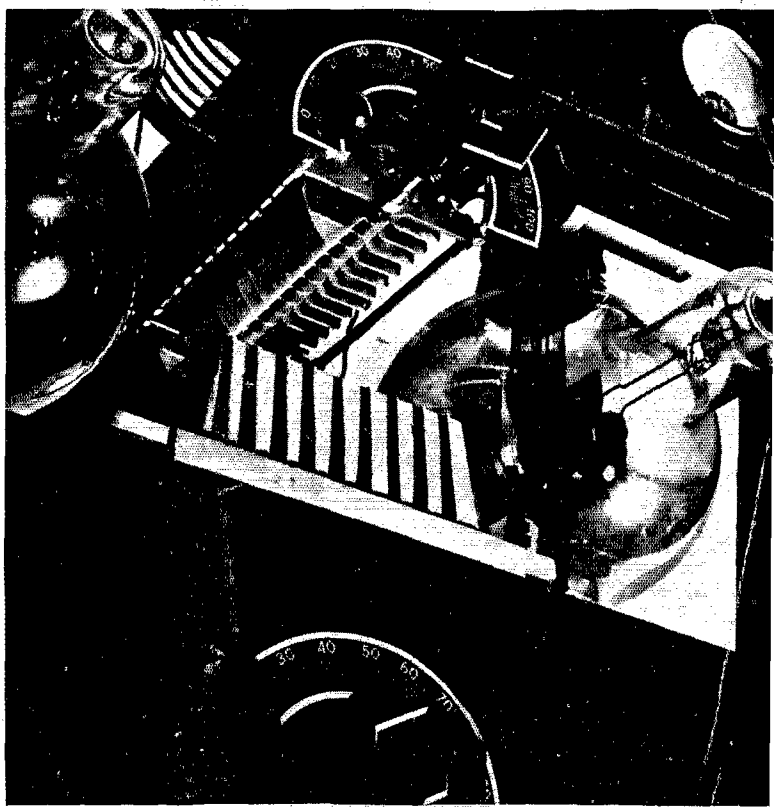
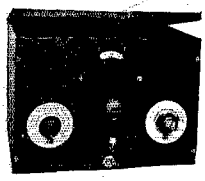
QST

devoted entirely to

amateur radio



october
1932
25 cents

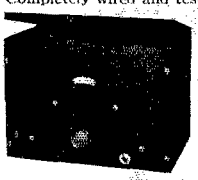


THE "HAWK" SHORT WAVE RECEIVER

employs two 236 and one 238 tube, uses screen grid R.F. and detector, Pentode audio. Complete band spread on ham bands or continuous coverage from 17 to 110 meters. Can be run with A.C. or D.C. on the filaments without any changes in the set. Has an excellent new vernier dial and German silver dial plates for logging.
Completely wired and tested with three Isolantite coils.....$22.00
Three matched tubes.....$2.50

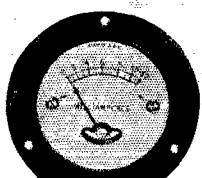
PENTODE CRYSTAL OSCILLATOR UNIT $10.95

Another beautifully constructed job includes one Hoyt meter, crystal holder and one coil for 40, 80 or 160 meters. This unit can be used as a one tube transmitter right on the antenna, ideal for the beginner who can later add amplifiers to it. Completely wired and tested $10.95. Power supply for crystal unit delivers 400 to 450 volts plate and 2½ volts filament, one 83 tube is used as rectifier. Unit mounted on a neat metal chassis. Completely wired and tested.....$8.50



MONITOR USES FULL SIZE DRY CELLS

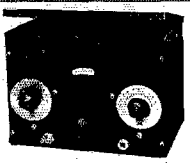
A real advantage for continuous monitoring. Again Jerry must say this is SOME job. Has back of panel vernier dial shielded in black crystalline finish cabinet with hinged cover, complete with three plug-in coils for 20, 40 and 80 meters, all batteries and tube, wired and tested.....$9.95



HOYT ANTENNA METERS!!!

Hot wire antenna meters 1½ and 3 amperes ranges. Why do without antenna meters when you can buy them at Jerry's who knows what the "Ham" wants. Special low price.....$2.95 each

Hoyt perfectly damped meters at a price. These are not to be confused with the usual meter "bargains." 2" mounting hole, flange 2¾" diameter, supplied in the following sizes: 10 m.a., 50 m.a., 100 m.a., 150 m.a., 250 m.a., 300 m.a., 4 volt A.C., 10 volt A.C., 15 volt A.C., 10 volt D.C. Price each, **$1.60** three for.....$4.50



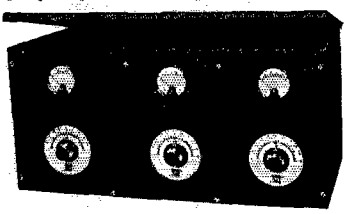
5-METER RECEIVER

A REAL receiver, completely shielded in a crystalline finish compact cabinet with a hinged cover excellent vernier dial. The quality of this set is above any offered — Jerry invites comparison — custom made construction a fine job. Uses 2-237's and 1-238 tube — Employs QST super regenerative circuit. Have the fun of wiring it yourself.

Completely assembled.....$12.50
Completely wired and tested.....$16.50

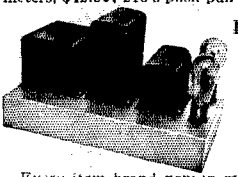
5-METER TRANSMITTER

Same construction as above receiver with two Hoyt milliammeters, Heising modulation employs 2-245's and 2-247's.
Completely assembled.....$17.50
Completely wired and tested.....$22.50



THE FAMOUS GC-30 CRYSTAL CONTROL TRANSMITTER Now a greater value than ever — HOYT METERS — GERMAN SILVER DIALS — BAKELITE INDICATOR KNOBS and other refinements at no increase in price.

Your choice of 210 oscillator 210 buffer 210 amplifier or Pentode oscillator 210 buffer 210 amplifier. Can also be supplied with two-210's in push pull in output stage. Completely assembled ready for you to wire with three Hoyt meters, **$29.50**; with three Weston meters, **$42.50**; 210's push pull in output stage **$8.00** extra.



POWER SUPPLY KIT $10.75

Here's the dope—
The pack will deliver 525 volts at 175 m.a. or 550 volts at 125 m.a.
The transformer weighs 14½ lbs.
The choke weighs 9½ 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 7½ V. windings and a 2½ 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 trapsformer, 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.

Plated Copper Tubing Inductances Wound and Ends Drilled Free

Inside dia.	*3/16"*	*1/4"*	*5/16"*
1¼"	7c turn	8c turn	
2½"	7c turn	8c turn	12c turn
3⅜"	10c turn	12c turn	14c turn

Keying Relays! will operate on one dry cell, can be used as a single pole, single throw, double pole single throw, also has an extra back contact which is very convenient for many purposes.....95c

CONDENSER MICROPHONE KITS, $3.00

Make your own condenser microphone — the kit contains the Western Electric type unit perfectly machined, the perforated brass back plate, duraluminum diaphragm, prongless tube base, protective screening and all hardware. When assembled as per instructions furnished this mike will surpass in performance the highest price carbon mike.

NEW!! "E. C." FREQUENCY METER
A better job in every way than you have seen yet. Calibration guaranteed accurate to 250 cycles.
With National $15.00 6" vernier dial, complete with tube.....$30
With National $6.50 4" vernier dial, complete with tube.....$26

LOOK!! 888's or 871's Guaranteed—Extra Special 95c

G. E. ¼, ½, 1 watt Neons	$ .55	Eby Bakelite UX and UY sockets	$ .15
866 Heavy duty tubes	$2.50	2¾" Kurz-Kasch dials	$ .40
281-M	$1.75	Isolantite Zepp spreader 2- or 3-inch, 10 for	$ .40
281	$1.00	5-meter receiver oscillator coil	$ .75
282	$ .55	Brand new R.C.A. 211's, each	$16.50
210	$1.40	The new type 83 fullwave 5-volt filament mercury rectifier tube	$ .90
247	$ .60	Midget 2.5 V. C.T. filament transformers, 7 amps	$ .90
230	$ .70	Midget 7.5 V. C.T. filament transformers, 3 amps	$ .90
Enamel solid copper wire, No. 14 per 100'	$ .30	Power transformers for use with the new 46 tubes, 415 V. each side of C.T. at 200 M.A., three 2½ volt C.T. windings	$4.75
Enamel solid copper wire, No. 12 per 100'	$ .45	Midget power transformers, 350 V.—350 V. C.T. 2½ V. and 5½ V. filament	$1.35
Enamel solid copper wire, No. 10 per 100'	$ .80	Fil. trans. 2½ V.—2½ V. and 7½	$1.50
Enamel solid copper wire, No. 8 per 100'	$1.20	30 Henry 80 M.A. chokes	$ .60
1¾" sure fire porcelain insulators	$ .80	Special Heavy plate condenser with variable tank and tuning portion for EC oscillator.	$4.75
6" stand-off insulator wood screw in base	$ .25	No. 14 Push back wire, solid, per 100'	$1.25
Egg strain insulators, 6 for	$ .35	No. 16 Push back wire, solid, per 100'	$1.10
10 Volt filament transformer, 7½ amps	$1.25	No. 20 Push back wire, solid, per 100'	$ .75
Mike transformer for single button hand mike	$ .85	Aerovox Dry 8 mfd Electrolytics	$ .85
Stand-off insulators (beehive)	$ .07		
Midget stand-off insulators	$ .10		
R. C. A. single button hand mikes	$1.75		
Filament transformer 2½ and 5-V.	$1.25		
Fil. trans. 2½-2½- and 5-V.	$1.35		
Fil. trans. 7½-7½- and 2½-V.	$1.50		
Franklin Transmitting key	$ .75		
Eby Isolantite UX and UY sockets	$ .17		

Erpee lightweight phones	$1.35
Baldwin Type C mica Diaphragms	$3.75
Thord, double chokes, 36 H. 250 m.a.	$7.00
Special 30 H. 250 m.a. chokes	$2.75
Plate filament transformers same as in power pack above	$3.95
Hammarlund band spread condenser 20 and 100 mmf.	$2.10
Transformers for 866 tubes, 2½V, 10 ampere	$2.65
Bliley 80- or 160-meter quartz crystals	$5.50
Bliley 40-meter quartz crystals	$9.00
Ebonite panels, beveled edges, ⅜" thick (easily drilled)	
8½"x25" $1.10 8½"x15"	$ .70
8½"x20" $ .95 8½"x10"	$ .60
10"x10½" $1.10	
2 mfd 2000-volt filter condensers	$5.25
2 mfd 3000-volt filter condensers	$8.25
Power transformer 750–750 each side of C.T. two-7½ V. windings 300 M.A.	$6.75
Westinghouse Universal A.C. and D.C. 0–1 m.a. meter	$8.75
Duovac 852, 211, 203-A tubes as used by the Army and Navy stations, guaranteed firsts — write for special quotations.	

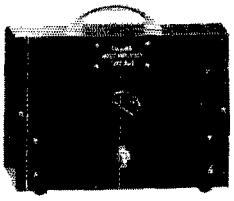
20% deposit with all C. O. D. orders. Include Postage.

Collins Transmitter
TYPE 40B

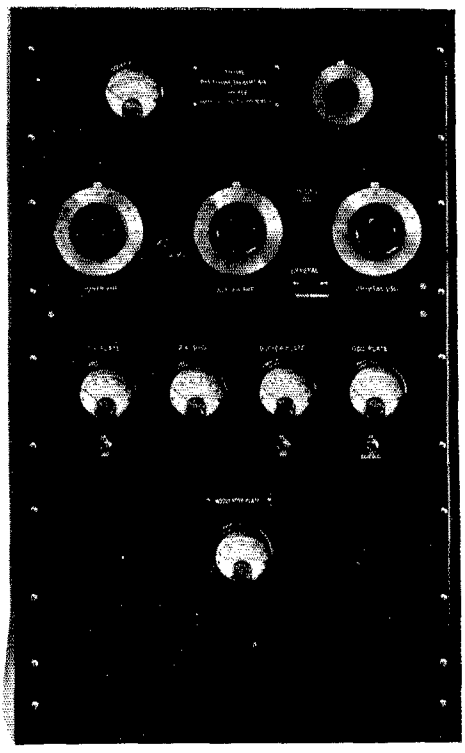
The 40B is a high grade phone and CW transmitter embodying the most advanced technical refinements. Its performance, construction, and appearance are not equalled in transmitters selling for many times its price.

Type 5A Microphone

100% Class B modulation
25 to 30 watts carrier output



Type 90C Amplifier



Type 40B Transmitter

Specifications

Frequency Range: 14,300 to 1,715 kc. Coils for one amateur band are standard equipment.

Modulation: Perfected Class B. The COLLINS 9C Modulator Unit is employed using two 46's Class B driven by two 45's Class A with 82 rectifier. This Unit provides more undistorted modulation power than two 211's Class A with 1,000 volts on the plate.

Fidelity: Flat within 2 db. from 80 to 8,000 cycles. Harmonic content less than 5%. Harshness, caused by transient oscillations present in most Class B systems, is entirely eliminated by means of special circuit and transformers. Each Transmitter is tested with special audio oscillators and cathode ray oscillograph.

R. F. Circuit: The R.F. section of the 40B is identical with the COLLINS 30W. 10A Crystal Control Unit with 247 oscillator, 247 buffer and 510 amplifier is driven by heavy duty power unit. Grid-block keying.

Construction: Burnished aluminum and nickeled chassis mounted on standard 19-inch relay rack. Engraved Formica panels. Surface type Weston meters. Highest quality material throughout. The 40B Transmitter is obtainable either in 34-inch table rack (as illustrated) or in a 60-inch floor rack at no increase in cost.

90C Input Amplifier: Provides necessary gain for operating the 40B with condenser or carbon microphone. Uses two 56's. 500-ohm line to Transmitter.

A complete C.W.-phone installation is priced as follows:

40B Transmitter	$235.00
90C Input Amplifier	32.00
Kit of Matched Tubes	25.75
Crystal and Holder	7.50
5A Condenser Microphone	125.00

F.O.B. CEDAR RAPIDS

Send 25c in coin for manual describing COLLINS Transmitters with parts lists and circuit diagrams

Collins Radio Transmitters
Cedar Rapids, Iowa
W9CXX

LATEST & FINEST

"Communication Type" H.F. Receiver

For amateurs who want the latest and finest in "communication type" HF Receivers, we now offer the NATIONAL AGS. The AGS has been developed in conjunction with the Airways Division of the U. S. Department of Commerce to comply with the exceedingly strict requirements of aviation ground-station service.

Nothing has been omitted to make the AGS the very last word in performance and reliability.

It can be shifted from CW to Voice with the turn of one control. It is equipped with optional manual — or automatic-volume-control. A ground-celluloid station chart on the panel allows for easy change or erasure in listing stations. Provision is made for either phone or speaker output.

Tubes employed are four 236's, four 237's, one 238. Other special features of the AGS are:

1. Design to give image suppression, improved signal-to-noise ratio, improved weak-signal-response.
2. Single tuning-control with 270° precision vernier German-silver dial (straight frequency line tuning).
3. Calibration curves and station chart on front panel.
4. Coil-change from front-of-panel.
5. Extremely rigid mechanical construction.
6. Relay rack mounting, size 8¾" by 19".
7. Frequency range 2400 to 15,000 kc. Additional coils available to extend range to 20,000 kc.

Operates on Full AC

New NATIONAL Power Units are available for operation of single units or pairs, permitting stand-by on two or more frequencies. R.C.A. Licensed.

We also Announce the NEW NATIONAL "58C" COMMUNICATION TYPE SHORT-WAVE RECEIVER

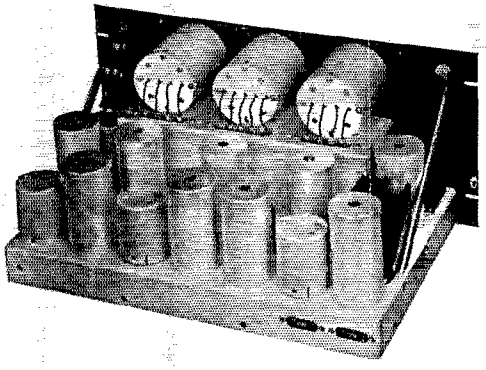
The SW-58, with its definitely superior signal-to-noise ratio, as compared with any other type of commercially available short-wave receiver, is now available for rack panel mounting with front-of-panel coil change. This adapts it for use in standard or transport communications equipment.

The 58C may also be obtained mounted in a walnut cabinet for table use. Standard coils cover frequency range of 2.6 mc. to 22 mc. Special coils available for extending range to include all frequencies between 150 k.c. and 33 mc.

Send Coupon Below for Full Information and Prices

NATIONAL "AGS"

Communication Type SHORT-WAVE RECEIVER



Made by the Makers of NATIONAL VELVET VERNIER DIALS

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Please send me full particulars of the AGS Receiver and your new 16-page Catalogue.

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QST

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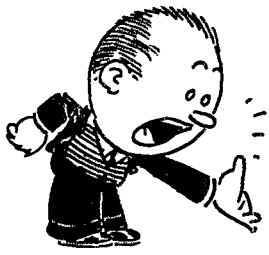

OCTOBER 1932

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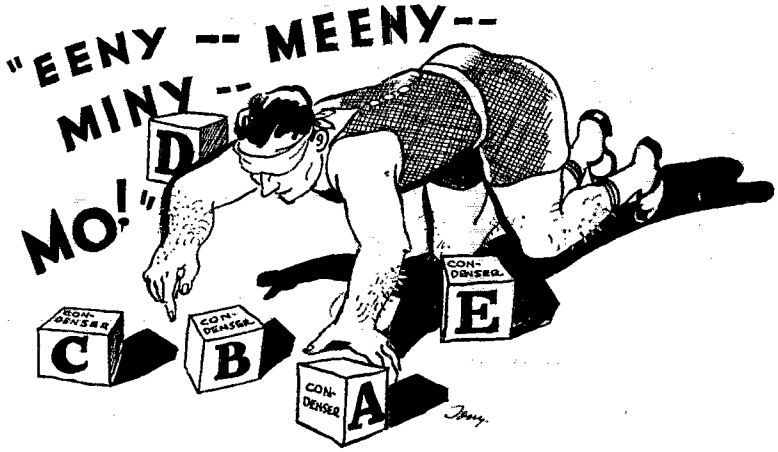


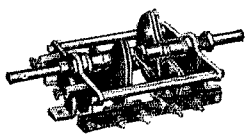
"EENY, MEENY, MINY MO"—How meaningless, this formula for the simple selections of childhood, yet how frequently is as meaningless a method of selection employed when grown-ups choose variable condensers!

Chance may favor you in some of your "Eeny, Meeny, Miny Mo" selections, but chance should have no part in your choice of this most important part of your receiver or transmitter. On every hand, for your guidance, can be found abundant evidence of the desirability of CARDWELL condensers over all others. Why experiment with anything whose superiority has yet to be proved?

If results really mean something to you, hook up to CARDWELLS and see how they'll stick by you and hold down the job.

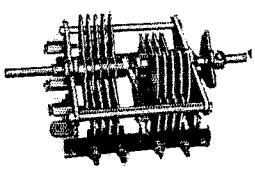
CARDWELL receiving condensers, and CARDWELL transmitting condensers for broadcasting, commercial and Amateur stations, for aircraft installations and portable sets, have won — and kept — the confidence of engineers and Amateurs the world over and have been, for more than a decade, truly "THE STANDARD OF COMPARISON".

Send for literature



Type No. 518

● A "band-spread" condenser in the famous Midway Featherweight model, smaller, lighter and more compact, for use where space and weight are important factors. Low capacity section — 25 mmfd. High capacity section — 100 mmfd. Also Type No. 517, 25 and 50 mmfd. Separate Shaft for each rotor. Others to order.



Type No. 516

● A "double ender", "standard" size condenser. Can be supplied in various combinations of capacities. This particular one is 90 mmfd. per section with separate shaft for each section. (Plates double spaced.)

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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.

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Ontario	VE3HB	H. W. Bishop	49 Eastman Ave.	London
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Quebec *	VE2AP	J. C. Stadler	4334 Westmount Ave.	Westmount, P. Q.
		VANALTA DIVISION		
Alberta	VE4HM	C. H. Harris	10806 125th St.	Edmonton
British Columbia	VE5AL	J. K. Cavalsky	4868 Blenheim St.	Vancouver
		PRAIRIE DIVISION		
Manitoba	VE4BQ	John L. Green	115 Furby St.	Winnipeg
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* Officials appointed to act until the membership of the Section choose permanent SCM's by nomination and election.

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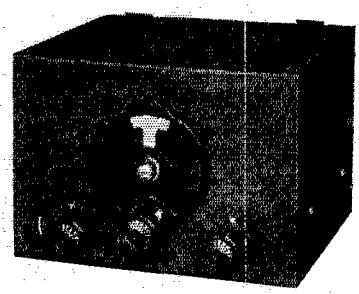
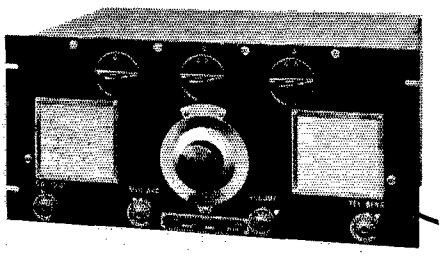
NATIONAL PRODUCTS at prices that are worth investigating

S.W. 58 less coils	$40.88
Power supply for S.W. 58	23.24
S.W. 34 less coils	38.52
S.W. 3 A.C. model less coils for use with National power supply	20.88
5880 A, B and C supply	20.30
S.W. 3 D.C. 6 volt — 2½ v. tubes	20.88

All National Coils at 40% and 2% off list price





Type A.G.S. Super Heterodyne, A.C. or D.C., in stock. This receiver is unquestionably the finest on the market. Band spread coils may be secured for amateur use of this commercial receiver. Write for Special Prices.

We are pleased to introduce a permanent solution to most amateur audio problems at a remarkably low price. The new Kenyon class B-46 amplifier system may be adapted to a number of uses in every ham's shack. Double microphone input, '24-A voltage amplifier, '46 class A second stage, and class B '46's in the final amplifier. Develops 20 watts undistorted audio output. Will cover an athletic field like a tent as a public address amplifier or will 100% modulate a 40 watt carrier.

1 Kenyon B-46-PT power transformer for class B amplifier	$5.88
2 Kenyon BC-100 filter chokes 15 henry 150 mil	4.71
1 Kenyon BLG universal input microphone transformer	3.25
1 Kenyon B-3000 250 H Plate impedance	2.65
1 Kenyon B-46-I class B input transformer	3.53
For Public Address amplifiers:	
1 Kenyon B-46-O class B output transformer with 500 & 15 ohm secondaries	3.53
For RF amplifiers:	
1 Kenyon B-46-RF output. Secondary 4000 ohms 100 MA capacity connects in series with B supply to RF amplifier	3.82
Basic transformer kit with either type output transformer and blue print as listed above	19.60
Complete kit of parts including metal chassis with blue print	30.00

HARDWICK HINDLE ANSWERS THE BLEEDER RESISTOR AND GRID LEAK PROBLEMS ONCE FOR ALL. USE THIS LIST FOR REFERENCE ON YOUR RESISTOR PROBLEMS

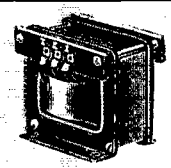
BLEEDER RESISTORS

Voltage	*Ohms Resistance*	*Wattage*	*Price*
400	20000	50	$1.08
500	25000	75	1.47
750	40000	75	1.53
1000	50000	100	2.25
		200	3.00
1500	2-40000 Units	100	3.85
		200	4.65
2000	2-50000 Units	100	3.95
		200	4.75
2500	2-60000 Units	100	4.45
		200	5.25
3000	3-50000 Units	100	5.95
		200	7.15

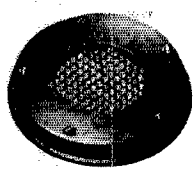
GRID LEAKS

Tube	*Ohms Resistance*	*Wattage*	*Price*
1-210	15000 var. tap	50	$1.05
2-210's	10000 var. tap	75	1.26
1-203-A	10000	100	1.65
2-203-A's	10000 C.T.	200	2.25
1-852	20000	100	1.75
2-852's	10000 C.T.	200	2.25

We can also supply the new 25, 50 and 75 watt ranges of resistors at low prices. These vitreous resistors are supplied with a slider for use as bridges, etc. and come in all popular sizes. Write for prices.



Leeds 866 transformer—2½ v. 10 amp. Center tapped, 10,000 v. insulation	$2.75
Leeds mounted filament trans. 7½ v. 5 amp. center tapped	2.95
Leeds mounted filament trans. 2-7½ v. 3 amp. center tapped windings	3.95
Leeds mounted 10 v. 7 amp. fil. trans. with 3 primary line taps to insure correct voltage	3.95
Leeds mounted fil. trans. 2½ v. 10 amp. 1000 v. insulation for receiver or 888 fil. in low voltage power supplies	1.15
Dubilier Dry Electrolytic Condensers:	
8 mfd. Special	$ .60
8-8 mfd. Special	1.10
8-8-8 mfd. Special	1.60



Announcing Chrisell Acoustic Condenser Microphones

These units will enable you to put your phone in the "broadcast quality" class at a remarkably low figure.

Complete kit of parts for condenser head	$2.95
Condenser head tested & guaranteed	7.95
Condenser head with two stage resistance coupled amplifier, complete in shielded box, tested and guaranteed	19.75

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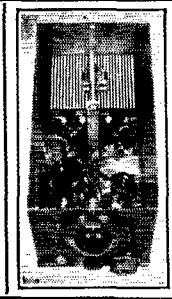
STARTS The Fall Season With A Smashing Price Reducing Sale

Leeds Lusty 56 Meg. Twins Are Still Going Strong

3 tube 56 Meg. Super Regenerative Receiver..... $12.45

56 Meg. T.N.T. Push-Pull Oscillator $7.85

Both units are wired and unconditionally guaranteed



LEEDS Band Spread MONITOR

furnished complete—DeForest 430 tube, A and B batteries and 20–40–80 coils. 50 division spread on 20 meters—35 divisions on 40 meters and 70 divisions on 80 meters. Unconditionally guaranteed.

$9.95

FLECHTHEIM Transmitting Condensers

High tension non-inductive trans. condensers used by over 50% of the Broadcasting stations

Cap. Mfd.	*Former list price*	*Special*
Type TC	*1000 v.d.c.*	*750 v.r.a.c., r.m.s.*
1.0	$3.75	$1.50
2.0	6.50	2.50
4.0	11.00	4.50
Type T	*1500 v.d.c.*	*1000 v.r.a.c., r.m.s.*
1.0	$4.50	$1.88
2.0	8.00	3.25
4.0	14.00	5.50
Type T H	*2000 v.d.c.*	*1600 v.r.a.c., r.m.s.*
1.0	$10.00	$3.50
2.0	15.00	6.25
4.0	25.00	11.00
Type H P	*3000 v.d.c.*	*2200 v.r.a.c., r.m.s.*
1.0	$20.00	$7.50
2.0	32.00	12.50

Navy Type Telegraph Key

List $3.60. Navy knob—⅛" Tungsten contacts. While they last.... $1.25

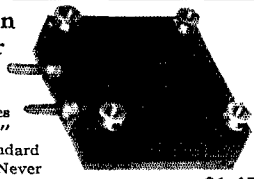
Leeds SUPREME transmitting key. Ideal for beginner's practice set. List $1.75. Special NOW 55c

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 they last..... $4.45

No. 10202 Extra heavy 3/16" contact..... $5.45

Leeds Precision Crystal Holder



A husky job with accurately ground plates; accommodates crystals up to 1¼" quare, with standard ¾" pin spacing. Never sold for less than $3.45. Now Special..... $1.45

Crystal—160-80 meter bands; one-tenth of 1% accuracy..... $4.35

Genuine Type C Baldwin Phones

$12.00 List—Mica diaphragm. Limited quantity—only 2 pair to a customer. Special.....	$3.95
Erpe imported 4000 ohm featherweight phones. Special.....	$1.35
Para imported featherweight phones.....	1.35
$5 Eiseman Head phones; 2500 ohms; brand new; complete with head band and cords	1.00

LITTLEFUSES — Complete assortment of sizes at Special Prices

National and R. E. L. Sets and parts at lowest wholesale prices. Let us quote you on your needs.

DeForest TUBES

Look at these prices — all perfect

401-A.....	$.38	437	$.88
412-A.....	.75	410-50-81.....	2.50
422.....	1.50	438.....	1.38
424-A.....	.80	439.....	1.38
426.....	.40	445.....	.55
427.....	.50	447.....	.88
430.....	.80	471-A.....	.45
431.....	.80	480.....	.50
432.....	1.15	482.....	.63
433.....	1.38	566½w. rec.....	3.95
435.....	.80	510 15w.....	3.95
436.....	1.38	503-A-11-45.....	14.45

Aerovox High Voltage Condensers

Type 1456 2500 v. Test		Type 1457 5000 v. Test	
.00005 to .0005.....	$.29	.00005 to .00015...	$.38
.001.....	.38	.0002.....	.44
.0015.....	.47	.00025.....	.44
.002.....	.56	.0005.....	.53
.0025.....	.60	.001.....	.71
.003–.004.....	.66	.0015.....	.83
.005.....	.75	.002.....	.95
.0075.....	.96		
.01.....	1.20		

Thordarson transformers and chokes — Drastic Cuts. Why gamble, when you can purchase nationally known apparatus at inferior merchandise prices? Items listed below are typical of the entire line.

T-2387	2000–3000ct	300 w.	Special	$10.85
T-2388	3000–4000ct	500 w.	Special	14.28
T-2389	3000–4000ct	1 K.W.	Special	17.10
T-2098	1120ct	150 w.	Special	5.14
	2–7½ v. windings			

CHOKES

				Special
T-1700	.130 mils	28 H.	231 ohms res.	$2.54
T-1998	.160 mils	27 H.	190 ohms res.	2.83
T-2071	.150 mils	18 H.	240 ohms res.	5.70
T-2027	.300 mils	23 H.	134 ohms res.	7.70
T-2073	.500 mils	26 H.	135 ohms res.	9.68
T-4451	.150 mils	25 H.	291 ohms res.	5.70
T-4456	.250 mils	25 H.	140 ohms res.	8.55
T-3100	.200 mils	15 H.	125 ohms res.	5.70

Weston Meters

Model 267—List $16.25

Front panel mount. There are only a few of the following numbers left. 0–15 V.D.C..... $3.95

0– 20 M.A.D.C. } $5.00
0– 30 " " " }
0–150 " " " }

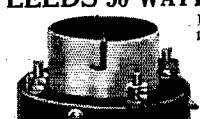
Other sizes at $16.25 net

Leeds Rectifier Tube Specials

280M Rectifier.....	$1.25
Improved 888 rectifier, now only.....	1.75
Regular 866; formerly $2.25 now.....	1.95
Heavy duty 210, now.....	1.50
Special low loss 210 as described in Sept. 1931 QST.....	2.95

Newly developed super 866 with spiral filament, self supporting plate; flashovers are practically impossible in this tube due to its unique construction..... 3.95

LEEDS 50 WATT SOCKET



Heavy special porcelain base. Double phosphor bronze springs, high grade construction throughout.

Extra special price **95c**

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 by return mail.

NOTE—ABOVE PRICES INCLUDE GOVT. TAX

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• • • • • 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.

A directory of the amateur societies affiliated with the League, showing their times and places of meetings, is available upon request.

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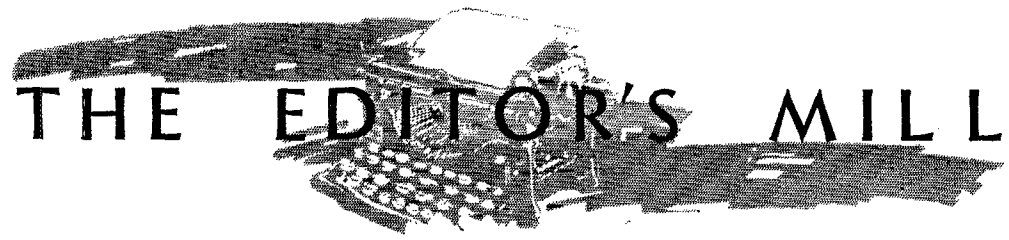


Madrid

As THESE lines are being written in late August, a week before the opening of the Madrid conference, no report on progress is possible beyond the news (just received via ham radio) that the firm of Warner and Segal had arrived in Madrid and was busily engaged making arrangements for office space, establishing contact with amateur and other groups, and generally preparing for the long grind.

Excellent communication has been established between Headquarters and the League's representatives at Madrid via W1SZ on this side and EAR96, with EAR224 pinch-hitting, on the other, so we expect to keep informed of developments as rapidly as they take place.

We hope to have a report from KBW on the opening moves of the conference in time for the next issue; in the meantime any vital developments will be relayed to the membership via W1MK and the League's official broadcasting stations. However, it should not be expected that red-hot news will be forthcoming at hourly intervals. Cautious battledore-and-shuttlecocking between the representatives of the various nations will probably be the order of the day for the first month or two, at least. We suppose, too, that there will be times when a tired and haggard conference will ditch affairs of state for a day or so and hie itself off to Andalusia or some place as guests of the Spanish government to recuperate over a week-end.

It is only as the conference approaches an end that announcements of any definiteness can be expected, and even then none of the agreements or recommendations of the various sub- and sub-sub-committees will be final until approved by the conference as a whole at its closing session.

Alien Operators Again

WHEN it was reported in the August issue of *QST* that aliens would no longer be issued operator licenses in this country, under the terms of an amendment to the Radio Act just made effective, it was anticipated that aliens at present holding licenses would be allowed to keep them until the date of expiration. This has now been confirmed in a letter received from the Federal Radio Commission: operator licenses issued to aliens prior to the enactment of the amendment on May 19, 1932, are valid for the term of the license.

The Commission also informs us that a United States citizen (which, by the way, includes a "citizen" of Porto Rico or Hawaii) when applying for a license need submit no further proof of citizenship than a statement under oath that he is a citizen of this country. So it won't be necessary to arm yourself with a birth certificate when you appear before the supervisor.

Several people have written us recently under the impression that the taking out of first papers entitles them to state they are citizens. Not so, OM's. The filing of initial papers does not confer citizenship. An alien must receive his final certificate of naturalization before he becomes a citizen of these United States.

Spit-Ball Effect?

NO LITTLE excitement was created around these diggin's early in August when press reports from Rome announced that Marconi had successfully transmitted both radiotelephone and radiotelegraph messages on a 57-centimeter wave from his yacht *Electra* to a point some 170 miles distant in Sardinia, with the implication that the eminent inventor had at last found a way to "bend" such short waves and overcome the horizon range that has, so far, limited us in all ultra-high-frequency work.

What ho! Does this mean that we are now to be presented with the "reverse English" dingus (shiny brass wheel and all) so long awaited and so hopefully mentioned by KBW in his editorial of September 1931? Has some method of putting the desired curve on a radio wave been actually developed, after all these years? Can its effect be pre-determined? And can it be utilized on other of the short waves than the 57-centimeter wave reported to have been utilized in the experiment?

To all these questions the press reports remain mum. While they stated that "bending" had been accomplished, no actual data on the method used have been received as yet. Prominent U. S. engineers and authorities on short-wave phenomena, when asked for their opinions, have declined to commit themselves until further data are forthcoming. Some think it possible to have achieved the desired spit-ball effect, but confess they have no idea how it could be done; they want to be shown. Others hazard the thought that the press reports were somewhat exaggerated, and that the communication may have been accomplished through repeater stations, balloon aerials, or some other more obvious methods. For the time being, then, there seems to be nothing to do but await details, and hope for the best.

But if it is true, Senatore Marconi, just let us amateurs have a whack at it for about six months . . . !

A. L. B.

W6USA—The World Was Its Oyster

By W. A. Lippman, Jr., W6SN

IT IS without misgivings that the writer sets forth on the task of chronicling the life and adventures of W6USA. The average ham station, running three hours per day, would have seen sixteen long months of brass pounding roll by in the sixty 24-hour days of operation that this station was on the air. To preserve some semblance of order and to put the salient features separately to save unnecessary wading, three major points will be considered: equipment; traffic, schedules and DX; operating, operators and the Olympic Village.

THE EQUIPMENT

The 40-meter transmitter: — 210 oscillator, 203-A doubler, 203-A buffer and 204-A final was our mainstay. An input of one kilowatt to the final stage, coupled with our excellent location, seemed sufficient power to put good signals into all continents under all conditions. Europe is a stranger to the Pacific Coast on this band, hence no contact was made there. We have several reports on our signals from that continent, however. The 14-mc. harmonic (MIM) of this transmitter was also reported in England.

The 20-meter transmitter utilized the same first three stages, but the final amplifier was a single 852 drawing approximately 650 watts. The 14-mc. band has been notoriously rotten this year, still we managed to poke through consistently, and did a lot of work on that band.

The main transmitter was built on a board seven feet long and three feet wide, with the 14-mc. amplifier fastened on the wall above it. This arrangement gave easy access to all stages and simplified watching for breakdowns. Fortunately we had very few of the latter. We were finally forced to use resistance bias to save batteries, and after a rectifier tube died we installed a mercury arc. The 3700-volt load to the 204-A caused more wear and tear on our nerves, I think, than on the 866's — but we probably saved ourselves a bit of grief. At the start most of the equipment was inadequate for the load, so from time to time replacements were made. The filaments of the first three stages were lit continuously for two months, and the final two stages shared sixty days' illumination. One 203-A went flat. It is indeed a tribute to present-day tube manufacturing. Through the efforts of the local distributor, the Hammarlund Manufacturing Company loaned us a Comet Pro receiver.

SOME W6USA STATISTICS

Total days on air	60
Total hours on air	1450
Total continents contacted	6
Total countries contacted	24
Total domestic contacts made	1515
Total foreign contacts made	409
Total all contacts made	1924
Average daily airline mileage	75,000
Total mileage covered (approx.)	4,500,000

Traffic handled	*First Month*	*Second Month*	*Total Two Months*
Orig.	499	2979	3478
Rlyd.	916	716	1632
Dlrd.	192	380	572
Total	1607	4075	5682

Average messages handled per contact 2.94

TRAFFIC, SCHEDULES AND DX

During our first month, due to the absence of any quantity of inhabitants in the Village, most of our traffic was relay work. This was necessary to the establishment of reliable schedules, and to the spreading of a feeling of confidence among major traffic men. Originations that month totalled 499, while during the second month nearly 3000 were started. We do not know whether or not this is a new world's record. We do know that it is a new Olympic record!

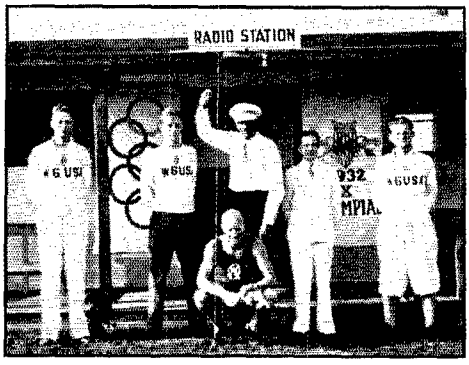
Fully seventy-five percent of these originations were in foreign languages. No one or half-dozen stations handled all this traffic. It was well distributed — one here, five there, and so forth, steadily enough to average 130 per day. Of course we had a few outlets that accounted for twenty or more per day, but not many.

The grand total of messages handled in the two months was 5682. Taking into consideration the normal summer shut-down of most big traffic stations and the seasonal discontinuance of major cross-country lanes, we had remarkable success. Inasmuch as amateur traffic handling carries no compensation there is little incentive to fighting, night after weary night, heavy static, fading, breakdowns and all the other little troubles we know so well, just to fill the hooks with foreign jargon we can't read next morning. In spite of this, station after station contacted along our hustling road expressed not only willingness but desire to do just that thing. How could we fail, with that sort of prop under us?

During the first thirty days, when time was not at a premium, we worked all continents and twenty-four countries. Later there was little time between skeds to hunt for elusive prefixes. Doubtless more countries could have been contacted had we been able to make the effort. Our most distant contacts were with South Africa — ZS2A and ZS5U, both stations being worked twice weekly on sked, with very few misses. Four

European countries were worked on twenty meters, some twice, and all reported our signals QSA5. Because of the very short periods during which that continent was workable, no attempt was made to pass traffic, however.

A total of five continents and eighteen countries was represented on our weekly chart of schedules. To us DX had no thrill. A new country worked meant only an effort to establish regular contact — questions concerning possibilities



THE MEN BEHIND THE BUG AT W6USA

Left to right: Bill Lippman, W6SN; Charles Perrine, W6CUH; Capt. Strasser, the Olympic interpreter who speaks 27 languages; Norman Madsen, W6FGQ; Don Shugg, W6ETJ; and below, Bill Barwick, Australian distance runner. Operators not present when this was taken are F. C. Martin, W6AAN; Chas. Cheatham, W6CUU, and E. O. McNeely, W6CII.

of QSP to still other countries. If success crowned our efforts a bulletin on the village board announced the fact that certain countries could now file traffic with us.

It might be of interest to record the results of an average day's work, picked at random from our log. During the twenty-four hours five continents and eleven countries were represented among the thirty contacts. The total mileage was 89,000 miles. Taking 75,000 miles per day as a fair average, W6USA covered in the neighborhood of 4,500,000 miles during its existence! A truly international station.

Schedules filled our day to the tune of about one an hour. Many were made and many broken. Of all the men who stuck with us, we have a special honor roll for a handful of them. Men who stayed through rotten conditions, were always on sked, and patient as new mothers when a message took ten repeats. We only wish that we could shake each one by the hand and tell them how much we appreciated it. They follow: ZS5U, NY1AB, KA1LG, VE2CA, VK2OC, VK3RJ, W3ZD, W4BL, W9CVQ and W9HCC. Among these we would also like to include PAØQQ and W2ZC, who with W3ZD spread Olympic Games messages over the face of Europe. Next to these men of iron come a host of men who handled great gobs of traffic, but under less trying conditions: AC8NA, AC6ZZ, KA1HR, OM1TB, VS6AG, LU3FA, HC1FG, W1MK, W5CGD, W6ATJ, W6BPU, W6CNX, W6FOM, W6UA, W7BB, W8AOW, W9EL and W9EQC. There were many others who held regular skeds and eased our burden. All of them, we believe, have been written to and thanked. Space prohibits naming them here. We are deeply indebted to all for the coöperation and help which were so gladly given.

THE OPERATORS

Two men took over the lion's share of operating. Don Shugg, W6ETJ, and "Chuck" Perrine, W6CUH, lived in the cottage and accounted for fifty hours a week each. Cheatham, W6CUU, McNeely, W6CII, Martin, W6AAN, and the writer split up the balance.

That Perrine and Shugg were able to give this time and energy is not so much to their credit but that they were willing to bury themselves in the station for the summer — stomach irregular sleeping hours — follow an endless, nerve-racking round of skeds, skeds, skeds from midnight 'til midnight — with static that left you reeling — 'phone calls — deliveries — mail to be answered — all the million and one complications attached

W6USA — THE OPERATING POSITION

Note the hooks where traffic was filed — also the complete chart of skeds above the Comet Pro receiver.

to a station handling over 130 messages per day, and through it all to preserve a saving sense of humor that never cracked — that is the stuff that real men are made of. These two men got more from this experience than merely being there. They made contacts, friendships, learned things the memory of which will take more than a lifetime of brass pounding to destroy. We salute them — Hams What Am!

In comparison, the work the rest of us did was but little. Madsen, W6FGQ, and the writer acted more as administrators than anything else. Cheatham, to whom we are indebted for most of the equipment used, and who in years was a man among boys, was a steadying influence when the "jitters" set in. His wise decisions saved many a bad situation, and many hours of operating are down to his credit. To Ellsworth McNeely, W6CII, we owe much of our reputation for clean-

cut operating. While he was not affiliated with us until the station was a matter of cut and dried traffic, he filled a big place in the scheme of things.

The heavy hours — 4 p.m. to 8 a.m. — were divided into four-hour shifts, while one man took charge of the eight-hour shift during the day. As a rule, all operators but Shugg and Perrine slept at home and handled shifts that fitted in with their normal outside existence. What we might call the normal interruptions of a normal existence often prevented our reporting for duty, with the resultant extra hours falling to those two men. Suffice to say that only once was an outside operator brought in.

THE OLYMPIC VILLAGE

The Olympic Village, which the local scribes were pleased to call the "International Settlement," was an impregnable fortress. From early morn 'til late at night hordes of the curious, friends and autograph seekers stormed the main gate. It is estimated that more than 600,000 people came at one time or another to watch the athletes file through the gate, to marvel at it all and try to get inside the Village. No visitors were allowed at any time within that place, sacred to athletes, firemen and radio operators.

You may imagine that this put us in a very preferred position. To some extent it did. We (and the athletes) were free from the idle questions of the unconcerned. Yet it was hard to refuse entry to relatives and local ham friends. Where a ham was from a distance, in a few instances we were able to get him in to see the station. Notable among these was Horace Gray, OB2SK, who had traveled from Borneo to see the Games. Many ruses were attempted to gain entrance. One ham posed as a reporter from an eastern newspaper — another drove up to the gates in an official-looking studio sound truck — and very nearly made it. Mr. J. M. Chapple, local arm of the Federal Radio Commission, who came around to check up the station for Uncle Sam, wasted a half hour talking, and after being vouched for by an operator was sent in under guard!

THE TRANSMITTER

Built breadboard style, it starts out with a 210 crystal oscillator back in the corner of the shack, and moves along to a 203-A doubler, 203-A buffer and 204-A final amplifier on 7000 kc. On 14 mc. a single 852 gets its excitation from the second 203-A. A kilowatt input on 7 mc. and 650 watts on 14 mc.

Fifteen hundred of 1932's most famous personages made our shack their loafing place for many weeks. Close behind us, in a ravine, an open air theater gave nightly talking pictures and shots of Games competition. No other immediate entertainment was offered. If these men drifted outside the Village they were strangers in a strange land — besieged by well meaning botherers — so they stayed inside, yes, and bothered us. At times fifty of them jammed the doorway — peered through the windows — talked forty languages. When they had left, our message box was littered again.

Sets of signs printed in five languages were hung around; stock explanations. A map of the world was strung with colored twine to show direct contacts and connecting lanes. After that sunk in, a set of gestures was gone through explaining what happened to a message bound for Latvia after PAØQQ got it in his clutches. Some of them never caught on to that one. One day when we had well over 200 on the hook for Europe a Dane nearly tore down the place because we wouldn't take a message for his mother back home. Her birthday was the *next day!* His trainer finally came and took him back to his hammer throwing practice, and we breathed again. And so it went — far into the summer.

Of course, in some instances we were able to give real service. Several Australians lived in Melbourne, and VK3RJ was kind enough to get their folks over often for a first hand chat. The Australians would come down at 5 a.m., sleepily gnawing apples, and write questions and answers for an hour or so. After the American team arrived from Palo Alto trials, every one of them wanted us to line up a ham in his home town for a nightly chew with the girl friend. They got over that, and were content with two-day delivery in any state — our usual domestic service.

It was necessary to have two men on duty at all times; one to pound brass and the other to keep the customers under control and happy. Answers — we had a million of 'em. And if the questioners weren't satisfied with one we gave them two others instead. Every time a movie star, a foreign official or notable of any kind was shown around the Village they were always shown through the "wireless station." The newspapers were most kind. Most of the dailies ran a column devoted to Village doings, and since the reporters made a practice of coming in the shack each day for any stray gossip, we broke into print often. Feature stories were also run in most of the local papers with pictures 'neverything.

We have tried to answer every card and letter received. There was work enough for a day and

(*Continued on page 90*)

Electron-Coupled Oscillators for the Small Transmitter

By George Grammer, Assistant Technical Editor

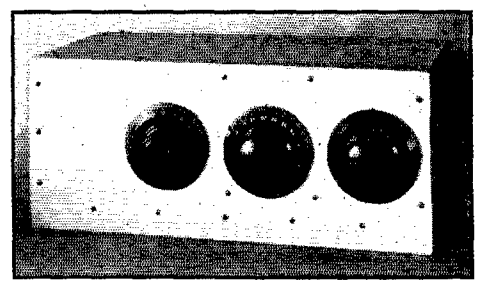
THE purpose of this article is not so much to furnish "how-to-make-it" information as it is to enumerate some of the things which are likely to be encountered in experiments with low-power electron-coupled oscillators for transmitters. That the electron-coupled type of oscillator is superior in many respects to the more familiar forms there is not the slightest doubt — the circuit can do a really admirable job in m.o.p.a. transmitters. This refers particularly to the degree of frequency stability obtainable — not only the kind of stability which has been labelled "dynamic" and means the ability of an oscillator to stay put with changes in plate voltage, but also to another kind of stability which we might call "oscillator frequency independence"; that is, the oscillator frequency is unaffected by variable load conditions imposed, for example, by the tuning of a following amplifier.

All the above is by way of saying that an m.o.p.a. transmitter with the electron-coupled oscillator gives a signal of about the same character, and "handles" in about the same way, as crystal control. But let's not get off on the wrong foot about this "good-as-crystal" business. No self-excited oscillator can equal a crystal in some ways — vibration, for example, must always be guarded against with the self-excited oscillator, although its effects are practically negligible with crystal. But, on the other hand, the non-crystal set has the big advantage that its frequency can be placed anywhere the operator wants, and few transmitting amateurs will deny that a change of frequency is desirable occasionally. We won't go into the one really valid argument against switching frequency — the possibility of getting outside the band. A good ham always looks before he leaps!

TUBES AND CIRCUITS

Theoretically, any tube with two grids can be made to work as an electron-coupled oscillator, whether the tube is of the screen-grid variety or not. But if the second grid is not a screen grid it becomes necessary to neutralize the capacity existing between the plate and the outer grid. Fig. 1 shows a typical circuit of this sort. The outer grid acts as the plate in an ordinary Hartley circuit; L_1C_1 is the tuned circuit, C_4 and C_2 are the plate and grid condensers respectively, and R_2 is the grid leak. The plate of the tube is connected to a second tuned circuit, L_2C_2, which may be tuned to the same frequency as L_1C_1 or to a harmonic.

The neutralizing arrangement is simple enough — the condenser is connected between the inner grid and plate, and no extra neutralizing taps on coils are necessary. Actually, however, the neutralizing tap is still with us, because the filament tap on L_1 performs that function. The nearer the filament tap is to the control-grid end of the coil the greater is the neutralizing capacity required at C_6, and vice versa. With the tap in the exact center of L_1, C_6 would have the same capacity as the outer-grid-to-plate capacity being neutralized. At first thought this might



AN EXPERIMENTAL EXCITER UNIT

The aluminum box contains a '24 electron-coupled oscillator and a '47 amplifier. Complete shielding between all circuits was used to find out just how essential it is to the stability of the oscillator.

seem to be a very convenient arrangement, but in practice it leads to difficulties because the oscillator grid excitation adjustment is tied up with the neutralizing, as we shall explain.

The reason for going into the neutralized circuits when the use of a screen-grid tube makes neutralization needless is simply that it would be desirable to get a reasonable amount of power from a low-priced tube. In the screen-grid types there is nothing between the '24 and the '65 — quite a jump. The 46 and '47 are multi-grid tubes of the right ratings, but since they are not screen-grid tubes neutralization is required to get true electron coupling.

It is not hard to neutralize the tube once the right place is found for the tap of L_1. The ordinary procedure is to start out with the tap set about as it would be in a regular Hartley, put C_6 at minimum, touch a neon bulb to the plate of the tube (the plate voltage, B_2, should be disconnected) and turn C_2 until the glow of the neon bulb indicates resonance. With either the 46 or

'47 the voltage on the extra grid, $+B_1$ in Fig. 1, can be in the neighborhood of 200 volts. Next turn C_6 until the glow disappears, retune C_2 to make sure the new setting of C_6 has not changed the resonance point on C_2, and work back and forth between the two condensers until the tube is neutralized. This is a familiar process to anyone who has neutralized amplifiers. If no setting of C_6 will give neutralization, place the tap on L_1 a turn or two either way from its first position and

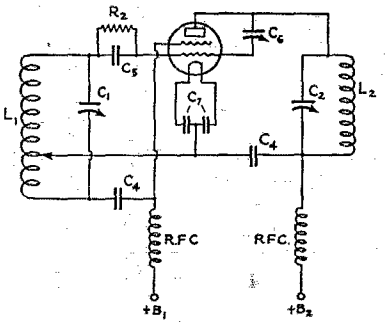


FIG. 1 — EXPERIMENTAL CIRCUIT USING A MULTI-GRID TUBE WITH NEUTRALIZATION

Both the 46 and '47 have been tried in this circuit, with about the same results from both types. The constants are equivalent to those encountered in other circuits. The oscillator tuned circuit, L_1C_1, should be high-C for the band on which the oscillator is to be operated. The L_2C_2 circuit, which may be tuned to the same frequency as the oscillator portion or to a harmonic, should preferably have a fairly high ratio of inductance to capacity. Grid condensers, by-pass condensers, etc., have the usual values. The neutralizing condenser, C_6, is the only element likely to differ from ordinary usage, and more is said about it in the text.

try again. Eventually a position will be found which will give neutralization with some setting of C_6. If the signal is listened to in a monitor after neutralizing it will be found that C_2 can be tuned through resonance without affecting the frequency.

At this point the plate voltage can be put on the tube — possibly 250 to 300 volts — and the performance of the oscillator checked. Tuning the output circuit at this time, C_2L_2, will cause an appreciable change in the oscillator frequency. Generally the outer grid current will take a big jump as C_2 is tuned through resonance, accompanied by a frequency shift of several kilocycles. If C_2L_2 is tuned to the second harmonic of the oscillator frequency the frequency change at resonance will be lessened considerably, though still greater than is encountered with screen-grid tubes.

There are a few practical operating differences between the 46 and '47 in these circuits, chiefly in neutralizing. A neutralizing condenser of about 25-$\mu\mu$fd. capacity will serve quite satisfactorily with the 46, but unless the condenser has a very low minimum capacity it will be found that the tap on L_1 has to be set so near the control-grid end of the coil that oscillations stop as soon as voltage is put on the plate of the tube. Unfortunately, for maximum output in the plate circuit the tap should be nearer the outer-grid end of L_1 than the control-grid end.

The '47 is a bad tube to neutralize in this circuit because its screen-to-plate capacity is so small. Repeated attempts to neutralize the tube with all sizes and varieties of condensers at C_6 were hopelessly unsuccessful until it was accidentally discovered, in trying the tube without neutralization, that the base and socket capacity between the control-grid and plate leads was great enough to do the trick provided the tap on L_1 was put on the right place. Naturally this scheme is even less flexible than the more conventional condenser used with the 46 had turned out to be. In this particular case, however, the tap happened to come on a turn which gave a better ratio of control-grid to outer-grid turns than it was possible to get with a regular condenser and the 46. Since the socket undoubtedly has a lot to do with the effective capacity, different makes will put the tap in different places. We used a Pilot Type 212 in the experimental layout.

Fig. 1 can be used for both the 46 and '47, since the suppressor grid in the latter is already connected to the filament inside the tube. It is this third grid which makes the inter-electrode capacity so small.

Besides the fact that the output circuit has a great deal more reaction on the oscillator frequency with these two tubes than occurs with screen-grid tubes, both types, even when initially adjusted to oscillate satisfactorily may, after a few minutes of continuous operation, suddenly quit work and draw large quantities of current on both plate and outer grid. This only happens when the voltage is more than 300, but it also happens, unfortunately, that at low plate voltages the output is not perceptibly greater than can be obtained from a '24. Thus affairs reach an *impasse:* if the voltage is lowered to give stable operation the output is low; while, if the voltage is raised to get reasonable output the tubes seem to go haywire.

This, in general, is what we have learned to expect after trying several different circuit variations and layouts. It is not intended to be as discouraging as it may sound, however. There is an interesting field for experiment with these tubes, and we have not been able to put in as much time as we would have liked in working with them. The foregoing information is, as we have indicated previously, intended primarily to give some indication of what the experimenter who tries the tubes is likely to find awaits his first efforts. We hope these obstacles can be eradicated.

