

QST

devoted entirely to

amateur radio

december
1932
25 cents



*Written by amateurs for amateurs,
and published by the American Radio
Relay League, the amateur's own organi-
zation, the handbook is hailed everywhere as the
greatest help to amateurs ever published.*

*Because it starts in at the very
beginning of the story and tells
what amateur radio is, how to
become an amateur, how to
learn the code, obtain the neces-
sary licenses and how to build
and operate a simple station,
it is an invaluable and
sympathetic guide for the
beginner who has wanted
to get in on "ham" radio,
but hasn't known how to get
started. Because it progresses
through working descrip-
tions and building instruc-
tions for many varieties of the
most modern short-wave re-
ceivers and transmitters, power
supplies and antennas, and be-
cause it goes into all the intricacies of
station operation and message hand-
ling, it is a necessity for the proficient amateur.*

*Ninth
Edition*

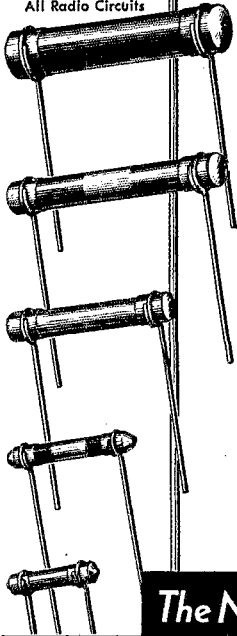
One Dollar

*Postpaid
anywhere*

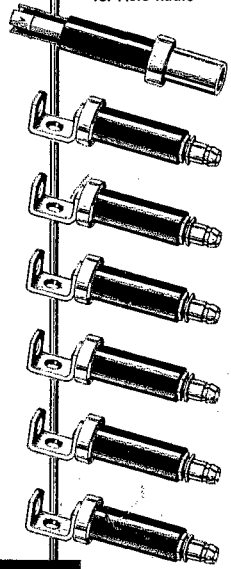
AMERICAN RADIO RELAY LEAGUE
West Hartford, Connecticut



Bradleyunits for All Radio Circuits



Bradley Suppressors for Auto Radio



Bradleyunits Solid Molded Resistors

The Choice of the World's Largest Radio Manufacturers

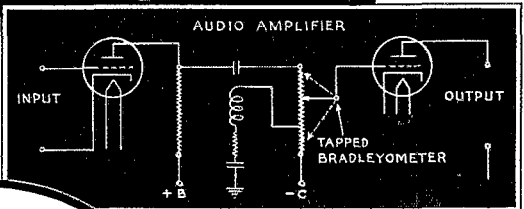
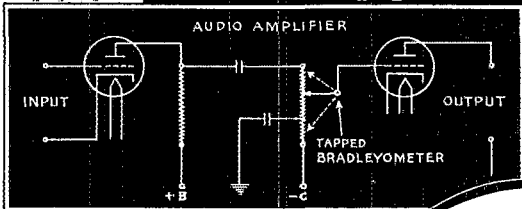
Don't risk the reputation of your receiver with poor resistors. Standardize on Bradleyunit Resistors because their resistance values are stable under varying conditions of load, temperature and moisture.

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.

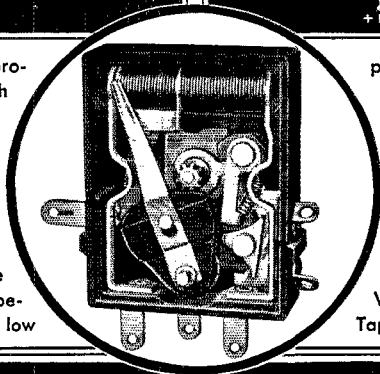


The New Tapped Bradleyometer



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.

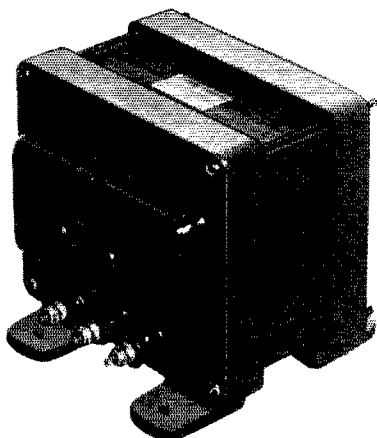
A single-pole line switch approved by the Underwriters' Laboratories and the Hydro Electric Power Commission of Ontario with a rating of 2 amperes, 125 volts, can be provided within the Bradleyometer and is operated by the regular control knob.

Write for complete data on the New Tapped Bradleyometer.

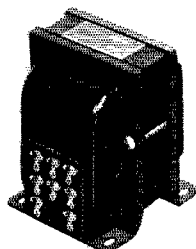
ALLEN-BRADLEY RESISTORS

Produced by the makers of Allen-Bradley Control Apparatus

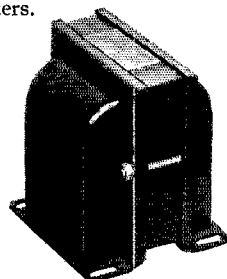
Collins Power Transformers



Mounting A



Mounting B



Mounting C

In the development of Collins Class B modulated phone transmitters and high powered CW transmitters, it became apparent that none of the transformers previously on the market were satisfactory. The Collins Power Transformers and Filter Chokes listed below were developed to meet the exacting requirements of continuous duty in modern commercial and amateur transmitters.

The larger COLLINS transformers and chokes are mounted in heavy cast frames with pressed steel covers and large porcelain insulators (Mounting A). The medium sized and smaller transformers are mounted in heavy pressed steel cases provided with bakelite terminal boards (Mounting B) or with heavily insulated leads out of the base (Mounting C), for chassis mounting. These mountings are very convenient and attractive in appearance.

Type No. Secondaries

HEAVY DUTY PLATE TRANSFORMERS

Type No.	Secondaries	Mtg.	Price
921.	650-650 v. 300 Ma. d.c.	A	\$13.50
930.	1350-1350 v. 400 Ma. d.c.	A	22.50
935.	1500-1500 v. 300 Ma. d.c.	A	18.00
937.	1500-1500 v. 600 Ma. d.c.	A	36.00
950.	2000-1500 — 1500-2000 v. 300 Ma. d.c.	A	26.00
955.	2500-2000 — 2000-2500 v. 400 Ma. d.c.	A	47.00
960A.	3000-2500 — 2500-3000 v. 1 a. d.c.	A	145.00

FILTER CHOKES

Type No.	Secondaries	Mtg.	Price
807.	25-10 Hy. "swinging" 150 Ma.	C	4.00
810.	25-10 Hy. " 400 Ma.	C	6.30
811.	35-15 Hy. " 400 Ma.	C	9.75
840.	25 Hy. 100 Ma.	C	2.50
841.	20 Hy. 150 Ma.	C	4.00
850.	20 Hy. 300 Ma.	C	21.00
852.	15 Hy. 1 a.	A	60.00
853.	20 Hy. 1 a.	A	70.00

Data on Modulation Chokes supplied on request

Transformers for special requirements can be supplied promptly at prices in line with those of standard items.

Unless otherwise noted all primaries are for 110 volts 60 cycles.

Transformers for other voltages and frequencies are available on special order.

Prices are NET, f.o.b. Cedar Rapids or Chicago.

Type No. Secondaries

FILAMENT TRANSFORMERS

Type No.	Secondaries	Mtg.	Price
1020.	7.5 v. c.t. 7.5 v. c.t. 2.5 v. c.t. 2.5 a. 2.5 a. 10 a.	5000 v. Ins. C	\$5.50
1021.	2.5 v. c.t. 2.5 v. c.t. 10 a.	5000 v. Ins. C	5.50
1022.	2.5 v. c.t. 10 a.	5000 v. Ins. C	3.60
1030.	10 v. c.t. 2.5 v. c.t. 2.5 v. c.t. 10 a. 10 a.	5000 v. Ins. C	9.00
1035.	10 v. c.t. 2.5 v. c.t. 2.5 v. c.t. 15 a. 10 a. 2.5 v. c.t. 10 a.	10,000 v. Ins. A	15.00
1040.	10 v. c.t. 8 a.	2500 v. Ins. B	6.50
1050.	11 v. c.t. 10 a.	2500 v. Ins. B	8.00
1051.	15 v. c.t. 15 a.	2500 v. Ins. B	10.00
1052.	5 v. c.t. 25 a.	15,000 v. Ins. A	15.00

COMBINED PLATE AND FILAMENT TRANSFORMERS

Type No.	Secondaries	Mtg.	Price
910.	350-350 v. 5 v. 2.5 v. c.t. 2.5 v. c.t. 100 Ma. d.c. 3 a. 10 a. 3 a.	C	4.00
904.	500-500 v. 2.5 v. c.t. 2.5 v. c.t. 150 Ma. d.c. 4 a. 4 a. 2.5 v. c.t. 4 a.	C	5.85
916.	600-600 v. 7.5 v. c.t. 2.5 v. c.t. 175 Ma. d.c. 2.5 a. 2.5 v. c.t. 2.5 v. c.t. 3 a. 3 a.	C	9.85
918.	650-650 v. 7.5 v. c.t. 2.5 v. c.t. 150 Ma. d.c. 2.5 a. 10 a.	C	9.85
919.	750-750 v. 7.5 v. c.t. 7.5 v. c.t. 150 Ma. d.c. 2.5 a. 2.5 a. 10 a.	C	8.75

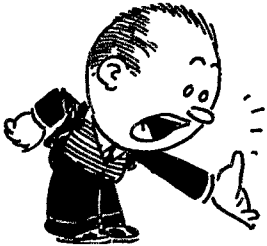
IMPORTANT: Complete list of COLLINS audio transformers appeared on page 73 in the November issue of QST. Preserve these advertisements for your guidance in ordering, or send 25c in coin for a complete manual on COLLINS Transformers and Transmitting Equipment, with circuit diagrams and design data.

Collins Radio Company
CEDAR RAPIDS, IOWA

QST

Published monthly, as its official organ, by the American Radio Relay League, Inc., at West Hartford, Conn., U. S. A.; Official Organ of the International Amateur Radio Union

devoted entirely to AMATEUR RADIO



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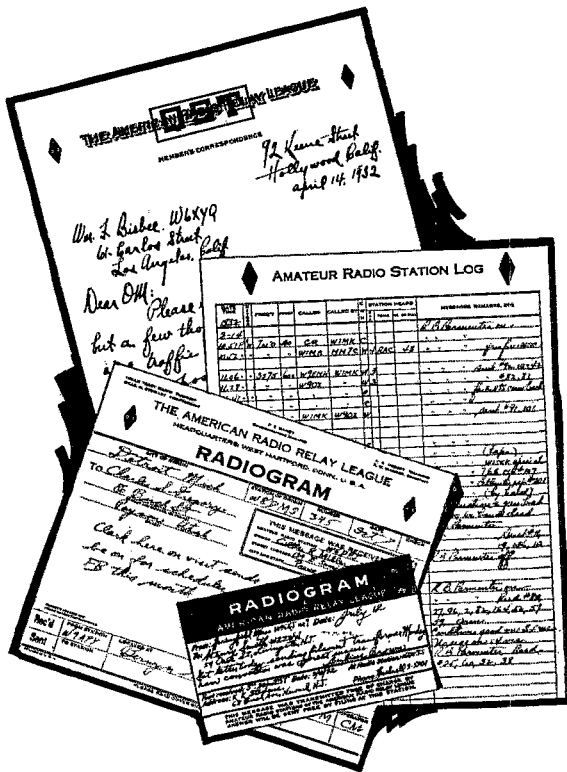
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THEY WON'T GIVE YOU MORE ANTENNA CURRENT— BUT

they'll
improve
your station
efficiency
just the
same.



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 $8\frac{1}{2} \times 10\frac{3}{4}$, bond paper, bound in heavy paper covers. *One book 40c or three books for \$1.00. Postpaid.*

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.*

MEMBER'S CORRESPONDENCE STATIONERY

Write your radio letters on this A.R.R.L. stationery. It identifies you. Used by most old-timers and prominent amateurs. Excellently lithographed on $8\frac{1}{2} \times 11$ bond paper. Now using heavier 20-lb. stock instead of 16-lb. as heretofore. *100 sheets — 50c; 250 sheets — \$1.00; 500 sheets — \$1.75. Postpaid.*

OFFICIAL A.R.R.L. MESSAGE BLANKS

The proper and most convenient form. Designed by the A.R.R.L. Communications Department to make speedy and accurate handling easy. A great aid to good operating practices which reflect credit on your station. Bond paper, size $8\frac{1}{2} \times 7\frac{1}{4}$. Put up in pads of 100 sheets. *One pad 35c or three pads for \$1.00. Postpaid.*

THE AMERICAN RADIO RELAY LEAGUE

West Hartford, Connecticut

Section Communications Managers of THE COMMUNICATIONS DEPARTMENT, A. R. R. L.

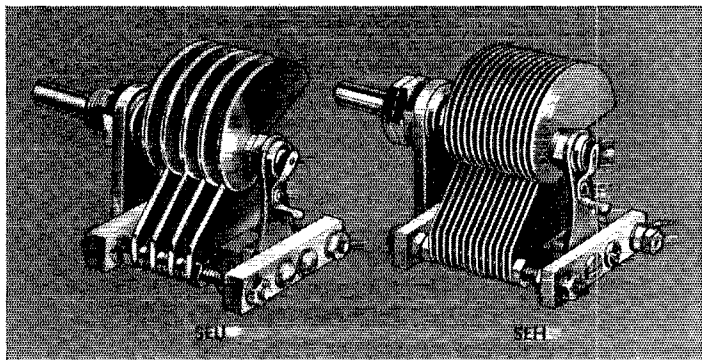
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Manitoba Saskatchewan	VE4BQ VE4EL	PRAIRIE DIVISION John L. Green Wilfred Skalfe	115 Furby St. 2040 McTavish St.	Winnipeg Regina

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

Standard NATIONAL MIDGET

PARTS FOR HIGH & ULTRA H.F. WORK

NATIONAL Company makes a full line of variable condensers, coil forms, coil and tube sockets, H.F. chokes, dials and accessories for H.F. work: — also complete receivers and converters, including the AGS (finest Short-Wave Communications Receiver made.) Send for FREE Catalogue Q-12.



NATIONAL MIDGETS FIT YOUR EVERY REQUIREMENT

Whatever the MIDGET CONDENSER you need for high-frequency work, there is a NATIONAL MIDGET that fills the bill.

We made and patented the first 270° Straight Frequency Line (Equicycle) Plate Midget in 1928. Everyone knows how much easier tuning this gives, how it spreads out the stations over 50° more dial space. This isn't a boast — it merely indicates the experience behind the NATIONAL Line of Midget Condensers. NATIONAL Midgets are up to the minute in design and performance. As each new H.F. development or improved material has become available, it has been incorporated in NATIONAL Condensers.

NO SHORTED TURNS IN NATIONAL MIDGETS

Years ago we recognized that efficient H.F. Condensers should have no shorted turns, and years ago we began making all NATIONAL H.F. Condensers without shorted turns. In fact we had ceased even to mention this feature, but we mention it again because it is a basic feature of NATIONAL H.F. Condenser design. All two-bearing NATIONAL Midgets have the *insulated front bearing* — result — no shorted turns. Naturally the single bearing types can have no shorted turns anyway.

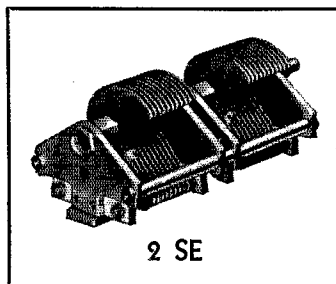
EXCLUSIVE CONSTANT-IMPEDANCE PIGTAIL

Constant-impedance pigtail, a patented NATIONAL feature, is only one of many advantages that make NATIONAL Midgets such consistent and invariable performers. This exclusive and electrically perfect connection to the rotor eliminates the noise, crackle, and varying impedance (A.C. inductance) of the brush type of contact.

OTHER ADVANTAGES OF NATIONAL MIDGETS

Isolantite, acknowledged high-efficiency dielectric, is used for insulating NATIONAL MIDGETS — reducing dielectric losses to a minimum; assuring uniform condenser performance at maximum level under all conditions of humidity and temperature.

Aluminum plates; thick, polished all over, with wide polished rounded edges, are used in the NATIONAL SEU Ultra-High-Frequency Midgets. Here — where rigidity and extreme stability are essential, where surface losses begin to count, we have chosen a suitable material fabricated in such a way as to give best possible performance. Equally thick plates (and thick plates are needed to give wide round edges) of any other metal, would run up cost and increase weight. In aircraft work this is most important, and there also the non-resonant characteristics of aluminum plates prevent any possibility of microphonic feed-back from plate vibration.



THE NATIONAL 2-SE MIDGET WITH GANGED ISOLATED ROTOR

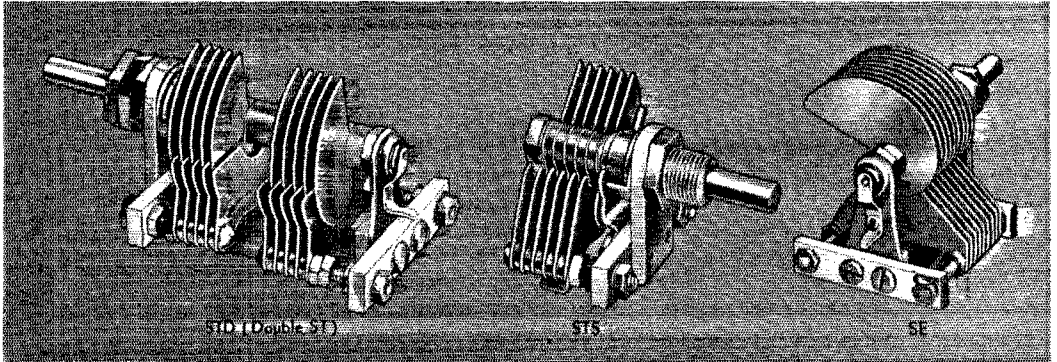
For high-frequency T.R.F. and super-heterodyne work. Heavy, rigid, permanent, precise in mechanical construction; constant in electrical performance. Rotors are effectively insulated AND isolated from each other. Equipped with standard NATIONAL 270° straight-line-frequency (Equicycle) plates.

ALL CAPACITIES from 50 to 350 mmf. PER SECTION. Standard model has equal capacity each section and is furnished for clockwise rotation unless otherwise specified in order. On special order, the 2-SE will be furnished with different capacity sections, at a slight advance in price.

LIST PRICES — STANDARD MODEL — TYPE 2-SE
Type 2-SE 50 to 99 mmf. each section \$5.50
Type 2-SE 100 to 200 mmf. each section 6.50

High and Ultra High Frequency CONDENSERS

Receiving
Transmitting
Neutralizing
Instrument



Complete Specifications and Prices STANDARD NATIONAL H.F. and ULTRA H.F. MIDGET CONDENSERS

Catalog Type No.	Capacity in Mmf.	Air Gap	Number of Bearings	Plate Shape	Rotor Plates	Stator Plates	Depth behind Panel	List Price*
SE- 50	50	.026	2	270° S.F.L.	6	5	2 3/4"	\$3.00
75	75	.026	2		8	7	"	3.25
100	100	.026	2		10	10	"	3.50
150	150	.026	2		15	14	2 3/4"	3.75
SEH-200	200	.0175	2		14	13	2 3/4"	3.75
250	250	.0175	2		16	16	2 3/4"	4.00
300	300	.0175	2		20	19	2 3/4"	4.00
335	335	.0175	2	22	21	2 3/4"	4.25	
SEU- 15	15	.055	2		3	3	"	2.50
20	20	.055	2		4	4	"	2.75
25	25	.055	2		5	4	"	2.75
ST- 50	50	.026	2	180° S.L.W.	6	5	2 3/4"	\$1.80
75	75	.026	2		8	7	"	2.00
100	100	.026	2		10	10	"	2.25
150	150	.026	2		15	14	2 3/4"	2.50
STH-200	200	.0175	2		14	13	2 3/4"	2.75
250	250	.0175	2		16	16	2 3/4"	3.00
300	300	.0175	2		20	19	2 3/4"	3.25
335	335	.0175	2	22	21	2 3/4"	3.50	
STN- 18	18-3000v.	.065	1		4	3	1 9/16"	2.00
STHS- 15	15	.0175	1		2	1	"	1.40
25	25	.0175	1		2	2	"	1.50
50	50	.0175	1		4	3	"	1.60
STD- 50	50 per sec.	.026	2		180° S.L.W.	6 per sec.	5 per sec.	2 3/4"
STHD-100	100 " "	.0175	2	180° S.L.W.	7 " "	7 " "	" "	4.50
SS- 50	50	.026	2	180° S.L.C.	5	4	2 3/4"	\$1.80
75	75	.026	2		7	6	"	2.00
100	100	.026	2		9	8	"	2.25
150	150	.026	2		12	12	2 3/4"	2.50
SSH-200	200	.0175	2		11	10	2 3/4"	2.75
250	250	.0175	2		13	13	"	3.00
300	300	.0175	2		16	15	2 3/4"	3.25
350	350	.0175	2	18	18	2 3/4"	3.50	
SSN- 18	18-3000v.	.065	1		3	3	1 9/16"	2.00
SSS- 20	20	.0175	1		1	2	"	1.40
30	30	.0175	1		2	2	"	1.50
50	50	.0175	1		3	3	"	1.60
SSD- 50	50 per sec.	.026	2		180° S.L.C.	5 per sec.	4 per sec.	2 3/4"
SSHD-100	100 " "	.0175	2	180° S.L.C.	5 " "	5 " "	2 3/4"	4.50
150	150 " "	.0175	2		8 " "	8 " "	" "	5.00

*Usual trade discounts apply

- All shafts 1/4" diameter.
- Standard direction of rotation clockwise. Specify if desired counter-clockwise.

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THE AMERICAN RADIO RELAY LEAGUE, INC., is a non-commercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

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

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

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite. Correspondence should be addressed to the Secretary.

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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THE EDITOR'S MILL

IT IS a little early, perhaps, to start reminiscing about 1932 and what it has meant to amateur radio, but already it is apparent that this has been one of the big years in our history. We've gone through the throes of another international conference; the number of amateur stations in the United States again registered a great increase; activity on the ultra-high frequencies has been widespread; W6USA, at the Olympic games, brought amateur radio to the attention of hundreds of people from all over the world; director elections have been characterized by more interest and participation of the membership than ever before; we've had more contests, more traffic handling, more friendly contacts and a keener interest in amateur welfare.

Particularly gratifying has been the progress along technical lines, both for outstanding articles presented for the first time in *QST*, and for strictly amateur developments. In the first class we have such contributions as the first publication of basic electron-coupled circuits by Lt. Dow in the January issue, the power supply filter studies in the series by Dr. Dellenbaugh and his co-worker Mr. Quimby, and the tourmaline crystal scoop of Dr. Straubel, of Jena University, which represented the initial treatment of this subject in any American journal.

Amateur technical development, both in the adaptation of these subjects to our particular needs as well as along original lines, is likewise a source of satisfaction. Electron-coupled circuits, described by Lt. Dow for their application to transmitters, have been adapted to amateur use by the League's technical staff for better frequency meters and superhet receivers. In receiver development, in particular, *QST*'s own lab has set the pace with such contributions as that of Ross Hull's "unorthodox" receiver, and Jim Lamb's initial article on stabilizing superhet performance, culminating later in the year in the practical development of the most advanced short-wave receiver to date, the single-signal superhet.

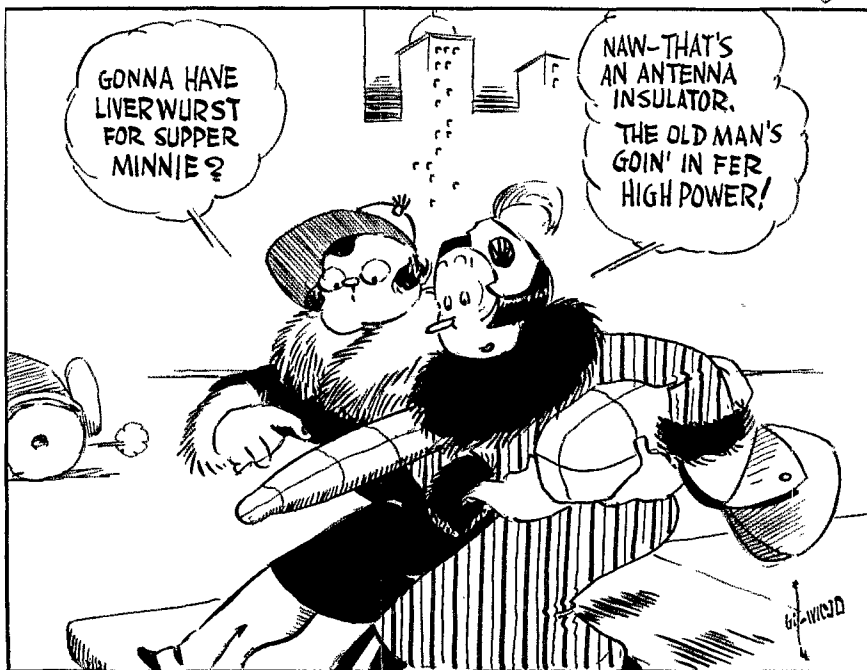
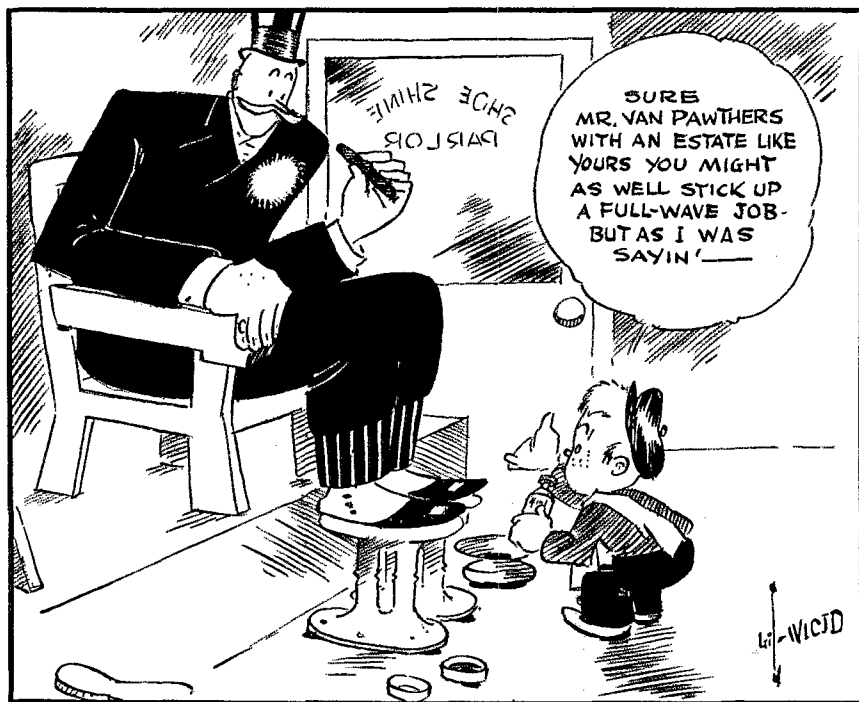
Amateurs everywhere can take pride in the part that their *QST* has played in first publishing practical information on all these worthwhile developments and in the fact that a goodly share of them, valuable to the entire radio art as well as an asset to amateur radio itself, are of solely amateur origin.

BARRING further deadlock on broadcasting problems, it is likely that the Madrid international radio and telegraph conference will be officially terminated by the time this issue gets to print, and the outcome for amateurs already announced by official broadcast.

For that reason we confine ourselves at this time merely to mention of the fact that at the end of October the outlook appeared favorable for the retention of all our present amateur territory. Our high-frequency bands, at that time, had gone safely through the sub-sub-committees. The long fight on our 1715-kc. band was not yet settled, but seemed at last to be headed for settlement on the Washington shared basis. Other matters, such as I.A.R.U. representation at C.C.I.R. conferences, continuance of our present general regulations, and a host of minor questions affecting amateur operation, which we will learn more about when Secretary Warner writes his story of the battle, were likewise definitely over the first hurdles.

Unless unforeseen circumstances arise, it looks as though we now have an excellent chance of seeing all our territory assignments going through to final adoption. — A. L. B.

IT'S STILL THE SAME OLD GAME



Ham-Band Receivers from B.C. Midgets

Converting a Broadcast Receiver to an All-Wave Superhet for C.W. and 'Phone

By Howard F. Anderson, WIBVS*

THIS article is intended to bring to the attention of amateurs something that has been neglected too long — the lowly "midget" broadcast set which, as will be demonstrated, can be elevated both cheaply and easily to the status of a darned good short-wave receiver, while still remaining as good a b.c. job as it ever was. Models of both the tuned radio-frequency and superhet type, flooding the market at prices ranging from about \$14.40 up, nearly all have features that make them readily adaptable to amateur purposes with less labor and expense than would be involved in building a comparable ham receiver from the baseboard up.

Looking one over to see what we get for our money, we find first a complete "A," "B" and "C" supply built in. Of course some will say that these power packs have too much hum; and, true enough, some manufacturers do not put much into the filter. But an extra 8- μ fd. electrolytic filter condenser will bring down the hum satisfactorily in most cases, down below that coming from a lot of "B" eliminators that are supposed to have less. After checking over the power pack, we find that most of these sets have variable- μ Type '35's or '51's in the r.f. stages, a screen-grid Type '24 audio detector and a '47 pentode working into a dynamic speaker — all the modern conveniences. In the better t.r.f. types the line-up is generally two stages of tuned r.f., screen-grid detector and pentode output. Counting in the rectifier, this makes a five-tube set. Superhet models usually have a stage of signal-frequency r.f., first detector, oscillator, one stage of 175-kc. i.f. amplification, screen-grid second detector and pentode output, making a seven-tube line-up with the rectifier included. Either of these two types can be converted to a short-wave version. Suggestions for performing the operation on t.r.f. types will be generalized and the process of changing over a typical superhet type will be

described in detail. In either case, revamping of the input circuits is the main necessity, the rest of the set being left practically untouched.

GENERAL METHOD FOR T.R.F. SETS

Most midgets of this type have two stages of tuned r.f. ahead of the detector while the standard type of s.w. set calls for only one. No need to worry on this score, however, because one of the r.f. stages can be omitted quite easily and the socket, tube, etc., of the other put to work at something else, such as in a first audio stage or separate regenerator tube. The tuning condenser associated with this stage can be left idle, as a sort of spare against the future. To put the remaining two to work for ham-band tuning is the problem. These condensers have a maximum capacity of some 350 μ fd. and a minimum of about 50 μ fd. This is obviously too great a capacity range for the present job and a trick is called for.

When two condensers are connected in series the resulting capacity is always less than that of the smaller condenser. Series capacity arrangements taking advantage of this have been utilized

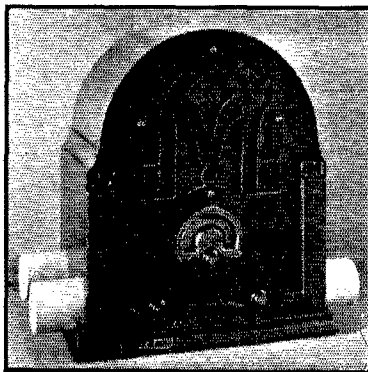
for band-spreading by quite a few amateurs, but usually with the larger capacity fixed and the smaller variable for tuning. In this case, however, we shall leave the small one fixed and tune the large one.

Assuming a 30- μ fd. fixed condenser in series with a variable of 350- μ fd. maximum and a 50- μ fd. minimum, let us figure out the resultant capacities:

$$\frac{350 \times 30}{350 + 30} = 27.6 \mu\text{fd. maximum}$$

$$\frac{50 \times 30}{50 + 30} = 18.8 \mu\text{fd. minimum}$$

Here we have only 8.8- μ fd. change in capacity with an 18.8- μ fd. minimum. This will do for some ranges — it does not take much change in capacity to band-spread the 7- and 14-mc. bands



THE B.C. MIDGET SUPERHET AFTER CONVERSION TO AN ALL-WAVE JOB

The controls perform as before and most of the wiring is left "as is." Shielded coils for r.f., first detector and oscillator plug in at the sides.

* 28 Maple Street, Torrington, Conn.

— but in the 3.5-mc. band we shall use a 40- μ fd. fixed series condenser instead of the 30. Thus we can spread the bands to any extent we want to, providing we have the proper series capacity and the proper size inductance. It is advisable to use an adjustable trimmer for each coil form so that each coil can have its individual series capacity. This is not at all complicated and works out very well. It is also possible to put the coils into cans to shield each one. Since everything else is shielded, then the only pick-up will be that intended, through the coils.

Next we come to the detector, generally a Type '24-A. This can be made regenerative by any one of the several different methods satisfactory to the amateur building the set. Finally comes the audio end. Most of these sets feed into a pentode from the detector; but a fellow can convert one of the r.f. tubes to a first audio, using resistance coupling. Instead of a '35, however, it is advisable to use a '27 or 56 tube and

put a 'phone jack in the output side, leaving the pentode on the speaker for R9 output.

These sets make an ideal foundation kit for an A-1 amateur-band tuned r.f. receiver and, with a little ingenuity, from one of them the ham can make an a.c. receiver that needs no apologies.

CONVERTING THE SUPERHET TYPE

The "midget" superheterodyne can furnish the amateur with a receiver that is of the coming type, for with a little changing it can be made into an ideal short-wave superhet. Let us analyze the circuit that is conventional to most of these sets. It is composed of a tuned r.f. stage with a '35 tube, a '24 first detector, '27 oscillator and one stage of intermediate-frequency amplification with a '35. This stage is tuned to 175 kc. and is followed by a '24 second detector, '47 pentode output tube and a dynamic speaker. The volume control varies the bias on the first r.f., first detector and intermediate-frequency tubes. The

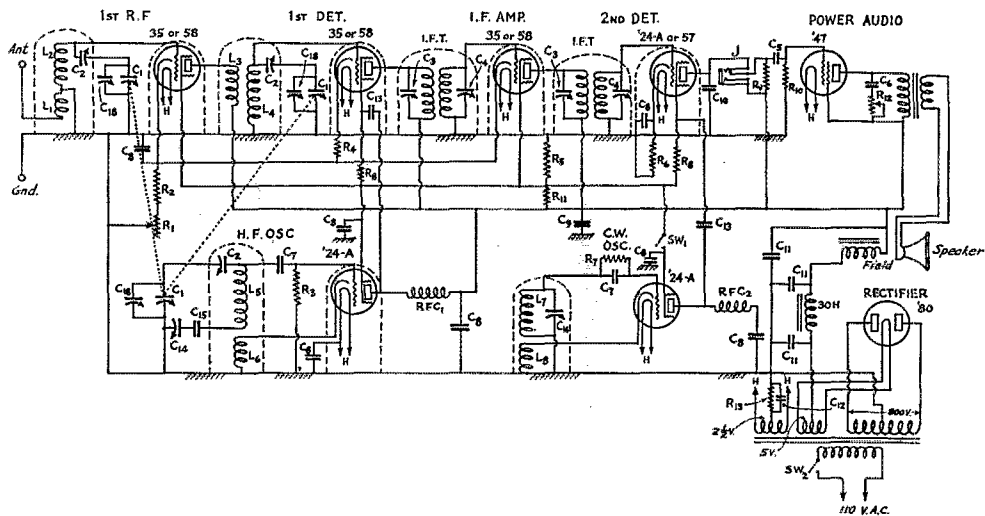
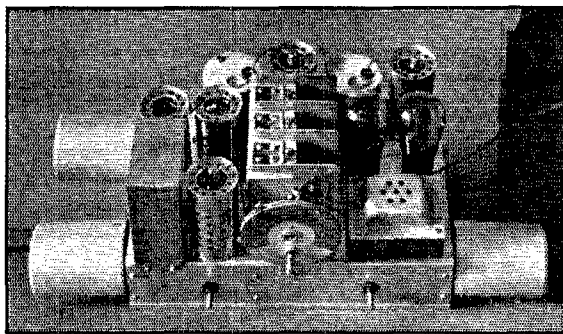


FIG. 1—COMPLETE CIRCUIT OF THE REMODELED "LAFAYETTE" MIDGET SUPERHET

The circuit constants are typical of receivers of this type, but may be somewhat different in individual cases. Components that are additional to the originals are indicated as "Extra."

- R₁—Gain control.
- R₂—Fixed bias resistor.
- R₃—H.f. oscillator grid leak, 100,000-ohm 1-watt (Extra).
- R₄—First-detector bias resistor.
- R₅—Divider resistor.
- R₆—Second-detector plate resistor.
- R₇—C.w. oscillator grid leak, 100,000-ohm 1-watt (Extra).
- R₈—First- and second-detector screen resistors, 50,000-ohm 1-watt (Extra).
- R₉—Second-detector plate resistor.
- R₁₀—Audio grid-coupling resistor.
- R₁₁—Divider resistor.
- R₁₂—Tone-control resistor.
- R₁₃—Audio stage bias resistor.
- C₁—Main tuning condensers, each 350- μ fd. max.
- C₂—Adjustable series condensers, adjustable mica type, one for each short-wave coil. Capacity approximately 30 μ fd. for 7- and 14-mc. bands, 40 μ fd. for 3.5-mc. band (Extra).

- C₃, C₄—I.f. transformer tuning condensers.
 - C₅—Audio coupling condenser.
 - C₆—Tone-control condenser.
 - C₇—H.f. oscillator grid condenser, 100 μ fd. (Extra).
 - C₈—By-pass condensers, 0.01 μ fd. or larger.
 - C₉—1.0- μ fd. by-pass.
 - C₁₀—Second-detector plate by-pass.
 - C₁₁—Power-pack filter condensers.
 - C₁₂—Audio-stage bias by-pass. If none in set, 1.0- μ fd. condenser can be used.
 - C₁₃—Oscillator coupling condenser, 100 μ fd. (Extra).
 - C₁₄, C₁₅—Oscillator series condenser and trimmer for broadcast band. In some sets this combination is on grid side instead of ground side.
 - C₁₆—C.w. beat oscillator tuning condenser, adjustable mica type, approximately 100 μ fd. (Extra).
 - C₁₈—Trimmers on main gang condensers.
- For specifications of coils L₁ to L₅ inclusive, see coil table (Extra).
- L₇, L₈—C.w. beat oscillator coils. See text (Extra).
 - J₁—Circuit-closing telephone jack (Extra).
 - S₁—Power switch.
 - S₂—C.w. oscillator switch (Extra).
 - RFC—Short-wave type r.f. chokes (Extra).



TOP VIEW OF THE REMODELED CHASSIS

The r.f. coil is the one on the right side, those on the left being the first detector (front) and oscillator (rear). The tubes to the left of the tuning condenser gang are first r.f. (front), first detector (immediately to the rear) and high-frequency oscillator (extreme left). Behind the condensers is the i.f. amplifier, with the second detector to its right. The pentode output tube and plate supply rectifier are behind the power transformer in the right front corner. A screen-grid oscillator tube has replaced the triode since the photograph was taken.

three ganged tuning condensers are each 350- μ fd. maximum and about 50- μ fd. minimum capacity and have an illuminated dial calibrated in kilocycles. The oscillator has a large series condenser, generally about 745 μ fd., for shifting its frequency 175 kc. above the received frequency all the way through the broadcast band, and also has two trimmers to align these condensers on both ends of the broadcast band.

We will apply the method of tuning just described to the r.f. and first detector circuits. But in the oscillator we must track 175 kc. higher than the received signal frequency, all the way across the dial for each band. In order to do this our series condenser must be slightly smaller than the other two.

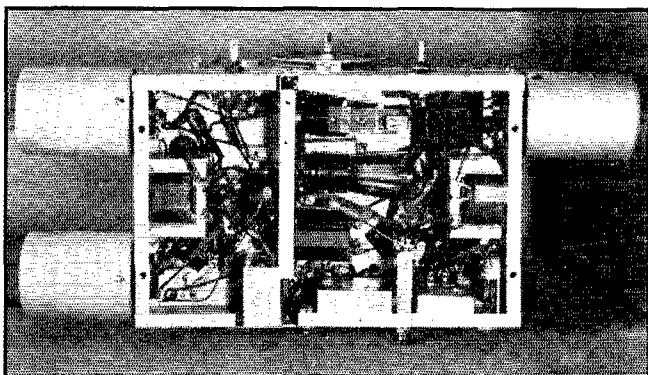
In this particular set the r.f., detector and oscillator b.c.-band coils were mounted on the center section of the shielding under the chassis. These were removed and Pilot 5-prong sockets were mounted inside the chassis end plates, two on one side for first detector and oscillator and one on the other side for the r.f. stage. Holes were cut in the end plates of the chassis to let the tops of these sockets stick through because there was not enough room to put the set back in the cabinet with the sockets on the outside.

This set was so good on the broadcast band that I hated to spoil it for that purpose. Therefore the original b.c. coils were mounted on the ends of some Pilot 5-prong coil forms cut off to fit them. This type of form was used for all coils. National 3-inch shield cans were used for the

short-wave coils, but the original cans were used for broadcast coils. Cans smaller than 3-inch diameter should not be used on the Pilot coil forms, because the efficiency of the set goes down very fast as the cans become smaller and increase coil losses. The coil table gives the proper number of turns and wire sizes for the different amateur bands.

The primaries for the first-r.f. coils and the plate coils in the first-detector forms are wound on $\frac{1}{2}$ -inch wooden dowels and centered inside of the coil forms as shown schematically in Fig. 2. The primaries (antenna or plate coil) are wound so that the ground or "B"-plus end of the winding comes in line with the ground end of the grid coil. Remember also that all shield cans must be grounded. The r.f. stage and first-detector coils are conventional, but the oscillator is modernized to use the electron-coupled circuit.

In order to reduce the tuning range of the main gang condenser a condenser is used in



THE C.W. OSCILLATOR IS IN THE SUB-CHASSIS

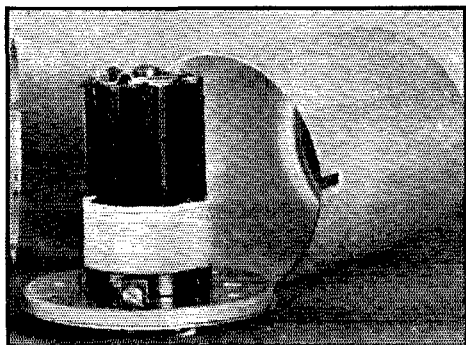
A screen-grid tube with a shield can has replaced the unshielded triode shown. The coil is just above the tube. The 'phone jack is at the lower right with the c.w. oscillator switch to its left.

series with it, as mentioned previously. Remember that it must be on the grid end of the coil — C_2 in Fig. 2. The coil socket connections are arranged so that on the broadcast band none of these condensers are required and the set runs with the original coils which it was designed to use.

Let us assume that you have rebuilt the broadcast coils and mounted them on the coil forms. The first thing to do to tune up the set is to put these coils in their respective sockets. Turn on the set and tune in some station in the neighborhood of 1300 kc. If the set was properly ganged before you took it apart, you should not have to change the trimmers C_{18} very much, if at all; but start with the r.f. stage and adjust C_{18} for maximum volume; then go to the first detector and, last of all, to the oscillator. Now retune the set

to about 600 kc. and check the low-frequency trimmer C_{14} for maximum volume. Then retune to 1300 kc. If your set has vanes on the outside plates of the main tuning condenser C_1 , move these in or out a little for maximum volume. Do this to r.f., first detector and oscillator respectively. Then move the dial until the next set of vanes is intermeshed and repeat. Do this all the way down to 550 kc. *Caution:* Do not move these vanes too much, because if the set was properly ganged in the first place they will require but very little shift one way or the other. When the set is properly ganged on the broadcast band, do not change these adjustments for any of the short-wave ranges, but *make the new coils match the ganging.*

For preliminary lining up of short-wave coils for bands other than those specified, it is almost an absolute necessity to have a calibrated oscil-



ONE OF THE PLUG-IN SHORT-WAVE COILS WITH SHIELD REMOVED

The antenna winding of r.f. coils and the primary (plate) winding of first detector coils are on $\frac{1}{2}$ -inch dowel forms inside. The series trimmer condensers for all high frequency coils are on top as shown.

lator which can give out either modulated or unmodulated signals. Also, some kind of visual resonance indicator is necessary. This may be a milliammeter connected in either the grid-return or plate circuit of the calibrated oscillator, the grid connection being that of the familiar "grid-dip" oscillator. First wind the 3500-ke. first-r.f. grid coil, with the series condenser C_2 in the top of the coil form. Put this coil into the first-r.f. socket and check the frequency range with the calibrated oscillator, without the coil shield and with different values of C_2 . Be sure the r.f. tube is in its socket but the set is not turned on. Also be sure, when you measure this, to take two readings, one with C_1 at maximum capacity and the other with C_1 at minimum. This gives an approximation of the range of the coil. Now wind on the antenna coil. Next duplicate the procedure for the grid winding of the first-detector coil. By this process you can make your coils for any range desired by simply choosing the proper series condenser and inductance.

After completing the first-r.f. and first-detector coils, tackle the oscillator coil. Remember the frequency of this coil and condenser combination must tune 175 kc. *above* that of the r.f. and detector coils, all the way through the tuning range. So wind on the grid and cathode coils and check as before, remembering the frequency difference of 175 kc.

For the final precise tuning we can use a modulated signal. Remove the oscillator tube from the receiver. Unsolder the plate lead of the first-detector tube and connect a pair of 'phones in series with it. Put all the coils in their shield cans and put them in their respective sockets. Before proceeding farther, be sure the shield cans are grounded. Of course there must be a small hole in the end of the cans to adjust the series condenser. Turn on the set, let it warm up about a half minute and couple the test oscillator, now adjusted to produce modulated signals, to the antenna. Set it at 3500 kc. Set the main tuning dial at about 575 kc. Listen for the modulated signal on the 'phones and tune the series condenser C_2 on the r.f. and first-detector coils for maximum volume. Be very careful not to go right by the signal and also be sure to use an insulated screwdriver, of bakelite or hard dry wood, for this purpose. After this is done, resolder the plate lead of the first-detector tube and replace the oscillator tube. After it warms up, tune the series condenser C_2 in the oscillator coil for maximum receiver output. Here some sort of visual indicator comes in handy. If the test oscillator is modulated with 60-cycle supply, an ordinary low-range a.c. voltmeter connected across the speaker terminals will do the trick. A small milliammeter (0-1 ma.) in the plus-"B" lead of the second detector can be used to indicate resonance with an unmodulated signal, the plate current being maximum at resonance, as suggested in the August and September *QST* articles on the Single-Signal superhet. Let me repeat again: Be very careful when doing this; the tuning is very critical, especially that of the oscillator.

After the set is lined up for 3500 kc., check it on the high-frequency end of the main dial. Repeat the same procedure for all three sets of coils; remembering, of course, to change the calibrated oscillator to 7000- and 14,000-ke. ranges for the other bands.

FOR C.W. RECEPTION

Now for the c.w. arrangement. The electron-coupled c.w. beat oscillator is coupled to the screen grid of the second detector through the small condenser C_{12} . The tube and coil are mounted in the place where the broadcast coils originally were. The principle, of course, is that this oscillator is tuned to produce a beat note of about 1000 cycles with the signal coming through the intermediate amplifier. You will note that there is much less background noise with this

separate beating oscillator in comparison with what you get with an oscillating second detector. The two coils are each composed of 450 turns of No. 30 enamelled wire wound on a 1/2-inch dowel and are 1/4-inch thick. The two coils are put on the dowel so that the two windings are continuously in one direction, starting from the outside of one coil. If you do not get oscillation, turn one coil around on the dowel.

sible to get effective "off-set" tuning as described by J. J. Lamb in June, 1932, *QST*. This finishes this part of it and from now on when you want to hear c.w. signals all you have to do is turn on the c.w. switch.

Continuing to the second detector and audio end, there is no change made here except to put a 'phone jack in the plate circuit of the second detector. This must be insulated from the chassis.

Incidentally, you will get a very good signal here for headset reception — even though a screen-grid detector is feeding the 'phones. The tone control is a useful feature and can be used to reduce noise from static and also to reduce interference from high-pitched heterodynes on the 'phone bands when the speaker is used.

A suggestion: Before you start to tear a set apart to rebuild it, be sure to make a diagram of the original wiring and to familiarize yourself with the whole layout, as each manufacturer has his own and every one is different. It is better not to start at all than to make a mess of it. Of course if you rebuild a tuned r.f. set, the layout will not be as complicated as for a superhet.

This just about finishes the job.

I believe that with a little patience and common sense the careful amateur can build an A-1 receiver out of the "lowly broadcast midget." It is a straightforward procedure. Every amateur wants each band spread across the dial, and most every ham nowadays wants a complete a.c. receiver with modern tubes and the complete "A," "B" and "C" unit built in. Here is a way to get one cheap. This "Midget Super" cost me \$32.50 complete with tubes; and you, too, can get one at this price, or maybe cheaper, at one of the wholesale houses in New York, Chicago or San Francisco — because most of them give wholesale prices to amateurs on everything. I will be glad to hear from fellows interested in this outfit — but please enclose a stamped envelope.

EDITOR'S NOTE. — It happens that we have had the opportunity of testing Mr. Anderson's receiver and are pleased to vouch for the statements he makes concerning it.



To remove paint from aluminum or enamel from wire, submerge the article to be cleaned in a concentrated lye solution and let it soak. After the paint has come loose, wash off the metal with hot water. — WICNU

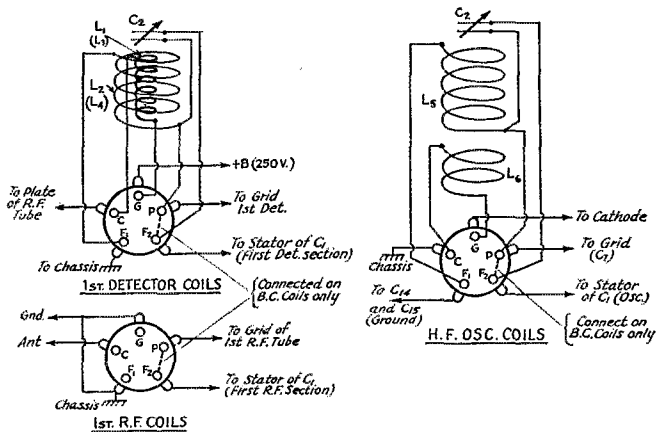


FIG. 2 — COIL AND COIL-SOCKET CONNECTIONS

The first-r.f. and first-detector coils are identical, but the socket connections differ as indicated. The high-frequency oscillator coil and socket connections are shown at the right. Note the dotted lines indicating prong connections for the broadcast-band coils in which the series condensers C_2 are not used.

To set this oscillator, put the broadcast coils in the set and tune in WOR on 710 kc., WLW on 700 kc., or some other dependable broadcast station. Turn on the c.w. switch and tune the condenser C_{16} until you hear a beat note of about 500 to 1000 cycles. By careful adjustment it is pos-

COIL TABLE FIRST R.F. AND FIRST DETECTOR

	3500-kc.	7000-kc.	14,000-kc.
L_1, L_3	40 t. No. 30 d.s.c.	30 t. No. 30 d.s.c.	20 t. No. 30 d.s.c.
L_2, L_4	38 t. No. 30 d.s.c.	20 t. No. 22 d.c.c.	9 t. No. 22 d.c.c.

L_1 and L_3 are wound on 1/2-inch diameter wood dowel formers.

L_2 and L_4 are wound on Pilot formers of 1 1/2-inch diameter.

All four are close-wound (no spacing between turns).

HIGH-FREQUENCY OSCILLATOR

	3500-kc.	7000-kc.	14,000-kc.
L_5	31 t. No. 30 d.s.c.	18 t. No. 22 d.c.c.	8 t. No. 22 d.c.c.
L_6	13 t. No. 30 d.s.c.	8 t. No. 30 d.s.c.	3 t. No. 30 d.s.c.

Oscillator coils close-wound on Pilot formers of 1 1/2-inch diameter.

Spacing between L_5 and L_6 not critical.

An All-Purpose 56-mc. Station

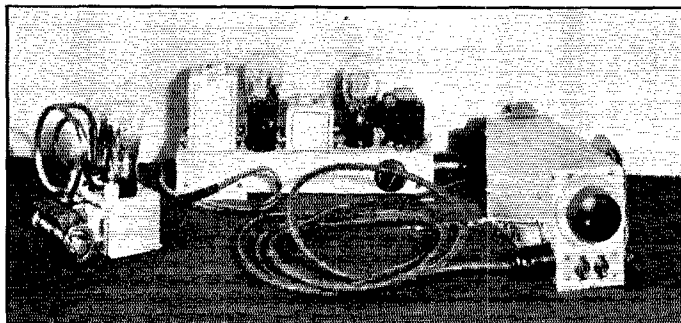
Full Constructional Details of a Class B-Equipped Five-Meter Outfit

By Ross A. Hull*

IT IS only natural that, in the early period of 56-mc. experiment, a great deal of utterly hay-wire equipment should have been put to work. Most of the tests were run off on the spur of the moment and the necessary gear usually was thrown together with products of the junk box. To-day it is different. A year of solid practical work has given us a fair idea of what constitutes an effective 56-mc. station. To-day we can go ahead with the construction of a five-meter outfit with the same confidence that we

in providing that degree of flexibility so desirable in an all-purpose station.

In studying the general layout it will be well first to examine the outline circuit given in Fig. 1. It will be seen that all metal work is interconnected and serves as the negative filament, negative plate and positive bias connection. The positive filament lead runs through to the two switches mounted on the receiver, one of which controls the receiver, the other the transmitter tubes and microphone. To allow operation in the field or in a 'plane, it was considered desirable to plan for a 6-volt "Hot-Shot" as filament supply. Hence, Type '30, 49 and '31 tubes are used. The three '30's in the receiver and the three 49's in the modulator are grouped in series to run off the six volts. The two '31's of the oscillator are also in series, with an external resistor to give the necessary two-volt drop. The cable between the oscillator and modulator is a home-made affair with old '99 tube bases serving as plugs. The cables between the



OSCILLATOR, MODULATOR AND RECEIVER

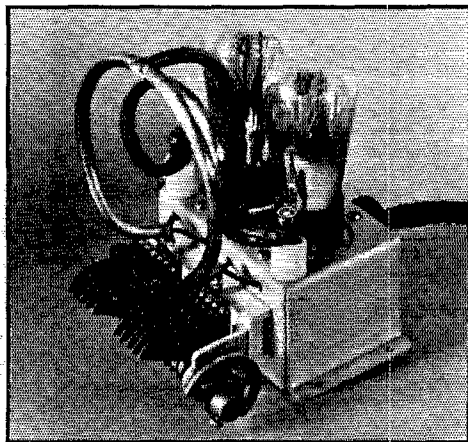
The three units of the 56-mc. station in an unnatural pose. When operated in an automobile, the oscillator could be on the ceiling, the modulator in the rear and the receiver on the dash.

have in building apparatus for any other work.

The particular equipment to be detailed in this article was originally built for test work during the recent eclipse. Its first assignment was as W10XN in the auto-gyro — a job which it performed without a single mark to its discredit. Since then, the outfit has been installed in automobiles, on a roof-top, out in the fields and indoors without once failing to perform at the first click of the switch. Its reliability, its convenience in operation, its light weight and its economy of battery supply make it a desirable rig for almost any sort of 56-mc. work. We have no hesitation in providing full details of it to fulfill the current demand for the design of an efficient 56-mc. station.

Unlike some of the early five-meter gear, this affair is built up in four units — power supply, oscillator, modulator and receiver-control — inter-connected by three cables. The arrangement may appear awkward and complicated, but actually it is entirely practical and almost invaluable

*Acting Editor, QST.



THE UNITY-COUPLED PUSH-PULL OSCILLATOR

Arranged so that its tank is a single turn well out in fresh air, this oscillator gives a performance superior to that of the older rigs. The ends of the tank coil are soldered to the condenser stator lugs.

modulator and receiver and from the modulator to the power supply are Yaxleys.

In building the outfit, one might well start with the oscillator. This unit is, by the way, perhaps the most efficient 56-mc. oscillator we have run across. Its circuit, given in Fig. 2, is nothing more than one of the simpler variations on the "unity-coupling" theme. The main tank

cabled. With well-separated supply leads, the oscillator did not seem to mind whether there was a by-pass or not. The fitting of cabled leads, however, started the oscillator off on a program of acrobatics which could be halted only by the addition of the by-pass condenser. The antenna coil (not shown in the circuit diagram but visible in the photograph) is mounted on two small National isolantite insulators.

The only problem in the construction of the oscillator is folding the small aluminum base. It measures $2\frac{1}{2} \times 3\frac{1}{2}$ inches on top and is 2 inches deep. Probably the best plan is to work up the layout on paper, then transferring it to the sheet of aluminum. Along the lines on which the aluminum is to be folded, the rear or inside surface should be scratched deeply. This will allow clean sharp bends to be made. Holes for the two-tube sockets and for the cable socket at the rear should be drilled after the base has been folded. An ordinary expanding bit or a washer cutter does the trick splendidly if well lubricated. Threading the grid coil is the only other matter requiring much care. The process will be greatly simplified if it is completed before the plate supply tube is soldered to the center of the tank coil.

Construction of the modulator might well come next. Its three tubes and three transformers are mounted on a folded aluminum "channel" measuring 12 inches long, $3\frac{1}{2}$ inches wide and

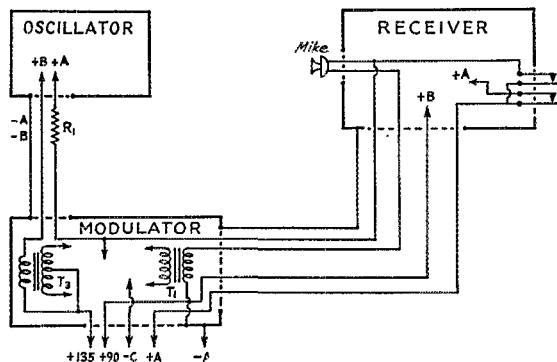


FIG. 1 — AN OUTLINE CIRCUIT OF THE CONNECTIONS BETWEEN THE VARIOUS UNITS

is a single turn of $\frac{1}{4}$ -inch copper tubing, the ends of which are connected directly to the tube plates and to the stators of the tuning condenser. Plate voltage is fed to the center of this coil on the piece of tubing seen diving down between the two tubes in the photograph. At its lower end, this tube leads through a bakelite bushing in the aluminum base. The grid coil, of rubber-covered flexible wire, is threaded through the tank coil and the plate supply tube. Its outside ends cross over and go directly to the tube grids. Its inside ends join as they emerge inside the aluminum base and connect to one end of the grid-leak. This leak, the radio frequency choke and the by-pass condenser C_2 are located inside the base. The by-pass condenser, we might mention, was found essential in cases where the supply leads were

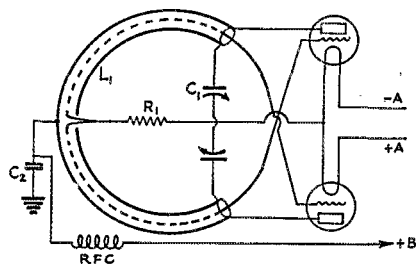
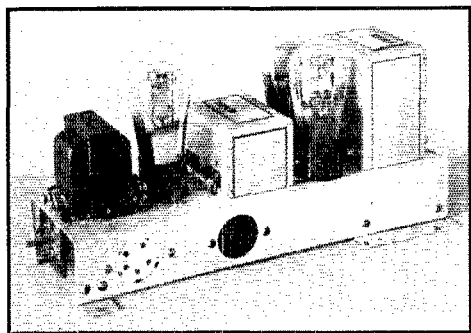


FIG. 2 — THE OSCILLATOR CIRCUIT

- L_1 — One turn of $\frac{1}{4}$ " copper tubing $3\frac{3}{8}$ " inside diameter.
- C_1 — Hammarlund Type MCD-35-X variable condenser (33 μ fd. per section).
- C_2 — .0001- μ fd. fixed condenser.
- R_1 — 100,000-ohm 1-watt fixed resistor.
- RFC — About 20 well-spaced turns of No. 26 wire on $\frac{1}{4}$ " dowel. The antenna coil, visible in photograph, is $2\frac{1}{4}$ " inside diameter.

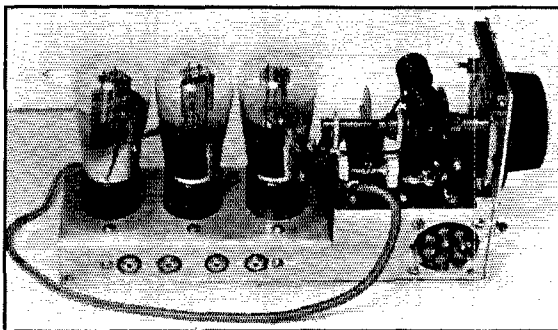
$1\frac{3}{4}$ inches deep. The layout of the parts and the wiring between them should present no difficulties. The only two possible "snags" are in the wiring of the various tube grids and in the connections to the three cable sockets. The speech amplifier in the unit is one of the Eveready 49's arranged for Class A operation by connecting its "C" and "P" terminals together. With 135 volts on its plate, it requires approximately 20 volts of bias. Because the drop in the modulator fila-



BIGGEST OF THE TRIO

The speech amplifier-modulator unit fitted with Type 49 tubes.

ments opposes this bias, a 22½-volt unit will prove suitable. The two 49 modulators are, of course, connected for Class B operation. In this case, the "G" and "C" terminals are connected together and the tubes are operated without bias. The completed modulator is relatively large, quite heavy and fairly expensive. It is capable of doing an excellent job of modulating, however. With only the 135 volts of plate supply and about 8-ma. drain when idling, it is capable of an undistorted output of 3.5 watts — which is something. Other simpler modulators could be arranged (such as a pair of Class A Type '33's). They could not be expected to give a comparable performance, however, and they would certainly be much more wasteful of plate current. We believe the Class



WITH THE COVER OFF

The internals of the super-regenerative receiver. The tubes, left to right, are audio amplifier, interruption frequency oscillator and detector. Microphone and headphone pin jacks, battery cable plate and shielded antenna lead all face the camera.

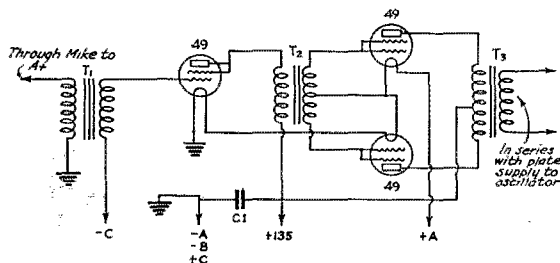


FIG. 3 — THE CIRCUIT OF THE MODULATOR UNIT

T₁ — Thordarson Type 2857 microphone transformer.
T₂, T₃ — Any small Class B transformers designed to operate with Type 49 tubes and to work into a 5000-ohm load. The originals were Silver Marshall.¹
C₁ — 1-μfd. fixed condenser.

B affair to be well worth its weight even in the case of 'plane work.

The receiver is obviously the most complex portion of the outfit though it is fundamentally quite straightforward. In the original set we made use of an unusually small audio transformer (make unknown) which measured 1¾ inches square and 2 inches long. This enabled the complete receiver to be built to occupy a space 2½ x 4½ x 8½ inches. But there is no air space. A larger audio transformer would certainly call for increased case dimensions.

The chassis of the receiver is folded 1/16-inch aluminum. The rear portion is just an inch deep, but the section three inches back from the front panel is formed to provide a step two inches high. Supported on this step is a piece of ½-inch bakelite carrying the tuning condenser

¹ From information received after this article was written it is understood the Silver-Marshall transformers are no longer available. Equivalent transformers can be obtained, however, from the Clough-Brengle Co., 1134 W. Austin Ave., Chicago, Ill.

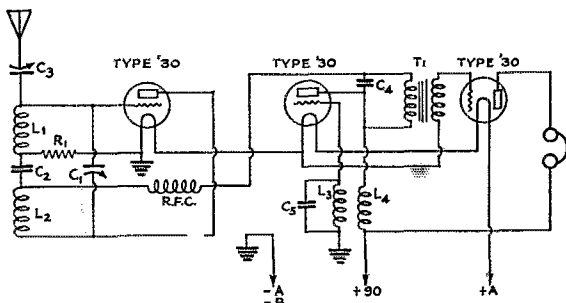
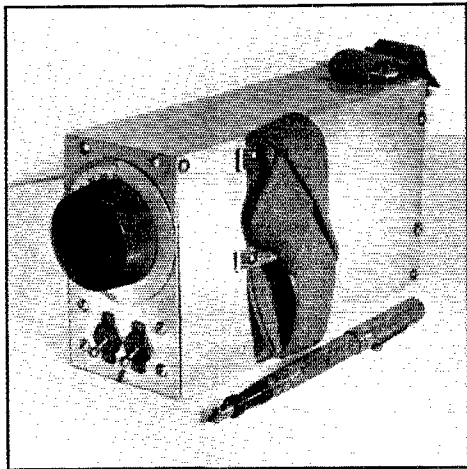


FIG. 4 — HOW THE RECEIVER IS WIRED

C₁ — Hammarlund Type MC-20-S three-plate midget condenser.
C₂ — .0005-μfd. midget fixed condenser.
C₃ — Two ½-inch square brass pieces about 1/16 inch apart.
C₄, C₅ — .002-μfd midget fixed condensers.
L₃, L₄ — Sickles interruption oscillator coil unit. Should this not be available, the coils may be wound with 1400 and 900 turns, respectively, of No. 34 silk covered wire wound on a ¾" dowel with cardboard disks spaced ¼" between the windings.
R₁ — 1 megohm fixed resistor.

Type A dial — the dial itself from a G.R. of the small type. The mix-up was undertaken because of the desire to retain the large knob and vernier without being obliged to make the set 4 inches wide.

The circuit of the receiver, given in Fig. 4, will be found quite similar to those of super-regenerative sets previously described. Prolonged experiment has failed to disclose the desirability of any radical change in this type of set. This receiver, like its predecessors, puts up an excellent performance. It operates smoothly and with high sensitivity across the entire tuning range, not-



THE RECEIVER-TRANSMITTER CONTROL UNIT

Microphone and headphones plug into pin jacks on the far side of the set. The two switches control the transmitter and receiver filaments. The fountain-pen is really not an essential adjunct to the receiver. It is merely intended to aid in the process of visualizing the size of the set.

withstanding the lack of a "regeneration" control.

Upon completion of the oscillator, modulator, receiver and associated cables, it is advisable to fit up some sort of battery box. It might well be provided with a connector plate for the supply end of the battery cable. It is desirable, also, that a closed-circuit 'phone jack be arranged in the box so that a plate milliammeter may be plugged in series with the positive high-voltage lead. A six-volt "Hot-Shot" will readily supply the necessary .31 amperes for filaments. At 135 volts, the usual 30 to 35 ma. of transmitter plate current can be provided by the smallest size "B" batteries should the weight problem be a really serious one. Larger batteries or an eliminator are naturally much more desirable.

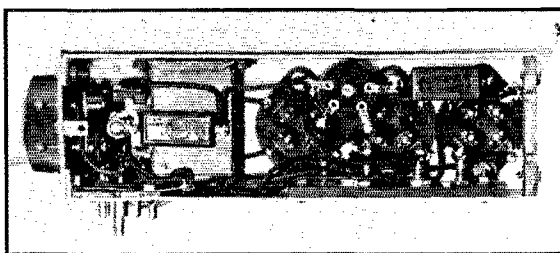
With everything ready to shoot, the filament circuits should first be given a thorough check with the plate supply disconnected. Then, with a flash-lamp bulb in series with the negative "B" lead for protection, the transmitter may be switched on. Should it be operating normally, the plate current of the oscillator alone, without any antenna load, should be about 7 or 8

ma. Upon tuning the oscillator to a suitable antenna, this current should rise to about 28 or 30. The normal plate consumption of the speech amplifier-modulator unit, when idling, should be about 8 or 9 ma. The meter needle will hit peaks of about 50 ma. when the modulators are fully excited and working into the loaded oscillator. With normal speech, the modulator unit will handle the full output of an ordinary single button microphone. For 'plane work (when the operator is usually shouting close to the microphone) it will be necessary to reduce the gain (by putting a potentiometer in the grid circuit of the speech amplifier) unless some form of low output mike is used. In our own 'plane work, the input tube was given the full output of one of the old-time Navy anti-noise aircraft microphones.

The receiver should present no problems of adjustment other than spacing of the coil turns to give the desired band coverage. If the receiver works, there will be a loud rushing noise all across the tuning range. If it fails to work, there will be chiefly silence. There are no half measures in these 56-mc. super-regenerators.

The antenna problem is one that will have a different solution in every location. In the 'plane we used a half-wave long feeder (made of untwisted pair threaded through 2-inch wooden spreaders) feeding a quarter-wave rod worked against the frame of the ship. On the automobile, we are in the habit of using a quarter-wave feeder hitched to the bottom end of a vertical half-wave copper pipe. At home, we hook on the big antenna and juggle it until resonance is indicated at the desired frequency.

The antenna ordinarily used for reception may be any elevated piece of wire. In the 'plane we used a twelve-foot wire dropped overboard. A definite improvement in interference from the



WITHOUT THE BOTTOM PLATE

The audio transformer is to be seen about 1½ inches to the right of the knob end of the set. Immediately at its left is the radio-frequency choke in a vertical position. The interruption oscillator coils are between the first two tube sockets.

engine ignition was obtained by making the first six feet of this length a piece of shielded wire with the shield grounded. As any 56-mc. worker well knows, there is an almost infinite number of antennas possible. And most of them, for one reason or another, work.

Modulating the Screen-Grid R.F. Amplifier*

How It Behaves With Grid, Screen-Grid and Plate Modulation

In Two Parts—Part I

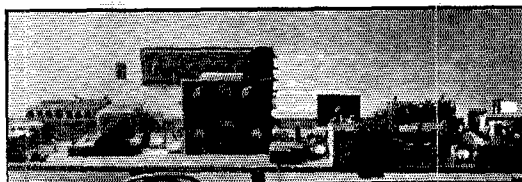
By H. A. Robinson, W3LW**

WITH the more rigorous requirements of present day radio transmitters in regard to frequency stability, it becomes an absolute necessity to employ master-oscillator power-amplifier transmitter arrangements for radiotelephony. In order to reduce reaction on the oscillator it is the usual practice to modulate the final or one of the intermediate r.f. amplifier stages.

With the advent of the screen-grid power tube there became possible a considerable degree of simplification in the design and construction of this type of transmitter. Critical neutralizing adjustments can be forgotten and a greater degree of flexibility results. However, in the case of the r.f. amplifier stage in which the modulation is to take place, the triode with the troublesome neutralizing control has held sway. Perhaps many amateurs have wondered why this situation should exist and it is the purpose of this paper to review briefly the relative advantages and

disadvantages of the screen-grid tube as the modulated r.f. amplifier.

The increasing emphasis upon higher modulation percentages tends toward a more careful and critical adjustment of the neutralizing condenser in the case of a triode. This is evident when one considers that for complete (100%) amplitude modulation of the r.f. carrier, the output must



THE EXPERIMENTAL SET-UP WITH WHICH THE PRACTICAL ASPECTS OF GRID, SCREEN-GRID AND PLATE MODULATION WERE INVESTIGATED

The oscillator-amplifier transmitter is behind the center panel.

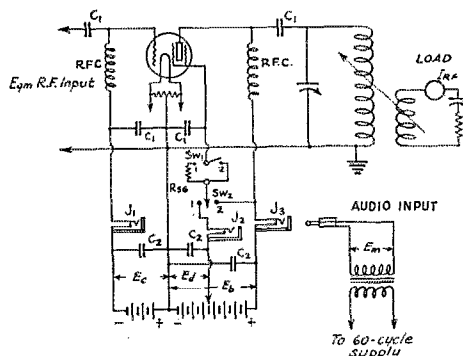


FIG. 1—SCHEMATIC DIAGRAM OF THE MODULATED SCREEN-GRID AMPLIFIER

Oscillatory circuit values are usual for the 3500-*kc.* band. Condensers C_1 are each .002 μ fd. and C_2 each 1 μ fd. The circuit is set up quickly for each of the various systems of modulation by placing the audio input plug in the proper jack and operating the switches.

Grid modulation—Audio input J_1 ; SW_1 at "2"; SW_2 at "1."

Screen modulation—Audio input J_2 ; SW_1 at "2"; SW_2 at "1."

Plate modulation—Audio input J_3 ; SW_1 at "2"; SW_2 at "1."

Plate modulation—Audio input J_3 ; SW_1 at "1"; SW_2 at "1."

Plate S.G. modulation—Audio input J_3 ; SW_1 at "1"; SW_2 at "2."

The voltages indicated are as follows: E_{gm} , r.f. excitation peak voltage; E_m , audio modulating peak voltage; E_c , control-grid negative bias, d.c.; E_d , screen-grid voltage, d.c.; E_b , plate voltage, d.c.

fall to zero when the modulating signal swings the plate voltage of the modulated tube to zero. This can only occur with a perfectly neutralized triode or a screen-grid tube (well shielded) in this stage.

In radiotelephone transmitters designed for rapid changing of frequency (portable, aircraft, amateur equipment, signal generators, etc.) single control tuning adjustment is highly desirable and the critical neutralizing cannot be tolerated. The use of the screen-grid tube in the modulated r.f. stage is the ideal solution of this problem.

EXPERIMENTAL SET-UP AND METHODS

In order to determine the advantages of the screen-grid tube as a modulated r.f. amplifier, an experimental set-up, employing a very stable (high- C Hartley) Type '10 master oscillator and a Type '65 screen-grid modulated power amplifier was constructed as shown in the photograph. The Type '65 s.g. tube was selected for this study because of its general availability and considerable usage in amateur circles as a straight r.f. amplifier, as well as the ease of obtaining the required plate and screen supplies and r.f. excitation. The use of the relatively high-power master-

* Abridgment of graduate thesis, Moore School of Electrical Engineering, University of Pennsylvania.

** Silver Lake Farm, Willow Grove, Pa.

oscillator tube with separate power supply and adequate shielding resulted in a negligible degree of reaction of the screen-grid amplifier upon the oscillator, a frequency shift of less than 1 part in 10,000 (0.01%) being observed when the plate or screen voltage of the modulated amplifier was varied from zero to normal value. A carrier frequency of 3906 kc. was employed and the resulting frequency modulation was negligible.

The screen-grid modulated stage was arranged so that various methods of introducing the modulating signal could be applied conveniently and their relative advantages and disadvantages investigated. The schematic diagram is shown in Fig. 1. The experimental procedure consisted in varying the d.c. voltage supplied to one or more electrodes (plate, grid or screen) and obtaining a characteristic curve showing the radio-frequency output as a function of that particular electrode voltage. These curves, all of which were taken with a constant value of radio-frequency excitation on the control grid (measured with a peak v.t. voltmeter), are referred to as "r.f. modulation characteristics." The operation of the modulated stage can be predicted from these characteristics and the degree of modulation and accompanying distortion can be predetermined for any given modulating audio signal input. *It should be noted, however, that this statement is true only so long as the impedances in any of the electrode circuits are substantially the same for the modulating frequency as for d.c.*

This method of determining the performances of the modulated r.f. stage is applicable to the usual modulating arrangements employed in

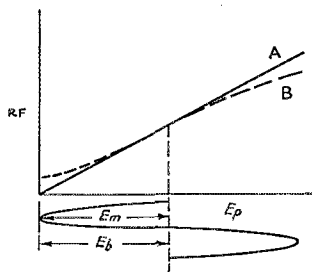


FIG. 2 — R.F. MODULATION CHARACTERISTICS FOR PLATE MODULATION

A — Ideal. B — More usual, especially with incomplete neutralization of the modulated amplifier, improper excitation, etc.

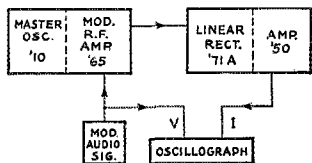


FIG. 3 — BLOCK DIAGRAM OF THE COMPLETE EXPERIMENTAL SET-UP

amateur practice but care should be exercised in obtaining the modulation characteristic to insure that the r.f. excitation is constant and that the voltages on the electrodes, other than the one where the modulating signal is to be introduced, remain constant or vary only in the same manner as they will when modulated at audio frequencies.

MODULATION CHARACTERISTICS AND DISTORTION

It is quite apparent that the ideal r.f. modulation characteristic is one in which the r.f. output (current or voltage) is a linear function of the voltage of the electrode upon which the modulating signal is impressed. For example, with plate modulation (the usual amateur practice) in which the audio modulating signal is applied in the plate circuit, the ideal modulation characteristic is one in which the modulated amplifier output tank current (or r.f. current in a coupled load circuit such as an antenna) varies linearly with the d.c. plate voltage both higher and lower than the normal unmodulated value, over a range extending to the peak value of the modulating input voltage at the highest desired modulation levels. Specifically, for complete (100%) plate modulation, the ideal modulation characteristic

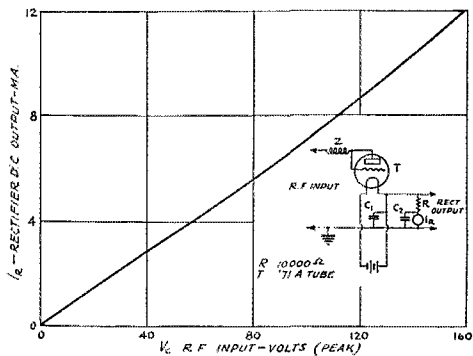


FIG. 4 — THE LINEAR TWO-ELEMENT (DIODE) RECTIFIER — ITS CIRCUIT AND CHARACTERISTICS

should be linear for a plate voltage range from zero to twice the normal unmodulated value, as shown by "A" of Fig. 2. It should be noted that this curve passes through the origin, requiring perfect neutralization when a neutralized triode is employed. It is further evident from these considerations that the required a.c. modulating signal should have a peak voltage equal to the normal d.c. plate voltage on the modulated r.f. amplifier.

The more usual form of modulation characteristic encountered in amateur practice is similar to that of curve "B" in Fig. 2. A characteristic of this form could easily be obtained from an imperfectly neutralized triode modulated amplifier in which there is r.f. output even with zero d.c.

plate voltage. The flattening of the characteristic for the higher values of d.c. plate voltage results from saturation, over-excitation, etc. Such a modulation characteristic would result in the flattening of both the positive and negative loops of the modulated r.f. output wave for high percentages of modulation and there would be distortion.

At this point it might be well to clear up the much abused and over-worked idea that any radiotelephone transmitter which shows a 22.6% rise in the antenna current (as measured on a thermocouple meter, r.m.s. value) is being modu-

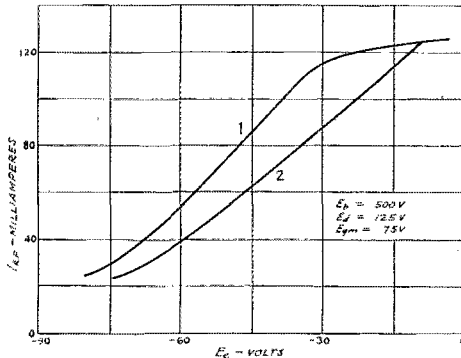


FIG. 5 — GRID MODULATION CHARACTERISTICS FOR TWO LOAD VALUES

Critical adjustment of excitation, bias and modulating voltages is necessary and the power output is relatively small.

lated completely (100%). This relation is true only under the following conditions:

1. The average r.f. carrier amplitude remains unchanged during modulation.
2. There is sine-wave (pure tone) modulating signal input.
3. The modulation characteristic is linear.

That the average value of the r.f. carrier amplitude can change with the modulation level is apparent from one illustration: In a Class B modulator the load on the power supply unit increases with the modulation level; hence, unless the power supply has excellent regulation and if the modulated r.f. stage receives its plate supply from the same source, the mean plate voltage on the modulated tube will decrease with increasing modulation level, with accompanying decrease in the average value of the carrier amplitude.

The requirements that the modulating input voltage be sinusoidal and that the modulated tube have a linear modulation characteristic are apparent when one considers that this figure of 22.6% rise was calculated upon the basis of a sine-wave modulated output.

To verify the correctness of the performance predicted from the r.f. modulation characteris-

tics, the modulated r.f. output was rectified by a linear rectifier and, after suitable amplification, applied to one element of an oscillograph, another element of which recorded the wave form of the modulating input signal. This set-up is Fig. 3.

The oscillograms which follow were obtained by this means. Fig. 4 shows the characteristic of the linear rectifier which employed a Type '71-A as a diode. In all the oscillograms, the traces indicated by a "V" show the modulating input voltage, (60-cycle a.c. being employed for convenience) while the traces marked "I" show the rectified modulated r.f. output current. The data showing the conditions under which the oscillograms were obtained are compiled in Table I—given in Part II of this article.

GRID MODULATION

Typical modulation characteristics for grid modulation are shown in Fig. 5, Curve 1 being obtained for a lightly loaded plate tuned circuit, while Curve 2 shows the effect of an increased load. There is a limited region of linearity of r.f. output current and control-grid voltage, this region being more extended for greater loading of the tank circuit. This linear portion is but slightly affected by the change of screen-grid and excitation voltages, being but slightly displaced to-

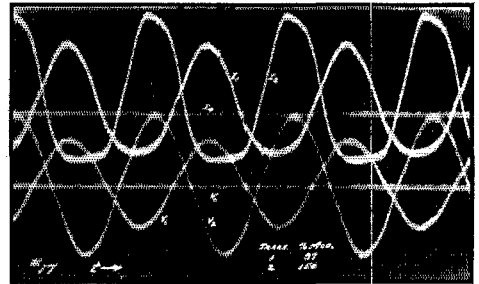


FIG. 6 — OSCILLOGRAMS OBTAINED WITH GRID MODULATION

These were obtained under conditions similar to those for Curve 2 of Fig. 5, Trace 2 being for excessive modulation. Note the flattening of the negative loops as a result of nonlinearity in the modulation characteristic.

towards the higher negative bias region for increasing values of these factors.