USING THE '24

We have intimated above that screen-grid tubes show a much higher degree of frequency

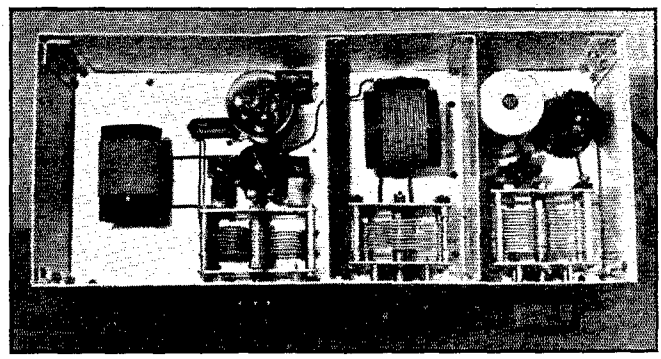
stability and independence than any of the non-screen-grid tubes tried. We are chiefly concerned here with the '24, which has the advantages of being low in cost and having an indirectly-heated cathode. The "free" cathode in the '24 obviates the necessity for the filament chokes or special methods of feeding the filament required by tubes of the '65 or '60 type when the screen-grid is at ground potential.[1]

To obtain the greatest freedom from frequency changes with changes in plate voltage, the voltage for the plate and screen grid should come from the same power-supply source, and the screen-grid voltage should be taken from a suitable tap on a voltage divider. In this way any change in voltage will appear on both the plate and screen grid, and the two changes operate to cause the frequency to remain constant.[1] In actual work with the circuit it is not difficult to get the right ratio between plate and screen voltages to give this effect. The voltage divider shown in Fig. 2 is about right; in fact, the voltage across the terminals of the divider can be swung between 20 and 250 volts with a resulting frequency change of less than 200 cycles, most of which occurs at the very low voltages. Between 100 and 250 volts the frequency change is hardly perceptible. It is quite apparent that ordinary voltage changes caused by shifting line voltage or varying loads on the power supply, even if the regulation of the latter is rather poor, will have no effect on the frequency for all practical purposes.

The oscillator-amplifier unit shown in the accompanying photographs is an experimental affair, with shielding between all tuned circuits. It was built that way primarily to see just how vital to the operation of the circuit complete shielding would be. After comparison with similar, but unshielded, breadboard layouts we are of the opinion that shielding can be dispensed with entirely under most conditions and at any rate is of appreciable help only when the output circuit of the oscillator is tuned to the same frequency as the oscillating part itself. If the output circuit is tuned to a harmonic there is little to be gained by shielding.

HARMONIC OPERATION

One of the nice things about the electron-coupled oscillator is its ability to generate strong harmonics. There is just about as much pep in the output circuit when it is tuned to the second harmonic as to the fundamental. At the same time there is almost no reaction of the output circuit tuning on the frequency when tuned to the second harmonic. At the fundamental frequency this reaction amounts to a kilocycle or so at 3500 kc. — less than that resulting from tuning the usual buffer amplifier. However, we might just as well eliminate it entirely and use the second harmonic, since there is no loss of power output by so doing.



INSIDE THE BOX

The frequency-determining portion of the oscillator is in the compartment at the right-hand end. The oscillator tube, in the same compartment, has an individual shield to keep it out of the field of the coil. The output tuned circuit and amplifier grid-coupling condenser are in the second compartment. On the left is the amplifier tube and its tuned circuit. The neutralizing condenser is mounted on a hard-rubber strip which in turn is fastened to the frame of the tuning condenser by L-shaped pieces of brass strip. As the amplifier is intended primarily for exciting one or two Type '10 tubes, no provision for antenna coupling has been made in this unit.

Other apparatus included in the circuit diagram, Fig. 2, but not shown in this photograph is mounted beneath the aluminum base on which the tubes and coils are placed.

The output circuit can be coupled to a following amplifier by any of the conventional methods. In the unit shown here parallel plate feed was made necessary by the fact that all the tuning condensers were mounted on the aluminum panel. Series feed *could* be used under these conditions, but we have little enthusiasm for putting mica condensers in the middle of a tuned circuit carrying r.f. current; probably this *is* a personal prejudice which should not be given too much weight, at least when the power is low. However, the fact that parallel feed *is* used on the plate circuits allows the grid of the amplifier to be series fed. The amplifier can be either a 46 or a '47; what is needed here is a tube which will give a relatively large step-up in power, because the output of a '24, even with 250 volts on the plate, is not very great.

No fixed bias is needed on the amplifier with either type of tube. Some automatic bias is helpful, however, both in increasing the efficiency of the amplifier and in making the grid resistance sufficiently high to be a fairly decent load for the plate circuit of the '24. If no grid leak is used the plate tuning of the amplifier causes such a wide

[1] J. B. Dow, "Electron Coupled Oscillator Circuits," *QST*, January, 1932, p. 23.

change in the grid resistance of the tube that the constants of the tuned circuit in the '24 plate are affected, with a resulting reaction on the frequency. A grid leak of a few thousand ohms completely cures such a tendency and improves the efficiency of the amplifier.

Although the 46 and '47 both give about the same output we very much prefer the 46 as an r.f. amplifier. It is exceedingly difficult to neutralize a '47 in r.f. circuits, especially when the excitation voltage is small. The grid-plate capacity of the tube is so low that a very small neutralizing condenser must be used — ordinary midgets have too high a minimum capacity for any reasonable turns ratio between neutralizing and "active" windings in the plate circuit, and therefore must be cut down or double-spaced — and it is difficult to find the correct setting even after the condenser question has been settled because so little r.f. voltage is fed through the tube capacity. An ordinary neon lamp or loop-and-lamp indicator won't do business for this reason, and a more sensitive indicator such as an r.f. galvanometer or v.t. voltmeter has to be employed. The 46, on the other hand, has normal inter-electrode capacities and consequently can be neutralized just as easily and with the same circuit constants as a Type '10. There is also the fact that the 46 requires no screen voltage, which must be supplied to the pentode from a tap on the voltage divider or through a series resistor, and which generally means an added by-pass condenser as well. Incidentally, the control grid and screen grid in the '47 can be connected together and the tube operated in the same way as a 46 with about the same results — but there is still that troublesome question of neutralization to contend with.

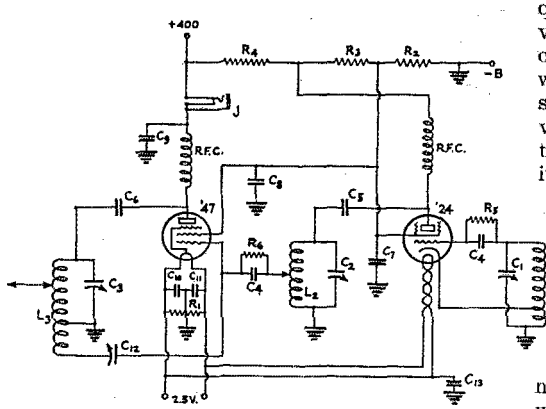


FIG. 2 — ORIGINAL CIRCUIT OF THE UNIT SHOWN IN THE PHOTOGRAPHS

This outfit used a '24 oscillator followed by a '47 amplifier. The grounds shown on this diagram are connections to the aluminum box. The various parts have the following values:

C_1 — *500-μμfd. variable condenser.*
C_2, C_3 — *250-μμfd. variable.*
C_4 — *100 μμfd.*
C_6, C_8 — *250 μμfd.*
C_7 — *.002 μfd.*
C_8 — *.01 μfd.*
C_9 — *.001 μfd.*
C_{10}, C_{11} — *.01 μfd.*
C_{12} — *Neutralizing condenser made by double-spacing a 100-μμfd. midget condenser.*
C_{13} — *.25 μfd.*
R_1 — *20 ohms, center-tapped.*
R_2 — *10,000 ohms.*
R_3 — *3000 ohms.*
R_4 — *4000 ohms.*
R_5 — *50,000 ohms.*
R_6 — *2000 ohms.*
J — Single closed-circuit jack for milliammeter.
RFC — Any good short-wave choke.
L_1 — *For 3500-kc. operation: 34 turns No. 22 d.s.c., close-wound on 1½-inch diameter form, tapped at 14th turn from plate end.*
For 7000-kc. operation: 12 turns No. 22 d.s.c. on 1½-inch diameter form, spaced to occupy 1¼ inches, tapped at 6th turn from plate end.
L_2 — *3500-kc.: 17 turns No. 16 d.c.c. on 2½-inch diameter form, spaced to occupy 1½ inches.*
7000 kc.: 9 turns No. 16 d.c.c. on 2½-inch diameter form, spaced to occupy 1⅛ inches.
L_3 — *3500 kc.: 34 turns No. 16 d.c.c. on 2½-inch diameter form, no spacing between turns. Tap at 18th turn from plate end.*
7000 kc.: 13 turns No. 16 d.c.c. on 2½-inch diameter form, spaced to occupy 1¼ inches. Tap at 9th turn from plate end.
Provision should be made on both L_2 and L_3 to permit adjusting the excitation tap to the next stage.
Condenser C_{13} may not be necessary in all cases, but in this particular layout helped prevent coupling between the oscillator and amplifier via the common filament leads.
The oscillator coil, L_1, actually works on the next lower frequency band to that indicated; the output circuit of the oscillator is tuned to the second harmonic.

It is advisable to have L_2 tapped so that maximum power can be transferred to the grid of the amplifier. The best place can be found quite easily by noting the effect on the amplifier plate current; the tap which results in the greatest plate current when the amplifier is off tune and the smallest when tuned to resonance is the right one. The position of the tap will depend chiefly upon the resistance of the grid leak in the amplifier grid circuit; the higher the resistance the nearer the tap will be to the plate end of L_2. This test should be made *after* the amplifier is neutralized; it is quite meaningless if the amplifier can oscillate. Remember in trying different taps that each change will affect the tuning of the L_2C_2 circuit, and accordingly, a readjustment of C_2 must be made each time.

Utilizing either the fundamental or second-harmonic output of the oscillator to excite the amplifier, the output of the latter will be sufficient to excite one or two Type '10's satisfactorily on 3500 or 7000 kc. The output of the '24 seems to drop off considerably when an attempt is made to get anything out of it on 14,000 kc., however. At first we suspected that this might be caused by losses in the shielding, so a breadboard layout was built to prove or disprove this point and the results turned out to be exactly the same. With reasonable voltages on the '24 the following amplifier does not get enough excitation to do a good job of exciting a '10. The amplifier can be used as a doubler with a fair amount of output, but the most satisfactory scheme is to use another

tube and double frequency in its plate circuit, as shown in Fig. 3. In this way the frequency-determining part of the oscillator will be on 3500 kc., the output tank of the oscillator on 7000 kc., the first amplifier on 7000 kc. and the final tube, the doubler, on 14,000 kc. The output from the last tube is more than enough for a '10 or two.

Of course the output of the amplifier or doubler can be fed directly into an antenna instead of to a following amplifier for low-power work. The power delivered should be between 5 and 10 watts in most cases, assuming that the voltage on the amplifier is about 400. A power supply built from broadcast-receiver parts will handle the oscillator, amplifier and doubler with ease. A power supply such as the one shown on page 12 of July *QST* works nicely.

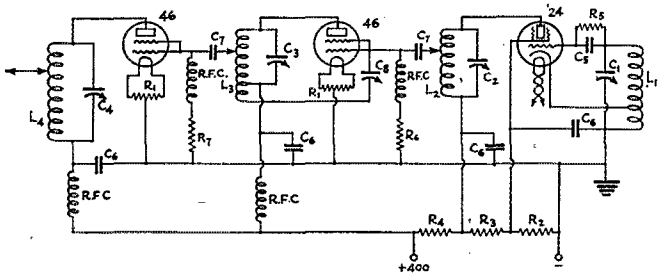


FIG. 3 — RECOMMENDED CIRCUIT FOR THREE-BAND OPERATION

Using a '24 oscillator, 46 amplifier on either 3500 or 7000 kc., and a 46 doubler on 14,000 kc. only. On the first two bands the tap on L_3 is disconnected from C_7 and connected to the grid circuit of the following amplifier, if one is in use.

C_1 — 500-μμfd. variable condenser.
C_2, C_3 — 250-μμfd. variable condenser.
C_4 — 150- or 250-μμfd. variable condenser.
C_5 — 100 μμfd.
C_6 — .002 μfd.
C_7 — 250 μμfd.
C_8 — 50-μμfd. midget condenser.
R_1 — 20 ohms, center-tapped.
R_2 — 10,000 ohms.
R_3 — 3000 ohms.
R_4 — 4000 ohms.
RFC — Any good short-wave choke.
R_5 — 50,000 ohms.
R_6 — 2000 ohms.
R_7 — 20,000 ohms.
L_1, L_2, L_3 — Same as specified under Fig. 2.
L_4 — 4 turns No. 16 d.c.c. on 2½-inch form, spaced to occupy 1½ inches.

A FEW NOTES ON THE 46

The 46 has a few peculiarities as an r.f. amplifier which are likely to surprise those of us who are accustomed to handling '10's. They result from the very high mu the tube has when its two grids are connected together.

The input or grid resistance of the tube is very low and varies appreciably with the load in the plate circuit. We have mentioned this previously in pointing out that the tuning of the plate circuit has a great effect on the load conditions in the tube ahead of it unless there is some bias on the 46. The tube will, however, work without grid bias, but unless the excitation is low operation without bias is undesirable. *Fixed* grid bias (supplied by batteries, for instance) is entirely unnecessary. It is useful with other tubes mainly because it will hold down the plate current should the excitation fail for any reason. In saying this we have in mind c.w. amplifiers. It may be necessary to use fixed bias in some 'phone transmitters. The 46 requires no insurance in the form of fixed grid bias, however, because as soon as the excitation is removed the plate current drops almost to zero.

Because of the low grid resistance with no bias, it is actually possible to give the tube *too much* excitation. Under conditions which would be about normal for '10's, for example, the grid current to a 46 will reach such relatively tremendous proportions that the output falls off unless the excitation is reduced. The normal plate current for one tube, when delivering power, should not exceed 50 or 60 milliamperes, and it is not at all difficult to have grid currents of the same proportions if there is no bias on the grid. Under these conditions the drain on the filament is simply too great for the tube to work efficiently. A grid leak should be used with the tube, therefore. Anything between 2000 and 5000 ohms will be about right in most cases. It is advisable to measure the grid current when making adjustments to the amplifier; it should not be allowed to be more than about 25% of the plate current.

When using the tube as a doubler a grid leak of fairly high resistance is necessary for best results. With a 20,000-ohm leak the tube will work on the second harmonic just about as it does on the fundamental; that is, the plate current will dip down to a very low value as the tank condenser is tuned through resonance and the efficiency is quite good. No neutralizing is needed when doubling.

FINALLY

The electron-coupled oscillator is well worth trying in transmitters, even though it is necessary to start out with a tube of such low power as the '24. With reasonable precautions against vibration it is easy to get that steady, singing note characteristic of crystal control — with the added advantage of being able to change frequency. Perhaps there may be some objection to the fact that the line-ups recommended here have just as many tubes and circuits as are required when a crystal is used, but, after all, why not?

(*Continued on page 88*)

Stabilized "B" Supply for A.C. Receivers

By D. Dekker, PA0PDA, and W. Keeman, PA0ZK*

MANY modern short-wave receivers in which indirectly a.c. heated tubes are employed still use plate power derived from batteries, but progress in receiver design has followed another course in Holland. Here we have used "B"-eliminators since quite a long time, but were unable to use a.c. for cathode heating because there were no suitable tubes with which hum-free reception on high frequencies was possible. In order to obtain the great gain possible with those modern heater-type tubes, it was necessary, therefore, to supply the rather heavy current of 2 amperes, for two such valves, out of the usual A battery. Of late, however, a few new suitable tubes have appeared on the market, and to our great satisfaction we found out that when using these tubes, absolutely hum-free reception was possible up to the higher frequencies, by using a.c. for both filament and plate power supply. As the descriptions in *QST* have proved that suitable tubes are obtainable in America, too, we thought it might be of interest to tell the brotherhood over there how we solved the "B"-eliminator problem.

The usual complaint against the use of a "B"-eliminator is the fluctuating output voltage caused by the line voltage going up and down. To obtain satisfactory performance, therefore, the output voltage must be made constant. Now this is quite a simple problem since a neon bulb

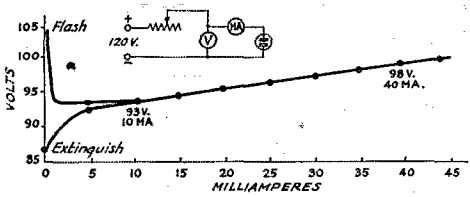


FIG. 1 — THE VOLTAGE-CURRENT CHARACTERISTIC OF A TYPICAL NEON LAMP

The lamp in this case is an Osram "night-lamp." The small neon bulbs available in this country behave similarly.

has all the necessary qualities to iron out these unpleasant ups and downs, leaving us the constant voltage we have wished for so fervently. When we place a neon bulb in the circuit shown in Fig. 1 and gradually increase the voltage between the electrodes of the bulb, it will flash up when a certain tension is reached (flash voltage), thereby drawing a current indicated by the milliammeter. The voltage lowers considerably at this point, as may be seen in the curve of Fig. 1. It is impossible, however, to increase this voltage more than a few percent. If we try to do this, the result will be an increase of the current drawn by

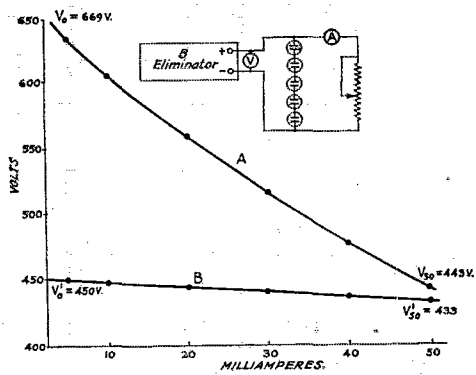


FIG. 2 — SHOWING THE STABILIZING EFFECT OF NEON LAMPS

Curve A is the output voltage of the eliminator at progressive output currents, without stabilization. Curve B, taken with the neon lamps in the circuit, very clearly shows the tremendous improvement in voltage regulation.

it, but the inter-electrode voltage remains practically constant. When we lower the input voltage beneath the stabilizing voltage, the tension between the electrodes lowers, too, until a point is reached where the input voltage becomes so low that the bulb stops glowing (extinguishing voltage). In other words, as long as we feed the neon bulb with a fluctuating voltage, the lowest value of which is still somewhat higher than the stabilizing voltage, the output voltage will remain constant, while only the current through the bulb follows the fluctuations in the original tension. When we want higher tensions than the stabilizing voltage of a single neon bulb, we simply connect two or more such bulbs in series (Fig. 2).

Though special stabilizer valves are made for this purpose, the amateurs here mostly use the common neon glow lamps known as "night lamps," which are designed for use on the mains, and in the socket of which a high resistance is built in series with the electrodes. For use as stabilizer it is necessary, of course, to remove this resistor, but both great European factories making those neon bulbs, Philips and Osram, on request are also willing to make them without this resistance nowadays.

The voltage usually varies between 50 and 100 volts, mostly being about 80 volts. What we have to do further is nothing more than to select a

*Caan van Necklaan 227, Rijswijk (Z.H.) Holland.

couple of those bulbs so that the stabilized voltage is a trifle below the lowest output voltage of the "B"-eliminator we want to stabilize, and to connect them in series across its output terminals. When this difference of potential is too great, the

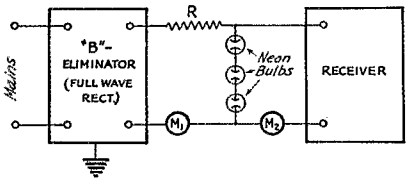
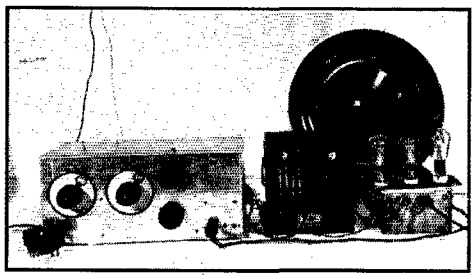


FIG. 3 — CIRCUIT FOR OBSERVING THE EFFECT OF NEON LAMPS IN HOLDING THE ELIMINATOR VOLTAGE CONSTANT IN SPITE OF VARIATIONS IN LINE VOLTAGE

current through the stabilizing neon bridge might become too great, thereby decreasing the life of the bulbs considerably. In this case we connect a resistance between the stabilizer and the "B"-eliminator, of such value that the current through the lamps is about 30 ma. The "B" leads to the receiver or transmitter are connected then to the terminals of the stabilizer as shown in Fig. 4. Lower tensions may be tapped from between the neon bulbs, just like when using a normal bleeder resistance, though care must be taken not to draw more current through the tap than that at which the voltage becomes lower than the stabilizing voltage.

The neon bulbs have a very low internal resistance, and also a very remarkable smoothing effect; we may consider them equivalent to a condenser of several μfds! When the whole affair shown in Fig. 3 is placed under constant output load, the interested observer will see that the milliammeter M_2 is standing still like a rock, while the other one, M_1 is constantly moving up and down its scale, following the whimsical course of the line voltage. In this way it is possible to use "B"-eliminators even on the most rotten power lines — for instance here in Rijswijk, where the main voltage is fluctuating between 200 and 240 volts, while the power works are telling us that the regular tension ought to be 220 v., 50 Hz (50 cycles). The greatest trouble we now experience with those severe main voltage fluctuations is that the temperature of the heaters changes so much that this causes oscillations to start and stop when listening on the verge of oscillation. This is not the fault of the "B"-eliminator, however. Though we have never seen it mentioned in *QST*, this neon stabilization is nothing new, and has been known long since in America, too; we even saw quite old b.c. receivers of American make employing it.



THE RECEIVER AT PA0PDA, SHOWING THE "B"-ELIMINATOR AND NEON TUBE STABILIZERS

The circuit of this receiver is shown in Fig. 4. At the time the photograph was taken the cathodes were being heated from the storage battery between the set and the eliminator.

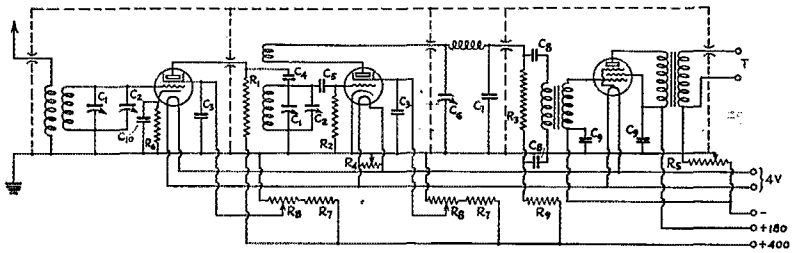


FIG. 4 — CIRCUIT OF THE TWO RECEIVERS SHOWN IN THE PHOTOGRAPHS

C_1 — *Tuning condensers (Pilot midgets).*
C_2 — *Parallel condensers (Pilot midgets).*
C_3 — *1-μfd. non-inductive condenser.*
C_4 — *20 μμfd.*
C_5 — *20 μμfd.*
C_6 — *100-μμfd. midget.*
C_7 — *200 μμfd.*
C_8 — *2 μfd.*
C_9 — *1 μfd.*
C_{10} — *.01 μfd., non-inductive.*

R_1 — *200,000 ohms.*
R_2 — *.5-megohm grid leak.*
R_3 — *200,000 ohms.*
R_4 — *100 ohms, center-tapped.*
R_5 — *1000 ohms, variable.*
R_6 — *600 ohms.*
R_7 — *100,000 ohms.*
R_8 — *50,000-ohm potentiometer.*
R_9 — *10,000 ohms.*

To conclude with, we are showing in Fig. 4 the wiring diagram of the two all a.c. receivers we have in use now. Capacitive coupling between r.f. amplifier and detector was chosen as we thought the making of r.f. transformers too difficult from a constructional point of view, and as the usual method of feeding the plate of the am-

plifier through the detector tank circuit wouldn't do when using a.c. screen-grid values with their comparatively low internal resistance. Both coupling condenser and grid condenser are kept very small in order to keep the load on the tuned detector circuit as low as possible. For the rest

ANOTHER RECEIVER USING THE CIRCUIT OF FIG. 4, BUT WITH GANGED TUNING

This set is the property of PA0ZK. The "B" supply with its neon lamp stabilizers is built breadboard fashion.

the diagram is quite a normal one and needs no further explanation. Screen-grid detectors are used, as no suitable indirectly heated pentodes are available. Care should be taken, of course, to use as high a self-inductance in the detector plate coupling device as possible. Only very good chokes or transformers should be used here.

While the set in use at PA0PDA is covering the whole high frequency range from 38 to 1.5 MH_z, the receiver of PA0ZK, shown in another photograph, is designed for band reception only, which enabled us to gang the tuning condensers, something we have done here for three years already, after a publication of I. H. Pomes, now PK4YY, on this subject. Parallel condensers are used in this to obtain the necessary spread-out of the amateur bands. The setting of these condensers is almost the same for both tuned circuits. The design of the National SW-3 receiver has been a much appreciated example in building this one, though copper is used for shielding material, as the owner is likely to go to tropical countries sooner or later, where aluminum corrodes quickly. In both receivers shown here all a.c. leads are made of lead cable, the sheath of which is connected with the shielding of the set. Volume control is effected by varying the screen grid voltage of the r.f. amplifier. We thought this system better than that used in the sets recently described in *QST*, as we prevent the detector from becoming overloaded in this way. For antenna a piece of wire of about 5 meters will do. There is no gain in using a longer one.

For the benefit of European readers we might add that the following tubes have been found suitable in these receivers; for r.f. amplifier Philips E442, Telefunken RENS 1204 or any other a.c. r.f. valve drawing a small plate current; for detector the French Fotos metallized T4150 or Philips E442S, which is not so good, however; while in the a.f. amplifier every normal pentode will do.

Navy Day

Annual Receiving Competition to be held Oct. 27 — All Operators invited to take part — A receiving test under actual operating conditions — How well can you really copy? — Mark the date and locate NAA and NPG in advance — Mail your "copy" to A.R.R.L. — Secretary of Navy expected to commend 25 operators submitting best copies

OCTOBER 27, 1932, is Navy Day. A special program of telegraphic broadcasts to all amateur radio operators and members of the Naval Communication Reserve has been arranged under the auspices of the Navy League of the United States. NAA and NPG will each send a different Navy Day broadcast, using frequencies in accordance with the schedule given herewith.

Station	*Time of transmission*
NAA, Washington, D. C.	8:30 p.m. E.S.T.
4205 kc. (71.3 meters), 8410 kc. (35.7 meters), and 12,615 kc. (23.7 meters).	7:30 p.m. C.S.T. 6:30 p.m. M.S.T. 5:30 p.m. P.S.T.
NPG, San Francisco, Calif.	10:05 p.m. E.S.T.
4385 kc. (68.4 meters), and 8770 kc. (34.2 meters).	9:05 p.m. C.S.T. 8:05 p.m. M.S.T. 7:05 p.m. P.S.T.

All who take part will be cited in a Navy Day Honor Roll, to appear in *QST*, on receipt of what was copied from one or both these stations. Everyone who listens and reports has a chance to "make" this Honor Roll. Advance preparation will determine the receiver dial settings and which of the frequencies shown in the table can be received best in your locality at the time of day indicated. Only the messages transmitted by NAA and NPG count in the receiving competition.

Commendatory letters from the Secretary of the Navy to those operators submitting the most accurate and complete copies will be divided between the several Naval Districts in proportion to the number of reports received from each District. Legibility and neatness will determine the relative standing of the high operators if large numbers of perfect copies are submitted — but ACCURACY counts first in importance. (In the interest of accuracy it is often better to send in original copies than to transcribe them.)

Please tell other operators, especially new brasspounders, who may not have taken part in this annual competition previously, about this announcement. It is hoped as many as possible will take part. All operators are cordially invited to participate. This is an opportunity to try our skill in copying a message, at the same time we learn something of the significance and traditions of our Navy and Communication Reserve, and have a good time using our receiving equipment.

(Continued on page 38)

Crystal Control of Radio Commission Hearings

By Paul M. Segal, General Counsel, A.R.R.L.

WHEN John Q. Amateur develops excessive grid bias in his relations with the Federal government — or it may not be John at all but some ringer such as old Commercial Interest or Pete Rumrunner traveling under the amateur alias and holding or seeking a license to use our amateur frequency bands — there develop spurious sidebands known as "hearing troubles." These first manifest themselves in the appearance at the shack of a formal printed document entitled a "notice" which looks like a cross between a criminal indictment and an insurance policy. Its receipt is no occasion for putting on blue spectacles and taking the first United Fruit steamer for Venezuela. Such awesome documents are necessary under the Radio Act of 1927 and the Fifth Amendment to the Constitution, both of which require notice and hearing before any adverse action may be taken. This serves to remind us that the happy days are gone forever when the R. I. would write "the operation of your station is causing blinking of your neighbors' lights; please send in your station and operator's licenses for cancellation."

The Board of Directors wants *QST* to give an analysis of what is to be done about these hearing notices, so here goes:

In discussing hearings before the Commission in which amateurs may be involved it is necessary to consider two different types of hearing: (1) on original application either for new or renewal license, and (2) on order of revocation.

The Commission has no power under the Radio Act of 1927 to issue a station license to anyone for any purpose unless it appears from the application or other evidence that the granting of such license would serve what that Statute calls "public interest, convenience or necessity." This is a fearfully complicated matter in most services, but for amateur and ship stations it has been exceedingly simplified. The Commission presupposes that all amateur applications will serve public interest unless it appears either that the applicant is not actually an amateur, that is to say, a person proposing to engage in radio communication for purely personal aims and without pecuniary motives, or unless it appears that the person requesting the license is the type who, either because of past sins or other factors, can be expected to violate the provisions of the law or the Commission's regulations.

Accordingly, all applications whether for renewal or new license are scrutinized and checked against lists of previous violators or of persons known not to be amateurs, and if this examination reveals nothing suspicious, the application is granted and that ends the matter. On the other hand, if things are not quite right the examining Divisions of the Commission recommend that the application be designated for hearing. At the next Commission meeting, if the recommendation is approved, an order is entered on the minutes designating that application for hearing because the Commission is unable to find that the granting thereof will serve public interest.

Shortly after this designation, the formal notice of hearing is sent out. This notice advises the recipient of his rights to a hearing, tells him what he must do, and in general seeks to outline the reason for which the hearing is called, although it is stated that these reasons are not exclusive and that a general inquiry will be made.

This notice of hearing contains two important dates. One of them is the actual date on which the hearing will be held in Washington. The other is the date of the mailing of the notice. It is this second date which is of immediate importance, for within 20 days after this date of mailing the applicant must have on file with the Commission what is called an "appearance, statement and affidavit." In calculating this 20-day period it must be borne in mind that it runs from the date of the Commission's mailing of the notice to the date of receipt of the appearance. In other words, it is their mailing and their receipt; and your dates, either of receiving or mailing, do not count. In figuring the 20-day period you may have time out for Sundays and legal holidays. If you live in the Fifth Zone (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming) you get an extra five days, and if you have a K call the extra period is twenty days. The document to be filed is expected to contain a statement that the applicant intends to be present in person or by attorney on the hearing date, a statement in writing of the facts he intends to prove, and an affidavit that he has mailed a copy of these papers to anyone mentioned as requiring such mailing in the notice itself. As for the statement of facts in amateur cases, it is necessary only to state that one is a *bona fide* amateur and to state wherein he proposes to show that the questions raised by the notice can be satisfactorily answered by him. Attached to this discussion as Fig. 1 is a suggested form of such appearance, with proper answers

suggested for typical allegations in hearing notices.

In all too many instances amateurs have misled themselves into thinking this written appearance is the only appearance they need make. This is a serious error which has resulted in many defaults. It is for the purpose of actual appearance that the other date is in the notice, that is, the date of hearing itself. On that day the amateur must appear personally in Washington and give testimony on the witness stand before an Examiner of the Commission as to why his original or renewal license should be granted. In cases where the amateur, because of distance or expense, is not able to make the trip to Washington or bring necessary witnesses with him, he must get into communication with an attorney, either at home or in Washington, who will apply for authority to take depositions. This application for authority must be in form such as is customarily used in United States courts. It must be received by the Commission well in advance of the hearing time, so that the order may be issued and served at least five days before the taking of the depositions themselves, and so that the depositions when taken and transcribed will be filed with the Commission not later than five days before the date of hearing. Depositions are not affidavits. They are the completely written-out testimony of witnesses just as though they had been given before the Commission, but they are actually given before an official at some other place convenient to the applicant, under the terms of an advance order naming and authorizing the person before whom they are taken, who is customarily both a notary public and a shorthand reporter.

Unless this deposition order is issued, and if issued, unless it is sufficient to include all the necessary evidence, it is required that the applicant and witnesses come to Washington. When they give testimony in Washington they give it before an Examiner who is appointed by the Commission for the purpose of hearing the particular case and reporting back to the Commission as to his findings. On this occasion evidence is taken in accordance with rules of law such as prevail in courts generally, and particularly in courts of the United States. Hearsay is no good, affidavits and opinions are useless. Letters will not be received. Testimony must be given by persons who know the facts about which they testify. If the Commission has anything against the applicant, that will be given in evidence at this time, and the applicant witness will be cross examined by Commission attorneys. Exhibits must be submitted in duplicate.

After the hearing is over the Examiner takes a reasonable period of time for a study of the typewritten transcript of record and he then draws up his report of findings from the testimony, and his conclusions and recommendations based upon those findings, which he submits to the Commis-

FIG. 1

BEFORE THE FEDERAL RADIO COMMISSION
WASHINGTON, D. C.

IN THE MATTER OF THE APPLICATION OF JOHN DOE, WEST HARTFORD, CONN., FOR AMATEUR STATION LICENSE
(Or renewal of license, as the case may be)

APPEARANCE, STATEMENT AND AFFIDAVIT

(Must be filed at the Commission within 20 days of mailing by the Commission of its notice of hearing. See text concerning time out for Sundays, and additional time in certain areas.)

I. *Appearance*

Now, this ..... day of ....., ..., comes John Doe, files this, his written appearance in the above entitled matter and states that he desires to be heard in said matter on .... (date of hearing) ...., at the hour of ..... o'clock, a.m., at the offices of the Commission at Washington, D. C.

.....
John Doe

II. *Statement in Writing of the Facts to be Proved at said Hearing*

Applicant shows that at said hearing he expects to prove:

1. Applicant is a bona fide amateur within the provisions of Paragraph 363 of the Rules and Regulations of the Federal Radio Commission.

2. Applicant is competent to operate his station according to the requirements of the Radio Act of 1927, and the Rules and Regulations of the Federal Radio Commission, as is evidenced by his possession of a valid operator's license, issued on the ..... day of ....., expiring on the ..... day of ....., and bearing No. ....., which license is now in full force and effect. (Or if applicant does not himself possess a license, substitute the following:)

(2. Pursuant to Paragraph 363 of the Rules and Regulations of the Federal Radio Commission, applicant's station will be operated by a licensed radio operator, to wit, Richard Roe, who is a qualified operator, as is evidenced by his possession of a valid operator's license, issued on the ..... day of ....., expiring on the ..... day of ....., and bearing No. ....., which license is now in full force and effect.)

3. With further reference to the allegations contained in the notice of hearing heretofore served upon applicant, applicant shows:

a. } (Here give your explanation of whatever
b. } charges or accusations may be contained
c. } in the notice of hearing.)

4. Granting this application will serve public interest, convenience and necessity.

.....
John Doe

(If no parties respondent are named in the notice of hearing the following affidavit need not be used.)

(*Continued on next page*)

FIG. 1 (Continued)

STATE OF CONNECTICUT }
COUNTY OF HARTFORD } SS:

John Doe, being upon his oath first duly sworn, says that on ..... (date) ....., he mailed true and correct copies of this Appearance, Statement and Affidavit, to

(List parties respondent)

.....
John Doe

Subscribed and sworn to before me, a Notary Public in and for the County of Hartford, State of Connecticut, this ..... day of .....
My commission will expire .....

.....
Notary Public

sion. A copy of this is sent to the applicant. If these findings of the Examiner are satisfactory to the applicant, there is nothing further for him to do. He can only hope that the Commission will agree with the Examiner, sustain his findings, and issue the license. On the other hand, if the findings are not satisfactory, there is trouble. In order to express his dissatisfaction, the applicant must file "exceptions" to the report. The nature of these exceptions will, of course, vary with the nature of the findings, and it is practically impossible to give suggestions either as to their form or content. In general they must be prepared by an attorney, because they must relate to the legal effect of evidence, must specify particular items in the record, etc. They must be filed within 15 days after the date of the mailing of the Examiner's Report. In this connection too there are the regular additional periods for certain areas and the dates are mailing and receipt *at the Commission.* If no exceptions are filed, the Commission has a right to believe that the report is satisfactory. If one wishes, one may file with his exceptions a request for oral argument before the full Commission, a request which is seldom granted; or the Commission may itself set the matter down for oral argument.

The Commission examines the Examiner's Report, compares it with the record, studies the exceptions and ultimately renders its written opinion, discussing the case and announcing whether the application is granted or denied.

If the application is denied, the applicant has 20 days within which to appeal to the Court of Appeals of the District of Columbia. Inasmuch as this is a Court of the dignity of a Circuit Court of Appeals of the United States, which requires printed records, printed briefs, and in general follows a method of procedure which is highly expensive, the remedy by appeal is one which can be exercised only in the most unusual cases. It should be pointed out that the 20-day period for appeal involves no extra time no matter

FIG. 2

BEFORE THE FEDERAL RADIO COMMISSION
WASHINGTON, D. C.

IN THE MATTER OF THE REVOCATION OF LICENSE OF AMATEUR STATION LICENSE W1EEE, JOHN DOE, WEST HARTFORD, CONN.

REQUEST FOR HEARING (AFTER NOTICE OF REVOCATION IS RECEIVED)
(Must be filed with Commission within 30 days of receipt of revocation order)

Pursuant to the provisions of Section 14 of the Radio Act of 1927, as amended, and of Paragraph 56 (b) of the Rules and Regulations of the Federal Radio Commission, I acknowledge receipt of notice of revocation in this matter, dated ...., and do this ..... day of ...., request a hearing thereon.

Respectfully submitted,

.....
John Doe

FIG. 3

ANSWER TO ORDER OF REVOCATION
(To be filed at the Commission not later than 20 days after the Commission's mailing of the notice of hearing.)

STATE OF CONNECTICUT }
COUNTY OF HARTFORD } SS:

John Doe, being upon his oath first duly sworn, says that he is the licensed operator of station W1EEE, concerning which the Federal Radio Commission has heretofore and on the ..... day of ....., ..., issued its order of revocation, and that he files this answer pursuant to the provisions of Paragraph 56(d) of the Rules and Regulations of the Federal Radio Commission.

1. With reference to the first ground of revocation wherein it is alleged that: .....
.....
Respondent shows that.....
.....

2. With reference to the second ground of revocation wherein it is alleged that.....
.....
Respondent shows that.....
.....

3. Etc.

.....
John Doe

Subscribed and sworn to before me, a Notary Public in and for the County of Hartford, State of Connecticut, this ..... day of .....
My commission will expire .....

.....
Notary Public

where one is located, and does not permit the counting out of Sundays or holidays.

So much for hearing on original applications.

On revocation the procedure is more complicated. Causes of revocation of an existing license are limited by the Radio Act to false statements in the application, conditions revealed which should have required an original denial if those conditions are revealed in documents requested by the Commission, failure to operate as set forth in the license, and violation of any provision of the Radio Act or of the Regulations of the Commission. If the Commission discovers any of these items it may issue an order of revocation which is served upon the applicant. Within 30 days after this order is received by the licensee, that licensee must have on file with the Commission a request for a hearing, a form for which is attached as Fig. 2. This request need not discuss the case, but is sufficient in merely requesting the hearing. After the Commission has received this request it then sends out a notice of hearing. The various causes for which the revocation order was issued will be found contained in both the original order and the notice of hearing or in either of them. After this notice of hearing is sent out, the licensee is expected to file a sworn statement answering the accusations and after this is received by the Commission, a hearing upon the accusations and the answers is held on the date fixed in the original notice. It is to be borne in mind that the exclusion of Sundays and holidays and extra time for certain areas apply to the 20-day period for filing the answer to the notice, but do not extend to the 30-day period within which a request for hearing must be filed.

"LICENSE TROUBLE" SIMPLIFIED SCHEMATIC DIAGRAM
ACCORDING TO RADIO ACT 1927
100% MODULATION BY RADIO COMMISSION RULES
(References to Sections §§) (References to Paragraphs ¶¶)

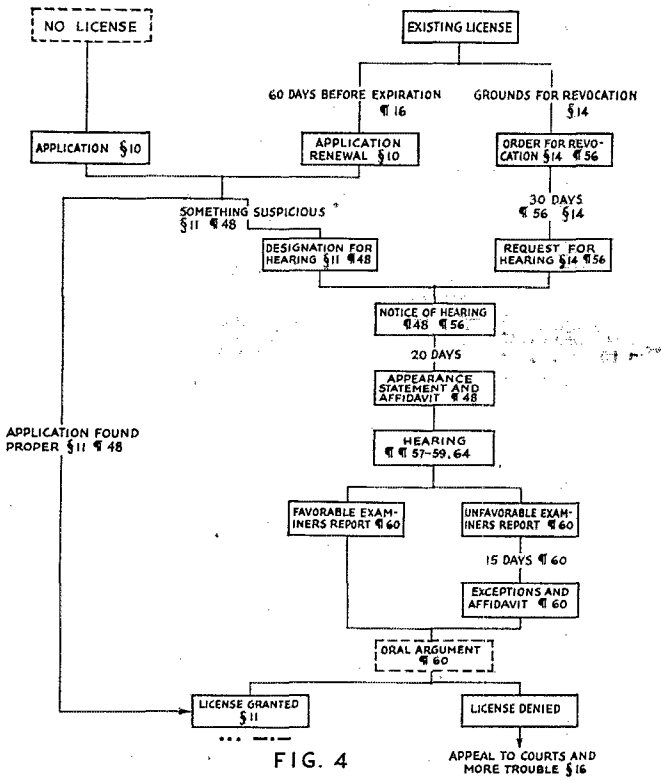


FIG. 4

Procedure at the hearing on the order of revocation will be substantially the same as on hearing for renewal or new license except that in revocation cases the Commission has the burden of proof while in renewal and original application cases, the applicant has the burden of proof. However, the same regulations as to depositions, witnesses, exceptions, oral argument and decisions apply. Throughout the entire period of revocation proceedings the licensee is, nevertheless, entitled to continue operating his station, until, if ever, the Commission definitely affirms the original order at the conclusion of all proceedings.

As Fig. 3 there is attached a typical form of outline answer to a notice of hearing in a revocation case.

Possibly the best way of indicating all of the steps in various cases is to attempt to draw a schematic diagram of them and that is our Fig. 4. On it all of the steps can be traced and at the various points in the circuit you will find reference either to the section of the statute or the paragraph of the Commission's Rules and Regulations which governs that item in the procedure.

It all looks pretty tough, but it must be remembered that it is all required for the protection of applicants and licensees. These things are what make up "due process of law," and no one is going to either deny your application or take away your license without following this procedure and giving you ample opportunity at each step to get your case fairly and properly before the Commission.

Transmission-Line Feed for Short-Wave Antennas

By True McLean*

MUCH has been written on short-wave antennas and methods of connecting them to the associated transmitting apparatus. The half-wave Hertz antenna seems to have become almost the universal favorite. Long and heated has been the controversy over the advantages of vertical versus horizontal Hertz radiators, although in the last analysis the choice seems to be made on a basis of convenience. The horizontal type can be located with a greater average height than the vertical, with a given mast. Two common methods of feeding Hertz wires are in wide use: the end or so-called "voltage" feed, and the center or "current" feed. The choice here also is largely a matter of convenience, the results in either case being determined by the care taken in the design and adjustment of the feed system rather than by the choice of method. If the radiator is located a considerable distance from surrounding objects, either the end or center or both is bound to be inaccessible from the apparatus room. This is, of course, the reason for the development of a considerable variety of transmission-line feed systems.

In the present discussion only two-wire systems will be considered, and it will be assumed the lines are uniform; that is, each foot of line is like every other foot of line as to wire size and spacing. Uniform lines have certain characteristics that are independent of length and frequency, and certain others that appear only when there is a definite and often critical relation between frequency and line length.

If a uniform line is infinitely long, it will have at its terminal a definite impedance. This may vary somewhat, though not largely, with frequency, but has the interesting property that it steadies down to a definite limiting value as the frequency is raised. For all practical lines this limiting value, called the surge impedance, is very closely approached throughout the useful range of frequencies used in radio communication. It is safe to say that the natural or surge impedance of an r.f. line does not change appreciably between frequency limits of, say, the longest waves used for radio, and waves so short that the line spacing becomes an appreciable fraction of the wavelength. Do I hear a small voice say, "But what good is a line of infinite length?" True enough, no one could afford to build one long enough to approach that condition electrically and would not want to if he could, for it would be useless. The useful part of the discussion is that you can take a line of any useful length, and fool it into thinking it is infinite in length, making it behave exactly as if it were. This is done by "matching" the surge impedance at the receiver (load) end.

Suppose you had an infinite line, beginning at your transmitter and extending out to your antenna and on indefinitely. Then suppose you went out as far as your antenna and cut off the line there. The section beyond would still be infinitely long, and so the impedance measured would still be the same. But how about the short section from the shack to the antenna? You could make it *appear to be infinite* if you connected to its receiver end something which had the same impedance as the indefinitely long section you cut off. If, therefore, you know what the surge impedance is, and connect on to the receiver end a piece of apparatus which duplicates it, the sending end will show the same value of impedance as an infinite line, regardless of the frequency used or the length of the section.

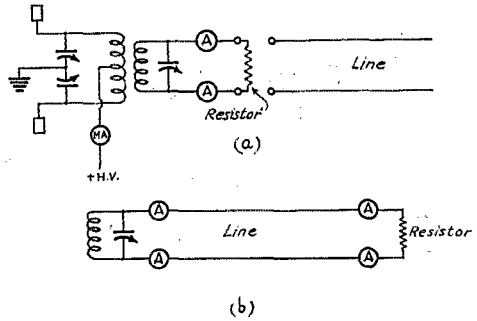


FIG. 1—METHOD OF ADJUSTING IMPEDANCE MATCH OF DUMMY LOAD TO A LINE OF RANDOM LENGTH

A dummy resistor of the same resistance as the line characteristic surge impedance is connected to a Low-C coupling tank, as shown at a, and the circuits tuned to resonance and coupling adjusted for normal power with the line disconnected, as described in the text. The dummy is then removed to the antenna end of the line, and if the line and dummy impedances are identical, all tuning adjustments will check the same as before, and the power in the dummy and p.a. plate current will duplicate for the same coupling.

The reasons for terminating a line in its surge impedance are two: first, it produces the condition discussed above, making the line impedance independent of frequency and line length; and

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second, for reasons too complicated to discuss here, it makes the line transfer power from generator to load with the highest possible efficiency. Any well constructed line, if correctly terminated, will show an efficiency of nearly 100% in any length up to a thousand feet or more. I have in mind a line that has been in operation at a broadcasting station for over a year. It is approximately 800 feet long. Its efficiency is so high that I was unable to determine its losses with the best available instruments under operating conditions. To determine its efficiency special indirect methods would be required, and under the circumstances this was not deemed worth while.

SOME ESSENTIAL THEORY

How do we find out the value of this magical surge impedance for a given line after we have built it? Well, there are two ways. If the line is of a simple geometrical configuration, the easiest and most accurate way is to calculate it from a formula. For two of the commonest types of line the formulas are simple and easy to apply. These cases are parallel solid wires and concentric cables. For ordinary round parallel wires the formula is:

$$Z = 276 \log \frac{b}{a}, \qquad (1)$$

where Z is the desired surge impedance in ohms, b is the wire spacing (center to center) in inches, and a is the wire radius (half the diameter) in inches. The logarithm is common or Briggs log to the base 10, found in any trigonometry or engineers' handbook, or the "L" scale on any slide rule. In using this formula two precautions must be taken. First, do not mix units in the values of a and b. You can use inches, centimeters, or anything at all, but a and b positively must be in the same units. Do not use inches for one and

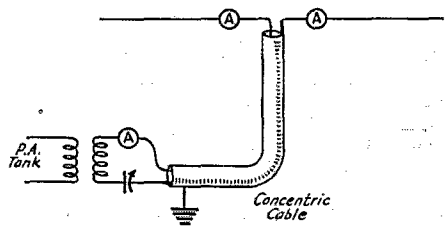


FIG. 2—A CONCENTRIC CABLE LINE WHICH REQUIRES NO IMPEDANCE MATCHING

mils for the other, or mix centimeters and millimeters. Second, log tables and slide rule scales give logarithms only to the right of the decimal point; you have to supply the part to the left. Here is how it is done.

If the value of b/a is less than 10 (it cannot be less than 2, or the wires would touch), there is no figure to left of decimal point; use the value right out of table or slide-rule scale, with decimal point in front. If the value is 10 or more, up to 100, the figure is 1 to left of decimal, and the table value to the right. If b/a is 100 or over, up to 1000, the figure is 2. From 1000 and up as far as 10,000 it is 3, with one added in this fashion for each additional decimal place. Any line with a value of b/a of 10,000 or more would have poor efficiency, however, since it would either be made of very small wire or else spaced so widely that radiation would become appreciable in any but a short length.

Practically, it is best to use wire not smaller than No. 14 and spacings not more than 10 inches. In building a line, use only bare wire. Insulation is always bad, especially in wet weather. If you are bothered with corrosion from smoke, use enameled wire. Use only enough spacers to keep the line in shape. In attaching spacers avoid metal pieces, and do not wrap the conductors around the ends of the spacers. I think high-grade glass or porcelain spacers are best, but if you use porcelain be sure it is the best grade and won't soak up water.

The concentric cable type of line is more difficult to build, but has certain advantages to be discussed later, so here is its formula:

$$Z = 138 \log \frac{b}{a}. \qquad (2)$$

Again, Z is the surge impedance, b is the *inside* diameter of the outer conductor, and a is the *outside diameter* (not radius) of the inner conductor. Same precautions as formula (1). Notice that a is radius in (1) and diameter in (2). (This is *not* the reason why the constant in (1) is twice as big as in (2) however.) Practically, in the concentric cable the greatest problem is in the spacers. Now here is a chance for the whole gang to get busy and figure out something. What we want is some kind of bead to slip on the wire or small pipe forming the inner conductor to keep it uniformly spaced in the center of the larger pipe or outer conductor. We want to be able to bend the cable after assembly without throwing the center conductor very far out of line or breaking the beads. We also want to fasten the beads so they won't slip and so we don't have to use too many of them. We do *not* want to pack the cable with insulation. Air is best. The beads should be made of good low-loss insulation. Who has some bright ideas?

MULTIPLE QUARTER- AND HALF-WAVE LINES

Uniform lines have some interesting properties if cut to lengths that are exact multiples of a quarter wavelength. If the line length is just

$$l = \frac{2n-1}{4}\lambda \qquad (3)$$

where λ is the wave length and n an integer, 1, 2, 3, 4, 5, etc., then the line acts like a transformer. If it is terminated in its surge impedance, it will still give the same value at the sending end,

since this is true for any length. But if it is terminated in anything else, say Z_r, its sending-end impedance, Z_t, will be related to the receiving-end impedance, Z_r, and the surge impedance, Z_s, by the simple relation,

$$Z_t = \frac{Z_s^2}{Z_r}. \qquad (4)$$

Stated in words this is: The product of the sending-end impedance by the connected-load impedance is equal to the square of the surge impedance. If a very high impedance is connected at the receiver end, the sending end value will be low, and vice versa.

This principle is the foundation of the well-known Zeppelin feeder. An end-fed Hertz doublet has a high impedance. The line is cut to an odd quarter wavelength and acts simultaneously as a feeder and matching transformer, feeding the antenna with a high voltage and small current, while taking a high current and low voltage from the transmitter. This scheme is very convenient and is widely used, but it should be appreciated that there are two important disadvantages. First, the line must be cut to an exact length, which may not suit the location. The length is critical, and swinging due to wind is sure to vary the transmitter frequency unless a very stable m.o.p.a. is used. Besides, one is never sure that the current node is really at the junction. The line is also operated in an unbalanced connection. Second, the line is operated under conditions where its efficiency is minimum instead of maximum. A quarter-wave Zeppelin feeder may have fairly good efficiency, but in the longer multiples the losses are bound to pile up rapidly.

Another interesting condition is when the line length is just

$$l = \frac{n}{2}\lambda \qquad (5)$$

where the symbols have the same meaning as before. Under this condition the line acts just like a pair of jumper wires of negligible length. Whatever impedance you connect at the receiver end will be duplicated at the sending end, regardless of value. This is not quite true if the value is extremely large or extremely small, but is accurate for most ordinary values. If the line were free of all losses, the statement would be correct for any value; it is an ideal condition which is closely approached. The same thing is true of the formula for the Zeppelin feeder of odd quarter length.

At this juncture I think it is about time for the Old Man to touch off a string of profanity and tell me I sound like Final Authority — all theory and formulas, ifs, ands, buts and no results. There is many a slip between pencil and paper, and copper and pyrex. What good is it to know that the surge impedance is 400 or 600 ohms, and must be matched at the load end? We do not care what the value is; what we want is to push the key and see the antenna meter hop. Then we would like to know if the reading we get is the best possible. The problem is just this: After we get the transmitter working O.K. and the antenna and feed line installed, how do we adjust the whole works so we actually get the desired results?

FITTING THEORY TO PRACTICE

To begin with, a few remarks about radiation from feed lines might not be out of place. The objective is obviously to make the antenna do all the radiating, and prevent radiation from the line, for two reasons. First of all, the main object of using a feed line is to make it possible to locate the antenna a reasonable distance from all objects that might distort the field and soak up

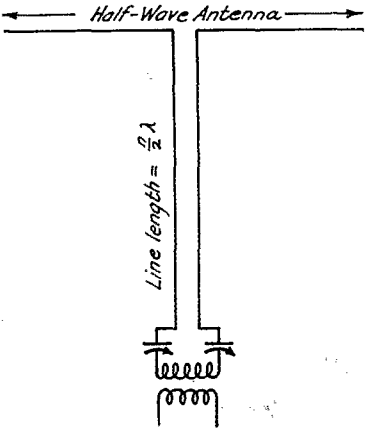


FIG. 3 — SPECIAL CASE OF LINE OF LENGTH EQUAL TO ONE OR MORE HALF WAVES, IN WHICH THE IMPEDANCE LOOKING INTO THE LINE BECOMES THE SAME AS THE LOAD IMPEDANCE FOR ALL VALUES OF THE LATTER

some of the valuable watts that have been generated at considerable cost of labor and money. If the line has an appreciable field of its own its main purpose is defeated at the very start, because its field will react with that of the antenna to produce a resultant which is not what we want, and the line usually passes quite near objects we want to keep out of the intense field, such as tin roofs, rain pipes and gutters, lighting conduit, gas pipes, to say nothing of telephone wires and such things. Secondly, we want the power all at the antenna. Even if the line gives useful radiation instead of loss, we do not want it, because that is not what we set out to accomplish. To prevent line radiation, the circuit must be balanced. By that I mean that the currents in the two wires must be equal and opposite in direction. If they are, the fields of the two wires will cancel. The cancellation is never perfect even though the balance is correct, because the line still acts like a long thin loop antenna of one turn.

This effect can be kept small by avoiding wide spacing. Transposition helps but is not a cure, and I believe is more nuisance than it is worth. Here is where the concentric-cable line shines; its field is entirely internal.

The business end of a transmitter is almost always a tuned circuit (tank). The power amplifier must be given the right amount of loading to make it perform efficiently. The best way to adjust the loading is to use inductive coupling to the plate tank; then an adjustment of loading can be made over a considerable range nearly independently of tuning. The line can be coupled to the plate tank with a simple coil; this is common practice in broadcast transmitters but has the disadvantage that the reactance of the coupling coil affects the plate tank tuning when the coupling is changed. The best scheme is to use a light (low *C*) tank circuit on the line. Then the condenser tunes out the reactance of the coupling coil, and it will be found that the coupling adjustment has very little effect on the tuning of the p.a. plate tank.