In practice the audio modulating signal input is impressed at J_1 (Fig. 1) and the oscillograms of Fig. 6 show typical results obtained for conditions similar to those under which Curve 2 of Fig. 5 was obtained. Both traces show the flattening of the negative modulation loops in agreement with the departure of the modulation characteristics from linearity. Trace 2 was taken for an excessive audio signal input. This method of modulation, when carefully adjusted, permits a modulation capability of the order of 60% without excessive distortion, this degree of modulation being ob-

(Continued on page 90)

Boosting the Output of the Low-Power Transmitter

Practical Information on Using a 4-Tube Oscillator

By F. J. Fink, W9FJY*

THE ham who wishes to add a little more kick to the old rig without going to great expense should be interested in the transmitter described below.

Briefly, the set consists of four Type '10's in a push-pull parallel tuned-grid tuned-plate circuit; in other words, the ordinary push-pull circuit with two '10's operating in parallel on each side of the plate and grid tank circuits. The rig possesses excellent stability and puts out a husky wallop, considering its size.

The photograph gives an idea of the appearance of the transmitter, which is built breadboard fashion. It differs from the usual breadboard set, however, in that the breadboard is mounted vertically on the wall of the shack instead of horizontally on a table. This accounts for the unusual positions taken by the oscillator tubes.

The board is a piece of 4-ply oak veneer measuring 12 inches by 36 inches, trimmed with wooden strips. The two antenna series condensers are mounted at the top, with the parallel condenser just below. Next come the G-R-type insulators on which the antenna coils are mounted, with the plate tank coil fastened to a similar pair of insulators just below. The plate tank tuning condenser, C_1 in Fig. 1, is next in line, and is the one with the white dial in the photograph.

The tube sockets are mounted on small wooden pieces which act as miniature shelves, one being placed at each side of the board with the grid coil and its stand-off insulator mountings between. There is one tube socket on the top and one on the bottom of each of these shelves. Immediately below the grid coil is the grid tuning condenser, and below the latter is the plate milliammeter, with the plate r.f. choke off at the left. The power connections are brought in to a number of Fahnestock clips mounted in a row at the bottom of the board. The complete circuit diagram is given in Fig. 1.

No special precautions were taken in constructing the set other than judicious selection

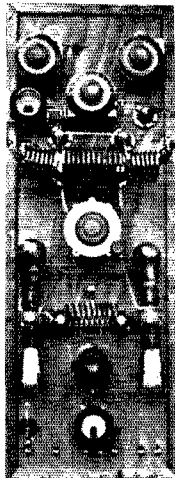
of apparatus and care in placing the grid and plate tank coils and their associated condensers so that fairly short leads are obtainable. Possibly in some sets it might be advantageous to use parasitic suppressors (either a non-inductive resistance of about 100 ohms or a small choke of ten turns or so wound on a pencil) in the grid leads to the tubes, but they have not been deemed necessary in this particular layout because there has been nothing abnormal in the operation of the transmitter. Tuning the set is exactly like that of any ordinary push-pull oscillator, and there are no critical adjustments in the process.

This four-tube arrangement has the advantage that in case of failure of one or two tubes, it can go right ahead working as an ordinary push-pull tuned-plate tuned-grid outfit. On the other hand, if a couple of spare tubes are kept for emergencies, they can be put to work with the regular pair to get more power simply by the addition of two sockets to an already-existing transmitter.

One point that must be taken into consideration is that the power supply must be capable of handling the extra load. The filament transformer which lights the '10's in the transmitter has to furnish 5 amperes. Many power transformers have two filament windings, each of which will handle two '10's or the equivalent, and in that case the two windings can be connected in parallel

to furnish the necessary power. This may mean that an additional filament transformer must be purchased for the rectifier tube or tubes, but since the use of mercury-vapor rectifiers will be a practical necessity for such a set, probably the extra transformer would be needed anyhow. As used at W9FJY the set takes 150 milliamperes at 650 volts, which is not asking a great deal of the oscillator tubes. There is absolutely no indication of tube heating, and the signals are perfectly steady. Four '10's should easily handle 250 milliamperes if the power transformer can stand the gaff. A load of this size calls for either an 83 or a pair of '66's.

To prevent chirps the power supply should have good regulation, which in turn means that



THE NOVEL
FOUR-TUBE
TRANSMITTER.
A DESCRIPTION
OF WHICH FORMS
THE BASIS OF
THIS ARTICLE

*Crivitz, Wis.

a transformer of ample rating must be used. A choke-input filter is also desirable from this standpoint if the transformer voltage is high enough to permit its use.

The transmitter has only been used on the 3500- and 7000-kc. bands, but specifications are given in Fig. 1 for 14-mc. coils as well. Since the input and output capacities of each pair of paral-

all the QSL cards that have been arriving lately. If this doesn't bring any results, BBC hopes the other guy will work some DX once in a while!

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?

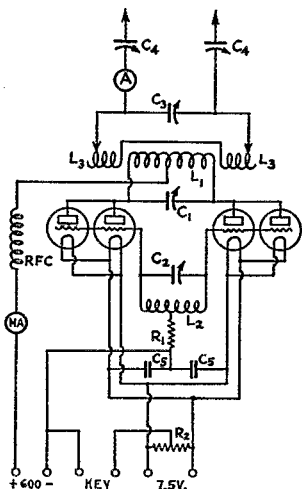


FIG. 1—CIRCUIT OF THE FOUR-TUBE TRANSMITTER

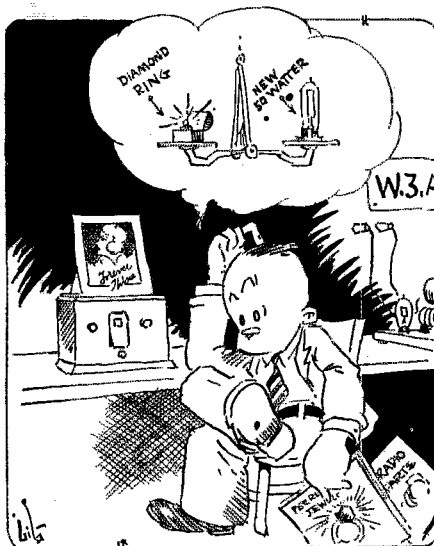
- C₄—500- μ fd. variable condensers.
- C₅—500- μ fd. fixed condensers.
- R₁—10,000 ohms, 20-watt rating.
- R₂—100 ohms, center-tapped.
- L₁—3500 kc.—12 turns $\frac{1}{4}$ -inch copper tubing on 2 $\frac{1}{2}$ -inch diameter.
- 7000 kc.—6 turns $\frac{1}{4}$ -inch copper tubing on 2 $\frac{1}{2}$ -inch diameter.
- 14,000 kc.—4 turns $\frac{1}{4}$ -inch copper tubing on 2 $\frac{1}{2}$ -inch diameter.
- L₂—6 turns $\frac{1}{4}$ -inch copper tubing on 2-inch diameter.
- RFC—Any good short-wave choke.
- A—0-1.5 r.f. ammeter.
- MA—0-300 d.c. milliammeter.

leled tubes are in series across the circuit, the total is equivalent to a single tube and should, therefore, cause no trouble on this score.

Other types of tubes than Type '10's also may be used in the set. Four '45's with a power supply capable of delivering 200 milliamperes at about 400 volts should put out quite a respectable signal; in fact, equivalent to that from a push-pull '10 outfit at the inputs ordinarily used on those tubes. By the addition of two neutralizing condensers the transmitter also can be made into an amplifier which when adequately excited will deliver even more power than it will as an oscillator.

Strays

W7BBC says that if the fellow who is using his call will give him his address, BBC will send him



About This 56-mc. Band

A Brief Review of Recent Work—The Story of an Expedition on the Pacific Coast

IT WOULD be utterly futile to attempt a comprehensive report of recent happenings on the 56-mc. band or to outline the present status of the game. A year ago, we could do it. To-day, it would be about as easy a job as reviewing activity on the 3500-kc. band. Around Long Island and in New Jersey there are actually hundreds of stations working. Fifty 56-mc. contacts in one night, it is said, do not represent an extraordinary feat. Stations are not packed together so closely in other parts of the country but few centers would seem to have been immune to the 56-mc. serum. And the United States do not hold a monopoly in the field. On the Continent, in England, Australia, South Africa and China, the old super-regenerators are doing their stuff. Amateurs all over the world would seem to be climbing the nearest hills, working forty or fifty miles and experiencing their first real thrills since the original trans-ocean contacts.

Sad to relate, however, we really don't know a great deal more about the behaviour of 56-mc. signals than we did a year ago. We know that reliable contact is assured within the range of visibility; we have learned that it can often occur at slightly greater distances than that; we have knowledge of a definite "night effect"; we have experienced various forms of fading; we know that brief snatches of signals are often heard over very long distances. We do not know, however, what makes the wheels go 'round. We would have an awful time, for instance, explaining why signals from the Empire State station in New York can be heard consistently in Hartford when the range is probably three or four times that of visibility. Some day, of course, we'll have it all worked out. In the meantime we will just have to realize that there is a great deal more to ultra-high frequency work than at first meets the eye.

Though it may be impossible to write a com-

plete history of recent doings on the band, we at least wish to record some of the outstanding work we have heard about.

First on the list comes the splendid work of Arthur E. Bent, W1COO, who made several trips to the top of Mount Washington, New Hampshire. His greatest DX for prolonged and reliable two-way contact was with Clarence C. Margerum, W1AQM-W1CVJ at Mount Wachusett, near Worcester, Mass., — a distance of approximately 125 miles.

The second longest reliable two-way circuit, as far as we know, was that set up by Floyd Vanderpoel, W1BEP-W1WR, at Sedgwick Mountain, Connecticut, and John M. Murray, W2AMD-W2ZZV, at the Catskill Mountain House, N. Y. — a distance of 75 miles. Many hours of solid duplex 'phone were run off on this link during

two week-ends, the plate supply at each end being nothing more than 135 volts of "B" battery.

The next step in the way of DX probably brings us to the excellent station of T. F. Cushing, W1OF-W1AWW, on Mount Wilbraham, near Springfield, Mass. Operated by a group of Springfield amateurs on every-week-end for the last seven or eight months, this station appears to have contacted almost every city in Connecticut over distances up to about 60 miles.

Then, we must mention the work of the Bloomfield Radio Club, Bloomfield, N. J.; the Atlantic Radio Club, Pleasantville, N. J.; the South Jersey Radio Association, Audubon, N. J. These groups have contributed greatly to the 56-mc. cause.

From this point on, it becomes impossible to mention calls or results. A 12-inch thick file of miscellaneous reports gives proof that many hundreds of stations are now using 56-mc. for ordinary routine communication around town and over distances up to 40 or 50 miles. These reports prove, too, that the band is still a marvel-



IN THE MOUNTAIN COUNTRY.

Arthur E. Bent, W1COO, who, with C. C. Margerum, W1AQM-W1CVJ, provided a reliable 56-mc. link over 125 miles. The oscillator is half way up the pole, the remainder of the gear within reach of the operator.

ous field for experimental work. "Night effects," "freak" long-distance signals, unexpected changes in polarization—all are reported but none of them in sufficient detail to serve as real contributions to our knowledge. It is obvious that we have only scraped the surface of 56-mc. working. More comprehensive and much more careful experimental work is needed desperately.

And now we quit preaching to allow the presentation of the first story of 56-mc. activity which has reached us from the Pacific coast—an excellent picture of the fun that five-meters can provide.

— R. A. H.

Pacific Coast Amateurs Dig Into 56 Mc.

By R. G. Martin, W6ZF-
W6ARD-W6AYC

THIS is the story of one of the first five-meter expeditions in these parts—an expedition which resulted in a magnificent round of thrills.

On the evening of October 8th, a group of twelve members of the Associated Radio Amateurs of San Francisco started to locations, prearranged for them by the writer. Equipment was loaded into autos for the trips to Mt. Hamilton, 75 miles from San Francisco (undertaken by Dick Barrett, W6GDQ, and James Welch, W6WC), and to Mt. Tamalpais, some fifteen miles from San Francisco, with two good hams, Doc Watson, W6DW-W6CLW and Alan Whittaker, W6SG at the wheel. Jack Stevens, W6PW, and Warner Hobdy, W6MV-W6FMV, attired in regular seafarin' clothes, made the boat ride to Yerba Buena Island, in San Francisco Bay. Tom Watson assisted our able-bodied SCM, Clayton Bane, W6WB, and Byron Goodman, W6CAL-QV were at Twin Peaks, in San Francisco. And at the control station, W6AYC, Bill Tracey, W6AKU, Eddie Hoetzel, W6DZZ, and the writer, stood a hot and heavy trick. This station was located on the roof of the Examiner Building in a nicely furnished penthouse.

The elevation at Mt. Hamilton was 4000 feet. Dick Barrett and Jimmy Welch deserve a lot of credit for making that long trip by auto, setting up the equipment and making the score of 71 miles duplex to Mt. Tamalpais. "The duplex was better than the average telephone circuit," Dick and Jimmy quoted, "and we heard W6CLW loud enough to walk 15 to 20 feet away from the phones and hear them with ease."

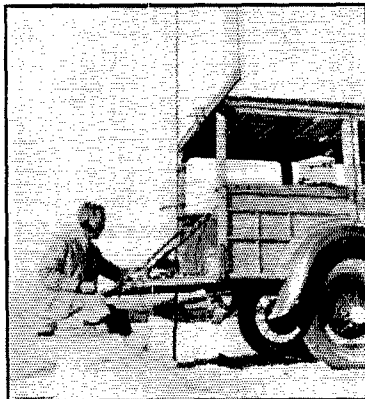
Control-station W6AYC went on the air at 6:30 p. m. Back-ground noise was terrible. We

were situated in the heart of the business district and the interference from motors, street cars, automobiles, and other electrical appliances was at times unbearable. To top that off, KUP, the *San Francisco Examiner's* Press Station QRM'd us at times in about six or seven spots on the band. But even through all of this racket, we

managed to make two-way clicks with all the other stations with a good degree of success. The transmitter was a push-pull affair, employing two 45's, with approximately 300 volts on the plates and modulated by a pair of '47's. The transmitting antenna was a 100-foot wire semi-vertical, hung from the 85-foot pole on the top of the penthouse, 15 stories above ground. This system was worked against ground, with quite fair results. Several receiving antennas were tried—and the final stand was made with a short wire, rubber covered, strung out the window, about 18 feet and tied around a flower pot sitting in the roof garden. Later in the evening the wire was blown down and when we came out to take it down, found we had been using a wire laying on the floor of the roof garden.

Our first contact was with W6GMV at Yerba Buena, about one mile away. We made our second contact with W6QV, Twin Peaks, two and a half miles west of us. We lost them shortly in the QRM. That was at 8:03 p.m. At 8:07 p.m. we called W6QV, Twin Peaks, and told him W6CLW on Tamalpais was calling him, and QV immediately turned to CLW for a hookup. Then at 8:11 p.m. W6GMV, Yerba Buena, called us with information regarding CLW, Mt. Tamalpais, and attempted to hook up us, but we couldn't get across to Tamalpais, evidently because the steel buildings around us were blocking us out. But we could hear them perfectly. We hooked them later on in the evening. Then at 8:31 we heard W6GMV working W6GDQ at Mt. Hamilton—what a thrill—working two-way with Hamilton, some sixty miles south of us. Then five minutes later QV and GDQ clicked. Another thrill. Then the thrill of the evenings work—we heard GDQ, Mt. Hamilton, calling CLW, Mt. Tamalpais. We waited for him to sign off. Would he make it to Mt. Tamalpais? Those seconds seemed like hours.

At last CLW answered him, said GDQ was R9-QSA5, asked to try duplex—it worked—CONTACT! And a record 71 miles airline between two fixed points. Then at 9:08 we called GDQ and clicked! Another thrill—we didn't expect to get through as well as we did but he had previously



Floyd W. Vanderpoel, W1BEP-W1WR, whose 75-mile link with John M. Murray, W2AMD-W2ZZV, presented the opportunity for much valuable experimental work

told GMV we were coming through fine. For nearly 45 minutes we carried on with him, handling two messages, and talking about everything in general. Then at 9:53 p.m. we clicked with QV again. They were much better that time and we exchanged greetings with Bane, Goodman and Watson who said they were just about freezing to death on the tops of the Peaks. Then we worked CLW for a few moments, got Doc to QRT until we could clear GDQ at Hamilton, 60 miles away. Boy, oh boy, what a feeling of accomplishment and satisfaction. When we closed up for the night, we all vowed, 56 megacycles for ever!

But let us describe the other stations. W6QV located on Twin Peaks, two and a half miles west of the control station, 925 feet in the air, had a 100-foot pole on the very top to tie antennas to. The transmitter was a pair of 71's in push-pull, modulated with a pair of 47's in parallel and about 230 volts on the plates, supplied from a bunch of heavy duty "B" batteries. The filaments were run from storage battery. The receiver was the typical super-regenerative job made famous by QST. The equipment had to be carried 150 feet up a steep side to the top of the hill, as driving a car up a mountain side, especially the last 150 feet was entirely too perilous for the gang. An 8-foot vertical "Zepp" antenna was used for transmitting, a 40-foot piece of wire for receiving. Upon placing the receiver into operation, all the other four stations were heard with R9 signals. Several stations in Oakland were also heard. At 8:00 p.m. a short CQ was rewarded with an answer from the control station and they established their first contact. From then on until 10 o'clock, QV was as active as a beehive, contacting Hamilton, Tamalpais, Yerba Buena, and other stations in Oakland. Upon contacting Mr. Hamilton QV, like the other stations, went into a jamboree. Signals were R9 at both ends.

W6GMV at Yerba Buena Island was manned by Jack Stevens, W6PW and Warner Hobdy, W6MV-GMV, who, arriving aboard a naval tug boat, were met at the dock with all the gala reception usually afforded two scientists about to embark on some perilous journey. After the installation of the gear and a madly eaten dinner, the crew raced up some umpty-ump flights of stairs to the top of the hill and then 259 steps more to the tower-top. The first blast from the receiver occurred at 6:30 p.m. From then on until 9:00 p.m. two-way contact was had with every station of the group. Their transmitter was of the QST type — employing a pair of '45's modulated with '47's and "B" battery supply at about 235 volts. The receiver was *a la* QST.

On Mt. Tamalpais, elevation 2406 feet, was W6CLW. This mountain is 11 miles north of San Francisco and one of our scenic tours of California. The tower on the very tip-top is used by the State Fire Marshall. From it, to the northeast,

one can see the State Prison, San Quentin. To the east, the cities of Oakland, Berkeley, Richmond, El Cerrito, Alameda and Hayward are visible. To the north is the famous Redwood highway. To the south, the Golden Gate, the city of San Francisco and Twin Peaks, where W6QV was. On that evening one could also have seen Doc Watson, W6DW-CLW and Alan Whittaker, coaxing a DeSoto up the dusty mountain road, with their load of equipment, stopping at the toll gate, presenting their passes to the watchman, arguing that they should retain the pass for future dates, but losing out in the end. Their transmitter employed a pair of '71's and modulated with '47's, with about 250 volts of "B" batteries on the plates. Their antenna was a Zepp of three waves long. The receiving antenna was a short piece of wire about three feet long.

On Mt. Hamilton, at the Lick Observatory, elevation 4000 feet, were Dick Barrett, W6GDQ-FPU and James Welch, W6WC. Dr. Aitken, director of the Lick Observatory, offered the gang the use of his front porch which was facing San Francisco Bay and which was conveniently lighted in addition to having a.c. outlets handy for power.

It was with many doubts and forebodings that W6GDQ listened for perhaps a weak tiny R2 or R3 signal from San Francisco if any at all. Imagine the surprise and thrill when W6GMV, Yerba Buena Island, came roaring in a good QSA5-R9, and could be heard at least 15 feet from the phones. When Mt. Hamilton finally got the transmitter on the air and gave out a hopeful CQ, it was still more surprising to hear Yerba Buena come right back and give them a QSA5-R9 too. From then on it was a simple matter to QSO in rapid succession the various other stations as quickly as they were able to put their transmitters on the air and call CQ. The big thrill of the evening was the QSO between Tamalpais and Hamilton, 71 miles airline distance apart.

The transmitter at Hamilton consisted of a pair of '45's in a push-pull TNT circuit, with about 350 volts on the plates of the tubes with 40-m.a. plate current.

In conclusion, we were all certain that longer distances could be handled with just the same success as we have had on the tests. The Associated Radio Amateurs plan several long hauls, between Mt. Lassen, and Mt. Tamalpais, and possibly Mt. Diablo. The distance is approximately 250 miles airline between the first two points and approximately 215 miles between Diablo and Lassen. Then the next expedition probably will be to Bear Mountain, from which the gang have hopes to work Mt. Diablo, some 300 miles airline distance.

We would extend our thanks to Mr. O. W. Tuttle of the *San Francisco Examiner*, for his kindly assistance and cooperation in obtaining

(Continued on page 82)

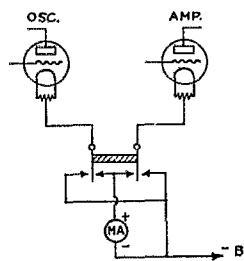
Gadgets, Notions—Try These

Switching the Plate Meter

IT IS common practice when a single milliammeter is used to read currents in several stages in a transmitter to use a system of plugs and jacks. However, when only two circuits are to be metered, as in a straight m.o.p.a. transmitter, the job can be done much more conveniently using a

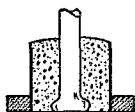
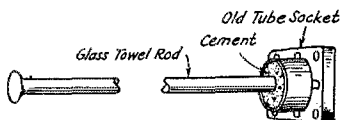
double-pole double-throw switch, as the accompanying diagram from Richard R. Turner, W3HJ, shows. The meter is placed in the negative lead, and the switch automatically closes the center-tap to one tube when the meter is switched to the other. W3HJ uses a Yaxley jack-switch, which looks neat on a panel and takes up little space.

The same idea can be used to make one meter read both grid and plate current on a single stage when a separate milliammeter is available for each stage.



Inexpensive Stand-Off Insulator

A STAND-OFF insulator which can be made from a cast-off tube socket of the metal shell type, a glass towel rod and a little cement is shown in the drawing. The prongs should be removed from the socket, leaving only the shell and base, then the glass rod is centered in the socket and cement poured in. The cement should



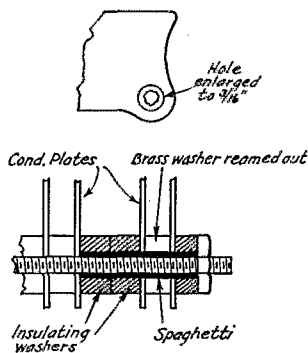
be quite rich — practically all cement and little sand. Care should be taken to keep the rod aligned until the cement has hardened.

One advantage of this type of insulator is that it can be made in almost any length desired. R. B. Newhauser, W9HWO, suggested the idea.

Split-Stator Pilot Midget

ONE popular method of band-spreading in ham receivers calls for the use of a tuning condenser with two stationary-plate sections. The job of cutting the stator into two parts is easy if the condenser has supports for the stator in both front and rear, but if the whole assembly is supported from the front bearing plate it presents something of a problem. Here is a solution provided by Bill Best, W4ACQ, as applied to the Pilot midget.

The extra materials needed are a few short pieces of standard-size spaghetti and some insulating washers the same thickness as the regular brass spacing washers. Take off the plates that are to form the extra stator section (generally two plates will be enough) and ream out the holes



to make them 3/16-inch in diameter. The insulating washers should also be reamed out to have the same size hole if not already drilled to the right size. Two of the regular spacing washers should also be reamed similarly. Then, leaving the rest of the condenser with its regular construction (using the right number of plates of course) slip a piece of spaghetti over each of the mounting bolts and assemble the new section as shown in the diagram. A soldering lug should be brought out from the insulated section for making external connections.

This scheme has given good service at W4ACQ, and has permitted the use of a small condenser in limited space.

Carbon tetrachloride, or Carbona, as well as being a good cleanser for crystals often will get that noise you can't clear up in your receiver. Apply it to the 'phone plug contacts and to the contacts of the 'phone jack itself. Then too it is a good cleanser for the dry bearings of variable condensers.

— W1ADF

How to Calibrate Your Frequency Meter from WWV

By Louis Berkowitz, W1AVE*

TUCKED away at the very end of the schedules of "Standard Frequency Transmissions" is one small paragraph with the heading "WWV 5000-kc. Transmissions." The amateur, in search of a standard frequency transmission with which to calibrate his monitor or frequency meter, passes this by with just a glance. It looks as if it would be impossible for one to calibrate a frequency meter on the 3.5-mc. band to use 5000-kc. transmissions for this purpose. This article gives a method by which the 5000-kc. transmissions may be used to calibrate such a frequency meter, with the following advantages over the methods usually employed: First, freedom from the QRM encountered on transmissions in the amateur bands; second, the transmissions take place (at the present time) every Tuesday, which is a real advantage if you have missed the transmission from your nearest s.f. station and have to wait a month for the next transmission on 3.5 mc.; third, the transmissions are continuous from 10:00 a.m. to 12:00 noon and from 8:00 to 10:00 p.m., Eastern Standard Time, allowing a generous amount of time to make adjustments; fourth, the transmissions consist mainly of a continuous unkeyed carrier frequency which assists in taking precise readings.

The extra apparatus necessary consists only of a roughly calibrated intermediate oscillator having a range of from about 1500 kc. to below 500 kc. The oscillator uses a Type '01-A tube with a 45-volt "B" battery for plate supply. The filament of the tube is heated from the same battery that runs the short-wave receiver. A good vernier dial is used to turn the variable condenser and a Bradleystat is used for filament control. Any of the smaller receiving tubes could be used, of course. The oscillator, unshielded, gives plenty of signal strength. Its circuit is shown in Fig. 1.

To make a preliminary calibration of this oscillator, it is assumed that access can be had to a broadcast receiver. A local broadcast station is tuned in on the receiver, and the intermediate oscillator dial is turned until a whistle is heard in the receiver. This is the beat note between the oscillator and the carrier wave of the broadcasting station. As the dial is slowly turned the whistle will start at a high pitch, gradually change to a low pitch; then it will stop entirely. (At this point the music again will be heard clearly and the oscillator will be at zero beat with the carrier frequency of the station received.) As the dial is then

slowly turned a bit more, the whistle will start again at a low pitch and rise to a higher pitch until it goes above the limits of audibility. Log the dial reading at zero beat as being for the same frequency as the broadcast carrier. Do this with

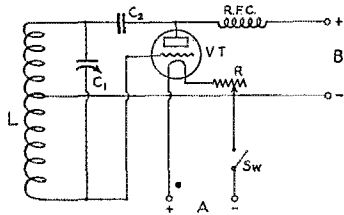


FIG. 1—THE INTERMEDIATE OSCILLATOR CIRCUIT

C_1 — 500- μ fd. variable.
 C_2 — .002- μ fd. fixed.
 L — See text.
 R — Bradleystat.
 R.F.C. — 20-millihenry radio-frequency choke.
 VT — See text.
 SW — Filament switch.

as many stations as you can receive, making a graph similar to the one shown in Fig. 2, the assigned frequencies of the stations being taken from published programs, etc.

The following explains the general method of calibrating an amateur frequency meter with the above oscillator. Tune in WWV (frequency 5000 kc., wavelength 60 meters) on the short-wave receiver and turn on the intermediate oscillator. There will be seven points on the dial between 1500 kc. and 500 kc. where beat notes will be heard. The seven frequencies having harmonics which beat with WWV's 5000 kc. transmissions are as follows:

4th harmonic of	1250	kc.
5 "	"	" 1000 "
6 "	"	" 833 $\frac{1}{3}$ "
7 "	"	" 714 $\frac{2}{7}$ "
8 "	"	" 625 "
9 "	"	" 555 $\frac{5}{9}$ "
10 "	"	" 500 "

By the use of harmonics of some of the above seven frequencies, calibration for the amateur bands is made possible. With the oscillator tuned to 500 kc., for instance, the 7th and 8th harmonics will mark 3500 kc. and 4000 kc., the limits of the 3.5-mc. band. Likewise, calibration points can be obtained for the edges of the new "160-meter" phone band (1875 kc. to 2000 kc.); the center of 3.5-mc. band (3750 kc.) etc. All the points obtain-

* 849 Blue Hill Ave., Dorchester, Mass.

able up to the 14th harmonic of the intermediate oscillator are shown in the chart.

CONSTRUCTION AND USE

The oscillator is built on a baseboard 8" by 6 1/2". The panel is a wooden panel 8" by 7" and was cut from the panel of an old five-tube t.r.f. broadcast receiver. The variable condenser is a 500 μ fd. from the same BCL set. The coil *L* is a replacement radio-frequency coil for a Victor model R-32 set. These are readily available from

as a fine vernier for frequency control because the frequency of the oscillator will vary slightly with the filament temperature. The blocking condenser *C*₂ should be tested for a short circuit before it is installed in the oscillator, because it will run the "B" battery down if it is defective. The old dial was removed from the panel and was replaced with a good vernier for easy adjustment of the oscillator.

To receive the signals from WWV, a coil which had 19 turns of No. 26 d.s.c. magnet wire wound on a tube base was built for the receiver at W1AVE. The tickler coil is seven turns of the same wire. The tuning condenser is a seven-plate Pilot midget.

The calibration procedure is as follows. Tune in WWV. Adjust the oscillator to approximately 500-ke., zero-beating the oscillator's tenth harmonic with the signal from WWV. Now leave the oscillator set and tune the receiver to the 3.5-mc. band. Tune in the 7th harmonic from the oscillator, at the 3500-ke. end of the band. Then turn on your frequency meter, and adjust it to zero beat with the oscillator signal in the receiver. Log the frequency meter dial setting. Now tune the receiver to the other end of the band, zero-beating the receiver to the 8th harmonic of the oscillator. Adjust the frequency meter to zero beat with oscillator signal in receiver, as before, and log the frequency meter dial setting for 4000 ke. The intermediate points are obtained by the same procedure. There will probably be a small amount of body capacity noticed in the oscillator. If the rheostat is turned up enough to place about four volts on the filament of the 201-A, the final tuning of the oscillator to zero beat with WWV may be done with filament rheostat; and body capacity will be nil.

By reference to the chart other calibration points will be found.

If greater accuracy is desired, two receivers

(Continued on page 88)

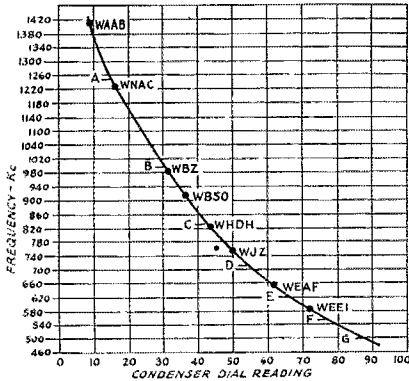


FIG. 2 -- HARMONICS OF INTERMEDIATE OSCILLATOR FREQUENCIES

A to G inclusive will give beats with WWV's 5000-ke. signal.

most jobbers of surplus parts at a cost of about fifty cents for a set of four. This coil was used because it is small in size and comes with a center tap brought out to a soldering lug on the end of the form. The primary winding of this coil may be removed or left on without any connections to it. The coil was mounted in back of the variable condenser by a single bolt which passes through the coil form and the condenser frame. The filament rheostat is a Bradleystat and this is used

Harmonics		Intermediate Oscillator Frequency						
		A	B	C	D	E	F	G
		1250 kc.	1000 kc.	833 1/3 kc.	714 2/3 kc.	625 kc.	555 5/6 kc.	500 kc.
3rd	2nd		2000			1875		
5th	4th	3750	4000		3571 3/4			2000
7th	6th		7000			3750	3889 3/4	3500 4000
9th	8th							
11th	10th				7142 2/3			
13th	12th						7222 2/3	
	14th		14,000					7000

Break-In Operation with Crystal Control

Blocked-Grid Keying Applied to a High-Power Transmitter

By Robert T. Foreman, W9ZZE*

THE use of break-in for traffic handling is generally regarded as the smoothest way of avoiding long and useless repetitions, but its use is largely confined to low-power self-controlled transmitters, where the oscillator is stopped when the key is up. After working several schedules with hams using break-in at their end, and after wishing in vain for the ability to use it at this end, the writer finally decided that if break-in could not be used with a crystal-controlled station, either low or high-powered, it might be preferable to go back to a High-*C* self-controlled transmitter. Much paper was wasted in an endeavor to procure an effective system by modifying the various methods described in *QST* from time to time; each method was given a thorough trial, and although as many as six relays were used in some of them, it was impossible to eliminate clicks in the phones. The method to be described was finally adopted as wholly satisfactory, and is presented with the hope that it will enable others to enjoy the benefits of break-in operation.

The receiver in use at this station is a four-tube affair, with a.c. on the filaments and a "B" eliminator for plate and grid supply. A stage of Type '24 r.f. (tuned or untuned at will) is followed by a '24 detector using grid detection; the detector is coupled to a '27 by means of a Ford coil and condenser, giving peaked audio amplification with an over-all detector gain of 27, compared to 10 or 12 for resistance coupling; the '27 is transformer coupled to a '45, the output of which is shown in Fig. 1. The receiver is enclosed in a metal cabinet, but filament transformer and eliminator are located about two feet from the receiver, and are not shielded.

The transmitter employs a Type '10 oscillator, a '45 buffer, a 50-watt amplifier, and a 250-watt final amplifier. The use of the '45 buffer has cer-

*3009 Decoursey, Covington, Ky.

tainly been justified, since it permits keying both the 50-watt and 250-watt stages, while still providing ineffective isolation for the crystal tube. As pointed out in *QST* many times, such isolation is essential to avoid creeping and other frequency changes due to changes in the load on the crystal tube.

Both transmitter and receiver are mounted on the operating table, with only a few inches between them. The antenna is a current-fed Zepp, with two-wire feeders. The receiving antenna is run at right angles to the transmitting antenna, and the receiving lead-in goes up about 20 feet from the feeders to the Zepp. With this physical

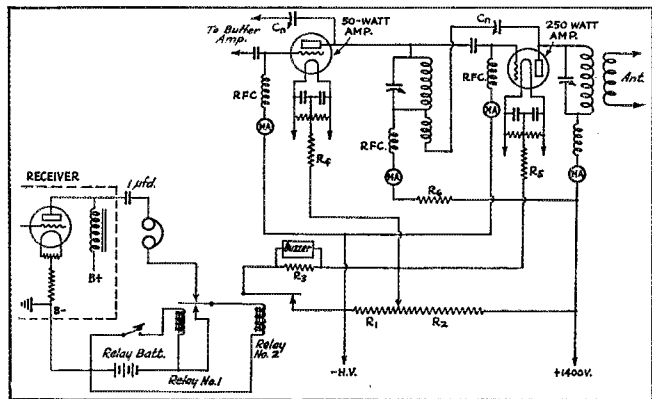


FIG. 1 — SIMPLIFIED SCHEMATIC DIAGRAM OF THE RELAY AND BIAS CIRCUITS

With the key in the open position, relay No. 1 connects the phones to the output of the receiver while relay No. 2 allows the drop across R_1 to block the grids of the 50-watt and 250-watt stages. In the closed position, relay No. 1 disconnects the phones and closes relay No. 2, shorting R_1 and removing the high bias from the amplifier tubes. Resistors R_4 and R_5 in the cathode circuits of the amplifier tubes provide normal operating bias by virtue of the drop across them due to plate current to the respective tubes. R_3 reduces the plate voltage to the 50-watt tube. Separate filament supplies are used for the two tubes.

arrangement it might seem that enormous pick-up would result, but such is not the case.

The 50-watt and 250-watt stages are shown in skeleton diagram in Fig. 1. The keying arrangement is by no means new, having been described at length in *QST* for May, 1929. It is simple, effective, needs no filter to eliminate sparking, and is the best all-around arrangement the writer has ever tried. The theory of operation is completely covered in the article referred to, but is

briefly as follows: The combined resistor R_1 plus R_2 forms a potentiometer, the filament center-tap being connected to the junction of the two resistors and the plates to the positive end. As the center-tap is moved to the right it becomes positive with respect to the grids — that is, the grids are negative with respect to center-tap. At the same time, the plate is made less positive with respect to center-tap. The result is that the grid bias is raised and the plate voltage lowered, this adjustment being continued until the tubes stop oscillating, even with excitation applied. The relay (or key) is connected from center-tap to negative high voltage; when the key is up the grids have a high bias, but when the key is down the additional bias is removed and the grids are connected to center-tap. The arrangement can be applied to any number of tubes, either self-controlled or separately excited; the only requirement is that the tubes to be keyed shall receive plate voltage from the same source. Either batteries, grid leaks, or resistances in the negative leads can be used for bias; batteries or grid leaks would, of course, be connected at the points in the grid leads at which the grid milliammeters appear in Fig. 1.

With this arrangement a very high bias is suddenly applied to the grids, and just as suddenly removed; it therefore may be necessary to use one of the schemes shown in the *Handbook* to taper the wave trains and prevent thumps, although no such arrangement was necessary at this station.

So much for the general layout. Again referring to Fig. 1, it will be seen that the key is used to close relay No. 1, the latter being energized by one or two dry cells. When relay No. 1 is actuated, its moving contact is drawn down and closes the circuit through the coil of relay No. 2, which in turn shorts out the high grid bias referred to above. Furthermore, when relay No. 1 starts to move down, it opens the phone circuit before it closes relay No. 2; and when the key is opened and relay No. 1 starts up, it opens relay No. 2 before the phone circuit is closed. The result is that the phone circuit is dead *before* the tubes start oscillating; and it is not closed until *after* the high bias stops oscillation in the tubes. The gap on relay No. 1 is made very wide and the spring is loose, while the gap on relay No. 2 is normal and the spring is very stiff; this results in relay No. 2 opening a split second before relay No. 1 reaches the top of its travel. Obviously, there cannot be any click in the phones due to detector excitation from the transmitter.

In practice, then, the Type '10 oscillator and the '45 buffer are allowed to run continuously (they have a separate low-voltage plate supply), and the 50 watter and 250 watter are dead until the key is closed. Both oscillator and buffer are working well under their rating, the oscillator being tuned far below the point of maximum output (by detuning the plate tank to a higher frequency). However, the output from the '45 buffer is more than enough to swing the 50-watt

grid and its signal covers but a 50-kc. band in the receiver. Any station, therefore, which is operating on a frequency 25 kc. above or below W9ZZE's frequency can be heard perfectly when the key is up, and break-in operation proceeds as usual.

As previously stated, the physical arrangement at this station is such that the receiver does not block when the key is closed. This may not be the case in other stations, and if the detector tube shows a tendency to lag in oscillation after the key is opened, an additional relay may be used to

ground the antenna, as shown in Fig. 2. The field of this relay may be placed in shunt with the field of relay No. 2. When the key is closed, the action is the same as before, except that the antenna is now grounded. If this relay is used, the antenna should be connected to the stationary contact to reduce capacity to ground, since the stationary contact usually contains less metal than the moving contact.

To provide an audible signal when the key is closed, a small resistance R_3 is placed so as to produce a drop of 2 or 3 volts when relay No. 2 is closed (it may be seen that the full plate current flows through this resistor). A buzzer connected across the resistor will be actuated as the transmitter is keyed; the buzzer might also be connected in shunt with the field of relay No. 2, but will increase battery drain. Furthermore, relay No. 3, if used, can also be connected across the resistor, still further reducing battery drain.

A slight click may result from sparking at the key contacts, the lower contact of relay No. 1, and the contacts of relay No. 2. In such cases a small condenser (.5 μ fd. or more), or a condenser and resistor in series, will remedy the trouble. However, relay No. 2 will seldom spark, even with plate current on the order of 500 ma.

In determining the values of R_1 and R_2 it is well to use enough resistors to limit the voltage drop across each resistor to not more than 250 volts. With 1500 volts, therefore, six resistors would be used in series for R_2 since this section must stand

(Continued on page 90)

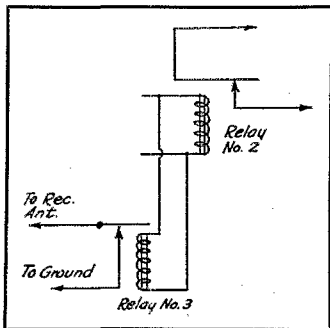


FIG. 2 — AN ADDITIONAL RELAY MAY BE USED TO GROUND THE RECEIVING ANTENNA

Radio Commission Reorganizes Field Force

Number of Inspection Districts Increased to Twenty—Amateur Calls to Remain the Same—Station License Applications now go Direct to Washington

ALL amateur station license applications are now to be submitted direct to the Federal Radio Commission at Washington as the result of a sweeping reorganization of its field force announced by the Commission to be effective November 2. Operator licensing will continue to be handled by the individual district inspection offices, but new inspection districts for this purpose have been named, as outlined below.