TUNING WITH THE AID OF DUMMY ANTENNAS

Now the surge impedance of a line has the character of a pure resistance. Hence adjustments are best made with the aid of a dummy resistor. The very best kind is made like a piece of cloth, woven out of resistance wire for the woof and asbestos cord for the warp. These resistors are relatively inexpensive and convenient because they can be adjusted with clips on the edges (selvage). They are relatively non-inductive and have low distributed capacity, which is very necessary for best results. They are not self-indicating, however, and must be used with a meter. Lamp banks are convenient because maximum current can be detected at a glance without a meter, but care must be taken to use them only near their rated power because lamps change their resistance over wide limits with variable input. A common 20-watt 110-volt lamp has a resistance of about 600 ohms at normal brilliance. A pair of 210's in the p.a., a very common combination, should work a 20-watt lamp in good shape. If they do not there is trouble somewhere in the transmitter.

Referring to Fig. 1, first connect the dummy resistor to the line-coupling tank as shown at (a). Adjust the coupling for normal load on the p.a. Tuning the plate tank should give a sharp minimum plate current when properly adjusted. Tuning the load tank should give a broad maximum of both plate current and power in the dummy. If the maximum comes at the zero end of the condenser, the coil is too large. If it comes with condenser all in, the coil is too small. Change the coil accordingly, to bring the maximum well on the condenser scale. Note all adjustments carefully. Then remove the dummy and attach the line. Take the dummy outside and attach to the receiver end of the line, Fig. 1b. If the dummy resistance is the same as the line surge impedance, all readings and adjustments will duplicate, so that as far as readings and adjustments are concerned it would be impossible to tell whether the load is connected through a line or right to the tank. If you notice a difference, try a slightly different value of dummy resistance and repeat. It has been my experience with broadcast transmitters that if the dummy is made equal to the calculated line surge impedance, it always works first trial without any fuss or trouble. Incidentally, the value is not at all critical; quite a little variation in either direction will produce only a small effect on tuning and p.a. loading. After this adjustment is finished, note all adjustments and p.a. plate current. Incidentally, this is an excellent opportunity to check up on p.a. efficiency, since the actual load is known. The next trick is to adjust the antenna connection so that it duplicates the dummy.

MATCHING THE LINE AND ANTENNA

The method chosen to match the antenna to the feed line will depend largely on convenience. There are a number of different ways, and if the general principles are kept in mind any of them can be made to work. For frequencies above 14 mc. the direct "Y" connection is the simplest and best for ordinary ladder-type lines and half-wave Hertz antennas. This scheme was described in detail in *QST* for December, 1930. To adjust the match, attach the line to the antenna with clips and vary the spread of the clips from the center. The correct adjustment is when the p.a. loading and tuning adjustments agree with those for the dummy resistor. If no satisfactory adjustment

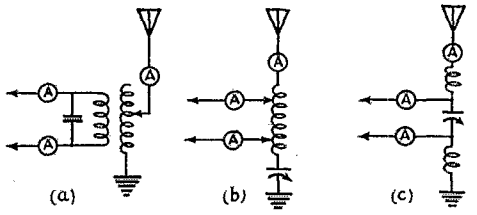


FIG. 4 — THREE METHODS OF COUPLING TRANSMISSION LINES TO GROUNDED ANTENNAS

can be found, it is probably because the transmitter frequency is not in tune with the antenna. Check up antenna length and master oscillator frequency.

For frequencies lower than 14 mc. the Y connection does not work out so well. It is clumsy and becomes difficult to adjust when the spread is large. There are two ways out of the difficulty: Use a matching network; or make the antenna and line match without a network by changing the impedance of one or the other to fit. A half-wave Hertz antenna has a series resistance (at the

center) of about 65 ohms at resonance. This is practically independent of frequency; that is, a larger or smaller antenna, driven at resonance by a lower or higher frequency respectively, will have the same resistance. It is not practical to alter this value without adding networks of some kind. So to get a match without a network, it would be necessary to terminate the line with 65 ohms. A little juggling with formula (1) will convince anyone that to build an open wire line with 65 ohms surge impedance is practically impossible. If the spacing is reduced until the wires touch you can only get down to 83 ohms, even if there was no short circuit. But look at the formula for the concentric cable line. Try a value of b/a of 3 or a little less, and you find that if b/a is 2.96, Z is 65. The answer is simple. Use a concentric cable line and connect it directly to the broken center of a half-wave Hertz and forget about matching impedances. Use a series tank to feed it. The outer conductor may be grounded, and the whole assembly makes an efficient lightning rod. See Fig. 2.

Another way to do the trick is to use the principle of formula (5). Then any type of line will do, but must be an integral multiple of a half-wave in length. Use the same circuit as for the concentric cable, but divide the condenser just as you would for a standard Zepp feeder. See Fig. 3. This arrangement works exactly like a Zepp system except that the antenna is current fed in the center, and the line length fits formula (5) instead of (3). This arrangement is open to the same objections as the standard Zepp, however. There is high standing wave current in the line, which works at lower efficiency than it would if terminated in Z_s. A point of very high voltage will develop in the center of line, so watch out for leaky insulators near it.

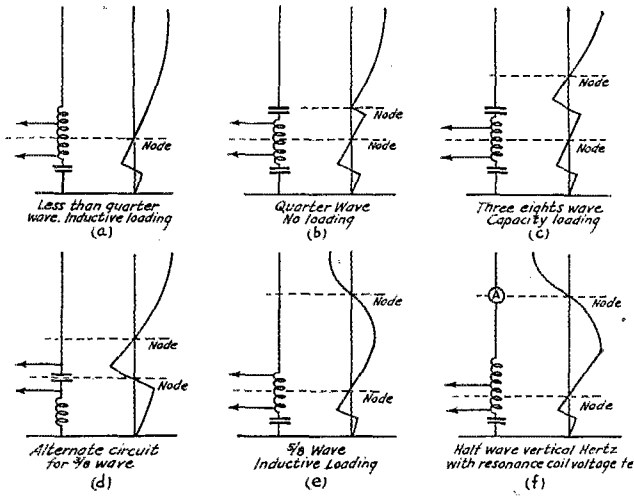


FIG. 5—THE CIRCUIT OF FIG. 4b APPLIED TO ANTENNAS OF DIFFERENT LENGTHS

Ideal potential distributions along the antenna and tuning apparatus also are shown.

GROUNDED ANTENNAS

The good old Marconi grounded antenna seems to be coming back into favor after several years of neglect. In this case the antenna system is inherently non-symmetrical, and care must be taken to balance the feed line so that the potential node is in the center of the line inductance. Fig. 4 shows some types of feeder connections for grounded antennas. At (a) is shown the most popular circuit for broadcast transmitters. It is not recommended because it is too difficult to tune properly. Every adjustment affects every other, and unless you have had considerable experience with this circuit I would not advise it. At (b) is the most satisfactory circuit for general use. It has no appreciable losses if built decently. High C tanks, as in (a), are effective harmonic suppressors, but exact their toll in losses. An alternative circuit equivalent to (b) is shown at (c). It is equally effective but a little more tricky to adjust, because the potential node, being in the condenser, is not accessible for test.

In Fig. 5 is shown the circuit of (4b) for different antenna sizes, along with ideal potential distributions. The coils and condensers serve the double purpose of matching and loading. The method of adjusting is very simple. Proceed to adjust the line with the dummy as in Fig. 1, then attach line to network and tune to resonance (maximum antenna current). Vary the spread of the line clips until the line currents and p.a. loading are the same as with the dummy. If the number of coil turns is small, giving adjustment in too big steps, replace with a coil of smaller diameter and more turns. Then fish for the nodal point by the touch test method. It should be in the center of the part of inductance included between the line clips. If not, move both line clips together up or down, keeping the spread constant. If in either spread or balance adjustment you run off the bottom end of the coil, reduce the ground series condenser and add more turns in series with antenna. This will move the nodal point up on the coil. If you run off the other end, you will have to change to the circuit shown in 5b. After the balance is adjusted recheck the impedance match with the dummy. You will probably hit it right on the second trip through this procedure. It is

(Continued on page 88)

'Phone-C.W. QSO Contest Results

By E. L. Battey, Assistant Communications Manager

A NEW type of informal QSO contest to see which 'phone station operator could contact the greatest number of c.w. telegraph stations and, likewise, to determine which brasspounder could QSO the most 'phone stations in a period of one week — that was the 'Phone-C.W. QSO Party held during the week of May 15th-21st.

This contest afforded an opportunity for QSOs between c.w. and 'phone stations, something that seldom takes place in everyday amateur radio due to the rather pronounced difference in these two types of communication. Many new friendships were made. 'Phone operators enjoyed copying code for a change; and c.w. operators enjoyed the novelty of copying "voice" rather than "telegraph." A few representative comments made by participants will be of interest: "It was sure a treat to get the ear going again on code." . . . "Had a good time and plenty of code practise." . . . "Not having copied any c.w. for about five years, I got a big kick out of it." . . . "I have never had so many real nice QSOs since I have been on the air, which is a number of years." . . . "We enjoyed the contest immensely in addition to getting acquainted with a bunch of fine c.w. men." . . . "I certainly enjoyed the QSOs I had with the 'phone men; nearly all could copy at least 15 w.p.m., and nearly all had f.b. modulation." . . . "This contest was one of the most interesting of the contests staged by the A.R.R.L. It was too bad to hear the number of 'phone stations that were on but failed to take part, and as a result missed out on many pleasant QSOs and some good DX." . . . "During the week I became well acquainted with several of the 'phone operators, and they are a mighty fine bunch." . . .

THE PRIZE WINNERS

Four quartz crystals (ground to any frequency in the 1750-kc. or 3500-kc. band) were donated by the Staff at W8YA, the radio station of the Pennsylvania State College (Department of Electrical Engineering), to be awarded to the two highest scoring c.w. operators, and the two highest scoring 'phone operators. The winners and their scores are: 'phone, W2TP 12,100, W9CJJ 8900; c.w., W9BVI 1830, W9BWJ 860. Congratulations, OMs!

SCORING

The system of scoring was very simple. Each participant merely multiplied the total number of different stations worked by the number of A.R.R.L. Sections contacted. As new Sections were worked the score was found to mount rapidly, and those who worked towards QSOing as many Sections as possible came out with the leaders.

NOTES OF INTEREST

Due to the much greater number of c.w. stations active in the contest than 'phone stations, 'phone scores average considerably higher than c.w. totals. There seemed to be about ten c.w. stations active to every one 'phone station. Those 'phones who did take part certainly had their hands full working all the brasspounders who answered their "CQ c.w." calls. The 3500- and 14,000-kc. bands proved most popular. 14,000-kc. was advantageous from a standpoint of "adding sections" to the list of those worked. It will be noted that the highest scorer on both the 'phone and c.w. sides used both 3500 and 14,000-kc. The 1750-kc. band was tried by some with but middling success. W2TP was the 'phone station to contact the greatest number of different c.w. stations — 242! Next in line were W9CJJ and VE3HC, 178 each, W2BYF 160, and W1ADM 151. Among the brasspounders, W9BVI contacted the greatest number of different 'phones — 61. Next highest were W9BWJ 43, W5AUX 35, W6AHP 31 and W4TO 30. W2TP and W9CJJ are tied for the honor of having contacted c.w. stations in the greatest number of A.R.R.L. Sections, both having made contacts in 50 Sections. W5BEE 42, W9BRX 37 and VE3HC 25 come next among the 'phones. W9BVI leads the c.w. group in number of Sections worked by contacting stations in 30 Sections. W9BWJ and W6AHP are next in line with 20 Sections each to their credit, followed by W5AUX 18, W4TO 17, W9ARH 16 and W4BDD 15. VE3HC, one of the highest 'phone scorers, had some advantage over other participants inasmuch as he operated in the old 3500–3550-kc. 'phone band, which is still open to 'phone in Canada, and was consequently not troubled by QRM from other 'phones. At W2TP the 14-mc. outfit consisted of a 3.5-mc. crystal '10, '10 doubler 7-mc. stage, '10 doubler 14-mc. stage, and '03A mod. amp. as final stage, modulated by two 211's in parallel, condenser mike with two stages of resistance coupling, fed into a three-stage speech amplifier. The W2TP 3.9-mc. outfit consisted of a 3.9-mc. crystal '10, '65 buffer, '03A mod. amp., with same modulation equipment as used on 14 mc. W5BEE makes a bid for the "most points per watt" — the input to the last stage of his 14-mc. 'phone was only 43 watts, yet he is third high man in the 'phone group. Others used low-power 'phones with varying

THE TEN HIGHEST 'PHONE PARTICIPANTS

Station	Score	No. Stns.	No. Sects.	Freq. Bands	Station	Score	No. Stns.	No. Sects.	Freq. Bands
W2TP	2100	242	50	3.9 & 14 mc.	W2BYF	2880	160	18	3.9 mc.
W9CJJ	8900	178	50	14 mc.	W1ADM	2869	151	19	3.9 mc.
W5BEE	5292	126	42	14 mc.	W2CIF	2520	120	21	3.9 mc.
VE3HC	4450	178	25	3.5 mc.	W3BMS	1000	50	20	3.9 mc.
W9BRX	3108	84	37	14 mc.	W9BON	732	61	12	3.9 mc.

THE FIFTEEN HIGHEST C.W. PARTICIPANTS

Station	Score	No Stns.	No. Sects.	Freq. Bands	Station	Score	No. Stns.	No. Sects.	Freq. Bands
W9BVI	1830	61	30	3.5 & 14 mc.	W9ARH	304	19	16	14 mc.
W9BWJ	860	43	20	3.5 mc.	W9EVQ	276	23	12	3.5 & 14 mc.
W5AUX	630	35	18	14 mc.	W8DED	234	18	13	3.5 & 14 mc.
W6AHP	620	31	20	3.5 & 14 mc.	W3BWD	200	20	10	3.5 mc.
W4TO	510	30	17	1.75, 3.5 & 14 mc.	W8CVS	171	19	9	1.75 & 3.5 mc.
					W9HDN	165	15	11	3.5 & 14 mc.
W4BDD	420	28	15	14 mc.	W3CHN	160	16	10	3.5 mc.
W5BZT	350	25	14	14 mc.	W2WC	153	17	9	3.5 & 14 mc.

degrees of success. VE3HC made the highest score for Canada on the 'phone side, VE3GT the same on the c.w. side. Several participants — both 'phone and c.w. — suggest that we set aside one day of each week for 'phone-c.w. contacts. Why not have them *every* day? A "CQ c.w." or "CQ 'phone" should do the trick! What is believed to be the lowest powered c.w. station entered in the contest is W1BGZ-DLE with 6 watts input to a type '10. The operator at W1BGZ nominates the following as the "most consistent 14-mc. 'phones" during the contest, in order: W5BEE, W9BRX and W9CJJ. W2WC says, "If nothing else, this contest gave the 'phone men some code practise. Hi." W3CKD, a nearly blind chap, who took part using c.w., expects soon to be on the 3.9-mc. band with 'phone. Several "foreign" 'phones were worked on 14 mc. during the contest period, including PY2BQ, CM2JM and CM2RA. We quote W8DOS (c.w.): "W8CI should be commended on his fine spirit as he spent considerable time ragchewing with each c.w. contact, whereas many of the other fellows said, 'QRA QSA and so long.'" On the 3.9-mc. 'phone band W9BVI reports W3BMS and W9BON as the most consistent 'phones trying to work c.w. stations; on 14 mc. he says W5BEE was the most consistent 'phone heard. 26 'phone operators, 110 brasspounders submitted scores.

SCORES

Two complete lists of scores follow, one the 'phone participants', the other the c.w. men's scores. These lists are both tabulated by government inspection districts.

'PHONE SCORES

First District: W1ADM 2869; W1SL 310. Second District: W2TP 12100; W2BYF 2880; W2CIF 2520. Third District: W3BMS 1000. Fourth District: W4AGR 252; W4ACY 36. Fifth District: W5BEE 5292. Sixth District: None. Seventh District: W7MD 700; W7TS 75; W7DP 32; W7AQK 1. Eighth District: W8CI 462; W8DNO 280. Ninth District: W9CJJ 8900; W9BRX 3108; W9BON 732; W9DGH 384; W9HRF 360; W9BBR 140; W9EVQ 44; W9DXI 15; W9AMY 1. Canadian Third District: VE3HC 4450. Canadian Fourth District: VE4GM 637.

C. W. SCORES

First District: W1APJ 128; W1BIH 104; W1BHH 96; W1CNU 88; W1AXI 80; W1NC 80; W1CSC 70; W1AIC 28; W1DVS 24; W1AZT 24; W1AIZ 21; W1DBG 20; W1BGZ-DLE 16; W1EAO 12; W1CNE 9; W1DJQ 9; W1BQS 9; W1CLG 9; W1DNC 6; W1AAD 4; W1BOF 3; W1DYM 2; W1DEQ 1; W1AJD 1. Second District: W2WC 153; W2AGO 96; W2DDW 72; W2DXK 72; W2CUH 70; W2AZF 66; W2DJI 60; W2CZL 42; W2DGF 9; W2DQK 6; W2DRN 6; W2BPY 6; W2CSV 1. Third District: W3BWD 200; W3CHN 160; W3BRH-AZL 84; W3CDG 60; W3CKD 56; W3CBF 54; W3AFC 28; W3BBB 20; W3BNY 4. Fourth District: W4TO 510; W4BDD 420; W4APU 99; W4PDL 12; W4AKV 6; W4AZH 6. Fifth District: W5AUX 630; W5BZT 350; W5AXD 36. Sixth District: W6AHP 620; W6ETJ 60; W6FGT 52; W6BQL 16; W6CDX 2; W6EGZ 1. Seventh District:

(Continued on page 44)

The 56-mc. Eclipse Expedition

FLYING down from North Conway with John Wells, W1ZD, on the day after the eclipse, we spent our idle moments planning this brief story on the tests. The title, we decided, would be "The Eclipse (Oh, Yeah) Tests" and the page under it would be left quite blank. That was yesterday. To-day, after the first decent sleep of the week, we feel a little better. The tests, we now realize, were not altogether a waste of effort, even though we did fly into the worst series of incidents we have experienced in many years.

The 'plane used for the work was an autogyro, under-powered with an engine designed to develop 120 horse-power. First tests revealed that with one passenger and 28 lbs. of radio gear it had a "ceiling" of about 3000 feet if everything went well. They showed, also, that the rotor of the gyro was to give much trouble from frequency modulation of both transmitted and received signals. There was, however, nothing much to be done about it. Attempts to obtain a replacement 'plane proved unsuccessful. We were obliged to go ahead.

The first move was the installation of a vertical transmitting antenna in place of the horizontal one used at first. Because of the proximity of the rotor, this antenna could not be placed above the fuselage. Insufficient ground-clearance did not allow it to be mounted permanently below the fuselage. Eventually, we had to resort to a hinged quarter-wave rod arranged so that it could be lowered into a vertical position when the ship was off the ground and pulled back under the fuselage before landing. This arrangement eliminated frequency modulation of the transmitted signal by the rotor and gave us an effective radiator. To clean up frequency modulation of received signals, we installed a ten-foot length of shielded antenna lead between the six-foot antenna and the receiver. The whole affair, of course, was lowered over the side of the 'plane. It solved the problem.

IMMEDIATELY AFTER TOTALITY

John Wells, in the cockpit, muses on the joys of flying while mechanics go in search of the trouble. The writer is not standing on the "lizzie" in the background. (He felt about that size, however.)

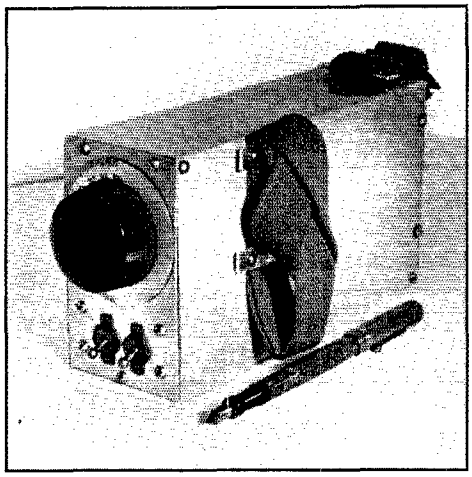
The apparatus used in the 'plane was especially designed and built for the work. It comprised a three-tube receiver and control-box located in the cockpit, a push-pull oscillator mounted back in the fuselage and a Class-B modulator slung in the luggage compartment. Type '30 tubes were used in the receiver, Type '31's in the oscillator and 49's in the modulator. The whole affair was run from a hot-shot as filament supply and three light-weight 45-volt batteries as plate supply. A Westinghouse anti-noise microphone enabled the operator to win his noise battle with the engine (not three feet in front of him).

Final tests, on the day before our departure for points north, gave strength to our expectations. At 1800 feet, we worked solid 'phone up to 50 miles, were heard at almost twice that distance.

During the flight to Mount Washington, F. C. Beekley of this office accompanied John Wells and operated the gear. The writer, in a 56-mc. equipped automobile (W1UY), was successful in contacting the 'plane for most of the journey, the car being stopped for schedules every 15 minutes. Late that evening, after many delays in search of gasoline, the gyro landed in an unbelievably rough field near the expedition headquarters. From then on, things started to happen. First off, it was realized that the fields, about which we had heard such good reports, were quite unsuited even for the gyro. The following morning (Tuesday) was therefore spent in finding something else. Eventually, the radio end of the expedition decided to take leave of the photographic end and move to North Conway (some 30 miles distant), at which point a fairly good field was found to be available. During the afternoon, tests were conducted with the N.B.C. group in preparation for a possible broadcast and many CQ's were called. A 1500-foot ceiling undoubtedly had a hand in preventing us from working farther than W1EXL at Casco, Maine (about 45 miles). The mountain country, however, seemed to be fairly sprinkled with 56-mc. portables. Driving around in the car, we could stop almost anywhere, call a CQ and work someone.

Next morning, the eclipse day, we awoke to find the sky heavily clouded. Towards noon, however, the sky cleared and we hopped off for a final check of the gear. Everything was in order. We were all set for the big party. At 3.30 D.S.T. (clouds having obscured the sun) John Wells climbed into the 'plane accompanied by George

Hicks, N.B.C. announcer. Contact was established with the N.B.C. ground station. The engine was started. John manipulated the clutch to put the rotor in motion. And — nothing happened. In just about one split second we realized that the 'plane was hay-wire; that we could never get in the air in time for the eclipse; that we were completely washed-up. We were right. A pin in the drive shaft to the rotor had sheared. We were grounded for the rest of the



THE RECEIVER-CONTROL BOX USED IN THE PLANE

This unit, together with the remainder of the equipment, is to be given full treatment in a review of new 56-mc. equipment to appear in the November QST.

day. While mechanics tried to find the trouble, John Wells, George Hicks and the writer sat on the grass deploring the limitations of a language in which we could not fully express our emotions.

Now that our mind has cleared, we wish to offer our sincere thanks to the N.B.C. crew. Mr. C. K. Atwater (W2JN), who operated the N.B.C. 5-meter gear, gave us all the help humanly possible. Mr. W. R. Brown and Mr. Harold See, though working against time on the N.B.C. broadcast, coöperated with us to the limit. We would thank, also, the many amateurs who worked with us. We are particularly indebted to Harold Whitford and Clinton Sherman, who operated W1EWW on the top of Mount Washington, and to Paul Hendricks and John Dyer, who operated W1AML at the expedition headquarters near Pinkham Notch. Mr. John Wells is naturally in receipt of our sincerest gratitude. We only hope that he will not feel too badly over our restrained but nevertheless nasty remarks about his 'plane. We know that he is to join us in the search for a powerful ship — a gadget that will fly so high into the upper atmosphere as to oblige us to fit out a combination microphone and oxygen mask. —*R. A. H.*

Canadian Convention

At Toronto, Ontario, October 7th–8th

THE Wireless Association of Ontario is sponsoring an A.R.R.L. Convention to be held at the King Edward Hotel, Friday and Saturday, October 7th and 8th, respectively. A cordial invitation is extended to all Canadian amateurs and our cousins across the frontier. The event takes place near our Thanksgiving Day, and should enable many to take advantage of this holiday to make us a visit. Director Woodruff, W8CMP, has promised to be with us and to bring along his usual box of "tricks." Lectures on Rochelle Salt Crystal Microphones and loudspeaker units; latest type of tubes available; many side trips, etc. A.R.R.L. Headquarters is sending Ross Hull, Associate Editor, and our Australian cousin.

Arrangements will also be made for putting up as temporary members of the Toronto Flying any of the fellows coming, so that they will be able to arrange for machines at reasonable figures if they wish to make any flights during their visits in Toronto. Now, Canadians, let's put this thing over in the right way, and your attendance will do it. Keith Russell, former C.G.M., is the Convention Manager, so please write him at Room 303, 53 King St. West, Toronto, Ontario, for further particulars.

Strays

On the night of August 6th thieves entered the home of Andrew Janiga, Jr., 4002 Fir Street, East Chicago, Indiana, and made away with three W.E. 211-E's, a 50-watt socket, a Martin Vibroplex, an RCA 210 and a 281. Hams in the vicinity are asked to keep an eye out for any unusually cheap offers of articles corresponding to this list.

The six-volt field coils for the old Magnavoxes make good filter chokes for the high-power transmitter. The inductance is about 15 henrys, and the wire will handle an ampere without difficulty. They can often be picked up for a song.

—*K7AD*

Mrs. W5EB has this one to propound: If Eve was Adam's rib, are OW's "hambones"?

Navy Day

(Continued from page 20)

These broadcasts will be sent at about 15 words per minute and preceded by a 5-minute "CQ." To make a 100% copy requires a sincere effort, and not a little proficiency. Copy all you can of one or both transmissions! Mail the results of your reception promptly to A.R.R.L. Hdq., Attention the Communications Department.

More Changes in Standard-Frequency Schedules

COMING out of the summer doldrums into the high-activity season of the ham year, in addition to the changes in W1XP and W6XK schedules announced recently (see September *QST*) we now have W9XAN shifting its Sunday afternoon transmissions to Wednesday afternoons. The WWV 5000-kc. transmissions on Tuesdays also go on Fall schedule, as given further on. Here are the complete schedules for October and November:

DATES OF TRANSMISSIONS

Dates	*Schedules*	*Stations*
October 5, Wednesday	B	W1XP
	BB	W9XAN
October 7, Friday	FB	W6XK
	A	W9XAN
October 8, Saturday	BX	W6XK
October 9, Sunday	C	W6XK
October 14, Friday	A	W6XK
October 16, Sunday	C	W1XP
October 19, Wednesday	A	W1XP
October 21, Friday	B	W9XAN
	B	W6XK
October 26, Wednesday	BB	W1XP
	C	W9XAN
October 28, Friday	B	W9XAN
	A	W6XK
November 2, Wednesday	B	W1XP
	BB	W9XAN
November 4, Friday	BB	W6XK
	A	W9XAN
November 5, Saturday	BX	W6XK
November 6, Sunday	C	W6XK
November 11, Friday	A	W6XK
November 13, Sunday	C	W1XP
November 16, Wednesday	A	W1XP
November 18, Friday	B	W9XAN
	B	W6XK
November 23, Wednesday	BB	W1XP
	C	W9XAN
November 25, Friday	B	W9XAN
	A	W6XK
November 30, Wednesday	B	W1XP

STANDARD FREQUENCY SCHEDULES

Time	*Evening Sched. and Freq. (kc.)*		*Time*	*Afternoon 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				

Time (a.m.)	*Morning Sched. & Freq. (kc.) 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 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 10:00 a.m. to 12 noon and from 8:00 to 10:00 p.m., E.S.T. The accuracy of these transmissions is to better than 1 cycle (one in five million). Information on how to receive and utilize the signals is given in Letter Circular LC-335, 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

Commercial muriatic acid is FB for polishing copper tubing. It takes the oxidation off like lightning. A coat of thin clear lacquer will preserve the finish. — *W5AIB*

for the

EXPERIMENTER

The "Economy Special"

An Inexpensive Oscillator-Amplifier Transmitter with the Electron-Coupled Oscillator

By Winston Bull, W9HCM*

FOR some time the writer has been working with the electron-coupled oscillator in an effort to probe its possibilities. It appeared to me to offer the fellow who is short on cash an opportunity to put out a signal equal in quality to that of the more plentifully financed station. I also desired to get the greatest possible output consistent with high-quality signals. The result is the present "40-meter" rig at W9HCM: a 235 electron-coupled oscillator with 350 volts on the plate, a pair of 224 buffers in push-pull, also with 350 volts, and a final amplifier consisting of a pair of 245's in push-pull with 600 volts. The input to the '45's usually runs about 80 watts. The circuit diagram is shown in Fig. 1.

The layout used is an arrangement of three shelves, supported by wooden uprights at each corner, as shown in the photograph. Since the rig was built experimentally, it was put together with an eye to electrical efficiency rather than beauty, and as a result does not in the least resemble anything turned out by W. E. The lower shelf contains the electron-coupled oscillator; on the second is the buffer amplifier and also a home-made filament transformer which lights the three screen-grid tubes. The power amplifier — which, by the way, is nothing more or less than the old push-pull '45 rig of November, 1930, *QST*, neutralized and arranged for external excitation — occupies the top shelf. This should be a tip to those who, having built this popular outfit, wish to increase its output and at the same time improve signal quality. Conversion of the old PP-TNT to m.o.p.a. practically doubled its output at the same plate voltage.

Now for a few operating hints. It is important to have low-C in the oscillator output tank circuit, since the ratio of L to C has a marked effect upon the output and should be kept as high as possible. When adjusting the oscillator for maximum output the indicating device should be coupled to the output tank and not to the oscillator circuit itself, because an adjustment which increases the r.f. energy in the oscillator tank often has the opposite effect on the output circuit.

The buffer stage is used because the output of the electron-coupled oscillator is not great enough to excite the '45's directly. The '24's are used in it because they are easy to excite and because they require no neutralizing. Putting two tubes in push-pull makes for increased output, cooler tubes and uniform excitation of the following stage.

The '45's are used in the final amplifier primarily because of their cheapness. Although these tubes require large excitation voltage and high bias, they have good r.f. output and will stand fairly high voltages. The high bias required is of relatively little consequence, however, because leak bias is just

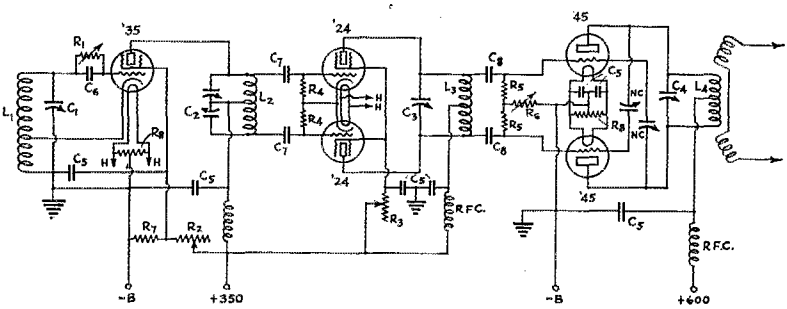


FIG. 1 — CIRCUIT DIAGRAM OF THE "ECONOMY SPECIAL"

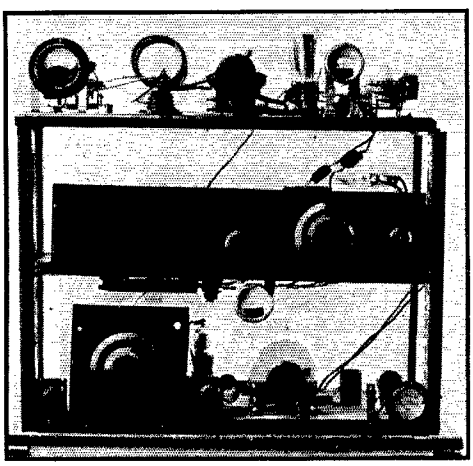
L_1C_1 — *High-C tank circuit for 3550-kc. operation. Coil tapped one-third of distance from grounded end.*
L_2C_2 — *Low-C circuit for 7000 kc. Coil tapped in center. Split-stator condenser is used, but an ordinary condenser will do.*
L_3C_3 — *Usual for 7000 kc., fairly low-C.*
L_4C_4 — *Same as L_2C_2. If the final stage is made from the November, 1930, QST, transmitter, as is W9HCM, L_4 may be the 3500-kc. tank coil.*
C_5 — *.006-μfd. mica condenser.*
C_6 — *.001-μfd. mica condenser.*
C_7 — *100-μμfd. mica condenser.*
C_8 — *.001-μfd. mica condenser.*
R_1 — *50,000 ohms.*
R_2 — *25,000 ohms, variable.*
R_3 — *20,000 ohms, variable.*
R_4 — *15,000 ohms, 2-watt rod-type resistor.*
R_5 — *50,000 ohms, 2-watt rod-type resistor.*
R_6 — *25,000 ohms, variable (Bradleyohm).*
R_7 — *20,000 ohms.*

* Oakley, Kans.

as efficient as battery bias, consequently no batteries are used. When adjusting an amplifier circuit in which resistor bias is used, no attempt should be made to get "cut-off." Instead, excitation is applied and the bias resistor adjusted for maximum efficiency. The variable resistor R_6 is an important adjustment in getting good efficiency from the output stage.

A feature of the transmitter which probably will draw gasps of horror from conventional-minded hams is the omission of r.f. chokes from the grid circuits. However, after a day of winding different kinds of chokes I found that arranging the grid resistors as shown gave better results than the best choke I had succeeded in winding; therefore there are no chokes in the grid circuits of the amplifiers. The resistors have the double function of keeping r.f. in its place and biasing the tubes. It is important that these resistors be non-inductive, however. The carbon-rod type of fixed resistor is satisfactory, the rating of each being two watts. The variable resistors are Bradleyohms.

Two power supplies are used with the transmitter. The low-voltage power pack supplies the buffer and oscillator. The final amplifier gets its power from a separate supply. Although the tubes undoubtedly are overloaded, judging by the manufacturers' ratings, nevertheless there isn't a plate in the whole rig that shows the faintest blush. Reports are always d.c. or p.d.c., and over 75% of them are "crystal." I might add that this same pair of '45's has been laboring under 600 volts for about a year and both tubes test OK. This outfit is giving me more good signal per dollar than anything I have ever built.



W9HCM'S "ECONOMY SPECIAL" TRANSMITTER

The electron-coupled oscillator occupies the lowest shelf; the buffer amplifier with two '24's in push-pull is in the middle, and the final amplifier is on top. The '45's in the last stage handle 80 watts without difficulty, and the signals are nearly always reported "crystal."

Transmitter Enclosure

W8BIB uses old ferrotype or squeegee plates (used to dry photographic prints) to enclose the sides and back of his transmitter frame. The plates are made of soft sheet iron, have a glossy black finish, and can be easily cut to size with tin shears. They can often be picked up at photographic establishments for the asking.

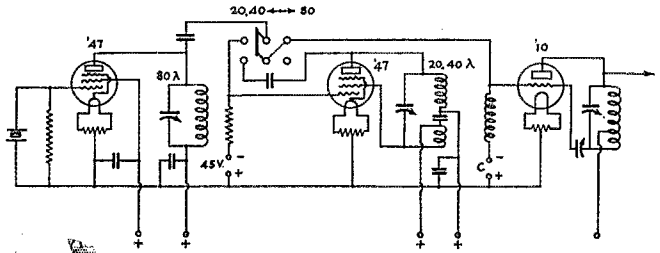


FIG. 2 — A THREE-BAND CRYSTAL-CONTROLLED TRANSMITTER USING THE "POWER-TYPE" MULTIPLIER

A Three-Band Transmitter with the "Power-Type" Multiplier

Since the publication of my article on frequency multipliers in March *QST*, it has been called to my attention by letters from various readers that a simple scheme for operation on the three most popular (and most populated) bands would be most welcome. Therefore I devised the circuit shown in Fig. 2. The outfit is not so much a '10-powered transmitter as it is a complete unit for exciting fifties on any of the three bands. However, there is no reason why it could not be used as a three-band 210 outfit, for the 210 is still the most widely used tube.

The tank condenser of the multiplier, originally a 50-$\mu\mu$fd. midget, is now made a 200-$\mu\mu$fd. variable condenser, while the coil is not altered. This enables the multiplier to be tuned to the two higher-frequency bands without changing coils.

When operating on the lower-frequency band the '10 amplifier is excited directly by the crystal oscillator. The rather high bias on the multiplier cuts off the plate current there, so long as the grid is not excited, and as a result this tube might just as well be left in the socket.

The grid blocking condensers are placed as shown to keep the high d.c. voltage away from the switch.

The R, L, and C values are the same as in Fig. 4, page 23, March, 1932, *QST*.

— *Henry S. Keen, W2CTK*

Screen-Grid Voltage and Detector Sensitivity

Although it is pretty generally realized that a high order of sensitivity can be obtained with a screen-grid regenerative detector, many amateurs are not aware of the importance of having the correct screen voltage on the detector. The dope given in the following letter from J. C. Flippin, W8BQY, is well worth putting into practice:

"There may be some amateurs who are failing to obtain maximum sensitivity from a 224-227 receiver by using too many turns on the tickler of the '24 detector, causing the latter to break into oscillation with an insufficient amount of voltage on the screen grid.

"In my own experience the higher this s.g. voltage can be, without roughening up the regeneration control, the better. As the screen voltage is increased to produce oscillation, a relatively enormous gain in sensitivity results. If the detector squeals when the regeneration potentiometer is advanced past the normal "slide-in" point, it is a fairly sure indication that maladjustment of either screen voltage or antenna coupling exists, and considerable socking power is being overlooked. The obvious remedy is to decrease tickler turns or tickler coupling, or both, until the highest practical screen-grid voltage is being used to produce smooth oscillation.

"Any method of preventing the detector from breaking into oscillation with an inadequate value of screen voltage will cause the signal response to be improved. It is, for instance, possible to couple the antenna so tightly to the detector grid coil that the detector will not break into oscillation without raising the screen-grid voltage to a higher-than-ordinary value. It is, however, in my experience preferable from the standpoint of both selectivity and smoothness of regeneration control to use a low value of antenna coupling, and decrease the reaction of the tickler upon the grid coil to bring about the aforementioned benefit.

"The effectiveness of proper adjustment in this respect is quite marked. The volume of all signals is heightened appreciably and the pick-up in the strength of DX is particularly noticeable. By bringing the sensitivity of the receiver up to a maximum, it is, of course, possible to employ a much smaller antenna than seems feasible with a receiver which operates indifferently without a fairly good antenna. The efficacy of the small pick-up in closely packed regions of interference, as in cities, needs no comment. It is also valuable where static is encountered, and I have found this to be especially helpful during the last couple of months.

"This simple adjustment may be overlooked by the chap who has, perhaps, centered attention primarily upon smooth oscillation, believing that the tickler is O.K. if it causes oscillation over the band on one potentiometer setting. That is only part of the story. The screen-grid voltage — its proper adjustment — has a very material bearing upon signal strength and DX ability of the receiver."

The Doublet Antenna at 5 Meters

Probably a good many experimenters working on the 5-meter band have wished for a sure-fire method of feeding an antenna which is located some little distance from the transmitter. Karl White, W5WR, has been using a doublet antenna with a two-wire untuned feed-line which has given better results than any of the several other methods of feeding tried. The dimensions are given in Fig. 3. W5WR's feeders are approximately 25 feet in length, but shorter or longer feeders can be used without changing any of the

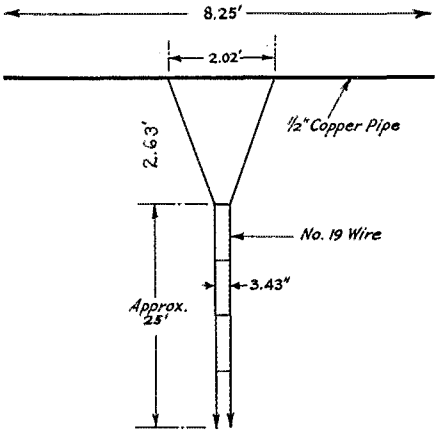


FIG. 3 — DIMENSIONS OF AN APERIODIC FEED SYSTEM FOR 56-MC. OPERATION

measurements. The transmitter ends of the feeders can be clipped right on the plate tank circuit, the position of the clips being adjusted so that the transmitter takes normal plate current. If the transmitter is push-pull the clips should be equidistant from the center-tap on the tank coil.

Some By-Passing Pointers

By Charles S. Linell*

During the past year the use of circuits which supposedly do not require the radio-frequency chokes has become quite prevalent. Many of these so-called "balanced" circuits, while quite

*Oak Park, Ill.

commendable from the standpoint of electrical symmetry, introduce irregular effects which if not taken into consideration cause two specific types of trouble. These are often entirely over-

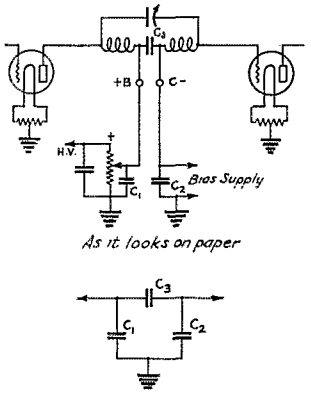


FIG. 4 — HOW THE POWER-SUPPLY CONDENSERS CAN AFFECT TUNING WHEN A SERIES-FED CIRCUIT WITH SPLIT INDUCTANCE IS USED

looked because of the belief that the circuit is immune from the ills of stray radio-frequency paths.

Generally, this trouble pertains only to circuits in which a fixed mica condenser or condensers are inserted in series with and in the electrical center of a tank inductance to allow bias and plate potentials to be fed in at the voltage node.

If we analyze the typical examples shown in Figs. 4 and 5, it becomes apparent that part of the power-supply filter capacity is incorporated in the tuned circuit. This is not a theory but an actuality, as will be shown. If the usual practice of by-passing the voltage divider taps in the plate and bias supplies is followed, we have in reality placed both of these by-pass condensers, which are usually of the rolled-paper or electrolytic variety, in a simple series-parallel circuit with C_3, and a variation in either C_1 or C_2 will cause a change in the resonance frequency of the tuned circuit by affecting the total capacity. Since paper and electrolytic condensers, especially those of high capacity, show constant small variations in capacity with changing voltages, we can expect variations in the tuned circuit to result. These variations take two forms; first, the occasional change in the tuned circuit which would seriously affect the stability of a self-excited oscillator and cause lowered efficiency in crystal-controlled rigs. It may be said here that some forms of split Hartley and Colpitts oscillator circuits are prone to this effect, especially if an un-needed grid condenser should inadvertently be placed in the circuit or if a split-stator tank condenser with the rotor grounded should be used.

The second form, which is even more important since its source is not apparent, is slight modulation of the tuned circuit, the effect of which is quite appreciable when occurring in the first doubler or amplifier stage. In a broadcast-frequency signal generator which was built here using a split Colpitts circuit with a split-stator tank condenser a noticeable hum on resonance was found which disappeared when a battery-operated signal generator was used, thereby eliminating the receiver as the source. The power supply for this apparatus contained 32 μfd. of filter capacity and had no measurable ripple — yet when the final 8 μfd. of filter capacity was removed the effect was eliminated although the a.c. ripple voltage could then be detected in the power supply by a sensitive v.t. voltmeter. This effect can be explained by the slight changes of capacity caused by periodic variations in the thickness of the film in an electrolytic condenser or corresponding movements of the foil in paper condensers with the hum component of the supply voltage, which while very minute can greatly affect the transmitted wave by imposing undesired modulation. This effect of changing ca-

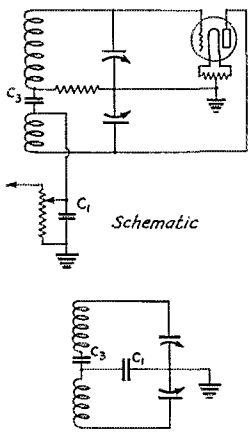


FIG. 5 — ANOTHER POPULAR SERIES-FEED CIRCUIT IN WHICH BY-PASS CONDENSERS CAN HAVE UNDESIRABLE EFFECTS

pacity with ripple in the power supply voltage can readily be visualized by comparison with the electrostatic speaker, in which the same principle is used to reproduce sound waves from the movements of one of the plates of a large condenser with respect to the other, the motive force being the changing electrostatic field supplied by the varying voice currents. It is quite possible that this effect plays quite an important part in the poor performance of some amateur transmitters, especially on the higher frequencies where a minute change of capacity will cause a relatively great change in the resonance frequency of the circuits.

It will well repay the experimenter to consider these facts in conjunction with circuit design, since effects such as these are often invited right into the circuit in the guise of perfect symmetry.

It must not be thought that such circuits are impractical. To the contrary, they have been shown to be very effective in doubler and amplifier stages and have the advantage of high efficiency when properly designed. From the above discussion, however, the necessity for radio-frequency chokes, and good ones at that, becomes evident. This does not present much of a problem, however, since these circuits are seldom used in high-power oscillators and their use in doubler and intermediate amplifiers where the d.c. plate current is relatively small should cause no worry so long as a choke with low distributed capacity and having a natural period far below the lowest frequencies used is available. Such is the case with the small honeycomb-type broadcast receiver chokes, which are quite adequate and may be obtained reasonably from many of the radio concerns specializing in surplus and service apparatus. For the home constructor or for the ham who feels that his plate currents are too high for this type of choke, an equally effective one may be made by jumble-winding the proper size wire in several slots or cardboard spools, being sure of course to use plenty of wire and take care to distribute the winding properly.

It is hoped that this will help some of those who may be having troubles similar to those mentioned, and also point out some of the pitfalls into which apparently well-designed transmitters may stumble because of failure to consider fully the part of the circuit upon which we depend for plate and bias supplies — and not for tank capacity.

Resistance of Paralleled Ground Rods

The letter below, from W. L. Everitt, of Ohio State University, contains some helpful comments on the paralleling of ground rods, which was touched upon in the Experimenters' Section in August *QST:*

"The figure on page 50 of the August issue of *QST* needs, I think, some qualifications. The efficiency of paralleling ground rods is most decidedly a function of the ground conductivity so that Fig. 4 would hold in only a special case. Unfortunately the higher the ground resistance per rod the more poorly they will parallel, so that if an individual rod is 100 ohms two rods separated by 10 feet would be well over 60 ohms, while if the individual rod is 10 ohms they might parallel almost perfectly, i.e., two might be 5 ohms. Where low resistances of the order of 2 or 3 ohms are desired it is sometimes necessary to parallel several hundred rods.

"This illustrates the desirability of operating grounded antenna systems in such a manner that the antenna resistance *measured at the grounded point* should be as high as possible in order that I^2R losses due to the ground may be small in comparison with the radiated power."

Experimenters' Section
Report of Fox River Radio League

On the banks of the Fox River in northern Illinois there exists a hardy group of amateur radio men who have through the years become accustomed to foregather at periodic intervals under the group designation of the Fox River Radio League. Although a continuing organization, the turnover among the membership in this thriving union is large. In searching for causes for this phenomenon at a recent meeting, the startling effect of marriage upon attendance at the club was commented upon.

So intense did interest in this contributory cause become that the subject was referred to the Experimenters' Section of the F.R.R.L for a report. The head of this Section, W9DTC, was himself believed to be contemplating matrimony, and it was thought that a little study would be beneficial for him, as well as a source of enlightenment to the entire club.

The report is here presented in the hope that individual amateurs, as well as those interested in club work, may profit by it. QST*'s thanks to Mr. Joseph A. Stoos, W9DTC, for an interesting contribution, and to Mr. Dwight S. Young, Secretary of the F.R.R.L., for transmitting the report to us.*

Report No. 6793
June 24, 1932

SUBJECT: *Marriage and Its Effect on Attendance at Radio Club Meetings*

AT THE F.R.R.L. meeting of June 10, 1932, it was moved by W9GYO and seconded by someone of still greater intestinal fortitude that the chairman of the Experimenters' Section be delegated and appointed to thoroughly investigate the customary absences from club meetings of recently married hams and to offer some satisfactory solution to prevent the recurrence of such cases.

While the author has had to resort to second-hand data, he has had the benefit of years of observation of causes and effects contributing to the matter at hand. He wishes to thank his brother members for their assistance (often given unknowingly). He wishes to apologize for the superficial treatment of some of the data, but two weeks are scarcely sufficient to correlate complete rules of procedure when married men with fifty

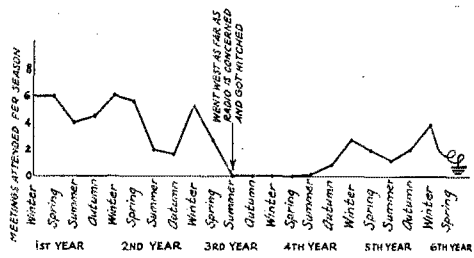
years of service welts still do not know what it is all about.

1. *Investigation*

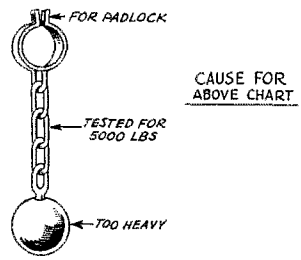
It began thus: Ages and ages ago a bit of Paleozoic protoplasm emerged from a stagnant sea and worked its way across the sands.

Years passed into centuries and the bi-sexual organism developed into a uni-sexual animal. Then from the processes of evolution emerged man and woman. Ever since the day of the evolution of the uni-sexual animal the male has endeavored to understand the female — and without the slightest success.

Since this paper must deal with the irrational sex as well as the rational, it must be indefinite and uncertain in places. With such apologies the author will proceed with his analysis of the question at hand.



AVERAGE CURVE OF ATTENDANCE



2. *Analysis*

This is a question of such simple nature as, "How far is up?" or, "What happens when an irresistible force meets an immovable object?"

Let us consider an evening in early June. Summer static has started its season of drum rolls. A faint odor of roses comes into the Ham's shack along with June bugs and moths. It is pleasantly warm. The full moon hangs low in the eastern sky. The sound of a girl's voice floats from a passing car. Says the Ham, "Aw, shucks, can't work anybody tonight anyhow." He hangs up the headphones, not noticing the waiting spider who promptly starts spinning his web across them — a web that is to remain there 'till winter.

The summer passes. We leave it to the poets to chronicle the romantic tale. But — early winter — the headphones come down again and dust and cobwebs are brushed off. Why? Well, perhaps the girl was too temperamental and uncertain compared with the definite and positive performance of short waves. Or perhaps Christmas was drawing near, with its accompanying necessity for monetary releases.

But the winter passes and the radio club prospers. Comes another summer — and fall — and winter — and the Ham does not return. Dues long overdue, he is dropped from membership . . . they say he is married, and there is much shaking of heads and great sorrow.

From statistics gathered during this thorough research, it has been found that only a super-ham returns to the club during the first six months of married life. After that period statistics show no well-defined trend. There are those hams of assertive ability sufficient to get away from home even in the face of physical hazard. There are those who come late and leave early. And there are those who are completely lost.

Perhaps the wife is sometimes in the right. Take as an instance the ham who picks up an old girl friend who lives but two blocks off his direct route to the club meeting. Still, his speedometer shows thirty-six miles as the distance he has covered in traversing those two blocks. Then there is the ham who takes baby's shoe money to buy a new xtal from a fellow member. It is obviously beyond the scope of this paper to cover every case, since there are no two cases alike.

3. *Solutions and Remedies*

For those lost brothers who have obtained a license signed by a Justice of the Peace instead of by a Radio Inspector, there is little hope. Being of a cautious as well as sympathetic nature, the author cannot recommend measures which could do nothing but bring physical harm and mental discomfort to any ham who might follow such advice.

As for the brothers who are still concerned with the frequency of an intermediate stage in a superhet instead of the frequency of the rent, there is yet hope if you will faithfully follow these rules:

1. No dates on meeting night.
2. No dates (whatever the consequences) on nights when you have a sked.
3. No dates when you have not sent out all your QSL cards.
4. No dates when you have a message on the hook.
5. No more than two dates with the same girl.
6. Do not learn to dance.
7. Wear dark-colored glasses (frosted on both sides) on windy days.
8. Never leave the house on a moon-lit night.
9. Sell, give away, or destroy your car.

Suggested alternatives:

1. Buy an island 200 miles off the steamship lane and live there.

2. Join Byrd's next expedition and don't come back. (*Note:* Avoid the penguins.)
3. Start a skunk farm.
4. If there's nothing for it but to get amorous, try an amour with the main tank of the largest local broadcasting station.

4. *Summary*

After a careful consideration of all facts at hand, the author arrives at one definite conclusion. While data may exist that is not yet available, it is his contention that this conclusion will amply cover past, present and future cases throughout the entire world of amateurs. This conclusion can be stated in very concise form, as follows: "Aw, heck, what's the use?"

West Gulf Division Convention

At Fort Worth, Texas, October 7th–8th

YAHOO! YAHOO! The Texas Gang under the auspices of the Fort Worth Radio Club is preparing for the big round-up of the West Gulf Division "Hams" for the big convention to take place at the Blackstone Hotel, Fort Worth, Texas, on Friday and Saturday, October 7th and 8th respectively. AND some convention it will be. First, the price has been made right — $3.75 — and this includes the big *barbecue* the first night at Casino Park on beautiful Lake Worth and all the events leading up to a fine Banquet on the last night.

Special speakers will attend and cover interesting subjects such as ¾ meter work and a demonstration of a talking wire. Many stunts are planned amongst which will be a fencing match. A cordial invitation is extended and a royal reception awaits those who come. Write the convention manager, Roy L. Taylor, 1614 St. Louis Ave., Fort Worth, Texas.

Strays

A small glass cutter is a fine tool for marking aluminum for breaking or bending. Cut deeply on both sides to make a clean break, but be careful not to make the scratch too deep when marking out a bend. — *W3AAJ*

ELECTION NOTICES

To all A.R.R.L. Members residing in the CENTRAL, HUDSON, NEW ENGLAND, NORTHWESTERN, ROANOKE, ROCKY MOUNTAIN and WEST GULF Divisions of A.R.R.L.:

1. You are hereby notified that an election for an A.R.R.L. Director, for the 1933–1934 term, is about to be held in each of the above divisions, in accordance with the constitution. Your attention is invited to Sec. 1 of Article IV of the constitution, providing for the government of A.R.R.L. by a board of directors; Sec. 2 of Article IV, defining their eligibility; and By-Laws 10 to 19, providing for their nomination and election. Copy of the constitution and by-laws will be mailed any member upon request.

2. Voting will take place between November 1 and December 20, 1932, on ballots which will be mailed from the headquarters office in the first week of November. The ballots for each division will list the names of all eligible candidates nominated by A.R.R.L. members residing in that division.

3. Nomination is by petition. Nominating petitions are hereby solicited. Ten or more A.R.R.L. members residing in any one division have the right to nominate any member of the League in that division as a candidate for director therefrom. The following form for nomination is suggested:

(*Place and date*)

Executive Committee,
American Radio Relay League,
West Hartford, Conn.

Gentlemen:

We, the undersigned members of the A.R.R.L. residing in the.....Division, hereby nominate .....:....., of ....., as a candidate for director from this division for the 1933–1934 term.

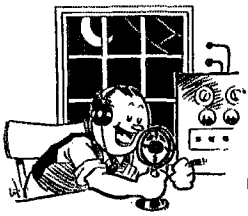
(*Signatures and addresses*)

The signers must be League members in good standing. The nominee must be a League member in good standing and must be without commercial radio connections. His complete name and address should be given. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon of the first day of November, 1932. There is no limit on the number of petitions that may be filed, but no member shall append his signature to more than one petition.

4. Present directors from these divisions are as follows: *Central*, Mr. Loren G. Windom, W8GZ-W8ZG, Columbus, Ohio; *Hudson*, Mr. A. Lafayette Walsh, W2BW, New York, N. Y.; *New England*, Mr. G. W. Bailey, W1KH, Weston, Mass.; *Northwestern*, Mr. K. W. Weingarten, W7BG, Tacoma, Wash.; *Roanoke*, Mr. W. Tredway Gravely, W3BZ, Danville, Va.; *Rocky Mountain*, Mr. Russell J. Andrews, W9AAB, Denver, Colo.; *West Gulf*, Mr. Frank M. Corlett, W5ZC, Dallas, Tex.