The principal effect of the new order, which comes as a continuation of the economy program inaugurated with the absorption of the Radio Division by the Federal Radio Commission last July, is the abolishing of the old field system of nine districts, with nine main offices and ten sub-offices, and the creation instead of twenty inspection districts, each reporting direct to Washington and each to be managed by an "Inspector in Charge."

Amateurs need feel no alarm over the possibility of losing their present calls. There will be no change. Our number prefixes will continue to run from "1" to "9" and will be assigned in the same areas as at present. While, for administrative purposes, there are now twenty inspection districts, the Commission will issue licenses and call letters in accordance with the old nine areas.

Application blanks for both station and operator licenses may be obtained through the district inspection offices, but the *station* application, when filled out, should be sent direct to the Federal Radio Commission at Washington. All *operator* license applications and examinations will continue to be handled by the district inspection offices, however, and should be returned to them.

Designed to effect economies in radio administration, the new system should speed up the issuance of both station and operator licenses and for that reason constitutes a welcome step, from our standpoint. Under the old system an application went first to the district supervisor (and in many cases to a sub-office before that), and then to Washington. The procedure now provides for station applications to go direct to Washington with, we trust, a consequent speeding up in the licensing procedure.

Summarized, then, the situation is as follows: Obtain application blanks for both station and operator licenses from your local inspection office. Send the station license application direct to the Federal Radio Commission at Washington. Send your operator license application to and take your operator license exam at the district inspector's office.

A. L. B.

U. S. INSPECTION DISTRICTS

Radio District No. 1: Headquarters, Boston, Mass. Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island.

Radio District No. 2: Headquarters, New York City. The City of Greater New York and the Counties of Suffolk, Nassau, Westchester, Rockland, Putnam, Orange, Dutchess, Ulster, Sullivan, Delaware, Greene, Columbia, Albany and Rensselaer of the State of New York, and the Counties of Bergen, Hudson, Passaic, Sussex, Warren, Morris, Essex, Union, Somerset, Middlesex, Monmouth, Mercer, Hunterdon of the State of New Jersey.

Radio District No. 3: Headquarters, Philadelphia, Pa. The City of Philadelphia and the Counties of Bucks, Montgomery, Philadelphia, Delaware, Chester, Lancaster, York, Adams, Cumberland, Perry, Dauphin, Lebanon, Berks, Schuylkill, Lehigh, Northampton, Carbon and Monroe of the State of Pennsylvania, and the Counties of Ocean, Burlington, Atlantic, Cape May, Cumberland, Salem, Gloucester and Camden of the State of New Jersey.

Radio District No. 4: Headquarters, Baltimore, Md. The State of Maryland, the District of Columbia, and the Counties of Arlington, Loudoun, Fairfax, Prince William, Fauquier, Rappahannock, Page, Warren, Shenandoah, Frederick and Clark, of the State of Virginia.

Radio District No. 5: Headquarters, Norfolk, Va. The State of Virginia, except the Counties of Arlington, Loudoun, Fairfax, Prince William, Fauquier, Rappahannock, Page, Warren, Shenandoah, Frederick and Clark, and the State of North Carolina, except the Counties of Ashe, Watauga, Caldwell, Avery, Burke, McDowell, Yancey, Mitchell, Madison, Buncombe, Haywood, Swain, Graham, Cherokee, Clay, Macon, Jackson, Transylvania, Henderson, Pope, Rutherford and Cleveland.

Radio District No. 6: Headquarters, Atlanta, Ga. The States of Alabama, Georgia, South Carolina, Tennessee, and the Counties of Ashe, Watauga, Caldwell, Avery, Burke, McDowell, Yancey, Mitchell, Madison, Buncombe, Haywood, Swain, Graham, Cherokee, Clay, Macon, Jackson, Transylvania, Henderson, Pope, Rutherford, and Cleveland of the State of North Carolina.

Radio District No. 7: Headquarters, Miami, Fla. The State of Florida.

Radio District No. 8: Headquarters, New Orleans, La. The States of Louisiana, Mississippi and Arkansas.

Radio District No. 9: Headquarters, Galveston, Texas. The Counties of Jefferson, Chambers, Harris, Galveston, Fort Bend, Brazoria, Wharton, Matagorda, Jackson, Victoria, Calhoun, Goliad, Refugio, Arkansas, San Patricio, Nueces, Jim Wells, Kleberg, Brooks, Kenedy, Willacy, Hidalgo and Cameron of the State of Texas.

Radio District No. 10: Headquarters, Dallas, Texas. The State of Texas, except the Counties of Jefferson, Chambers, Harris, Galveston, Fort Bend, Brazoria, Wharton, Matagorda, Jackson, Victoria, Calhoun, Goliad, Refugio, Arkansas, San Patricio, Nueces, Jim Wells, Kleberg, Brooks, Kenedy, Willacy, Hidalgo and Cameron, and the States of Oklahoma and New Mexico.

Radio District No. 11: Headquarters, Los Angeles, Cal. The Counties of Monterey, Kings, Tulare, San Luis, Obispo, Kern, Santa Barbara, Ventura, Los Angeles, Orange, San Diego, Imperial, Riverside, and San Bernar-

(Continued on page 32)



STRAYS



QST Index (1932) Now Available

The annual index to *QST* for 1932 (Volume XVI) has been published as the second section of the December number, and sent to every member of the League. Newsstand readers may obtain a copy of this index for 6 cents in stamps.

Monte Douglas missed one town in his list of the names of towns with radio meanings. I have found that there is a town in Ky. with Eighty Eight for a name. — W9FYB

RESISTORS IN KIT FORM

The International Resistance Company has recently placed on the market a Grid-Bias Kit which contains resistors suitable for cathode-biasing of various types of tubes now used. A folder enclosed with the kit gives information on how to use the resistors. A second kit contains twenty 2-watt resistors ranging in value from 500 ohms to 500,000 ohms, the individual units of which can be used singly or combined to give thousands of resistance values. More information about resistor kits and their uses can be obtained by writing the International Resistance Company, 2006 Chestnut St., Philadelphia, Pa.

On page 25, September *QST*, W7YX is listed as being one of the outstanding stations logged in Oceania on 7 mc. during the February 20th-26th period of the International Goodwill Tests. This should have been W8YX, the station at the University of Cincinnati.

Ever know Benjamin Franklin was a ham? Yep, he signs W7AVK.

W6BTT nominates H. A. Mandoli for a high place in the H.A.M. fraternity. His call is W6HAM!

Taking a tip from the broadcast stations, a Detroit ham periodically cleans the dust out of his transmitter with an air blast. Hard to get? Not a bit. Take a look at the gadgets that come with Mother's vacuum cleaner. There's usually one intended to blow instead of suck, and the dust can be shooed out of condenser plates and from inaccessible corners in a matter of minutes.



Left to right: Mr. Van Dyke, M.G.M., now directing the production of "Eskimo"; E.R. Stevens, W7BB; Clyde DeVinna, W6OJ, chief photographer with the "Eskimo" photographing expedition; photo taken in front of W7BB's shack. The expedition is now in northern Alaska. W6OJ has his portable set up and operating under the call K7UT with 500-cycle plate supply on about 7290-kc. crystal-controlled. A daily schedule is maintained with W7BB. K7AZ, portable of Mr. Watson, radio and sound man with M.G.M., is also in operation with a p.d.c. note on about 7275 kc. Watson is also operator on the schooner Nanuk, which took a number of the troupe North. K7BV is the call of Mr. Pratt, the chief sound engineer with the party. The latest plans of the expedition are to spend the winter at Teller, Alaska, about seventy-five miles northwest of Nome, and just south of the Cape Prince of Wales. Watch for K7UT, K7AZ and K7BV and try a QSO with the "far north." All "company business" for M.G.M. is taken care of by an R.C.A. installation, with both high and intermediate frequency gear, under the call WKDB.

Word from DeVinna, K7UT-W6OJ, dated July 16th, reads in part as follows: "Just at present we're ramming around among the ice up here, making scenes with walrus, polar bear, seal and whale; but most of our opus will be made in the vicinity of Teller, where the Nanuk will be frozen in during the coming winter."

There must be something in this mast business after all. By radiogram from W4AJH comes word that since putting up a pair of the two-by-two sticks described in September *QST* he gets out twice as well. More power to the sky-hooks!

1932 GOVERNMENT CALLBOOKS NOT TO BE PUBLISHED

The Government Printing Office at Washington has advised us that owing to recent legislation curtailing Government expenditures the publications "Commercial and Government Radio Stations of the United States" and "Amateur Radio Stations of the United States" will not be published. Should publication be resumed notification will be given in *QST*.

Don't use acid to clean copper tubing coils, since acids attack the copper. A better cleaning solution can be made by dissolving a half pound of sodium cyanide (obtainable from druggists or chemical supply houses) in a half gallon of water. The coils can be left in this solution any length of time with no danger to the copper, since the solution removes only the oxide. This is the method used by platers to clean copper. *Caution* — This solution is deadly poison if taken internally, so don't leave it standing around and don't fail to wash your hands thoroughly after using it.

— W9FKC

Learning the Code

How to get Full Benefit from the A.R.R.L. Code-Practice Program—Complete Schedules of Code-Practice Schedules

By E. L. Battey, Assistant Communications Manager

ONE of the primary requirements in obtaining an Amateur Radio Operator's License is a knowledge of the Continental Code. A speed of at least ten words per minute (five characters to the word) in both receiving and sending must be attained before an Amateur license can be secured.

To assist newcomers in learning the code the A.R.R.L. during the active radio season conducts a program of code practice from various amateur stations throughout the United States. This program is conducted on the 1715-2000-kc. band. Most of the stations use a combination of 'phone and code in transmitting code practice, 'phone being used for announcements and a buzzer or audio oscillator keyed in front of the microphone furnishing the actual code signals. A list of the stations whose operators have volunteered their services as "code practice senders" are here listed, together with their locations, operating frequencies, and days and hours of transmissions. All schedules are effective upon the appearance of this issue of *QST*.

All stations listed would be pleased to hear from their listeners, and to render as much additional help as possible. They are particularly interested in receiving reports on how their signals are received, what benefits are obtained from their transmissions, and what progress their listeners are making in learning the code. Correspondence requiring a reply should be accompanied by a stamped addressed envelope. If you cannot locate the complete address of any of the stations in your call book, you may send your letters care of the A.R.R.L. Communications Department, including sufficient postage for forwarding.

Attention is called to the schedule for the transmission of Official and Special A.R.R.L. Broadcasts from the League's Headquarters Station, W1MK. These messages are sent by a tape transmitter at a speed of approximately 13 words per minute and afford excellent code practice for more advanced operators. The schedules for these transmissions follow:

W1MK TRANSMITTING SCHEDULE—OFFICIAL AND SPECIAL BROADCASTS

Sunday	8:30 p.m. E.S.T.	3825 & 7150 kc.
"	Midnight "	3825 & 7150 kc.
Monday	8:30 p.m. "	3575 & 7004 kc.
"	10:30 p.m. "	1850 & 7004 kc.

Tuesday	8:30 p.m.	"	3575 & 7150 kc.
"	Midnight	"	3575 & 7150 kc.
Thursday	8:30 p.m.	"	3825 & 7004 kc.
"	Midnight	"	3825 & 7004 kc.
Friday	7:30 p.m.	"	3825 & 7150 kc.
"	10:30 p.m.	"	1850 & 7150 kc.

A complete discussion on learning the code is given in the Radio Amateur's Handbook. It would be well to read the suggestions given therein before tackling the code. Too many beginning amateurs become discouraged at their progress in conquering the code. To them (and to all other newcomers) we say, "Have patience!" Don't expect to learn it all in one day. Take things easily. Be optimistic! You will be surprised at your progress. If possible, get some one to practice with you, preferably some one who is also just starting in the game. Master the art of "receiving" before you try to "send" at top speed. Many beginners put too much stress on their "sending ability" and not enough on their "copying ability." A good operator can copy as fast as he can send. Do as much listening to actual signals on the air as possible. Try to copy as many letters as you can. Write down every letter or numeral you recognize. Keep at it regularly. Soon you will find yourself getting whole words, and later whole sentences. Then you will find your speed increasing. Learning by actual listening on the air is in many ways preferable to learning by the use of a buzzer as it accustoms you to copying through interference, static, fading, and so on.

A well balanced program for the individual starting to learn the code might be to divide time between (1.) one or more of the stations sending code practice on the 1715-kc. band, (2.) periods of listening to general amateur work on any of the bands, and (3.) periods of practice with a buzzer and key, preferably with another beginner. Several other methods of learning the code are given in the "Getting Started" chapter of the Radio Amateur's Handbook.

Schedules of additional code practice stations will appear in future issues of *QST* as they volunteer their services. Any amateur operating a transmitter on the 1715-kc. amateur band who is willing to devote some of his time to the A.R.R.L. program of code practice transmissions, is invited to write the League's Communication Department, West Hartford, Connecticut, for details as to how he may help in this work.

1715-KC. STATIONS SENDING CODE PRACTICE

<i>Station</i>	<i>Location</i>	<i>Frequency</i>	<i>Days</i>	<i>Hours (Local Time)</i>
WIASZ	Pawtucket, Rhode Island	1925 kc.	Sundays, Mondays, Thursdays	7:45-8:45 p.m.
W1BGT	Wilson, Connecticut	1877 kc.	Mondays, Tuesdays, Thursdays, Fridays	7:00-7:15 p.m.
W1BTL	Plymouth, Massachusetts	1943 kc.	Tuesdays	8:00 p.m.
W1DEA	Middleboro, Massachusetts	1750 kc.	Tuesdays, Thursdays	9:00 p.m.
W1DND	South Boston, Mass.	1795 kc.	Wednesdays and Fridays	8:00-9:30 p.m.
W1GV	Cranston, Rhode Island	1750 kc.	Sundays Tuesdays, Thursdays	1:00 p.m. 5:00 p.m.
W3BLH	Baltimore, Md.	1980 kc.	Sundays Thursdays Saturdays	11:00 a.m.-Noon 7:00-7:30 p.m. 6:30-7:30 p.m.
W3BR	Baltimore, Md.	1765 kc.	Saturdays	4:30-5:30 p.m.
W3CEI	Philadelphia, Pennsylvania	1876 kc.	Tuesdays, Thursdays	7:30-8:30 p.m.
W3CNS	Dover, New Jersey	1970 kc.	Wednesdays	8:00 p.m.
W5ALF	Pawnee, Okla.	1760 kc.	Thursdays	5:00-6:00 p.m.
W6CQK	Los Angeles, California	1925 kc.	Tuesdays, Thursdays, Saturdays	7:30 p.m.
W6CTT	Los Angeles, California	1885 kc.	Thursdays	7:30-8:30 p.m.
W7CEH	Idaho Falls, Idaho	1890 kc.	Mon., Wed., Fri.	7:00-7:30 p.m.
W8ARF	Toledo, Ohio	1960 kc.	Wednesdays	9:30-10:00 p.m.
W8BFN	Canaan, New York	1980 kc.	Mondays, Fridays	8:00-9:00 p.m.
W8BYD	Cleveland, Ohio	1945 kc.	Sundays Mondays, Tuesdays	9:00-10:00 a.m. 9:00-9:30 p.m.
W8CMF	Sunbury, Pennsylvania	1840 kc.	Tuesdays, Thursdays Tuesdays, Thursdays	7:00-8:00 p.m. 10:00-10:30 p.m.
W8CUW	Avon Lake, Ohio	1800 kc.	Sundays Sundays	9:45-10:00 a.m. 3:00-3:30 p.m.
W8CVF	Baldwin, Michigan	1950 kc.	Sundays Daily except Sundays Daily except Saturday and Sunday Saturdays	8:00-8:30 a.m. 6:30-7:00 a.m. 10:00-10:30 p.m. 10:30-11:00 p.m.
W8DDX	Toledo, Ohio	1811 kc.	Mondays	3:00-3:30 p.m.
W8DPN	Toledo, Ohio	1825 kc.	Tuesdays	4:45-5:15 p.m.
W8FO	Toledo, Ohio	1811 kc.	Fridays	Midnight-1:00 a.m. (Sat.)
W8FRC	Johnstown, Pennsylvania	1915 kc.	Sundays Sundays Wednesdays, Fridays	3:00 p.m. 7:30 p.m. 7:30 p.m.
W8GDC	Worthington, Ohio	1950 kc.	Sundays Sundays Mondays	3:00-4:00 p.m. 10:30-11:00 p.m. 8:00-9:00 p.m.
W9AFP	Tabor, South Dakota	1750 kc.	Sundays Sundays Tuesdays Thursdays	9:00-10:00 a.m. Midnight-1:00 a.m. (Mon.) 9:00-9:30 p.m. 9:30-10:30 p.m.
W9BB	Crete, Nebraska	1950 kc.	Tuesdays, Thursdays Saturdays	7:00 p.m. 4:30 p.m.
W9GCG	Kansas City, Missouri	1750 kc.	Sundays, Mondays, Wednesdays, Saturdays	10:00-11:00 p.m.
W9GFS	Evansville, Indiana	1950 kc.	Mondays, Thursdays	8:30 p.m.
W9IK	Cogswell, North Dakota	1880 kc.	Tuesdays, Thursdays, Saturdays, (beginners) Tuesdays, Thursdays, Saturdays, (advanced)	7:30-8:15 p.m. 9:40-10:00 p.m.

The Right Way to Do It

Helpful Hints for Freqmeter Calibration—Standard Frequency Transmissions

EVERY once in a while we note comments on standard frequency report cards that indicate something wrong either with the s.f. signals or with the method used to transfer the calibration to the meter at the receiving station. "Zero beat too wide" and "signal very unsteady" are typical comments. Since other reports on the identical transmissions often completely contradict comments like those quoted, it is reasonable to suspect that the fault is very likely to be traceable to the procedure used at the receiving station.

The practice of keeping the receiver oscillating while beating the freqmeter signal against that of the s.f. station is probably most likely to be the seat of trouble. When this is done, the unstable oscillating detector of the receiver gets into the picture too and gives the impression that the s.f. station is wandering about in frequency. Now we know that oscillating detectors are poor examples of stability. The way to eliminate this uncertainty is, of course, to have the detector non-oscillating while the precise calibration is being made. *Back off the regeneration control and use the frequency meter as a separate heterodyne.* Here is the recommended routine procedure:

1. Tune in the s.f. signal as usual, with the detector oscillating to give the beat note.

2. Adjust the frequency meter approximately to zero beat.

3. Back off the regeneration control until the detector stops oscillating.

4. Tune the frequency meter to zero beat with the s.f. signal, using it as a separate heterodyne oscillator. Retune receiver, if necessary, to compensate for detuning that may be caused by regeneration control adjustment.

Using the freqmeter as a separate heterodyne, with the detector below oscillation, also makes it easier to pick out the s.f. signal because both QRM and QRN are considerably reduced with the detector non-oscillating.

Try this method on the following s.f. transmissions.

Date	Schedule	Station
Dec. 2, Friday	BB	W6XX
	A	W9XAN
Dec. 3, Saturday	BX	W6XX
Dec. 4, Sunday	C	W6XX
Dec. 9, Friday	A	W6XX
Dec. 11, Sunday	C	W1XP
Dec. 14, Wednesday	A	W1XP
Dec. 16, Friday	B	W9XAN
	B	W6XX
Dec. 21, Wednesday	BB	W1XP
	C	W9XAN
Dec. 23, Friday	B	W9XAN
	A	W6XX

Dec. 23, Wednesday	B	W1XP
	BB	W9XAN
Dec. 30, Friday	BB	W6XX
	A	W9XAN
Dec. 31, Saturday	BX	W6XX
Jan. 1, Sunday	C	W6XX
Jan. 6, Friday	A	W6XX
Jan. 8, Sunday	C	W1XP
Jan. 11, Wednesday	A	W1XP
Jan. 13, Friday	B	W9XAN
	B	W6XX
Jan. 18, Wednesday	BB	W1XP
	C	W9XAN
Jan. 20, Friday	B	W9XAN
	A	W6XX
Jan. 25, Wednesday	B	W1XP
	BB	W9XAN
Jan. 27, Friday	BB	W6XX
	A	W9XAN
Jan. 28, Saturday	BX	W6XX
Jan. 29, Sunday	C	W6XX

STANDARD FREQUENCY SCHEDULES

Evening Sched. and Freq. (kc.)		Afternoon Sched. and Freq. (kc.)	
Time (p.m.)	A	Time (p.m.)	BB
8:00	3500	4:00	7000
8:08	3600	4:08	7100
8:16	3700	4:16	7200
8:24	3800	4:24	7300
8:32	3900	4:32	7400
8:40	4000		

Morning Sched. & Freq. (kc.)	
Time (a.m.)	BX
6:00	7000
6:08	7100
6:16	7200
6:24	7300

The time specified in the schedules is local standard time at the transmitting station. W1XP uses Eastern Standard Time, W9XAN, Central Standard Time, and W6XX, 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 W6XX 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 W6XX to 0.01 per cent.

THE TRANSMITTING STATIONS

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

(Continued on page 80)

for the

EXPERIMENTER



More About the Direct-Coupled R. F. Amplifier

By H. A. Erickson, W9EVI*

THE publication of the information on the direct-coupled r.f. amplifier in the August, 1932, issue of *QST*, brought a flood of correspondence asking about the possibility of using crystal control, separate power supplies for different stages, 14-mc. operation, and a large number of other questions as to wire sizes, condenser values, etc. I have, therefore, worked out a new layout utilizing crystal control and direct coupling between all stages, with series feed to all plates and grids and using resistors to control

the same way that cathode resistors are used to obtain bias in receiving sets. If the excitation should be cut off from one stage its plate current will not jump up as it does with simple grid leak bias, because an increase in plate current causes an increase in bias so that the system becomes self-balancing without damage to the tube if the right values of resistance are used. If R_1 and R_2 are variable, the grid bias can be adjusted individually for each stage to obtain maximum efficiency.

It is evident from the diagram that the plate voltages from one stage to the next add up. The total voltage from the oscillator minus B to the plus 1000 volts on the final amplifier is 1900 volts. The filament transformers should be well insulated, and all of the blocking condensers should be of the 5000-volt transmitting type for protection against puncture by the plate voltage. If good quality parts are used throughout there should be no trouble in operating the rig, since it is adjusted in just the same way as the usual multi-stage transmitter.

Each stage should have its own plate supply, although two will be sufficient if both have approximately 1000-volt output. In this case one would be used for the amplifier and the other for the intermediate stage and oscillator, the proper voltages for the latter stages being obtained from a voltage divider. The 300-volt tap on the divider becomes the plus 300 volts for the oscillator and the minus 600 for the buffer.

For 14-mc. operation the 203-A can be used as a doubler by putting a suitable coil in the tank circuit. Alternatively, however, another 210 doubler stage can be added to the rig, in which case it will be necessary to add another power supply to take care of the extra tube. Fig. 2 shows schematically how this can be done with 210's. The same circuit diagram will apply if a 203-A is used in the output stage, although the voltages on the tubes should be adjusted to suit the changed conditions. While operating on 14-mc. the plate voltage recommended should not be exceeded.

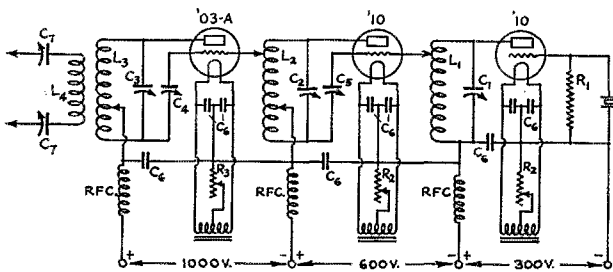


FIG. 1 — CRYSTAL CONTROL WITH DIRECT-COUPLED AMPLIFIERS

- C_1, C_2 — 500- μ fd. variable condenser.
- C_3 — 440- μ fd. transmitting condenser.
- C_4 — 100- μ fd. transmitting condenser.
- C_5 — 100- μ fd. receiving condenser.
- C_6 — .002- μ fd. 5000-volt condensers.
- C_7 — 350- μ fd. variable condenser.
- R_1 — 10,000 ohms.
- R_2 — 1000 ohms, variable, 50-ma. rating.
- R_3 — 1000 ohms, variable, 150-ma. rating.
- L_1 — 12 turns $\frac{1}{8}$ " copper tubing on 3-inch diameter.
- L_2 — 12 turns $\frac{1}{8}$ " copper tubing on 3 inch diameter for 3500 kc.
6 turns same for 7000 kc.
- L_3 — 14 turns $\frac{1}{4}$ " copper tubing on 3-inch diameter for 3500 kc.
7 turns same for 7000 kc.
- L_4 — 6 turns $\frac{1}{4}$ " copper tubing on 3-inch diameter.

grid bias. Eliminating shunt feed r.f. chokes and coupling condensers from the usual m.o.p.a. circuit helps prevent the bad effects of poor chokes and faulty condensers, and it is with these that most of the trouble is experienced in oscillator-amplifier transmitters.

The new transmitter uses a 210 crystal oscillator, 210 intermediate stage and a 203-A final amplifier, as shown in Fig. 1. The resistors marked R_1 and R_2 automatically control the grid bias on each stage by the flow of plate current, in

* 724 E. Bank St., Ishpeming, Mich.

Coupling an Untuned Line to a Zepp

After reading the article on transmission lines in the October *QST* the writer decided to place

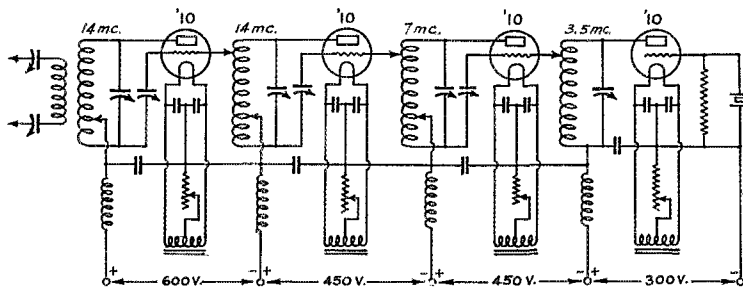


FIG. 2 — A DIRECT-COUPLED CIRCUIT FOR 14-MC. OPERATION

A tube of greater power rating than the last Type '10 can be substituted and the plate voltage raised accordingly.

one of the untuned variety in operation. The radiating system is a Zepp antenna designed for the 3500-ke. band, and since there was no diagram in the article which gave a means of feeding a Zepp with a random length transmission line, the method shown in Fig. 3 was tried.

Referring to the drawing, the line was coupled to the amplifier tank by a coil and condenser, *L* and *C*. This coil and condenser was constructed to tune to resonance with the amplifier tank frequency. At the receiving end of the

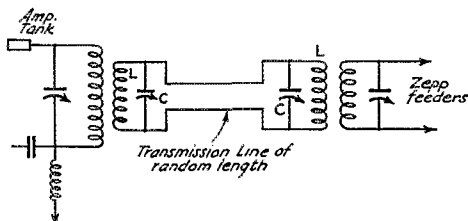


FIG. 3 — COUPLING AN UNTUNED TRANSMISSION LINE TO A ZEPPE ANTENNA

transmission line a duplicate of *L* and *C* was placed. The Zepp was then coupled to the receiving end in the conventional way. The line was tuned exactly as described in the article.

The results were excellent. As much current could be obtained in the Zepp feeders as when it was originally coupled to the amplifier tank itself. The layout worked as soon as it was built and the writer got QSO the first station called. Incidentally the Zepp was disconnected and a local station worked. The report was that the signals were very weak, showing that the line was not radiating a great amount.

— Roger W. Hodgkins, W1DUW

Operating Full-Wave Mercury Vapor Rectifiers with Plates in Parallel

In attempting to use both plates in parallel in 82 and 83 rectifiers, it is sometimes difficult to

get the load to divide evenly between the two halves of the rectifier. Generally one of the plates will take all the load and the other will not "start." This is almost certain to happen if the positive lead is taken off one side of the rectifier filament transformer.

This can be corrected in a number of ways. A center-tap on the filament transformer often will do it, but the tap must be in the electrical center. Various experimenters have reported that center-tap resistances like those

used in receiving sets will cause the load to be divided evenly between the two plates if connected across the filament transformer or if connected between the two plates. The positive high-voltage lead comes off the center-tap in the first case, and the a.c. is fed to the center-tap in the second.

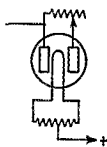


FIG. 4 — CIRCUIT FOR BALANCING CURRENTS WHEN OPERATING BOTH PLATES OF MERCURY VAPOR TUBES IN PARALLEL

Fig. 4 shows a scheme used by W6CKK which is a handy one to use. An old filament rheostat (can be picked up for a few cents at almost any radio store) is connected between the two plates, and the resistance varied with the load connected until both plates show equal blue. A low-resistance potentiometer with the ends connected to the plates and the a.c. brought in through the arm could also be used.

A Hissless Microphone

A good and inexpensive microphone of the type shown in Fig. 5 can be made quite easily by any amateur from parts which can nearly all be found in the junk box found in every ham station. This type of mike is used by practically all Australian 'phone stations, and is notable for the lack of carbon hiss that is so annoying in the cheaper carbon-button microphones.

The construction should be evident from Fig. 4. A wooden block of the dimensions shown forms the "bedplate" of the instrument. Mounted on it is a piece of $\frac{1}{8}$ -inch bakelite measuring $4\frac{1}{2}$ by $3\frac{1}{2}$ inches, drilled at the corners to pass the wood screws which hold it in place. On top of this is a second bakelite piece made as shown at B. The cut-out portion of B is the chamber in which

the carbon is placed, and also contains the two electrodes, which are pieces of brass or copper of the size shown at A. The electrodes are drilled and countersunk to take machine screws, and are mounted on the back plate at the edges of the

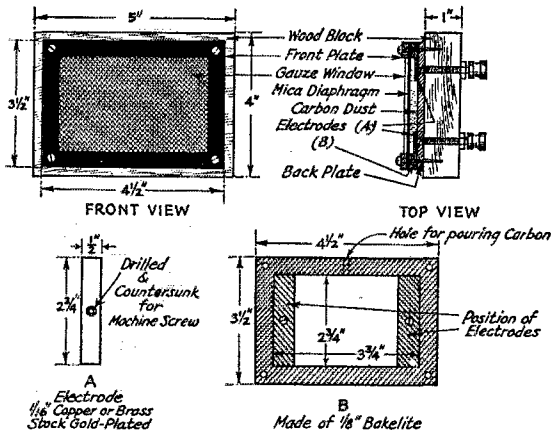


FIG. 5 — A MICROPHONE WHICH HAS A LOW HISS LEVEL

opening in B. The diaphragm, which is a piece of mica the same size as the back plate, goes on top of B. The diaphragm should be of the order of .002 of an inch thick. Finally there is a front plate, cut out in the same way as B, in which a piece of metal gauze is inserted to protect the diaphragm.

The secret of reducing the hiss is in gold-plating the electrodes, a job which any jeweller can handle. The carbon should be high grade, and should be about as fine as face powder. The microphone is used with a 22 1/2-volt B battery, and at this voltage the drain is about 6 milliamperes.

— M. M. O'Brien, VK4MM

Combined Oscillator and Doubler

Many amateurs who wish to use crystal control on the 7- and 14-mc. bands have difficulty in multiplying the 3.5-mc. crystal frequency for work in the higher bands, especially when the cost of the set must be kept down. In the course of experimenting with many types of doubling equipment I have arrived at the circuit arrangement of Fig. 6, which gives very good results with a minimum of parts.

Either a 46 or '47 can be used in this circuit. The oscillator tank is placed in the screen grid of the '47 or outer grid of the 46, and this much of the circuit performs just like any other crystal oscillator. The tank in the plate circuit is tuned to twice the crystal frequency, and is adjusted for the dip in plate current in just the same way as the ordinary amplifier or doubler. The

values are not critical. At the voltages shown an output of about 5 watts is obtainable on 7 mc.

In actual operation the '47 is superior to the 46. With the '47 the plate current is 18 to 20 milliamperes, with an r.f. crystal current of 20 mils, while the 46 draws 35 to 40 milliamperes with a crystal current of about 60 mils. The output is the same in both cases. If the voltage applied to the screen grid is too great the grid will overheat, and when this happens the circuit will not start up again after the power has once been turned off.

Using this circuit and a second doubler of the ordinary type with a 46 tube, the output on 14 mc. is great enough to make a Type '10 draw 20 to 25 mils grid current. The results using the oscillator as a quadrupler have not been so good, since the output is only sufficient to excite a 46 tube to about 5 watts output.

For 3.5-mc. operation the tank in the screen-grid circuit is shorted out and a 3.5-mc. coil plugged in the plate circuit, changing the circuit to that of the regular pentode crystal oscillator.

— William P. Durkin, W2DHM

Reducing Clicks with High Power

The following is a brief description of a type of keying system which solves to a great extent the key-click problem of the ham using rather high power.

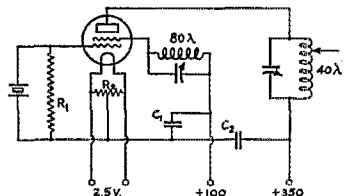


FIG. 6 — COMBINED OSCILLATOR AND DOUBLER

R_1 — 100,000 ohms.

R_2 — 20 ohms, center-tapped.

C_1, C_2 — .25 μ fd.

Tank circuit combinations are any which will tune to the respective frequencies, preferably low-C.

As a rule the low-power station has little or no trouble with key clicks, or if he has them he can eliminate them with simple key filters per the *Handbook*. Where a multi-stage outfit of higher power is used, however, those clicks are almost invariably serious.

The best thing that can be done is to key in a buffer stage of much lower power, but an important factor is caring for excess plate dissipation in the following amplifier, when the excitation is removed. Many hams are now using resistor bias and so when excitation is lifted, they have no bias on the tubes. By the method shown in Fig. 7, the

bias may be added just at the right time to prevent damage to amplifier tubes which are running Class "C" with resistor bias when the buffer is keyed. A relay with two "make" contacts and one "break" contact is used and may be bought

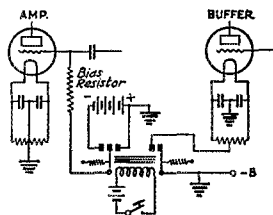


FIG. 7 — CIRCUIT FOR INTRODUCING BIAS ON AMPLIFIER STAGES FOLLOWING A KEYED STAGE

for less than a dollar from the New York mail order houses. As the excitation is removed by keying the buffer, just enough bias may be added to the tube to prevent overheating.

This system is used with great success at both W1BVP and W1ASY. Bias in one case is being supplied by a rectifier and in the other by a battery.

— L. A. Reilly, W1BVP

ELECTION NOTICE

To All A.R.R.L. Members Residing in the PACIFIC DIVISION:

1. You are hereby notified that Clair Foster has resigned as A.R.R.L. Director from the Pacific Division. You are also notified that a special election for A.R.R.L. Director is about to be held in the Pacific Division to fill the remainder of the 1932-1933 term left vacant by this resignation. Your attention is invited to Section 1 of Article IV of the constitution, providing for the government of A.R.R.L. affairs by a Board of Directors; Section 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. The election will take place during the period between January 15 and March 1, 1933, on ballots which will be mailed from Headquarters in the first week of that period. The ballots will list the names of all eligible candidates nominated for the position by A.R.R.L. Pacific Division members.

3. Nominating petitions are hereby solicited. Ten or more A.R.R.L. members of the Pacific Division have the right to nominate any member

of the League in that division as a candidate for director therefrom. The following nominating form 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 Pacific Division, hereby nominate of as a candidate for director from this division for the remainder of the 1932-1933 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 January 15, 1933. There is no limit on the number of petitions that may be filed, but no member shall append his signature to more than one such petition.

4. This election is the constitutional opportunity for members to put the man of their choice in office as the representative of their division. They are urged to take the initiative and file nominating petitions immediately.

For the Executive Committee:

A. L. BUDLONG, Acting Secretary.
West Hartford, Conn., November 12, 1932.

Strays

Don't buy a crystal with the idea that it will obviate the construction of a frequency meter. Calibrations on crystals aren't always the most accurate in the world, especially since crystals have become so cheap, and mistakes can creep in. A ham we know bought a crystal marked 3585 to double into the 7-mc. band — and the frequency turned out to be 3855 with embarrassing results! Then, too, crystals often have two frequencies, and the second may turn out to be off the reservation. Build that frequency meter and play safe.

I'd like to put
To Eternal Rest
The guys who CQ
When making a test!

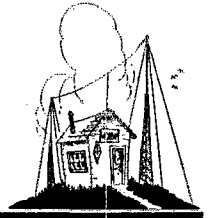
— VE4FJ

W3LA has worked 115 ORS and heard 93, handling at least one message with each ORS worked. Can anybody beat this?

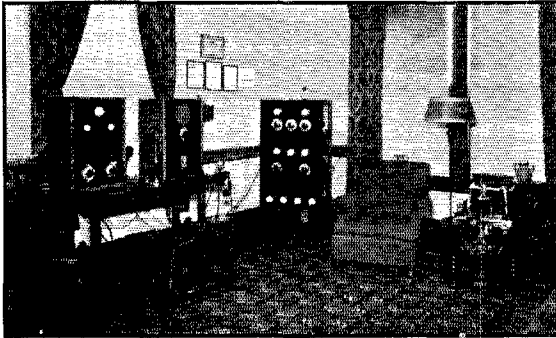
W6ANH answers to the name of D. C. Crystal. Swell moniker for a ham!



Amateur Radio STATIONS



W1DTJ, Hartford, Conn.



W1DTJ is an excellent example of combining business with pleasure—the station is located in a room in an office building on the floor above that on which its owner, David L. Goldberg, conducts his law office. A telephone extension connects the radio room with the office so that any incoming business calls can be switched up to the operator whenever he may be caught playing “hookey” at the radio set! Incidentally, the station room is not a bad place to spend idle hours, as the photograph shows.

The transmitter, built with the cooperation of W1AVK, is a 'phone-c.w. outfit with four 852's in the output stage. The line-up, briefly, is as follows: 210 crystal oscillator (160 meters) with 200 volts on the plate, 210 doubler with 500 volts, 210 buffer with 500 volts, 203-A modulated amplifier with 975 volts, and a linear amplifier with four 852's in push-pull parallel at 2200 volts. The input to the last stage on 'phone usually is about 600 watts. A full kilowatt input can be used on c.w.

The speech equipment consists of a double-button Gavitt microphone, two stages of speech amplification using 227's, a third stage with a 245, and an 845 modulator. The last tube works at 1250 volts.

Three power supplies are used. One has a 2500-volt transformer with 866 rectifiers; the second a 1500-volt transformer also used with 866's, and the third a 750-volt transformer with 281's. Swinging chokes are used in all three for the sake of good regulation. Bias is supplied by batteries throughout. The filaments of all tubes are

kept on during QSO's, and the high-voltage is applied through remote-control relays.

The power supplies, r.f. stages and the modulator tube are all built into the frame which occupies a corner of the room. Another photograph shows more of the details of the transmitter. The aluminum cabinet on the second shelf contains the oscillator and two buffer stages. A combined crystal holder and oven plugs into a plate on top of this cabinet.

The cabinet at the left on the operating table contains the speech amplifier, together with the necessary controls. A galvanometer pickup and a frequency meter are also mounted in the same cabinet. The similar cabinet on the right contains the receiver,



which consists of a Philco 9-tube broadcast chassis with automatic volume control, used in conjunction with a National NC5 converter. For c.w. reception a 227 oscillator is coupled to the b.c. receiver to beat with the intermediate frequency. The automatic volume control is switched off when c.w. signals are being copied.

The microphone, keys, and a small horn speaker for listening to c.w. signals occupy the space on the table between these two units.

Although W1DTJ has been on the 75-meter 'phone band for only six months, all U. S. districts have been worked on 'phone as well as the Ca-

nadian 1st, 2nd, and 3rd districts and X5N. The station also has been reported several times in New Zealand and Ireland, and once in Czechoslovakia, in spite of the fact the station is located in the Hartford business district and surrounded by steel buildings.

WIASP, New Haven, Conn.

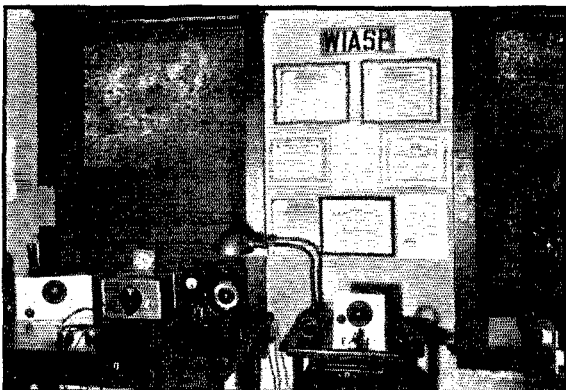
THIS station is owned by Sidney Z. Bear, 262 Canner St., New Haven, Conn. First put on the air with a flea-power outfit in 1927, the station as it now stands has crystal control with a 211 in the output stage, an a.c. receiver, and all the fixings of the modern ham station.