5. These elections are the constitutional opportunity for members to put the man of their choice in office as the representative of their division. Members are urged to take the initiative and file nominations immediately.

For the Board of Directors:
A. L. BUDLONG, *Acting Secretary*
West Hartford, Conn., 15 August 1932.

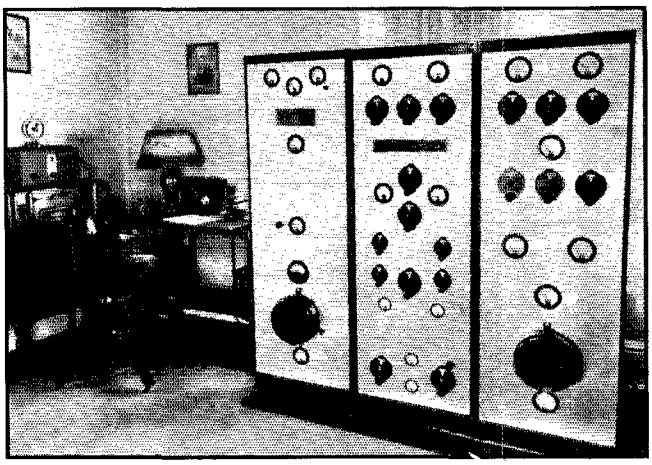


Amateur Radio STATIONS

W8DSO, Fairmont, W. Va.

W8DSO is owned and operated by H. A. Mills, "HAM," chief engineer of WMMN, Fairmont, W. Va. When operating in the third district the call W3UO is used. This outfit is intended to be operated at either station, although a glance at the accompanying illustrations will dispel the impression that it is portable. At present it is located at Fifth and Walnut Streets, in Fairmont.

The transmitter is designed for operation in the 3500- to 4000-kc. band, having crystals ground to 3980, 3616 and 3502 kc., the first-named for radiophone. Although the transmitter may be operated using either 'phone or c.w., the following description is based on the radiophone line-up:



Radio Frequency

Crystal oscillator, Type '10.
Buffer amplifier, Type '10, double-ended.
Modulated amplifier, pair Type '10's in push-pull.
First linear amplifier, pair Type '52's in push-pull.
Second linear amplifier, pair Type '04-A's in push-pull.

Audio Frequency

One W.E. 387-W double-button carbon microphone.
Two stage UX-230 impedance-coupled preamplifier.
One stage Type '27 transformer-coupled amplifier.
One push-pull stage Type '45 transformer-coupled amplifier.
Pair Type '10's Class B modulator.

Plate Supplies

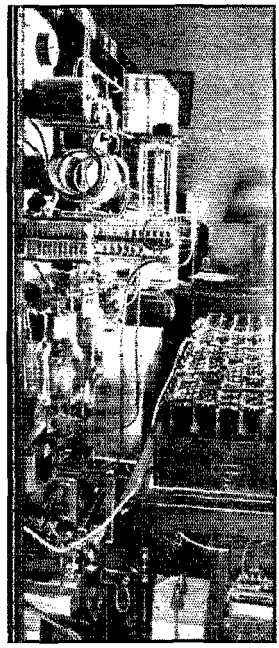
Three Type '80's, each 300 volts output, supplying crystal oscillator and buffer, audio amplifiers and floating charge on battery bias supply.
Two Type '66's in full-wave supplying Class B modulators and Class C modulated amplifier.
Two Type '72's in full-wave supplying the Type '52 and '04-A push-pull linear stages.

Although the '52 push-pull stage is far larger than necessary to excite the final amplifier to full output, it is built in this fashion to give true push-pull excitation or permit coupling its full output to the antenna when desired. When feeding the '04-A stage it is operated considerably below its maximum output.

All amplifiers with the exception of the final linear stage are shielded in large ventilated aluminum cans. The Class A audio stages are shielded from the Class B modulator by steel cans in order to reduce stray magnetic coupling to a minimum.

The three ⅛" aluminum one-piece panels are mounted on 63-inch W.E. relay racks. All equipment is bolted to these panels with the exception of grid-bias and crystal-oscillator supply. The component parts of all r.f. stages are insulated from the panels by means of stand-off insulators. Metal shafts of all variable condensers to be controlled from the front are cut short and joined to hard-rubber rods and coupling collars. Two aluminum subpanels are employed to support separately the Type '66 power supply and the Type '72 full-wave rectifier together with its sockets and filament transformer. The three r.f.

push-pull stages are metered to record separately the plate readings of each individual tube so that circuits may be balanced perfectly. Blocking condensers are employed in series with both ground and plate of the push-pull circuits. By this arrangement the plate blocking condensers need only carry the plate r.f., the ground series condensers giving added protection against voltage breakdown. However, the ground condensers should be, in any case, large enough to form a low impedance by-pass. Sangamo 5000-volt condensers serve admirably in the circuits of both Type '52 and '04-A stages. Sangamo receiving condensers are sufficient for the Type '10 modulated amplifier.



BEHIND THE TRANSMITTER PANEL

To operate, the common filament switch controlling the Type '66's, '72's, '52's and '04-A's is thrown in. Next, the filaments of the Type '10 r.f. stages, the '80 crystal plate supply and '66 plate supply are turned on. The lag of the '80 rectifier filament is sufficient to permit the '10 filaments to attain proper temperature before the plate voltage builds up. The switch applying plate voltage to the '52 and '04-A stages is then thrown in, followed by the switch operating modulator, speech amplifiers and power supplies. To shut off the transmitter when listening it is necessary only to throw off two switches, those of the '66 and '72 supplies, which will at the same time cut off the crystal plate supply and filaments of the Type '10 r.f. stages. When operating or listening, the filaments of the '66's, '72's, '52's and '04-A's burn continuously.

The antenna system is a half-wave Zepp with quarter-wave feeders. The fundamental is approximately 3900 kc.

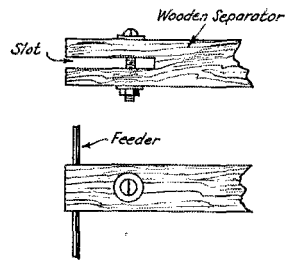
The receiver is a National NC-5 superhet converter operated in conjunction with a Victor b.c. receiver. For c.w. reception, plate modulation of the second detector as described in June *QST* is employed, with the intermediate frequency at 575 kc.

Later it is planned to add several low-power fundamental and doubling amplifiers to excite the push-pull stages in the 7000- or 14,000-kc. bands, incorporating multiple switches to select the approximate amount of inductance to tune each individual stage.

Slotted Feeder Separators

THE diagram shows a neat method of fastening Zepp feeders to spacers, suggested by Robert E. Foltz, W9GKG. It has the advantages of neat appearance and ease of construction, and permits slipping the spacers along the feeder wires to get them in just the right position.

A slot ¾-inch deep and wide enough to take the feeder wire is sawed in each end of the spacer



and a hole drilled through at right-angles to the slot about a half-inch in from the end. A machine screw is run through the hole and fastened down with a nut. The wire slips in the slot outside the bolt near the end of the spacer, and when the latter is in the right position the bolt is tightened to hold the wire securely in place. The gripping pressure is greatest near the ends of the spacer. The spacers should be made of hard wood boiled in paraffin.

Strays

Somebody must have taken our remarks about insulation in Class B output transformers very seriously. One of the catalogs advertises a transformer which is "exceptionally large and uses 60,000-volt insulation throughout." Some transformer! W2EHK, who sent in the clipping, observes — with some reason — that those transformers should not break down. HI!

W9CTV's auto license carries the number 47–866. Since there are two plates, CTV has a pair of 46's and a pair of 866's, both guaranteed until January 1, 1933. FB!

W2DCP suggests that music stands should make FB microphone stands. The height can be adjusted in a jiffy.

CALLS HEARD

HAF8D, Stephen Doktorits, Pasaréti út 10-b, Budapest, Hungary

7- and 14-mc. band

w1afu w1agz w1awd w1bgk w1bgy w1bo w1bsk w1bwj w1bz w1byw w1ccd w1ckr w1cfy w1clx w1clz w1dai w1det w1dhs w1dww w1dze w1ebr w1gf w1hm w1hz w1jo w1km w1lh w1lk w1me w1mk w1rr w1ry w1te w1te w1uh w1vw w1wv w1zzx w2adp w2ais w2ajd w2amr w2anl w2arb w2awc w2azo w2bfu w2bha w2bhj w2bhz w2bj w2bro w2bux w2bxa w2cim w2cjm w2ckw w2cvj w2czp w2dej w2deo w2dew w2dh w2dhp w2djo w2dng w2gu w2kl w2nz w2ox w3adm w3afs w3agc w3apn w3bb w3bgk w3bkz w3bof w3bpm w3cep w3dc w3de w3fq w3md w3mv w3zg w4ajx w4akh w4aps w4bdd w4cs w4ft w4mk w4rx w6bsk w6dio w6emk w6env w6mv w6wb w7ab w7bd w8aow w8bl w8cpo w8cra w8cte w8dyk w8eoa w8eys w8zy w9bfk w9dku w9gdh ve1bm ve1bt ve1bv ve1dh ve1dl ve2cq ve3wm au1de au7di au7kat cm2mm cm2op cm2rz cm2sv cm2vm cm2wa cn8ma cn8mi cn8mj cn8mk fm4mba fm8cr fm8da fm8eg fm8fs fm8gk fm8ih hc1fg j1ee j1ex k4rkt k5aa k5ad k5ae lu2ca lu3cn lu3de lu8en ny1aa ny1ab oa4u oa4v oa4z pk3bq py1cr py1dy py1hc py2bn py2qa py9am py9ao py9hc rx1aa su1aa su1cx su1ec su6hl ti2rc ti2tao ti2xo tf3tp v1yb vo8mc vp2am vq4crh vs1mk vs3ac vu2ah xzn2a xzn2b xzn2c xx1yj xx2ae yi2dc yi2fk yi6kr ym4zo yv3lo zl2je zl3kf zu2kk

G6YL, Miss B. Dunn, Felton, Northumberland

7000-kc. band

ct2aa xffnfh xg5uw

14,000-kc. band

w1afc w1cfy w1he w1lz w1me w2ais w2bhd w2bsr w2fk w2hj w2oi w4ru w4zh w8aow w8cpc w8dhc w8dml w8dyk w9cnj w9dku ce1ai cm2ma cm2vm cm2wd hc1fg j1ee j3de k5ae lu2ca my1ab oa4u oa4v py2ga rx1aa su6hl ti2fg ti2rc au1de ve1bv ve1ck ve1dt ve2be ve2dl ve3bk vp2ja vu2ah yi2dc yi2fk yi6bz yi6wg yv3lo xla1s xla3g xx1yj xzn2c

W8ECF, D. E. Schryver, 742 Morrison St., Watertown, N. Y.

3500-3900-kc. band

w5al w5bjl w5chx w6aan w6aep w6atv w6bar w6btt w6bxc w6cav w6ccf w6cis w6cko w6cqi w6cwz w6dds w6deu w6dhv w6dtx w6dvi w6dyj w6eml w6eod w6epk w6etm w6evq w6fac w6feo w6fgu w6fii w6flu w6fqy w6fsr w6fvw w6mn w6nt w6rj w7aiu w7alk w7anf w7ape w7aw w7azk w7brv w7buf w7buo w7kq w7yk ve4gr x2ln zl2be

VK6KZ, Albany, West Australia

7000-kc. band

w2ja w2bg w2bxj w2bhw w2brp w3amp w3la w3pf w3air w3jl w4bjp w4ajx w4tk w4qo w4wo w4akr w4pf w4beq w5bzu w5bzt w5bmi w5amk w5bw w5bvg w5ms w5buz w5bbc w5bzp w5akx w5ew w6cxw w6uc w6fmx w6byb w6cjn w5avj w6eet w6by w6dh w6bax w6af w6atw w6aor w6fbc w6dq w6fzx w6ba w6hm w6bc w7ja w8fco w8ako w8bny w9xb w9gdm w9cha w9jl w9bhh w9gfu k4afc k5ado k6ei k6crw k6auq k6auz k6biz k6ebr k6aja zx5 au1nm ac8bd ac6aa cm1mg vs6ad vs7ae vp1fr vp2pk pk1jr pk6er j1jx j1bx j1es j3da xx1yj pk3pr zl2fi zl3bk w1vxewid

3500-kc. band

w2ky w6fir w7abx w9rh

K7CKT, L. F. Rylie, Mile Seven, Alaska

7000-kc. band

k7ahi k7tf k7az k7ut k7ckk w6afu w6aix w6aj w6amo w6anq w6asq w6atj w6ay w6azb w6ben w6bdp w6bfl w6bga w6bgj w6blm w6bqp w6brv w6bwk w6byw w6bzm w6bzx w6ccf w6cgn w6chw w6cno w6ctd w6cto w6cuq w6cvp w6cxw w6dde w6de w6dkh w6dta w6dzu w6ecw w6eca w6eho w6eim w6elj w6enn w6eqw w6evq w6ewt w6eyg w6faj w6ffy w6fm w6fmt w6fv w6fvq w6fqa w6fxg w6fxm w6gav w6gdj w6gei w6gmx w6hb w6hm w6oia w6usa w6ux w6vd w6wm w6yb w7aep w7ahf w7ait w7apr w7arw w7asy w7awg w7azr w7azz w7bav w7bb w7bbz w7btw w7bhe w7bjx w7bkp w7blh w7bpj w7brw w7bsx w7btx w7bub w7buw w7bva w7cez w7ckz w7hd w7ip w7kk w7lp w7qi w7rq w7iz w9dnc k6auq k6ayd k6bmy k7boe k6cco k6dv k6cog k6fzo k6ln ka1ch ka1hr f3oci j3de j5bc j5ce vk2ah zl2cf vk3vl

Keith Morehead, Mount Druitt, New South Wales, Australia

3500-3550-kc. 'phone band

w1bes w1tq w2aih w2fi w3zj w4tm w5abf w5abo w5agp w5ajo w5ali w6abf w6awl w6ceq w6cjq w6clh w6coe w6cxg w6cxq w6dal w6dbg w6dx w6etj w6fdn w6fdo w6fev w7abp w7aqx w7bec w8bre w8cmd w8cmq w8dsx w9edw w9gyk

3900-4000-kc. 'phone band

w1avk w1bes w2kr w3aqt w3ey w4ib w4yc w5abo w6ave w6crf w6da w6ell w6fdo w6ig w7ant w7ar w7aqx w7bec w7nl w9etd w9eo

VE4DK, C. H. Brereton, 130 Ruby St., Winnipeg, Canada

cm2lc cm2mm cm2rz cm2sv cm2wd ear224 ei2d f8pz g2bm g2by g2dw g5fv g6hp g6qb g6wt g6yk k4bu k5aa k5ab k5ac k5ad k5ae k6aja k6alm k6ami k6auq k6ayl k6baz k6bmy k6dsf k6dud k6ebr k6fab lu2ca ny1ab oa4z om2tg on4jb ox6s oxye py2aj py2bn py2bq ti2tao vk2ba vk2hg vk2hm vk2nf vk2oc vk2px vk2tx vk3jt vk3ka vk3ml vk3ou vk5pk vk5yk vk6wr x1u x26a zl1ck zl2fi zl2gn zl2gr zl2gw zl3aw zl3bf zl3bj zl3ca

W9ARH, Bob M. Simmons, Milan, Mo.

7000-kc. band

ce1ai cm2do cm2fa cm2jm cm2jt cm2mm cm2cp cm2ra cm2sv cm2vm cm2wd cm2xr cm6rc cm8az ct1aa hc1fg hh7c hj1ak hj1mi k5aa k5ae ny1aa ny1ab oa4v oa4z py2bk py2bq py2qa rx1aa ti2fg ti2rc ti2tao vp2ja vp2mr x1u x9a x10a yv3lo

W6BME, Craig Burton, 4115 Supreme Court, Los Angeles, Calif.

hh7c k4cv k6ain k6baz k6ebr k6eif k6fzo k7anq k7arl k7bnd k70x ve3bm ve3hd ve4dj ve4dk ve4it ve5ac ve5am ve5aq ve5fe ve5fe w1jo w2an w2bba w2bqg w4ajk w4si w5ct w5fw w8azd w8ajz w8bqy w8epb w8edv w8fey w8gly w9dqh w9dwd w9fkc w9fmk w9fmp w9fvk w9guw w9hsz w9huh w9ifg w9ijx w9rj w9tj zl1cn zl2bx

• 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
Associacion E. A. R.
Associazione Radiotecnica Italiana
Canadian Section, A.R.R.L.
Deutscher Amateur Sende-und-Empfangs Dienst
Experimenterende Danske Radioamatorer
Lwowski Klub Krotkofalowcow
Nederlandsche Vereeniging voor Internationaal Radioamateurisme
New Zealand Association of Radio Transmitters
Norsk Radio Relæ Liga
Radio Society of Great Britain
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South African Radio Relay League
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Sveriges Sandareamatorer
Union Schweiz Kurzwellen Amateure
Wireless Institute of Australia
Wireless Society of Ireland

Conducted by Clinton B. DeSoto

THE past summer seems to have produced field days in plenty, particularly among the British Empire amateurs. Ultra high frequency work in the field has been indulged in by amateurs of many countries, that of U. S. hams having been recounted in other pages and issues of *QST*, and from reports received it seems indicated that almost all recent field days have been conducted in this region.

In Great Britain at least 50 R.S.G.B. members are concentrating on 56 mc., according to J. Clarricoats, Hon. Secretary, and new ground is being broken on every hand there. Tests from launches, top bedrooms hired in hotels perched high upon ranges of hills, duplex 'phones, YL's left at home reading before the mike . . . while the OM chases around the country with a hookup in a Baby Austin, organized tests on the Devonshire moors — truly 56 mc. has provided the thrills of the year in England.

Erratum! In commenting on the London National Radio Exhibition last month, through a typographical error it was stated that the D.A.S.D. had prepared certain apparatus for their stand at the Exhibition. Obviously, this should have been the R.S.G.B., and we apologize to both societies for the error, which was not noted until the issue was on the presses.

The Manitoba Wireless Experimenter's Association, of 602 Union Ave., Winnipeg, Manitoba, Canada, has offered to act as QSL Forwarding Bureau for the Canadian 4th district, and solicits cards intended for delivery to stations within this area.

The director of the R.E.F.'s 28 mc. experimental group, M. Tourrou, F8OI, informs us that French stations will transmit on schedule in this band every Sunday from 0800 to 1200 G.C.T.

A special Parisian division of this section is at present being organized by M. Borne, F8BY, and a traffic organization of 28 mc. 'phones is contemplated. F8BY has long specialized in 28 mc. work, and his experience indicates that the new network will be a decided success. It is expected that the system will be later extended to include all of France and the colonies, and will operate in conjunction with the emergency system, which is under the direction of J. F. Bastide, F8JD, R.E.F.'s chief of interior traffic.

An interesting group of 28 mc. contacts occurred between PAOAPX and HAF4D during June of this year. G. Werkema, PAOAPX, who reports the working, states that on June 4th for an hour reliable contact was maintained, and that this was repeated on June 21st for a half hour. A superautodyne receiver was used at the Dutch station, and it was possible to read HAF4D with the 'phones on the table. The distance between the two points is about 1200 kilometers.

The General Meeting of the R.E.F. was held Sunday, July 3rd, writes P. Godfrin, F8BJ. Members of the board whose term had expired, and which were represented at the meeting, were reëlected by a large majority.

The by-laws of the association were changed in form, in order that they might be brought into conformity with present labor conditions. The modified by-laws are being published in the current issue of "Radio REF."

Numerous conversations with a view toward harmonizing ideas resulted in perfect accord between almost all members of the association and the members of board.

The Rotab Cup of the R.S.G.B. has been awarded to Jack Wylie, G5YG, the Honorary Scottish Manager of the Society, while the Wortley-Talbot Cup has been awarded to H. C. Page, G6PA, Contact Bureau Manager. The Powditch 28-mc. Transmitting Trophy has been awarded the Messrs. H. and L. Wilkins, G6WN; the Somerset Trophy to E. G. Ingram, G6IZ (winner of the 1.7-mc. transmitting tests); and the 1930 Committee Trophy to P. L. Waters, G2WP (winner of the 3.5-mc. transmitting tests).

Press dispatches the day this is being written report the successful ascent into the stratosphere of Prof. Auguste Piccard and Max Cosyns. The famous Belgian scientist and his young radio amateur assistant have reached a height greater than that ever before attained by man, exceeding even Piccard's flight last year by about 3000 feet.

The radio apparatus used in the balloon, which was pictured in this department of the August issue of *QST*, functioned very well, according to reports. Several messages were sent, including one from the stratosphere, the first radio message ever sent or received from this region. We have, unfortunately, no information as yet as to the part played by amateurs in this radio work, but undoubtedly many amateurs in all parts of the continent were listening with ears atune for these history making transmissions.

The N.Z.A.R.T. was recently granted honorary affiliation with the B.E.R.U. Steps are being taken to prepare a draft constitution for the union for submission to all honorary affiliated societies, reports the R.S.G.B.

An interesting sidelight on vacations and amateur radio is presented by P. Godfrin, F8BJ. "The vacation season," says he, "not only enables certain OM's to take a rest by taking them away for a time from their keys and microphones, but it permits others, less fortunate during the remainder of the year, to take advantage of the summer vacations to put their projects into execution and enjoy their hobby to the fullest extent."

Amateur Radio in Portugal

By Pié de Avillez, Secretary, R.E.P.

THE high frequency era in Portuguese radio began in 1923 and 1924, with several early Portuguese experimenters working on the low wavelengths at dates corresponding with those in other countries. With the opening up of the high frequencies, additional stations appeared nightly, striving for the DX contacts that had become possible and in general enjoying excellent success.

At about the same time amateurs began broadcasting to the general public, entirely without

PIÉ DE AVILLEZ, CT1BE

commercial interest and in accord with the amateur status as it is known to-day. A great service was rendered many communities in the country by these early amateurs.

Prominent in this broadcasting activity was our star station, CT1AA, whose call has traveled to the most remote corners of the world. Senor Abilio Nunes dos Santos, Jr. (CT1AA) at present operates a broadcasting transmitter on 282.25, 42.9, and 31.25 meters with such great success that the government has granted him an official order. At this occasion a meeting was held which many amateurs attended, and enthusiastic speeches were delivered.

Other amateurs have followed CT1AA in the broadcasting field, notably CT1BO and CT1DH. The BCL Radio Club operates its own broadcast transmitter, CT1GL. So effective has been all this activity that the Portuguese government now has under construction a powerful national station for the carrying on of its own broadcasting activities. With the coming of the highpower station these amateurs will have to close down, a circumstance which will be much regretted both at home and abroad.

Other amateurs in addition to these have devoted their activity to 'phone work with some success. Many agreeable contacts have been made, and nightly it is possible to find QSO parties in progress, some of which find foreigners joining in. W 'phones are reported in the 3500-kc. band, and on 14 mc. Despite very bad receiving conditions stations were heard last year in Porto Rico, Cuba and the United States (CT1AA, CT1BY), but no reports have been received of two-way contact on 'phone with the U. S.

The greatest amateur activity in Portugal, however, is on C.W. We have several WAC stations, and many of our CT calls are known in all parts of the world.

The first C.W. amateur was ex-CT3CO, now CT1DX, and formerly our Madeira delegate. The OM's from Madeira have done great work in all branches of amateur radio, although it is impossible to give a complete account of all the DX accomplished and interesting experiments carried out. Crystal control is widely used on the islands,

and beautiful notes are heard from these stations (CT3AB).

In the Azores a very active community tickles the ether with no small success. Without taking space to consider the past, during this last year CT2 OM's contacted New Zealand, Australia, South Africa and Soudan (CT2AX, CT2AA, CT2AN, CT2AV, and CT2AP).

In the Portuguese colonies Angola, Mozambique, Cape Verde, and Macau amateurs are already active, and growing in numbers.

On the continent the number of CT amateurs increases daily, and much of interest has been accomplished in both DX and research. Several radio engineers have come from our ranks, as have army and navy men. Following the good work carried out by ex-xep1MA, who first demonstrated to the navy the value of the high frequencies and amateur radio, CTBJ, a naval officer on board the cruiser "Vasco da Gama," has done interesting work lately.

In the army the president of the R.E.P., CT1AE, has played a prominent part in modernizing radio equipment and in carrying on research work. Many of our amateurs have also helped in the carrying out of official experiments, and in consequence of this action amateurs to-day are viewed with quite different eyes by the authorities. Indeed, in this country amateurs are indebted to the courtesy of the naval and military authorities who have patronized their experiments.

His Excellency, the President of the Portuguese Republic, has become Honorary President of our society. On this occasion a very interesting test took place at the headquarters of the R.E.P., where in the presence of His Excellency, CT1AE exchanged messages with Madeira in record time.

During the past year some interesting DX work has been accomplished. CT1AA has been QSO Japan, Ceylon and South Africa. CT1GU and CT1AZ have contacted Persia. CT1GU, CT1DX and CT1EM worked Malaya; CT1EM, Palestine; CT3AB, Fanning Islands; CT1BE, Barbados; and CT1CC and CT1AV, Iraq. All this has been in addition to the regular contacts with New Zealand, Australia, Canada, Brazil and the U.S.A.

Conditions for reception are really bad, especially for contacts with the United States, and it is difficult for our stations, which in general use low power, to make consistent QSO's with W stations under the QRM conditions now prevailing. The 14-mc. band has been very irregular, with weak signals buried in QRN and QRM. The old timers are prone to recall the "good old days," and many would welcome a high-power holiday. Intelligent operation and especially the cessation of useless CQ calling would help greatly to relieve the congestion now prevailing. More should be learned and put into use concerning break-in, directive antennae, and more selective receivers. Our Portuguese stations are progressing rapidly in the direction of better notes and steady signals, and very seldom do bad notes disgrace our call signs.

Many of our stations have taken up crystal control in real earnest. Much experiment and research work has been done by CT1BX, using high power, and CT1BI, using low power. Other crystal transmitters are owned by CT1AA, CT1AE and CT1EM. Push pull is also in great favor, and competes with crystal control in giving steady notes economically.

Numerous CT stations are obtaining excellent results with receiving tubes in their transmitters. 28 and 56 mc. have not yet obtained much favor in our country; however, some signals were recorded last year on 28 mc.

Our society has made great progress during the past year, and the calls of many new Portuguese amateurs have been listed. Portugal can certainly contribute some excellent work on high frequency radio, in addition to the many excellent friendships that have been made by means of amateur radio, leading to the better knowledge of our country abroad.

As a YL operator and secretary of our society, I am very glad indeed of these good results, notwithstanding that they represent an increasing burden in the QSL service, which also belongs to me.

Delta Division Convention

Pine Bluff, Arkansas, October 14th–15th

ANNOUNCEMENT! ANNOUNCEMENT! The Delta Division Convention will be held at Pine Bluff, Arkansas, on October 14th and 15th, under the sponsorship of the Tri-State Radio Association, and has the full approval of Director Hill and A.R.R.L. Headquarters. The headquarters of the convention will be at the Chamber of Commerce. The Radio Inspector will be present to give license examinations; the Army and Navy will also be represented. A cordial invitation extended to all, including the ladies. For further information address E. R. Arledge, Box 6, Pine Bluff, Ark.

Strays

W9FJV, whose article on d.c. plate supply from Ford coils appeared in the June issue, says that subsequent tests prove that a single vibrator will handle two coils in parallel if only six volts are used on the primaries. A two-tube rectifier — with the tubes in parallel — will take care of the output of both coils, and the power to the transmitter will be the same as with two coils with independent vibrators and rectifiers. This will eliminate a few connections when lower power are to be used. However, one vibrator will not handle two coils with 12 volts on the primaries.

THE COMMUNICATIONS DEPARTMENT

F. E. Handy, Communications Manager
E. L. Battey, Assistant Communications Manager

Traffic Briefs

K6BAZ took two messages from K7BMY, delivered them and received answers by telephone, and returned the answers to K7BMY, all within eight minutes. Mighty good time for QSP between Ketchikan, Alaska and Honolulu, Hawaii.

BRASS POUNDERS' LEAGUE

Call	*Orig.*	*Del.*	*Rel.*	*Total*
W6USA	2979	380	716	4075
CX7	1688	946	—	2634
W7BLH	362	316	780	1458
W5OW	335	85	810	1230
W3APN	74	164	973	1211
W7BB	215	222	598	1035
VE5DH	702	321	10	1033
NY1AB	130	504	350	984
W3CXL	148	207	589	944
W8AUI	27	34	878	939
KA1HR	244	215	464	923
W5ANX	478	342	34	854
W6ATJ	12	174	666	852
K6AUQ	146	76	630	852
W6PQ	330	165	354	849
W7BSX	117	67	508	692
W9HCC	27	81	544	652
W8AOW	47	85	472	604
VE5DB	230	319	32	581
W9FLG	190	293	84	567
W8DDS	367	9	185	561
OM2TG	213	139	206	558
W5BII	25	16	505	546
W5IT	15	27	502	544
W7WY	10	16	517	543
W9GNV	284	20	226	530
K7FF	—	—	529	529
W6DPJ	42	37	449	528
K6YAL	497	12	14	523
W6ETL	86	223	212	521
W32D	21	14	468	503
W1MK	117	177	204	498
W3ARN	50	146	298	494
W3AOV	308	159	—	467
W9FRC	196	226	10	432
W8GEG	93	123	214	430
W8GQM	243	183	—	426
W8FZX	217	182	—	399
W8GB	62	116	208	386
W8ZZAF	215	153	—	368
W9DVQ	143	202	11	356
W3BWT	87	117	149	353
KA1LG	154	176	22	352
W6DQ	41	222	68	331
W6BPU	84	112	132	328
VE5AL	103	163	45	311
W2ADQ	140	165	—	305
W9GKJ	95	186	—	281
W2SC	7	135	124	266
W9GXV	82	170	13	265
W6HM	37	210	1	248
W8AFV	104	111	26	241
W6AMM	116	101	12	229
W9EIB	82	107	—	189
W9PB	68	118	1	187
W9BNU	38	132	3	173
W9CXZ	7	103	11	121

Month of July 16th–August 15th. 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.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?

ELECTION NOTICES

To all A.R.R.L. Members residing in the Sections listed below:

(The list gives the Sections, closing date for receipt of nominating petitions for Section Manager, the name of the present incumbent and the date of expiration of his term of office.) This notice supersedes previous notices.

In cases where no valid nominating petitions have been received from A.R.R.L. members residing in the different Sections in response to our previous notices, the closing dates for receipt of nominating petitions are set ahead to the dates given herewith. In the absence of nominating petitions from Members of a Section, the present incumbent continues to hold his official position and carry on the work of the Section subject, of course, to the filing of proper nominating petitions and the holding of an election by ballot or as may be necessary. Petitions must be in Hartford on or before noon of the dates specified.

Due to a resignation in the Southern New Jersey Section nominating petitions are hereby solicited for the office of Section Communications Manager in this section and the closing date for receipt of nominations at A.R.R.L. Headquarters is herewith specified as noon, October 14, 1932.

Section	*Closing Date*	*Present SCM*	*Present Term of Office Ends*
Idaho	Sept. 15, 1932	Oscar E. Johnson	Oct. 2, 1932
South Dakota	Oct. 14, 1932	Howard Cashman	July 12, 1932
Tennessee	Oct. 14, 1932	James B. Witt	March 20, 1932
Southern New Jersey	Oct. 14, 1932	Robert Adams, 3rd. (resigned)	.....
Colorado	Nov. 1, 1932	Edward C. Stockman	Nov. 5, 1932
Arkansas	Nov. 1, 1932	Henry E. Velte	Nov. 15, 1932
Maritime*	Nov. 1, 1932	A. M. Crowell	Nov. 15, 1932
Rhode Island	Nov. 15, 1932	N. H. Miller	Dec. 1, 1932
San Francisco	Dec. 15, 1932	Clayton F. Bane	Dec. 20, 1932
Southern Minnesota	Dec. 30, 1932	Herman Radloff	Jan. 9, 1932
Utah-Wyoming	Jan. 10, 1933	C. R. Miller	Jan. 15, 1933
Michigan	Jan. 10, 1933	Ralph J. Stephenson	Jan. 15, 1933
Mississippi	Jan. 10, 1933	William G. Bodker	Jan. 15, 1933
Los Angeles	Feb. 15, 1933	H. E. Nahmens	Feb. 24, 1933

*In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian General Manager, Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid such petitions must be filed with him on or before the closing dates named.

1. You are hereby notified that an election for an A.R.R.L. Section Communications Manager, for the next two-year term of office is about to be held in each of these Sections in accordance with the provisions of By-laws, 5, 6, 7, and 8.

2. The elections will take place in the different Sections immediately after the closing date for receipt of nominating petitions as given opposite the different Sections. The Ballots mailed from Headquarters will list the names of all eligible candidates nominated for the position by A.R.R.L. members residing in the Sections concerned. Ballots will be mailed to members as of the closing date specified above, for receipt of nominating petitions.

3. Nominating petitions from the Sections named are hereby solicited. Five or more A.R.R.L. members residing in any Section have the privilege of nominating any member of the League as candidate for Section Manager. The following form for nomination is suggested:

(Place and date)

Communications Manager, A.R.R.L.
38 La Salle Road, West Hartford, Conn.

We, the undersigned members of the A.R.R.L. residing in the.....Section of the.....Division hereby nominate.....as candidate for Section Communications Manager for this Section for the next two-year term of office.

(Five or more signatures of A.R.R.L. members are required.)

The candidates and five or more signers *must* be League members in good standing or the petition will be thrown out as invalid. The complete name, address, and station call of the candidate should be included. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon of the closing date given for receipt of nominating petitions. There is no limit of the number of petitions that may

be filed, but no member shall sign more than one such petition.

4. Members are urged to take initiative immediately, filing petitions for the officials for each Section listed above. This is your opportunity to put the man of your choice in office to carry on the work of the organization in your Section.

—*F. E. Handy, Communications Manager*

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections on or before the closing dates that had been announced for receipt of such petitions. As provided by our Constitution and By-Laws, when but one candidate is named in one or more valid nominating petitions this candidate shall be declared elected. Accordingly election certificates have been mailed to the following officials, the term of office starting on the date given.

North Carolina	H. L. Caveness, W4DW	August	15, 1932
Nevada	Keston L. Ramsey, W6EAD	August	15, 1932
Oregon	Raymond W. Cummins, W7ABZ	August	15, 1932
Kentucky	Carl L. Pflumm, W9OX	September	8, 1932

In the Southern Texas Section of the West Gulf Division, Mr. David H. Calk, W5BHO and Mr. James N. Barclay, W5CT were nominated. Mr. Calk received 37 votes and Mr. Barclay 28 votes. Mr. Calk's term of office began August 8, 1932.

Relative Traffic Standings

(JULY–AUGUST)

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
Delt.	111.1	Pac.	264	N. W.	+71	Pac.	22421	**Pacific**	**92.9**	**Philippines**
W. G.	99.2	Cen.	259	Cen.	+35	Atl.	10575	**Northwestern**	**80.3**	**Washington**
Pac.	84.9	N. W.	154	Pac. ‡(+40)	+28	N. W.	9885	**Atlantic**	**73.3**	**Western New York**
Atl.	80.7	N. E.	135	Roa.	+19	Cen.	8446	**Central**	**69.7**	**Michigan**
Mid.	78.	Atl.	131	Can. ‡(+19)	+15	Mid.	7809	**New England**	**60.7**	**Connecticut**
R. Mt.	71.9	Mid.	100	N. E.	+12	N. E.	6204	**Canada**	**57.2**	**British Columbia**
Can.	65.9	Roa.	76	Dak.	+ 8	W. G.	4863	**Midwest**	**55.4**	**Kansas**
N. W.	64.1	Can.	61	Atl.	+ 7	Can.	4021	**West Gulf**	**55.4**	**Northern Texas**
Hud.	46.5	Dak.	56	R. Mt.	− 1	Roa.	3078	**Roanoke**	**51.9**	**West Virginia**
N. E.	45.9	W. G.	49	W. G.	− 2	Hud.	2049	**Dakota**	**37.5**	**Southern Minnesota**
Roa.	40.5	Hud.	44	Hud.	− 3	Dak.	1857	**Rocky Mt.**	**35.7**	**Utah-Wyoming**
Dak.	33.1	S. E.	44	Delt. ‡(−3)	− 4	R. Mt.	1367	**Delta**	**35.7***	**Mississippi**
Cen.	32.6	R. Mt.	19	Mid.	− 8	Delt.	1334	**Hudson**	**33.9**	**New York City-L. I.**
S. E.	26.1	Delt.	12	S. E.	−15	S. E.	1151	**Southeastern**	**10.7**	**Eastern Florida**

THE TEN HIGHEST SECTIONS — S. C. M.

Kans.	201.	Los Ang.	145	Wash.	+60	Los Ang.	10516	**Kansas**	**70.**	**Spetter, W9FLG**
Brit. Col.	197.	Wash.	104	Kans.	+16	Wash.	7147	**Los Angeles**	**70.**	**Nahmens, W6HT**
P. I.	183.9	Mich.	86	Los Ang.	+13	Kans.	6232	**Washington**	**70.**	**Gruble, W7RT**
Miss.	179.5	Ill.	65	Va.	+13	W. N. Y.	3886	**Michigan**	**37.5**	**Conroy, W8DYH**
Hawaii	144.	Ohio	50	Mich.	+ 9	B. C.	2758	**Brit. Col.**	**37.5**	**Cavalsky, VE5AL**
So. Tex.	142.5	W. N. Y.	44	Ill.	+ 9	Ohio	2662	**Illinois**	**30.**	**Hinds, W9APY-WR**
Sac. V.	137.2	Va.	39	W. Va.	+ 8	So. N. J.	2595	**W. New York**	**30.**	**Farrell, W8DSF**
So. N. J.	123.5	Mo.	39	Alaska	+ 8	Maine	2426	**Ohio**	**27.5**	**Tummonds, W8BAH**
M-D-DC	106.4	Conn.	33	Wisc.	+ 7	P. I.	2391	**Virginia**	**27.5**	**Eubank, W3AAJ**
No. Tex.	105.8	Kans.	31	So. N. J.	+ 7	Mich.	2195	**Philippines**	**25.**	**Thompson, KAIXA**

KANSAS gets the Banner this month by a very narrow margin! Los Angeles, Kansas and Washington are *tied*, each having an "all-around" rating of *70%*. Since Kansas is the only one of the three to "make" *each of the high ten columns* she gets the Banner decision. It was necessary to examine the M.P.S. ratings for L.A. and Washington in order to decide the "second" and "third" places. Los Angeles again sets a *new "all time high"* in number of stations reporting traffic with *146 traffic reports!!* (The previous high for traffic reports was L.A.'s 132 of last month.) Washington sets a new record in "gain in traffic reports" with a +60 this month; this breaks the previous record of +40 (also made by Washington!). Rather than the usual "slump" in traffic activity for the July–August reporting month, this year we report an *increase* in traffic handled and an *increase* of *179* in stations handling traffic over the previous month!

During the traffic reporting month July 16th–August 15th, 1404 stations originated 24,223; delivered 18,409; relayed 42,428; total 85,060. (75.9% del.) (60.5 m.p.s.)

* No reports were received from the Louisiana and Tennessee Sections this month.

‡ Since no reports were received last month from the Hawaiian, Manitoba and Mississippi Sections, the "Gain or Loss" *standings* for the Divisions containing those sections are determined by a consideration and comparison of the figures for the months when the SCMs of those Sections last sent in a report. *Actual* "gain or loss" figures from June–July are given parenthetically and are used in computing the "gain or loss" for the whole field organization.

DIVISIONAL REPORTS

ATLANTIC DIVISION

SOUTHERN NEW JERSEY — SCM, Robert Adams, 3rd, W3SM — It is with regret that I must announce my resignation as SCM, effective August 15th, as I am moving to Rising Sun, Maryland, in order to be near my business. Mr. Gedney Rigor, W3QL, will be Acting SCM until an election is held, and I hope that he will receive the same coöperation as I have. W3APN leads this month with 1211 messages, most of which was W6USA traffic. W3AOV, the 108th Field Artillery Station, reported a nice total as did W3ARN, who missed the BPL by six messages. W3AWV is back on the job. W3BPT and W3ACJ are keeping Ocean City on the air. We were very glad to hear from the Atlantic City gang again, namely: W3UT, W3BDO, W3PC, W3APV, and W3CVR. W3CEU, W3ASG, W3BSC, W3BER, and W3SY are all rebuilding. W3BYM, an old-timer in Jersey, sent in his first report. W3AYA is working for his ORS. The South Jersey Radio Association is arranging for a "Station Description Contest" to be held next month. Very 73 to the South Jersey gang, and I hope anyone on the road to Washington will stop and see me.

Traffic: W3ARN 494, W3CBR 4, W3ARR 15, W3BPT 40, W3AOV 467, W3SM 8, W3ADL 65, W3BDO 7, W3BZI 7, W3AWV 13, W3BYM 9, W3ARV 101, W3PC 6, W3AEJ 8, W3AYA 5, W3BWC 76, W3UT 3, W3APN 1211, W3BPD 4, W3ZI 6, W3QL 46.

WESTERN PENNSYLVANIA — SCM, C. H. Grossarth, W8CUG — A 56-mc. field day to be held jointly by the A.T.A. of W. Pa., and the I.R.E. is being planned for an early date in October. The affair will be in Pittsburgh, and information may be obtained from Secretary Richeimer, W8BSO. W8AJE leads the Section this month, and is planning to organize a Pittsburgh traffic net. He will be glad to hear from anyone interested. W8EDG expects a lot of traffic from the Cleveland Convention W8DLG, one of the new RMs, is forming a Northwestern Pa. traffic and emergency network. W8FKU has so many schedules he wishes the day were longer. He reports new stations W8GLA,

W8GSJ and W8HAF. W8YA has been manned for the past month by W8DZP. W8CQA says things are dead in Wafren. W8HGG sends his first report. W8KD is back on 3.5 mc. W8DKL took a ten-day vacation. W8FGL has portable call, W8HNS. W8ELZ is trying to raise his traffic total. W8AZG received his commercial license. W8DVZ has a new crystal. There's a new antenna at W8VI. W8ASE is thinking about one. W8CEE is off the air. W8GN is W8AGG's new call. W8DXI has been on 14 mc. most of the summer. W8CEO has a super-frequency meter. W8CMP, Director Woodruff, is "cooking" something up for the Syracuse Convention. W8FAK wants more and better schedules. W8BKS is busy at the Millvale Armory with U.S.N.R. work. W8DRO is on 7 mc. W8CRK is off on account of burned-out tubes. W8AAQ reported by radio. W8GBC is back on the air. W8CPE has been working 1.75-mc. 'phone. W8CFR is having trouble with his transmitter. W8DGW is spending the summer playing baseball. W8AJU handled traffic for the American Legion Convention in Pittsburgh. W8CUG has worked two stations on 56 mc. A section QSO Party has been inaugurated at the suggestion of RM W8DLG. The time is 10:00 a.m., E.S.T., every Sunday morning. Get on 3.5 mc. and become acquainted with the rest of the gang in the Section.

Traffic: W8AJE 173, W8AJU 136, W8EDG 119, W8DLG 84, W8FKU 82, W8YA 65, W8CUG 63, W8CQA 44, W8HGG 43, W8KD 23, W8DKL 22, W8BKS 21, W8FGL 20, W8ELZ 20, W8AZG 20, W8DVZ 18, W8DXI 17, W8DRO 14, W8CFR 9, W8AAQ 8, W8CPE 8, W8FAK 5, W8CMP 5, W8GBC 6.

WESTERN NEW YORK — SCM, Don Farrell, W8DSP — W8AOW is high traffic man in the ORS group for the month. W8DSS has been spending his vacation at his camp on Oneida Lake. W8AQF is now OBS. W8FOL changed his transmitter to TPTG. W8AWX is on 7 mc. W8ECF took part in his first ORS Party. W8BFF did fine work at the National Glider Meet at Elmira. W8EUY still keeps his schedule with VE3AQ. W8AGS has a new zepp perking. W8FDY is spending part of his vacation in Rochester with W8AWX. W8DHQ is organizing S.T.T.A. net. W8DES is joining A.A.R.S. W8DEQ shows better traffic conditions in his report. W8DSP is busy with the coming Convention. W8BHK reports his 50-watt bottle gone west. W8DHU is QRL work. W8AED scored 1070 points in 5 hours in the ORS Contest. W8CJJ is getting all set for fall traffic. W8DGR visited VE2DL near Quebec City. W8BFG is awaiting his new Tourmaline crystal. W8GWZ put in a new grid leak and cured his chirpy note. W8FTB reports four new stations in Rochester — W8HEB, W8HCO, W8HMZ, W8GZX. W8AYU had twenty-four foreign contacts during the month. W8BLI says nice weather put the curtain on his radio activity. W8ABX is doing a lot of work on 56 mc. W8BGN is working on modulators and speech amplifiers. W8AFM is hard at work rebuilding. W8AYM reports from Atlanta. W8QP has his new crystal rig ready for testing. W8AVI is doing nice traffic work on 7 mc. W8EOA handled some traffic from the Olympic games. W8EMW is lining up his winter schedules. W8COO say activity around Fulton at a very low level. W8GZM is building a new MOPA. W8DEA has been using his portable in the Finger Lake region. W8BHS sends in his first report. W8FLX will be using his portable W1ZZE at Worcester Tech this winter. W8GWT has a nice bunch of traffic. W8AKX is back from C.M.T.C. The Jamestown Club held their annual picnic on August 13th. W8CQW has a job now. W8BIF and W8CHA are on a farm near Buffalo for the summer. W8DMJ attended the convention in Washington. W8FFU says his temporary license expired. W8AWH wants ORS. W8BOM will operate VE2CP again this winter. W8AWH has a fine traffic total. W8LGR reports from Lockport. W8AN has a '45 on 14, 7 and 3.5 mc. The Mohawk Valley Brass Pounders held their annual Field Day at De La Fleur Camp on July 17th. Lt. W. D. Hamlin, U.S.A., formerly W8LX of Clinton, is on his way to Panama where he will be on with a K5 call. W8DPS has a nice crystal job on 3.5 mc. President Al Fitch, W8DT, of the Mohawk Valley Brass Pounders represented the SCM at the Atlantic Division Convention in Washington. W8EWC is off the air on account of a change in QRA. W8DWJ has been helping two prospective hams build receivers. W8FFF and his YL spent the week-end of August 6th at Kenka Lake with W8BFF and his OW. W8CJJ, W8CSW and W8BFF, all using their 56-mc. portable outfits at the National Glider Meet, did some record-breaking work handling traffic. W8BYD-ZZAQ is visiting in Jamestown, his old home town. W8GPS nearly bought out the American Sales on his vacation trip to New York City. W8DES has a schedule with his YL, W8HRI of Cleveland. W8AWM got his fingers smashed in a big press at his shop. All ORS please watch the expiration date on your ORS certificates and return same to the SCM for endorsement, so they will be valid for another year.

Traffic: W8AOW 604, W8DSS 166, W8AQF 131, W8FOL 101, W8AWX 69, W8ECF 67, W8BFF 55, W8EUY 44, W8AGS 40, W8FDY 36, W8DES 26, W8DEQ 20, W8DSP 19, W8BHK 19, W8DHU 15, W8AED 15, W8CJJ 13, W8DGR 13, W8BFG 12, W8GWZ 10, W8FTB 6, W8AYU 3, W8BLH 2, W8ABX 1, W8AYM 10, W8AUI 939, W8GQM 426, W8FZX 399, W8AWH 285, W8BOM 58, W8EMW 48, W8AN 41, W8LGR 39, W8GPS 32, W8GWT 31, W8EOA 22, W8AVI 20, W8ZZAQ 12, W8DT 11, W8CQW 10, W8FLX 6, W8DMJ 6, W8COO 3, W8AKX 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Harry Ginsberg, W3NY — W3AOO, Bob Hensell; W3BAK, Edgar Hudson; RMs. W3BWT. Eppa Darne, Chief RM. In spite of summer conditions, it is gratifying to receive 33 reports. Thanks a lot, gang. Leaders in % of deliveries are W3BWT, W3LA, W3CXL. W3ZD contributes to the glory of our Section with his excellent relaying to Europe W6USA traffic — 80% in foreign tongues. The Washington Radio Club is sponsoring a 56-mc. contest for the local gang. W3DG and W3APS have held very FB 56-mc. tests with low power up to 15 miles. W3CPQ is new president of the Westminster Amateur Radio Club. The Frederick Amateur Radio Association awaits change of QRA on license to cut loose. New Hams reporting and reported are W3CPQ, W3ASE, W3BT, W3CPB. W3CGO, portable W3WN, kept 1.75-mc. schedules with W8GXM while at Mountain Lake. District of Columbia: W3CXL continues to lead us with his excellent work. W3BWT makes BPL on deliveries. W3NR gets over to Europe FB. W3IL likewise works the B.I. W3CDQ, W3BJA, and W3PN are getting great kick out of 56-mc. tests. W3ASE is welcome addition to D.C. gang. Maryland: W3ZD leads with a splendid total and makes BPL. W3LA is using 800 watts on his 3 '03As. W3BGI has finally erected that new sky-wire. W3CDG is getting set for winter traffic. W3CV has been under the weather. W3BRS is using '10s temporarily on 3.5 mc. W3BVL is hot for traffic. W3ADO got reply to message sent to U.S.S. *Wyoming* via Blinker system. W3ZT was off most of month. W3AFF still puts out a few messages. W3AOO complains of too much summertime. W3CJS still blames depression and YLs. W3BHE is working out FB with '01As on 7 mc. W3BKC is awaiting that changed QRA. W3SN wrecked his power transformer. W3AHA held a 3-hour 'phone QSO. W3ZK requests ORS and OO suspension. W3NY is finding work putting big crimp in his transmissions. W3DG's latest YL may make a W7 out of him. W3WN is about ready to go on with FB 3.9-mc. 'phone and c.w. Welcome to W3BT, a new local op. W3AVD isn't getting out, even with his new ticket. Delaware: W3BAK has been very busy. W3CPB and W3CPG, both owned by same op, looks FB to help the Delaware traffic gang.

Traffic: W3CXL 944, W3ZD 503, W3BWT 353, W3LA 153, W3BGI 31, W3CDG 21, W3CV 19, W3BRS 16, W3WN 15, W3BVL 13, W3NR 12, W3ADO 12, W3IL 9, W3ZT 8, W3AFF 7, W3AOO 5, W3CPG 3, W3CJS 2, W3BHE 2, W3BKC 1.

EASTERN PENNSYLVANIA — SCM, Jack Wagenseller, W3GS-W3BF — Please note: Your reports do not appear in *QST* until SIX weeks after you send them in. Many of the gang do not understand this and think their reports are overlooked. W8AFV is high man this time. W8CVS continues to send in his exceptionally fine reports. W8FLA will soon be an ORS. A little better each month is W3AQN's policy. W8EOH and W3AIR report for the second time. QRM from a lil' YL with blue eyes sorta' put W8CFF on the blink. W3NF has moved his rig to Easton until he gets some a.c. on the farm. W8FJF wants to be an ORS. W3CHL and W3CCR report for the first time. W3MC had a portable with him up at camp. W3EO came

up on 3.5 mc., and found he could handle much more traffic. W3NA is building a transmitter for the Quakertown Radio Club. W8VD is getting back in trim. W3AHD built a '10 1.75-mc. rig. W3BCD built a bug, and he says it really works, too. A crystal rig with a '45 and a '10 is now perking down at W3BPX. W8EU hopes totals get bigger and BCL business better. W3QP still schedules VK5HG. W3BVX sends in a nice list of off-frequency stations. W3BF is awaiting station license renewal.

Traffic: W8AFV 241, W8CVS 120, W8FLA 111, W3AQN 90, W8EOH 40, W3NF 38, W8CFF 36, W8FJF 36, W3CHL 33, W3MC 28, W3EO 27, W3NA 23, W8VD 22, W3AHD 18, W3AAD 18, W3BCD 14, W3BPX 14, W8EU 13, W3QP 10, W3CCR 5, W3ATR 2, W3BVX 1.

CENTRAL DIVISION

KENTUCKY — SCM, J. B. Wathen, III, W9BAZ — The gang responded nobly and the traffic totals this month doubled last month's, W9JL alone almost equaling Section total for July. Increasing power at W9DKD sure did help his totals. W9CXZ (Steamboat Bill) got his license. W9AUH reports entertaining W9JHY, with the assistance of W9ELL, W9ALD, W9DKD and W9FQQ. While visiting W9OX, R.P. of W1MK persuaded him to erect new antenna, which was done with very gratifying results. I hope letters from W9BAN will not stop coming my way after my term as SCM expires! W9CNE and W9BZS are keeping daily schedule with Fort Knox. W9BWJ is now doing some drilling in Ohio, near Ashland, Ky. W9ABV and W9AZY at Ft. Knox are learning to be soldiers. W9FQQ will decorate the home premises from now on. How about some news from your region, W9HNV? No matter how small the total, W9FZV gets *his* report in. W9HAX, being a "regular," will have to stay at Ft. Knox most of the summer. W9AEN reports possessing an SW3. W9IFM blew his receiver tubes. W9JMR is working in Flemingsburg. W9IQK says "too hot for traffic." W9AOW is new call in Madisonville. W9CDA is busy moving the printing office. W9EGO is now one of the operators at WPET, Lexington Police Station. W9FRF says his license expired July 1st. W9ARU hasn't finished designing new transmitter yet. W9DQC is having trouble with new mike. W9DLU will have 500 watts on air soon as he can get bugs out. W9ERH plans new transmitters while drilling at Ft. Knox. A Form 1 card, perfectly blank, received. Sender please make known your wants. W9ACS and W9BEZ are experimenting with portable outfits. We learn that W9BOF is constructing a special radio house in back yard, aided and abetted by W9ACN. W9KDZ is new call in Winchester. W9EDV moved to Ft. Thomas, Ky. In parting I want to say "many thanks" to those who assisted so well with their reports the four years I was in office, and I am confident you will give the same fine support to the incoming SCM. My regards and best wishes to all; drop in to see me while in Louisville. Auf Wiedersehen!

Traffic: W9JL 484, W9DKD 313, W9CXZ 121, W9AUH 75, W9OX 64, W9BAN 30, W9CNE 30, W9BWJ 28, W9HXN 25, W9FQQ 18, W9HNV 3, W9FZV 2, W9HAX 2, W9AEN 1, W9IFM 1.

ILLINOIS — SCM, F. J. Hinds, W9APY. RM, E. A. Hubbell, W9ERU — Let's make schedules with the other fellows in Illinois and build up our Illinois State Traffic Net. W9EGD worked J1EC. W9HUX has crystal. W9CKM and W9FYZ are on again. W9FJB visited W2DOM. W9FO and "Lil" visited W8DEF. W9BXJ passed away, August 6th, thereby closing a continuous 5-year schedule with W9KB. W9HPP is working new crystal. W9FQU was heard in Masterdon, New Zealand, on his 3500-kc. 'phone. W9AAK is all set to go. W9KX has a dandy PP outfit. W9CFV is secretary of the newly formed Central Illinois Radio Club. W9GJJ has been op of "WGCW," is S.S. *South American*. W9CGZ is installing 50-watt crystal. W9AXM is still trying to get the buffer in the MOPA to "Buff." W9HVA has a dandy 300-watt crystal. W9EBL, W9OQ and other local hams have been doing fine 56-mc. field work. W9BLA has a nice a.c. receiver. W9DDE is on with a bang. W9AFN is doing fine DX and traffic work. W9LW is one of our newest ORS. W9CTP visited W9CVQ and W8BTK. W9ENH is the Chicago schedule of W1MK. W9HQH wants to know whose 'photo that is on the cover of August *QST*. (R. B. Beaudin's, Asst. Circ. Mgr., OM). W9JUC (Ex-6BPQ) is doing nice traffic work. W9DP is proud possessor of W9ZZBM portable. W9BGK has W9KAH, portable call. W9KHL has set like that of W9JUC. W9AFB is building new transmitter so he won't bother the 42 BCLs in his apartment. Hi. W9AAR is now rebuilt. W9ATS will make the old tubes get hot. W9IVG says the portable, W9KCF, is great. W9DGK is using W9HYI's crystal. W9HPK is using '10 TNT. Low power at W9BON. W9ICT took his first message. W9VS and W9WR are changing QRAs. W9ITA (Ex-9AZS) is on again. W9GEP says schedules ND account of QRM. W9CGV is ready for the ARRL Trunk Lines. W9DOU is one of our newest ORS. Overhauling at W9CZL. W9BPU has organized new ham club. There is a new home-made bug at W9DPD. W9FUR has a new crystal rig. W9HUU has a junior op. now. W9EJO takes the traffic lead for Illinois this month. W9FGN is working on 4 frequencies in the 7000-kc. band. W9NN has a '52 with high power. W9FGD is trying for extra first commercial. W9HBU joined the Coast Guard. W9FGV reports 7000 kc. dead for traffic. W9DBO gets out well. W9IVH telephones messages direct to Chicago and gets answers. W9FCW has been appointed AARS Net Control Station for 4th Illinois district. W9HYO had his aeroplane outfit "W1OXAE" flying over Wheaton, Ill., and made several contacts with W9BRX. Watch for W1OXAE on 56 mc. on week-ends. W9BYZ held fine schedules with W9KAT at Camp Grant, Ill. W9AMO is on 1.75-mc. 'phone. W9PK reports one of his best traffic months. W9BSR handled a lot of W6USA traffic. W9IEP had his receiver ruined by lightning. W9IUF is changing to MOPA. W9RO worked England and Cuba. W9ACU is getting out fine with 5 watts input. W9GDI has portable call W9JWC. W9ILY is out for traffic. W9GVX wants short-haul traffic and schedules. W9RO has a fine SW3. W9DXZ is back with us. W9FRA is ready for a heavy traffic season. W9BTT and W9JJN are both same fellow, W9JJN being portable. Poor weather conditions at W9BIR. W9FXE came to Chicago, attended the CRTA meeting and went home with a brand-new ticket. W9HAW is working on 14 mc. W9ABA is doing nice traffic work. W9ICN wants an ORS. W9ILG is getting some nice traffic. W9JO found his modulations in the CW note to be a loose connection. Hi. W9JLK has a fine motto — "Work Traffic to Develop Your Sending and Receiving."

Traffic: W9EJO 206, W9BVP 163, W9AFB 160, W9VS 125, W9PK 109, W9CGV 105, W9DOU 78, W9APY 75, W9HQH 52, W9DXZ 46, W9CUH 45, W9FCW 43, W9NN 36, W9GVX 34, W9CZL 30, W9ILY 30, W9AFN 35, W9BTT 28, W9BTU 28, W9DBO 25, W9HUU 23, W9FGN 21, W9JCK 19, W9LW 19, W9CTP 18, W9EMN 18, W9JUC 17, W9ENH 15, W9CEO 13, W9RO 12, W9ATS 10, W9AVB 10, W9DGK 10, W9FGV 10, W9IEP 10, W9JO 10, W9WR 10, W9BON 9, W9IVH 8, W9AAR 7, W9BPU 7, W9HPK 7, W9IJA 7, W9ILG 7, W9BSR 6, W9DPD 6, W9GDI 6, W9FGD 5, W9IUF 5, W9ABA 4, W9AMO 4, W9BYZ 4, W9GEP 4, W9ACU 3, W9FDQ 3, W9BIR 2, W9BRX 2, W9FXE 2, W9ICN 2, W9ILH 2, W9IVG 2, W9JLK 2, W9ICT 1, W9ISR 1, W9JUO 1.

INDIANA — SCM, A. L. Braun, W9TE — This is my first report as new SCM of Indiana. I hope to build up Indiana as a traffic center and lead the Central Division in traffic. Plans are under way to organize a state net. If interested, write W9ESU. The Indianapolis Radio Club will hold its annual Hamfest on October 15th and 16th, at 460 Century Bldg. W9FUT leads the list for traffic this month. W9JKP is sporting a new '52 outfit. W9JHY has his hat in the ring for ORS. W9GFS is new ORS. W9HTX is back on the air. W9ARK is new OBS on 'phone. W9AHL, W9HKH and W9EPT want ORS. W9ESU expects to be on daily. W9DOO pounds the brass occasionally. W9AXH says his new Zepp-fed Hertz works FB. W9CKG is back at Purdue and signs

W9QG. W9HSF also signs W9JJW. W9AEA has a portable call, W9KHH. W9JVN is new ham in Muncie. W9BKJ was reappointed ORS and RM. W9FUT is rebuilding. W9EYQ is new ham in Evansville. W9BZF is going to change to c.w. W9FQ may move out of state. W9BHC works 3.5 mc. now and then. W9DSC is working with 56 mc. W9CYQ gets on the air when the spirit moves him. W9JIY is looking for filter. W9ELX expects to work some real DX soon. W9YB is back on the air on 3750 kc. W9CRV has increased power. W9FJN hasn't bought any QSL cards yet. W9AKJ has QSY to 14 mc. W9DVE has taken on a better half. W9BXT is awaiting license renewal. W9AEB's rectobulbs went "blooie." W9EGE has QRT YLs and is QRL radio again. W9FYB is now using an '03A. W9HIU has QRM from oil-burning ovens. W9JSM is a new station at South Bend. W9AQD is having trouble with new crystal rig. W9EBQ has been reduced to low power because of a burnt-out HV transformer. W9FZH has some ideas on a low-powered Hartley. W9JQX finally got on the air. W9KFS is a new station at Ft. Wayne. W9AZC has a new speech amplifier. W9BHM has visions of a HF stenode receiver. W9DAQ expects to spend the winter aboard his yacht in southern waters. W9AET has changed to an X-cut crystal. W9HPQ's shack was raided and valuable equipment stolen. Ex9BSK is back again with call of W9QS. W9AQD is rebuilding the crystal rig.

Traffic: W9FUT 126, W9BKJ 41, W9HKH 20, W9CKG 19, W9JHY 11, W9AXH 6, W9EPT 5, W9GFS 4, W9ESU 4, W9HSF 2, W9TE 22, W9FQ 12, W9DHJ 14, W9FZH 12, W9JSM 7, W9FKE 6, W9HPQ 4, W9GGJ 3, W9YB 2, W9FYB 2.

WISCONSIN — SCM, Harold H. Kurth, W9FSS — W9FSS is busy with his work as SCM and picnic chairman of the Milwaukee Radio Amateurs Club. W9HMS has built two new transmitters. W9HSV wants to know how to eliminate key clicks from his 250-watt transmitter. W9ATO is off the air because his operator's license expired. W9FHU will be on the air from Mosinee on week-ends and from Wausau during the week his portable W9GIR. W9FAV is on 3653 kc. with 300 watts input. W9AUX reports that Sheboygan is organizing a ham radio club. W9DXV is planning to visit some of the Upper Michigan hams. W9EEQ is using an MOPA on 3650 kc. W9EFX-ETK is home from U. of W. for the summer. W9ERS had a daily schedule with his YF, W9GAF, while she was at Sparta. W9HTZ and W9KCP are visiting some of the hams in northern Wisc. W9GVL is going to shift to 14 mc. this fall. W9EYX will soon be back on the air with his musical DC note—(?).W9DKA was chaperon for a camp of young boys at a lake. W9FAF, "The Air Hog," gives the same old story — not much new in town. W9IZQ visited W9FAV. W9GHN, "Doc," sends his first report. W9ZY-AZN was a little late with his report, but blames it on the depression. W9JDP thought a little publicity wouldn't hurt, so sent in his report. W9ISD hopes to have a YL opr. W9BIB reports that Racine is pretty dead. A group of BCL's helped W9HKL put up his new antenna mast. W9ABM spent 2 weeks at Camp McCoy. W9AVG has no special news. W9BWZ sends his congrats to the new SCM. Ex-W9EWN is training his YL in code. W9VD, our former SCM, forgot to report until the present SCM QSOed him over the air. Hi. W9EAR has been rebuilding. W3HDT has a '52. W9APU is a new ham in Beaver Dam. W9EBI, which is to be operated by OMs Latimer and Morterud of Westby, is not yet in commission. W9IZO kept an intercept watch on W9IZQ while at Lake Geneva, so as to be in touch with home. W9EZU-JPK has a fine 3.5-mc. 'phone going. W9HQK-(W2CJV) is building a transmitter. W9ESF is moving again. W9JWN blew his '71A transmitting tube while QSO the SCM. W9IZU sure puts out a nice signal. W9HHG, W9AFW, and W9ESE have been down on 56 mc. W9JXU and W9ACK are new hams in Sheboygan. The Naval Reserve Unit of Milwaukee has secured the use of the shack on the top of the Schroeder Hotel for use as control station. W9DTK, Wisc. Sect. Commander, is the one who did all the hard work. The Milwaukee Radio Amateurs Club holds its annual picnic at Waukesha Beach this year, and W9FSS is in charge. W9JLM worked all districts with a pair of '45s. W9IFL is trying 56 mc. W9JAM and W9JNE are new stations at Brooklyn.

Traffic: W9FSS 26, W9HMS 26, W9HSV 25, W9ATO 24, W9FHU 23, W9FAV 20, W9AUX 17, W9DXV 13, W9EEQ 12, W9EFX 11, W9ERS 9, W9HTZ 6, W9GVL 6, W9EYX 6, W9DKA 4, W9FAF 4, W9IZQ 4, W9GHN 3, W9ZY-AZN 6, W9JDP 3, W9ISD 2, W9BIB 2, W9IKL 1.

OHIO — SCM, Harry A. Tummonds, W8BAH — District No. 1. RM W8BYD: General Ohio RM, W8DDS, is getting ready for winter schedules. W8BYD was using portable in Jamestown, N. Y., part of this report. "Schedules with W8BYD, W8APC, W8EBY, W8FTV, W8ATV and VE3AU," reports W8BAH. W8FXH is handling plenty of traffic. W8EBY will soon be ORS. Another new ORS will be W8FGP. W8EBT blew his rectifiers. Keep up the good work, W8DIH. New crystal rig at W8FFK. Frank Fix is the operator at W8GUL. W8FVL does some traveling. W8CIP is a welcome new reporter. "Under the weather," reports W8BNC. "Going after ORS," reports W8ZZB. 75-watt c.c. rig at W8AOJ soon. New crystal rig at W8EIN. "Taking W8FIQ on vacation," reports W8AXV. W8EFW is using crystal won at Canton Hamfest. W8ACZ has been up in Michigan. W8UC is vacationing in Northern Ontario. Traffic at W8BHJ this month. W8GME joins the ARRL. W8FNX wants traffic. New reporter W8HGW heard from this month. W8HFN wants a break in traffic. W8DXL has portable W8HIZ. W8ZZAQ has 12 for western N. Y. report. Welcome to W8CEJ, new reporter. W8GQU has portable W8ZZCC. W8RN is still on the lakes. Antenna blew down at W8CIY. W8BRB just got on the air. W8AUM sends a QSL report. W8DQI is a new reporter. W8ELY is now at Port Arthur Radio School. W8DTF wants dope on ORS. District No. 2. RM W8BKM: W8HKN at Conneaut uses an '01A for traffic. "Back on air early next month," reports W8EJ. W8BKM schedules W8ADN at Erie. New sky wire at W8EJY. District No. 3 RM (needed): W8CMY burned out his rectifiers. No schedules yet at W8EKJ. New crystal at W8APC shortly. District No. 4. RM W8EEQ: W8PO now has portable W8HSG. W8OQ works on 7 mc. "Won't be long till school starts, and that means football," says W8HT. W8QQ schedules W8FGP. W8GXQ handles messages to Buenos Aires. Nice report from W8ATV. W8EEQ again leads his district. District No. 5. RM W8DFR: Two tens in PP at W8HCP. Welcome first report from W8CUH. '52 pretty soon at W8BSR. W8EXI is on trip to New Jersey with portable W8ZZBS. Another new reporter, W8FGV. District No. 6. RM W8BBH: W8BBH schedules W1MK. Welcome report from W8HEY. District No. 7. RM W8VP: "Handled traffic from W6USA," reports W8CKX. W8VP has been on vacation. District No. 8. RM W8CGS: New Zepp at W8CGS. Welcome, W8BRQ of Cincinnati. W8GES wants schedules on 7 mc. District No. 9. RM (needed): W8EQB handles all his traffic on 14-mc. 'phone. W8EQF now has new call W8VR. Report from Headquarters states that I have been reëlected SCM for next two years. Thanks for confidence, fellows, and with your help I will strive to keep Ohio among the leaders.

Traffic: W8DDS 561, W8BYD 398, W8BAH 156, W8BBH 138, W8FXH 119, W8EBY 118, W8VP 108, W8EEQ 107, W8EJY 102, W8FGP 101, W8FGV 74, W8ATV 72, W8EBT 68, W8DIH 57, W8FFK 47, W8APC 46, W8CKX 34, W8GUL 31, W8GXQ 29, W8FVL 26, W8BKM 25, W8EXI 24, W8QQ 20, W8CIP 16, W8BNC 14, W8EQB 13, W8ZZB 12, W8AOJ 11, W8BSR 10, W8EIN 10, W8EKJ 9, W8CMY 8, W8AXV 8, W8EFW 7, W8HT 6, W8CGS 6, W8HEY 5, W8VR 5, W8ACZ 5, W8HCP 4, W8UC 4, W8BHJ 4, W8GME 4, W8FNX 3, W8HGW 3, W8HFN 3, W8DXL 2, W8ZZAQ 2, W8BRQ 23, W8GES 4.

MICHIGAN — Acting SCM, Kenneth F. Conroy, W8DYH — Hi, gang, we're taking a shot at this SCM work again after being off it for a couple years. Good ol' Steve just ups and quits, and we're waiting for another to be elected — sure sorry to see him leave,

. W9GFS is new ORS.

but expect he'll be pounding brawss as usual soon. We dug up 116 fellows reporting (86 handling traffic), and this is the hottest and worst radio month of the year. From now on we go *UP! C'mon along. On June* 25th the former Miss W8DZ came back with a snappy dahditdahdit, and she and yours "trulish" were hitched. That "mistake" gives W8DYH another operater, stenog, etc. Send congrats via radio — we need the total! W8CFM just remembered. W8GUC is scheduling 'em already. W8BIU moves — again. W8FX must be too strong! W8HER sends in lotsa stamps for "Bulln." Thanks. W8QT is still winding (wotta transformer!) W9EQV is back, reports W9CEX. Ex-W9LL, of Chicago, is now W8BEP in Pt. Huron. W8AFH is on portable W8ZZCB. W8ALL is QRL chickens — poultry (Says *You*). W8HNB is new at Stormy Point and will be on with W8HBZ this winter. W8GRN rebuilds between CQs. W8AZQ and W8AEQ will keep Traverse City hot this winter! W8HBT starts right . . . nice totaling, OM. W8BTP is another live newcomer. What's this rumor, W8DNT — engaged? Say, W8FRW, when you have toothache, visit W8CJZ (dentist), not *W8EHD!* W8CFZ *will be going strong* soon. W8GMB sets a start — crystal and traffic total. Why not join the U.S.N.R.? Or the A.A.R.S.? Give strength to amateur radio through the government — if interested, put it on your report card . . . *we'll put it through proper channels.* W8EYH was heard in Hungary on 3.5 mc. W8CEU is crystal on 3775 (More good grinding by W8DOV). W8IN is IN the game. SAY, GANG, HERE'S A CHANCE AT FREE QSLS — TWO-COLOR BY W8DKO, WILLIAMSTON'S (MICH.) NEW PRINTER — OCTOBER SECOND (mark it on calendar) from 9 A.M. TO 1 P.M. *EASTERN* STANDARD TIME, each QSO to be at least ten minutes long. Let's go. W8UD is going to put up transformers for prizes of other contests. Any suggestions? W8ABH, W8CSR, W8ECN, W8EZM, W8DWL, W8GSP and W8CPY are all rebuilding. W9HK (Radiating Ray) tells us: W9CSI will trade 75-watt crystal set for baby buggy, and W9EGF is another leap-year victim — he warns W8DYH — too late! Nice work, W9DAB, will you try to get W9YX to report? W9HXB is another débutante . . . we still need more reporters. W8BMG says ". . . looks like there's going to be doings in traffic again as soon as it gets too cold to sit on a rotten log and 'gaze in her ize.'" W8GDR and W9IJH keep the "Abfalter trunkline" going. W8DZ looks for a job with his eyes on the "zoup" line. W8GQS has great possibilities. As has W8FQD. W8EHD dodged the QRN on 7 mc. W8FTV makes 'em sit up and notice. W8AKN found a job, but the out-go is more than the income! W8GP is living on love. Whereas W8FX is making a living, but no loving. Get it? We don't! W9HSQ keeps on the air, although he just has an '01A left. W9EVI, if you'll get a total of 4 consecutive reports into SCM, we line you up for ORS. W9DPQ keeps the YLS busy. W8COW-SM had his skyhook fall. W9IOV (W9EXT's brother) is visiting in Detroit. W8DA has new zepp. W8PP worries about Mrs. W8DYH's lost engagement ring . . . you seem to know too much! W9CCI still uses W9CE to QSO his YF at W9FAV. W9IHM promises some stamps next time for "Bulln." Hawt Dawg! W9FSK suspects W9??? for telling on him, so tells us that W9??? talks to Miss so-and-so in Illinois. W8CPH has new bug! We're sorry to hear W8CWN is plenty sick. W9GQF wants morning schedules. W9EEM is still camping. W8JO can get airplane for 56-mc. tests . . . interested? W8EVC plans crystal. W8AYO now has a *four-stage transmitter.* Other reports will be found in the DARA "TFC BULLETIN." A report will bring you a copy free.

Traffic: W8PP 338, W8AEQ 255, W8FX 123, W8BTP 122, W9DAB 111, W8FTV 110, W8EVJ 63, W8DYH 60, W8BJG 59, W8GBB 56, W9FSK 41, W9HK 38, W8ECN 35, W8EHD 34, W8CEU 33, W9CE 33, W8CPY 32, W9HXB 32, W8GUC 30, W8FTW 29, W8FRW 25, W8DA 24, W8HNB 24, W8BTK 22, W8DED 21, W8WO 20, W8AKN 17, W8NR 17, W8ARR 16, W8BIU 16, W9EVI 16, W8EZM 16, W8AYO 15, W9IHM 14, W8AZQ 12, W9GJX 12, W8GRN 11, W8QM 11, W8BGY 10, W8DYM 10, W8EYH 10, W8GMB 10, W8GBQ 10, W8ABH 9, W8IN 9, W8JO 9, W8CPH 8, W8CST 8, W8DMS 8, W9DPQ 8, W8DZ 8, W8HBT 8, W8EVC 7, W9GDJ 7, W9GQF 7, W8HER 7, *W8CFM 6*, W8EGI 6, W8QT 6, W8BNS 5, W9CEX 5, W9CGP 5, W9EXT 5, W8GQS 5, W8AJL 4, W8BXJ 4, W9EEM 4, W8HSQ 4, W8UD 4, W8ALL 3, W8AUB 3, W8BEP 3, W8CFZ 3, W8FXB 3, W8GP 3, W8JF 3, W8BIK 2, W8BMG 2, W8BMI 2, W8GQG 2, W8GSP 2, W8AAF 1, W8AFH 1, W8FQD 1, W8GDR 1, W8HOT 1.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Wm. A. Langer, W9DGS-W9IFW—W9HJC, RM, asks that all traffic handlers send information on schedules, so that he may sketch a traffic map for N. Dak. W9EVQ wants schedules with "anybody, anytime on 14, 7 or 3.5 mc." W9BVF has gone to Connecticut for a four-year course in U. S. Coast Guard Academy. W9EGI is rebuilding. W9JVP, now on with c.c., reports a newcomer, W9KBE. W9AZV is grinding a crystal for his recently rebuilt MOPA. Another c.c. convert is *W9DM. W9DOY is very busy at* WDAY. Letter from W9FMC states that he expects to give 3.5 mc. a try this winter. W9DHQ is building a c.c. rig for 14 mc. W9DGS is trying to build an electron-coupled Freqmeter.

Traffic: W9HJC 67, W9DGS 36, W9EVQ 34, W9JVP 3, W9EGI 4, W9AZV 4, W9DM 2.

SOUTH DAKOTA — Acting SCM, Stanway Gough, W9DNS — W9BJV keeps his 14-mc. rig going. W9DKL (portable W9GIO) lost a set of receiving tubes when his place was struck by lightning. W9IEK and W9CAU now have crystal. W9DKJ has changed from 'phone to CW. The Huron gang will have a station at the State Fair and want schedules. W9DKJ got a portable license. New stations are W9KCV at Huron and W9JLA at Yankton. W9EUH is building a portable crystal set. W9CPB is recovering from an operation. The Redfield gang is holding a hamfest October 8th and 9th and invite all hams to come. W9DNS and W9BLZ just returned from a fishing trip in Northern Minnesota; they enjoyed a few days with an old friend, W9DRB, on the way home. W9DTZ is still up north.

Traffic: W9BLZ 74, W9FMP 33, W9IDW 22, W9CAU 16, W9DKL 3, W9JLA 3, W9BJV 2, W9DNS 2, W9FOQ 2.

NORTHERN MINNESOTA — SCM, Palmer Andersen, W9DOQ — W9HCW starts out the traffic season with a total of 155. W9HIE has so much fun on c.w. he has given up 'phone. W9EHI says 73. W9BRA is looking for traffic and schedules. Support your R.M., gang. W9JIE has a daily schedule with W9JWA. W9BBL has a new National SW3. W9GWR is back from his vacation. W9DPP likes 3.5 mc. W9FNJ is building a 12-inch reflecting telescope. W9HNS has raised his power. W9HDN is working lots of DX. W9IAA has finally got all his parts for his power supply. W9IPA is building an MOPA. W9EOZ is working in the country now. W9GYH has a good voice for selling fish, so will be on with 'phone. W9IJS reports that W9BFV has been blessed with a junior op. W9JJL has new two-tube receiver. W9DLN, although a broadcast announcer, finds time for traffic and rag chewing. W9DOQ has been on 7 mc. mostly. W9GBW is building low-power crystal rig. W9GKO has finally snared a click filter that works. Your SCM wants your criticisms, ideas, or ideals on sectional activities.

Traffic: W9IPA 23, W9GYH 4, W9IJS 35, W9HDN 14, W9HCW 155, W9HNS 7, W9HIE 36, W9JIE 13, W9BBL 34, W9DPP 5, W9GWR 2, W9DLN 21, W9FNJ 5, W9DOQ 11.

SOUTHERN MINNESOTA — SCM, H. Radloff, W9AIR — W9HCC speared a man-sized chunk of Olympic Village traffic. W9BKK christened his newly acquired yacht the "Tipsy." W9CTB is lined up with good schedules. The W9BN-W9HJC-W9DGS link of *Trunk "A"* operated throughout the summer. W9EPJ will have that 1 KW going by fall. W9FJK inaugurates at Minneapolis a traffic system similar to the Detroit plan. W9AFR joined the AARS. W9CKU built a low-power c.c. transmitter for emergencies. W9CSJ is teaching a prospective ham in Tracy. W9DEI was elected chairman of the newly

organized I-W-M Club. W9JBA reports a new call at Kenyon. W9BNN turns in his 24th consecutive traffic report. W9FNK-ZZA is building a cottage. W9FCS enjoyed rag chews. W9JHG has a new transmitter built by W9DGH. The XYL at W9IJD took out portable call W9FOX. W9AIR is not a candidate for reëlection as SCM. D9FFY sports a new '10. W9GUX lines up for the traffic season. W9GLE has his crystal on 3615 kc. W9JID worked 60 stations immediately after receiving his licenses! We appreciate W9IJN's first report. W9HRH qualifies for ORS. W9DGE visited the Winona gang. W9EVG hammed around in Upper Michigan; W9CPM at Kansas City. W9GDE and W9BBV are canoeing near the Canadian border. W9DHP returned from Europe. W9IKD works on a river steamer. W9JFH has new power supply. W9BWM works at WCCO. W9FRJ is QRL at A. T. & T. EXTRA! W9CRW has a houseboat on the Mississippi. W9IAE put his '52 on 14 mc. W9ELA and W9HGN agree that 14 mc. is *the* band. W9GHO travels with an orchestra. W9JEQ moved to second floor in preparation for DX. W9EPD'S YL passed operators exam with flying colors. W9FWN has a pair of '03As on 3780 kc. W9FCC operates portable W9WY at Tofte resort. W9CYA has a new Zepp. Being papa for the first time holds more thrill for W9QE than his first foreign DX. Hi. W9AJU plays with 56 mc. W9FMA is a new station in Minneapolis, as are W9CSY, W9GCN and W9KAV. Other newcomers include W9ATD, Faribault; W9ANU, Northfield; and W9JFL, Alden. W9EAT and W9FDX allowed licenses to expire. W9EGG visited the SCM and other Section stations. W9DBC installed '66s. W9EYL believes the electron coupled meter much better than the dynatron. Beware of cheap equipment being offered for sale: A Minneapolis commercial station was recently robbed of 5 type '51 (1kw) and 8 type '11 tubes. W9EYS put up a new stick. The A.R.R.L. members of southern Minnesota were offered several periods on the schedule of WCAL through the courtesy of Milford Jensen, Operator-Manager. W9KDI arranged the program, and the Faribault and Owatonna gang turned out to help put it across. The 1.75-mc. boys held a picnic in Soldiers Memorial Park in Red Wing on August 14th. W9FWN, W9CSU, W9JMQ, W9BQJ, W9ESZ, W9FCS, W9BXC, W9IRH, W9JEF, W9DEI, W9HRH, W9JDO, W9IXI and W9DGB were present together with YLs, OWs and juniors, numbered 40 all told. The I-W-M (Iowa, Wis., Minn.) Club was organized, and will hold monthly meetings over the air on 1.75-mc. 'phone and CW, the first Tuesday of each month, at 7 p. m. W9JDO and W9HRH will conduct the meetings. W9BN and W9DH traffic received at last minute.

Traffic: W9HCC 652, W9BKK 160, W9CTB 59, W9EPJ 36, W9FJK 21, W9AFR 19, W9CKU 17, W9CSJ 13, W9DEI 12, W9JBA 12, W9BNN 12, W9FNK 9, W9FCS 9, W9JHG 8, W9IJD 6, W9AIR 5, W9FFY 4, W9GUX 4, W9EFK 4, W9GLE 4, W9JID 4, W9IJN 4, W9HRH 3, W9DGE 1, W9BN 101, W9DH 6.

DELTA DIVISION

MISSISSIPPI — SCM, William G. Bodker, W5AZV — W5ANX turns in a whale of a total for this season; the same was made by operating his portable W5ZZAB at Ft. Knox, Ky., and Camp Beaureguard, La., in coöperation with the National Guard. W5AAY has received his portable call. W5CBB. W5AZV has rebuilt to crystal control. W5BGU is struggling along with his 1.75-mc. 'phone. W5BUI will be on in October. One of W5ID's '52s got tired and quit working. W5BK is looking for an African for WAC. W5UM says W5AHA has a 50-watter on 14 mc. W5CLD and W5BUP are new stations at Natchez. W5BZG is practicing code so he can get his license renewed. W5ALZ reports a new YL in the family. Congrats, OM. W5VJ has a crystal-controlled 3.9-kc. 'phone. W5CIK and W5CQJ are new additions to the Jackson gang.

Traffic: W5ANX 854, W5VJ 96, W5ID 92, W5UM 13, W5BK 13, W5AZV 9.

ARKANSAS — SCM, Henry E. Velte, W5ABI — W5BMI isn't very active, due to weather. W5JK is using a new PP rig. W5BXM and W5AKB report traffic. W5ANR and W5VZ are new stations in Alma. W5BDW is rebuilding W5CCY is on 3.5 mc. W5VK and W5PX have crystal rigs. W5ABL is having trouble getting his transmitter stabilized. W5BRI is occupying a new shack. W5UI and W5BXN are on occasionally. W5BED is on the air when he is not found in BED. W5ABI wishes to extend an invitation to all amateurs to attend the Delta Division Convention to be held in Pine Bluff, Ark., on October 14th and 15th, 1932. This convention is sponsored by the Tri-State Radio Association. W5LV, President; W5SI, Secretary. It will be the biggest convention ever held in the South. For full details and reservations write to W5SI, E. R. Arledge, P. O. Box 6, Pine Bluff, Ark. See you all at the convention, fellows.

Traffic: W5BMI 113, W5AKB 39, W5BXM 36, W5ABI 35, W5CCY 17, W5JK 17.

TENNESSEE — SCM, James B. Witt, W4SP — These news items sent in by W4AQV. W4AJJ has crystal rig with 50 watts final amplifier. W4AFI has a new dependable MOPA on 14 mc. W4UU is chief operator at WTJS. W4FA is 2nd operator at WTJS. W4HL has 250-watt rig, crystal-controlled 3.9-mc. 'phone. W4ANC has new portable W4ZZAD. W4JG has new call W4PFL. W4BAX has an FB new shack. W4BBF is on 14 mc. W4PV is President of "I Tappa Key." W4JU is new National Guard armory call. W4AWW has '10s in P.P. T.P.T.G. W4ASC and W4AXN QRT for summer. W4WU is on staff of WTJS. W4TM is the proud father of a new baby girl. W4ALO is on 14- and 3.9-mc. 'phone with '04A in final stage R.F. W4LC has 2nd grade commercial. W4AED moved to Memphis for the summer. W4AGA is FB on 3.9-mc. 'phone. W4AAH is on 1.75-mc. 'phone. W4AJQ has gone commercial. W4AQV-W4PEQ is Secretary of "I Tappa Key."

HUDSON DIVISION

EASTERN NEW YORK — SCM, R. E. Haight, W2LU — Good, reliable schedules will bring in the traffic plus credit to your station and your Section. Route Managers W2BJA, W2ACD, and W2BZZ will be glad to assist you in getting in the traffic end of the game. All active ORS desiring to get in the ENY traffic net, QSO or drop R.M. W2BJA a line for dope. W2ACD is all shined up with new outfit for CW and Phone. W2BLU is running around with his W2ZZDC portable rig at numerous QRAs. W2KW visited Pittsfield gang. W2DQT enjoys very trying time on 14-mc. band. W2BJP was on sick list. We welcome as a new ORS Ex-Navy operator W2DQD. W2BKM changed QRA to 124 Riverside Ave., Scotia. W2CBN joins the boys after parting with Ex-W9BPH. W2BSH gave the boys a pleasant surprise by pounding brass from W8DSS, where he spent many happy hours of his vacation. W2BZZ is getting all oiled up to get that BPL hot again. W8AJS made a mistake and sent report to ENY Section. W2CQH is QRL still school. W2CSC is perking with that '52. W2DMC is crystal-controlled on 3530-3801. W2AUX hopes some day to get rats out of his 'phone. W2BEH, "Swamp Angel," is experimenting. Ask W2DIN what his OW did to his RIG when he got Balky! W2DON-W2DFU and W2CTE keep Rockland county on the 56-mc. map. W2DIB likes 7000 kc. W2DXJ has an FB receiver. W2CGO hits the ole brass again. W2CJP visited many ham friends on trip to Washington. W2DUG is out for more power. W2ACB is back from the west coast. W2BLL promises activity soon.

Traffic: W2LU 117, W2BJA 85, W2ACD 25, W2BLU 23, W2KW 21, W2DQT 11, W2BSH 6, W2BJP 4, W2DQD 4, W2DUG 4, W2BLL 4.

NORTHERN NEW JERSEY — SCM, Walter A. Cobb, W2CO — W2CBY turned in a total of 136. W2CIZ went on long bus trip and visited numerous hams enroute. The BCL with the modern (?) receiver finally licked W2AKC and he is moving to new QRA, Closter, N. J., October 1st. The RM for this Section, W2BPY, has been fooling around with an experimental MOPA. With his MOPA working 100% now, W2CNL should be all set for the winter season. W2CIM's 50-watter is getting monkey glands installed, and he is bothered to death with YL trouble, hi! Power company proving very ungrateful to W2BJZ, after he had advertised their product all over

this country and Europe, pulled the main switch. A former ORS, W2CDQ, has started reporting again. W2CVY was plenty previous with his report, being two weeks early. Johnny Knight, Ex-W2ALU, has blossomed out with a nice shiny license plate on the back of his coupe, bearing the new call, W2JJ. The outing of the Bloomfield Radio Club, postponed from the previous week, was held on August 10th, and the usual good weather attended same. Old Jupiter Pluvius poured, and a number of fellows claimed that they did not get as wet staying under water as out in the open. Eats for 50 were divided among 18, and the following week was used to recuperate from stomach ache, hi! W2DCK sent in a list of prehistoric signals. The Raritan Valley bunch thought up a very ingenious scheme in connection with their outing on August 21st, a transmitter, W2DPD operated on half-hourly schedules, giving out clues on CW and then on 'phone as to the location of the picnic grounds. W2AFQ, along with W2WR, former SCM, have started a back-to-the-air movement. W2CO promises to be on 3600 kc. with a Dow oscillator outfit using a pair of '10s in final. W2ZZAW, portable outfit of W2TP, is seeing plenty of service these days, being dragged around all over the Palisades. W2DXN expects to go to Tri-States College about September 20th. A steady traffic handler is W2ABT, who is runner-up to W2CBY. A new reporter is W2CGG. The Newark Amateur Radio Association is holding its premier outing on September 10th, at Union. Let's hear from more new hams next reporting month.

Traffic: W2AKC 48, W2BPY 63, W2CIZ 28, W2CNL 9, W2ABT 69, W2BJZ 3, W2CBY 136, W2CGG 11, W2CVY 12.

NEW YORK CITY AND LONG ISLAND — SCM, M. J. Grainger, W2AUS — The new SCM wants to thank his supporters for the whole-hearted support in the election, and appreciates the large number of congratulatory letters and messages received. A general reorganization of the communication activities of this Section has commenced, and by the time this is in print a number of important cancellations and appointments will have been made. For the good of the Section, hereafter, there will be no room for inactive ORS, and there must be a continuous increase in traffic totals for the Section if we are to put it where it belongs. The most thickly populated section in the country should be the highest rated. Now, we are rather low in the scale. ORS should get in touch with their RMs immediately, informing them of schedules and possible new ones which can be put into operation at once. Along this line W2DBQ, W2CHK and W2DOG have a fast local trunk working from Brooklyn to Montauk Point, L. I. It certainly is a pleasure to listen to this efficient circuit in operation. N. Y. C. and Staten Island: W2WP reports that vacations have cut down her totals. W2ADB is on 3.5 mc. again. W2BNL reports no business. W2AWT is handling his traffic on 7 mc. W2DHK promises to make the BPL. W2BDP has gone to sea to pound brass. W2SC has increased power to 200 W input. Queens: W2ADQ beats the Section this month with high total. W2AIQ reports slowing down for vacation schedule. W2DQK is after ORS appointment. W2COI, W2BDR and W2BDN pound away on 7 and 3.5 mc. W2AGL is lining up A.A.R.S. net for fall opening. W2AKL has a number of new hams in training. W2DHN reports. W2BVV brothers are leaving for Florida. W2OB reports business has "rooned" his ham work. W2DFW has MOPA going strong. The Boss at W2KG went to Coloradio and took one transmitter along . . . there's one man we'll miss. Bronx: W2EAF is back on after fifteen years off the air. Our Mr. Swyx of the U.S.N.R.F. and points Northeast is very busy with his enlisted men. W2FF changes QRA this month. W2CBB is back on the air. W2DYJ reports extreme DX of 8 miles. Brooklyn: W2BRB kills time playing chess on 3.5 mc. W2LB says the heat has him. W2BAS reports a ZL QSO on 3.5 mc. W2ASG reports heavy traffic. The Brooklyn amateurs have nominated W2BEG as candidate for Director in the next election. W2CCD again invites the gang to visit him at Radio Hill, N. Y. W2PF has been visiting Upper New York State hams on a recruiting trip. W2CEF reports a card from Africa saying he was heard there on 3.5 mc. Long Island (Nassau and Suffolk): W2CHK is new ORS at Bellmore, taking the place of W2BFG, who resigned his appointment. W2LR is new OO. W2DOG made 700 points in ORS Party. W2BST has hi-power '52 on 7 mc. W2CLM reports QSOing 100 stations in ten days. W2CY has FB crystal set on 7 mc. W2DNW is active.

Traffic: N. Y. C. and Staten Island — W2WP 145, W2AHO 124, W2SC 266, W2AWT 13. Bronx — W2CBB 131. W2FF 14, W2CYX 16, W2DYJ 4. Brooklyn — W2CPY 3, W2LB 1, W2BAS 19, W2DBQ 29, W2ASG 11, W2AZV 16, W2CCD 20, W2EET 15. Queens — W2ADQ 305, W2AUS 49. W2AGL 57, W2DHN 8, W2DQK 66, W2AKL 13. Long Island — W2CHK 20, W2DOG 21.

MIDWEST DIVISION

NEBRASKA — SCM, S. C. Wallace, W9FAM — W9DI, the RM, takes the lead this month, and wants all information possible from the gang so he can get traffic channels lined up. W9DMY will be going strong soon. W9FWW is held up for change in address of station license. W9AZT reports visit to Colorado. W9EEW says watch us this fall. W9DGL is doing some fine DX work. W9FUW is working 3.5-mc. c.w. W9BBS says "Conducting" on RR is slow. W9BQR had good time attending National Guard Camp. W9EWO has new transmitter going FB. W9EHW has been off the air for a month on account of serious illness of his mother. We all hope for her speedy recovery. W9DHA visited with W9FAM a week. W9IFE tore loose with a nice traffic total. W9ESY reports good traffic. W9GKZ put in his time handling traffic. W9HTU has crystal rig going. W9FAM will be ready to start the ball rolling 100 percent soon.

Traffic: W9DI 69, W9DMY 14, W9FWW 12, W9AZT 11, W9EEW 3, W9DGL 2, W9FUW 2, W9IFE 42, W9ESY 14, W9GKZ 75, W9HTU 55.

KANSAS — SCM, O. J. Spetter, W9FLG — WOW — how these reports have come in this month. Thanks, gang. CX7 takes all honors. W9KG has been appointed RM for eastern Kansas. Give him your support, fellows. W9CFN is RM western Kansas. W9JVC is building '45 push-pull rig. W9DVQ handled death message with CX7. W9PB is putting '04As in push-pull in final stage. W9GXV is converted to crystal. W9KCK is new station in Hiawatha. LaVergne Close (Horton) got his blue ticket, but is still awaiting station license. W9ABP reports Parsons gang will be in Topeka September 10th. W9GKJ handled much CX7 traffic. W9IQI is a new reporter. W9KCR reports '01As better than '47s. We herald the return of W9BNU, one of the best traffickers in Kansas. W9HSN is new ORS. W9IEW invites Topeka gang to visit him. W9GBP asks for ORS. W9HL is rebuilding. W9IHH is on 7 mc. W9JVC is rebuilding for 56 mc. W9BFZ is new station in Leavenworth. W9GHI is building up '52-c.c. rig. W9FRC says 99.9 percent traffic. W9FVR is rebuilding to 211Es in push-pull for 'phone and c.w. W9IGQ uses '45s in push-pull. W9EMH uses '10s in TPTG PP. W9FFO has a new rack and panel job. W9KDJ is new station in Osawatomie. W9EDU is rebuilding. W9FLG had W9ESL, W9YAB and W5SJ visiting him. W9ESL is building public address system. 'Phone men please get in touch with W9ESL for schedules or traffic. W9ABX is new station in Topeka. All ORS, OBS and OO, please have your certificates signed by your SCM so that he may have a record of these offices.

Traffic: CX7 2634, W9FLG 567, W9FRC 432, W9DVQ 356, W9GKJ 281, W9GXV 265, W9KG 207, W9EIB 189, W9DEB 188, W9PB 187, W9BNU 173, W9KCR 126, W9BYM 113, W9HSN 102, W9IHH 99, W9KDO 63, W9IGQ 39, W9EVM 42, W9GUZ 35, W9ABR 24, W9CFN 17, W9HWW 16, W9YAB 15, W9GBP 14, W9IQI 13, W9IEW 9, W9AWP 6, W9EDU 5, W9ZZAP 3, W9HL 1, W9EMH 11.

IOWA — SCM, George D. Hansen, W9FFD — W9EIV, RM; W9BPG, RM. W9ERY leads in traffic having taken advantage of the Old Settlers' Picnic. W9BWF is second and took part in the same celebration. W9FFD builds a new receiver with the air of W9AHQ and experiments with

W9JXA, aided by W9DFK. W9BFL reports the formation of a new club in Des Moines with meetings to be held twice a month. FB, fellows. W9ABE says traffic is better. W9ACL also reports that the action is speeded up. W9EIV reports trunk line "H" is now in operation. W9AYC is holding daily schedules. W9CYL also profits by the Old Settlers' Picnic. W9HMM sends in HAMNEWS from the TCARC, which he edits. W9JXA, the SCM's portable, was able to get a few during an experiment. W9FEB reports a few. W9CWG sends in his report. W9EOE got the MOPA to perk finally. W9FYC says the work was done while the shack held 103 degrees F. Hi. W9DMX gets in a few licks. W9BPG has a new MOPA ready for business. W9AHX has a new crystal rig; he has new portable, W6ZZBL, and desires contacts and reports. W9GWT is very QRL. W9AWY is building new home. W9GPL is rebuilding. W9HOH is QRL work. W9BCL is on with a new '60. W9AHQ gets in a lick now and then on 7 mc. and 14 mc. W9IHO reports a gang of fifteen making a trip to Omaha for an interview with the R.I. Stick with it, gang, and we will be looking for those reports, which by the way don't forget, are due immediately after the 15th of each month.

Traffic: W9ERY 96, W9BWF 83, W9FFD 45, W9BFL 43, W9ABE 37, W9ACL 25, W9EIV 24, W9AYC 24, W9CYL 21, W9HMM 19, W9JXA 17, W9FEB 17, W9CWG 17, W9EOE 15, W9FYC 11, W9DMX 10, W9BPG 8, W9AHX 8, W9GWT 8.

MISSOURI — SCM, C. R. Cannady, W9EVG-HCP-JPT — RM, Wm. Atkins, W9TJ. What's the matter with MISSOURI? No, she isn't all right! St. Louis came forward and reported practically as many stations as the rest of Missouri combined. SNAP OUT of it, GANG, and let's get that old "SHOW ME" and "MISSOURI MULE" spirit back again and into action. W9GCG upset the dope, and this month led the state in traffic and in the race for the ACTIVITY CUP. W9CRM leads, with W9HNM second in the CUP race, displacing W9TJ's early lead. St. Louis: Bernal C. Payne, President, Associated Radio Amateurs of Greater St. Louis, ex-W4LD, ex-W9DDM, ex-W9CRY, ex-W6HM, is driving to Long Beach, Calif., to attend the Pacific Division American Radio Relay League Convention at Breakers Hotel on September 3rd–4th–5th. W9FFW is returning to St. Louis and Rolla from Van Buren, Ark. W9IJW works 40 stations in a week. W9GTY is coming back soon. W9AAL, W9KEI, and W9KIU are new St. Louis hams. W9PW reports too hot to QSO. W9DOE reports a "call thief" using his call. W9HWE worked a K7. W9HWD operates on 56 mc. W9HEL is working nights. W9HHK off until higher power can be found. W9TA moved. W9HVJ was reported heard in Germany. W9HVC is using new crystal rig. W9ILI moved. W9CCZ is building 50-watter. W9HVN is building crystal rig. W9GSO is temporarily off. W9GTK has new portable call of W9ENK. XW9CRY promises report from Associated Radio Amateurs. St. Louis Amateur Radio Club: W9AUB is back for traffic. W9DGI is operating both 14 and 7 mc. W9HVC is using 1.75-mc. 'phone. W9EMP is idle until cooler weather. W9GTF is bringing in DX on 7 mc. W9BEU has too much work. W9GUL operates on 7 mc. W9GYT is using W9AUB's station. W9DUD uses both 3.9-mc. 'phone and 7-mc. c.w. W9EWT handled a little traffic. Mississippi Nines: W9FTA, W9GDU, and W9HUZ are getting into working order. Kansas City: W9GCG worked OK2VA. W9AOG has new call of W9KEP. W9EL applies for ORS. W9DQN is off the air for the time. State News: W9BGS is about ready to go. W9AIJ is trying to get on 7 mc. W9BGW has job at different QRA. W9CAK is doing considerable 56-mc. work. W9DGN reported early so as to go to N.G. camp at Nevada. W9HVW sends report direct this time. W9DVV sends in first report. W9FYM is having receiver trouble. W9IOU is having little trouble keeping batteries up, W9CRM is getting into action again. W9CXB hopes to be on soon. W9IGX is building 'phone rig. W9HIW is not on much because of hot weather. W9BAU is new ORS. W9HNM, W9FSU, W9FSL and W9JBV are going to K. C. to take exam from the R.I. W9ARH reports working TI2TAO, NY1AB, LDSD, etc. Hannibal Radio Club: W9GBC and W9FSZ handled some traffic. W9FGJ, W9FSB, W9HSZ, W9HBJ, and W9IRR are taking active interest in club activities. South Missouri Association of Radio Amateurs: W9GBJ is too busy to keep schedules. W9HUG is off because of receiver trouble. W9CJR and W9FEH are QRM'd by court just a little too heavy for usual activity. W9FVM-W9CON is acting as temporary OO and OBS for Missouri. W9EHS is getting back on a little. W9FYU is touring the west. W9GAR is coming back with a '10. W9EYG-W9HCP-W9JPT is having hard time finding time to operate. W9EYG-2 doing a little experimenting.

Traffic: W9GCG 101, W9EL 69, W9AOG 62, W9CRM 51, W9AIJ 49, W9HNM 44, W9FVM 44, W9KEP 34, W9FTA 32, W9DHN 31, W9GBJ 20, W9DUD 20, W9EYG 15, W9HCP 15, W9JPT 15, W9AUB 14, W9CJR 12, W9BGC 11, W9HVW 10, W9IXO 10, W9DOE 10, W9RR 9, W9BAU 9, W9PW 9, W9DGI 9, W9ARH 7, W9HVC 5, W9FEH 4, W9HWE 4, W9GDU 4, W9ZZ 4, W9EOW 3, W9CON 3, W9EWT 2, W9HVJ 2, W9DVV 2, W9FSZ 2, W9EHS 2 W9FYU 1.

NEW ENGLAND DIVISION

VERMONT — SCM, Roy L. Gale, W1BD — W1BZD wins the blueberry pie again. W1EMQ is a new one in White River Jct. W1EZ, an old-timer, reports. W1AZV delivered much traffic from Camp Wilson. W1CGT is with us again. W1CGV and W1BNS visited the SCM. W1DHX likes his new Zepp. W1CBW wants to be an ORS. W1EFC has grist-mill QRM. Hi. W1CGP keeps a raft of schedules. W1BHR is QRL school. W1DAJ is awaiting the R. I. W1ATF and W1BD visited W1DTF. W1BAS handled traffic at Camp Wilson. W1EHB is building a 56-mc. receiver. W1BD and W1DGU have been QRL summer school. W1EGU is getting started. W1BJP visited several of the gang. W1CGX reports traffic. A.A.R.S. W1BAS was installed at Camp Wilson, Fort Ethan Allen, during the August encampment. W1BCK and W1CIY were operators at W1BAS.

Traffic: W1BZD 115, W1CGV 87, W1BNS 76, W1AZV 47, W1CGP 19, W1BJP 15, W1DHX 12, W1ATF 11, W1EFC 9, W1CBW 7, W1EZ 5, W1CGX 29, W1BAS 100, W1BCK 15.

WESTERN MASSACHUSETTS — SCM, Earl G. Hewinson, W1ASY — W1BWY has painted the club room. W1DCF, W1COI and W1AIC are new ORS. W1BPN is rebuilding. W1DJW reports QRM from his landlady. W1ARH sends in good traffic report. W1ASY-W1RB is working on new A.R.R.L. program for WBZ-A. W1BNL of WTAG is on vacation. W1AJD sports the best traffic report. W1BVR expects to have new crystal rig for October 1st. W1AZW is RM for Berkshire County. W1OF reports traffic on 56 mc. "Experimenting with antennas," says W1APL. W1CCS and W1BZA have applied for ORS. W1AFU is QSPing DX. W1BCX is shouting for schedules. D4AAR is reported by W1DCH as his best DX. Woods of W1CWP is building a 50-watt amplifier. W1EFM, W1CIZ and W1CKU send in their first reports. W1DJQ says that W1DCH got a blue ticket. W1CGL would like to see another Worcester-Springfield get-together. W1NS reports the activity for his part of the Section.

Traffic: W1AJD 140, W1AFI 131, W1AIC 70, W1BWY 59, W1OF 52, W1ASY 32, W1DCF 26, W1AZW 25, W1COI 16, W1BVR 13, W1ARH 11, W1APL 8, W1BPN 3, W1BCX 102, W1DCH 25, W1NS 60, W1BZA 19, W1DJQ 18, W1CCS 15, W1CKU 15, W1AFU 9, W1CGL 5, W1DJW 10, W1EFM 2.

MAINE — SCM, J. W. Singleton, W1CDX — W1BOF is on top again this month. W1CDX is close behind. W1CRP wins the wall sign. W1AQW put up a big race for the wall sign. W1BEU is pushing plenty of traffic. W1BOZ puts out a nice signal. W1DHH is now ORS. W1BEZ came through with a nice total. W1DFN, who in the winter months is W1CRV of Medford, Mass., gives us a nice string this month. W1EEY says an "ohm" is an Englishman's name for an "ouse." W1APR sends us another fine total. W1CFG is taking a rest this summer. W1EF reports W1EUL in Brooklyn, Me. W1BGZ blew his rectifier tubes. W1BFA has portable WIZZAU. W1BYP sends in a nice score. W1AXJ will have his crystal rig going soon. W1DIJ has been busy rebuilding.

W1BWB and W1CEQ visited the SCM, but the OM at W1CDX was out of town. W1BLI will be on regularly now. W1DHD and W1CKZ report for first time. W1APX has 56-mc. outfit ready to go. W1BWB sure knows how to make wall signs. W1CPT reports good bunch of traffic.

Traffic: W1BOF 332, W1CDX 322, W1CRP 311, W1AQW 258, W1BEU 255, W1BOZ 139, W1DHH 134, W1BEZ 131, W1DFN 128, W1EEY 67, W1APR 41, W1CFG 35, W1EF 34, W1BGZ 34, W1BFA 30, W1BYP 20, W1AXJ 18, W1DIJ 17, W1CKZ 12, W1BWB 9, W1BLI 8, W1APX 3, W1DHD 8, W1CPT 80.

EASTERN MASSACHUSETTS — SCM, Joseph A. Mullen, W1ASI — W1VS is rebuilding for the trunk line season. W1WU has his new a.c. receiver working. W1LQ reported from Jersey while on vacation. W1ABF will be going full blast by September. W1AGA has a portable going. W1BNJ reports plenty of traffic. Another DX traffic report comes from W1BBY, who is summering at Nova Scotia. W1CHR blew his bottle. W1CQN got a big kick out of the ORS Party. W1BFR and W1ME are rebuilding. W1BGW has a rack and panel 250-watt job. W1ESK offers schedules for the cape and islands. W1CCP has applied for reissuance of his ORS. W1AOV is undergoing reconstruction. W1BMW is now an ORS. W1AKN is tied up with fishing QRM. W1DFS reports plenty of activity with the National Guard. W1CSG has been away on vacation. If W1BO doesn't stop working foreigners he will need a course in the English language. W1DVD waves good-by to the first district as he hauls anchors for Mt. Vernon, N. Y. W1DOF "doffs" his hat and makes his first report. W1CFI only gets on for a few hours a month. Out of the bushes comes a report from W1CVA. The boys at WNAC are all ready for the fall season with new transmitters. W1BBX is ready to put on his crystal outfit. W1AAL has rebuilt for fall activity. W1DFU has a new buffer outfit going. W1VA is "unlaxing" in Maine for a few weeks. W1CWA has his brother helping him rebuild. The SCM received all the dirt from Melrose from W1EHP. Here it is: W1EMF is the most active ham in town. W1EHR needs a new '10. W1EMG needs a new power supply. W1EAB should be in line for congratulations for the work he did in organizing the Middlesex Amateur Radio Society. W1EPW is having great success. W1DSR has received his sheepskin from Mass. Radio School, and W1DEU has set out to get his from the same place. W1CZE is awaiting parts to get his new rig going. W1DEV has been heard on the air quite frequently lately. W1CQB from all appearances has hibernated for the summer. W1BEF has new jr op! W1COX is doing great work on 56 mc. W1AIO gave W1DFS a big lift during National Guard activities. W1ESS and W1EEK are new hams in Bryantville. W1ASI and W1KH are headed for Portland Hamfest. W1FR will be ready to go on with 100-watt 'phone job first of September. New stations in Hingham: W1ECL, W1ECK, W1EQB, W1DLO and W1DDE. W1KH heard a station on Mt. Washington, N. H., while listening in Boston (Weston) on 56-mc. 'phone. This is your column, so make use of it. Let's have more reports, and more ORS.

Traffic: W1BGW 172, W1CVA 137, W1BNJ 54, W1CCP 48, W1KH 42, W1ABG 32, W1ESK 30, W1AGA 30, W1CQN 23, W1DFS 22, W1ME 18, W1BFR 17, W1BMW 13, W1ASI 10, W1BO 8, W1CFI 7, W1AOV 6, W1WU 6, W1CSG 4, W1CHR 3, W1ABF 3, W1DOF 3, W1AAL 9.

CONNECTICUT — SCM, Fred A. Ells, Jr., W1CTI — W1MK handled traffic with W6USA and NY1AA. W1AFB has been appointed RM. W1CVL says the majority of his traffic came from the radio show station W1EJZ, erected by the Mystic Amateur Radio Club. W1AJB says the Middlesex Club has purchased lumber for the new clubhouse. W1APJ says the best event this month was the "swell ORS Party" of July 24th. W1BFS used his portable call W1EJZ at the Bazaar station in Mystic, and did fine work. W1CJD shut down a couple of weeks to rebuild power supply. W1EAP inquires about ORS. W1BEO is moving to New Hampshire. Sorry to lose you, OM. W1CY reports by radio. W1BDI handled most of his traffic in the ORS Party. W1CTI attended the forming of the New Canaan Amateur Radio Club. W1EHK was elected president. W1BGJ has to get busy and do some work so no more radio for awhile. W1UE took the helm at W1MK while "RP" went on a vacation. W1FL is active on 3500 kc. W1BNP says weather too hot for schedules. W1DOW says the Bristol Radio Club celebrated the first anniversary of its existence with a big time and feed. The clubhouse on South Mountain is nearly finished. W1CNU is working all kinds of DX. W1DGG moved to Milford. W1TD reports that the TCRC has filed incorporation papers. W1EIZ sends in his first report. W1APW and W1BQS changed QRAs. W1CUX worked his first W6 on 7 mc. W1EFW and W1HD worked W2EHO on duplex 56-mc. 'phone from West Peak. W1COA was admitted to Yale and received portable call W1ESL. W1EAO, Official Observer, says the gang is behaving OK this summer. W1ES will be with us again soon. W1AVB is on 14 mc. W1AMG says his new crystal job is still full of bugs. W1QV has been having trouble with his ears, and expects to have his tonsils out. W1APZ is active on 56-mc. 'phone. Following report traffic: W1BYW, W1BNB, W1DBU, W1CUH and W1BAX. New ORS appointments are W1BNP, W1DOW, W1BFS and W1APW.

Traffic: W1MK 498, W1AFB 213, W1CVL 104, W1BYW 63, W1AJB 61, W1APJ 60, W1BFS 58, W1CJD 56, W1EJZ 40, W1EAP 35, W1BNB 33, W1BEO 32, W1CY 30, W1BDI 24, W1CTI 23, W1BGJ 14, W1UE 13, W1FL 12, W1DBU 12, W1BNP 12, W1DOW 11, W1CNU 10, W1CUH 10, W1DGG 7, W1TD 6, W1BAX 4, W1EIZ 3, W1APW 3, W1BQS 3, W1CUX 3, W1EFW 2, W1COA 2, W1EAO 1.