One photograph shows the operating table, on which are the receiver, monitor and dynatron frequency meter. A 5-meter receiver occupies the small table at the right. The receiver is similar to the one described in December, 1930, *QST*, and uses a '24 detector and 56 amplifier. A homemade power supply using a Raytheon tube furnishes the "B" power.

The monitor uses a 230 tube, with coils available for all bands, including 28 mc. To the right of the monitor is a dynatron frequency meter which uses a '24 tube and is checked regularly against Standard Frequency Transmissions. The 56-mc. receiver has a pair of Type '30 tubes in the popular super-regenerative circuit. The companion transmitter is not visible in the photograph, but is a low-power set using two 112-A tubes.

The main transmitter, shown in another photograph, is similar to that described in November, 1931, *QST*, but with the substitution of a pentode as the crystal oscillator tube. The buffer doubler is a 210 and the final amplifier a 211. The input to the latter is ordinarily about 100 watts.

Underneath the wooden frame on which the r.f. part of the transmitter rests is the power supply equipment. Two power supplies are used, one with 866's for the 211, and the other, using



231's, taking care of the oscillator and buffer. Filament controls, switches, etc., are mounted on the lower panel. A "B" eliminator supplies bias for the transmitter.

WIASP's radiating system for 3500-kc. is a center-fed Hertz, or "antenna-counterpoise," one wire being 68 feet long and the other 66 feet. On 7 and 14 mc. only the 68-foot wire is used, the antenna then being end-fed.

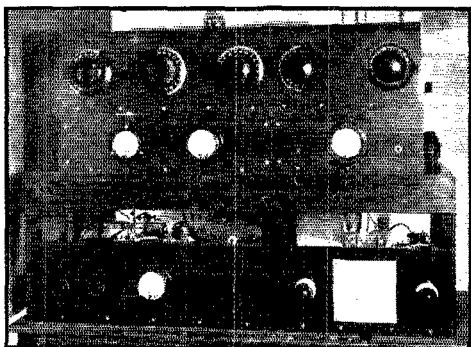
Since 1927 about 4000 contacts have been made, including 15 countries in five continents. WIASP is an ORS, and is also a member of the Naval Communications Reserve.

W2PF, Brooklyn, N. Y.

DAVE TALLEY needs no introduction to old timers in this ham game, especially in the New York area. After getting on the air back in 1915 with a 1-inch spark coil, the call 2PF was secured in 1919 when the reopening came along, and the station went through the usual phases of the time — spark powers up to 1 kw. with a synchronous gap, followed by a.c.c.w., and then, in 1925, crystal control, 2PF being one of the first stations in the vicinity of New York to put in crystal. About this time all continents were worked on 40 and 20 meters.

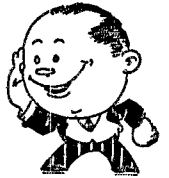
The present W2PF is used chiefly for Army-Amateur work on Monday nights. The transmitter, a photograph of which is shown here, is the result of seven years of experimenting with crystal control. It is built on an angle-iron frame, the power supply equipment being at the bottom.

(Continued on page 76)





CALLS HEARD



VUSCW, C. W. Brown, 3 Bungalow, R.A.F. Risalpur, N.W.F.P. India.

14-mc. band
aux8am d4hol f8xz f8ps f8rj g2by g2am g2ao g2ak g2zr
g2zq g5bj g5bt g5ai g5vl g5pl g5uc g5xa g6cl g6cl g6gd g6fp
g6vp g6hp g8bs g8qz g8ng gr4h haf2g hb9x j1ec j1ep j1ee
j1do j2cb j8rh kac7 la3b ok2op ok2vg ok2ko ok2va on4rx
on4my oz7ph oz7t paopx paofl pk1ac sulec un7yv vq4erh
vq4rl vs7gt vu21j vu2as vu2bg vu2es xzn2b y6bz zn2b

Ray White, Shirreff St., Stawell, Victoria, Australia
7-mc. band

ae2uf k6boe k6dsf k6flv k6fzo k7ft om1tb pk6er ve3bm
ve5dx vk6pk vk6fo vk6kz vk6rt vk6ow vk6rl vk6jk vk6gf
w1anc w2cjr w2cmo w3cah w3bes w3cc w3cdp w4ami w5oed
w5amk w6erp w6ybv w6bls w6bkk w6fr w6ddd w6atv
w6cuh w6ly w6dlr w6aor w6cxw w6dqz w6be w6yb w6fyt
w6bqx w6adp w6ql w6dde w6ffm w6ecw w6aom w6cnx
w6vcj w6cis w7bhe w7bfg w8aec w8bjz w9io w9do w9dhh
w9bi w9my w9btu z1gf z1lq z1rj z1zi z1zj z1zop z1zq z1zbi
z1zdi z1zaz z14ao z14j

W7UI, Conrad Dyar, 526 E. 12th St., Spokane, Wash.

14-mc. band
em2mg j5ce j1do j1ec g6hp k5aa k7ft k6aiu rx1aa vk5hg

7-mc. band
j1dm j1ep k6aja k6baz k6bmy k6ebr k6fab k6fzo kalup
k7ahi k7bme k7ckk om1cb vk2cr vk2hm vk2px vk2xg
vk3bx vk3cp vk3jt vk3mr vk3ot vk5lk vk5pk z1cl z1zhi
z13cs

W6DBZ — W6ZZAC, John Irwin, 2921 Regent St., Berkeley, Calif.

3900-kc. 'phone
k5ba ve5ai ve5es w1id w1avk w2aih w3aif w3aqt w3bms
w3lo w4bfa w5ali w5amx w5anq w5apm w5ate w5bjc
w7aeh w7afd w7amq w7aqk w7bec w7bux w7bvu w8bng
w8di w8dil w8ne w8ark w8hr w8cmz w8cpv w9cex w9dwl
w9dyk w9edw w9eo w9etd w9gij w9gnk x5n

7000-kc. band
j1dn j1ec j1ee j1et j1ff j3cr j5oc j5ce j5ch kaloo kalox kalhr
kallg kaltg kalxa k6hfi k6ome k6ewq k6flv k7ahi k7bmc
k7cfn k7ox om2dm tilfi ve3wf ve4iu ve4na ve5dx ve5hg
vk2ah vk2kh vk2kl vk2mj vk2oj vk2rt vk2xf vk2xg vk2xr
vk3bb vk3ch vk3vl vk3vl vk3sw vk4wt vk5dq vk5hg
vk5my vk5wd vk5wr vk6ra vk7ch vna1 w1bs w1de
w2acy w2aix w2bys w2cde w2ejr w2cmo w2cwo w2ebi w3aqt
w3ark w3arv w3cop w3cv w3dy w4agi w4alm w4amd w4aqd
w4aay w4awm w4aws w4bbt w4bgo w4bll w4bod w4buo
w4gn w4gu w4ha w4ux w5agz w5ahz w5akw w5axt w5ays
w5ben w5bka w5bky w5bxy w5bzt w5cww w5cew w5ehg
w5cip w5cit w5cje w5cks w5cmj w5cna w5ej w5fb w5gr
w5hy w5ke w5mn w5nu w5pf w5pj w5su w5vk w5ajp w8anq
w8aty w8bjz w8bob w8cn w8ow w8ehd w8eqc w8fip
w8ftm w8gae w8gmd w8gpr w8htr w8ie w8uq w9aah w9aak
w9ajk w9ban w9bbp w9bpm w9ckv w9cme w9cpv w9cyy
w9dee w9dfz w9dgl w9dmy w9egb w9etr w9fhj w9fmx
w9fra w9gcz w9gxv w9hfo w9huv w9hnm w9hon w9hpw
w9hrs w9htu w9hya w9ijj w9ijx w9ikl w9isp w9ivh w9ivu
w9jqa w9jso w9juc w9my w9rh z1zbo z1zoc z1zcl z1zda
z1zfp z14om

W2BEB, William Adamovsky, 1335 York Ave., New York, N.Y.

56000-ko. band
w1zjz w2afp w2ag w2als w2ati w2bbv w2bhy w2bih w2bui
w2cdl w2cfo w2cuv w2euz w2eyd w2daj w2dlq w2ks w2va
w2vk w2zzaw

Joseph Magen, Aboard S. S. Munorleaux between British Guinea and Trinidad, B.W.I.

k5aa nylaa t13la w1af w1bjt w1bmj w1bqz w1cto w1dhs
w1duk w1lep w2adq w2aqn w2bds w2bop w2bjw w2obi
w2ccc w2dnu w2drj w2gh w2gt w3bdr w3bgi w3bqv w3bkz
w3cdn w3cod w3md w4ait w4bbt w4ec w4kk w4uj w5ags
w5ama w5anl w5aoo w5aze w5bid w5chg w5cmg w5nu
w5px w6adp w6ahp w6bbi w6bdq w6bgs w6bhp w6bsz
w6cpj w6cui w6cuz w6cvf w6cxw w6dce w6dnc w6edw
w6exq w6flw w6fff w6fnk w6flp w6fyq w6fxm w6gl w6gm
w6hx w6hz w6mk w6te w6ve w6yq w7hs w7yq w8cpk
w8dvw w8dzc w8fey w8fzn w8fpv w8fwh w8er w8hk w8rh
w9afn w9bez w9djp w9ehi w9fhy w9iwl w9kib w9pd

W7BRU, Dick Frazier, 2602 Woodlawn, Boise, Idaho

3.5-mc. band
w1afo w2da w3bdo w3ccw w3clo w3coo w4hw w5agl w5ahy
w5asu w5clw w5oot w5px w5tc w6ege w6cdo w6dve w6cad
w6exh w7bnw w7cks w8be w8btk w8cnu w8ope w8oul
w8edy w8fmp w8hl w8kg w9aex w9aia w9ajf w9bhl w9epd
w9fod w9gl w9huy w9jq w9jy w9ky w9qs

K. Akazawa, care of Naniwa High School, Sakuraidani, Toyonogun, Osaka, Japan

7-mc. band
w5aep w5abf w7bb w7aip w7cmq w7cong w7vt w7tao w7acy
w7lq w7eh ve5ez k7abp k7ahi k7ox k7ck k7arg k7bmc
w8an f8by eu2g eu2fy eu2gr eu2fj eu2r233

VK3EK, Ed. F. Kosseck, Belmont, Victoria, Australia

7-mc. band
aulno ct1ah ct1av ct1ay ct1dj ct1g d4ade d4bun d4wum
ear4 ear185 ear186 ear227 ear228 f3oc f8cl f8ps f8tz f8xz
xf8fi fm8ih g2dh g2oq g5fv g6li g6kg hb9h hb9q j1do j1ee
j1ep j1rt j3cl j3db j3eq kalhr kalxa k6arb k6auq k6baz
k6cqs k6cru k6dvz o4u om2dm pa0gh pa0gq pk1ab
pk3bp pk4da splaf sulec t13la vo3bv ve2be ve2cq ve3bm
vp1fr ve6ab vsfad vsfas vsfah vs7gt vu2jp vk3nm w1aep
w1agz w1azi w1bo w1di w1du w1gu w1qy w1zn w2aan
w2aew w2ais w2ajt w2bkw w2bhy w2ctb w2cqv w2fa w2rt
w3apn w3arh w3bip w3cek w3dcy w3md w4anx w4cs
w4dw w4eg w4mk w4nn w4tk w5bzt w5do w5ht w5ke
w5ma w5vp w6adk w6adp w6ahb w6ahq w6ahs w6al
w6apd w6arp w6axi w6axv w6be w6bax w6bib w6bif
w6bja w6blp w6bpt w6brt w6btx w6buo w6byb w6bye
w6ctx w6cuh w6cuv w6cxw w6dep w6dio w6dnc w6dng
w6ehg w6eea w6ein w6ele w6elu w6ens w6eop w6eqa w6exq
w6ezk w6ezp w6fal w6fff w6fmx w6foy w6jb w6so w7aax
w7abx w7aem w7aad w7ath w7avl w7bb w7gm w7jq
w7kq w7qh w7te w7vn w7vy w8bjz w8bny w8bpb w8cfl
w8cra w8ctn w8ded w8dfl w8ve w8akj w8ang w8bnu
w8aav w8bui w8oe w8ces w8clq w8do w8dti w8epv w8etu
w8euh w8faf w8fry w8ij w8lv w8nac x1j x1ly earva
earul rhu val xznza

• I. A. R. U. NEWS •

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

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Vice-President: C. H. STEWART

Secretary: K. B. WARNER

Headquarters Society:

THE AMERICAN RADIO RELAY LEAGUE, West Hartford, Conn.

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Norsk Radio Relæ Liga
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Wireless Institute of Australia
Wireless Society of Ireland

Conducted by Clinton B. DeSoto

THE formation of specialized amateur bodies, normally organized through the national amateur societies in cooperation with their respective governments, brings forcibly to mind the worthwhile advance in the public regard enjoyed by amateur radio in those countries where such organizations are inaugurated. Last month we told of the new British Royal Naval Wireless Auxiliary Reserve. At present, we have at hand some highly interesting particulars of the also newly formed New Zealand Radio Emergency Corps.

The corps was founded by the N.Z.A.R.T. in early 1932, and received official sanction and special concessions in June of this year. The

from the scene of any tragedy or national calamity.

The inauguration of an emergency station at Napier at the time of the 1931 earthquake disaster demonstrated the effectiveness of such a system to the authorities as well as the general public, and the necessity for a thoroughly organized emergency network in New Zealand.

The suggestion that a corps should be formed was first put forward by N. W. Laugeson, ZL3AS, vice-president of the N.Z.A.R.T. The proposal was taken up by the headquarters in February, and at the present time the scheme has spread thoroughly to all parts of New Zealand.

The Post and Telegraph Department has granted a special band from 2850 to 3000 kc. for the operation of Emergency Corps stations under the classification of private commercial stations auxiliary to the general communications system. Special call signs are also being allotted. The corps is now capable of establishing communication between any parts of the Dominion without delay.

Sections have been formed throughout the Dominion, we are told by J. C. Elliott, ZL3CG, leader of the Christchurch section. Each section comprises at least twelve members, including the following officers: Section Leader, Deputy Section Leader, Equipment Supervisor, Assistant Equipment Supervisor, Secretary-Treasurer, and Operators. Operators must be capable of operating at a speed of not less than 20 words per minute.

The organization is under the command of Commanding Officer W. G. Ashbridge, ZL2GP, of Wellington. Captain Ashbridge, who is communications supervisor of the N.Z.A.R.T., is



George Neelmans, ON4FT, traffic manager of the Reseau Belge, on board his yacht, "Tenace." A real amateur, and a real yachtsman, as well.

stated purpose of the corps is that of providing a readily organized means of communication to and

also senior wireless officer in the N.Z. Signal Corps.

Each section will provide mobile transmitting and receiving stations, with trained operators, ready to function at a moment's notice. The apparatus in each section consists of two complete portable stations, one called the outpost station and the other a zone station. The outpost station is a light portable set, capable of being transported by one man. The zone station is a transportable outfit of higher power. In the event of emergency the outpost station will be taken as near as possible to the scene of emergency. The zone station will act as intermediary between the outpost and base stations.

The organization of the corps is well under way, from the progress reports appearing monthly in the N.Z.A.R.T.'s official organ, "Break-In." Sections are obtaining the cooperation of all utilities and public bodies. Field days to test the apparatus have been held, and have proved most successful. Members are all enthusiastic, and should an emergency occur, they will undoubtedly give an excellent account of themselves.

And a great deal of good has been done amateur radio in New Zealand. After all, public service is one of amateur radio's most glorious opportunities, and emergency work is about the finest piece of public work that we can do.

A new prefix, FF, makes its way onto the amateur horizon. Two stations are reported to be using this prefix, FF8BG and FF8GD. Their location is in the city of Djelfa, in the Sahara Desert, 250 miles south of the city of Algiers. According to Walter V. Turner, W8AYU, who has been QSO with him four times recently, FF8BG is the same as old FM8BG.

The R.S.G.B.'s schedule of tests for the 1932-33 season has just been made public, and

we find listed therein a number of events in which amateurs in all parts of the world will want to participate. The organized tests have been arranged for the following periods:

1.7 mc.	Nov. 5 & 6	Nov. 12 & 13
3.5 mc.	April 1 & 2	April 7 & 9
28 mc.	Dec. 3 & 4	Dec 10 & 11
QRP	Jan. 14 to 22	
B.E.R.U	Four week-ends in February	

All week-end contests extend from 0001 G.C.T. on Saturdays to 2400 G.C.T. on Sundays.

The D.A.S.D.'s annual convention held in Berlin on Aug. 27-28th was a gratifying success to its sponsors, for in spite of the trying times more than 100 hams from all over Germany gathered in the capital, although (as previously reported) it was decided to run this convention along rather simple lines owing to the difficult economic conditions.

At the Hamfest on Saturday, Aug. 27th, Werner Nestel, D4LV, of the Central Laboratory of the Reichsrundfunkgesellschaft (German Broadcasting Co.) reported on his impressions of the amateur radio situation in the U. S. A. Max Drechsler, D4ABI, produced an amateur movie, while Erhard Graff, D4ADC, seconded him by reproducing self-made gramophone records of some outstanding amateur traffic.

The business meeting was held on Sunday, Aug. 28th, when the old Council was completely reelected. Dr. Curt Lamm, D4AFA, was forced to resign from the post of Foreign Secretary of the D.A.S.D. on account of increased work, but upon the insistence of the president and his colleagues our good friend will remain a member of the board. At his suggestion, Julius Kron, D4SAR, and Rudolph Romeike, D4ZUA, were unanimously elected Foreign Secretaries, and will "endeavour to maintain and to foster the cordial



MEMBERS OF THE RED ESPANOLA WELCOME WARNER AND SEGAL TO SPAIN AND ARE PHOTOGRAPHED ALONG WITH MEMBERS OF THE SPANISH RADIO ADMINISTRATION

Left to right, front row: Señor Monino, Paul M. Segal, Señor Balseiro, Señor Regueiro, K. B. Warner, EAR80, EAR121, and EAR12. Middle row: EAR10, EAR122, EAR25, EAR22, EAR00, EAR223, EAR234, EAR110, EAR3, EAR125, EAR224, EAR136. Back row: EAR-CV, EAR96, EAR16, EAR123, EAR-FL, EAR225.

relations existing with Germany's foreign friends and sister societies." All other officers of the D.A.S.D. will again resume their duties for the coming year.

Amateur radio in Brazil is at ebb tide these days, revolutions and the stringent economic situation having conspired to cause governmental cancellation of all amateur licenses. J. Jonotskoff, ex-PY1AA, who has temporarily abandoned the ham game for this reason, writes that there is no immediate hope for return of the old favorable conditions.

The long-standing interest in inter-Antipodes communication on 3.5 mc. still remains. The latest achievement in this connection to our knowledge was the W6ATV-VK3RJ contact, a most satisfactory one according to reports. VK3RJ was using 24 watts input to his '10 PA, with a half-wave 40-meter Hertz antenna.

VK stations were recently reported heard in the U. S. 8th district on 3500, but no QSO's outside of W6 have been reported on the low frequency band.

Conditions on this band are reported pretty terrible in Europe. QRM from 'phone stations is so bad that ragchewers have mostly moved to the higher frequencies, writes C. A. Gehrels, PA0QQ, European RCC organizer. W signals have been coming through rather good, often very strong, in most parts of the continent. The band was crowded with them from 0300 to 0500 G.C.T. during August and September, but QSO's were impossible owing to the terrific QRM. There is one exception to this: PA0ASD's regular sked with VO8Z.

A particular request for a month-long December test on this band. All American 3.5 mc. stations should make strenuous efforts to contact Europe during this month. The best time is from 0600 to 0700 G.C.T. daily; this is one hour before European sunrise, when W signals are strongest.

Conditions on the other bands seem to have been uniformly good during recent months, although, as is to be expected, freakiness increased with frequency. Daylight DX QSO's on 7 mc. have been of major interest, and should appeal to many U. S. DX stations. VK5BY has been known to work W1AAO and W1SZ at 4 p.m. E.S.T., the signals going the long way 'round. The big difficulty with this sort of thing is, of course, the terrific interference at this time of day.

European stations have been coming in very well in New England on 7 mc. from early in the afternoon until late in the evening. Transatlantic QSO's have daily been possible, with good signal strength; during W1SZ's regular sked with EAR96 and EAR224, for example, signals are

normally R6-7 and occasionally R9. XU1U was recently worked from the Netherlands on this band; the Antipodes occasionally, as well, the most successful station being PA0GO.

As a result of negotiations with the officials of the Danish Postal and Telegraph Service, the E.D.R. announces a relaxation in the absolute ban on amateur transmission during the broadcast hours. A special permit to transmit at all hours will be issued any amateur with the proviso



L.R. Julius Kron, D4SAR; Dr. Curt Lamm, D4AFA, and Rudolph Romeike, D4ZUA, retiring and succeeding Foreign Secretaries of the D.A.S.D.

that it will be immediately forfeited if interference is caused.

A special beginner's license requiring a code speed of 8 words per minute instead of the usual 12 will also be issued; the recipient will only be permitted to use the frequency band 3550-3600 kc. This license can at any time be changed to the regular license when proof of ability to send and receive at 12 wpm is added.

Both changes were suggested by the E.D.R. to be useful in eliminating unlicensed amateurs in Denmark, we are told by James Steffensen, president, and it is hoped results will soon begin to appear.

Brief items of gossip from the month's mail: VK3RJ is a commercial landline operator, and on several occasions when the submarine cables connecting VK3 and VK7 have failed, his station and services have been placed at the disposal of the Postmaster General, who controls all communications systems in Australia. . . . On each occasion hundreds of public messages have been handled with ease. . . . On other occasions the station has been utilized as a breaking circuit for the Postal Department's emergency station VK3LR (5KC). . . . Great progress has been made by the recently formed British Royal Naval Wireless Auxiliary Reserve, with the London District now practically established. . . . The organization of Reserve centers in Bristol, Birmingham and Glasgow will follow almost immediately. . . . Another seasoned ham joined in double harness. This time it was VK5BY,

(Continued on page 78)

THE COMMUNICATIONS DEPARTMENT



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

Traffic Briefs

In early September W6BIP worked ZS5U "both ways," at 8 p.m. and again at 7 a.m. P.S.T. With just a single '10 running perfectly cool BIP has a record of about 60 QSOs with ZS . . . dozens of 'em with ZS5U, ZS2A, ZS2F and ZT5W. W6FFP (who gave us the "low down" on this work) has a regular "sked" with ZL1AR which has netted well over 100 QSOs with ZL to date.

W8EIK handled an emergency neatly — maintaining communication with a fleet of 10 bombers and 6 scout planes (marooned at Bluefield, W. Va., by bad weather) with their base at Langley Field over the period Oct. 15th-19th. FB, Larry!

Congratulations and best wishes to W5AUW, SCM of New Mexico, on his marriage, which took place October 10th at Los Lunas.

On June 27th W8ECF heard ZL2BE on 3650 kc. at 5:20 a.m. E.S.T. QSA3 R4.

A 3500-kc. QSO with PA4ASD is reported by VO8Z for August 6th. VO8Z was using a single '10 and received a QSA5 report. He received PA4ASD QSA4 R5-7. A schedule was arranged for August 13 to see if the QSO could be repeated. Sure enough, at the appointed time they again clicked and had another fine QSO.

"Variety is the spice of life" — in ham radio as in anything else — W2BKL complains that the majority of QSOs start out, "Ur sigs QSA-R- hr in Podunk Hollow." He says why not vary this procedure now and then with, "Greeting from Podunk Hollow eher your sigs are QSA-R-," or some other procedure of your own. No harm in adding a little "spice" to the game, OMs.

W9FKI suggests that we sign our "state" after our call, thus, "W9FKI Indiana," or "W9FKI Ind." This might help in routing traffic, and in adding states never before worked. It would surely save time spent in looking up locations in the call book.

On March 16th W8SG on 7 mc. contacted 8 VKs and ZLs in succession, without missing any called!

On the occasion of "Founder's Day, Young Men's Christian Association," October 11, 1932, a message from President Herbert Hoover to "All Young Men" was transmitted from the A.R.R.L. Official Broadcasting Stations (some 175 in all). Many stations other than O.B.S. copied the message and retransmitted; VE4EL did outstanding work in Canada. The message was copied in all parts of the United States and Canada, and in many other countries throughout the world. A cup, offered to "the man who did most in forwarding the Presidential Founder's Day message to the youth of the world," was awarded to Mr. Edwin C. Wilbur of New York.

W2BSR reports that "CAB" of VE5FX, Chesterfield Inlet, Northwest Territory, Canada, is returning next summer after three years in the Arctic. When he returns he will QSL to all operators worked with a "photo" of himself, the post, the station, groups of Eskimos or views of the northwest country; operators worked are to specify the kind of "photo" they would like.

Official Observer W8CIO has a new 100-kc. bar. . . . W8BON wants to know if it has a foot rest!

A NEW EMBLEM

A new, special color, A.R.R.L. personal emblem is now available for League Route Managers. Just as an emblem with Blue background signifies "ORS," and an emblem with Red background signifies "SCM," appointment as Route Manager now provides the privilege of wearing one of the attractive new "Green-background emblems." Each holder of ORS, SCM, or RM appointments should wear the particular color emblem that exemplifies his office.

The following contribution by Mr. R. N. Eubank, W3AAJ-WS, wins the C.D. article contest prize for this month.

Your articles on any phase of amateur communication activity are solicited. Each month the prize winner has his choice of three selections of prizes. See page 55, September, 1932, *QST*, for more complete details of the article contest. Send yours today. — F. E. H.

Crystal Versus Self-Excited

By R. N. Eubank, W3AAJ-WS*

IN this article the writer compares the merits of a crystal controlled transmitter using a type '47 pentode with those of a self-excited rig using the well-known TNT circuit. The superiority of the crystal outfit will speak for itself.

Let us first consider the construction costs since this is a primary consideration these days. The prices used in determining the total cost of each transmitter were taken from the same catalog; the same type power supply was used for both. The total costs of parts for each transmitter are very near equal, with the pentode crystal outfit costing slightly less. Now, more about the power supply. While the same type power supply was assumed in making a cost comparison, actually much heavier construction and equipment should be used in the power supply for the

* A.R.R.L. Section Communications Manager Virginia, 2817 Montrose Ave., Richmond, Va.

self-excited rig, if fair frequency stability and note are to be obtained. With the crystal outfit, the crystal will offset a lot of ills which may be present in the power supply.

From an operating standpoint "frequency stability" and "character of note" are perhaps the basic things to consider in choosing a transmitter. With the crystal controlled transmitter you have practically "guaranteed frequency stability and constancy" (provided, of course, that the frequency of the crystal has been checked accurately and that it is not ground too near the edge of a band where it might accidentally drift out of the band due to changes in temperature, holder, etc.). Under normal operating conditions a crystal controlled outfit will hold its frequency constant and will not get out of the band. Self-excited rigs can get off frequency easily. The slightest change in adjustment can throw the tuning off several hundred kilocycles. Here we must mention one of the few disadvantages to crystal control from an operating standpoint — it is not possible to change frequency to different spots in the band without stocking a number of crystals. The self-excited rig allows for QSY over the entire band, and in this flexibility of adjustment is often advantageous in picking a spot free from QRM. But this disadvantage of crystal control is a real advantage in that most operators like to pick one spot in a band and stick there so that other operators will know where to find them. There is no system better than c.c. for this feature! And, to go into more detail about the "character of the note" emitted by a crystal controlled transmitter. You cannot beat those clean out, musical crystal notes. You know the thrill you get when you hear a real c.c. signal. Put yourself in the shoes of the man who owns one and try to imagine how he feels! One can get crystal type signals from a self-excited rig *only* by watching many points—solid construction, Low C, freedom from vibration, careful adjustment with listening monitor—BUT a crystal-excited circuit with '47 pentode at once assures a beautiful signal without much laborious and painstaking attention to these details.

BCL QRM trouble is greatly eliminated by use of the crystal controlled rig. Keying the single tube pentode outfit in the center tap there is a small lag from the time the

key is closed and the time the crystal starts oscillating. This lag causes the hump to be knocked off and consequently the key thumps to be eliminated. No need to say how difficult it sometimes is to eliminate key thumps with a self-excited circuit!

With the advent of the Single Signal Receiver we are able to chalk up another advantage for crystal control. Crystal controlled signals are received best on the single signal receiver since c.c. signals have but one frequency . . . and a much higher order of frequency stability than any self-excited transmitter. Properly built crystal controlled transmitters *stay put*, regardless of people walking near the transmitter, swinging antennas, and the like.

Power output consideration of the '47 pentode outfit is interesting. Using the '47 pentode with 400 or 500 volts on the plate with 40 to 55 mills current, feeding directly into the antenna, being keyed in the center tap, the measured output in the antenna is from eight to eleven watts. As a fairly good crystal will stand up to 100 mills (3500-ke.) there is a large factor of safety. Other types of commonly used oscillator tubes will draw from two to three times as much current through the crystal, with much less efficiency in output. This limits the output from other type tubes if the crystal is to be kept in one piece. Hi.

The use of circuits with pentode-crystal has great merit. Its use is bound to increase by leaps and bounds. Give the pentode crystal a try against your high power outfit!

O. B. S.

The following is a supplement to the list of A.R.R.L. Official Broadcasting Stations in November *QST* (page 51):

W1BIO, W1CRP.
W3ADO, W3ATJ, W3ZA, W3ZX.
W4UW-W5NO.
W5ABO, W5CGJ.
W6BME, W6GEG, W6UCV.
W8CPC, W8CUG, W8XCX, W8CYT, W8ELF.
W9CHA, W9FTA, W9YB.
CM2WWV.
VE3HC.

Relative Traffic Standings

(SEPTEMBER-OCTOBER)

Messages Per Station (25%)	Stations Reporting Traffic (25%)	Gain or Loss (Traffic Reports) (25%)	Traffic Total (25%)	Standing Based on Average of All Four Ratings %	Leading Section in Division
Atl. 106.9	Can. 339	Can. +45	Pac. 19763	Central 78.6	Michigan
Roa. 85.8	Pac. 283	Mid. +25	Can. 14763	Pacific 73.3	East Bay
Dak. 84.7	N. E. 162	Can. +25	Atl. 14006	Midwest 71.5	Missouri
Pac. 69.5	Mid. 144	Hud. +18	N. E. 8421	New England 69.7	Maine
Hud. 69.2	Atl. 131	N. E. +16	Roa. 8249	Roanoke 67.9	North Carolina
Delt. 64.2	N. W. 102	W. G. +14	Mid. 8187	Atlantic 67.9	Western New York
W. G. 63.1	Roa. 96	Roa. +12	Hud. 6824	Hudson 62.5	N. Y. C.-L. I.
Mid. 56.8	Hud. 80	R. Mt. +11	Hud. 5538	Dakota 53.7	Southern Minnesota
N. E. 51.9	Can. 78	Delt. +10	W. G. 4169	West Gulf 46.5	Northern Texas
R. Mt. 47.8	Dak. 77	Dak. +5	N. W. 4131	Canada 46.5	Ontario
Can. 47.3	S. E. 68	S. E. +3	Can. 3697	Delta 32.1	Arkansas
Can. 43.5	W. G. 66	Pac. +1	S. E. 3371	Northwestern 30.3	Oregon
N. W. 40.5	R. Mt. 37	Atl. -5	Delt. 2185	Rocky Mt. 26.8	Colorado
S. E. 34.8	Delt. 34	N. W. -24	R. Mt. 1771	Southeastern 21.4	Ga.-S. C.-Cuba-etc.

THE TEN HIGHEST SECTIONS

S. C. M.

N. C. 157.2	Los Ang. 166	Mo. +26	Los Ang. 9195	Michigan 67.5	Conroy, W8DYH
E. Bay 156.6	Mich. 121	Mich. +25	Mich. 5736	Los Angeles 50.5	Nahmens, W6HT
Hawaii 150.2	Ill. 82	Maine +13	S. Minn. 4712	Cannady, W9EY G	Gavness, W4DW
M.-D.-D. C. 133	Mo. 70	So. Tex. +13	W. N. Y. 4321	No. Carolina 30	Houston, W6ZM
S. F. 128	Ohio 58	Colo. +12	N. C. 4088	East Bay 35	S. Minnesota 30
P. I. 121.1	Wash. 58	Ind. +10	E. Bay 3915	Illinois 30	Radloff, W9AIR
W. N. Y. 120.	Va. 48	Va. +9	Ill. 3563	W. New York 27.5	Hinds, W9APY
W. Pa. 117	Conn. 43	NYC-LI +9	Conn. 3406	Virginia 20	Farrell, W8DSP
S. Minn. 112.1	NVC-LI 43	Ont. +9	Ohio 3342	Ohio 20	Eubank, W3AAJ
N. Mex. 109.8	S. Minn. 42	So. Minn. +8	W. Pa. 3276		Tummonds, W8BAH



MICHIGAN breaks through the Los Angeles line this month and captures the Banner! Michigan is a real competitor, L.A. — watch your laurels! Again, for the fourth consecutive month, Los Angeles sets a new "all time high" in number of stations reporting traffic with 186 traffic reports! Michigan also goes over the 100 mark in "stations reporting traffic" with 121 reports! This month we report a gain of 155 stations leading traffic over the previous month, and a traffic total of over 100,000 — these are active days in traffic work . . . get in on some of the fun!

During the traffic reporting month September 16th-October 15th, 1093 stations originated 23,498; delivered 15,610; relayed 64,529; total 103,635. (66.6% del.) (61.1 m.p.s.)

Traffic Briefs

During June and July while T12TAO was in New York City, a daily schedule was maintained on 14 mc. from W2WC with his station in Costa Rica, T12WD handling the TAO transmitter. Many important messages were handled and T12TAO got a big "kick" out of working his own transmitter, some 2000 miles away.

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 Sacramento Valley 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, December 15, 1932.

Section	Closing Date	Present SCM	Present Term of Office Ends
Rhode Island	Nov. 15, 1932	N. H. Miller	Dec. 1, 1932
Arkansas	Dec. 15, 1932	Henry E. Velte	Nov. 15, 1932
Maritime *	Dec. 15, 1932	A. M. Crowell	Nov. 15, 1932
Sacramento Valley	Dec. 15, 1932	Paul S. Farrelle
Louisiana	Dec. 15, 1932	Frank Watts Jr.	(Resigned)
Utah-Wyoming	Jan. 10, 1933	C. R. Miller	Jan. 15, 1933
Mississippi	Jan. 10, 1933	William G. Bodker	Jan. 15, 1933
Los Angeles	Feb. 15, 1933	H. E. Nahmens	Feb. 24, 1933
Iowa	Mar. 15, 1933	George L. Hansen	Mar. 20, 1933
Western Fla.	Mar. 15, 1933	Edward J. Collins	Mar. 20, 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. B. 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.

Idaho	Charles R. Thrapp, W7AYH	Oct. 2, 1932
Tennessee	F. F. Purdy, W4AFM	Oct. 14, 1932
Southern New Jersey	Gedney Rigor, W3QL	Oct. 14, 1932
South Dakota	Carroll B. Miller, W9DKL	Oct. 14, 1932

BRASS POUNDERS' LEAGUE

Call	Orig.	Del.	Rel.	Total
W6DKQ	2356			2356
W3CXL	214	163	1205	1582
W4NC	39	18	1246	1303
W6PQ	383	155	720	1258
W6AQ	1250			4
W2DIU	362	152	62	1126
W9EPI	154	72	808	1032
W8BJO	248	73	755	1076
W8PP	85	66	903	1054
W9HCC	102	73	856	1031
W6PQ*	203	89	720	1012
K4IHR	198	153	630	981
W2EJ	75	32	724	899
W6GMX	7	3	800	810
W8BNT	202	287	305	794
W8DPJ	45	24	683	752
W6RJ	7	20	708	735
W1CID	68	65	588	721
W28C	23	238	447	708
W8DLG	25	58	593	676
W8NK*	48	69	538	655
W4ZH	232	40	376	648
W3BWT	106	152	388	646
W3EPA	34	76	515	626
W6CDA	16	19	590	625
W6EBK	30	25	569	624
W8DDS	57	109	456	622
W8BKK	126	104	392	622
W8JE	41	95	478	614
W8EN	33	52	518	603
W5OW	98	102	388	588
W6FYT	31	4	552	587
W9HSG	235	12	310	557
W8YA	57	57	412	556
W4FAP	549			549
W1WH	16	19	510	545
W5BMI	39	58	441	538
K6EBE	126	120	268	514
W5AOD	90	45	369	504
W3BQK	156	18	328	502
W1MK	53	150	268	501
W4JR	10	59	432	501
W6CDU	85	194	198	477
W1VS	58	110	308	476
NY1AB	106	132	216	454
W8DTN	15	253	154	422
W8YD	160	117	144	421
W8FX	89	101	158	348
W6BPU	65	107	168	340
W6CEC	21	186	86	293
W3CXM	32	117	124	273
W8DAB	126	114	10	250
W8BOW	9	106	88	203
W8NF	72	118	10	200
W6EGJ	14	103	6	123

Month of September 16th-October 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? * Correct listing for this station for August-September.

ATLANTIC DIVISION

SOUTHERN NEW JERSEY—SCM, Gedney M. Rigor, W3QL—W3ZX is new RM for 'phone, W3APN new RM for CW. W3BEI reports off-frequency stations. W3APV completely rebuilt. W3BYM gets his ORS. W3CLQ applies for ORS. W3BGP is chief op at WCAM. W3EPD is on 14-mc. 'phone. W3ASG is President of new Camden Radio Club. W3ZI has FB schedules. W3BPT has installed e.c. W3ARN is working DX. W3AYA blew the complete works. W3QL has 15 schedules per week. The South Jersey gang put over the first 50-mc. relay between two Mayors in history of U. S., when the Mayor of Camden greeted the Mayor of Atlantic City on October 15th. W3ADL reports great activity in Ocean City. W3ATJ passed bar exams. W3CLE, W3CGY and W3BLR will be heard often. W3AWL handled his transmitter at 250th anniversary of founding of Bordentown, N. J. W3OH is getting around after long sick spell.

Traffic: W3QL 221, W3ARN 124, W3ARV 75, W3BPT 45, W3AWV 42, W3AEJ 29, W3ZI 25, W3ASG 16, W3APN 16, W3BPD 14, W3CLQ 5, W3BYM 11, W3APV 4, W3BEI 3, W3ATJ 9, W3AYA 2.

WESTERN NEW YORK—SCM, Don Farrell, W8DSP—W8BJO, high traffic man, has been appointed Route Manager. W8GWZ, W8AON, W8CJJ and W8BR

are rebuilding. W8DBX built a DC Super Wasp. W8AQF reports nice total. W8DME has two schedules. W8HKF has new c.c. job. W8BQJ and W8KR attended hamfest in Schenectady. W8FTB visited Guelph, Ont. W8DHQ reports new hams in Hornell — W8HVB, W8BSU. W8FDY joined A.A.R.S. W8FMX is building frequency meter. W8BFF has good total. W8DHU is ready for big winter. W8AYU handled traffic with K5AA and ON4FE. W8EKM's YL op is handling all traffic there. W8AGS says someone tore down his zepp. W8AFM rebuilt all transmitters. W8AED is hot after traffic. W8BLP worked Egypt and South Africa. W8AWX is QRL school. W8DEJ reports many ham visitors during summer. W8DSA is off account of sickness. W8AOW is Route Manager for Central New York. W8DT is QRL BC repair work. W8DPS works VKs and ZLs. The Mohawk Valley Brass Pounders opened a membership drive on October 22nd. Any amateurs interested in affiliating with this club should get in touch with W8DI, Al Fitch of Rome. W8HNZ is a new ham. W8BAI is QRL public address system. W8GWZ has new mercury vapor tubes. W8GWY and W8GPT attended the Schenectady banquet. W8GZS is going on 3.5 mc. W8AOR has been laid up with blood-poisoning. W8DWJ's 1.75-mc. phone is perking FB. W8FHO reports for Batavia gang. W8AJJ is QRL college. W8ASG is using new transmitter. W8CUY is giving 1.75-mc. phone a whirl. W8ESB is on. W8HUO is Morse op for NYC. RR. W8CYG turns in a good total. W8GZV is putting in higher power. W8ABM has a new portable call — W8ZAJ. W8GWT has one of the new three-year tickets. W8AKC has new receiver. W8CSO-W8EBH and W8FFU received their green tickets. W8BYD advises that W8ERI is his YL instead of W2DES'. W8GZM is building his transmitter in a rack job. W8AKX is having trouble with tubes. W8DMJ is spending more time on the air. W8JV has a new YL op. W8EWB and W8COB are getting out well. W8EWC can't get his outfit to perk on 7 mc. The wind blew down antenna at W8FFU. W8GPN is handling traffic for the students at Cornell. W8DEQ has a schedule with W3AHD. W8BLH is checking off-frequency stations. W8RFG has new c.c. rig. W8DSS is staying at a farm near Stockbridge. W8BWy is having trouble with key thumps. W8DXF burned out power supplies. W8DES has several good schedules. W8AIO is moving to the western part of the state. W8AXX has a PDC note. Ex-8BFV is on with a new call, W8COH. W8DSP is rebuilding completely. W8EWT is keeping a bunch of daily schedules.

Traffic: W8BJO 1076, W8DBX 367, W8DSS 218, W8AQF 210, W8AED 154, W8DHU 153, W8AOW 132, W8FDY 131, W8BFF 95, W8DEQ 57, W8DES 43, W8HKF 25, W8BQJ 22, W8GWZ 16, W8DME 14, W8ASG 13, W8BWy 13, W8FTB 10, W8BFG 8, W8DHQ 7, W8CJJ 6, W8EKM 6, W8AVX 6, W8BR 4, W8AYU 3, W8DXF 3, W8EWT 257, W8JE 614, W8CYG 435, W8DMJ 115, W8AOR 48, W8JV 22, W8GZM 19, W8GWT 9, W8GWY 6, W8FFU 4.

WESTERN PENNSYLVANIA — SCM, C. H. Gros-sarth, W8CUG — RM W8DLG comes out on top. W8DZL is new in Brookville. W8YA is going strong. RM W8AJE says he is getting bald-headed from wearing the cans! W8KD says the EARC banquet was a hum-dinger. W8CIR has a nice total. W8EDG says W. Pa. seems to be going dead. (?) W8FKU has new 7-mc. zepp. W8DKL attended Erie banquet. W8ELZ blew his outfit. W8HGG reports two new hams, W8FSO and W8HSN, W8EIS, ex-8DBL, is back after several years' absence. W8AJU was without a license for a short time. W8BWX enjoys three-and five-way QSOs. W8CMP keeps weekly schedule with W8DLG. W8CQA says work is interfering with radio. W8BSR will use portable W8DQX "in the woods." W8CPE is President of the Allegheny Valley Radio Association. The Secretary, W8GKQ, will be glad to hear from interested amateurs. W8BML is going to Penn. State; he reports for W8DZQ. W8AVY was elected Secretary of the A.T.A. of W. Pa. W8EEC has been fooling with short-wave converters. W8GUB is going to try for ORS. W8BKS' traffic totals are increasing. W8CQP reports. W8CFR is busy at night school. W8VI-GN gang are active. W8CTE got his WAC. W8FAK is QRL school.

W8HPQ is rebuilding. W8DVZ is active. W8GBC works 3.5 and 7 mc. W8CUG is QRL work. Both W. Pa. Traffic Nets are going full blast! Keep up the good work, gang.

Traffic: W8DLG 676, W8YA 556, W8AJE 373, W8KD 305, W8CIR 194, W8EDG 181, W8FKU 172, W8DKL 158, W8ELZ 97, W8HGG 92, W8BKS 75, W8CUG 64, W8EIS 61, W8AJU 41, W8BWX 38, W8CMP 22, W8GBC 22, W8DVZ 17, W8CQA 15, W8CPE 12, W8BML 12, W8AVY 11, W8CQP 6, W8CTE 6, W8GUB 3, W8FAK 2, W8HPQ 2, W8VI-GN 63.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Harry Ginsberg, W3NY. W3BWT, E. W. Darne, Chief RM: W3BAK, E. L. Hudson, RM. The radio men of Baltimore have formed the Institute of Radio Conferees (I.R.C.). Mr. George Sterling, W3DF, is President; Mr. L. C. Herndon, Vice-President; Mr. Schultz of WCAO is Secretary; M. L. Kann, W3ZK, is Treasurer; Mr. Gerald Cook is Chairman of the Executive Committee. The Frederick Amateur Radio Association deserves a lot of credit for the splendid Hamfest tendered to over 80 amateurs, October 8th. The Washington Radio Club participated in the activities of the President's Cup Regatta. The 56-mc. equipment of W3CPF, W3CDQ and W3PN was used, and operated by W3CFP, W3CFP, W3BEJ, W3ASE, W3OZ, W3AWS. District of Columbia: W3CXL piles up a whale of a total. Traffic is picking up at W3BWT. "C. J.", of the old Ep Darne gang, is helping W3ASO move traffic. W3NR is getting fine results. W3BOS has new receiver. W3LL can't seem to run into traffic. W3CDQ attended the Frederick Hamfest. W3ASE is going in for 56 mc. Maryland: W3SN leads Maryland. W3LA won second place in July ORS Contest. W3CDG has a new c.c. rig. W3ADO changed QRIH to 7010-kc. c.c. W3BRS did fine traffic handling. W3ZD QSPs European traffic through his EAR96 schedule. W3BGI finds "skip" hard to overcome. W3CV was heard by OKINA. W3CJS guarantees Baltimore delivery. W3BVL had a death in the family. W3AFF listens in on foreign broadcasting. W3ZT has his rig arranged to change bands by switch. W3AHG is back in action. W3NY received a ball and chain at the Frederick Hamfest to replace his missing YF. HI. W3CIZ is working DX. W3BT is building a panel and angle-iron job. W3HT is going in for flying. W3DG is building one compact 56-mc. portable rig. W3ZK is building a rack and panel job. W3BKC is QRL school. W3WN advertised the Frederick Hamfest by radiophone. W3AVD has changed QRA. Delaware: W3CPG has a decent antenna. W3BAK is on regularly. W3HC wants schedules on 1750 kc. W3ARM is getting fine results on 1750 kc.

Traffic: W3CXL 1582, W3BWT 646, W3SN 140, W3ASO 130, W3LA 102, W3CDG 78, W3ADO 52, W3BRS 38, W3ZD 31, W3BGI 18, W3NR 16, W3BOS 15, W3CV 14, W3CJS 12, W3BVL 11, W3AFF 10, W3CPG 7, W3ZT 7, W3AHG 6, W3BAK 4, W3HC 3, W3HT 5.

EASTERN PENNSYLVANIA — SCM, Jack Wagenseller, W3GS-BF — W3BKQ, The Chester Radio Club, makes the BPL. W3AHD's high total is the result of 10 daily schedules. W3OK reports plenty of traffic from Winston-Salem Fair. W3MC is planning to head the list. The Frankford Radio Club held a meeting at W3AKB's. W8FLA is making his shack warmer. A traffic club has been organized in York by W3AQN. W8VD is making up for summer slump. W3BEY reports for W3CLG and W3AXK. W8EUX is QRL work. W8FJF sends in a nice report. W8EOH moved to a warmer room. W8CFI is back for his last year at Bucknell. W3QP is trying out new receivers. W3AFG is back after being off a whole year. W3CHU worked a "ZS." W3ALX reports for first time. W3BOL is experimenting with electron-coupled oscillators. W3ATR says lots of DX on 7 mc. W8CFF promises better reports. W3BCD is using ford coils for plate supply. W3MG wants ORS put on ice. W3BTP and W3BF are back on the air. W3CHH has blown condensers. W3CJA is on 7 mc. W8EU says skip knocks his schedules. W3BNM reports for W3ARK, W3BIP, W3BQE. Don't forget the big Eastern Penna. Hamfest at Allentown, December 3rd! There were 400 there last year.

Traffic: W3BKQ 502, W3AHD 342, W3OK 309, W3MC 261, W3AKB 250, W8FJF 235, W8FLA 168, W3AQN 143, W8VD 114, W3BEY 100, W8EUX 83, W8EOH 65, W8CFI 32, W3BF 24, W3BIP 22, W3AFG 22, W3QP 21, W3AXK 21, W3BOI 21, W3ARK 20, W3CHU 19, W8CFF 15, W3BCD 13, W3BQE 13, W3ALX 13, W8AIT 4, W3ATR 4, W3CLG 3, W8EU 2.

CENTRAL DIVISION

KENTUCKY—SCM, Carl L. Pflumm, W9OX—W9FQQ, W9CIM, W9JYO, W9CKH and W9ELL want ORS. Since installing radio in his car, W9BAZ gets better results! Appendicitis has Fred of W9YL down. AA schedules keep W9HAX busy. W9BWJ comes on air in Ironton, Ohio, under portable W9ZZBZ. W9EYW had successful 'phone QSO with plane, 10XAE, on 56 mc. through W9BRK. W9IFM has new tower. School ruins W9GJZ. W9EQO relinquishes ORS, but his XLY W9JYO carries on. W9CDA's crystal refuses to cooperate with antenna. W9ERH has portable W9KFW. Bob Foreman is tinkering with speech amplifier. W9JMR has new doublet antenna. Depression is blamed for low total by W9BAN. W9DLU is on in great style. 3.9-mc. 'phone keeps W9DQC busy. WPDE duty breaks up W9FZV's schedules. Using a 1200-foot transmission line is only way W9BJA can have decent antenna. W9IPG blows his '10s. W9CEE is playing with couple '45s. W9BOZ schedules K5AA. W9AUH is out to win another ORS contest. Answering 6's and 7's keeps W9ETD occupied. W9K CZ is expert rag-chewer. "New antenna in new location," says W9HXN. W9AZY popped his 50-wattner. Married life is beginning to have its effect on W9CNE. W9BOF is our official DX-hound. W9HCO is suffering from modesty.

Traffic: W9OX 1112, W9FQQ 65, W9BAZ 60, W9JYO 39, W9CIM 28, W9JL 22, W9HAX 18, W9JMR 17, W9BAN 14, W9BOZ 14, W9BOF 10, W9EYW 12, W9QT 12, W9CNE 10, W9AUH 9, W9IFM 8, W9GJZ 8, W9EQO 6, W9HCO 6, W9HXN 5, W9ERH 4, W9ELL 2, W9CDA 2, W9AZY 2.

ILLINOIS—SCM, F. J. Hinds, W9APY-WR—RM NE Section W9DDE Ed Wilcox, RM NW Section W9ERU E. A. Hubbell, W9IUL and W9AXM have MOPAs. W9AAK helps W9FTK decide what circuit to use. W9GHT has new power transformer. W9EXB is building new rig. W9HUU has c.c. W9BTQ, W9GKI, W9ACP and W9JKQ are attending a "Commercial Ticket" night school. W9BVE is experimenting with 56 mc. W9IVF has fine schedules. W9CZL is going again. W9IVG and W9CFV have new a.c. receivers. W9FOV has a Hartley. W9BYL is building a 1.75-mc. 'phone. W9JUC and W9ING made eclipse tests. W9HKL works East and West Coasts. W9ING, W9BRX, W9AVB and W9FGN are rebuilding. W9IMH and W9IVV have new crystals. BCL trouble at W9JUC. W9BYZ thinks ORS parties FB. W9HQH and W9GVX are doing fine traffic work. W9AOE works Europe on 14 mc. W9LW has new bug. W9AFN CQs and the whole West Coast comes back at him. W9WA is on with CW. W9BBW is on with 'phone. W9DOX, W9DXZ, W9GEZ and W9ALI did fine army camp work with W9KAT. W9KEH wants an ORS. W9JFX is the Hinsdale Amateur Radio Club outfit. W9ACE wants an Illinois Director for the League. W9ABA is remodeling shack. W9DCI wires schedules. W9KHG and W9KHD found sky-wire down after a recent storm. W9FRA leads in traffic! W9BTU blew 4 tubes. The Central Illinois Radio Club was organized by W9CFV, W9AYO, W9FLH and W9BPU. W9OQ has W9BYF portable. W9KJN is W9EBL's portable. W9AND's portable is W9ZZBS. W9FGY has W9ZZBQ. W9HSG is knocking 'em dead on schedules. FB TNT at W9ILY. Traffic is scarce at W9AAR. W9GDI is struggling with MOPA. W9BPU worked Australia. W9AOV, W9DRV and W9DBO passed regular ticket exams. W9GZW rebuilt into PP TPTG. W9ATS has new crystal rig. W9JO has worked VK5HG 14 times. Parasitic oscillation troubles at W9FF. W9CUH is building 500-watt job. Crystal rig at W9EPN is taking shape. W9CEO has portable W9CYH. New Pilot Wasp at W9BPU. W9HPK is building an a.c. receiver. A 'phone fight was nearly staged at W9HVA shack! W9PK has worked 36 countries.

W9BTT is building c.c. 'phone. W9HTS is on 1.75-mc. 'phone. W9INA, W9BVE and W9FOD are helping W9GVX start traffic schedules. W9DOU has his best traffic report so far. W9FGD has a 7000 TNT. W9DPD rebuilt. W9JCK and W9EXE want schedules. W9HUX is W9KQN, portable. W9IUF has an '03A MOPA. W9FYZ will be on 1.75 mc. W9HNK is on again. W9IEP says the Rock River Radio Net is going fine. W9VS has a 40-foot "Stick that Stuck." W9FGV changed to a single 45 TPTG, W9EMN joined the U.S.N.R. W9NN worked "B4U.P." W9DXZ did some fine work with W5FC on Dallas State Fair traffic. W9IJA has a new portable call, W9SG. W9CSB is working on 56 mc. W9FCW is getting W9HMB started in traffic. W9GEP has new receiver. W9EZY uses MOPA. W9BVP moved to Minneapolis, Minn. W9KRA has just opened up in Galesburg. Wanted! Traffic report from every Illinois station. We extend welcome to the following new Illinois stations: W9CBW, W9KLM, W9FKI, W9AAY, W9AWD, W9JTC, W9AMP, W9KJY, W9KOR.

Traffic: W9FRA 626, W9HSG 557, W9FCW 189, W9FYZ 170, W9DOU 167, W9ENH 157, W9BTT 118, W9KAT 117, W9VS 112, W9ATS 103, W9GVX 103, W9CGV 80, W9HVA 76, W9HQH 66, W9DBO 62, W9APY 53, W9IEP 49, W9AMO 44, W9CRT 40, W9KEH 40, W9FKO 36, W9JUC 35, W9NN 33, W9DXZ-W9FGD-W9INZ 32, W9CUH 30, W9ACE 25, W9BYL 23, W9AFN 21, W9IVF 20, W9CSB 19, W9DCI-W9LH 16, W9AD 14, W9ALW 13, W9CHD-W9GZV-W9ICN 12, W9BVE-W9JO 11, W9FGN-W9FO-W9JCK-W9LW 10, W9EMN 9, W9EXE-W9ZZBS 8, W9HUU 7, W9FTX-W9BA-W9ILG 6, W9ACU-W9ALA-W9AVB-W9BSE-W9BYZ-W9IJA-W9PK 5, W9AMN-W9CEO-W9IVG-W9JLK-W9KV-W9WR 4, W9AXM-W9BIR-W9BPU 3, W9AAR-W9FOV-W9GEP-W9HNK-W9HPK-W9ILY-W9IUF 2, W9BRX-W9BTQ-W9BTU-W9CEC-W9DPD-W9GDI-W9HUX 1.

INDIANA—SCM, Arthur L. Braun, W9TE—The Hamfest at Indianapolis was a wow. W9YB leads this month in traffic. W9ESU is second. W9ACO goes to Purdue. W9AEB says QRM is bad. W9AET is ORS. W9AIP takes interest in ORS. W9AKJ is QRL work. W9ARK is doing FB with traffic. W9AUT has a new bug. W9AXH is QRL amateur movies. W9BCT has a pair of '10s. W9BXT works on 7 mc. WCB, ex-W9EXY, returns to the ham game after four years QRT. W9CHA is getting schedules lined up. W9CKB gets out FB. W9CKG is one of the 28 ops at W9YB. W9CVQ has W9FZP as a call at Univ. of Chicago. W9CWO is building new c.c. rig. W9DEJ has 50-foot mast. W9DJU and W9EEO want ORS. W9EOC has separate rig for 7 and 3.5 mc. W9EGE has new skywire. W9EPT worked 9 ZLs and 16 VKs. W9EXL took home an alarm clock as a prize. W9FHB took exam for unlimited 'phone. W9PKE has a canary for background to sweeten up sour CQs. W9FQ helped W9EEO build his transmitter. W9FUT wants a good spray for the bugs in his transmitter. W9FVI is new ham at Beech Grove. W9FVB is holding down traffic schedules. W9HSF and W9FZE are rebuilding. W9GFS is on 1.75-mc. 'phone. W9GGJ is experimenting. W9GGP and W9KPN are new hams in Indianapolis. W9GBK has portable W9KND. W9HIU has the 'phone fever. W9HKE is looking for reliable schedules. W9RS and W9HML reported in person. W9HPQ has new VF Hertz. W9HUF uses portable call W9IMT. W9JFA is on 3.5 mc. W9JHY has a pair of '03As. W9JY has filter trouble. W9JRK has two ops. W9JSM is lining up schedules. W9KGI has new Hartley. W9KGU has new receiver. W9KKA is "regusted" with 3.5 mc. W9KNJ and W9KPH are new hams at Salem. W9TE has portable call W9KMY. W9ABW is building new receiver. W9JCX reports for Wabash gang. He and W9GBI are going in for 56-mc. 'phone. Ex9DDPH hopes to get on again if BC service work ever lets up.

Traffic: W9YB 285, W9ESU 241, W9AET 80, W9EEO 25, W9FUT 25, W9FYB 23, W9TE 14, W9CKB 13, W9DEJ 12, W9AXH 10, W9JRK 10, W9ARK 9, W9JSM 9, W9HKK 7, W9DJU 6, W9HML 6, W9EOC 5, W9HPQ 3, W9HUF 3, W9EPT 2, W9HSF 2, W9RS 2, W9AKJ 2.

W9AEB 2, W9FJA 2, W9GFS 1, W9AIP 1, W9GGJ 1, W9CKG 14.

WISCONSIN—SCM, H. H. Kurth, W9FSS—W9AUX leads this month. W9DXV schedules W9EPJ. W9FSS is busy building c.c. rig for W9GHN. W9EYH had his aerial blown down. W9DGV schedules Chicago. W9DKH is sailing on the Lakes. W9ZZN-IAQ asks for schedules. W9PHU was busy putting out forest fires. W9FAV and W9CCI are grinding crystals. W9HMS is building a station for the Shiotoon High School Radio Club. W9ERS-GAF schedules W9EYX. W9GVL expects to stay on 3.5 mc. W9EHD-HA is building a station in his apartment. W9EEQ is organizing the Four Lakes Radio Club at Madison. W9IQW schedules W9EEQ. W9HKL shifted to 14 mc. W9HTZ is on 7200 kc. W9ZY reports that La Crosse Radio Amateur Club has begun regular meetings. W9HSK reported with W9ZY. W9FAP would be glad to trade radio parts for blonde YLs. W9ESZ has been grinding crystals. W9AVG hopes to make a trip to Milw. and see the SCM. W9JDP increased power. W9DRO-KFO started reporting again. W9APB sends first report. W9EOB is QRL YLs. W9ABM spent the month hunting ducks. W9HRM-Ex9AI will be on with a pair of '10s. Bruno Plitzko passed the exam at Chi. W9RH worked 10 VKs. W9ENP has two '52s. W9FIM is rebuilding. W9GSP is on 3.5 mc. listening on 7 mc. Hl. W9FRN is chicken-farming. W9DEI of So. Minn. is going to M. U. W9NY is still looking for some one on 56 mc. W9FAV is on 14 and 56 mc. W9ESE is the proud possessor of an O.O. appointment. W9ITU is using self-excited rig. W9JWZ is on 56 mc. W9CPW is on 1.75 mc. 'phone. W9AFZ is getting the Naval Reserve transmitter working. W9FSV is booming forth from WPDK. W9CZX renewed his station license. W9HOR has been building a "rock" holder. W9DUY is out of cash. W9IH, W9EYH, W9BIB, W9AFU and W9AVG spent a nice day at W9CUH and W9EYL. W9DJQ and W9IYZ visited W9AVG. W9BIB is on with c.c. W9BKA, W9DJH and W9FJX are new hams at Appleton. The Kenosha Radio Club has begun activities again. The Northern Wisconsin Radio Club opened meetings with a banquet.

Traffic: W9AUX 171, W9DXU 144, W9FSS 122, W9EYH 65, W9DGV 49, W9DKH 43, W9FHU 34, W9FAV 27, W9HMS 22, W9ERS 19, W9GVL 17, W9EED 16, W9HKL 12, W9IQW 14, W9HTZ 7, W9ZY 7, W9HSK 6, W9FAF 6, W9ESZ 6, W9AVG 5, W9JDP 5, W9DRO-KFO 3, W9APB 2, W9EHD 17, W9RH 3.

W9ACK sends news from Sheboygan. W9BBP visited Wisconsin. The Sheboygan Radio Amateur Club is growing. W9IDG has an MOPA. W9BTA is a new comer. W9FLW is tuning up on 7 mc.

MICHIGAN—Acting SCM, Kenneth F. Conroy, W8DYH—Merry Christmas, gang, may Santa be good to you. Looks like a Happy New Year—W8DCQ, W8CFM, W8CPH, W8AZQ and W8DYH found new jobs. W8BTP finds QSL business FB. W8EBQ has an extra sock to stuff in his tank coil. We handled 5736 messages with 141 stations reporting (121 of 'em handling traffic). W8PP is all caught up! W8EEM and W8GQC are brothers. W8GQC is going to double his total (of 1) and give W8HOT hot-hot competition! W8GSP reports W8CFX as new. W8GGB doesn't get out so well from Detroit. W9EXB is our idea of a nice, new amateur. W8AEQ claims that good schedules mean good totals. W9BBP is about ready to quit vagabond-ing and maybe quit brass-pounding, too! W8AYO is all set for the BARC Net. W8EVC got his shift changed to days so as to handle traffic. W8FRW wants dope on U.S.N.R. W8CTD reports a burned-out transformer! W8BTK has a 211. If we can find your QRA, W8CUP, you'll get a Bulletin. W8BRL-8QD got his license back. W8AW has a pair of back-brin' 'fess! W8FTW is in love again. W8HUD knocks off W7 with a '45. W8CST is wowwing them! W8ECN visited W8EVC, W8FBN and W8AOD. W8FXB is in love with the new '83 due to its effeminate shape. W8DUR is at WPDK operated by W8BJ and ARR. W8QT is trying MOPA. W8DED got a WAC. W8HER has moved to Pontiac with his airport. W8EGI reports for JARA.

W8DHC finds the traffic all right. W8FX makes the BPL. W8DA wants an Illinois schedule. W8CUX (Pres BARC) and W8EHD entertained the BARC, October 2nd. Lookie all the new reporters! W8BQN, W8BSG, W8NQ, W8EDO, W8HQ, W8DCN, and, thanks to the Activities Manager of Gratiot County Radio Club, we have W8AWE, W8DCQ, W8DSK, W8ECQ, W8EY, W8EJR, W8GOZ, W8GRB, W8GZJ and W8ELC! W8BPS schedules K5AD. W8GDR increased his total 1800%! W8DZ yelps that he got his total without the help of Polly. Well, she's still an asset at W8DYH! With just a little while left for leap year to expire, W9EXT wonders if he can hold out! Says W8BMG, "Hope you mugs get a bald head and flies roost on it. Pofaa-phaa-phaa!" W8HBT gets 270 miles per watt. W8CPLY wants traffic schedules. W8CWR had no success on 3.5. W8LQ at Northville T. B. Sanitarium would appreciate visits from brother hams. W8BEP (ex-W9LL) has two fractured ribs, and they aren't from football! W8AKN is being QRMed by local 'phone. W8FCU, "Traffic my objective, speed not sufficient—but—just wait." W9IJH reports the "Abfalter Trunkline" OK with a new zepp at W8GDR. W9EGF is building a "Green Serid receiver." Two sides: W9HK: "W9DAB is afraid to send messages to his YL through W9HK 'cause said YL thinks W9HK is nice!" W9DAB: "Ray's had new name is R U Butinsky!" W8AFH is on one night a week for BARC net. W8CSR shows good fellowship in using 300v dc instead of 750 ac. W8GQS used a piece of lens for crystal! W8FTV thinks we like 'phone 'cause we work at it! W9THM wants A.A.R.S. appointment. For complete Michigan news see the DARA Traffic Bulletin—free to anyone sending a report to Acting SCM W8DYH.

Traffic: W8PP 1054, W8CST 370, W8FX 348, W8AEQ 326, W8BMG 308, W9HK 305, W9DAB 250, W8EGI 158, W8BTK 157, W8DED 112, W8FTW 103, W8FTV 83, W8AKN 82, W8QT 81, W9HXB 80, W8CUG 79, W8EHD 71, W9FSK 70, W9LJH 64, W8DNY 60, W8DYH 58, W8BIU 56, W8DCT 55, W8FRW 52, W8JF 52, W8DZ 50, W8CPY 48, W9DCN 48, W8EVC 46, W8AYO 40, W9BBP 38, W9THM 37, W8BMZ 36, W8BUH 32, W8DHC 30, W8ECN 29, W8EJV 27, W8BXJ 26, W8EXT 26, W9CE 25, W8HTA 25, W8BEP - W8CPH - W8JO - W8HBZ 24, W8ARR-W8GY-W8DA 21, W8CFZ 20, W8AW-W8BTP 19, W8EFM-W8GGB 18, W8GDR 19, W8DMS-W8EYH-W8GQF 17, W9EVI-W8CEU-W8WR 16, W8BQN-W8DUR-W8HOT-W8GRN 15, W8AAF-W8CSR-W8BPS 15, W8EDO 13, W8AUT-W9EQQ 11, W8BJ 10, W8PIO 9, W8GTN 10, W8AZQ-W8CUX-W8HUD-W9CWR 9, W8CUP 10, W8FXB 9, W9CEX 8, W9HSQ-W8WO-W8NR 8, W8ABH-W8IN-W8CGP-W8GRB 6, W9HIS-W9HBT 5, W8FQD-W8GQC-W8GQB-W8GMB-W8HER-W9VI, 4, W8AJL-W8ALL-W8COW-W8DNT-W8DOS-W8EFM-W8EYF-W8FCU-W8FLQ-W8FWG 3, W9AAM-W8AFH-W8AWE-W8BTK-W8CFM-W8CSJ-W8CEV-W8FZM-W8GSP-W8HHQ-W8HQ 2, W8FLZ-W8GOZ-W8GQC-W8GZJ-W8NQ 1.

OHIO—SCM, Harry A. Tummonds, W8BAH—All Ohio traffic men please acknowledge reading this report at once by a message addressed to W8BAH. In message state your present activity and schedules. District No. 1: W8HSX is President of Lakewood Radio Club. W8BON reports from Wooster College. New Cleveland reporters are W8DVI and W8HSL. "Nothing less than QSA5 for 1½ months," reports W8FFM. A new reporter from Wellington is W8GDQ. W8RN is on KFMM. W8EFW is QRL school. W8FGC is rebuilding. W8GME is at new QRA. Twelve hams in West Tech Radio Club (W8CQF): W8CAC, W8CEJ, W8DAT, W8DQI, W8FGC, W8FOO, W8GUL, Lowe, Magyar, Klein, Pierce and W8BYD. W8FGP is anxious to meet the gang at the Mike & Key Club Hamfest at Lorain. W8FNX sends nice report. W8BKV is working on 56 mc. W8FGJ has his transmitter at Lakewood Radio Club. New Junior operator at W8AXV! W8BZG and W8BFT report. W8ZZB handles some traffic. New QRA at W8BRB. W8AOJ wants more report cards. A new car and YL are the reason W8BMX is not on the air much. W8VS schedules W8GHP. W8UC

has new rig. W8HBI schedules W8GNP. W8ACZ is Vice-President of Cleveland Amateur Traffic Association. W8CEJ schedules W8DAT. W8DHI schedules W1CIG. W8CZT schedules Detroit. W8GUL is Secretary of Lakewood Radio Club. W8FFK schedules W8EBY, W8FJE, W8ZZB and W8FIP. W8FVL now has W8FXH as a son-in-law. 50-watter TPTG at W8FJE soon. W8HFZ is new reporter. 2nd commercial ticket at W8EBY. W8DAT is doing real traffic work. "Ohio is coming along all OK," reports W8BAH. RM W8BYD has 15 schedules. W8DDS says watch for the CATA Greater Cleveland Net. W8HC accepted Director nomination for Central Division. District No. 2: W8BKM: W8BKM says A.A.R.S. schedules all shot. W8GHF is on with low power. W8EJ is an Ensign in U.S.N.R. District No. 3: RM W8APC: W8APC takes charge of this district again as RM. See him for schedules. Maumee Valley Radio Association Club will hold a QSP Contest, W8EME donating prizes. W8ATN is waiting for antenna. W8DIH is in radio service business. W8EKJ is awaiting new batteries. W8AND is going in radio business. Glad to hear from W8BTT. W8EXD is a new reporter. W8GE wants schedule with Bluefield, W. Va. W8CMY has a job on the Lakes. District No. 4: RM W8EEQ now has new QRA. Following report from W8DQA: New club in Galion with 8 members. W8GDE is President, and W8DQA chief cook. W8BCA, W8GDE, W8DQY have new transmitters. W8GAE is going to operate WJW. W8EMO is working on new receiver. W8DYW and W8GVY had hard time getting home after club meeting, as garage was too small. Hl. W8UW is a real part of the Ohio A.A.R.S. We will sure be glad to see W8PO back on schedules. District No. 5: RM W8DFR attended Toronto Convention. 50-watter went west at W8FBC. W8FGV is making good use of prizes won at Central Division Convention. Nice report from W8FDV. W8BZL is State NCS A.A.R.S. W8BMK has applied for ORS. Another hot report from W8EXL. W8BSR is not on much. District No. 6: RM W8BBH schedules W8PPP, W1MK, W8DLG and W8CGS. W8GZ reports nice total. W8FJN is back from Mines. We welcome W8ENH back. W8HPC is new ham. W8ENH will have 860 watts on last stage. W8ARW has his ORS renewed. District No. 7: RM W8VPI is doing great work in his Section. W8ANS schedules W8BAH. W8CKX is now in radio service work. District No. 8: RM W8CGS reports activity in district picking up. We hope W8ALQ got his ticket OK. New reporter is W8GDC. W8CUL lost ORS certificate in fire. "Busy rebuilding W8EAG, school transmitter," reports W8BRQ. District No. 9: New RM of this district is W8AEL of Nelsonville, ex-ORS W8GFU. W8FRV has a nice report. W8VR is active on 7080 kc.

Traffic: W8DDS 622, W8BYD 421, W8BAH 254, W8CMY 230, W8BBH 222, W8GZ 146, W8VP 96, W8EEQ 81, W8DAT 79, W8DFR 66, W8BKM 62, W8CUL 57, W8FJN 54, W8ANS 52, W8EBY 47, W8FBC 47, W8FHZ 44, W8UW 39, W8CGS 26, W8FGV 26, W8FDV 34, W8FJE 32, W8FVL 30, W8FFK 25, W8GUL 23, W8CKX 23, W8GE 15, W8ENH 14, W8CZT 14, W8VR 12, W8BZL 11, W8ARW 11, W8GDC 10, W8BZG 10, W8DHI 9, W8CEJ 8, W8EXD 8, W8ACZ 7, W8BTT 7, W8EBI 6, W8AEL 20, W8BMK 6, W8AND-W8UC-W8HVS-W8BMX 5, W8FRV-W8EXI 4, W8AOJ 3, W8BRB-W8FSR-W8ZZB-W8HSL-W8BSR 2, W8BFT-W8BRQ-W8PO 1, W8APC 232.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Wm. A. Langer, W9DGS-W9LFW — W9EVQ had visit from W9ECJ. W9HJC's traffic map is nearing completion. W9IGR is newest ORS. W9BPM's several ops keep the ether busy. W9DYA is c.e. on 1.75-mc. band for A.A.R.S. W9EGI discovers new things about c.e. daily. W9DPT, W9FSF, W9EIG, W9JAR and W9JZ send first reports. W9GRE finds 14 mc. FB. W9DM is struggling with a balky buffer stage. Froelich of Montpelier visited the SCM. He plans to use W9FJV's idea for power supply. The SCM is QRL the AA net. W9AZV's rig lines up like this: 47-27-45-10 final. Hl. Traffic: W9EVQ 310, W9DGS 309, W9HJC 223, W9IGR

135, W9BPM 96, W9DYA 13, W9EGI 13, W9FSF 11, W9GRE 11, W9CRL 9, W9DPT 7, W9JAR 3.

SOUTHERN MINNESOTA — Acting SCM, Vic Schleuder, W9BKX — Four stations made the BPL. W9EPJ leading, W9HCC a close second, and W9BKK and W9BN next in line. W9LN handled Farm Strike news for *Minneapolis Tribune* from W9BRA. W9LXQ is raising his traffic totals. W9FCS keeps schedules. W9BNN has new 3.5-mc. zepp. W9CSY joined A.A.R.S. W9CPP did good work in handling hospital case reports. W9FJK is leaving Minneapolis for winter. W9JBA reports fine hunting. W9BHZ returns to ranks of traffic handlers. W9GNU is active in traffic work. W9LJN has YLitis. W9CSJ has daily schedules. W9CTB is attending U. of M. W9YC reports traffic contest among ops at station. W9FFY is active in A.A.R.S. W9HRH is on 1.75 mc. W9JJD wants more traffic. W9EFK has new zepp. W9DEI has Comet Pro. W9DGE was transferred to Str. Thorp. W9FMA makes good use of 5-point system. W9ZT has his Z call back. W9DRG reports pre-war Canadian ham in his city. W9IDF is using a '10. W9EGG rebuilt to improve appearance. W9KDI is going c.c. W9GCN has gone to 3.5 mc.

Traffic: W9EPJ 1122, W9HCC 1031, W9BKK 622, W9BN 603, W9LN 216, W9BNN 150, W9LXQ 129, W9CKU 90, W9CSY 90, W9CYX 88, W9FCS 85, W9CPP 61, W9AIR 54, W9BKK 51, W9FJK 38, W9JBA 37, W9BHZ 34, W9KXR 26, W9GNU 20, W9EPD 16, W9LJN 16, W9CSJ 16, W9DH 15, W9CTB 14, W9YC 12, W9FFY 12, W9GLE 10, W9HRH 10, W9JJD 6, W9BCX 5, W9EFK 5, W9DEI 5, W9DGE 4, W9FMA 4, W9ZT 3, W9DRG 3, W9IDF 2, W9EGG 2, W9KDI 2, W9IAK 1, W9GCN 1, W9JHG 1.

SOUTH DAKOTA — SCM, Carroll B. Miller, W9DKL — This is my first SCM report. I sure appreciate your support to gain this office. W9BJV is looking for western schedules. W9FKL reports for W9HJU. W9DNS is building a new super het. W9BLZ, W9DES, and W9DNS visited W9HHW. W9CFU received his pilot's license. W9DGR built new AC receiver. W9GYG is on air. W9FOQ has new 52-foot towers. The Aberdeen gang has opened club again. The Redfield Hamfest was a real success.

Traffic: W9BJV 67, W9FKL 30, W9HJU 15, W9FOQ 5.

NORTHERN MINNESOTA — SCM, Palmer Andersen, W9DOQ — W9GBW, W9AVZ, W9AEL, W9GBN and W9AJZ now have regular tickets. W9HDN has a 'phone ticket. W9BBL leads this month. W9BAR had a great time at Mankato. W9GYH has portable W9KNU. Two new hams are W9KIZ and W9KJB. W9HEN reports that W9CWI has moved. W9GZO has a new radio shop. W9EGU has a 135-foot zepp. W9FJN gets a kick out of pheasant hunting. W9HRB has a dandy 'phone. W9BVI tried to keep his 1000-watt job a secret, but the news leaked out. W9IJS is rebuilding. W9KFF (W6FLA) is a new reporter. W9AVS reports via ham route. W9LPN is new ORS. W9CDV is going in for traffic. W9IPA mails deliveries. W9HCW is coming on with c.c. shortly. W9EOZ is working out in the country. W9ELE thinks grinding crystals is great sport. W9IAA is on once a week for U.S.N.R. drill. W9JIE is playing around on 56 mc. W9EHI has a new zepp. W9HLE is at new QRA. W9FNQ finds little time on air. W9GWR moved to 1.75 mc. W9BRA has a couple schedules. W9JCD is a Morse man. W9FEP and W9IGZ had a great time visiting ham stations. Traffic for Duluth should be routed to one of the trunk lines; it will find its way through W9BN to W9HZ. Please look at your ORS certificate for expiration dates.

Traffic: W9BBL 134, W9GYH 4, W9HEN 3, W9HDN 14, W9EHI 2, W9JIE 23, W9JUS 14, W9HZ 5, W9KFT 16, W9HCW 52, W9IAA 117, W9ELE 3, W9AVZ 35, W9HLE 2, W9FNQ 3, W9IPA 31, W9BRA 64, W9VFN 9, W9DOQ 20.

DELTA DIVISION

MISSISSIPPI — SCM, William G. Bodker, W5AZV — W5CFL is new reporter. W5AHA reports W5UM was heard in Berlin. W5BUI is putting in 50-watt MOFA. The following are new A.A.R.S.: W5ID, W5CLD and W5ARJ. W5BTL says his new c.c. outfit won't neutralize according to either Hoyle or Handy! The Tri-

State Amateur Association is planning a Hamfest. W5VJ is awaiting the arrival of new and bigger filter condensers. W5CIK has finally gotten full wave on his power supply. W5BIO is on 3.5 mc. Let's put Mississippi on top! SCM Velte of Arkansas has challenged your SCM to a friendly contest for first place in the Delta Division, so let's have your support.

Traffic: W5AHA 30, W5BJO 25, W5BUI 23, W5CLD 23, W5CFL 2.

ARKANSAS—SCM, Henry E. Velte, W5ABI — Boy-O-Boy, what a Convention! Everyone had a good time and plenty of personal rag-chews. W5BMI lands in the BPL. W5CFQ is active in Paris (Ark.). W5BM is on 1.75 mc. W5HN will be on with 3.9-mc. 'phone and 7-mc. C.W. W5FE is on 7 mc. W5CCY won a Radio School course. W5BKB and W5LV are c.c. on 3.5 mc. W5COZ and W5UI made the Convention. W5ANR and W5BRI report traffic. W5BDW has new ac receiver. W5JK is handling traffic. W5BMV flirts with 56 mc. W5BY will soon be active. W5BRW, W5IQ, W5CFE and W5EG are active. W5PX is new A.A.R.S. and O.R.S. W5ABL gets out fine. W5AKB and W5BED want schedules. W5FM pounds out a few. W5SI was busy with Convention. W5BUX is working on c.c. rig. W5CR copped some prizes at Convention. W5BZK is using type '10s in PP. W5EXM and W5CCW were at the Convention. W5ABI extends his thanks for all reports.

Traffic: W5BMI 538, W5BED 339, W5Q 144, W5PX 114, W5AKB 101, W5SI 95, W5ABI 80, W5JK 45, W5CCY 40, W5BUX 19, W5ABL 17, W5FM 16, W5ANR 9, W5BKB 7, W5BRI 6, W5PE 4, W5CCW 25.

TENNESSEE — SCM, Fremont Purdy, W4AFM-WLH8 — W4ABY, W4AED, W4LC, W4TM, W4FK, W4GX, W4AXN, L. E. Stevens and Mr. Birmingham of Memphis Chamber of Commerce were the Tennessee contingent attending the Delta Division Convention. W4TM displayed his Automatic Break-in System. Memphis plans to sponsor the next convention. W4OI has been promoted from first-class radioman to the rank of Ensign in U.S.N.R. Memphis hams had a visit from W5BUX. W4OI and W4ABY have combined. W4KH and W4AKG have given up Hamdom for Outdoordom. W4ACU is located in Memphis. W4WZ is again pounding brass. W4AFK and W4AVY reported QRM from work. Ex-W4CU is back at it. W4HA reports spearing plenty of DX. W4EX and W4RO say traffic is picking up. They and W4OV are now A.A.R.S. W4ADX and W4ABX have c.c. outfits. W4AER is recuperating after an operation for appendicitis. W4AAO is appointed ALT. N.C.S. of the Tennessee A.A.R.S. W4AAD is the proud papa of a bouncing YL. W4AFM succeeds W4APA as the N.C.S. of Tennessee A.A.R.S. and succeeds W4SP as SCM for Tennessee. He wishes to thank those members who supported him to office.

Traffic: W4OI 300, W4AAD 32, W4BFH 26, W4RO 24, W4EX 23, W4AFM 22, W4ADX 12, W4HA 10, W4ABX 8.

LOUISIANA — SCM, Frank Watts, Jr., W5WF — W5YW reports three new ops., W5BYJ, W4BDS and W5AHP. W5BPL rebuilt. W5HR is QRL WPEK. W5QJ and W5ABS have MOPAs. W5CFE and W5CFG are brother stations. W5CW will be on shortly. W5CEN and W5BYQ work DX. W5BFB is stepping out. W5CAX is kicking. W5AYZ is working them. W5BYI is on. Who is W5DC? Mail reports to 1624 Allen Avenue, Shreveport. Those attending the Delta Division Convention at Pine Bluff were W5BDJ, W5FR, W5AXU, W5AXD, W5CNG, W5AKT, W5ZZZ, W5CEW, W5ADM, W5ADJ, W5SWG is trying an S.S. super. W5BDJ has 50W c.c. W5FR has 50W 'phone. W5AXU is about to get BC license. W5AXD is Red Hot code man in AARS. W5ANQ bought an '04A. W5EB is running pair '52a PP plenty hot. W5BTH is c.c. W5ZK has rebuilt. W5AI has other things to worry about. W5ML is on 1.75-mc. 'phone. W5CEW and W5ADM received op. tickets.