NEW HAMPSHIRE — SCM, V. W. Hodge, W1ATJ — W1APK reports class B 'phone now with 50-watt modulator. W1EWF is new ham in Hanover. W1CBB is trying for ORS. W1DMI sent in his usual newsy report. W1ELJ has moved his transmitter to his shack. W1CVK is experimenting with antennas. A new ham in Nashua is W1ELM. W1CCM has a new 10-tube 'phone outfit. W1AXL has finished his new frequency meter. W1IP is resting up for the coming busy traffic season. W1ESB is new ham in Tilton. W1DNR sent in a report for the gang in Exeter. W1DZJ, ex-naval op, is back in the game. W1CVF is using two '10s on 3500. W1UN has hooked up his Huts with radio. W1CPM sent in a report for the Derry gang, W1EAY, W1ENX, W1EAK and W1CHT. W1CHT was heard in Germany on 3500 CW. W1ATO was visitor at the SCM's.

Traffic: W1IP 76, W1DMI 19, W1APK 8, W1AXL 5, W1CVK 2, W1ESB 4.

RHODE ISLAND — SCM, N. H. Miller, W1AWE — W1BUX handled some of the Olympic Games traffic. W1CAB has a new portable call, W1EYC. W1BDQ spent his vacation in the White Mountains. W1AWE is building a new crystal job. W1BOY is building a new 14-mc. transmitter. W1ALI joined the A.A. Net. W1CPV reports that W1CQG is active again. W1ASZ is going strong with 1.75-mc. 'phone. W1BTP has three schedules. W1AMU worked some DX on 7 mc. W1DIT is on 3.5 mc. W1DOT wants some traffic on 3.5 mc. W1EQF in Pawtucket is working good DX. W1BGA is working lots of DX on 14 mc. W1BOS in Westerly says things are pretty dead down there. W1EWM is a new ham in Greenville. W1II-W1BZI-W1ZS in Chepachet is busy with the eclipse data for Brown University. Don't forget reports on the 16th.

Traffic: W1BUX 20, W1DOT 18, W1BOY 14, W1AMU 10, W1BTP 9, W1DIT 8, W1ALI 7, W1ASZ 6, W1CPV 2, W1AWE 2.

NORTHWESTERN DIVISION

MONTANA — SCM, O. W. Viers, W7AAT — W7BDJ at Sheridan is our newest ORS. W7BII, the Missoula Radio Club, has applied for ORS appointment, also W7AHN and W7BYK. W7FL has put in '47s for oscillator and buffer. W7CT is installing all '47s. W7ASQ keeps a schedule with his dad, W9CAB in Denver. W7AHF works on 3570 kc. W7CEG will soon be on with a MOPA. W7BGC reported from St. Paul, Minn. W7AOD has crystal with '52 amplifier. W7BJZ also has crystal.

W7BKM had the pleasure of a visit from W7CHN of Buhl, Idaho. W7BNU has gone to Butte to visit W7FL. W7BVI is on again. W7BW has moved to Missoula and operates at W7BII on Saturdays. W7AQN has been on 14 mc. W7BPQ is rebuilding. W7AAT will open up September 15th with a 1000-watt crystal outfit.

Traffic: W7FL 36, W7AHF 14, W7AOD 8, W7ASQ 1, W7BDJ 1, W7AAT 36, W7BKM 3, W7BII 21.

OREGON — SCM, Dr. Dolph L. Craig, W7ALO — W7AYV steps out to lead the state for the first time. W7AWH keeps a bunch of schedules between motor boating. W7WR can always be depended on for a good report. W7SY reports. W7AHJ wants more traffic. W7BKL is picking up. W7AEM has an a.c. receiver. W7PE has been off the air. W7AYV's new crystal outfit is about ready to go. W7CBA has made several bugs. W7HD put up a new off-center Hertz. W7BOO is passing out lots of beach traffic. W7BOG says DX sure rolling in fine. W7WL has portable call of W7CMA. W7BUF worked a VK, who was using 'phone. W7BCZ is W7ZZZ portable at times. W7AWO is again on the air. W7MY hooked a "J." The Coos Bay Club held its first annual picnic in Allegany, August 7th; a fine time is reported by all. Visiting hams were W7QI, W7AHZ, W7AWL and W7BDU.

Traffic: W7AYV 152, W7WR 129, W7AWH 122, W7BOO 73, W7CBA 51, W7AEM 74, W7APE 24, W7SY 19, W7HD 15, W7BKL 13, W7ACH 9, W7AHJ 8, W7EN 4, W7BKG 6, W7AWO 2, W7AZJ 2, W7BOG 2, W7PE 2.

IDAHO — SCM, Oscar E. Johnson, W7AKZ — W7AT reported in person. W7BBE is rebuilding. W7AJQ gets on long enough to establish a contact or two. W7ATN has new portable call, W7ZZAF. W7QD is going to leave for school soon. W7CLS is new ham in Sandpoint. W7CHE, formerly a "six," is new ham in Idaho Falls. W7ALW has nice new 3.5-mc. 'phone. W7ACO spends much time on the water. Every Idaho ham should report to the SCM on the 16th of each month.

Traffic: W7AYH 10, W7CWX 4, W7AKZ 6.

WASHINGTON — SCM, John P. Gruble, W7RT — Who said Washington couldn't do it? Here we are, with an all-time record for this state of 103 traffic reports, representing a gain of well over 100%!! Los Angeles, we're coming for that traffic banner! We find W7BLH and W7BB well in the lead with over a thousand messages each! Following men make the BPL: W7BLH, W7BB, W7BSX, and W7WY. W7AIT keeps 31 schedules weekly. W7ANP is busy with A.A.R.S. and N.N. One of the finest W7 sigs comes from W7BOF. Couple VK QSOs is all DX for W7JD. A trip to southern Oregon lowered W7QI's total. W7CLK, Aberdeen, wants to hear from 56-mc. enthusiasts. W7CGN and his '10 on 7 mc. clicked VK3BJ. Our ex-SCM, W7ACS, promises bigger and better reports for future. Listen for Official A.R.R.L. broadcasts and special SCM broadcasts from any of the following OBS: W7AVM-W7BCV-W7AJI, and W7ANF. The latter is on 3.5-mc. 'phone. Masterson, ex-7AQI, ex-7QE, now has new call, W7ASN. W7FJ is on full blast again. Spokane's new OBS is W7AJI. In between trips as commercial op, W7OV finds time to run up a nice total. W7ANZ has new QRA: 805 Marion, Seattle. Portable of W7CJS is W7CBK. W7CHH and W7RL help Vancouver's standing. A new car at W7GM doomed traffic activities. W7BMU handled traffic with Fairbanks, Alaska. W7TX is running for Director Northwestern Division. Yakima's new ORS, W7BUW, handled considerable convention traffic. W7ARN is new Tacoma station. Three schedules on 3.5 mc. keep W7BUK going. Vacation, heat, and poor conditions are reasons for low total at W7HS. Seattle Y.M.C.A., W7YC, is out for traffic. The SCM has QSL cards for W7AIY, W7RU, W7BZN, and W7BQG. W7BKW is now located in Ellensburg. W7AZA, W7BJX, and W7AQB of Aberdeen seem to have banded together for traffic and DX. We thank W7BGH for the dope on Pasco and Kennewick activity. W7LD clicked W6ZZAP in Wyoming. W7CJC is using the same transmitter that was formerly used at KA1CE. W7CMO gets out nicely with '01A. W7ATE, 14 mc., clicked G5VL with a '10. W7IG and W7BZG play checkers over the air. W7BG pounds out occasionally on 3.5 mc. W7CLZ gets crystal note on 3.5 mc. with an input of 4½ watts! W7NR handled a nice amount of traffic. W7AJ keeps schedule with W7IG. W7AJS, Centralia, expects to move to Seattle in fall. W7BBB's total is for twelve days' work only. Whatever the Renton Amateur Radio Club lacks in membership is made up for in spirit and progressiveness. W7CCF and W7BVA certainly get the DX on 7 mc. W7CDN is new portable for W7APS. W7JZ recently received commercial ticket. W7APR schedules Olympia, W7AIT. W7AZI, new ORS, has been on VCR cruise. W7CGK-W7BOY at Ellensburg uses pair of '10s in PP. W7UO is preparing for 1.75-mc. 'phone. W7ATW is rebuilding to high power. W7BHJ is portable of W7AEA being used at Rosedale. The VCR at Tacoma, reports W7OS, looks like the royal king's guard when in drill. Hi. W7BSB's traffic is mostly Naval Reserve. W7AMN, a commercial op at Toppenish, has gone amateur since the depression. W7OO is also on the air near Toppenish. W7IA, mighty voice of Kirkland, is very active on 3.5 mc. W7CKA blew six dollars' worth of receiving tubes. W7BJB moved to Ogden, Utah. K7AOA will soon be back at Bellingham. W7WU likes the increase in section reports. W7BVA schedules K7ATF and K6CKK. W7MJ is the only Monroe station. The total at W7AF this month is the work of the OM's sister, who operated while he was in Alaska. FB! K7AIF highly commends W7AHQ and W7AJ for their reliable traffic handling. W7KO is keeping the summer schedule with KGYI and KGYA, Forest Service stations. W7ALE, W7AMZ, W7BWS, W7CAB, and W7CCH are reported active at Centralia. W7BLG is QRL at KIT. W7BRI and W7BUQ have consolidated. New ham at Bellingham is W7CMJ. W7ZZM reports unusual DX reception in the mountains. W7BIX-W7KV is doing a lot of flying. W7ADS keeps couple schedules weekly. Vacationing kept W7AFC busy. W7AIB's filter and rectifier are causing him trouble. W7ABU has portable W7CNN, and reports new ham in Tacoma, W7CNI. W7AAO worked B4UP on 7 mc. W7HE and W7BRS grind crystals of all descriptions. W7BQX is reported to have YLitis. W7AJI is the new traffic manager for the Spokane Radio Club. We wish to thank W7AHO for his past work in this capacity, and welcome all new reporters from Spokane. The R.F. from W7AIU's transmitter actually melts iron files and copper tubing. Hi. W7AGP put up new 50-foot masts. W7BFB is busy on his farm. The berry fields keep W7BUL busy. W7EH and W7AWP work together, boosting W7AWP's total and providing more activity. W7BFL handles navy traffic. W7LM, W7ARQ, and W7BUK are active at Bellingham. Congratulations to W7BKZ on his recent marriage. The Walla Walla gang handled the traffic for guests at the Regional Baseball Tournament of the American Legion Junior Teams. W7BCV is planning to have station at county fair. W7RB, section portable, has one of the nicest little portable outfits we've seen for a long time. W7BFG hears lots DX. W7CEK and W7VO are QRL till fall. W7BGH wants to know the QRA of XX1YJ. W7CLH and W7AJC keep Kennewick on the air. W7BUX is busy winding autoformers. W7ANF-W7AIX-W7BBH do their stuff on FB high-power 'phone. Among Seattle's active are the following: W7BAV, W7AFA, W7BPK, W7BZN, W7AGE, W7BAC, W7CFK, W7ANZ, W7BYF, W7BQX, W7CEZ, W7BRT and W7CKY. W7NE is active at Leavenworth, near railroad. W7AWQ uses a '10 in TNT on 3.5 and 7 mc. The whole section mourns the passing of two well-known amateurs, W7VL of Spokane, and W7BKR of Bremerton. W7AAX helps our traffic standing by reporting. W7CGN, W7BRS, and W7RT had an enjoyable time at Lake Sammamish, where portable W7ZZH was used over the week-end. Seattle and Tacoma gangs held their annual get-together in the form of a picnic on July 31st. We miss the reports of W7SL, W7DL, and W7AHQ. The SCM's "pall," Gunston, W7AAE, reports at the last minute. Hi. W7AAV is the call of Renton's new XYL op using 'phone on 1.7 mc. W7TZ is active on 3.5- and 7-mc. bands. Amateur Radio Club of Seattle has been operating a radio booth during Fleet Week, and securing much worthwhile traffic for all parts

of the world. W7BZG and the SCM were planning on installing radiogram service at Puyallup Fair. W7DF operates at W7AAO. W7BBL constructed a fine 56-mc. outfit. Some convention, wasn't it, gang? Full details in later *QST*. Kindly report traffic and news on 16th. Your individual cooperation will mean our success as a leading national section. More power to ole' Washington!

Traffic: W7BLH 1458, W7BB 1035, W7BSX 692, W7WY 543, W7AIT 352, W7TX 348, W7AYO 344, W7LD 289, W7NR 220, W7OV 156, W7RT 112, W7ANP 79, W7KO 76, W7BVA 70, W7BUW 56, W7BZG 52, W7ACS 48, W7BGH 48, W7AIB 47, W7QI 44, W7BSB 43, W7ANF 42, W7HE 39, W7LQ 38, W7CGN 37, W7AAX 33, W7AWP 31, W7BBB 31, W7BFG 30, W7BOF 29, W7BJX 29, W7BIW 29, W7NE 26, W7APR 26, W7CCF 24, W7YC 24, W7BWS 23, W7BUK 23, W7AZA 22, W7IG 22, W7BRI 22, W7BMU 21, W7AJ 21, W7ABU 21, W7CHH 20, W7OS 20, W7IC 20, W7APS 19, W7AIU 18, W7BCV 17, W7BUX 16, W7AJS 15, W7JZ 13, W7AZI 13, W7BAC 12, W7BAV 12, W7AVM 11, W7BHJ 10, W7BZN 9, W7AXT 9, W7CJC 8, W7GM 8, W7CFK 8, W7AAE 7, W7LM 7, W7CGK 7, W7AGP 7, W7RB 6, W7BIX-W7KV 6, W7ADS 5, W7CKA 5, W7HS 5, W7BUQ 5, W7AGE 5, W7AEX 4, W7CMO 4, W7BFB 4, W7AF 4, W7AFC 4, W7CJS 3, W7BRS 3, W7BYF 3, W7ANZ 3, W7BKR 3, W7AGV 3, W7BBH 2, W7BKW 2, W7AWQ 2, W7JD 2, W7ARQ 2, W7BCS 2, W7CEZ 2, W7BQX 2, W7RL 2, W7AUV 1, W7BRT 1, W7BYB 1, W7BG 1, W7CFZ 1, W7CED 1, W7AUC 1, W7CGZ 1, W7BLG 1, W7TZ 4.

ALASKA — SCM, Richard J. Fox, K7PQ — Despite alleged summer slump Alaska is gaining every month. Thanks, fellows! K7VH at Ketchikan is getting on the air with a 7½-watter. K7BMY has a new Zepp. K7AHI handled traffic for K7WB. K7ATD keeps schedules with K7UT, W6QOE and W6DE. K7TF blew up his filter. K7ARL is engineer on a Fisheries Patrol boat. K7BZX is captain on the mission boat *Messenger*. K7PQ claims the long distance QSL record, having received a card from a W6 worked five years ago. K7BMY reports that the Governor of Alaska has asked the Department of Commerce to station an assistant R. I. at Juneau. K7BGR is a new ham in Juneau. K7BWQ has finally received his license. K7AHI handled lots of traffic for the men aboard the Naval Supply Ship *Sirius* and for the movie outfit near Teller, Alaska. K7BLI reports a bridge and the land lines of the Copper River Northwestern Railway have been washed out. The only communication now is via amateur radio. Traffic is moving via K7BLI-K7PQ. K7ATF is back on the air after two months in Bristol Bay. K7BQE has left Cape Spencer Lightstation, and his new QTH is Cape Decision Lightstation. K7BKN is selling out. K7FF and K7BMY recently joined the Army Amateurs. K7CF is on 7000 kc. daily from 4:30 to 5:30 p.m. K7CEE has folded up and gone south. K7FF again hits BPL. K7CKK sent his report to HQs via W7BVA. K7AIF has returned to W7AF at Decatur, Wash.

Traffic: K7BZX 2, K7BHR 8, K7BWQ 8, K7AUM 8, K7TF 24, K7ARL 29, K7ANQ 31, K7BDV 42, K7CF 57, K7ATD 62, K7BLI 101, K7AHI 110, K7BUI 131, K7PQ 134. K7BMY 179, K7FF 529, K7CKK 113, K7CEE 62, K7BND 203, K7BOE 13, K7AIF 45.

PACIFIC DIVISION

NEVADA — SCM, Keston L. Ramsey, W6EAD — W6AJP blew his 50 watter. W6CRF is building a 75-watt portable. W6BYR is on 'phone again. W9DFF is in Nevada awaiting a W6 call. W6AAX is building a crystal job. W6FUO ordered a crystal. W6EEF has a push-pull MOPA. W6EAD visited W6ATN. W6UO is busy on Mondays with A.A.R.S. The R.I. will be in Reno soon. W6FMS is working night shift for a while. W6FKY must have found a YL. Please send in your reports to your SCM on the 16th of each month.

Traffic: W6UO 28, W6AJP 27, W6EAD 18.

SANTA CLARA VALLEY — SCM, Bruce Stone, W6AMM — There is an increase in stations reporting traffic. Let's keep up the good work and place a little more stress upon the traffic end of the game. Look at W6HM's report for two weeks' operation on trans-pacific work. W6DSZ is handling most of the traffic for T15FI, Cocos Island Expedition, to their head office. W6AMM's is also trans-pacific. W6CUZ and W6CDX come through with their first reports. W6FBW and W6BMH are newly appointed RMs. W6DBB, W6DSE, W6BMH are working for ORS appointment. W6BMH is now signing W6QR; he is doing some fine work clearing traffic from the Stockton County Fair and the American Legion Convention at Oakland. W6ALW is now using an '04A. W6NX has been promoted to the grade of Lieutenant in the U.S.N.R.

Traffic: W6HM 248, W6AMM 229, W6CUZ 60, W6FBW 49, W6DBB 38, W6QR 30, W6NX 10, W6ALW 11, W6DHV 7, W6BDR 7, W6FMT 6, W6CDX 6, W6DSZ 251.

EAST BAY — SCM, S. C. Houston, W6ZM — ALAMEDA COUNTY — KCRM — Ken Ross, W6ATJ. W6ATJ makes the BPL, leads the Section, and is in the lead for the section traffic trophy which will be awarded October 15th at the close of six months' contest. W6CDA has been appointed in the A.A. Net using the call WLV-3. W6RJ says he is keeping summer schedules — "sum r here and sum r there." Hi. W6WX dropped off some this month as W6USA has quit. W6BIS sends in his first report as ORS. W6DUB was visited by W8BTU. W6CDP is getting higher power. W6ZM is busy lining up shows for the fall season. W6CSV and W6DKJ are plugging along out in Albany. New reporters are W6GMX, W6FWO and W6EGZ. W6CIZ is building a crystal rig. W6EKB has a new zepp on a 50-foot stick. Jack Tait (Ex-W6IT) got his old call back, and will be on soon with crystal. Contra Costa County: W6EJA has a schedule with W7AIT. W6BIG has an SW-3. W6AAT has his pet power leak. Napa County: W6CAN says 56-mc. work rotten up there. W6ETL and W6DPB from Los Angeles were visitors to local stations during the American Legion Convention here. P. E. Current, Interference Investigator for the Pacific Radio Trades Association, was the speaker at the last section meeting, and you fellows who were not there sure missed a good talk. Get the habit of coming down to the section meetings on the last Friday of every month at the Oakland Radio Clubrooms, 1551 Alice St., Oakland.

Traffic: W6ATJ 852, W6CDA 228, W6RJ 102, W6WX 34, W6BIS 34, W6EJA 30, W6DUB 27, W6CDP 22, W6ZM 22, W6GMX 21, W6CSV 19, W6EGZ 17, W6CIZ 10, W6CAN 8, W6EKB 7, W6DKJ 3, W6FWO 6, W6AAT 1.

ARIZONA — SCM, Ernest Mendoza, W6BJF — This report prepared by Ruby LaRue, W6BRI. W6CAP is about set for the Convention. W6CVR sure is coming up with traffic. W6CQF departed for Kansas on vacation. W6FZQ (W2API) is preparing for fall. W6CHR, of Wickenburg, is a new Arizona station according to W6FZO. W6HS-W6DKX, now W5RM-W5ZZZ, visited W4TM. W6BLP and W6CVR are going to attend the Pacific Division Convention. W6CDU-W6FKX, Ex-W6DXC, W6COI and W6BJF are leaving for the annual two-week National Guard encampment near Flagstaff. Daily radio contact with Phoenix is assured with the coöperation of W6BCD and W6BRI. W6GJC is getting the bugs out of his new MOPA. W6BJF received a 2-letter portable call — W6QC. Robert Kirly of Tucson is new A.R.R.L. member. Ex-W6CWI, now W6CKF, is about ready to put his '52 MOPA on the air. W6GDF is a new ham in Tucson. W6FKX is helping to put the Guard band over in fine style. W6GCU is also attending camp at Flagstaff. W6DXC is a radio operator at the encampment, as are W6COI and W6CFG. W6CVW is putting forth a lot of effort to contact W6CLE.

Traffic: W6CDU 153, W6CAP 88, W6CVR 88, W6CLE 49, W6CQF 28, W6CVW 16, W6CEC 14.

SAN FRANCISCO — SCM, C. F. Bane, W6WB — Thanks to some fine work on the part of some of our stations in handling traffic from the National Shrine Convention, with splendid help from Capt. Woolverton, W6PQ, we finally boost ourselves over the 2000 mark once again. The RM and SCM want to particularly thank the following stations for their fine work on the Shrine traffic: W6MV, W6CBN, W6DZZ, W6FPU, W6BNA, W6IU, W6CIS and W6AAM. W6CAL and W6WB were also very active. W6CAL was responsible for all the "planning" concerning "Shrine Convention" traffic. We sure want to give W6PQ a cheer for his particularly brilliant report this month. Old

W6BGW is back on the air. W6BNA has decided to move his QRA. W6MV has built himself a new shack. W6DZZ is playing with MOPA. W6CBN was just going strong when he had to go back to school. W6FPU sends in a splendid traffic report. W6NK expects to better his rather low total next month. W6IU helped W6CAL collect convention traffic and also handled a batch himself. W6OS is planning on super power crystal. W6BVL still has his pet power leak. W6ADK reports being heard by VK on an *overtone!* W6KJ gathered in a bunch of Naval Reserve traffic. W6DTA reports things looking brighter. W6WF reports some trouble with his power supply. W6FPE has his crystal set going strong. W6CZK is now a big college man. W6ZS in San Anselmo reports for first time in ages. W6ERS worked a ZS. W6AKU expects to soon be on 56 mc. with a good set. W6WB has now been heard in 51 countries. All applicants for ORS will have to pass examination over the air, conducted by the RM. See the RM about ORS appointments.

Traffic: W6PQ 849, W6BGW 265, W6CAL 139, W6BNA 114, W6MV 101, W6WB 97, W6DZZ 82, W6CBN 74, W6FPU 72, W6NK 63, W6IU 44, W6OS 50, W6BVL 25, W6ADK 17, W6KJ 15, W6DTA 9, W6WF 7, W6FPE 7, W6ERS 7, W6CZK 6, W6ZS 3.

SAN JOAQUIN VALLEY — SCM, E. J. Beall, W6BVY — W6AOA turned in an FB report. W6FFP came through with a nice report despite the slack season. The new frequency of W6DQV is 3510 kc. W6AME is messing around with electron coupled oscillators. W6FFU came in third in April ORS party in this district. W6CYY worked South America for his fourth continent on 14 mc. W6DQR and W6CYY have applied for U.S.N.R. cruise. W6EPQ has his WAC. W6BIP is very active with schedules. W6FRH turned in his first report. W6SF reports W6DXL gave the boys a surprise by getting married. W6CGM has not been on long, but the older men had better watch his smoke. W6ASV is on 24 hours a day; the ops are W6EMI-BIL-ASV-ex, AB-. The U.S.N.R. gang, in command of Lieut. Beall, staged a real get-together at Lake Yosemite, with about sixty communicators from this district present. W6EKH moved his shack to a new location. W6COJ and W6BVY have been experimenting with self-rect hi-power tubes as final stage amplifier as an economical move to save on the big condensers and chokes.

Traffic: W6AOA 305, W6FFP 30, W6DQV 28, W6AME 20, W6FFU 39, W6CYY 70, W6DQR 32, W6EPQ 8, W6BIP 354, W6SF 20, W6FRH 5, W6BVY 43.

LOS ANGELES — SCM, Hal E. Nahmens, W6HT — No doubt about it, gang. The Los Angeles Section is awake! THREE banners in a row! We made new records last month, but this month is a honey! 10,516 messages were handled, making an all-time high for the Section! 145 stations report traffic — an all-time high for the entire country! Report traffic on the 16th and you will receive your copy of the *Dope Sheet!* W6USA, W6ETL, W6DQ and W6BPU make the BPL this month. Los Angeles County: Without W6USA the above would have been impossible. Real ops, real station, real traffic! 5,682 messages handled in 60 days. MIM. Our sincere thanks, fellers. W6ETL took death message from KA1HR, phoned it to Berkeley and had answer back to Manila in 13 minutes. FB! W6DER reports FB total via delivery net. RM W6BPU makes BPL for first time! Congrats. W6AYL helped W6USA with trans-pacific traffic. W6ALD is doing excellent work as Navy Net control. W6CCF has 56-mc. 'phone rig on air. W6FGT handled message to Bill Graber. W6AKD is doing excellent work in veterans' relief network. W6EXQ is rebuilding for higher power. W6EKZ-W6ZZAB mails report from S.S. *Prince George* enroute to Alaska. W6EBK helps out by mailing in report for W6FXF. W6EDW praises local delivery net. W6DWP has hopes of winning the crystal offered by W6BPU in delivery net contest. Power leak ruined schedules at W6FRB. W6KH is back on air. New a.c. receiver at W6BLS. W6EUV handled flock of Olympic traffic. According to W6ETM the 6th District A.A.R.S. will soon be a directed net on 3520 kc. W6COF gets more sock in antenna since he overhauled rig. W6AFU had FB time at last ORS Party. W6CTT is installing new Class A and B speech amplifier and modulator using '46s. W6TE received heard card from Wales. Portable W6DKQ was in operation at Morgan Park. W6BSW has portable W6BOB at Hermosa for summer. W6EGJ reports regular as clockwork. W6CZZ is now crystal-controlled on 3561 kc. W6CUH handled South Africa traffic for W6USA. W6AM is still looking for the 75 feet of antenna the aeroplane ran off with. Hi. W6DZI has new current fed antenna. W6FFN is experimenting with a dynamic microphone. W6DVV's crystal-controlled '52 rig will be used at the L. A. County Fair. W6ON reports excellent attendance at Pasadena Short Wave Club meetings. W6DLI is all set in new shack. W6BHP is rebuilding to crystal control. W6BVR is handicapped by power leak. W6CEM is returning to 3.9-mc. 'phone. W6AEO is lining up schedules. W6CAF handled traffic for the Junior Chamber of Commerce Convention in Pasadena. W6HX and W6GHX are new hams in Los Angeles. W6EEA has schedule with K7BVI. W6GAL worked more DX in his first month than most hams do in a year. W6BER, W6BSW and W6EXA spent summer at Hermosa Beach. Beach parties and moonlite are keeping the light bill down at W6BGF. W6CXW says DX OK, but local QSOs punk. W6HT hopes to be on air again after convention. W6ANN craves a snappy traffic schedule on 7 mc. W6CNH is kept busy at KFAC. W6FEW will be on deck at the L. A. County Fair ham station. W6DSP reports the following: W6ABK joined the Army and W6BEK joined the Navy. W6BIF made WAC. W6DNF is rebuilding. W6BCK installed '60s in push-pull in last stage. W6DKM reports the 1.75-mc. gang as follows: W6DUC, EYJ, BYJ, FHL, FHI, CEM, APD, CTT, ENX, DQT, CQK, FJA, ESX, DAY, CSP, FAY, FJW and DKM. A checker club has been organized; EYJ and DUC are the champs. W6DZR bought a new Plymouth in the morning and turned it over before the day was over. W6BEE had to resign from delivery net due to night work at Post Office. W6CVF is entertaining his mother, who is visiting from the east. W6FDQ has new MOPA. W6EV lost KA1JR schedule due to the latter installing 'phone. George Dery of W6HG-CHT and W6ARF got married. Congrats! W6DEL is working lots of DX on 14 mc. W6ZZBK is 50-watt crystal-controlled portable of W6FKF. W6ADH is off air again due to moving. W6LM-UJ is building FB radio shack atop his garage. W6BYF kept the local boys in touch with the American Legion Convention in Oakland by ham radio. W6EK is afraid she will never make a sea op, 'cause she was seasick coming home from Oakland on the *Yale!* Hi! W6WO is rebuilding entire station. W6YBB hopes to have a modern receiver soon. W6MA says her son Bill is good for 5 words per. New Morrill filter installed in W6ZZA gives greater capacity in smaller space. W6DLN is new reporter from Bellflower. W6CGP is doubling in his crystal stage. Work at field has doubled for W6AGF due to 2nd op flunking aeronautical exam. K6DVZ was visitor at W6BVZ. W6ESA is getting back on air after three months of illness. W6RZ obtained commercial ticket. W6DRZ worked his first VK. W6CEU would like to have reports from hams who hear his official broadcasts. W6ELX is on 1.75-mc. 'phone. W6LN has moved to Huntington Park. W6VO had to make trip to Nebraska and missed convention. W6EMJ is back on air after year's silence. W6DQZ and W6DWP have a private traffic contest. W6DWP is out to win the crystal in the Delivery Net Contest. W6DPB's 56-mc. sigs were picked up on Mt. Wilson. W6EKZ says when he dropped in on YL W7AGT, she was copying press solid at about 48 wpm. Due to living at W6USA, W6ETJ turns in first goose egg in over three years as ORS. W6DNA is back on air again after long illness. W6GLH and W6GMA are new hams in Baldwin Park. W6FJS is building a super. W6FGQ spent vacation at Catalina. The new officers of the Glendale Radio Club are: W6AYF, President; W6DNF, Vice-President; W6DWP, Secretary; W6DZL, Treasurer. A new club has been organized in Covina, the San Gabriel Valley Short Wave Club. The officers are: W6IS, President; W6FFN, Vice-President; W6BDH, Secretary; W6CDM, Treasurer. This organization expects to handle some real traffic at the L. A. County Fair. W6EBK will be the chief op. New reporters this month are: W6ZZAB, W6FWW, W6FKF, W6CAF, W6EMJ, W6CEM, W6DQZ, W6HX, W6DVV, W6GFE, W6CEU, W6EHP, W6FDM, W6FXF, W6DKQ, W6FZ, W6BFL, W6FOW, W6ELX, W6FEC, W6EYZ, W6DRZ, W6FFN, W6DLN, W6DFO, W6BCT,

W6DQZ, W6AQP, W6DRZ!! Surely appreciate your reports fellers, and look forward to hearing from you regularly. Santa Barbara County: W6BZF is again high man with W6EZK close on his heels. W6DJS shows marked gain in traffic. W6EDZ keeping daily schedule with Oakland. W6EMY has FB report. W6YAU has closed down indefinitely. We'll surely miss you, ol' timer. W6AKC has been appointed Commander of Unit 2, Section 7, U.S.N.R. W6FNK has been fighting bugs in his '52 crystal rig for six months. W6AIY is still working at airport. W6GLA has been appointed OBS for Santa Barbara. W6LC intends to report regularly. W6GKB is new ham in Santa Barbara. W6GKE has returned to his home in Tracy. W6DIU is back from 'Frisco. Riverside County: W6NF is high point station as usual. Bogue of W6NF-W6CFN has moved to Los Angeles. W6EFY is going to build the latest QST super. W6DLV on vacation. San Bernardino County: A good schedule put W6CVV at the top. W6BMC is new ORS in Upland. W6FTV was off air most of time due to blown filter. W6BIK is back on air with W6FBT as second op. Power leak has W6FNG worried. W6FYT made WAC in his first three months of operation. W6DGL says weather too hot to handle traffic. W6FEC is back on air with 1.75-mc. 'phone rig and 3.5-mc. c.w. San Luis Obispo County: W6DWW says it seems good to handle some traffic for a change. W6ALQ overhauled antenna, heard Portugal and worked OA4AL. W6FNP is very QRL account of deer season. Ventura County: W6DJZ returned to Santa Clara University with grid modulated '50-watt rig so he could QSO his OM, W6BHO. W6CVK rescued a complete 50-watt transmitter from an ash can. W6DMY is teaching his YF the code. We are well on our way to our goal of 200 reporters — let's continue forward!

Traffic: W6USA 4075, W6ETL 521, W6DER 345, W6DQ 331, W6BPU 328, W6AYL 300, W6NF 234, W6ALD 233, W6CCF 194, W6BZF 168, W6FGT 165, W6AKD 155, W6EXQ 150, W6EKZ 143, W6EZK 142, W6EBK 119, W6DJS 117, W6BZZ 117, W6EDW 106, W6EDZ 105, W6EMY 101, W6DWP 98, W6FRB 97, W6ELS 95, W6EUV 92, W6CVV 83, W6ZZAB 78, W6ETM 73, W6DQZ 71, W6BMC 66, W6AKW 65, W6COF 62, W6AFU 61, W6YAU 58, W6BVD 54, W6CTT 53, W6TE 50, W6AHQ 43, W6DKQ 40, W6FTV 39, W6BOB 39, W6FNK 36, W6EGJ 36, W6CZZ 35, W6BIK 34, W6CUH 32, W6AM 31, W6FNG 30, W6FYT 26, W6CTD 25, W6ELX 23, W6DZI 23, W6FEX 22, W6FFN 21, W6DZC 20, W6DVV 20, W6ON 20, W6FJS 19, W6DLI 18, W6BHP 18, W6BVR 18, W6CEM 17, W6AIY 16, W6BCT 16, W6AEO 16, W6GLA 15, W6DWW 15, W6ALQ 15, W6DKM 15, W6CAF 15, W6HX 15, W6EEA 14, W6LC 12, W6GAL 12, W6TN 12, W6DJC 12, W6CZT 11, W6FZ 10, W6BXH 10, W6LY 9, W6AAN 9, W6BER 9, W6EYZ 8, W6BGF 8, W6EWK 8, W6CXW 8, W6HT 7, W6ANN 7, W6BME 7, W6FWW 7, W6CNH 7, W6EHP 7, W6FXF 7, W6FEW 7, W6DYQ 6, W6DBJ 6, W6DFO 6, W6DSP 6, W6FXL 6, W6BCK 6, W6AQP 6, W6DZR 6, W6FXR 6, W6VH 6, W6BEE 5, W6CVF 5, W6AYF 5, W6FDQ 5, W6EV 5, W6ERL 5, W6HG 5, W6DEL 5, W6DGL 4, W6FNP 4, W6FKF 4, W6ADH 4, W6LM 4, W2ZZCG 4, W6BFL 4, W6FMP 3, W6EK 3, W6BYF 3, W6DQI 3, W6WO 3, W6YBB 3, W6MA 3, W6ZZA 3, W6EFY 2, W6FTH 2, W6FEC 2, W6DLN 2, W6CGP 2, W6FFF 2, W6AGF 2, W6BVZ 2, W6ESA 2, W6BBO 2, W6RZ 1, W6DRZ 1, W6FGQ 1, W6GFE 1, W6FJP 1, W6DLV 1, W6FDM 1, W6CEU 1.

SAN DIEGO — SCM, H. A. Ambler, W6EOP — W6UA turned in a nice total; he leaves soon for college and will be on in Michigan with call W8EF. W6BKZ has a new 'phone on 3.9-mc. band. W6FQU had to move, and lost several on his total. W6BCF attended the Olympics. W6ACJ is out to sea on the U.S.S. *Eagle*. W6AKY made a score of 200 in the ORS Party. W6EOH is on with a new crystal rig. W6CTP found time to handle a few. W6BAM, only a few miles from Los Angeles, says he has a hard time to raise any traffic handlers there. W6CTR has a new two letter call, W6LD. W6BHV is a new reporter. W6AYK says ORS Party was a success at his place. W6AXN says the hot weather keeps him off the air. W6DLR will be on soon. W6QA has been in Los Angeles. W6FOM has his eye on an ORS ticket. W6FSH is on with a new 1.75-mc. 'phone. W6BOW is building a new 1.75-mc. 'phone. W6DNW is QRL. W6AMO worked three new countries.

Traffic: W6UA 457, W6BKZ 105, W6FQU 85, W6AMO 57, W6BCF 51, W6ACJ 40, W6AKY 28, W6EOH 23, W6CTP 19, W6BAM 15, W6CTR 11, W6BHV 5, W6EOP 5.

PHILIPPINES — Acting SCM, Newton E. Thompson, KA1XA — KA1JR is building new 500-watt transmitter. KA1LY opened up August 10th with 250-watter. Last month lost OM1TB, and now OM2TG. Says closing down August 20th, leaving for States. KA1WR and KA1XA will have crystal 75-watters about September 10th. KA1NA with crystal is using pentodes. KA1TS moved station to new location. KA1LG is testing 250-watter. KA4HW increased his input.

Traffic: KA1HR 923, KA1LG 352, KA1CM 103, KA4HW 46, KA1JR 38, KA1PB 20, KA1SP 9, OM2TG 558, KA1NA 173, KA1LY 77, KA1CO 41, KA1TS 31, KA1XA 20.

HAWAII — SCM, C. D. Slaten, K6COG — This report received by radio at W6DQ from K6COG and mailed to Headquarters. Traffic much better this month. The Oahu Amateur Radio Club has grown to 45 members and has established permanent clubroom in the Young Hotel in Honolulu. K6AIU helped K7UT out of a hole with a stack of KPH traffic. K6CRT is set up a block from K6COG with a pair of '10s. K6FZO, K6FVL, K6CCO and K6FVH are new stations. K6BAZ has been off the air with flu. K6FJF is on 150-meter 'phone. K6EM is building 500-watt job. K6COG is building new bug. K6AUQ and K6FVH have been testing 56-mc. 'phone. K6DVZ is leaving Islands to become W5BRM. K6DXD will be on the air soon.

Traffic: K6AUQ 852, K6YAL 523, K6AJA 163, K6COG 144, K6EBR 137, K6AIU 74, K6EM 62, K6FVH 50, K6ACR 50, K6BAZ 32, K6CRW 25, K6BJJ 26, K6CIB 12, K6CRT 6, K6EDH 4.

SACRAMENTO VALLEY — SCM, Paul S. Farrelle, W6AXM — W6AIM'S traffic schedules are working FB. W6EOU has the high-power fever. W6AK is doing fine work with the U.S.N.R. W6APJ is back in town. W6DVE sends an FB traffic report. W6AXT is trying to make his 56-mc. rig work. W6FRP is traveling around California with 1.75-mc. portable. W6GAC is a new call at Auburn. W6GDJ is getting to be quite a speedburner. Hi. W6GR has a new 7-mc. crystal rig. Seen at the National Guard camp were W6BSQ, W6CMA, W6FMX, W6EMK, W6DYF and W6AXM. W6CAW joined the Naval Reserve. W6BLX is quite an aviator. W6EJM is on the air again. W6EOC is on the air with low power. W6AXM has taken up aviation. W6BYB was seen taking his YL for airplane ride. Hi. Please send in your reports on the 16th of each month.

Traffic: W6AIM 371, W6DVE 112, W6APJ 37, W6AK 29.

ROANOKE DIVISION

WEST VIRGINIA — SCM, C. S. Hoffmann, Jr., W8HD-WLH3 — Some notable relay work was done by W8ZZAF during a three-week Boy Scout encampment at Mill Creek. The set consisted of an '01A with 135 Volts B Bats. Schedules were handled daily with W8GEG and W8GBF, a distance of 100 miles. Both W8ZZAF and W8GEG made the BPL, handling Scout messages and hundreds of words of press daily. W8GBF keeps daily schedule with W8BTV and W3AKN. W8JM is on with new crystal rig. On vacation he visited VE3CP. W8DSO hasn't time to be on with his '04A push-pull job. W8HOJ is working at WMMN, and building a 'phone set. W8FQB and W8GAL are on with MOPA jobs. New hams in Fairmont: W8HHP, W8HOJ, W8ZZBJ, W8HSA. Ex-W8VZ hopes to get on the air soon. W8GQC, W8CLQ, W8AIC and W8GEG went to Wheeling for radio exams. W8EKK worked Pa∅. W8CDE and W8GOQ are only hams in McDowell County! W8CVX is new ham in Grafton. W8BKG has portable W8BPM, and is building new crystal job. W8BHG passed amateur exam. W8BOW was heard in Australia. W8BTV is going back to Lehigh University. W8CWY has portable W8HJB. W8BWK wants more schedules with U.S.N.R. stations on 3.5 kc. W8GB made BPL, and is building 'phone job. W8DPO is again our best DX hound, working K6, VK and ZL. W8BHG, W8CSF and W8GRJ handled traffic from W6USA. Following ORS reported participating in recent ORS Contest: W8HEI (W8TI), 3003 points; W8CDV, 414

points. The Ohio Valley Amateur Radio Club held a picnic August 21st, at Oglebay Park, Wheeling, which was attended by hams from the tri-state district. W8OK is back from Army Camp. W8CDE-W8ZZU and W8EGA are working with 3.5-mc. 'phones. W8GRJ, new station in Huntington, using two '52s crystal-controlled, has made application for ORS. He operated 50C in 1921, and 9EBN in 1922 to 1926. Amateurs in Bluefield held a Hamfest during August, which was attended by hams from central and southern W. Va. The R.I. visited the Hamfest to give exams, and from there went to Charleston, Huntington and Wheeling. W8HD has as out-of-town visitors: W8GEG-W8ZZAF, W8CLQ, W8AIC, W8DVX, W8CXC, W8VR, W8TW, W8ERR and Ex-W4KF. ORS certificate endorsed for another year: W8BOW.

Traffic: W8ZZAF 368, W8GEG 430, W8GB 386, W8BOW 81, W8GBF 50, W8BTV 50, W8HEI 32, W8BWK 35, W8CSF 32, W8FQB 27, W8DPO 25, W8GRJ 25, W8BHG 24, W8JM 22, W8CDV 10, W8CWY 16, W8ELO 11, W8BKG 4, W8HD 4, W8GOQ 3, W8CDE-W8ZZU 1, W8EKK 2.

VIRGINIA — SCM, R. N. Eubank, W3AAJ — W3ZU is rebuilding. W3COO is new station at Broadnax. W3CNY and W3COJ are new stations at Roanoke. W3AUG is QRL Naval Reserve. W3BDN is putting up 1.75-mc. antenna. W3CCK-3RL is building swell c.c. rig. W3WO applied for Ensign's commission in U.S.N.R. W3AOT is QRL club and new shack. W3WM had tube pop. W3ACN was sick three weeks. W3GY is QRL WLVA. W3ZA has swell new 'phone rig. W3BZ is on quite regularly. W3BGS is only on Sundays. W3BJX is handling lots of traffic. W3AKN blew Rectobulbs. W3BAN sends another swell Official Observer list. W3FE went to Camp with N.G. W3BZE sends first traffic report. W3CFL now has portable W3COW. W3CMJ went to N.G. camp. W8ELJ visited W3BRY for two weeks. W3NT comes back to traffic list. W3BUO has new 50-watt c.c. rig. W3EJ wants outlet for traffic. W3BYA sends first traffic report. W3BWA worked ON4UL on 7 mc. W3BBA makes first report a traffic one. W3CXM reported before leaving for vacation. W3AZU reports from Illinois. W3CLH is new station at Winchester. W3BAD visited Cincy. W3CLD worked W1, 2, 3, 4, 8, 9, VE 2, 3 last month. W3BAI was visited by W3AJA, W3AKN, W3IQ and W3NE. W3AAJ will be on September 1st with new rig. W3BLJ is forming club. W3FJ is now Lt. Natl. Guard. W3FJ-3CMJ-3FE-ex3ASA operated 3CLZ at Va. Beach Nat'l Guard Camp in August. W3ABM is new station at Big Stone Gap. W3CNY and 3COJ are new stations at Roanoke. W3ZZAU is portable call of W3BAI. W3APT reports 7 mc. FB. W3AEI has FB new outfit. W3CEY, W3CIE, and W3BXN report traffic. W3NE has M.G. W3APU wants schedules. W3BMN is planning FB shack and rig. W3BSB is putting in P.P. TNT. W3AVU is back from Scout camp. W3AVR blew transformer. W3BSW is QRL work. A new club has been formed in Staunton. W3AGY took extra first exam at Bluefield (W. Va.) Hamfest. W3AIJ is rebuilding to c.c. W3BDN will be on 1.75-mc. 'phone and 3.5-mc. c.w., September 1st. W3BLJ is working on club. W3BEV is awaiting license renewal. W3BFQ's QRA is now 3020 Edgewood Ave. W3GE is back on the air. W3CCK is working on new 'phone and c.w. rig. W3BUR has a new RCA 211. W3AH will be operated September to June at V.M.I. by Osborne W3CIE and Baldwin W3AII. A club will be formed. W3ATK is new station in Norfolk. A recent survey made by the SCM shows that 50% of Virginia stations are crystal-controlled. Anyone in Virginia who is not receiving Virginia Bulletin monthly, drop SCM a card. Do YOU KNOW OF ANY NEW STATIONS IN STATE??????

Traffic: W3NT 211, W3EJ 202, W3CXM 108, W3BJX 55, W3CLH 49, W3AKN 13, W3FJ 10, W3CLZ 10, W3BYA 6, W3BUO 6, W3FE 11, W3BZE 5, W3CMJ 5, W3BWA 5, W3BBA 5, W3ACN 5, W3BAN 3, W3CFL 3, W3AZU 2, W3BAD 2, W3WO 1, W3AAJ 5, W3COO 1, W3CLD 4, W3BAI 12, W3APT 8, W3AEI 8, W3NE 6, W3APU 6, W3BMN 4, W3BSB 4, W3AVU 2, W3AVR 1, W3CEY 7, W3BXN 12, W3BUR 2, W3CCK 5, W3CIE 1, W3CAK 6.

NORTH CAROLINA — SCM, H. L. Caveness, W4DW — The first of a series of monthly hamfests for the amateurs of the central part of North Carolina was held at W4EG's shack on August 21st, with about 30 hams present. After a watermelon feast, given by W4EG's OW, the gang visited some of the local ham shacks and then went down to inspect the broadcast station, WPTF, which donated time on the air for a fifteen-minute talk on amateur radio, read by W4DW. W4UM carried his portable, W4PFC, to a Boy Scout camp, and kept the boys in touch with the home folks. An electron couples detector-oscillator is the arrangement W4RX has in his new receiver. W4AFE and W4AEH handled traffic from W4PFC. Working up a Naval Reserve unit in Tarboro is keeping W4RE busy. W4CP has a new rig using two '10s in push-pull. W4AGD and W4DW attended army camps for two weeks' active duty training. W4BCG finally got his push-pull to work satisfactorily. W4EC handled quite a few messages from W6USA. A wind storm blew down W4AAE's antenna pole. "RW" of W5FW spent his vacation in Concord. W4ATS and W4MR continue to work good DX on 14 mc. W4IF is planning to enter State College in September. Very creditable work in traffic handling has been done by W4GZ this summer. It seems that W4JR can't get work out of the way of amateur radio. W4IW has moved to Greensboro. W4ZH has been appointed OBS. W4AGH-W4PDC has been on the air seven years, and has been operator at W9EZ, W9BDV, W9ACJ, W4FR, W4WE, and W4AGH-W4PDC. W4GC has entered Campbell College. W4TP and W4BHR have been conducting code classes this summer. W4BHR has built a push-pull job. The Winston-Salem gang have completed their new clubhouse, and will hold their formal opening in September. W4ABT has been laid up with "flu." W4BQC is a new ham in Winston-Salem. W4BJZ, W4IY, W4RA, W4AHF, and W4BUI are on 7 mc. W4ZN has been north looking for work. W4PA is planning a crystal-controlled job. W4ABT, W4ARB, and W4OG attended the Bluefield (W. Va.) Hamfest. W4ACY's 'phone was reported heard in Russia. W4OC is installing Class B modulation with condenser microphone. W4JB, ex-W4UI, is using an electron coupled push-pull oscillator and two stages of push-pull amplification on 3.5 mc. W4TN recently passed the North Carolina bar examination.

Traffic: W4PFC 224, W4AFE 121, W4AEH 80, W4GZ 43, W4ZH 38, W4EC 36, W4BCG 35, W4PDC 22, W4IF 13, W4RE 6, W4ANU 4, W4MR 2, W4ATS 2, W4RX 2, W4ADK 1.

ROCKY MOUNTAIN DIVISION

COLORADO — Acting SCM, Artie Davis, W9BJN — Our SCM, E. C. Stockman, is still at the hospital. W9JNV leads the totals this month. W9EYN and W9EOQ are building 1.75-mc. 'phone. W9DNP is busy at KVOR. W9GUW is working in Colorado Springs. W9FYR visited the Denver gang. W9IFD built a PP TGTP. W9JFD is building a new outfit. W9FYL and W9JFQ visited the Loveland hams. W9DQD keeps his schedules with W9HTU. W9CDE keeps his Army Amateur schedules. W9EHC will soon have his 'phone going. The Pikes Peak Amateur Radio Association elected its officers with W9DNP President, W9EYN Vice-President, W9EHC Secretary-Treasurer, and W9EXV Sergeant-at-Arms. They meet the second and fourth Tuesday each month at the Radio Hospital in Colorado Springs. W9DNK and W9CWA are on a two weeks' cruise on the U.S.S. *Oklahoma*. W9BCW keeps schedule with W6MK. W9EHP is busy at KGIW. W9CJJ worked K5AA on 14-mc. 'phone. W9AUJ is rebuilding. W9BYY is on 7 mc. with crystal. W9KV is busy at Estes Park. W9FCK and W9HPY are busy mining; they have a portable, W9KFJ. W9CND is working on a high-power layout. W9APR is experimenting with new antennas. W9FYY has a '52 in a crystal rig. W9EBR is building up a low-power crystal outfit. W9AQN is installing crystal. W9BTO does his monthly rebuilding. W9CBU is on some. W9BQO is busy at Phone Co. W9AAB is working on his low-power outfit. W9FRP moved his transmitter to the basement. W9DSB is busy at KLZ. W9BXQ is helping the cops work. W9EAM and W9EKQ are holding their Army Amateur schedules. W9IAV is pounding out. W9RJ gets out well. W9WO is back from school. W2KR, ex-W9ENM, is back in town. W9CAA will be in Denver soon for a visit. W9JNV would like to get in touch with any 9th district amateur who is interested in 1.75-mc. 'phone.

Traffic: W9JNV 530, W9HJS 21, W9EHC 4, W9CDE 4, W9DQD 27, W9EPC 26, W9FYY 24, W9BJN 14.

UTAH-WYOMING — SCM, C. R. Miller, W6DPJ-W6ZZZ — Wyoming, Utah and Idaho were represented at the hamfest held at the Trail Ranch of W7AWG in Jackson Hole, Wyoming, August 14th. About 20 hams were present. And over in Casper W7NY and YF entertained the club with a big picnic, at which about 40 were present. W7CJR set a new ice-cream eating record, while W7AMU, W7BTE and W7ACQ took the hot dog, baked beans and sandwich titles respectively. All extend thanks to W7NY and YF. W7AAH and wife visited Casper. W7AWG is thinking of putting in crystal. W7ANU schedules W9EBW. W7BXS can't decide which band to use. W7CJR wants crystal. W7CHR and W7ACG are having station troubles. Utah: W6DPJ made the BPL. He and W6APM attended the Jackson Hole gathering and stayed in Teton Park a couple of weeks, during which time W6ZZZ was on and worked all districts. W6EXL and W6BSE went on a canyon trip. W6BLE finished his new receiver. W6FRN is interested in an ORS appointment. W6FYX is getting out fine with a pair of '10s in PP TNT. W6CNX was sick in bed for eight days. He and W6DWH missed the Wyoming Hamfest, due to illness. W6GGR, a new 1.75-mc. Salt Lake City 'phone man, would like to hear a few more Utah 'phones on that band. W6DPO finished rebuilding temporarily. W6BTX is back again. W6DEU is having transmitter troubles.

Traffic: W6DPJ 528, W7AWG 78, W6APM 26, W6DPO 22, W6EXL 14, W6ZZZ 14, W6FRN 10, W6BLE 8, W7ADF 8, W7ACG 5, W7BXS 4.

SOUTHEASTERN DIVISION

ALABAMA — SCM, L. D. Elwell, W4KP — We welcome back an old-timer (ex5ACM-ex4AJY) as W4WO. Also Ex-SCM W4AAQ comes in with an FB report. W4ZC is QRL with serious illness at home. DX and traffic keep W4BGO busy. W4BAI works all three bands. The Hidden Transmitter Hunt went off with a bang, in Birmingham. W4DD won the crystal. The gang at Birmingham organized a new radio club with W4ASW President, W4AJP Vice-President, W4PAI Secretary and W4DD Treasurer. W4ASW, W4PDX and W4ZZ are going to National Guard Training Camp. W4EA is out for 1.75-mc. 'phone. W4GN has a new A.C. receiver. W4AYK changed his college QRA to Tuscaloosa. W4ALA is candidate for ORS. W4AP works both 'phone and c.w. W4AEZ visited hams in Atlanta. W4ADJ is putting in a 50-watt c.c. rig. W4OA is on 3990-kc. 'phone. W4GP is rebuilding. W4NU and W4AQO are on 7 mc. W4FB is to stage a come-back. W4OA's YL expects to be on with a call soon. Many thanks to Mr. McDermott, Jr., for the FB report. W4FI and W4BCB are back after a vacation. The SCM can't find time to operate much. W4AGI has a 50-watt rig. W4AHU has an MOPA on 14 mc. W4JX, W4BJA, W4BOU and W4BCP are coming back on. W4KO and W4AKX have FB rigs. W4AIY has left for North Carolina. W4AXU needs more power to kick out. W4BOE is an ex-Navy op. W4BEU and W4ARF are spark-day old-timers. W4BBA and W4BFP are getting out FB.

Traffic: W4KP 50, W4BBA 38, W4ARR 35, W4DD 18, W4AJP 18, W4BGO 16, W4AAQ 7, W4BAI 5, W4AYK 4, W4AP 4, W4ZS 5, W4AJC 3.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES-PORTO RICO-VIRGIN ISLANDS — SCM, Chas. W. Davis, W4PM — W4SS reports new "jr. op" at his shack. FB, OM. W4AZT wants ORS. W4BW says lots of traffic handled. W4UT is new OBS on 7265 kc. W4DK is now OBS in Macon. CM2WW wants O.O. W4KR is now ORS. W4BO reports hearing "QRR" from W5AUX after Galveston, Tex., hurricane — he sent QST requesting hams to QRX for emergency traffic from Texas. CM2DO doesn't block CM2WW's receiver now. (WW has moved to new QRA.) CM2SV, CM2RC, CM2LC and CM2RZ are on. CM2NA has all-a.c. receiver. CM hams would like to contact some ham in Isle of Pines. Atlanta Radio Club met with W4BEY in Hapeville. — W4OT was elected secretary. — Several out-of-town hams present including W4OL of Lagrange, Ga., and W4BAG of Monroe, Ga. W4MO wants ORS. The SCM will be back on for A.A.R.S. opening about September 1st. The Atlanta U.S.N.R. unit wins prize for best in the U. S. for second time. Congrats, W4ZA! Capt. C. L. Hoppough is new Signal Officer at 4th C.A., and, if you contact "QN" during season at W4SM, that's him. Welcome, Captain. Don't forget, gang, "no reports, no mention."

Traffic: W4BLQ 19, CM2WW 12, W4BO 10, W4BW 7, W4DK 2, W4BOB 7, W4PM 4.