Traffic: W5BPL 6, W5YW 14, W5BYQ 6.

HUDSON DIVISION

EASTERN NEW YORK — SCM, R. E. Haight, W2LU — W2BLU heads the Section. RM W2BJA is second high. W2UL can be heard on 3507 kc. W2CQH is back in

town. W2ACD reports "ole man skip." W2DVY put up a Zepp. W2KW and W2CCD are same man! The Hams Paradise can be found at W2OP's. W2BJP is QRL experimenting. W2DQD hooked up long-wave rig. W2DQT has 'phone on 1.75 mc. W2DEL is now using c.c. W2CJP with portable W2ZZK tried 56-mc. 'phone. W2CTA and W2CFU reported via radio. W2CJS reports new ham, W2EMB. W2BLL reports W2ENB as newcomer. W2DIJ makes first report. W2BZZ will be back with large totals soon. W2BIA has new pentode outfit. W2BKM is QRL on the stage. W2CGO and W2ANV are active on Navy Drills. W2BKW is heard pounding 'em out. W2CAZ is active on 56 mc. W2ACB is doing great work on 56 mc. W2CTC is on 56-mc. CW. W2ENC is new ham. W2BW attended the SARA Banquet. W2QY is new ORS. All active traffic men please mail list of schedules with full details to the SCM so that a traffic sheet may be printed and mailed to all active E.N.Y. stations.

Traffic: W2BLU 330, W2BJA 295, W2LU 136, W2UL 107, W2CQH 99, W2ACD 52, W2DQ 36, W2KW 26, W2BJP 29, W2OP 18, W2DQD 13, W2DQT 12, W2DEL 12, W2CJS 9, W2CJP 8, W2CFU 5, W2BLL 3, W2DIJ 2.

NORTHERN NEW JERSEY — SCM, Walter A. Cobb, W2CO — W2DIU, ably captained by exW3ASO, made the BPL with the nice total of 1126. W2BPY, RM, was second. 'Phone stations are urged to report each month, as well as CW. Traffic schedules keep W2CGG busy. W2DPB and W2CIM happen to be cousins. The RM is boasting additional calls of W1ETN and W2ZZFS. Rutherford has a new ham, W2CDG. W2CBEY is QRL. W2WR spends his time experimenting. Ful Webster, Vice-President of the Bloomfield Radio Club, signed the pledge and then came through; W3BPP, his present call, is in the hands of one who remembers the glorious days away back when he had charge of W1MX and W1XM. W2ABT keeps schedules with TI5FI and TI3LA. W2CIZ worked his portable rig W2ZZW much during the past month. W2EKM reports arrival of a YL op. Studies interfere with W2BPG. Wish we had the space to quote W2EIC's experiences! W2DQQ is 4th op at W2DIU. W2CCS corralled the job of teaching a troop of Girl Scouts the code! W2AGX reports a new receiver. W2BEI and W2ELV hope to become ORS. The Newark Amateur Radio Association, the Raritan Valley Radio Club, the Ocean County Radio Association, and the Bloomfield Radio Club are all active with hamfests, banquets, etc. W2ASB and W2COV are first reporters. W2JH, ole Bill Fricke, of East Orange, is back on the air. W2EJK reports plenty traffic handled by him and W2DQE. W2ALD now has c.c. on Naval Reserve frequency, 3590 kc. W2TP has qualified for ORS.

Traffic: W2CIM 4, W2DPB 8, W2CIZ 5, W2BPY 171, W2DIU 1126, W2CGG 26, W2CBEY 11, W2ABT 27, W2EKM 5, W2BPG 2, W2EIC 8, W2CCS 8, W2BEI 2, W2ASB 2, W2COV 3, W2DQE 53, W2EJK 41, W2ALD 9, W2CO 31.

NEW YORK CITY AND LONG ISLAND — SCM, M. J. Grainger, W2AUS — NYC and Staten Island: W2SC takes the Section lead. Our YL W2WP is runner-up. W2CYM is QRL work. W2AHO handles his on weekends. W2AWT moved to new QRA. Brooklyn: W2DBQ has 18 schedules per week. W2COO is a new station. W2CCD's law business and amateur work go well together. W2BAS is very active. W2FP is busy with 56-mc. experiments. W2BMH reports two new hams, W2CYY and W2BWL. W2BXJ worked all districts twice in 24 hours. W2ASG has new PP MOPA. W2BRB is moving to Bellmore, L. I., next door to W2EAF. W2AZV got a new 50-foot steel mast. W2LB says the depression is over — for him. W2CEF started a private DX contest all his own and, although he won, he didn't get anything but wise cracks from W2AUS and W2DMN. A new radio club in Brooklyn, "Long Island Radio Amateurs," has been formed with 24 members. Bronx: W2BGO operates from 2 to 4 a.m. W2QM will tie two trunk lines together. W2CAP has new '10. W2AFT blew his outfit. W2FF is settled at new QRA. W2DUP will be ORS soon. W2CZF has lots of schedules. Queens and Long Island: W2ADQ leads this part of the Section and now has a schedule with

Cuba along with Peru and Panama. W2AIQ gets some traffic on 56 mc. W2DMN keeps four schedules. W2CUH relays traffic to W2AIQ on 56 mc. W2BWD has new c.c. rig on 7 mc. W2CY will soon be moving. W2BVL, the Nassau Radio Club station at Oceanside, L. I., say traffic and schedules on 3.5 mc. are their meat. W2LR changed his outfit to remote control. W2OB moved to St. Albans. W2COI pounds away on 3.5 mc. W2BOM has a new a.c. receiver. W2EEL reports from Rockville Center; W2DJO is on again. W2DPU is using an electron coupled rig. W2DQK will have ORS soon. W2AGL is QRL working overtime. W2AUS is trying to make one transmitter do the work of three. W2DOG and W2CHK are going strong. All Hudson division hams are requested to attend the A.R.R.L. meetings held at the Armory at Whitehall Street, in N.Y.C., usually on the first Monday of each month. Please get in touch with the SCM or your RM if you are handling traffic. Let's get that traffic banner away from our rivals on the West Coast. Everyone report traffic! W2BW and W2BEG donated special prizes for our N.Y.C. and L.I. traffic contest. (See details last QST.)

Traffic: W2COH 6, W2BEG 17, W2BWD 13, W2AIQ 93, W2AHO 25, W2WP 341, W2CY 28, W2LB 17, W2BAS 31, W2BGO 34, W2CCD 20, W2DBQ 179, W2DQK 75, W2CEF 9, W2BMH 1, W2PF 78, W2FF 1, W2QM 86, W2BRB 1, W2ASG 14, W2ADQ 256, W2SC 708, W2AUS 172, W2LR 34, W2BVL 87, W2BXJ 11, W2BEY 4, W2AGL 34, W2CWP 34, W2CBB 26, W2CHK 65, W2CZF 154, W2DJO 9, W2CUH 53, W2DBA 3, W2DOG 18, W2ELK 2, W2DPU 13, W2DMN 8, W2DUP 19, W2ECU 5, W2DHN 9, W2CYM 6.

CONTEST FOR MIDWEST DIVISION BANNER

DATES: November 16th to and including February 15th.

COUNT: Message Count to be "Standard A.R.R.L." and from Traffic Reports.

INELIGIBLES: The SCMs, W9BNT, and Director W9GP to be ineligible to win the Division Banner, but their Traffic Reports SHALL BE COUNTED in the totals of the respective Sections.

Division Banner to be Awarded to Station standing highest in the Winning Section, except as noted as ineligible, and to be retained by said Station for a Period of One Year and the Contest Renewed. Section winning the Banner three respective years to retain it.

MIDWEST DIVISION

NEBRASKA—SCM, S. C. Wallace, W9FAM—W9BNT busts loose with an FB total. W9DMY is doing fine work in AA net. W9FAM started the ball rolling. W9DHA, RM, wants the gang to send him their traffic dope. W9FUW is rearing to go. W9DXY is getting in the harness again. W9DGL is a regular DX hound. W9EHW has everything all set. W9FWW reports. W9EWO is having trouble with his eyes. W9BOQ is back with us. W9HTU is doing fine traffic work. W9LFE reports traffic. W9HYR increased power. W9CWM is helping put Lincoln on the map. W9IFZ is traffic minded. W9EEW will be with us soon.

Traffic: W9BNT 794, W9DMY 130, W9FAM 146, W9DHA 140, W9FUW 58, W9DXY 45, W9DGL 25, W9EHW 18, W9FWW 9, W9EWO 11, W9BOQ 2, W9HTU 65, W9LFE 28, W9HYR 13, W9CWM 12, W9IFZ 10.

IOWA—SCM, George D. Hansen, W9FFD—W9EIV, RM; W9BPG, RM. W9EIV, western RM, leads this time. W9BWF is not far behind. W9GXU got his first-class ticket. W9ABE is QRL. W9BPG is back in the running. W9FFD manages to get a fair total. W9ACL blew power transformer. W9KBM, ex910, reports for first time. W9CWG has call W9KMX for 56 mc. W9JSO, ex9DXR,

reports. W9LFI holds daily schedules. W9AYC is active A.A.R.S. W9CYL is on 3.5 mc. W9BJP paid a visit to RI at Chi. W9FCY was on sick list. W9EOE has been QRL corn-picking. W910 reports new ops. W9AHX reports for portable W6ZZBL. W9DUE has ORS aspirations. W9FZO changed QTH. W9AFQ has good reports on his OBCs. W9JXO is holding schedules. W9DMX reports a few. W9ERY promises better next time. W9HLG reports new stations W9KMA, W9KAC and W9JZS. W9DNZ is followed by illness. W9FYX gives us the dope on the transmitter. W9JZM comes through with some news. W9KMK, W9DVR, and W9WT are new stations. W9JMB sports a new National. W9IYE, pre-war ex9RD, is back in the fold. W9DFK is QRL enlarging the wood pile. W9AHQ finally got the "J" card. Remember the Midwest Division Traffic Contest!

Traffic: W9EIV 311, W9BWF 305, W9ABE 190, W9BPG 176, W9RFD 156, W9ACL 155, W9KBM 154, W9CWG 83, W9JSO 77, W9LFI 58, W9AYC 56, W9CYL 52, W9BJP 33, W9FCY 26, W9EOE 24, W910 20, W6ZZBL 15, W9DUE 8, W9FZO 7, W9AFQ 7, W9JXO 5, W9DMX 5, W9AHX 4.

KANSAS—SCM, O. J. Spetter, W9FLG—W9FLG and W9BFZ were honored with a visit from W6DYC and his Buddy. W9ABR lost his antenna in wind storm. W9KFK is full-fledged AA. W9BYM is ORS applicant. W9CDM works all bands. W9IQF applied for ORS. New calls for Hutchinson, W9ELU, W9EMT, W9KMB, and W9CNW—exW9DDV. W9AHR has portable W9ZZAB. W9HUB got his operator's ticket. W9FMX is recovering from operation. W9AWB is getting used to being called Daddy. W9EHT got his renewal. W9GXD is experimenting with 3.9-mc. 'phone. W9LXE has FB c.c. rig. W9GDS is on 3.5 mc. W9BSK is building c.c. job. W9EVT spent week in Hutchinson. W9BJY is rebuilding. W9BNU and W9JVC are building new MOPAs. W9FDO put up 82-foot sky hooks. W9ESL is working DX on 'phone. W9CFN keeps five schedules. W9IEL enlisted in U.S.N.R. W9CDM has new five-stage c.c. rig. W9DEB is working both coasts. W9HSN is working graveyard shift. W9PB is having trouble with 500-watt final stage. The SCM would like to hear more from new radio clubs. Secretaries, please keep us posted. W9KG and W9CFN hold RM Round Table on air every Sunday morning.

Traffic: W9KG 435, W9FLG 350, W9CUF 202, W9BFH 151, W9ABP 149, W9KCR 111, W9DOV 90, W9CNW 82, W9DVQ 77, W9AWP 76, W9DEB 71, W9BNU 61, W9N1 59, W9FRC 53, W9CFN 50, W9KDO 48, W9PB 47, W9COA 45, W9LEW 44, W9KFK 41, W9BYM 40, W9EFE 31, W9HWW 29, W9CDM 27, W9HSN 17, W9IEL 15, W9JVC 15, W9BSK 12, W9CKD 8, W9ERR 6, W9BGL 6, W9ESL 5, W9FMX 2, W9EMT 2, W9GCL 3.

MISSOURI—SCM, C. R. Cannady, W9EYG—RMs: Harvey Glatstein, W9FTA and H. J. Becker, W9PW. GOING UP! A 58 Per Cent GAIN in one month. That's MISSOURI's record and all in getting ready for that BIG INTRA-DIVISIONAL CONTEST beginning NOVEMBER 15th and lasting three months. Don't forget your report on the 16th. Let's show 'em how to win a contest! W9EYG led the state in traffic. W9CGC came to the front in the ACTIVITY CUP race. W9CRM was able to take the lead, for the year's standing in the CUP race, by a mere one-fourth point over W9FTA. St. Louis: W9HUZ is arranging cross-country schedules. W91JW works all districts. W9PW is rebuilding. W9HWE blew transformer. W9AOB and W9FUL return to 7 mc. W9APW installed MOPA. W9HVJ is trying '47s. W9EPE comes back for more. W9GHI is experimenting with '46. W9GUC is trying '10s. W9BGE has portable W9KJK. W9GCH rebuilt. W9HIP is splitting the ether. W9HEL has something "BIG" up his sleeve! W9HWP has PP rig. W9KEI was visited by W9HEQ. W9HWE reported for W9BSH. W9GTK-W9ENK has trouble getting through QRM. W9CCZ is having trouble neutralizing P.A. W9KIK is new 3.5-mc. ham. W9DOE sends another FB report. W9MC is working 7 mc. W9EKY seems to be going places. W9FMK has a kw bottle. W9EFC returns after a little vacation. St. Louis Amateur Radio Club: W9GYT moved to new quarters. W9AUB built Electron Couples fre-

quency meter. W9FTA, W9GDU, and W9EVV are new members of the St. L. ARC. W9FTA is adding a couple of '52s. W9GTF went into business for himself. W9EJL and W9HVC turned partners in a 1.75-mc. 'phone. W9DGI-EOW is handling traffic. W9GCT and W9BEU are QRL work. W9EMP is back for experimental purposes. W9DUD-EWT was visited by K5AA and OM4UU. W9FFW is QRL school. Kansas City: W9GCG got WAC in 13 hours. W9EL built new super. W9FHV is getting trunk line underway. W9RR sends blanket report. W9ZZ and W9NP are reported by W9RR. W9EQC has FB Australia schedule. State News: W9FSL reports new 3600 c.c. job. W9HIW is getting over farm QRL. W9JBV got the rig on 7 mc. W9GNM is back for more. W9HNM and W9FSU are new ORS. W9BGW moved to Adrian. W9ENF put 50-watters in c.c. final amp. W9ASV and W9CLQ are QRL WMBH. W9CRM rebuilt. W9FJV sends all Missouri hams an invitation to join the A.A.R.S. W9AJJ handled European, Maltese and Chinese traffic. W9HVW and W9CNI were visited by W9DLC. W9DLC is moving to 7 mc. W9IYU is a new ham. W9ARH moved to Kirksville. W9JBZ gets in on some traffic. W9DHN ways E.E. at M.U. plenty stiff. W9CQY reports very little traffic. W9BGS reports not much doing. W9AOG is sporting radiotelegraph second. W9HKW reports for first time. W9IEF is a 1.75-mc. 'phone. W9CZI moved to Cape Girardeau. W9GEF has a 3.9-mc. 'phone. W9DWK and W9BDS QRL. W9INX, W9API, W9ECE, and W9ANG report by radio. Hannibal Amateur Radio Club: W9KEM is the new club station. W9GBC is trying to make up for lost time. W9FGJ is building 1.75-mc. portable 'phone. W9FSZ gets a little traffic. W9HSZ is installing '52s. W9FSB and W9HBJ experiment. W9KNK came in for a few deliveries. W9IRR divides his time with the club work. W9EFZ reported QRL. W9CNS with a couple of '10s on 3.9-mc. 'phone was heard in Australia. South Missouri Association of Radio Amateurs: W9GMI has new 7-mc. c.c. rig. W9HUG takes a little more traffic. W9GBJ adds another VK. W9FVM-CON attended the Delta Division Convention. W9CJR-FEH was appointed DNCS for A.A.R.S. W9FYU is trying to add DX. W9EHS added an OW to the shack! W9IXO was one of the several from Southwest Missouri who paid W9RI, Radio Inspector, Wm. J. McDonell, a visit of some two or three hours at Springfield. REMEMBER THE CONTEST, GANG!

Traffic: W9EYQ 375, W9CGQ 237, W9HNM 190, W9FSL 145, W9FJV 125, W9NP 122, W9CRM 101, W9ECE 100, W9AJJ 100, W9FTA 78, W9FHV 75, W9JBV 51, W9GBC 35, W9HUZ 32, W9EKY 27, W9JBZ 27, W9EQC 20, W9ENF 25, W9RR 25, W9CJR 23, W9IXO 21, W9FSU 20, W9EFC 19, W9GBJ 17, W9EL 16, W9DGI 16, W9DUD 16, W9JYC 12, W9HCP 11, W9JPT 11, W9HUG 10, W9DOE 10, W9BC 10, W9HUI 10, W9GDU 8, W9ANG 7, W9GCH 6, W9FSZ 6, W9HWE 5, W9KNH 5, W9PW 5, W9AOG 4, W9FYM 4, W9EHS 4, W9ZZ 4, W9FEH 4, W9AUB 4, W9HJL 4, W9HVC 4, W9GQY 4, W9IGW 4, W9GMI 4, W9KEI 4, W9LJW 3, W9EWT 3, W9FYU 3, W9CZI- W9EOW- W9DLC- W9ENK- W9GTK- W9HIW- W9HVJ- W9KEP- W9GEF- W9CCZ- W9FAB- W9IOS 2, W9HEL- W9COZ 1.

NEW ENGLAND DIVISION

WESTERN MASSACHUSETTS — SCM, Earl G. Hewinson, WIASY-WIRB — W1BVP, RM, is high man. W1BVR, W1DCH and W1CCS are QRL. A.A.R.S. W1APL promises big things on traffic. W1AQM visited W1OIF. W1BPN got himself a YF. W1AJD complains of skip. W1COI reports W1FAO and W1FCL new hams in Adams. W1EFM complains of YL trouble. W1AIC and W1BSJ are building electron-coupled outfits. W1AFI has DX fever. W1AZW, RM, visited the Hoosac Valley Radio Club. W1DGW just can't get out. W1BXP has been working 56-mc. duplex. W1DVW and W1FAJ send in first reports. W1NS reports that the Blackstone Valley Radio Association mourns the loss of Louis A. Giamarco, W1ALI, of Milford, who died October 9th. W1CPC reports W1ESE and W1DUS new hams in Worcester. W1DLD worked WTEP, U.S.S. *Oceanographer*. The

Springfield Technical High School has formed a new amateur radio club with the following members: W1EOB, W1DXW, W1TX, W1EBE, W1DTA, W1CKJ, W1ELH, W1ZZAB. W1BKS broke his '60s. W1CGL wants to buy a gas engine to drive his generator. The depression has hit the Worcester Radio Association badly. W1EOB is enjoying ham radio. W1EFM is this month's new ORS. The YLs in and around Springfield have formed a new club. Those interested should get in touch with Miss Gladys Rood. The N. E. Division Director and the SCMs and RMs in Eastern and Western Massachusetts held a meeting in Worcester during the month.

Traffic: W1BVP 163, W1AFI 116, W1EFM 101, W1AIC 75, W1ASY 74, W1AJD 66, W1ARH 57, W1AZW 46, W1DGW 28, W1BFX 22, W1DCH 23, W1BVR 20, W1APL 18, W1OIF 16, W1COI 14, W1CCS 14, W1AQM 7, W1AUQ 6, W1BSJ 1, W1BNL 1, W1BKY 60, W1ATK 5, W1ASU 3, W1NS 57, W1CPC 37, W1DJQ 18, W1DLD 17, W1DVW 6, W1EOB 5, W1EAJ 5, W1BKQ 4, W1CGL 4.

VERMONT — SCM, Roy L. Gale, W1BD — New ham sheet, "The Opium List," is being published by our RM, W1BNS. The North Troy gang visited W1BJP. W1EFZ is a newcomer. W1DXX and W1ERJ are trying 1.75-mc. 'phone. W1CGX and W1BAS are QRL service work. W1DAJ built a screen-grid receiver. We never knew that QRM had a color, but W1AHN thinks it's a little blonde. W1DAG is joining the National Guard. W1AXN returned from camp. W1CGV is back from W2DEQ. W1ATF turns over the trunk traffic line to W1BZD. W1DXX and W1BZD have joined the A.A.R.S. W1BD had a pleasant evening with W1BGY. W1CUN is on in Bethlehem, N. H. W1EFC is bothered by football QRM.

Traffic: W1BZD 137, W1CGV 107, W1BNS 74, W1ATF 33, W1BJP 28, W1BD 24, W1DXX 16, W1AXN 12, W1AHN 6.

MAINE — SCM, J. W. Singleton, W1CDX — W1BOF again takes the lead. W1EF is alternate control on Trunk Line "C." W1CDX is selling Philcos. W1BLI plans to have more power. W1APR and W1BWS are room-mates. W1CFG is on the job. W1CPT worked VK. W1ATO is QRL U.S.N.R. W1DAW has nice schedules. W1CRP is rebuilding. W1EY has a 1.75-mc. outfit. W1DHH has a new ham in the making. W1DOB is rebuilding. W1DJJ is going in for MOPA. W1AQW is going to increase power. W1CIP is on the air. W1CGG is QRL A.A.R.S. W1BYV needs new tubes. Welcome reports received from W1BEZ, W1DHD, W1BNC, W1DXJ, W1BP, W1EFX, W1DUW, W1BPO, W1AUC, W1CHF, W1BEU and W1BUO. W1AXJ is QRL school. W1APX visited the SCM. W1BYI was QSO ZL and VK. W1BWB is active. W1AQL says the Queen City Club has a fine program lined up for this winter. W1QH has a new 50-watt outfit. W1BYP QRL moving. W1EF wins the wall sign this month. Please mail a list of your schedules to the SCM.

Traffic: W1BOF 278, W1EF 250, W1CDX 216, W1BLI 178, W1APR 153, W1CFG 123, W1DHD 61, W1BNC 61, W1CPT 48, W1ATO 42, W1DAW 41, W1CRP 37, W1EY 33, W1DHH 33, W1DXJ 20, W1DOB 18, W1DJJ 18, W1AUC 10, W1AQW 8, W1CIP 8, W1CGG 7, W1BYV 6, W1AXJ 6, W1APX 6, W1BYI 4, W1BPO 5, W1BWB 2, W1PB 2, W1EFX 1, W1DUW 1, W1BUO 62, W1BEZ 17, W1BEU 4, W1CHF 13.

CONNECTICUT — SCM, Fred A. Ells, Jr., W1CTI — W1AMG wins the free QSL card design offered by "Gil" to the highest station for month ending October 15th. W1CJD leads in traffic with BPL total. W1MK keeps "Gil" company in the BPL. W1YU is keeping nine schedules. W1BYW reports W1FDV a new station. W1DGG has portable call. W1FCM. W1BDI is hot after traffic. W1CTI keeps schedules between 7 and 7:30 a.m. W1ES went away on a convention trip. W1BMP is active ORS. W1BFS put up a new mast. W1AUK reported by radio. W1DOW handled American Legion traffic from Portland, Oregon. W1AJB was away on vacation. W1BVV is trafficking. W1AMQ is looking for schedules. W1BHM worked Egypt. W1EAP worked DX on 14 mc. W1QV rebuilt power supply. Glad to hear from W1DGC. The

Taft School Radio Club (W1CIG) started off with 17 members. W1DMK says the Waterbury gang have the 56-mc. bug due to the efforts of W1HD. W1CVD sends in her first report. W1TD will be open for schedules soon. W1DF is working 14 and 3.5 mc. W1DFT says W1BGT sends code practice on 1.75 mc. W1BNB says DX good between 5 and 7 a.m. on chilly mornings! W1AOB added a buffer to his outfit. W1CSC requests ORS information. W1EAO is real active in O.O. work. W1BIQ QSOs W6 and W7. W1BOD says, "School QRM." W1BNP is building S.S. receiver. W1EWD reports that W1CEG is hooking up with real DX. W1CUX, W1DDP, W1DDX and W1CSY traveled to N.Y.C. and brought home their First Class licenses. W1AVB says if a little "Calox" oxygen tooth powder is used when grinding crystals they will work. The Annual get-together of Conn. ORS was held at A.R.R.L. Headquarters on October 16th. W1ARB found a lot of QSLs at HQs. W1APZ says not much time for radio. W1BWM is "regusted" with 56-mc. 'phone. W1FL reports bad QRM on W1XP S.F.T. The gang at W1CBA were entertained by W1ARB on October 6th. W1VB has a new Jr. YL opr. W1AFB says RP should put in a bed for him at W1MK. W1CNU now has portable W1ZZBM. W1CQF and W1ATW are in the radio business.

Traffic: W1CJD 721, W1MK 501, W1AMG 287, W1YU 275, W1AFB 244, W1BYV 158, W1DGG 147, W1BDI 119, W1CTI 111, W1ES 88, W1BMP 76, W1BFS 76, W1AUK 64, W1DOW 62, W1AJB 60, W1BWW 50, W1APW 44, W1APJ 40, W1AMQ 36, W1BEM 35, W1EAP 27, W1VQ 22, W1DGC 22, W1CIG 21, W1DMK 20, W1CVD 17, W1TD 9, W1DF 9, W1DFT 7, W1BNB 5, W1ALE 5, W1AOB 5, W1CSC 4, W1EAO 2, W1BIQ 2, W1BOD 1, W1BAX 1, W1BNP 1, W1ARB 1, W1CBA 10, W1BWM 3, W1FL 7, W1ATW 11.

EASTERN MASSACHUSETTS—SCM, Joseph A. Mullen, W1ASI—W1KH has QSO'd 25 on 56 mc. W1VS is organizing an Eastern Mass. traffic net. He makes the BPL! W1ASI is snapping the whip at all loafers. W1ABF is pumping kilocycles from WBDQ. W1WV is nursing his c.c. outfit. W1BZQ has new rig. W1CUO is awaiting action from the gang. W1VX, new Secretary for the South Shore Amateur Radio Club, reports new officers: W1CAC, President; W1AJA and W1RC, Vice-Presidents; W1VX, Secretary; and W1AKY, Treasurer. Meetings are held 1st and 3rd Wednesdays at 8 p.m. W1DES has been ill. W1BZO reports for first time. W1BYF reports for Reading: W1BYF is QRD 7 mc. W1DKM worked VK2RA. W1EXG is a new man. About 100 hams at the Middlesex Amateur Radio Club heard a talk by Hollis Baird of Short Wave and Television Labs. W1EEL sends the dirt from Malden. W1HX is at WKAV. W1DAI has MOPA. W1EEL has new zepp. W1ELF has moved to N.H. W1BFFK wants an ORS. W1SI of Revere was QSO xW6BQP for 3 hours and a half—100% on 7 mc. W1CCX heard W1KE Providence, and W1VW Fall River on 56 mc. W1BBY has an '04A on 7 and 3.5 mc. W1ALP is busy answering questions for new hams. W1ETX's Needham neighbor is W1RE. W1KH, W1VS and W1ASI had a buzz-fest with the traffic crew from Western Mass. W1HC, Somerville Police, are on the air. W1AIV and W1AOW are at the key. W1ECY sends in his bit from the U.S.S. *Humphreys* all the way from San Diego, Calif. W1DIU is on at new QRA. W1BRB has been experimenting. W1VA's transmitter is in cold storage. W1BBX is awaiting the pipefitters to get out of his cellar. W1DFU has completed a new transmitter, W1DMT. W1BIO has turned his cellar into a transmitter factory with W1DNL, W1AJA, W1BIU and W1SB all constructing transmitters there. W1CWA is getting disgusted with ham radio. W1AJK has silenced his 250-watt job. W1BO is still hugging 7 mc. W1MA has been active. W1AKN has returned to school. W1SC has been cutting holes in the air. W1MX is on with high power. Winchester is represented by W1EWX. W1NC and W1BNJ have resigned ORS. W1BNU is expected on 3.5 mc. W1FR wants to buy a rubber bucket for his excess RF. W1BRX is still testing. W1LQ has come back with a sock. W1BFR is handling traffic. W1BMW is on 1.75 and 3.5 mc. W1CGB is going on 56 mc. W1AGA says 1.75 mc.

FB. W1DL is operating a flea power MOPA. W1ACH is very silent. W1UG is showing signs of 7-mc. itch. W1JL's '10 has given up the ghost. W1LM has been changing location of outfit. W1CAW is on 3.5 mc. W1ATX reports W1FBC a new ham in Norwood. W1FDB has had his station only a month. W1CCP is organizing a ham club at Northeastern University. W1WU is hunting ORS for the Section. W1DZG is looking for schedules. Effective January 1st, all ORS must handle at least 30 messages per month to hold the appointment in Eastern Mass. Do your stuff! W1AAL is open for schedules. W1ABG has been sick.

Traffic: W1VS 476, W1ASI 215, W1BMW 63, W1SC 50, W1LQ 48, W1BBY 45, W1DZG 29, WIAGA 28, W1BZQ 27, W1CGB 27, W1BFR 24, W1CCP 22, W1EWX 21, W1CAW 14, W1AAL 14, W1JL 14, W1CUO 11, W1CWO 11, W1LM 3, W1WU 8, W1ATX 7, W1BFFK 18, W1ABG 16, W1KH 44.

NEW HAMPSHIRE—SCM, V. W. Hodge, W1ATJ—W1EES has been trying 14 mc. W1CME opened a radio store. W1AEF's '52 is working FB. W1DMI reports traffic increasing. W1IP is ready for a big traffic season. W1CCM has new 13-tube 'phone. W1AUW's 'phone was heard in England. W1DNC has five schedules. W1APK had his freq. checked by F.R.C., and it is 3945.7 kc. W1AXL has remodeled transmitter. W1CJG reports for Laconia gang. W1ATP moved to Massachusetts. W1BZK has gone to MIT. W1CLD is working. W1BST is planning a comeback. W1FX is playing with 56 mc. W1BAC is on again.

Traffic: W1IP 90, W1DMI 35, W1DNC 14, W1CGJ 8, W1AEF 3, W1EES 2, W1APK 5, W1AXL 5.

RHODE ISLAND—SCM, N. H. Miller, W1AWE—W1EOF has portable W1FDR. W1GV-W1FBP says traffic is FB. W1BLJ changed QRA. W1DJX has portable W1FCW. W1BDQ QSO'd New Zealand. W1AQ is getting on 3.5 mc. W1BUX is perking OK. W1CMG has 'phone on 3.9 mc. W1AWE is working on c.c. rig. W1CAB has c.c. W1BL has new transmitter. W1BOS reports W1AGJ just got married. W1BYA was Best Man. W1BGA is our new RM. W1DIT has increased power. W1BIW gets out FB. W1CGO has new receiver. W1CWP says traffic is scarce. W1ALI is new ORS. W1BTP expects big things this winter. W1ASZ is on 3.5-mc. c.w. and 1.75-mc. 'phone. Report to the SCM on the 16th.

Traffic: W1GV 72, W1BTP 17, W1ASZ 16, W1CGO 13, W1CAB 10, W1DIT 8, W1BOF 4, W1AQ 4, W1ALI 4, W1CPV 3, W1AWE 3, W1BOS 2.

NORTHWESTERN DIVISION

MONTANA—SCM, O. W. Viers, W7AAT-7QT—W7AHF is the star traffic station. W7BYE comes second and W7BCE, third. W7BII holds 21 weekly schedules. W7FL is back in Bozeman staying with W7BAY. W7BDJ wants traffic schedules. W7AOD has a 211 in final stage. The Missoula Club used portable W7BPS to relay reports to Moscow, Idaho, of the football game between U. of Idaho and U. of Montana. W7BKM was the only Montana ham at the Convention. W7BVE uses grid leak bias on his amplifier. W7BYR will soon have a new 50-watt transmitter. W7BQG has been moving. W7AUB is new station at Portage. W7BGC received W7BDM for portable call. W7AAT keeps the '03A steamed up on Trunk Line "A." W7AFS is QRL the farm. W7CEG gets out fine.

Traffic: W7AHF 205, W7BYE 108, W7BCE 100, W7BII 76, W7FL 51, W7BDJ 24, W7AOD 16, W7BKM 9, W7BVE 3, W7BYR 7, W7AAT 6.

IDAHO—SCM, C. R. Thrapp, W7AYH-W7CKO—Forward future reports on your activities to the new SCM, W7AYH. W7BAV has a new c.c. rig. W7CEH is rebuilding for 1890-ke. code practice. W7ATN blew his rectifiers. W7QD has entered U. of Washington. W7AJQ is rebuilding. Some one borrowed W7CLS' antenna! W7BWX has a tough time with tubes. W7ALW has moved to Illinois. W7AKZ has a new 60-foot stick. W7BAR and W7AYH are on 56 mc. The American Legion Convention boosted traffic totals, and W7CCU originated

plenty. W7BRY rebuilt. W7KJ, W7AXY and W7CMQ have new 'phone rigs.

Traffic: W7AYH 91, W7BAA 47, W7BEO 62, W7QD 40, W7AQJ 11, W7AKZ 10.

OREGON—SCM, Ray Cummins, W7ABZ—W7AWH leads again. W7AZF visited the SCM. W7BOH handled traffic. W7QO and W7BWD are back on the air. W7SY has new SW3. W7AVB and W7AZW are new Marshfield stations. W7BLN is QRL Telephone Co. W7CMK worked his first ZL. W7AHJ and W7AJX report traffic. W7AZJ lines up reports from the Marshfield gang. W7APE is op. at KGN. W7WL is rebuilding the dynatron. W7AMF handles wx reports for airways. W7ED and W7AKY are rebuilding. W7AXO worked a Belgian on 14 mc. W7AYV keeps five daily schedules. W7CBA hopes Oregon will lead in traffic. W7BOO has his eye on an ORS. W7AXJ keeps daily schedule with K7FF. W7ED is on 3.5 mc. for traffic. W7WR wants more schedules. W7BHT is employed at Pocatello, Idaho. Rose City Amateur Radio Club elected new officers as follows: President, W7BTS; Vice-President, W7PK; Secretary, W7BGW; Treasurer, W7QY. W7ALA resumes publication of the Amplifier, in booklet form, available to any 7th district amateur on request. W7LT has a 211D on 3.5 mc. W7BZS has portable call W7AYF. W7BWK is bothered with OM skip. W7AEM would like to hear more 1.75-mc. 'phones. W7CBO, W7COR, and W7AQY report traffic through W7QY. W7ABZ is on 1890-kc. 'phone, with a daily broadcast of traffic activity. 9:30 is the time.

Traffic: W7AWH 545, W7AXJ 210, W7AYV 116, W7BWK 83, W7BOO 51, W7ABZ 47, W7WR 41, W7AMF 32, W7ACH 31, W7ED 22, W7APE 22, W7QY 18, W7AEM 18, W7AXO 15, W7ALA 12, W7SY 10, W7AHJ 8, W7HD 6, W7CBA 6, W7BOH 5, W7BZS 4, W7WL 4, W7AJX 2, W7CBO 2, W7AQY 2, W7COR 1.

WASHINGTON—SCM, John P. Gruble, W7RT-W7ZZH—W7AYO, of Yakima, is Washington's new Route Manager. W7QI is our other R.M. Traffic handlers should get in touch with their nearest R.M. Plans are being formulated for the publication of a Washington section news bulletin in the near future. Seven schedules daily place W7IG in lead. Portable W7ZZH was used at the Puyallup Fair and was operated by W7DF, W7CCF, W7GM, W7AAE, W7HE, W7FP, W7RB, W7CMO, W7BBA and W7RT! W7AAX took 76 messages in a string! W7TZ says, "Yours till kilocycles have handlebars!" W7BXT's portable is W7CHI. W7CGN is using a pair of '52s. W7CGK's receiver only oscillates on 3.5-mc. c.w. band. W7BUW sends Yakima Club's traffic. W7BUP scheduled W7BIL. W7BHH has 50-watter. W7BPV clicked W4EG. W7WY is a sure outlet for Oregon traffic. W7ALP, Vancouver, is officer-in-charge at NDI, Portland. W7CMO is troubled with "B" power for receiver. W7BBH moved to Portland. W7SL is on the air Mondays, Wednesdays, and Fridays. Some hams that attend the U. of W. are W7LD, W7AUU, W7AUV, W7UX, W7BZN, W7CEZ, W7AZL, W7UZ, and W7AYZ. W7AEA, W7BRT, and W7LD enjoy 1.75-mc. operation. New stations at Seattle: W7AVK, W7CFJ, W7AVC and W7BDW. W7CBU, formerly of San Francisco, is now in Yakima. W7HE is QRL crystal-grinding and U. of W. W7AUI is operating portable W7CBU. W7AQB had over 150 QSOs one month. W7CJS reports for W7BFR. W7CCN is active at Alмота. W7BWS is the lone reporter from Centralia. W7CHI installed a station in his chicken house, saying, "More privacy." Hi. The new YL op at Tacoma has call W7BBA. Schedules for traffic keep W7AVM worried. W7CGT is resuming activity. We expect W7US on the air shortly. W7BNI relayed Wenatchee-Yakima football results to W7BUQ. W7AHQ is new ORS. W7CIJ is new op at Tacoma. A recent storm brought W7KK's antenna down. W7BCV is the President of the Walla Walla Radio Club; W7AIG is Vice-President; W7AGP, Secretary-Treasurer. W7APR reports many new hams at Spokane. We are pleased to receive a traffic report from W7MM. W7ZZAN is the portable call of W7BUC. We'd like bigger traffic totals from W7AZE. NY2AB is W7HS's best DX last month. New equipment being installed at W7BYT.

W7ANF is going in for radio business. W7BYS has difficulty in QSOing locals. W7ALH-W7BKE will install the first station ever operated from a sorority house, U. of W. W7XAP and W7XAG are experimental Forest Service stations. KGYI and KGYA are Park Service stations, and not connected with the U. S. Forest Service. W7BYB, Yakima, W7AZL, Tacoma, and W7CCF, Renton, are among recent visitors to the SCM's. W7AZA reports all Aberdeen stations "going strong." W7CLK is preparing to handle worth-while traffic. The San Leandro Flower Show aided W7AXT's total. W7JJ is now in Butte, Montana. W7WU, of Kent, left for Japan on October 15th. W7ACS reports. W7AIT sends traffic report of 21 for a new Olympia station, but fails to send call letters. The second op at W7BB got married. W7TX won't handle much traffic until after the Director's election. W7AAM is new Walla Walla station. W7AJI again reports for Spokane group, including W7BRP, W7BUY, W7ASN, W7AUN, and W7AAN. A traffic contest at Spokane is expected to boost things there. W7AFC is out of town too much to handle traffic. The neighbors threatened to saw W7BUK's antenna poles. Active stations at Ferndale are W7BWU, W7BWG, and W7BLP. Congratulations to W7JT on the arrival of a new Junior Op. Remember our Official Observer, W7KO, when desiring frequency check. The Tacoma Radio Club recently paid the Seattle gang a visit. W7JD is busy announcing at KPCB, where W7BCK is acting as chief technician. We understand W7AAE is going to East Coast and is planning a visit to the A.R.P.L. Advertising Department. We've just received our latest copy of the *Amplifier*, the Portland, Oregon, publication devoted to amateur radio interests. A copy will be sent free upon request to any licensed amateur in the seventh district. Get yours now. W7BHH and W7AXT are working on Trunk Line "F" hook-up. W7WG is interested in electron-coupled oscillators. Following men are interested in 28-mc. experimentation: W7BAC, W7VN, W7VG, W7TS, W7RT, and W7BCI. Any others? We wonder why W7BAK is so interested in Yakima. W7AFX is attending WSC at Pullman. More information wanted on activity at Pasco, Everett, Centralia, and Port Angeles. The mighty unconquerable has fallen! W7RT has *Y Litis*, and what's more, his YL has him worried. Hi! A rise in winter and holiday season activity is expected to place Washington in a high place in national section rating. Everyone report. Be there with us when we go over the top! 73 or 83, as you prefer. (Hi.) W7OV expects to be operator aboard a ship out of Juneau, Alaska.