EASTERN FLORIDA — SCM, Ray Atkinson, W4NN — Let's dig in, fellows, and get back the division leadership from Western Florida. Everybody report his traffic totals on the 16th of each month. Make your station a "100 total station." W4BL has a grand total of 403 messages! FB, OM. The Lakeworth Radio Club is the control station for the new "Seminole Chain," an all-Florida Net recently organized. All amateurs who are traffic men are urged to write to Dwight S. Exline, Secretary, 531 North O St., Lake Worth, Fla., and get in on this excellent plan. W4AYJ is on 56 mc. W4BNR has a new rig. W4BBN is back on the air. W4HY is rag-chewing. W4AII and W4AYJ went up for commercial second. W4ZZQ-ASA is installed at a barbeque stand. A newly organized club in Jacksonville is the Seminole Radio Club, with approximately 24 members to date. W4AZB is Secretary; correspondence should be addressed to his QRA, or to Hotel Seminole, where the club transmitter will be located. Every member of the JAROCS reported this month. Lakeland reports that W4AR, W4ATA, W4AUL, W4BL, W4BOD, W4BPA, W4GQ and W4AVQ are active. W4VP says W4BQD is a new station at Daytona Beach. W4TK has been vacationing. W4GS and W4MF were QRL Camp Foster. W4AGB is building her first crystal 'phone. W4NN is winding power and filament transformers. W4AXY is also building a power transformer. W4BMN is on 7100 kc., and wants your traffic to Miami. W4HC has a new amateur extra first ticket. W4NN and W4ASR have unlimited radiotelephone licenses. W4ASR handles traffic with TI5FI, the Treasure Expedition in the Cocos Islands. W4AKH is working DX on 14 mc. W4DE is on 14 mc. quite often. W4BHW is going in for traffic. W4AZB is an O.O. W4UX is fast becoming a traffic station. W4UJ has the highest traffic total in Jacksonville. We all send our best wishes to those attending the West Florida Hamfest, and hope they will have the biggest time of their lives. We also congratulate them for winning the Southeastern Division leadership last time.

Traffic: W4BL 403, W4AWO 48, W4UJ 42, W4AUL 21, W4ASR 17, W4VP 18, W4UX 15, W4AKH 8, W4AZB 8, W4DE 8, W4ASA 7, W4BHW 4, W4AFV 6, W4HY 3, W4AYJ 2, W4AGB 2, W4NN 2, W4TK 1.

WESTERN FLORIDA — SCM, Eddie Collins, W4MS-W4ZZP. Route Manager, S. M. Douglas, W4ACB-W4PCN — Everyone is getting ready to attend the big Hamfest at Tallahassee, where traffic handling will be a big subject besides numerous contests. W4AUA is away on his vacation, so W4ACB holds the U.S.N.R. drills over W4AUA. W4SC is active in FNG work. W4QR-W4PEL is having a time with his c.c. rig. W4AUW reports things FB on 14,000. W4AUV has been working on his station. W4ASG bought a crystal. W4BKD is pushing his push-pull rig. W4BOW is getting out OK. W4BPG is heard regularly. W4BCB pounds through with an FB PDC note. W4BMJ is getting out all around with spark coils as plate supply. W4BLW is getting his station rigged up the same way. W4BIV is having trouble with his power supply. W4AQA and W4ABK are new hams in De Funiak. W4AFT still seeks DX. W4ML keeps his 'phone hot. W4AQY reported tough luck in the ORS Contest. W4AGS-W4PCK has installed crystal in his MOPA. W4KB has been under the weather. W4ZZR is operating from the 3rd district now. W4ATN is now at his station, W6IM. Ex-W4ABJ was home for a visit. W4BGA has been working the 6's regularly. W4ASV-W4ZZW has been having power trouble — from his dad. Hi. W4VR finds it too hot to work on his station. W4BFD can only work east. W4BEW bought out W4BKQ. W4BNE is getting out FB on 7000 kc. W4AXP keeps five schedules daily. W4AOO still plods along on 1750-kc. 'phone. We regret to report the following calls going off the air due to the new license regulations: W4HQ-W4PBW, W4SZ, W4ALJ, W4MX. It is hoped that the R.I. pays this Section a visit real soon. W4ARV has not been heard on the air in sometime. W4ART is working the 3500 kc. band. W4QU has a motorboat. W4QK is seen, but not heard. W4UW-W5NO has been

working at WCOA. W4QG and W4ATF were visitors to the Pensacola stations. W4MS-W4ZZP handled plenty of traffic this month. W4PDS reports a super-powered '01A in his portable. The XYL at W4MS gets 100% QSL on her QSOs. Hi. Let's see more traffic going through, OMs, as we want Western Florida to lead this Southeastern Division every month.

Traffic: W4AUW 14, W4AUV 5, W4BKD 1, W4AQY 8, W4AXP 5, W4AGS 17, W4KB 18, W4BGA 18, W4BFD 8, W4BNE 26, W4ACB 10, W4QR 8, W4ASV 8, W4QU 7, W4BGP 1, W4BMJ 3, W4MS 115.

WEST GULF DIVISION

NEW MEXICO — SCM, Jerry Quinn, W5AUW-W5AOP is again heard on 7 mc. W5AOD has a new call, W5COS, and will be back on the air in conjunction with W5MP. W5ZZQ (the portable call of W5AUW) will be used up in Colorado while the OM takes a vacation. W5AOE has been helping out a beginner in Albuquerque. W5CGJ is doing very well up in the northern part of the state. W5BVC sports a new Hawk receiver. W5BVC and W5BUY both have rebuilt. W5BHY has been QRL. W5AGP is located in Albuquerque installing K.O.B. W5BQE was a visitor at the SCM's shack. W5AAX got an R7 from China on 7 mc.

Traffic: W5AUW 94, W5AOP 53, W5AOD 59, W5MP 45, W5ZZQ 13, W5AOE 9, W5CGJ 4.

OKLAHOMA — SCM, Emil Gisel, W5VQ — W5OJ ran up a good total by a schedule with the Olympics. W5BPM is overhauling. W5AA and W5APE were visitors in Frederick. W5BDX reports traffic picking up. W5ALD is going on crystal. W5BKK has increased power. W5ANL reports for the first time. W5BQA reports DX good on 7 mc. The Frederick gang have been enjoying the ham Bc's from KGKO. W5MF would like some traffic schedules. W5BQZ is on after being off three years. W5BOE is working on 14 and 3.5 mc. W5BTZ is off the air. W5CGH and W5COP are new hams in Muskogee. W5BOO is working 3.5-mc. c.w. W5MU is holding schedules with two old schoolmates. W5GA was a visitor at W5ATB. W5AUA is rebuilding complete station. W5ATJ is going strong on 1.75-mc. phone. W5AND says too much QRM from the fan motors. Many of the Oklahoma hams present at the National Guard encampment at Fort Sill visited W5VQ and W5PP-W5AJO. W5BLW built a Public Address amplifier.

Traffic: W5OJ 330, W5BMU 213, W5BQZ 49, W5BPM 45, W5ALD 45, W5BDX 16, W5BQA 10, W5ANL 4, W5BKK 3, W5MU 7.

SOUTHERN TEXAS — SCM, D. H. Calk, W5BHO — In opening this report I would first like to thank the men in this Section for their interest and support given me in my ascendency to this office. I deeply appreciate the honor that has been bestowed upon me, and it is my desire to do everything possible to justify the faith that the members of this Section have placed in me by electing me their representative. Houston: W5ON has replaced his '47s with '46s and his '81s with '82s. W5CBV has been busy at KTRH. W5LP was on during the recent storm in south Texas operating portable station W5ME. W5ANW has an attack of YLitis. W5BTD is busy at KTLC. W5ADZ has been on a tour of the southwest. W5VA is operating intermittently. W5CA has been handling quite a bit of traffic for W6USA. W5TD is on occasionally. W5OX is busy with the police broadcasting station. San Antonio: W5PF is on 14 mc. most of the time. W5BWM is working schedules with W5UX, W5BUV, W5MN, and W5ALV. W5MN is keeping schedules with W9JNV, W5VK, and W5BQU. W5AUC comes in with a nice report. W5ALN is a frequent visitor at W5AUC. W5BNK has finally got the 100-watt rig perking on 14 mc. W9AJC is instructor in radio at Brooks Field. Ex-W5CDC is too busy to get on the air. W5AUC is putting the finishing touches on the 500-watt crystal-controlled transmitter. W5OW sends in a nice traffic total. Ex-W5LB is now W9IMD at Springfield, Ill. Kerrville: W5BKE has been working W6USA regularly. W5BKZ has a new car. W5BSF has some nice photos of his station. Beeville: Ex-W5ZAI is back on under the call W5WE. El Paso: W5AEC is out of town. W5AEP is going to crystal soon. W5AFN is having trouble with '04A. W5AFS is having receiver trouble. W5AOT is visiting in California. W5BNJ is attending the National Guard Camp at Palacios. W5BOD is still plugging. W5BQU is very active. W5CAW is on now and then. W5DE still pounds the key in spite of business. W5ES is accumulating for the new rig. W5NT is vacationing. W5CGD is on occasionally. Corpus Christi: W5MX has moved his transmitter to the Nixon Building. W5ALV is doing some good Army Amateur work. W5CHN is building a crystal rig. W5HP is rebuilding receiver. W5BOY is another afflicted with Gal-itis. W5JJ is planning a new station. Wharton: W5BKV and W5AHK were on during the recent south Texas storm, and stayed at the set until the power failed and the masts blew down. In the event that your new SCM can be of assistance to any member of this Section in any matter pertaining to the betterment of amateur radio, do not hesitate to call upon him. Please address all reports to your SCM at 6726 Ave. Q, Houston, Texas. Mail them on the 16th of each month.

Traffic: W5MN 362, W5ON 22, W5BWB 1, W5PF 4, W5BWM 14, W5BKE 18, W5OW 1230, W5AUC 6, W5BQU 89, W5DE 15, W5CGD 70, W5MS 11, W5BKV 11.

NORTHERN TEXAS — SCM, Roy Lee Taylor, W5RJ — W5BTW is working on 7 mc. with crystal rig. W5AVG will soon be back on the air with '04A. Dallas Radio Club wants to arrange schedules for traffic handling during state fair. W5BFY is putting most of his time in on a receiver. W5NW will be on the air soon. W5RH has been operating a little from W5BGC. W5COX is a new ham at Burkburnett. W5AYX has just returned from U.S.N.R. cruise. W5ARS and W5COX are now members of A.A.R.S. The new hour for KGKO amateur broadcast is 2 p.m., Saturday. W5CHJ is having lots of fun on 14 and 7 mc. W5CPT and W5CPB are new hams in Clarendon. W5AFQ wants traffic. W5AVY is preparing for winter. W5CU, former W8LW, is now located in Texon. W5CJX is a new ham in Texon. W5BNF has moved to Hillsboro, and his rig is down there under his portable call W5CLO. W5EQ reports arrival of a junior operator. W5BAD reports that he will be at Texas College this winter. W5GZ is building a 1.75-mc. 'phone job. W5AVF got in on a little of the storm traffic. W5ARV is preparing to work all continents this winter. W5LY has just finished a new a.c. receiver. W5ASP visited W6USA during his trip to the Olympics. W5YF is enjoying 3.9-mc. 'phone and 7-mc. c.w. W5BFI is a new A.A.R.S. member. W5SU reports working NY2AB. W5BRZ is using 2 '45s in push-pull. W5BXY has rebuilt. W5HL, W5CV, W5CPZ, W5BIN, and W5BAW are new hams in Waco. W5CLY has been off the air changing his rig. W5AJG is going in for 'phone. W5BCW says he will be training his new YL for relief operator, now that he is married. W5ANU is busy on 3.5 mc. with traffic and A.A.R.S. W5BKH is on the U.S.S. *Eagle 36* on a naval cruise. W5CIJ says QRN and blown filter condensers are driving him nuts. W5IT wants some one in Ft. Worth to get on 3.5 mc. W5BII comes through with highest traffic total this month. We wish to compliment all stations handling the Galveston storm traffic in such good manner. Everyone seems to be enjoying the new paper, *Sparks*. We think this is going to be an FB ham paper. We hope all you fellows are preparing to attend the West Gulf Convention, October 7th and 8th. You can obtain full information from the Fort Worth Radio Club.

Traffic: W5BII 546, W5IT 544, W5CIJ 299, W5BKH 152, W5ANU 113, W5AVF 111, W5BCW 47, W5NH 31, W5AJG 30, W5CLY 24, W5CCD 41, W5BXY 11, W5BRZ 21, W5SU 11, W5BFI 7, W5ASP 8, W5BYF 7, W5LY 6, W5ARV 2.

CANADA

MARITIME DIVISION

NOVA SCOTIA — SCM, A. M. Crowell, VE1DQ — VE1AE jumps ahead this month with a traffic total of 219. VE1BV, our R.M. for N.S., is now an Empire Link Station for R. S. G. B. VE1BC is going after traffic on 3.5 mc. VE1DQ is using low power transmitter on 3.5 mc. on week-ends. VE1AG has been working low-power duplex with 'DQ. VE1CW has rebuilt his reciever. VE1ER rebuilt receiver to take pentode. VE1EA worked four Canadian Districts and eight "W"s using type '45s. VE1BM reports for Cape Breton. Two new hams in Glace Bay — VE1ED and VE1EC. VE1DM is busy rebuilding new

power supply. VE1DL is getting out FB on 14 mc. VE1DW was off the air for two weeks in training camp. VE1DR is still doing things on 14 mc. VE1AL is busy instructing signals section Cape Breton Highlanders. VE1CK spent ten days under canvas with them. VE1BN's high-power 'phone rig is perking FB on 3.5 mc. VE1BM worked his first D4. VE1CK worked all districts since April. VE1AH has YL QRM during vacation. VE1CR hopes to be on this fall with high power. New Brunswick: VE1CY collects a nice bunch of traffic from the 3.5- and 14-mc. bands. VE1BO is now on 3.5 c.w. VE1DU of Bathurst Mines talks of QSY from 7 to 3.5 mc. VE1AK has been trying 14-mc. 'phone. VE1DT, VE1EL, and VE1BA are on 3.5 mc. VE1DC and VE1DP and YLs had a very FB trip through the New England states, and visited Headquarters gang and looked W1MK over. VE1CX is building new MOPA.

Traffic: VE1AE 219, VE1BV 55, VE1BC 45, VE1CY 41, VE1DC 27, VE1DW 22, VE1ER 20, VE1DP 7, VE1EA 3.

ONTARIO DIVISION

ONTARIO — SCM, H. W. Bishop, VE3HB — Everybody start making their plans now to attend the Divisional Convention to be held in Toronto on October 7-8-9th. All the dope can be had from VE9AL, Keith Russell, Toronto. VE3GT worked all "W" but W8 in one day with flea power ('01A). VE3PN will soon be on again. VE3AD has rebuilt. VE3QB and VE3LI are getting into the traffic game. VE3RA and VE3HN are new ops from the ham ranks in the OFB. VE3ET expects to be back in the ham game soon. VE3HA reports that several months will elapse before he can be on the air. VE3SA is rebuilding a crystal 50-watt job. VE3RK and VE3LI had a portable at camp. VE3JW will be on this fall with a crystal 'phone. VE3TT handled Olympic traffic in three languages. VE3DW handled traffic and reports for a sick party. VE3CP would like schedules with all active VEs on 3.5 mc. VE3IG raised a new 42-footer, and celebrated the event with a small hamfest attended by VE3JS, VE3DE, VE3AP, VE3ZZ, VE3KB and VE3AY. VE3GL is erecting a new 60-footer. VE3LK, VE3MZ, VE3LZ, and VE3EN are new Toronto hams. VE3IB is getting key clicks cleared up. VE3CM has his 50-watt PA neutralized at last. VE3JA and VE3JZ visited the terrible triode and VE3QB in Ottawa. VE3HV is building a low-power crystal job. VE3IH has worked 'em all but W7. VE3JB likes rag-chewing. VE3AQ worked 76 stations in 13 days on 3.5-mc. 'phone. VE3LX has built a new receiver, harmonic monitor and P.P. transmitter. VE3QB reports someone using his call. VE3JS heard lots of DX. VE3DG is having trouble with street car QRM. VE3LJ seems to be working his share of bootleggers. VE3KY joins the gang from Kenora. VE9AL is busy working on the Division Convention. VE3AU has taken over VE3GT's schedules. VE3NH is a newcomer in London. VE3DD is still with the OFB. VE3HB is having trouble with chirps in his MOPA. VE3EI is getting set for 'phone with a condenser mike. VE3JW visited the SCM.

Traffic: VE3CP 178, VE3AU 75, VE3DW 47, VE3HV 56, VE3HB 31, VE3TT 19, VE3AQ 14, VE3GL 12, VE3LI 7, VE3IB 5, VE3HA 4, VE3IH 4, VE9AL 3, VE3QB 3, VE3GT 3, VE3JS 3, VE3LJ 1, VE3RK 1.

QUEBEC DIVISION

QUEBEC — Acting SCM, J. C. Stadler, VE2AP — VE2CA is the star traffic station for this month, a result of a month's schedule with W6USA. Earle certainly deserves a great amount of credit for the fine amateur spirit shown, when you take into consideration that he had to get up every morning for three weeks at 4 a.m. VE2BG has at last fallen for crystal. VE2CQ has again tackled MOPA. VE2BE has worked several British stations on 14-mc. 'phone. VE2AP, VE2CX and VE2AQ are away with McGill University eclipse expeditions, the former at Newfoundland and the latter at Van Cleek Hill. VE2CO and VE2BO spend week-ends on the latter's yacht. VE2DX and VE2BH have built one of the finest 'phone rigs seen around Montreal. Many newcomers are noted on the air, VE2BY, VE2DV, VE2BM, VE2EU, etc.

Traffic: VE2CO 6, VE2BM 5, VE2CA 130, VE2CX 30.

VANALTA DIVISION

ALBERTA — SCM, C. H. Harris, VE4HM — VE4HQ, VE4CY and VE4GD visited the Edmonton gang. VE4JI near made "Silent Keys" by falling off a roof. VE4DQ is pounding away. VE4BZ and VE4EO are prospective ORS. VE4DR is heard on again. VE4DT is busy with grain elevator. VE4FJ is getting ready for fall season. Why is VE4GM so quiet? Must have something up his sleeve. VE4EC handled traffic from W6USA. VE4EI and the OW visited Edmonton, also VE4EN. VE4EA is all set for Class B '46 'phone. VE4HM is on 3.5- and 14-mc. 'phone. VE4GY kindly donated a challenge cup for members of the Northern Alberta Radio Club. VE4BJ is putting out a nice signal with MOPA. VE4JQ is heard on occasionally. VE4HQ is now sporting a condenser mike. VE4LD and VE4AS are new hams at Milk River. VE4FR is on vacation.

Traffic: VE4BZ 17, VE4EC 15, VE4DT 8, VE4HM 7, VE4HQ 6, VE4DQ 5, VE4EO 3.

BRITISH COLUMBIA — SCM, J. King Cavalsky, VE5AL — It's a grand Section when three of the gang make the BPL in one month — and most of the traffic was handled on 1.75 mc. VE5DH is the leader with over one thousand messages — then comes VE5DB and VE5AL, who were working with him clearing traffic for the Y.M.C.A. camp. VE5HP and VE5AC did nice teamwork handling traffic for the Cocos Island Treasure hunt. VE5FF held down a schedule with W6USA. VE5EC threatens to lead the Victoria gang now that he has some schedules. VE5CT handled some rush traffic for Prince Rupert. VE5AM is doing some nice relay work. VE5FG received a letter from a doctor in the Whitehorse Hospital, thanking amateur radio for saving the life of one of his patients. VE5GT is holding down his part in the north. VE5FI is back from the east.

Traffic: VE5DH 1033, VE5DB 581, VE5HP 425, VE5AL 311, VE5AC 117, VE5EC 56. VE5FF 45, VE5GT 50, VE5AM 42, VE5FG 36, VE5EZ 31, VE5FO 15, VE5CT 11, VE5EW 5.

PRAIRIE DIVISION

MANITOBA — SCM, J. L. Green, VE4BQ — VE4DK popped his crystal. VE4DJ has been trying to reduce voltage on his new power supply. VE4FT has 120 watts input to his new C.F. antenna. VE4EF is away on holidays. VE4KX is boosting his power to 125 watts input. VE4IU is very enthusiastic over his new "vert." VE4FN is now on 7 mc. VE4LB is all set for action. On 7 mc. we hear VE4AG, VE4CI and VE4JB. VE4GL seems to be making good use of his summer holidays. VE4DJ pinned VK2XG and K6BAZ. A new station appears signing VE4TD. VE4GG is getting new shack ready at new QRA. VE4FU is now using a crystal oscillator. VE4BQ hooked VK3, VK5, CM2 and pair of G's. VE4KW operates an MOPA. VE4KU operates QRP DC on 7 mc. VE4NA and VE4CS are parked on 14 mc.

Traffic: VE4DK 22, VE4FU 5, VE4BQ 8.

SASKATCHEWAN — SCM, W. Skaife, VE4EL — Now that our RM VE4BB is getting the cities lined up for traffic, it is time to get the towns lined up with these centres, so if you are willing to handle a little now and then, send in your call, frequency and time of operation. We want a perfect net all over this Province so do your little bit, OM. Say, can you make the two tube MOPA work on the 14-mc. band? VE4HX is now using PP TPTG. VE4FH is building new power pack. VE4BM is going on Naval Volunteer trip. VE4BF now has the range of the VKs and ZLs. VE4GR had a visit from VE4GP and from VE4GM & Co. VE4EL has just concluded vacation. VE4FF sends in nice traffic report and hopes to be ORS soon. Have you seen the ORS certificate, OM? Say, you ought to get one, they are fine.

Traffic: VE4GR 43, VE4BF 18, VE4FF 16, VE4HX 6, VE4AT 6, VE4EL 2.

CORRESPONDENCE

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

Japanese Restrictions

109 Omotemachi, Koishikawa
Tokyo, Japan

Editor, *QST:*

Some time ago H. Y. Sasaki, W6CXW, wrote a letter to the correspondence section of *QST* in regards to the rules and regulation of the Japanese amateur, but due to great amount of amateurs in United States that do not understand the situation fully as yet, I am writing this letter in hope that all amateurs in United States as well as those of other countries will be aware of the fact that there are great many obstacles to our amateurs as far as freedom of air is concerned.

Our country is divided into seven districts, namely: J1-Tokyo; J2-Nagoya; J3-Osaka; J4-Shikoku; J5-Kyushu; J6-Sendai, and J7-Hokkaido. At present the number of licensed amateurs is well over 125, and although this number seems to be very small compared to most countries, we are very active on the air. Our power is limited to 10 watts output and the frequencies are specified as 1775 kc., 3550 kc., 7100 kc., 14,200 kc., 28,400 kc. and 56,800 kc.; and not 3500 to 4000 kc., 7000 to 7300 kc., etc., in bands as the case in United States. The times of operation are also limited as following: 0200–0400; 0600–0800; 1000–1200; 1400–1500; 1600–1800 and 2200–2400. All of these times are in Japan Standard time. Message handling is strictly prohibited. However we are hoping that the time would come when we can handle traffic in such a way that is done in United States. This is one thing that we (Japanese Amateur Radio League members) are all striving for. Every amateur is a member of J.A.R.L. and we are laying out a preparation to join the I.A.R.U. in near future.

I hope the above information would be of some use to the amateurs of the world in general and that the next QSO will be done with this in mind.

— *Y. T. Yagi, J1DO, Director Kwanto Division J.A.R.L. Chief Editor, J.A.R.L. News*

Friendly Hams

On board R.M.S. *Olympic*

Editor, *QST:*

For about five years now it has been my pleasure to play tennis as a member of the U. S. Davis Cup team and no matter where I am, Europe, Mexico, Cuba, Hawaii, anywhere, the local hams have always given me a royal welcome. Where in the world is there a fraternity more broad in scope or whose members are bound together more closely than are ours?

Four of us are going to Australia via Hawaii and New Zealand to play tennis this fall and winter. I anticipate meeting face to face a lot of the hams I have made contacts with in the small hours of the night, as well as another trip to that station of stations, K6BOE. Guess my DX this winter will be confined to what I do on foot! Hi!

— *Wilmer Allison, W5VT*

P.S. Needless to say I always manage to get *QST* wherever I am — and on time!

W. A.

GBA

361 West Wilson Ave., Glendale, Calif.

Editor, *QST:*

I would like to have you print this letter in *QST* in order to bring the contents to the attention of those amateurs who deal in traffic handling, either as a regular thing or occasionally.

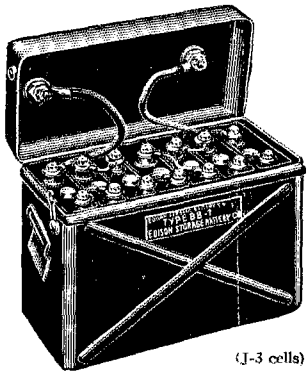
There are entirely too many messages of late, being (evidently) accepted with incomplete or erroneous addresses and in consequence such messages, at the city of destination, must remain undelivered for want of a better address. Unfortunately a service message to the station of origin very seldom results in a correction of the address.

In one evening's operating the writer has received as many as four messages with incomplete or erroneous addresses which had to be filed away undelivered, as no help was had by reference to city and telephone directories. A service to the station of origin would be of no use since the text of the messages indicated the usefulness would long since be outlawed by the time an answer to the service would be received.

This more especially in those cases where, like myself, only the evenings are available for operating and traffic handling and a full day's delay must necessarily accrue before action can be taken, for a message so addressed received on sked must rely on the chance of a random QSP for a service asking GBA.

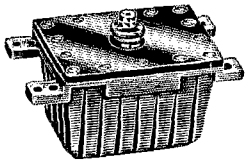
If the address of a message is not complete or if complete, not confirmed by the sender, it would be better not to accept the message at all, for a nondelivery always results in a "black eye" for our traffic handling, and the station of destina-

BARGAINS ARMY AND NAVY RADIO SURPLUS

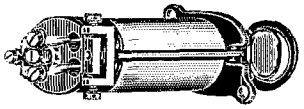


(J-3 cells)

NEW — Edison Storage Battery, Type BB-1, 10 volt, 37 amp., contains 7 cells. Complete in steel portable case . . . $15.00

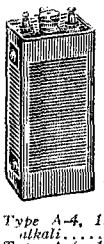


Condensers, Mica, op. volts 12,500, cap. .004
Dubilier, new . . . $10.00
Dubilier, used . . . 7.50
Wireless spec. new . . . 7.50
Wireless spec. used . . . 5.00
Condenser, Dubilier, mica, volts 40,000, cap. .0012–.001–.0008 or .003 . . . $10.00
Condenser, Dubilier, mica, op. volts 8,500, cap. .004 . . . $5.00
Condenser, Dubilier, mica, op. volts 3,500, capacity .0004 mfd. . . . $5.00
Condensers, Murdock .002 mfd. 5000 volt . . . $1.00



SPECIAL

Can be used with the new Vacuum Contact when operated on 45 volts. Western Electric Signal "Drops," 1000 ohm, type D-12 . . . $1.00



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Voltmeters, D.C. portable new Weston model 45, 3 scale 0–3–15–150, guaranteed ¼ of 1% accurate . . . $35.00
Ammeters, D.C. portable, new Weston model 45, 3 scale 0–1.5–15–150 with 3 scale external shunt and leads, ¾ of 1% accurate . . . $35.00
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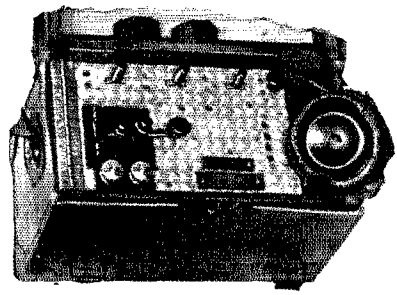
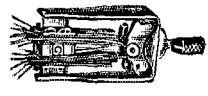


Telegraph and buzzer portable sets, mahogany case, 2 tone 4 contact platinum point high frequency buzzer, 2 telephone toggle switches, potentiometer, sending key, 3 mfd. condensers, transformer and 2 choke coils, receiver, $30. value . . . $5.00

EXTRA SPECIAL

Pyrene, 1 qt. size U. S. Army fire extinguishers, with 1 qt. Pyrene liquid. (Safe to use on "live wires.") Every station should have one. Reg. $12.00 . . . $4.50



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W.E. 12 and 16 Terminals, all with Platinum Contacts, value $3.50 each. Our price, 95c each.
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Also 12 Terminal, one side momentary, other closed . . . $.95
Induction coils, battery telephone type, excellent microphone transformers for home broadcast . . . 75c
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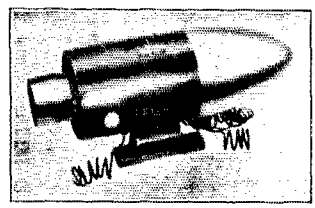
Mirror reflectors, glass 6 and 8" diameter @ .95c and $1.45
Spotlights, Army 6 volt 7" dia. adj. . . . $2.50
Transformers, 500 cycle 110 to 8000 volts . . . $2.00
50 watt G.E. sockets . . . 95c
Resistances, Ward Leonard vitrohm var. 5 to 15 ohm, 6 amp. . . . $2.00
Kit of 25 assorted condensers, resistors, switches etc. . . . $1.00
Relay and Jack Combination 350 ohms, 6 volt, . . . $1.00

W.E. TELEPHONE TEST SET

No. 175–125 W. has large variety of uses. Price . . . $4.50
Desk Phone, Kellogg, Single button microphone, 70 ohm receiver . . . $2.50

Voltmeter, Weston, No. 269 D.C., 0–50 . . . $6.00
Ammeter, R. Freq. Roller Smith, 0–10 . . . $3.50
Amp. hour meter, Sangamo, bat. charge and discharge, type MS 2 sizes, 0–300 and 0–600. List $50.00 . . . $5.00



Navy Aircraft Gynamotor, Gen. Elec., new, 24/1000 volts, 1 amp., extended shaft with pulley, can be driven by motor, or propeller, giving 24 volts output for filament and 1000 volts for plate or driven by its own input of 24 volts. Value $250.00. Our special price $50.00

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12–350 volt 80 mills . . . 18.00
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Dynamotor armatures, General Electric triple commutators, d.c. 24/1500 volt, . . . $12.50

GENERATORS

110 volt a.c. 900 cycle, self-excited 200 watts . . . $10.00
165 volt a.c. 600 cycle, self-excited 250 watts . . . $15.00
110 volt a.c. 500 cycle, self-excited 250 watts . . . $25.00
1500 volt d.c. 660 mills, 1 kw. Esco 1750 r.p.m. . . . $45.00
240 volt 500 cycle, self-excited 2500 r.p.m. 250 watt, (also hand drive) . . . $25.00
120 volt d.c. 5 kw. . . . 60.00
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120 d.c., 110 or 220 a.c., 500 cycle, 250 watt . . . $40.00
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120 d.c., 110 or 220 a.c., 500 cycle, 2 kw. . . . $50 to $150.00
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Converters, 32 d.c. — 110 a.c., 400 mills . . . $15.00
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Thermocouple ammeter, 0–2 or 0–10 model 425 Weston . . . $6.50
Voltmeter, Westinghouse, 2 scale 0–5–150. List $6.50 . . . $1.00

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S.E.143 and I.P.500,1420 . $100–$150.00
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Condensers, W. Elec. type 21AA, 1000 volt A.C. test, 1 mfd. . . . $.75

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tion is not equipped with the commercial telegraph company's delivery department facilities.

So what say, fellows? Let's tighten up on this address business and have a 100% record, at least in so far as our deliveries are concerned.

— *R. L. Hansen, W6DWP–W6GCI*

On Balancing Activities

Vancouver, Wash., Box 398, Route 1

Editor, *QST:*

I have read *QST* for some time, and several times have been greatly tempted to join in some of the arguments when the battle waxes hot, but have until the present refrained from doing so. There is a letter in August *QST*, however, which riles me up to the point of howling. I refer to the letter of Norman Krim, printed in the Communications Department.

Having operated more or less consistently during my time spent on the air (over 2450 QSO's since May, 1930) I feel that I am justified in saying a few words in defense of those hams that Mr. Krim seems to think are "mentally unbalanced."

Amateur radio is identical with any other phase of life in the fact that varied types of humanity are to be met there as anywhere. There are fellows who want to do something — strive toward a greater efficiency in some things — and on the other hand there is the fellow that adapts the haphazard, "who-cares-anyway" attitude. If one wishes to do something in amateur radio, it means time spent on the air. O.R.S. certificates, Navy or Army amateur certificates, or DX cards — all are the result of time spent on the air.

I, too, have crawled out of bed in the wee, small hours of the morning to call foreigners, and have stayed at home to participate in some unusual amateur activity. Though my attempts at working DX have been unrewarded in almost every instance, and though the few days spent at the key instead of at school have not always been "up to snuff," I do not regret my actions in the least, and will doubtless repeat them in the future.

Brother Krim will probably snort derisively and pronounce this letter as the ravings of another young squirt. In that case I would suggest that he snort several times, because there are quite a number of other amateurs who have the same opinions as I have.

May I never live to see the day when I cast a lugubrious eye over my log book, stare aghast, and go down the road mumbling to myself about the time I have wasted in amateur radio!

— *Robert Votaw, W7WY*

Off-Frequency Reports

Editor, *QST:*

Having been in the amateur game a few years, I have seen some ups and downs in this grand old game, and would like to make a few remarks that

P-2-KX
60 cents
3½" x 1¾" x 4½"
Weight 1½ pounds
3 volts for "A" circuit

V-30-AA
$1.50
Midget 45-volt "B" Battery for Monitors, portables and experimental work.
3½" long; 2¼" wide; 3½" high.
Weight 1 pound 6 ounces.

P-2-X
35 cents
2⅝" x 1⅜" x 4½"
Weight 13 ounces
3 volts for "A" circuit

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Midget Series

DESIGNED 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.

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

W8GYR, Ham Dep't, 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)

Special Offer Below:

Order Two and get ONE FREE
V-30-DX — 45-volt "B", $2.25 each
V-30-X — 45-volt "B", $3.75 each

perhaps would help some of the new men and *maybe* some of the ole timers. The wonderful record of W3BAN brings this up.

Every station that operates to any great extent will, in the course of averages, receive now and then a notice of off-frequency from various sources. Some of these cannot be questioned and others may cause you to doubt.

The amateur spirit of the ham a few years back was to take everything of such a nature as friendly advice. In those days a fellow who received a note that he was off-frequency or such would take it seriously and investigate to make sure. If it was found to be true in any way, he would thank the one sending the information. If on the other hand it was not, he would take it as a friendly warning and check up to be sure that there was no chance of anything appearing in the future that would justify a complaint.

Either way, it was a friendly reminder and represented time, trouble and expense to the one sending it and it served a good purpose. There are speed limit signs on every highway; they do not mean that you are breaking the limit, but cause you to drive more carefully.

Now, every Official Observer spends good time checking up fellows and he does this without any pay whatsoever. He also spends a lot of time in calibrating and checking his measuring equipment. He gives us all the benefit of this in sending reports to each man that he hears off-band (as far as his equipment shows). There are lots of things that come into consideration in making a frequency measurement, and therefore there are chances of an error.

Now, I have received frequency reports from O. O.'s and as a general rule they are accurate, but now and then there will be one that is in error a trifle. Maybe this trifle was enough to cause someone to be reported off-frequency a little.

Just remember fellows, that even the laboratories make errors once in a while, and take this wonderful service that Official Observers are giving us. They are putting in a lot of hard work. Take them in the right spirit and remember that the observer is doing his part to help you. If, after careful checking, you find that the report was a little in error, you will not be reported to the R.I. on one report. No harm done, but what a help if you had been off-frequency!

Better have an Official Observer call you before someone less friendly does.

— *R. N. Eubank, W3AAJ-WS*

QSL Card Uniformity

3 Tanabe, Osaka, Japan

Editor, *QST:*

I guess those who are requested to QSP some QSL cards to fellow hams will be always troubled with the different sizes of them, and especially so for those who handle a good many cards to QSP a month. From this point of view, it's desirable to unify the size of the QSL card throughout the world. But there may be some who will oppose

You Must Know Mathematics To Succeed in Radio Today

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Untrained Men Must Go. There Are Jobs and Contracts Today Only for Trained Men — Men Whose Work Is Solidly Based on Knowledge of Mathematics

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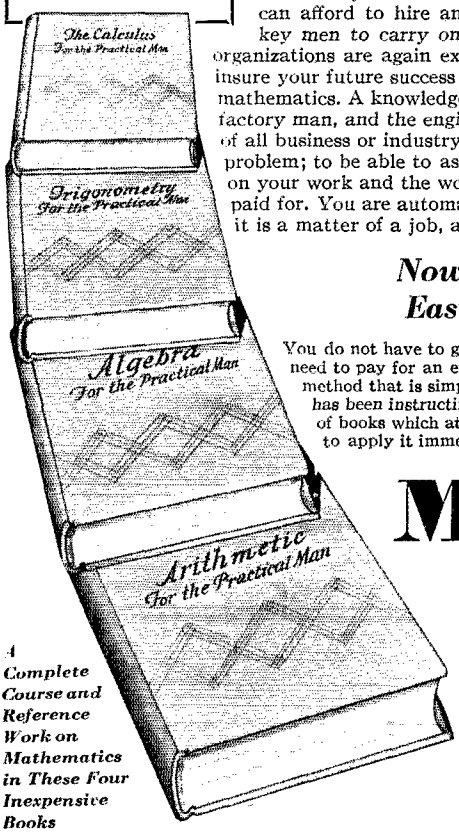
You do not have to go back to school or college to get a mathematics education. Nor do you need to pay for an expensive correspondence course. You can now master the subject by a method that is simpler, shorter, and cheaper than any other method devised. An expert who has been instructing practical men all his life has prepared an extremely interesting group of books which at last removes the mystery of mathematics and makes it possible for you to apply it immediately to your own work.



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Reference.....

this proposition on the ground that the proposition will deprive the national color of the card by unifying the size and for this opposition, I dare say, the national color can be still maintained by elaborated design for printing. And I want to propose to take the size of U. S. postal cards as the standard. Well, OM's, how about that!

Thanking you for a FB publication, I am

— *K. Asamura, J3CR. QSL Bureau*

Cousins

110 Riddiford St., Wellington, N. Z.

Editor, *QST:*

Ever since I worked my first "Yank," which is many years ago, I have been tempted to pick up my pen and write such a letter as this. We call this "ham" game a friendmaker and harmonizer between fellows spread all over the globe. Well, is it? It would be safe to say that every one of you fellows in the States regard us Zedders and all Britishers as foreigners. Well, boys, is that a friendly idea? We regard "Yanks," "hams" or otherwise, as our "cousins."

Next letter you write to a Britisher or next time you QSO one call him your overseas cousin and forget all this foreigner business. Let us hams be the creators of more and more friendly relations between our two great nations. I have never yet heard a Zedder call a "Yank" a foreigner, so how about you fellows thinking the same of us as we think of you? Don't forget and next QSO you have with a Britisher make it start like this: "Howdy cousin ur sigs QSA5 R9, etc., etc."

— *Harold G. Fownes, ZL2GO*

Plug and Socket for Transmitting Inductances

WE'VE been needing something like this for a long time — a plug and jack of real sturdiness and current carrying capacity for those copper tubing coils. The General Radio Company, Cambridge, Mass. has recently brought out a plug and jack which not only are

big brothers to the well-known small ones, but also possess some additional features which make them capable of handling heavier currents.

The accompanying photograph shows the jack and two types of plugs. The small jack gives an idea of the relative sizes of the new and old. The large plugs, however, have a cone-shaped section just above the springs, and this fits snugly into a correspondingly-shaped part of the jack, resulting in a large contact surface and also good mechanical contact. There are two types of plugs; one a solid affair with a

SPECIALS—THIS MONTH ONLY

Read 'Em and Weep

888's and 871's—The little 866—5000v. 300 Mil Mercury Vapor Rectifier.....$1.00
888 or 871 Filament Transformer—2½v. 12 amps—Special.....$1.25
50 WATTERS 203A, 211, 845. Very Special.....$8.95
Full Nickel stretched gold plated diaphram—100 ohms per button.....$5.45
Fully cased double button mike transformers.....$1.95
Desk model nickel plated mike stand and case.....$3.00
Complete parts for making a condenser mike head, with instructions.....$4.50
Quartz Crystal blanks.....$1.00

Radiobuilders Special UX210 15 Watt Transmitting Tube..$1.50

Made especially for us and now in use in over 16 countries. Ask any ham that's using them. Double your present output. Use up to 750 volts on the plate. Use in Class "B" amplifiers. Oscillators, RF amplifiers. They oscillate as low as 4 meters with ease. **Double Duty UX250's** 100% modulators—281's 110 mil 750 volt rectifiers Special Heavy Duty, ea.....$1.50
281M–300 Mill 15 volt drop.....$1.75 872 Power 2.5 amp 10,000 v Mercury Rectifier.....$11.95

!!! NEW TUBES (RCA Licensed) NEW PRICES !!!

NEW 46 Dual Grid Class "B" Amplifier; 56 Super-Triode Amplifier; 55 Duplex Diode Triode; 57 or 58 Triple Grid Super Amplifier **ea. 75c**

2 volt tubes		*New 6 volt tubes*		UX or UV 199's	$.55	UX226	$.45
230 Det-Amp	$.75	Can be used on AC or DC		UX200A	.40	UX240	.50
231 Amp.	.75	236 Screen Grid	$.75	UX201A	.35	UX245	.45
232 RF Screen Grid	.75	237 Det-Amp	.75	UX222	.95	UV247	.60
233 Pentode	.75	238 Pentode	.75	UY224	.50	UX171A	.40
234 RF Pentode	.75	239 RF Pentode	.75	UY224A	.65	235 or 551	.65

Mercury Full Wave Rectifiers, 300 Mill. 280M...$.95 282 & 283...$.75

CG1162 Navy Transmitting Tubes, 550 plate, 7.5 volt fil. All new in original boxes.....$.25

All tubes unconditionally guaranteed ninety days against mechanical and electrical defects

MORRILL TRANSMITTING CONDENSERS

Test voltage	2000v.	3000v.	4000v.	6000v.	10,000v.
Working voltage	1000v.	1500v.	2000v.	3000v.	4,000v.
1 mfd	$1.65	$2.10	$3.75	$6.60	$13.65
2 mfd	2.75	3.45	6.75	10.05	24.00
4 mfd	4.95	6.00	11.70	19.50	45.00

Condensers guaranteed one year against defects

Beehive Standoff insulators, best quality Brown Glaze finish. Each, $.08. Per Dozen.....$ .85
25 mfd 25v C Bias bypass condensers, each.....$ .40
C. T. Resistances—10, 15, 20, 25, 60, 75, or 100 ohms.$ .15
85 Milhenry R. F. C.'s for SW Rece vers.....$ .15
Pilot Midget Var. Condensers, 100 mmf, .0001.....$ .60
50 mmf, .00005.....$.55 25 and 15 mmf.....$ .50
A.R.R.L. Hand Books.....$1.00
A.R.R.L. Log Books.....$ .40
Complete line Cardwell Condensers in stock. Special for 5-meter sets 404B.....$1.44 For 5-meter Xmitters 410B dual.....$3.48
5-meter Receiver Long Wave Oscillator Coils each....$ .40
Here's a New service gang—We have a new bulletin ready to ship you which lists, part for part, every set described in the "Hand Book," ninth edition. Also list for all sets described in *QST* and Short-Wave Craft. Send 5c stamp for all dope—15 pages of prices on kits.
All parts in stock to build the new "Single Signal Receiver."
Dubilier Condensers, 8 mfd 500 volts working.....$ .65
¼ KW Silver Contact transmitting Keys. Each.....$ .95
Latest Amateur Call Books.....$ .85
Copper Coil, 3" diameter, ¼" tubing, per turn.....$ .07
85 watt grid leaks, 10,000, 15,000 ohms. Each.....$ .65
85 Milhenry RF chokes.....$ .15

100 Watt Bleeder Resistances, 9½" long | **5000, 10,000, 20,000 ohms**.....$1.40 | **50,000, 75,000, or 100,000 ohm**.....$1.40 | **75,000 ohm with six adjustable taps**..$1.90 | **100,000 ohm with six taps**.....$2.00

Accurate black flange flush panel mount meters.
Milliammeters 0-10, 0-50, 0-100, 0-150, 0-200, 0-300.$1.00
A.C. Voltmeters 0-3, 0-5, 0-7½, 0-10, 0-15, each..$2.50
Another batch of those 1000-volt oil impregnated condensers, Uncased—Make a 1000-volt filter at practically no cost.
1 mfd..$.15 2 mfd...$.40 3 mfd...$.50 4 mfd...$ .60 6 mfd.....$ .80
5" x 6" x 9" Monitor Cans.....$ .04
Red Devil Standoff Insulators, each.....$ .04
Mica Condensers, all capacities, 800 volts. $.15 1000v..$ .20
Tube Shields. For all standard tubes, each.....$ .15

PLATE POWER TRANSFORMERS

250 watts—750-0-750 and 7½ and 7½.....$ 5.50
350 watts—1000-0-1000.....$ 7.50
500 watts—1500, 1000-0-1000, 1500.....$ 9.60
850 watts—2000, 1500-0-1500, 2000.....$12.75
900 watts—2500, 2000-0-2000, 2500.....$14.25
Fully mounted in aluminum case. Terminals on bakelite panel
866 Transformer. In Beauty of a case with Standoff Insulators. Tested at 15,000 volts, 2½ volts 10 amps, center tapped.....$4.00
Uncased—Unmounted 866 transformers. Price..$2.75
210 Filament Transformers 7.6 volts, center tapped, each.....$ .95
In stock and on demonstration. Hammarlund "Comet Pro"
Pro chassis, less tubes.....$84.00
Comet Pro in Cabinet.....$88.82
National "SW3" less coils.....$20.88
No. 12 Enamelled Antenna wire, one piece 100'.....$ .75
200'.....$1.40 *300'*.....$2.00, or cut to exact length required for 1c per foot.
GE Neon Lamps—Excellent for locating stray RF and in wavemeters ¼-½-1-watt sizes. Each.....$ .55
Midget Power Transformers, 350-0-350, 5v 2 amps 2½ v 7 amps. Fully mounted. Special price.....$1.50
Insulating Grommets for aluminum panels. 15 for....$ .25
Amateur Band Quartz Crystals, 80 or 160 meters.....$3.95
Radiobuilders plug-in crystal holders with GR plugs..$1.50

RADIOBUILDERS 200-WATT FILAMENT POWER TRANSFORMERS

11 volts, 15 amps for 4-50 watters, center tapped, cased. $5.50
12½ volts 18 amps CT for 2 to 3—250 watters, cased. $5.75
5 volts, 20 amps CT 20,000-volt insulation for two 872's.....$6.00
The above transformers are very conservatively rated. The weight of each is 15 lbs. They are fully cased in a black crystalline finish can. Porcelain standoff insulator terminals. We invite comparison.

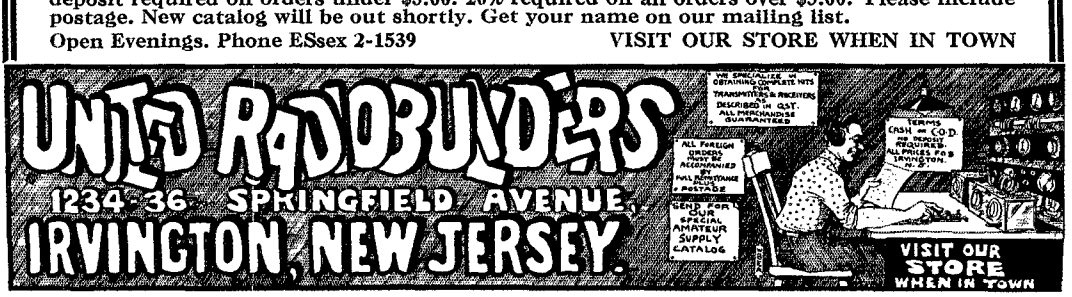
ALL SIZES MAGNET WIRE IN STOCK

	16–18	20–22	24–26	28–30	32–34
Enam	$.15	$.18	$.20	$.25	$.30
DCC	.20	.23	.25	.30	.35
DSC	.30	.33	.35	.40	.45
SCC	.15	.18	.20	.25	.30

Above prices are for ¼-lb. spools only. Other sizes in stock.

All merchandise guaranteed. Terms Cash or C. O. D. All prices F. O. B. Newark, N. J. No deposit required on orders under $5.00. 20% required on all orders over $5.00. Please include postage. New catalog will be out shortly. Get your name on our mailing list.

Open Evenings. Phone ESsex 2-1539 **VISIT OUR STORE WHEN IN TOWN**



threaded top on which a soldering lug is held by two nuts, and the other a combined plug and socket with an insulating sleeve covering the socket part. The socket, of course, takes the regular plug, so that any number of plugs may be stacked up for taking off parallel connections. Alternatively, the end of a copper tubing coil can be sweated into the socket. This plug is also provided with a soldering lug for wire connections.

Help Us—and Help Yourself!

THE Post Office Department recently announced that a fee of 2 cents, payable by the publisher, shall apply to each change of address notice we receive from any post office. During the course of a year we receive hundreds of such notices. It is our desire to minimize the expense of this service, which heretofore has been free. You can help by *promptly* advising us *direct* of your new address, giving your old address at the same time.

Many publishers, as you probably know, have a very strict change-of-address policy, requiring as much as five or six weeks' advance notice if they are to be held responsible for delivery of the current issue of their publications. Recognizing *QST*'s intense reader interest, we have never established such a policy, believing each reader should receive every copy of *QST* even though in many cases the fault of non-delivery is not ours. We plan to hold to this policy, but your co-operation, particularly in view of the direct expense now involved, will be appreciated.

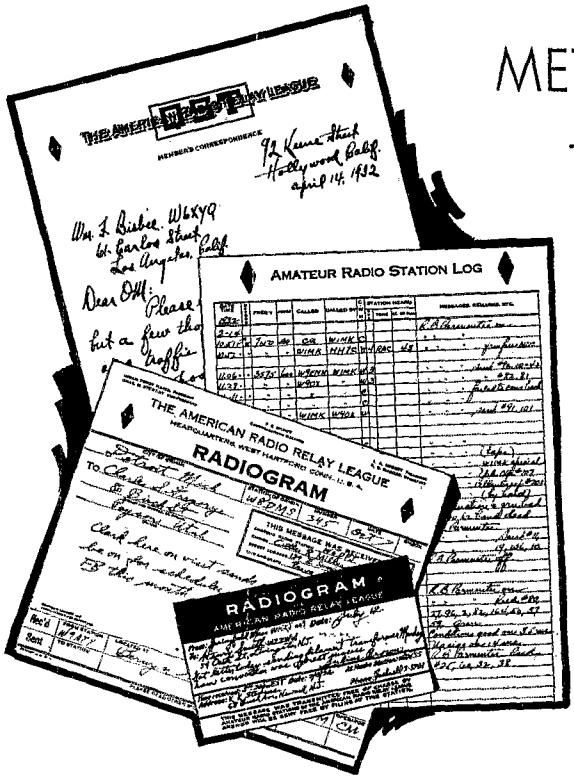
Won't you help, both in the matter of lessening the number of 2-cent fees and in our desire to promptly supply each issue of *QST* as it appears?

New Books

Radio-Frequency Electrical Measurements, by Hugh A. Brown. Published by McGraw-Hill, New York. 386 pages, including an appendix on laboratory arrangements and facilities, and an excellent subject index; 235 illustrations. Price $4.00.*

Intending "to present both the well-known methods of making certain measurements and some of the important advances recently made in the solution of radio-frequency measurement problems," the author, who is Assistant Professor of Electrical Engineering at the University of Illinois, has achieved what we believe to be the most useful work of its kind at present available. Although aimed at students of fourth-year electrical engineering caliber, the bulk of the practical material it contains (and there is a wealth of it) makes it valuable as well to the advanced experimenter without formal technical training. It requires a fairly ad-

* Obtainable from *QST* Book Department.



METERS
TRANSFORMERS
ANTENNAS

Yes!

But just as essential are your

STATION SUPPLIES

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 8½ x 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.**

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, message number sheet, bound-in page of cross section paper for receiver or frequency meter calibration, etc. Size 8½ x 10¾, bond paper, bound in heavy paper covers. **One book 40c or three books for $1.00. Postpaid.**

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 8½ x 7¼. Put up in pads of 100 sheets. **One pad 35c or three pads for $1.00. 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

vanced knowledge of alternating current phenomena and circuits but does not lean too heavily on mathematics. Following the necessarily prerequisite chapters on measurement of capacitance, inductance and resistance, in logical sequence come through treatments of measurement of frequency; antenna measurements; electromagnetic-wave measurements; thermionic-tube coefficients; electromotive force, current, power; measurement of wave form; transmitter, receiver and piezo-electric measurements — all modern and each progressing from the simpler and more crude to the elaborate and more accurate. Where it is practicable, detailed descriptions of the apparatus and instructions for procedure are given; the references to other sources for further data on the more involved than could be included in the book make it valuable for its bibliography alone.

Communication Engineering, by W. L. Everitt. Published by McGraw-Hill, New York. 567 pages, including appendix of hyperbolic functions and an adequate index; 335 illustrations. Price $5.00.*

To our way of thinking, this is the most satisfying text on radio engineering and its allies that has yet come from any printer's presses. Engineering college instructors who have bewailed the lack of a general text for both first-year and advanced courses should pounce upon it. Advanced amateurs and practicing engineers who want to have around an authoritative reference for home study or brushing up should greet it with enthusiasm. In pleasing style and with straightforward language, Mr. Everitt puts between two covers what, as it strikes us, every modern electrical and communication engineer should know.

Servicing Receivers by Means Of Resistance Measurement, by John F. Rider. 203 pages, 94 illustrations. Published by Radio Treatise Co., New York. Price .*

Mr. Rider, outstanding contributor to the literature of curing sick receivers, advocates making the ohmmeter the heart of the service man's kit — and explains explicitly just how it should be done. The methods described are eminently fitted to checking high-frequency receivers, too, and their application would save many a headache in getting the bugs out of home-built jobs that refuse to "perk first time."

Radio and Electronic Dictionary, by Harold P. Manly. Published by Frederick J. Drake & Co., Chicago. 300 pages, 550 illustrations. Price $2.50.*

Concise, accurate definitions for most every term one is likely to encounter in the literature of radio, amateur or otherwise, from "A-battery" to "Z-waves."

Projecting Sound Pictures, by Aaron Nadell. Published by McGraw-Hill, New York. 265 pages, including a list of symbols, "Precaution Index," "Trouble Index" and a subject index. 100 illustrations. Price $2.50.*

A practical manual for the theatre man.

Aircraft Radio, by Myron F. Eddy. Published by The Ronald Press, New York. 284 pages, including appendices of definitions and symbols, and a subject index; 68 illustrations. Price $4.50.*

Practicalities of radio communication along the airways, including chapters on radio aids to navigation and regulations.

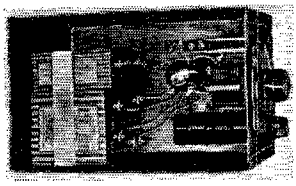
Strays

W9FFH says that the gasoline companies out in his territory must be trying to cater to amateurs, because one of them is putting out a gas called "73"

NEW!!

ROYAL MONITOR FREQUENCY METER

20, 40, 80 & 160 METER BAND
WITHOUT PLUG-IN COILS!



A MODERN INSTRUMENT

No loose coils to misplace or damage and ruin calibration. Band selector on panel! Wide spread on all bands. Checked against Piezo controlled oscillator to insure extreme accuracy of calibration. In neat crackle finished metal cabinet. Complete with tube, batteries, and accurate calibration chart. **$9.50**

160 METER BAND $1.50 EXTRA

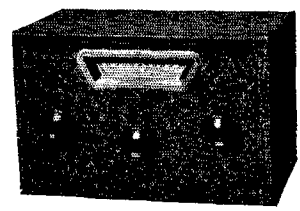
CONDENSER SPECIALS

(This Month Only)

AEROVOX 2 mfd. 2000 volt...**$3.60**
AEROVOX 2 mfd. 1500 volt and 4 mfd. 1250 volt in single case..**$4.25**
Tungsol 1 mfd. 2000 volt.....**1.85**
Faradon 2 mfd. 1750 volt.....**2.95**
(All above are in metal cases and rated at DC WORKING voltage.)
Dubilier mica transmitting condensers. .002 mfd. 12,000 volt test (6000 v. working).....**$1.95**
Faradon fibre cased 1 mfd. 1500 volt.....**$1.25**

Looking for a GOOD RECEIVER?

Read This ↓ Buy This →



Time tried and proven OK! Accepted as the OUTSTANDING VALUE today! Consistent reception of stations in all parts of the world. Wide spread of amateur bands. Quiet, ECONOMICAL, powerful, simple to operate, and INEXPENSIVE.

Higher priced receivers? They can give you no more! Cheaper sets? They simply can't be compared to ROYAL! We guarantee these ROYAL receivers to outperform any other set. **Order your ROYAL today and if you are not entirely satisfied we will promptly refund your money. What could be more convincing!!**

Beautiful crackle finished metal cabinet — heavy metal chassis — full-vision micro vernier dial — smooth regeneration control — single control tuning — for 20, 40, and 80 meter bands or from 14 to 200 meters (state choice). The use of a 232 screen grid detector and a 233 power pentode amplifier gives extreme sensitivity and extraordinary volume with low filament and plate consumption.

THE ROYAL STAR
(The famous model RP)

A two tuber with an enviable reputation! Uses a 232 super sensitive detector and a 233 power pentode. **$13.95**

Set of Tubes **$2.55**
KIT WITH FULL INSTRUCTIONS $10.95

THE ROYAL CHIEF

A three tube set embodying all of the well known superior features of the ROYAL STAR plus a stage of high gain screen grid radio frequency amplification (232). **$16.95**

Set of Tubes **$3.75**
KIT WITH FULL INSTRUCTIONS $13.95

THE ROYAL OLYMPIC

The ROYAL CHIEF with an additional stage of audio amplification for super-dynamic power. The ROYAL OLYMPIC makes new records! **$19.95**

Set of Tubes **$4.75**
KIT WITH FULL INSTRUCTIONS $16.95

Complete set of BURGESS BATTERIES for any ROYAL $5.45

HERE'S WHAT USERS OF ROYAL SAY:

"It's the sweetest little receiver I have ever used, barring none! . . . Pulling in W6's at 4 o'clock in the afternoon, something that Hams around here with five tube receivers can't do . . ." "I have different makes of SW sets, but the ROYAL Model RP gets more stations than any other set and with more pep . . ." " . . . Can lay the phones on the table, walk around the room, and still hear FYA in Pontoise, France . . ." "Received Spain and several VK's and ZL's through strong interference . . ." " . . . and have now heard broadcast stations in every continent . . ." "I certainly congratulate you for putting the best little DX hound on the market within the reach of any ham."
(Names on request)

PROMPT SHIPMENTS ● **TRY US FOR BETTER SERVICE** ● **SEND FOR CATALOG**

TUBES

RCA LICENSED. Unconditionally guaranteed for three months.

112A	$.50	231..	$.65	245..	$.43
171A	.38	232..	.70	46..	.65
199..	.55	233..	.70	247..	.55
201A	.33	234..	.75	250..	1.10
210..	1.10	235..	.55	55..	.65
222..	1.10	236..	.65	56..	.65
224..	.48	237..	.65	57..	.65
224A	.60	238..	.65	58..	.65
226..	.40	239..	.65	280..	.45
227..	.35	240..	.90	281..	1.10
230..	.65	281M	1.60	282..	.60
866..	1.65	871..	1.65	83..	.70

RCA 216B high voltage half-wave rectifiers. Use in place of 281. List price $7.25.....**$.95**
Cunningham CX-350. Very special.....**$2.45**
DeForest 445's FB oscillators.....**.44c**
Special 245's, 227's. Fully tested. Not guar. 7 for.....**$1.00**
Extra heavy duty 866. Spiral filament and cylinder plate.....**$2.35**
15 Watt 210. Will stand 750 volts **1.40**
Special 210's. Plate or grid lead at top. FB for 56 mc.....**$2.75**

G. E. OIL TANK FILTER CONDENSERS

Three 5 Mfd., 2000-Volt DC Working units in heavy metal case with large stand-off insulators. 10"x5" x 10½" 22 lbs.....**$9.75**
Same but 2500 Volt. 15"x5"x13½" 35 lbs.....**$11.75**
Two 30 Mfd., 1000 Volt sections. Series connection gives 15 Mfd. at 2000 Volts. 10"x5"x10½". 22 lbs...**$8.95**
Same capacities but 1250 Volt. 46 lbs. **$10.95**

SHOOT YOUR ORDER IN TODAY FOR EVERYTHING YOU NEED

We will fill it immediately at lowest prices

VISIT OUR NEW SALESROOMS (one block south of Cortlandt)

100 WATT BLEEDER RESISTORS

All mounted and center tapped 9½" x 1"

5,000, 10,000 or 20,000 ohms.....**$1.25**
50,000 or 100,000 ohms.....**1.35**
50,000 or 100,000 ohm with six sliding taps.....**1.80**
10 ohm one hole mount rheostats.....**12c**
Frost 500,000 ohm potentiometers.....**45c**
Bosch 210 power amplifier. Uses two 281's and one 210. Delivers 550 volts DC at 120 mils and filament and plate for eight tube set. FB for 210 transmitting power supply. In original crates, 38 lbs.....**$4.95**
Zenith Power Packs. Delivers 750 volts rectified ready for filtering and filaments for 210's etc. In metal case. Uses 281 tube. Special.....**$3.95**
Heavy Duty 20 Henry, 400 Milliampere *Power Choke.* FB for choke input to filter. 3000 Volt insulation. 70 ohms. Open Frame mounting. 8½ lbs. Special **$3.75**
MAJESTIC. Two 15 Henry, 200 Milliampere, 200 ohm power chokes in a metal case. Used but perfect. 7 lbs.....**$1.95**
Thordarson Double Choke. Two 30 Henry, 150 MA power chokes in a metal case.....**$1.95**
Thordarson 20 Henry 200 MA 250 ohms, 2000 volt insulation. Completely shielded. 6 lbs.....**$2.70**
GENERAL ELECTRIC 5 Henry, 1000 Milliampere Filter Chokes. In neat metal cases. 5000 volt insulation. 25 ohms. 11 lbs. Special **$1.50** each. Four for **$4.95**

Special Filament Transformers. Completely mounted in neat metal cases. All windings Center-tapped. Insulated for 2,000 volts.

2½ volts at 4 amps...**95c** 2½ volts at 12 amps.**$1.40**
7½ volts at 4 amps..**$1.25** 10 volts at 4 amps.... **1.95**
2½ volts at 10 amps. and 2½ volts at 4 amps..... **1.75**
7½ volts at 3 amps. and 7½ volts at 3 amps..... **1.95**
Pilot Polished Bakelite dials. Full 4". Reg. 50c Special..... **15c**
Cornell Vernier Dials. Art Metal. Illuminated. No back lash.....**27c**
Grebe transmitting RF Choke 1" x 4". Will pass 300 MA. Special.....**23c**
RCA output transformer. Pentode or power tube to phones or magnetic speaker.....**75c**
Samson Real Bakelite coil forms 2½" dia. 2½" long. **12c**
Uncased mike transformer. Single or double button. **60c**
100 Turn Honeycomb coils.....**15c**
Fixed mica condensers. All sizes. Ten for.....**$1.00**
Kellogg hand microphones. 200 ohms. Very sensitive. **$1.95**
¼" Heavy copper tubing. Soft drawn. 5c per ft.

ROYAL POWER TRANSFORMERS

Powerful and sturdy! Carefully constructed of the highest grade materials. Heavy duty windings and large, oversize silicon steel core give excellent regulation. Completely mounted in neat cast aluminum cases with leads to terminal board. Guaranteed for one year against any defect. Expressly designed for transmitters and power amplifiers. Insulated for 10,000 volts. All windings are center tapped. *It pays to buy the best.*

Output Voltages	*Watts*	*Price*
5000 and 3000	850	**$13.25**
4000 and 3000	850	**10.75**
3000 and 2000	375	**7.85**
2000 and 1500	350	**6.90**
1500, 7½ and 7½	450	**5.90**

The following are in neat brown crackle finished metal cases. Insulated for 1500 volts.

1500	250	**$4.95**
1500, 7½, 7½ and 2½	375	**4.25**
1200, 7½, 7½ and 2½	200	**3.65**

NOTE: *The above prices are FOB Minneapolis, Minn.*

THORDARSON Extra Heavy. 375 watts. Delivers 1300 volts at 200 mils, 7½, 7½, and fil. for 866's. All center tapped. Tapped primary. Mounted. 15 lbs.....**$5.45**

Zenith 750 volt half-wave, 7½ c.t. 7½, and 2½. 200 watt.....**$2.35**
Use two for a 400 watt full-wave unit. Two for.....**$4.25**

WE'VE GOT IT OR WE WILL GET IT FOR YOU AND SAVE YOU MONEY!

Deposit required
No orders can be accepted for less than $2.50

Harrison Radio Co. Dept. T-10

142 LIBERTY STREET NEW YORK CITY

Anti-Yooping Devices

LOTS of notes on the air would be good steady d.c. if they weren't keyed — but they swoop and dive so enthusiastically when broken up into dots and dashes that they're harder to read than those r.a.c. buzzes and fully as annoying to listen to. Self-excited sets with well-filtered plate supplies are the chief offenders — and what good is a good filter if the signal is still hard to copy?

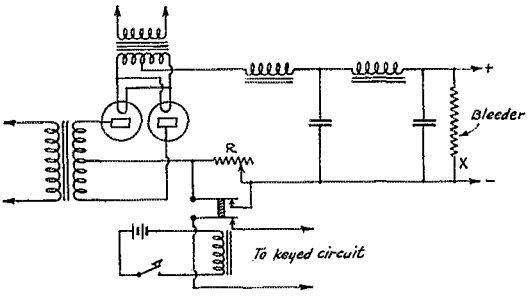


FIG. 1

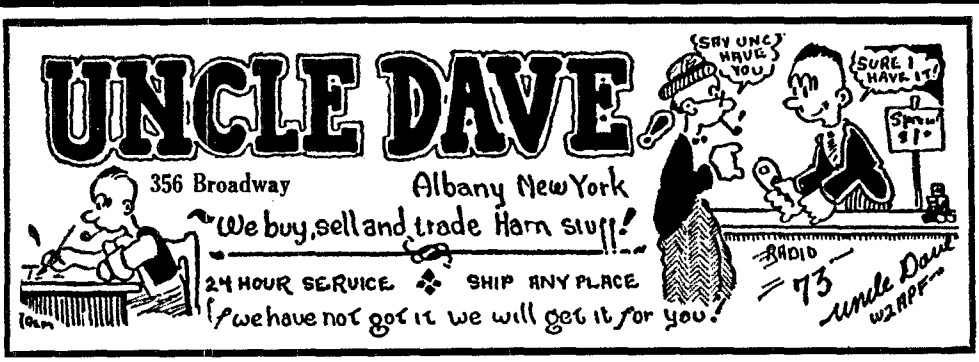
The question is simply one of power-supply voltage regulation. *QST* has recently carried several good articles on steadying the output voltage by correct filter design, but there are also several mechanical methods that can be used to give the same effect and which do not require special power-supply apparatus. The accompanying diagrams show three schemes of this sort.

MECHANICAL COMPENSATION

Fig. 1 is used by Clifford Livingston, W6CQF, of Tucson, Arizona. A relay with two pairs of contacts, insulated from each other, is required. Two separate relays will do just as well, of course. One pair of contacts does the regular keying, while the other pair is used to short out the resistor R when the key is closed. The value R is adjusted so that, with the key up, the output voltage drops to the same value that it has when the transmitter is taking power. Generally this will require some thousands of ohms, since the only load on the power-supply with the key open is that furnished by the bleeder. Fig. 1 shows W6CQF's filter arrangement, but the scheme will work with any type of filter; a bleeder across the output is essential, however. If you have no plate voltmeter a milliammeter in series with the bleeder, as at X in the diagram, will serve the same purpose. Adjust R so the bleeder current is the same whether the key is open or closed.

COMPENSATING IN THE PRIMARY

A similar arrangement is used by Verdon Stones, W9BHF, Webster Groves, Mo. In this case, however, the compensating resistor is placed in the primary circuit of the plate transformer, as shown in Fig. 2. It is necessary, therefore, to get the filament supply for the rectifiers and r.f. tubes from a transformer separate from the plate-supply transformer, because the secondary voltage changes with keying. The practical working of the circuit is about the same as that of Fig. 1.



866 Heavy Duty, mercury rectifier tubes $1.59

866 Extra heavy duty, uncond. guar. 1000 hrs. . . $3.35

TUBES

Arsco 15 watt 210 transmitting tubes, guar. $1.20
281M special new type, 300 mill 15 volt drop. 1.75
871 or 888, each. 1.50
280M, guar., each 90c; UX250s, each 65c; 82M, each . . .65
UX281—$1.39; '55—65c; '83—75c.
RCA UX200A, new, each 75c, three for 2.00
RCA UX240, 3 for $2.00; CG1162 Navy 5-watt xmitting tubes, new, 3 for $1.00
Speed Triple Twin $1.85; Speed UX230s, each. 86
Speed 56 — 70c; Speed 57 or 58, each 89c; Speed 46 Class B tubes, each. 83
DeForest 510, each $3.85; Rectobulbs R81 $3.40; R-3. 5.90
Western Electric 211E, all tested, special. 3.89

BLEEDER RESISTANCES

20,000 or 25,000 ohm 100 watt, each. 79
Ward Leonard 10,000 ohm 60 watt 50c; Ward Leonard 5000 ohm. 39

METERS

Readrite milliammeters: 0-5, 0-10, 0-25, 0-50, 0-100, 0-150, 0-200, 0-300, 0-400, each. 60
Readrite AC voltmeters: 0-6, 0-10, 0-15, each. 1.50
Hoyt 0-15 volts AC meter, peep-hole type. 1.15

WESTON 0–50 MILLS, MODEL 301, SPECIAL THIS MONTH ONLY, EACH. 3.39

TRANSFORMERS — THIS MONTH'S SPECIAL!

Thordarson — 2–7½ volt CT windings, 1–1½ volt CT winding, high voltage 1500 volts CT, Tapped primary; weight 11½ lbs.; height 6"; width 4½"; breadth 5", each 3.50

Arsco power transformers, all fully mtd., encased in aluminum-bakelite posts — a real heavy job and a pride to any xmitter: 750 volts each side center; 2–7½ volt CT fil. windings, each. 6.00
1000–1500 v. each side center 375 watts, each. 8.00
1500–2000 v. each side of center 850 watts, each. 11.00
1500–2500 v. each side of center 850 watts, each. 14.20
Arsco filament transformers: 2½ volt for pair of 866s. . 1.45
5 volt 10 amp; 7½ volt 7 amp; 10 volt 6½ amp; 11 volt 6½ amp; 12 volt 3½ amp, each type 2.25

Samson Power Transformers: Filament transformer No. 217, delivers 5 volts, CT, and 7½ volts CT, ideal for a pair of 281s, very conservatively rated.
No. 132 "B" eliminator xformer: 2–2.5 volts each side C. T., 300 volts each side of center
No. 463: 7.5 volt C.T.; 5 volt C.T.; 2.5 volts C.T.; 1.5 volts not C.T.

ANY OF ABOVE $2.69; Finished in black, with rubber cord for AC, beautiful job

CRYSTALS

80 or 160 meter-ground to your frequency — Y cut and of power type variety — accurate within .1 of 1%, bakelite dustproof adjustable crystal holder included. 4.50
Crystal oven with crystal ground to your frequency in 80 or 160 meter band, with holder. 13.35
40-meter crystals $8.00; Finished oscillating blanks, gtd. $2.00
Unfinished blanks. 1.20
Bakelite adjustable xtal holders, 89c; same but plug-in type. 1.15
Precision plug-in crystal holder, beautiful job, each. . . . 1.49
Crystal grinding compound. 25

CONDENSERS — SPECIAL!

Flechtheim 2 mfd. 1500 volt, each $3.50; 4 mfd. 1500 volts, each. 6.00
Each mounted in metal case with stand-off insulators

Arsco xmitting condensers (1 yr. unconditional guarantee)

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 DC voltage

Arsco unmounted condensers but sealed in paraffin, guaranteed 90 days.

600 volt	*800 volt*	*1000 volt*
1 mfd.....$.20	1 mfd.....$.30	1 mfd.....$.45
2 mfd..... .25	2 mfd..... .40	2 mfd..... .70
3.5 mfd..... .35	3.5 mfd..... .50	3.5 mfd..... .90
4 mfd..... .40	4 mfd..... .60	4 mfd.....1.00

WIRE: GENUINE ACME, solid enameled aerial wire 100 ft. No. 10 gauge 95c; No. 12 gauge 65c; No. 14 gauge 50c
200 ft. No. 10 gauge 1.65; No. 12 gauge 1.25; No. 14 gauge 90c

Arsco individually calibrated monitor, complete with tube, batteries, 20, 40, 80 meter coils, special 9.35

Arsco wavemeter with individual chart and coils for 20, 40, 80 meter bands, special. 6.25

ARSCO XMITTERS AND RECEIVERS

A new 5-meter xmitter $8.95; in kit form. 5.00
A new 5-meter receiver $17.95; in kit form. 12.00
Arsco Junior single 245 TNT transmitter, complete with power pack, tubes and mercury rectifier tube. . 13.95
Arsco Senior push pull TPTG 245 xmitter, complete with tubes and mercury rectifier. 18.95
Arsco 2-tube bread-board receiver, made of finest material, $8.75; in kit form. 5.75
AMERICAN Double button mike, list $15.00. . . . . 5.00

Standoff insulators, beehive type, brown and beautifully glazed, furnished with knurled nuts, per dozen .59

Signal Corps Bugs, similar to Vibroplex, each. 8.75

Teleplexes with three tapes, special for this month only. 10.00

RCA 2 henry, 300 mills key click filter chokes, or input filter, weight 14 pounds. 1.25
Hammarlund Comet Pros in stock — New type with new tubes — New Hammarlund xmitting condensers in stock

OPEN EVENINGS

INCLUDE POSTAGE WITH ALL ORDERS AND 20% DEPOSIT AGAINST C.O.D. SHIPMENTS

Visit Uncle Dave's New Radio Shack When in Town. Good Time Assured, hi! Four Story Building with over 35,000 square feet of space, devoted to nothing but parts. For Goodness' sake, what do you need? We sure got "it." — What have you for sale or trade?

Write for FREE HAM Sheet

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**

Resistor R, which should be a variable affair with a total resistance of 1500 ohms or so, is adjusted so the output voltage of the rectifier-filter system is the same with the key open or closed. A relay with two sets of contacts may be substituted for the two relays shown, of course. A bleeder re-

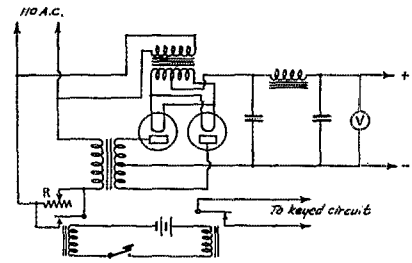


FIG. 2

sistor and milliammeter may be substituted for the plate voltmeter, as suggested above. Incidentally, this scheme was mentioned in a stray in March *QST*, but the information wasn't complete enough. The whole story is in Fig. 2.

V. T. REGULATORS

The third "anti-yooper" requires no relays, but utilizes a "regulator" tube which, when the key is up, takes the same plate current as the oscillator takes when the key is down. This system can be explained by reference to Fig. 3. With the key open, the regulator tube is self-biased by means of the variable resistor R_2, which is adjusted to cause the tube to take the same plate current as the oscillator. Then when the key is closed the additional bias battery comes into the

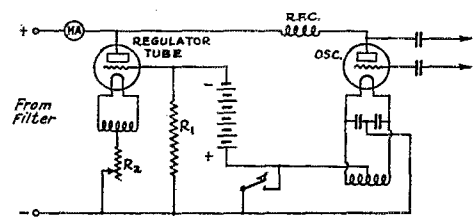


FIG. 3

circuit and the current through the regulator tube drops to zero, provided the battery voltage is high enough. Bernard P. Hansen, of Woodmen, Colo., is responsible for this arrangement.

In Mr. Hansen's case the oscillator is a '45 and the regulator consists of three '26's in parallel. Resistor R_2 is a 3000-ohm variable, and the extra bias battery is a 45-volt unit. Adjustment is simple. Note the oscillator plate current with the key closed; open the key and adjust R_2 to make the regulator tube current the same as that taken by the oscillator. A slight flicker in the meter reading with keying can be eliminated by a few final touches to all adjustments. In the original set-up R_1 was 100,000 ohms, and it was found that there was a tendency toward audio howling in the transmitter when the key was open. Increasing R_1 to 500,000 ohms cured it, however.

Higher oscillator plate voltages and currents will call for larger regulator tubes, of course. One or two Type '50's probably would be OK for an oscillator with one or two '10's. A larger bias battery would be required, of course.

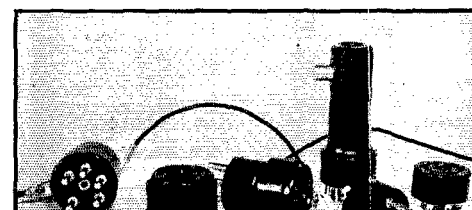
SAVING THE FILTER CONDENSERS

Besides curing yoops these methods, because they keep the output voltage down to the full-load value whether the transmitter is taking power or not, give the filter condensers a new lease on life. With condenser input to the filter it is not at all uncommon for the voltage across the condenser terminals to go up 50% or more when the key is open if no attempt is made to hold the voltage down. The small cost of the extra apparatus is more than justified.

New Six-Prong Adapters

THE advent of tubes with six-prong bases probably has caused some consternation among people who have purchased tube and set checkers within the past year or so in the hope that they could keep up to date for at least a reasonable length of time. However, there *is* something that can be done about it. The accompanying photograph shows a collection of adapters of various sorts which can be used with existing tube and set testers to make it possible to take care of the new tubes.

Included in the group are a straight 6-to-5-prong adapter, which has a 5-pin bottom and a top which is really a 6-prong socket, the suppressor-grid contact in the socket being connected to the cathode pin on the base; and a similar adapter in which the suppressor-grid contact is brought out to a 6-inch lead terminating in a 'phone tip; both being designed for tube checkers. For set analyzers there are special adapters which lock on the analyzer plug, a separate lead being brought out to a 6-to-5-prong adapter which plugs into the UY socket on the set analyzer.



There is also a new six-prong analyzer plug, with associated adapters which give 4- and 5-prong connections, for use in set analyzers now being designed to handle the 6-prong-base tubes. These have a latch lock which prevents losing the adapter when the plug is removed from a tube socket in the set being tested. A six-prong button-type socket which is held to the panel by a single bolt or eyelet is also available.

These new adapters and plugs are made by the Alden Products Company, Brockton, Mass.

Strays

In connection with the high-output audio amplifier described on page 29 of the August issue, Mr. L. S. Fox, of the Sales Engineering Department, National Carbon Company, points out that there is a possibility of unsatisfactory results when using the amplifier and adapter plug with commercial Air-Cell receivers. Several of these receivers have a filament-current consumption so close to the 650-milliampere limit of the Air-Cell battery that the additional drain imposed upon the battery when the amplifier is plugged in the set would result in an overload and probably a quickly exhausted battery.

A second point is that all commercial Air-Cell receivers are equipped with a fixed resistor in the filament circuit to drop the battery voltage to the proper value for the filaments. The increased load caused by the amplifier would cause a drop in filament voltage on all tubes which would be likely to cause a decrease in sensitivity of the receiver, even if the battery was not overloaded.

In cases like this the best scheme would be to use the adapter plug to obtain filament current only for the tube which the plug replaces, getting the filament current for the Class B stage separately from the filament battery, provided the load on the latter is not exceeded by this procedure. If the load is too great the use of a separate filament battery for the Class B stage is desirable. The plate potentials for all three tubes may be taken from the adapter plug, of course.

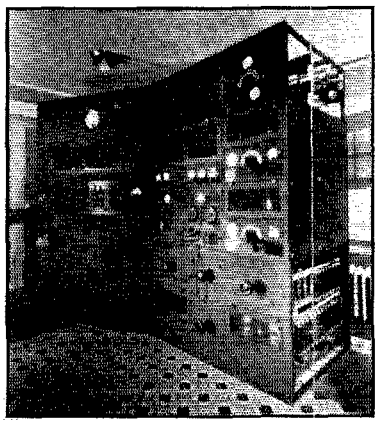
Two new booklets which will be decidedly worth-while adjuncts to the amateur library are the "RCA Radiotron Manual" and the "Cunningham Radio Tube Manual." Identical in text except for the company designations of the tube types, these Manuals contain a great deal of extremely interesting and useful information in their 83 pages.

The first chapter contains a discussion on cathodes, elementary vacuum tube operation, and explains why four- and five-element tubes are made. Following this there is a description of the manufacture of vacuum tubes, and then a chapter explaining just what is meant by vacuum tube "characteristics." A chapter on "Applications" explains how amplifiers work, including a description of the method of computing power output, differentiates between grid and plate detectors, and has something to say about oscillators. Some highly practical information is given in the section on "Installation." Complete characteristics are given for each of the receiving tubes now manufactured, together with the most useful curves for each type. Last but not least, there is a page devoted to socket connections for all types of tubes, and another page shows the dimensions of the various bulbs and bases now in use.

Although a price of twenty-five cents has been placed on the booklet, amateurs, experimenters and service men can obtain a copy gratis by

addressing either E. T. Cunningham, Inc., or RCA Radiotron Co., Inc., both at Harrison, N. J.

A 16-plate catalog and price list on Solar dry electrolytic condensers and molded mica condensers is available from the Solar Manufacturing Corp., 599–601 Broadway, New York City, on request. The booklet also contains data on the electrical characteristics of the electrolytic condensers.



The transmitter and three-phase rectifier at VE9GW, well known to amateurs in the United States and Canada through its broadcasts on 6095 kc.

Yes, they even have BCL troubles in China. Here is a letter received by a prominent AC ham from the local authorities:

"Headquarters House
Chefoo 1st April, 1932

"Sir:

"I am now told by my Chief to polite inform you, please for your honourable self to the more gently touch that operative key of your wireless machine as it is very noisesome to majority and greatly it disturb the heavenly atmosphere for multitudinous radiuses in this province.

"Complaints from much sources just now become too excessive and so somebody of the technique staff of our famous Aerial Corps make to suggest for you to affix a Silence Tube which modify greatly, he says, that infernal noise caused by you disturb the beautiful melodies from the great broadcast stations of the entire universe. Please attention kind Sir to this.

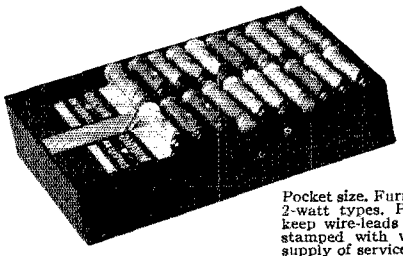
"Obediently Yours, Sir,
(Signed) LENG WOO DIEN
Secretary
To Chief of Northern Aerial Corps"

Copies of technical data sheets on the new 46, 56, 57, 58 and 82 tubes are available for the asking from the Arcturus Radio Tube Company, Newark, N. J.

In the diagram of W6GM's 'phone break-in system on page 14, July *QST*, there should be a

The Call *for* Trained Radio Men

Calls *for the* Right Products *for* Servicing Sets This Fall



FIRST-AID RESISTOR KIT

Pocket size. Furnished in 1-watt and 2-watt types. Protect-O-Packed to keep wire-leads straight. Each unit stamped with value. Includes free supply of service labels.

THIS fall millions of sets will require attention, for old sets cannot go on forever. Trained men will have plenty of work, but the products used must be of the best. We have perfected OHIOHM Resistors and the replacement service to a degree that simplifies your problems and assures success. Send for the facts.

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with initial order. Instantly tells resistance according to R.M.A. color code.

OHIOHM RESISTORS

FIRST-AID KITS

SPARK SUPPRESSOR SETS FOR AUTO RADIOS

SPARK SUPPRESSOR SETS for eliminating ignition interference on 4, 6, or 8 cylinder cars. Contain condenser and necessary suppressors.

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OHIOHM Resistors are made in Canada by C. C. Meredith & Co., Ltd., Toronto

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Keep posted on the new Universal products. Get your copy from your dealer.

New items include the superfine line of Bullet Type Microphones; the new compact Torpedo Microphones; the Watch Model "W"; the super-sensitive Midget Model "Y"; the sensational 2-button, popular priced "X" and an ultra-modern line of Transformers that will set the pace for years to come.

Universal makes Tomorrow's New Developments Available Today!

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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 4-A.
- **LITTELFUSE LABS. 1772 Wilson Ave., Chicago**

"Quicker than a Short circuit" **LITTELFUSES**

Low Prices on Crystals!

Power osc. Xtals, fully guaranteed. Calibrated to 0.1%. 3500–4000 Kc. $3.95; 1715–2000 Kc. $3.95; 4666–4800 Kc. triple to 20 meters $5.95; Osc. and finished blanks $2.25; unfinished blanks $1.25. Dust-proof Xtal Holders $1.50

210 tubes — 89c; 250 @ 89c; 866 @ $1.49; 281 @ 89c.

Mershon (wet) Elec. Conds. 18 mfd. 79c; double 8 mfd. 98c; triple 8 mfd. $1.50; 20 mfd. Sparton $1.98; 52 mfd. $3.98; 36 mfd. $2.79

Sprague (wet) elec. conds. single 8 mfd. 49c

Elkon dry elec. conds. single 8 mfd. 39c

20% deposit against all C. O. D. shipments

Include postage. We ship to any part of the world

MAURICE SCHWARTZ & SON

710–712 Broadway — Schenectady, N. Y.

Attention

AMATEURS *and* COMMERCIAL MEN

Have you seen our plug-in type crystal holders which use the new famous Titan Metal Mfg. Co. alloy, called Tinicosil? If not, we will be pleased to mail you full information concerning them. Amateur crystals 160-80-40 meter bands. Also finished and unfinished X or Y cut blanks.

Fridgen & Barnes Radio

Bellefonte, Pennsylvania

2-μfd. condenser between the plate and filament of the '71-A control tube. This condenser prevents Relay S_1 from chattering. In the same diagram a connection is shown between the plate of the '01-A speech amplifier and the '71-A which obviously should not be there. We suspect that our draftsman used some pencil "guide-lines" and lost control of his pen when filling in — but the thing slipped past us, nevertheless. Make these corrections if you're giving the system a trial.

W2BJZ dug out a copy of the *New York Herald* dated November 28, 1902, in which is a column headed "Wireless Reports of Passing Ships." A little way down the sheet we find this interesting information: "Steamers not carrying the Marconi wireless telegraphy system can communicate at night with the *Herald* operators on board the Nantucket Lightship by means of the Morse Continental Code, using either steam signals or flashlights." That's how they did it thirty years ago!

Electron-Coupled Oscillators for the Small Transmitter

(Continued from page 17)

The result is the same; tubes are cheap, so are the condensers and other parts required, and anyone can wind the coils in a few minutes. It's an ideal circuit for the oscillator-amplifier transmitter, and the m.o.p.a. is the best bet for the ham who wants something better than the average.

'Phone—C.W. QSO Contest Results

(Continued from page 31)

W7MF 42; W7BNI 18; W7DP 6; W7BHP 4; W7AHF 4; W7AHQ 4; W7KG 1. Eighth District: W8DED 234; W8CVS 171; W8DWJ 99; W8DWV 56; W8DHU 40; W8GNH 35; W8GHD 25; W8BYD 24; W8DTW 9; W8BZK 8; W8DOS 6; W8GWY 4; W8CGF 4; W8BFF 4; W8DBX 4; W8GPT 1; W8DHQ 1. Ninth District: W9BVI 1830; W9BWJ 860; W9ARH 304; W9EVQ 276; W9HDN 165; W9CWE 91; W9FOC 90; W9AND 75; W9EGD 64; W9HPQ 36; W9FLH 30; W9EMY 20; W9BOZ 20; W9DSS 12; W9CTB 9; W9DBO 6; W9IPY 4; W9ISD 2; W9DOU 2; W9DMY 2; W9IVF 2. Canadian First District: VE1AE 15. Canadian Third District: VE3GT 96; VE3IH 45. Canadian Fourth District: VE4EO 4.

Transmission-Line Feed for Short-Wave Antennas

(Continued from page 29)

not necessary to have a whole flock of thermo-ammeters; one will do for the line adjustments. Make several bakelite binding post blocks to insert in the various places, and put wire jumpers in place of the meter when it is being used somewhere else.

In Fig. 5b the condensers are the same size. In

5c the upper condenser is reduced in size. In 5d the inductance for correct operation will be found to be quite small. The arrangement at 5e is a low-angle radiation antenna of the type that has been given much publicity (WABC), though the line matching network is not that ordinarily used. I want to commend particularly to the amateur fraternity the circuit of 5f. This is a half-wave vertical Hertz, voltage-fed at the bottom by means of a resonance coil. The principle of this has been discussed in *QST* for July, 1932, page 45. The difference here, of course, is the addition of the feed line. The proper place for the antenna ammeter is half-way up. As before, the meter can be hauled up with the antenna for testing and read with a field glass from a convenient second-story window. For regular service replace the meter with a brass strip having a pair of binding posts on it. At the shorter wavelengths it is possible to remove the ground condenser entirely. The best way to tune the resonance coil is to use a small (peanut type) neon lamp held in the hand. It will glow when the top of the coil is approached even without touching. The spread adjustment will have to be made with the antenna attached.

Incidentally, an antenna is a two-way device, and coupling the feed line into the first tuned circuit of your receiver may give you a great surprise on the band used for transmitting.

W6USA—The World Was Its Oyster

(*Continued from page 12*)

night stenographer just answering cards from souvenir hunters. After July *QST* came out with our article we were swamped with requests for skeds, but by that time our time was filled. If our answer to a long and interesting letter was a cold, impersonal card it was not because we did not appreciate that interest. We simply didn't have time.

In closing, may I say that through the whole of this enterprise it has been a distinctly pleasant surprise to find that one can reach into the everyday ranks of ham radio and there secure the component parts of a machine-like organization such as we have enjoyed. That we have been able to weld hitherto entirely unrelated individuals into a whole that admitted no obstacle has surprised others as well. We believe that the functions of this organization, the results achieved and the contacts made will have definite and far-reaching effects. Fifteen hundred modern, thinking young men from forty different countries have had amateur radio explained and displayed to them. Many of them feel greatly indebted to us for our services, and expressed their desire to speak in our behalf whenever the occasion presents itself. We hope sincerely that this good-will may track itself across the world in ample time to help us at Madrid.

Again we wish to extend our thanks to every individual and organization in any way affiliated with us. It has been an experience we shall never forget. Whatever our success, we did our best and the job is finished. Aloha.

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 Rockwood Road, Cleveland, Ohio.

OVER six pounds radio data, circuits, bulletins, 50¢ postpaid. Beyond Rockies, 75¢. Kladag, Kent, Ohio.

GOOD crystals — fair prices. Hollister Crystal Labs., Merriam, Kans.

100 watt H. C. Hartley, 2000 Vpdc power, finest parts. Rivals commercial job, $75. W9DRG, Owatonna, Minn.

QUARTZ — make your own oscillating crystals. 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.

$25 reward information box tubes lost or stolen Kansas or Colorado. 250 watters, 75 watters, 50 watters and others. Can identify. W9ENG, 801 N. Catalpa, Pittsburg, Kans.

204A — Radiotron. In excellent condition, $30. A. B. Berresford, 1 Newport Rd., Cambridge B, Mass.

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 1933 catalog with diagrams. Universal Microphone Co., Ltd., Inglewood, Calif.

QST — 70 books. Will trade for shortwave receiver. John Hilton, 1821 Gillingham St., Frankford, Philadelphia, Pa.

FOR sale or trade. Bosch and Lomb high grade microscope with carrying case. Like new. Cost $150. Want anything in receiver or transmitting line, or what else have you? VE3GG, Hydro, Ontario.

BACK numbers QST complete May 1925 to date, $15. F.O.B. Chicago. W8BDF.

MICROPHONE repairs — All makes and models; eight hour service. Double button stretched diaphragm $7.00; others $3.00; single button $1.00. Work guaranteed. Write for microphone catalog. Sound Engineering Corp., 412 N. Leavitt Street, Chicago, Ill.

SELL complete station. 100 watt crystal controlled transmitter, monitor, four tube receiver. First $75. Kraft, 1115 Murray Road, Cincinnati, Ohio.

CONDENSERS: Oil impregnated, fully mounted, metal cases. 4 MFD. 1500 Volts d.c. Guaranteed. Individually tested at 1800 Volts a.c. $2.25 each, five for $10. W1VC, Richard Baer, 70 Ontario St., Pittsfield, Mass.

SELL best offer RCA 849 used approximately three hours' guaranteed perfect. RCA short wave converter $15. Trades, considered. W2CUZ.

TRANSMITTER, UX210 crystal three stages. Frame, meters, aluminum panel; $32. 650 volt power unit, $18. Write for description. Hal Justice, Canton, North Carolina.

CRYSTALS. Accurately ground to your frequency. 80 and 160 meter. 0.1% tolerance $4. C.O.D. Guaranteed strong oscillators. QRG Crystal Labs., Pompton Plains, N. J.

RELAYS. W1AKL.

QSLs, two color 100, 75¢; 150, $1; postpaid, samples. W9GOF, Maxham, Mishawaka, Ind.

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.

CRYSTALS: Your approximate frequency 80 and 160 meters, $1.35. One inch blanks 65¢. Prepaid. Fisher Laboratory, 1200 E. Nevada, El Paso, Texas.

PANELS. See August *QST*. W8BSR.

AUDIO-frequency design and measurements using latest GR equipment. Filter, peaked-audio, transformer, curves and adjustments — $1.00 up. Impedance measurements. Audio oscillators calibrated — 20 points $10. Oscillograms. Engraved Formica name plates. George Carson, Iowa City, Iowa.

QSL cards — distinct, lowest prices, samples. W8DDS Print, 2155 West 81, Cleveland.

BARGAINS in quality transformers of all sizes. Also other parts. W9DOQ, Route 1, Duluth, Minn.

CENTER tapped transformers, 50 watt. 7½V, 75¢; 7½V–7½V, $1.10. W8HCN, Waterville, Ohio.

TUBES: TX-281, 90¢; EX-210 $1.50; JX-280M $1.40; TX-888 $1.65; TX-281M $1.95; HX-866 $1.95. Guaranteed "firsts." Howard Tube Service, 5508 Fulton St., Chicago.

CRYSTALS: 0.1% accuracy, 2000 to 5000-kc. "y" cut $3.50, 7000-kc. band "x" cut $5. Several RCA 75 watt s.g. tubes attractive prices. Joe DuPre, Beachwood, N. J.

160 meter fone-cw transmitter, $25. W9DKF, Peoria, Ill.

CARTOON QSLs. W8DWV, Ellwood City, Pa.

QSLs — that speak for themselves. SWLs samples for stamp. W3BHG, 3536 Roland Ave., Baltimore.

CRYSTALS: 80 or 160 meters, $2.50. Guaranteed. W7ALW, Sandpoint, Idaho.

FOR sale — one REL278 used two months. One push-pull xmtr, t.p.t.g. with meters. Two Cardwell condensers .00044. Power supply 750 volts pdc. filtered by one 2 mfd. 2000 filter condensers and two 2 mfd. 1500 filter using Thordarson double choke. W5AK, Portales, N. Mexico.

SELL or trade, terms: Teleplex, Dynatron monitor oscillator, Vibroplex, RCA UX210s, all wave receiver, superhet converter, television equipment. Want: 212D, socket, filament supply, 211, power transformer. W8IV, Harper Richards, Argyle, N. Y.

VIBROPLEXES, medium base, new, $12. Slightly used, $10. Lydeard, 28 Circuit, Roxbury, Mass.

TRADE 204A tube A1 and 860 watt power transformer, 2000–1500 volts each side center tap for motor generator 1500 volts or higher around 750 watts. W9EMF.

G.E. transformers, k.w. at 2200. Matched pair to give 4400 c.t. both $15. 600 watt 2200 c.t. $9. All 110–220. Want filter. W5ABY, Huntsville, Texas.

CRYSTAL holders — plug-in, dust-proof. Excellent workmanship. Individually circuit tested, $1.95. W9HQ, Brookfield, Ill.

QSL cards, message blanks, stationery, snappy service. Samples free. Write today. W1BEF, 16 Stockbridge Ave., Lowell, Mass.

QSLs of distinction. Samples, prices for stamp. W2AEY, 338 Elmora, Elizabeth, N. J.

QSLs — Have a real ham print yours! Beautiful samples free. W8DED, Holland, Mich.

CASH for d.c. SW5. Chester Squibb, Mt. Vernon, Mo.

CRYSTALS, Brazilian quartz, c.o.d. calibrated crystals, one inch, x or y, $3.50. 1750 to 4000-kc. oscillating crystals, one inch, x or y, $1.50. Unfinished blanks, odds and ends less than one inch. Guaranteed to make good oscillators, 60¢. Grinding carborundum 25¢ per box. William Threm, W8FN, 68 E. McMicken Ave., Cincinnati, Ohio.

TRANSMITTING equipment constructed to your specifications at attractive prices. Mabbott and Chapman, Stevensville, Montana.

CRYSTALS, 75¢; guaranteed oscillating blanks. Grinding instructions, 10¢. W6EIJ, 3760 Kelton Ave., Los Angeles.

GENERAL ELECTRIC 24/1500 volt dynamotors $37.50; 24/750 volt 150 watt $27.50 in lots of six $20. each. Shafts for external drive $3.00 additional. Westinghouse 27½/350 volt $7.50; 6–15 volt 500 watt $10. 500 cycle 500 watt with d.c. exciters Special $7.50 new. All ball bearing machines. Henry Kienzle, 501 East 84th Street, New York.

TRANSFORMERS and reactors made to order. All kinds. True quality at reasonable prices. Write for quotations, giving specifications. This month's special — Class "B" Transformers for '10's — pair $6.50. Baker Engineering Labs., Fort Wayne, Indiana.

QSLs. Get our samples and prices before ordering. Maleco, 1512 Eastern Parkway, Brooklyn, N. Y.

MONITORS — electron-coupled frequency meters, xtal oscillators. Precision built equipment at lowest prices. W3ZU, 4523 West Seminary, Richmond, Va.

QSL cards, new style, two colors, 85¢ per hundred. Free samples. W8DTY, 257 Parker Ave., Buffalo.

203As brand new, Westinghouse or GE $12. Class B transformers pair 210 — $7; for 203As — $10. 10,000V heavy duty 866s — $3. 10 amp. ct fil. transformers for 866s — $2.50. New RCA 210s — $3; RCA 250s — $2.25. Weston type 301 milliammeters $3.75 (some new, all new condition, most all ranges). Perfect RCA 204As — $35; 849s — $40; 852s & 860s; 212Ds — $25. Beginners Candler course with Instructograph $25. New Weston RF meters $5.25. List. Edwin C. Ewing, Jr., 1057 Pratt Blvd., Chicago, Ill.

QSLs, 90¢ a 100, two colors. W9DGH, 1816 5th Ave., N., Minneapolis, Minn.

QSLs made to order, $1.95, 200. Others $1.45, 200. Stamp photos, $1.10, 100. T. Vachovetz, Elmsford, N. Y.

SHORTKUT $5. Master code few hours. Kill hesitation. Read 25 few days. Economical — time has value? Dodge, 128 Palmer, Mamaroneck, N. Y.

$500 worth ham apparatus for sale or trade. Will pay cash for tubes or condensers. W9ENG, 801 N. Catalpa, Pittsburg, Kans.

REL278 band spreader, coils and higrade tubes. Twenty five dollars. Kendall Hanson, Peabody, Mass.

QSLs, stationery, wall cards, blanks, etc. Hillcrest, Cranesville, Pa.

QSLs, 75¢. W8AKY.

QSLs, two color, 200 one dollar, samples. Foster Press, 1040 Prospect Ave., Appleton, Wisc.

ATTENTION: hard-to-get constructional materials. List free. Harvey Robey, East Lansing, Mich.

WILL swap crystals for parts. W6EOH.

FREE QSLs. The latest novelty. Your photo on each card. W8BVE, Ben Franklin Press, Franklin, Pa.

HAMMARLUND Pro's shipped prepaid on trial. $79.38; REL278s, $25.65; SW3s, SW58s; REL and National five meter equipment; any transmitting apparatus. Buy, trade and sell used apparatus too. List free. Inquiries welcomed. Henry's Radio Shop, Butler, Mo.

"4MOST" Front Page News — Dear fellow Hams listen to this: — We announce that the New "4most" Holder is now on the market. This small, compact piece of lacquered and nickel-plated furniture, finished in an array of beautiful colors, is ready for you. It is a part of the "4most" system and is an asset to any amateur studio. They're free so let's have your name and address. Start the fall and winter season off systematically with the "4most" System. "4most," Drawer E, Camden, New York.

GUARANTEED crystals $1.25. Near specified frequency. W9ACO-W9FJO.

QSL cards, send 15¢ for samples, new ideas. Good printing. Exchange, P. O. Box 607, El Monte, Calif.

CODE machines, tapes and complete instruction for beginners or advanced students — both codes — for sale or rent very reasonable. Rental to apply on purchase of new equipment. Special inducement to our amateur patrons. Extra tapes for all machines. Instructograph, 912 Lakeside Place, Chicago.

CRYSTALS: You can rely on Precision Power Crystals for frequency stability and maximum output. Guaranteed. Highest quality obtainable. X cut one inch square scientifically ground to your approximate specified frequency. Calibration better than 0.1%. 1750 and 3500 kc. bands — $4.50 each. Super special, 7000 kc. — $5.95. Plugin, dustproof holders — $2.25. Crystals ground to specified frequencies at a high accuracy quoted on request. Heavy duty type 866 rectifier tubes — $2.45 each. Type 888 — $1.85. Fifty watt tube sockets — $1. Please include postage. Precision Piezo Service, 427 Asia St., Baton Rouge, La.

SLIGHTLY used 212D, $25. Other tubes and apparatus cheap. W1GR, A. W. Hyde, 155 Shirley Blvd., Auburn, R. I.

TRADE alto sax for shortwave super; REL or National. Homer Grimm, Sac City, Ia.

BRAZILIAN quartz, x or y cut finished crystals, 1715-kc. to 4000-kc. C.O.D. $2.50. Scheufler Radio Service, Sandusky, Ohio.

SELL REL278 receiver. Stoughton, Greenwood Mt., Maine.

SELL — WE212D used, $20. T. H. Kemp, 99 Boulevard West, Mountain Lakes, N. J.

OMNIGRAPHS, Teleplexes, Signagraphs, receivers, Vibroplexes, meters. Bought, sold, exchanged. Ryan Radio Co., Hannibal, Mo.

WANTED: Weston or Jewell meters, all kinds. State type, range, condition, price. Also want used Vibroplex. N. A. Peebles, 717 Chestnut St., Wilmington, N. C.

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:

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W1AL J. J. Lamb "jim."
W1DF Geo. Grammer "hg."
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To Our Readers who are not A.R.R.L. members

YOU *should* become a member of the League! That you are interested in amateur radio is shown by your reading of *QST*. From it 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 *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 ($3.00 outside of the United States and its Possessions, and Canada) 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.

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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*?

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Thanks

For Your Convenience

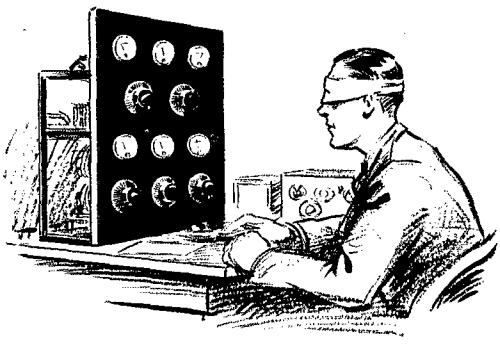
QST'S INDEX OF ADVERTISERS IN THIS ISSUE

Would you operate Blindfold?

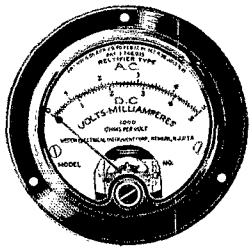
Lack of adequate meter equipment blindfolds you when making the critical adjustments that are necessary to get the utmost from your transmitter.

Adequate Weston or Jewell Indicating Instruments in your transmitter allow you to "see" when adjustments have been properly made — assuring maximum output, yet warning of dangerous overloads that may destroy expensive equipment.

The cost of complete Weston or Jewell Instrument equipment is less than the cost of replacements that may be necessitated by a single overload. Protect your transmitter before it is too late!



Universal A.C.—D.C. Meters



— with this instrument you can measure every

- A. C. and D. C. Voltage with ranges from 0-5 volts to 0-1,000 volts
- A. C. and D. C. Current with ranges from 0-1 ma. to 0-100 ma. and higher

A wide range of needs in laboratory and test work may be filled with this versatile universal A. C. and D. C. instrument.

Weston Shunts and Resistors may be added to either the Jewell Pattern 88 or the Weston Model 301 Rectifier Type Instruments to secure any ranges desired within the limits listed above. Write for literature completely describing these instruments and their many possibilities.

Weston-Jewell Instruments for every transmitting need

The new combined Weston-Jewell line offers radio amateurs a wide range of instruments that meet every possible transmitter need. Below is a chart listing several sizes of panel mounting instruments especially adapted to amateur uses. For complete list of ranges and prices, use the coupon at the bottom of the page.

Instrument Size	A.C.	D.C.	R.F.
Weston 4 3/8" case diameter	Model 429	Model 431	Model 401
Jewell 3 1/2" flange diameter	Pattern 78	Pattern 88	Pattern 68
Weston 3 1/4" flange diameter	Model 476	Model 301	Model 425
Weston 2" case diameter	Model 517	Model 506	Model 507

Instruments for many special applications are included in the complete line, including percentage modulation meters, universal A.C.-D.C. instruments, and many others.

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Weston Electrical Instrument Corp.,
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602 Freylingheusen Ave., Newark, N. J.

Please send me your complete catalog WJ on Radio Panel and Radio Service Instruments.

Name .....

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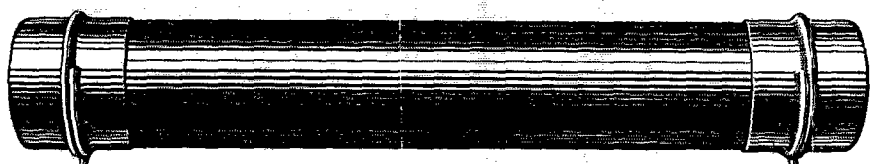
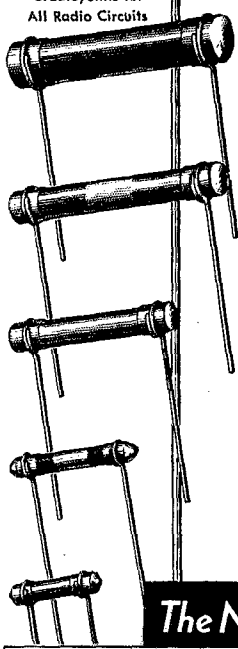
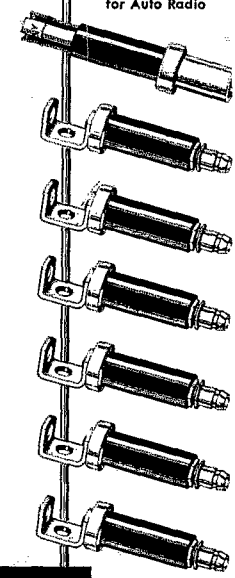


Bradleyunits for All Radio Circuits



Bradley Suppressors for Auto Radio



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Solid Molded Resistors

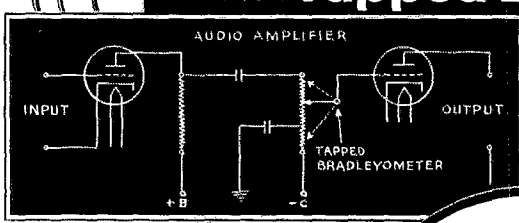
The Choice of the World's Largest Radio Manufacturers

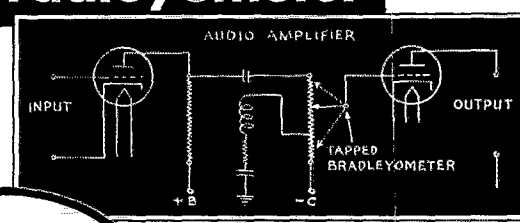
Don't risk the reputation of your receiver with poor resistors. Standardize on Bradleyunit Resistors because their resistance values are stable under varying conditions of load, temperature and moisture.

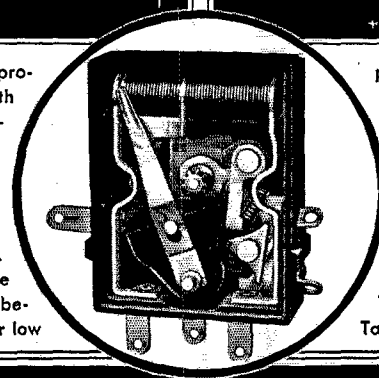
Bradleyunit Resistors are made in five sizes, with or without leads, and are R.M.A. color coded for resistance value identification. These solid molded resistors are accurately calibrated and have great mechanical strength. Get an Allen-Bradley quotation on your next order.

Allen-Bradley Co., 108 W. Greenfield Avenue., Milwaukee, Wis.

The New Tapped Bradleyometer







The new Tapped Bradleyometer provides automatic tone correction with volume control. It achieves this result in any one of several audio frequency networks. (See above diagrams.)

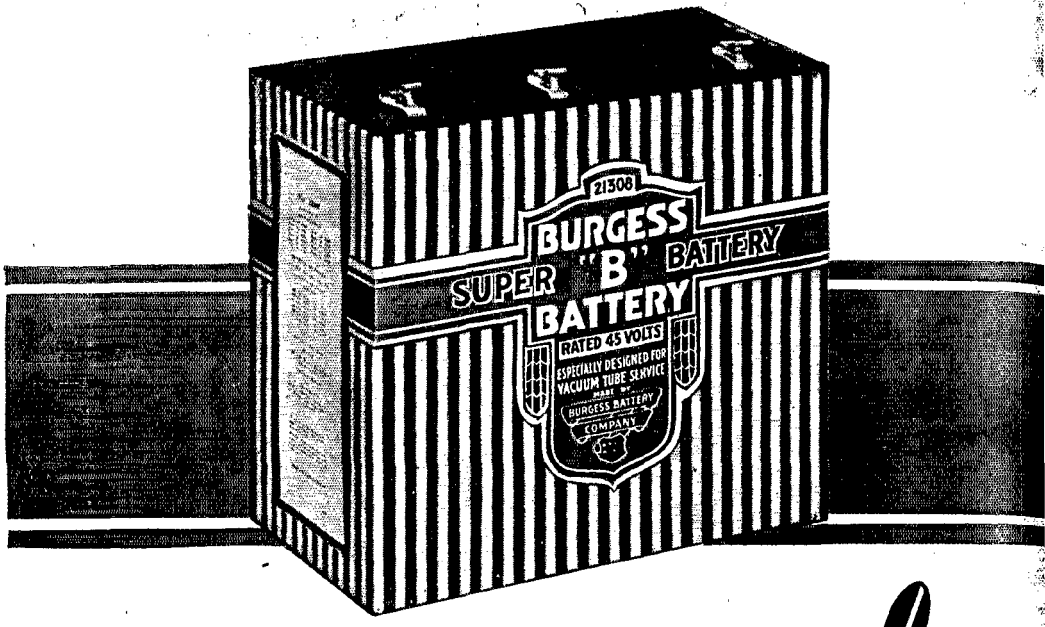
A tap on the resistance element is brought out to a fourth terminal. The network necessary to provide tone correction is usually connected between this tap and the grounded or low potential end of the Bradleyometer.

A single-pole line switch approved by the Underwriters' Laboratories and the Hydro Electric Power Commission of Ontario with a rating of 2 amperes, 125 volts, can be provided within the Bradleyometer and is operated by the regular control knob.

Write for complete data on the New Tapped Bradleyometer.

ALLEN-BRADLEY RESISTORS
Produced by the makers of Allen-Bradley Control Apparatus

RUMFORD PRESS
CONCORD, N. H.



HAMS!

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