Traffic: W7IG 257, W7OV 206, W7ZZH 205, W7AAX 137, W7WY 131, W7CCF 92, W7WU 85, W7BHH 76, W7HE 62, W7BCC 56, W7BB 56, W7BFR 54, W7APS 50, W7AZA 47, W7MM 47, W7AXT 47, W7HS 43, W7ALP 36, W7NR 36, W7ACS 31, W7RT 28, W7CGN 24, W7AYO 21, W7AIT 19, W7BNI 19, W7TX 17, W7BRP 17, W7AQB 12, W7CMO 16, W7BWS 13, W7TZ 13, W7AZI 12, W7SL 12, W7AHQ 10, W7QI 10, W7BCV 10, W7CCN 9, W7KO 9, W7ANF 8, W7ASN 8, W7KK 8, W7BYS 8, W7CGK 7, W7BUK 7, W7BUW 6, W7BUQ 6, W7BPV 5, W7CHE 4, W7CJS 4, W7AVM 2, W7APR 2, W7GN 2, W7BXT 2, W7AFC 2, W7AUN 2, W7BUX 1, W7AAN 1, W7LD 1, W7CGZ 1.

ALASKA—SCM, Richard J. Fox, K7PQ—K7CKK has returned to the States and will be heard from W7CNS. K7BLE reports from Kennebec. He assists K7BLI and K7EZ with their stations.

Traffic: K7CKK 41.

Regular report from the SCM received at HQs too late to include traffic in Traffic Summary. K7ARL is proud father of a 7-lb. boy. K7BEL and K7BHR consolidated. K7BMY is curing the doubler stage of his c.c. rig. K7VEH has moved to Juneau. K7BNW is a new ham in Ketchikan. K7ARL, K7BQE, K7BLI and EXW9OI visited K7PQ. K7BFO is EXW7BFO from Salem, Oregon. K7ADY is getting back on the air. K7ASM has an FB c.c. rig. K7ASV and K7LW are new hams at Anchorage. K7BZX is back from a trip around Southeastern Alaska. K7FF has gone to 14 mc. Anchorage hams are organizing a new radio club. K7BLI has left for the States. W7OV

expects to be operating a ship out of Juneau in near future. K7TF reports.

Traffic: K7TF 4, K7BHR 5, K7BWQ 12, K7ASM 14, K7ARL 16, K7BFO 20, K7BMY 28, K7PQ 95, K7FF 139.

PACIFIC DIVISION

SAN FRANCISCO—SCM, C. Bane, W6WB. — Byron Goodman, W6CAL, Acting SCM. W6PQ continues his fine work. W6NK sends a nice report. W6CIS is going FB on Trunk Line "B." Quoting Martin, W6AYC: "Thanks to all who participated in the 56-mc. EXPEDITION, October 8th. The 48-mile record of the Bloomfield Radio Club was broken by a 71-mile duplex QSO between Mt. Tamalpais, near San Francisco, and Mt. Hamilton, near San Jose. Those responsible for the success of the venture were W6PW, W6MV-GMV, W6WB, W6VM, W6CAL-QV, W6DW-CLW, W6SG, W6FPU-GDQ, W6WC, W6AKU-AWM, W6DK, W6DZZ, and W6ZF-AYC-ARD." W6AZK has c.c. rig going. W6BVL heard Portugal on 7 mc. W6EYY moved to 3.5 mc. Twenty-three countries have been worked by W6WU. W6CAL is now WAC. W6ARG reports two new stations at Eureka, W6CWR and W6FYH. W6ERS found time to handle a few. Africa is duck soup for ol' W6DZZ. W6BTT sends a description of his station. W6IU promises traffic. With the deepest regret, a silent key is reported at W6BTO. With the passing of Frank Joseph we lose one of our keenest amateurs.

Traffic: W6PQ 1258, W6NK 100, W6CIS 71, W6AZK 32, W6BVL 17, W6EYY 16, W6WU 14, W6CAL 10, W6ARG 9, W6ERS 6, W6DZZ 2, W6AYC 1.

SANTA CLARA VALLEY—SCM, Bruce Stone, W6AMM — Traffic some lower this month. Send more reports, please. W6HM and W6AMM have trans-Pacific totals. W6DBB is bed-ridden, but on the air. W6DSZ had 32 straight QSOs with T15FI without a miss. W6FBW is doing FB as RM. W6YG and W6YL are back on. W6BNF is crying for traffic. W6BMW cracked his best crystal. W6FMT (YL) raises her traffic report every month. W6CEO has daily schedule with KA1CO. W6ALW has a new crystal job. W6ASC worked up totals at W6YG and W6DSZ.

Traffic: W6AMM 218, W6HM 134, W6DBB 101, W6DSZ 91, W6YG 69, W6FBW 56, W6BNF 50, W6BMW 32, W6FMT 23, W6CEO 23, W6DHV 14, W6YL 12, W6ALW 8, W6CDX 9, W6DSE 2.

PHILIPPINES—Acting SCM, Newton E. Thompson, KA1XA — The P. I. Section will have three c.c. stations on air by November, KA1WR, KA1XA and KA1LY. KA1NA is returning from China.

Traffic: KA1HR 981, KA1LG 183, KA1CO 94, KA1TS 72, KA1JR 62, KA1HW 60, KA1WX 34, KA1PB 19, KA1NF 16, KA1PS 16, KA1XA 14, KA1MG 14, KA1CM 10.

HAWAII—SCM, C. D. Slaten, K6COG — The call K6EM is being returned to K6CIB as a portable. K6EWQ has been appointed RM for Hawaii. K6EIQ and K6AIU are organizing an inter-island traffic net. K6CCO and a few new calls are bringing the island of Kauai into prominence. K6ENE returned to Honolulu. K6FZO is a new call in Pearl Harbor. K6CRT is a new ORS. K6BOE has a badly injured finger. K6COG was married in August.

Traffic: K6EBR 514, K6AIU 76, K6EDH 7, K6ACW 4.

SAN DIEGO—SCM, H. A. Ambler, W6EOP — W6FWJ leads the Section. W6DQN is a new reporter. W6GNT sends in a nice report. W6CTP is awaiting more contests. W6AXV is out to sea. W6CNQ has Utah schedule. W6BAM reports successful walnut harvest. W6FQU is looking for schedules. W6EPF changed QRA. W6AYK has new MOPA. W6AXN worked VS, VK and J. W6QA is back on the air. Notice to all ORS in San Diego Section: All ORS not handling traffic will be asked to turn in their ORS tickets.

Traffic: W6FWJ 94, W6DQN 43, W6GNT 11, W6EOP 10, W6CTP 3, W6QA 8, W6AXV 5, W6AXN 4, W6CNQ 3, W6BAM 2, W6FQU 1.

ARIZONA—SCM, Ernest Mendoza, W6BJF—W6CDU is installing c.c. on PP '04A TPTG. W6CEC will have

crystals for all bands. W6FZQ has junked his MOPA. W6BLP cracked his crystal. W6BRI excels in cooking! W6ABY is a new station in Tucson. W6CVW worked five continents. W6CQF also worked a PK1. W6FGG and W6AGL have new c.c. rigs. W6COI expects to attend a Gulf radio-technical school this winter. W6CKF works a big string of DX. W6CAP is putting up 50-foot pipe "sticks." W6CVR is thinking of going QRO. W6FAI is doing fine work. W6FOH is active on 1.75 mc. W6EFC has new "Radiotelephone First." W6CTI is getting the itch for a ham key again. W6BJF has 211 perking FB. W6GJC is working a gold claim near Prescott. W6DIE is experimenting. W6SCHZ was in Phoenix enroute to California. W9DLS-W9ZZAF, of Des Moines, Iowa, spent a week in Phoenix. W6BUQ, former second op at W8CZC, attends Tempe Teachers College. W6DUQ is one of the "Profs" at Tempe Normal. W6FLG was promoted from Corporal to Sergeant in the Tempe Guard. W6CLL keys in the doubler. W6FAI and his wife were guests of W6CDU and W6BRL. W6DKF made a trip to California. W6DOW has a new super het. W6BVN is "tolling her own" '45 PP TNT for use on 7000 kc. W6GFK works every corner of the U.S.A. W6DPS may get an all-district portable. W6DSQ is QRL playing bridge. W6BYD loaned his receiver to W6GFK. W6AEK uses a 50-watt modulator. W6BM does consistent work. W6GGG is heard on 7 mc. (can this be Mrs. W6EL?)

Traffic: W6CDU 477, W6CEC 293, W6FZQ 71, W6BLP 29, W6BRI 23, W6ABY 13, W6CQF 11, W6CVW 12, W6COI 7, W6DOW 12, W6CKF 15.

NEVADA—SCM, Keston L. Ramsey, W6EAD—W6UO is high man. W6AJP is busy with trunk lines. W6FUO is increasing power. W6YAR is on 'phone. W6FAIS joined the A.R.R.L. W6EAD is building 56-mc. equipment. W6BTJ is moving.

Traffic: W6UO 72, W6AJP 55, W6EAD 8.

EAST BAY—SCM, S. C. Houston, W6ZM — CRM J. H. MacLafferty, Jr., W6RJ. Alameda County: W6AQ rolled up a big total at the California Flower Festival in San Leandro. The station was installed and operated by W6ZM with the FB assistance of W6BMF, W6CQS, W6DGI, W6AIS, W6EGM and W6BQK. W6GMX has been appointed Official Observer. W6RJ has been busy as RM. W6CDA-WLV-3 has been QRL. A.A.R.S. W6FLP says W6CTL is a new ham in Berkeley. W6CSV and W6DKJ are keeping Albany on the map. W6GHG, W6CQS, and W6ANK are new reporters. W6DBP worked ZL and J. W6FQE is on 1.75-mc. 'phone. W6DUB is now c.c. W6CIZ is QRL repairing BCL sets. W6ATR, W6EKB, W6AAT and W6ABA are active on 56 mc. W6HIS has been ill. W6UX (W6BJJ) changed QTH. W6EGZ has joined the Coast Guard on the U.S.C.G. *Shoshone*. W6EDR has been working from Grizzley Peak. W6BQB reported. W6BKM is rebuilding. ExW7KG is now W6AII. Contra Costa County: W6CTX schedules K6BJJ. W6EJA and W6BIG are on 1.75-mc. 'phone. W6AAT has been working day and night. Solano County: W6BPC moved to new QRH. Napa County: RM John Clausen, Jr., W6AUT. W6AUT was on his vacation up in the hills. W6FII is going to put some filter. W6BYS is going to shelf the 1-KW bottle. W6APB and W6GPT are new hams. W6CAN is a new ORS. W6CZN needs a good receiver. W6EVD changed his rig to Rack and Panel. Lake County: W6CVG is on 1.75-mc. 'phone. W6CBF is planning to hold code practice on 1.75-mc. 'phone.

Traffic: W6AQ 1254, W6GMX 810, W6RJ 735, W6CDA 625, W6CTX 121, W6FII 50, W6FLP 43, W6CSV 85, W6EGH 34, W6ANK 28, W6DBP 25, W6FQE 24, W6DUB 17, W6DKJ 16, W6ZM 14, W6CAN 12, W6CIZ 12, W6ATR 13, W6HIS 15, W6CQS 9, W6UX 7, W6EGZ 5, W6EJA 3, W6EDR 2, W6BQB 1.

SAN JOAQUIN VALLEY—SCM, E. J. Beall, W6BVB — Well, gang, this is the last report that I, as SCM, will make to QST. Remember, the 16th of the month is "QST" report day." W6SF came through with his usual good report. W6CGM did good work in contacts with the Tehachapi Cloudburst disaster party. W6AME is

moving again. W6AGV has '81s. W6DQV is active in U.S.N.R. W6EPQ claims four continents in 45 minutes. W6BUZ knocked 'em over at the U.S.N.R. meet in San Jose with the SCM'S pet gun. W6FFU, W6AME, W6EKH, W6AHO, W6FFP and others also did some fancy shooting. W6FBQ uses 211E in final stage. W6FYM reported for first time. W6BIP sent in a long report. W6ASV is R-8 in Japan and Australia. W6BIL has portable W6ZZAK. W6EUQ operates Police Station. W6YBK is Tulare High School call. W6GFR and ex8AB passed op exams. W6CRC is building 1-KW job. W6CCW would, even take to tap-dancing for a blonde. W6FZA, the youngster of this Section, is NINE years old. W6EML lost his mother recently. Sorry, OM. W9DOQ is settling in Visalia using call W6ZZ. W6GDN worked WIAMP for his first DX. W6EFS lost his 60-foot mast in a wind storm. W6BIP worked PK6ER for his 41st country. W6FFP busted up his bus going to the U.S.N.R. rifle shoot. W6CVA is on 7 mc. W6AOZ, W6BFH, and W6GJO joined U.S.N.R. W6EXH'S wife recently passed her exam. W6DZN is putting up a good battle for SCM. Stockton Amateur Radio Club now has 29 out of 30 stations crystal control. W6AOZ copied President Hoover's message to all Y.M.C.A.'s direct from W1MK on 3.5 mc. So long, gang, 73 — Beall.

Traffic: W6AME 41, W6AGV 21, W6DQV 29, W6EPQ 43, W6BUZ 41, W6FFU 31, W6FBQ 3, W6FYM 8, W6ASV 5, W6EUQ 14, W6BIP 16, W6DQR 4, W6ENA 10, W6GEG 71, W6CGM 27, W6SF 51, W6BVY 70, W6CVA 2, W6EXH 80, W6DZN 63, W6AOZ 32, W6BFH 12.

LOS ANGELES — SCM, Hal E. Nahmens, W6HT — 166 stations report traffic, a gain of 3 over last month. 190 individual reports received! Send in YOUR report the 16th. Help us to make our goal of 200 reports and receive YOUR copy of THE DOPE SHEET. Los Angeles County: Five stations make the BPL: W6DKQ, W6EBK, W6DTN, W6BPU and W6EGJ. W6DKQ, located at the Los Angeles County Fair in Pomona, leads the entire Section. W6EBK did his share of the work. W6DTN ran up a nice total. Our RM, W6BPU, has installed pair of '52s. W6ERC handled bunch of Fair traffic. W6EKZ is QRL UCLA. W6EGJ has schedule with W6PQ. W6EOG is on 14 mc. W6BZX will report regularly. W6EDW received letter in answer to message sent through W6USA. W6EK is in line for ORS. W6CVF is installing super. W6DBC is helping out on the unemployment relief net. W6CVZ works schedules with KA1HR and AC8NA. W6DWP is signing off indefinitely. W6AKD has been QRM'd by sickness. W6FGT is keying his crystal. W6DH rebuilt antenna. W6DEP took his portable, W6ZZCE, on his vacation. W6FMK worked ZT, ZS, VS, AC and KA. W6EGH WAC seventeen times during October. W6FEX persuaded W6EUP to report. W6CZZ has 700 watts on his '04A. W6AKW reports excellent work done by army amateurs during Tehachapi flood. W6DVV moved to Covina. W6CSC is minus filter. W6EUP has some FB east coast schedules. W6FSE helped relay Fair traffic. W6AAN handled traffic from the Dallas Fair. W6EV reports KA1JR back on air. W6TE worked all ZL districts twice in one morning. W6BSW, W6BOB, is on 56 mc. with W6AUB, W6FLY, W6BWG and W6YBB. W6DQZ hears plenty of DX. W6ANN is ORS. W6BLS shielded his oscillator. W6COF expects to be on soon with 100% perfect station. W6AFU has rectifier trouble. W6BVZ received report on his 3.5-mc. signals from VK. Two separate antennas are especially coupled and used simultaneously on transmitter at W6AM. W6BSV worked all districts on 3.5 mc. W6DKM reports for W6BQU. W6FKF is putting out football reports on his new 56-mc. portable, W6ZZBK. W6ETJ is QRL Junior College. W6FWN took message from K6EWQ for Los Angeles and had answer back in five minutes. What's this we hear about a blonde YL, W6FVV? W6FVN is having trouble with c.c. rig. W6VXW has now worked 45 countries. W6HT changed antenna. W6ETL is revamping. W6BGF is QRL school. W6CEM blew '47 buffer. W6DJC is getting to be a traffic hound. W6EUV is QRL at U.S.C. Law School.

If you want to see a man-size QSL card, QSO W6DZR. W6DIP had 126 contacts with 19 countries in 6 continents during September. W6AHP installed pair of '45s. W6EII has 1-KW input. W6ACL is back on air. W6BCT is using four '10s. W6BIF is handling foreign traffic. J1EE reports death of J1DM through W6EAK. W6DEL has new shack. W6EYJ put 1100 volts on his '101 New transmitting antenna at W6LN. W6BME took traffic from fishing boat 500 miles off Mexican Coast during filming of "Tiger Shark." W6CGP is shoving 100 watts into the antenna. W6BVC's '61 is smacking out FB. W6CLY reports for W6GFG. W6DTX has new super. W6WO has flock of DX postage stamps and would like to swap with other ham stamp collectors. W6FFV can't get out of the back yard on 3.5 mc. W6EXQ is QRL school. W6BER junked his c.c. rig. W6AIF handled traffic from bed while laid up. 800 watts input on final at W6AEO. W6DSP has new c.c. rig. W6GOO is new ham in Glendale. W6BZR is now located in Burbank. W6BMN is doing lots of work on 56 mc. W6EVL is using a '52 in TPTG. W6GNZ is a new station in L.A. W6CTZ is wife of W6ETX. A new station in Santa Monica is W6HAM. Both W6CHY and W6GEF (YL) moved to L.A. W6BHA left Santa Monica for parts unknown. W6VB grinds crystals. W6GOJ won the Leeds 56-mc. transmitter at the Convention. W6DNA is experimenting with receivers. "No money, less YLs, more traffic," says W6PD. W6CUH worked ZS, ZT, ZU, CR twelve times in seven days. W6BHP is using an electron coupled oscillator. W6ZZA is sporting a set of new 4800-ohm super-sensitive 'phones. W6RW made a special three-phase rectobulb with three arms for W6MA. W6FXR installed couple of '10s. W6FYA is putting out a healthy wallop. W6FJT won crystal at Glendale Radio Club. W6GEU is QRL working and going to school. Both W6FMI and W6FMH are QRL at L.A. J.C. W6DZK installed 212-D in final. W6EMJ is lining up a regular KA schedule. W6DZI is building his brother-in-law a boat. W6CCF, W6ERL and W6AGF are QRL account of change of address. W6VO acquired an SW3. W6LY is experimenting on 56 mc. with W6BMN and W6BXR. W6DTT, W6EAN, and W6AUB are new hams in Pasadena. W6CLX applied for ORS. W6HG is working at KELW. W6DPB has started an MOPA. W6BZZ is now WAC. W6KT has novel machine that records dots and dashes on tape. New reporters this month are W6BSV, W6GJA, W6FJ, W6EAK, W6GFG, W6FLC, W6BZX, W6FMK, W6EUP, W6FSE, W6GHE, W6DGU, W6ETX, W6BIF and W6VB. San Bernardino County: W6FYT leads the county and makes BPL. W6EAR is a new reporter from Highlands. W6CVV built a 56-mc. rig. W6BMC has returned to his home at Bard. W6DZC installed transmitter on relay rack. W6BIK is not using MOPA. W6FNG has new c.c. rig. W6FEC had auto wreck QRM. W6FTH is bored with DX. W6ERM received his WAC. W6FTV is building a new shack. W6BFW is new ham in Redlands. Santa Barbara County: W6BZF leads this county. W6FNK is trying to get bugs out of his '52 rig. W6CTD enjoys the *Dope Sheet*. W6EZK changed QTH. W6EDZ has resumed schedule with Oakland. W6EMY is now an ORS. W6LC reports W6EQS new ham in Santa Barbara. W6FFC is awaiting return of license. W6EDZ, W6BFM, W6DJS, W6GDU and W6GIE make good reports. W6AKC is building outboard motor boat. W6AWY worked three Africans. W6CTD, W6FYF and W6EZK went to Oakland and drove new Chevroleets down for the local dealer. We hear rumors about W6EOF and a YL taking the fatal step (?). Riverside County: W6NF leads the county and makes BPL on deliveries. W6CFN is busy at L.A. Naval Reserve Armory and NDV. W6DZF makes nice report. W6EFY is experimenting. W6DLV took traffic from Guam for U.S.A. Ventura County: The Ventura Short Wave Club has been organized in Ventura. Meetings are held every Friday night. President, W6CEV; Vice-President, W6FEF; Secretary-Treasurer, Ralph Weigle; Activities Manager, W6DTY. W6BRE and W6DTY are new hams in Ventura, and W6FAP new in Ojai. San Luis Obispo County: W6PNP has built trans-

mitter into panel job. W6CJJ is back on air. Mono and Inyo Counties: W6FVD has some excellent schedules. See you all at the Hamfest in Pasadena, December 3rd. Write W6ON for details. 73.

Traffic: W6DKQ 2356, W6EBK 624, W6FYT 587, W6DTN 422, W6BPU 340, W6AFO 220, W6EAR 221, W6NFB 200, W6BZF 172, W6ERC 154, W6CVV 138, W6EKZ 134, W6EGJ 123, W6EOG 117, W6BZX 114, W6EDW 104, W6EK 101, W6CVF 96, W6DBC 95, W6FNK 94, W6CVZ 92, W6DWP 88, W6AKD 85, W6FGT 85, W6DH 82, W6BMC 79, W6DEP 74, W6FMK 68, W6EGH 66, W6FEX 58, W6CZZ 53, W6AKW 52, W6DVV 50, W6EQW 49, W6CTD 46, W6CSC 44, W6CZT 41, W6EUP 38, W6FSE 38, W6BVD 37, W6AAN 37, W6PNF 36, W6EV 34, W6TTE 34, W6DZC 33, W6ADP 33, W6BOB 33, W6DQZ 31, W6CWE 31, W6BLS-W6COP-W6AFU 30, W6BVZ-W6EZX-W6ALD 29, W6GJA-W6AM-W6BSV 27, W6FET-W6BLK 26, W6BQU-W6FVD-W6DKM 25, W6FKF 24, W6FNG-W6ETJ-W6FVN-W6CXW 22, W6EDZ-W6HT 21, W6ETL 20, W6CNO-W6DZF-W6BGF-W6CEM 18, W6EJF-W6DJC-W6BGN 17, W6EUV-W6BFM-W6LM 16, W6FGH 15, W6DZR-W6DIO-W6AHP-W6EII 14, W6EFC-W6ACL 13, W6BVI-W6FZ-W6YBB-W6BCT 12, W6BIF-W6DLV-W6EAK-W6EHZ-W6DJS-W6DEL-W6CUU-W6EYJ 11, W6DLN-W6BME-W6CGP-W6DUY-W6BVC 10, W6CLY-W6BFL 9, W6DTX-W6GDU-W6EFD-W6FLC-W6WU-W6BEE 8, W6EYF-W6FTH-W6ERM-W6DLI 7, W6FPV-W6EMY-W6EYZ-W6EXQ-W6ON-W6BER 6, W6AIF-W6GIE-W6AEO-W6ESA-W6EYK-W6DSP-W6EVL 5, W6GNZ-W6DGU-W6BYF-W6FTV-W6GOJ 4, W6DNA-W6VB-W6VH-W6TN-W6DTY-W6CUH-W6BHP-W6PD 3, W6ZZA-W6MA-W6FXR-W6FUW-W6FYA-W6CEU-W6FEW-W6FJT-W6FAV-W6CNH-W6CTZ-W6DUC-W6GAL 2, W6BMI-W6FMH-W6LC-W6BFW-W6BYU-W6FMP-W6DZK-W6EMJ-W6ETX-W6GEU 1.

SACRAMENTO VALLEY—W6APJ has left for Shreveport, La. W6GGD is a newcomer. W6FKM has 3.9-mc. 'phone. W6GBB is ready for DX. W6GBA has 45s P.P. W6FRP has 1.75-mc. portable. W6BHM wants ORS. W6AK is active. W6DVE keeps good schedules. Traffic. W6APJ 140.

ROANOKE DIVISION

WEST VIRGINIA—SCM, C. S. Hoffmann, Jr., W8ED—W8ELJ installed a station at the Fair in Logan. W8CDE had the Bluefield Amateur Club as guests. W8EIK is doing FB traffic handling. W8OK and W8HD QRL A.A.R.S. Storm brought down W8EL's antenna. W8BHG is building new rig. W8ELO is c.c. on 3598 kc. W8BKG made trip through Virginia. W8BOW makes BPL by delivering 1061! W8CDV delivered some interesting talks before the Ohio Valley Amateur Radio Club. W8DPO worked PAØFE. W8GB says business rushing. W8GAL breaks his traffic record. W8AAI is on 1.75-mc. 'phone. W8CVX has a flock of schedules east. W8DSO and W8BDP are on 3.5-mc. 'phone. W8GBF is installing high power. Both ops at W8TI got their amateur extra first licenses. W8FKR is a new traffic station. W8FQB and W8HSA QRL school work. W8JM wants schedule with Parkersburg. W8IB got R8 from Africa, Australia and Europe. New stations: Wheeling: W8CYV, W8ZZCO and W8ZZCT; Northfork: W8EUK. We are all very sorry to see W8BZ leave us after over 15 years of such FB work as our Director. W8EIK is making preliminary arrangements for the Roanoke Division Convention to be held sometime next spring, possibly during April.

Traffic: W8GBF 274, W8GB 211, W8BOW 203, W8EIK 125, W8CVX 72, W8ELJ 68, W8EL 53, W8BWK 51, W8GAL 45, W8OK 43, W8JM 30, W8HD 30, W8IB 26, W8DPO 18, W8FKR 12, W8EHA 10, W8HSA 9, W8FQB 5, W8CDV 5, W8BKG 3, W8TI 3, W8DCE 3.

VIRGINIA—SCM, R. N. Eubank, W3AAJ—W3EJ leads off with a bang. W3NB knocks 'em out. W3FJ maintains high total. W3CKM is active. W3GE, W3BUO and W3BJX are rebuilding. W3CAH has new Zepp. W3AAJ is on daily, 12 to 3 p.m., 3650-kc. c.c. W3APT is after

traffic and DX. W3BSM QSOs lots DX. W3BNH is shielding his c.c. rig. W3AKN sure gets out. W8IQ, W3AJA and W3AHW have electron-coupled oscillators. W3BUY worked 2 ZLs. W3CNY wants '45s. W3ACN is building 150-watt outfit. W3BTM sends nice report. W3AHC is coming to 3500 kc. W3AIJ visited SCM. W3BBA handled 3 DX messages. W3AVR uses slate for copying. W3CKM wants schedules. W3AHQ has new c.c. rig on 3527 kc. W3AAF increased power. W3GY is 'phone OBS. W3CFL is planning big winter. W3BRY is working schedules. W3CBQ and W3BYA are new ORS. W3ZU uses inside antenna. W3AZU has new Zepp. W3CLD reports regularly. W3AOT broke arm with car. W3FE is adding new '47 Amp. W3BZE is on 7 mc. W3BSE is QRL college. W3AJK's QRA is now Ashland. W3BAN is doing FB OO work. W3BZ is chatting lots. W3WO is looking for job. W3AZI is awaiting change of address. W3BFQ has portable W3ZZBL. W3WVM reports by radio. W3CMJ started a new club. W3CEY wants Va. schedules. W3BUR is QRL WRBX. W3BAI is building rack and panel job. W3AKZ improved filter. W3CLH and W3AUG are building c.c. rigs. W3ZA sends OBS at 10:30 a.m., Sundays, and 12 midnight, Saturdays. W3NT is handling 7-mc. operation. W3COJ hopes to handle traffic soon. W3BWA is moving. W3ALF has station ready for license. W3BIW reports club FB. W3BPI is building 3.5-mc. PP '10s. W3AVR asks temporary cancellation of ORS. W3COO can copy plenty. W3APF has new 132-foot Zepp. Following clubs active: Richmond, Danville, Lynchburg, Roanoke, Staunton, Petersburg, Charlottesville. Others, please write.

Traffic: W3EJ 899, W3NB 373, W3FJ 322, W3CXM 273, W3BJX 110, W3GHE 110, W3CLH 98, W3CEY 78, W3CAH 71, W3AAJ 69, W3APT 62, W3BNH 41, W3AKN 34, W3CMJ 30, W3BUY 28, W3CNY 28, W3ACN 25, W3AKZ 23, W3BTM 21, W3AEI 12, W3COO 12, W3WM 9, W3BAD 11, W3AIJ 11, W3AHC 9, W3APF 11, W3AJA 9, W3BAI 8, W3BBA 7, W3AVR 7, W3CKM 6, W3AHQ 6, W3AAF 6, W3BGX 6, W3GY 5, W3BUR 5, W3CFL 4, W3BRY 4, W3BYA 3, W3CPN 3, W3ZU 2, W3AZU 2, W3BRA 2, W3CLD 2, W3BSM 2, W3BIW 1, W3BXN 1, W3ZA 1.

NORTH CAROLINA—SCM, H. L. Caviness, W4DW—RM, G. H. Wright, W4AVT. W4PEG was operated at the State Fair by amateurs of Raleigh. W4PCP was operated at the Winston-Salem Fair by the Radio Club there. W4JR and W4ZH deserve credit for keeping traffic moving. W4NC, W4PCP, W4ZH, and W4JR make the BPL. The State College Radio Club has been reorganized with W4AKC President, W4AXX Vice-President, and W4BOH Secretary-Treasurer. The transmitter, W4ATC, is on 7202 kc. At the State Fair ground during the Fair, WPTF operated an experimental transmitter on 69,000 kc. with the call W4XD. The signals were picked up on a short-wave receiver, transmitted by land line to their studio, and rebroadcast on 680 kc. The Winston-Salem Club has been assigned the call W4NC. W4BJZ and W4OG are moving to 3.5 mc. W4ZN returned from his trip north. W4BIU is on with new c.c. rig. W4VN-W3BKA is back on 3625 kc. W4ATS is working DZ. W4BJU worked all W districts on 1.75-mc. 'phone. W4AEH worked Austria. W4NP plans 3.5-mc. 'phone. W4MR has worked a total of 38 countries in five continents. W4AGD has completed c.c. transmitter. W4AVT's rig has gone haywire. W4BCG is rebuilding. W4EG reports DX better on 7 mc. W4AWP finished school at Port Arthur, Texas. W4BDU put in crystal. W4ABW dismantled his outfit. W4TR is putting in condenser microphone. W4AOE is going full speed. W4RE reports progress on U.S.N.R. unit. W4AMC is trying to get some eastern N.C. hams on 3.5 mc. North Carolina jumps ahead this month—let's keep at the traffic, fellows.

Traffic: W4NC 1303, W4ZH 648, W4PCP 549, W4JR 501, W4VN 260, W4PEG 209, W4DW 125, W4TR 82, W4EG 76, W4AVT 72, W4AMC 34, W4TO 30, W4ANU 27, W4NP 27, W4AOE 25, W4ATS 24, W4AEH 17, W4BCG 17, W4AGD 14, W4MR 14, W4AOA 12, W4AGX 10, W4OG 6, W4AGF 3, W4BIU 2, W4BHR 1.

ROCKY MOUNTAIN DIVISION

UTAH-WYOMING — SCM, C. R. Miller, W6DPJ — Utah: W6BTX reports more U.S.N.R. activity in S.L.C. W6EXL is active A.A.R.S. W6BSE keeps his '45s oscillating. QRM from new 50-KW KSL transmitter is bad at W6AVW. Not much activity at W6DGR. Miss Ada L. Chamberlin, W6GCJ, is honorary member of the U.A.R.C. What happened to the big traffic total W6DAM was going to have? W6DEM says W6DFY is on the air. W6FRN tried MOPA. W6AHD will represent A.A.R.S. in Southern Utah. W6FAE's MOPA sounds FB. W6EYS went deer hunting. W6DPJ keeps several traffic schedules. W6FEB has perpetual power leak. Two transmitters at W6APM. W6AFN is on the air. Wyoming: W7ARK is a new station at Big Horn. W7ADF hears lots of DX. W7AMU joined A.A.R.S. W7NY is back on. W7BXS, W7ACQ, W7CJR, are hunting DX. W7AWK and W7AXX are new stations in Casper.

Traffic: W6DPJ 752, W6DEU 40, W6BSE 30, W6BTX 28, W7AMU 20, W6EXL 15, W6EYS 11, W7CJR 8, W6APM 8, W6DPO 8, W6FAE 5, W6DEM 5, W6DAM 4, W7ACQ 4, W6AFN 2.

COLORADO — Acting SCM, Artie Davis, W9BJN — W9ESA is on the air again. W9JNV tops the list. At the Pike's Peak Amateur Radio Association W9JNV's motion passed to charge each ham 10 cents for not reporting to the SCM. W9DNP is handling lots of traffic. The following passed unlimited 'phone exams: W9DHI, W9DNP, W9EPN, W9EYN and W9JNV. W9GCM is getting out well. W9EHC will be on with c.c. W9EPN blew power transformer. W9DYP tied up to a better half. W9EYN is getting his portable rig fixed to operate from top of Pike's Peak, New Year's night; his call will be W9EOP. W9CDE says pancake coils are better than helix. W9FPZ holds a broadcast ticket. W9CWA wants schedules with Denver. W9GNK has new 350-watt c.c. outfit. W9JCQ has a.c. receiver. W9HDI and W9EPN are rebuilding. W9EHC has a volume level indicator for his Ford. W9GLG visited Denver hams. W9CKO reports for the Loveland gang. W9KKY is a new ham. W9JFD keeps rebuilding. W9JFD is buying parts for new rig. W9CKO moved. W9BJN worked K8AJA. The Gateway Radio Club is a new club. The Loveland hams were visited by W9BSP and W9IC. W9CRK is getting steamed up again. Two portable calls, W9HZZ and W9KBO; first belongs to W9CKO — second to W9JFD. The Greeley Amateurs and the Loveland gang held a Hamfest, and the following Denver gang went: W9AAB, W9CJJ, W9BTO, W9FYF, W9BCW, W9AUJ, W9FUQ, W9BYK. W9FRP pushes out a real 'phone signal. W9HOO is station at North Denver High School. W9AQN is using a '52 final. W9CND has a pair of '52s. W9CND and W9APR are on some. W9LJU is kicking out OK. W9IAV is on 7 mc. W9HPY will soon be on. W9FCK has portable W9KJF. W9ZKG, exW9ENM, will have his high power rig on soon. W9EKQ is active A.A.R.S. W9EPC has moved his outfit. W9BCW gave a talk on U.S.N.R. at Greeley. James A. (Pop) Fernald, Treasurer of Colorado Radio Experimenters Association, built a real 56-mc. Super. W9QL will soon be c.c. W9CSR is QRL college. W9EQO is busy at Phone Co. W9DOE moved to California. W9CVE finds time for a good traffic total. W9BXQ and W9APR keep Police Radio KGPX on the air. W9CWK is pounding out. W9KIN's rig was built by W9AAB. W9FUQ blew a filament transformer. W9EAM has been on a rest. W9GBQ is QRL Grange meetings. W9GUW is QRL work. W9HFZ will be going soon. W9HJS ops at Colorado National Guard station. W9JB is QRL Radio Store. W9RJ is QRL servicing radios. A Hamfest was held in Grand Junction, at W9RX; also one at W9DQD. W9APZ has flea power on 1.75 mc. W9AUJ is ready to go on again.

Traffic: W9JNV 416, W9EHC 16, W9GNK 20, W9CWA 4, W9FPZ 2, W9CDE 3, W9DNP 92, W9GCM 2, W9GLG 1, W9BRZ 1, W9EJW 20, W9BJN 27, W9ZZH 24, W9FYF 6, W9EKQ 4, W9EPC 5, W9IFD 6, W9CDE 3, W9DQD 5, W9ESA 48, W9CVE 117.

SOUTHEASTERN DIVISION

WESTERN FLORIDA — SCM, Eddie Collins, W4MS-W4ZZP — Route Manager, S. M. Douglas, W4ACB-W4PCN, W4ACB and W4QR have been working on 56 mc. W4AUV is getting out FB. W4ASG is taking the exam to enter West Point. W4BKD and W4BOW are QRL school. W4AUW is planning a new transmitter. We are sorry to hear that W4AUA lost his father. W4BCB can't QSO other West Fla. stations. W4BPI had battery trouble. W4BPG moved to Georgia. W4AFT is still getting the DX. W4ML keeps the mike hot. W4AGS hears a lot of DX. W4KB handles traffic on 'phone and CW. W4QU moved to W4HQ's. W4BMJ has worked all districts except "2" and "7" on 3500 kc. with spark coil plate supply. W4BIV, you had better get in touch with W4BMJ! W4UW-W5NO has been "sea going." W4ZZR reports via radio. W4BLW is hard at it. W4ABK is going to rebuild. W4AQA will be showing them soon. W4BJF knocks them out on 3500 kc. W4A00 says nil until this repression is over. W4AXP keeps three schedules. W4AQY works with a Public Address System. W4AGS' crystal oscillates on two freqs. You should hear Mrs. W4KB's 7080-ke. crystal note! Mrs. W4MS received a heard card from JIFF. W4BGA is stepping out FB. W4BNE has moved to the West Coast. W4QK got a three-year operator's license. W4ASV-W4ZZW is studying hard at school. W4MX saved his call. W4ZZAO is our newest ham. W4ART-W4BGB is on 3500 kc. W4BKQ is still off. The W.U. office QRMs W4BEW. W4SZ received commission in the U.S.N.R. W4ALJ-W4CV-W4ZZAE renewed his operator's license. W4HQ-W4PBW has turned his equipment over to W4QU. W4AUW is getting out our bulletin, the "XMTR." W4VR is QRL. W4MS led the fourth district in the ORS QSO Party. W4ZZP is being operated on 56 mc.

Traffic: W4AGS 89, W4MS 76, W4KB 62, W4ZZR 27, W4AQY 20, W4AXP 13, W4BGA 12, W4ASV 5.

EASTERN FLORIDA — SCM, Ray Atkinson, W4NN — W4AWO, W4GS and W4NN make the "100 Total Club" this month. W4ANY is new terminal station for Trunk Line "J." Trunk Line "C" includes W4NN, W4AWO and W4BMN. W4BMN is our newest ORS. W4AKH is ahead in the S.R.C. DX Contest. W4DE and W4UX are in the same contest. W4BHW and W4BGR are in the traffic swim. W4AZB is a very busy station. W4BGG has become a "peachy" traffic man. W4MP, W4KW, W4BKX, W4PAB and W4BIF are doing a big share of the traffic work in North Florida. W4HY has a new receiver. W4TK reports not much time for operating. W4BIE, exW4ADP, is back with us. W4AMV is new ham in Tampa. W4AI is now operating aboard ship. W4VP has never missed a report. W4GR is off the air. W4BDM and W4ASR handle traffic. W4BQD is building 1.75-mc. 'phone. W4BNR is scheduling ZX5. W4GS is active in FNG and A.R.R.S. work. W4ZU kept schedules with ZX5. W4BJS and W4ZV are QRL football. W4OT is recovering from an auto accident. W4BKN is not very active. W4AKJ makes a bid for a spot on the Seminole Chain. W4WS is heard on 'phone as are W4DU, W4PK, W4MF, W4BL and W4ACZ. W4UJ has a new power supply. W4MS, Eddie Collins, SCM West Fla. says, "Why not have a 5-meter short hop net to West Fla.?" All 56 mc. men get in touch with him at once. All those interested in joining the Seminole Traffic Chain communicate with W4AWO or W4NN at once.

Traffic: W4AWO 207, W4NN 124, W4GS 113, W4BIE 88, W4BGG 52, W4AGB 36, W4VP 34, W4BMN 26, W4BHW 22, W4ZU 21, W4BNR 21, W4UX 20, W4AI 18, W4AKH 15, W4MF 12, W4ANY 12, W4AKJ 10, W4DE 10, W4HY 10, W4UJ 9, W4BDM 8, W4BGR 8, W4MP 8, W4DU 7, W4WS 7, W4ACZ 6, W4PAB 5, W4BKX 3, W4TK 2, W4BIF 1, W4TK 1.

ALABAMA — SCM, L. D. Elwell, W4KP — W4GI handled 248 messages in ten days. W4BAI is QRL A.A.R.S. W4AYK is planning on a portable at U. of A. W4AWM gets FB reports from the west coast. We regret the loss of W4FI (op WAPI), who goes to Tennessee. We welcome

ExW4WS-SAC as his successor. W4ADL is the new OO. Ex-SCM W4AAQ is at WAPI. W4AJP has a schedule with T15FI. W4BFP, W4BBA, and some of the gang have a portable at the Paul Haynes High School, B'ham. W4APU promises renewed activity. W4BEP works K6. W4APJ is new A.A.R.S. W4AJY is back from Ga. Tech. W4DD blew two 10's and a 50-watter. W4BPY is new ham in B'ham. The club at B'ham was visited by Capt. Rooke of the Cocos Island Treasure Expedition. W4AP handled death message. W4ALA is an ORS. W4ZS moved from cellar to the attic. W4DS moved to new QRA. W4IA has been dismantled. W4AHU built six different transmitters in three days. W4BFA has an FB 'phone at the Hillman Hospital in B'ham. W4PAL lost a 70-foot lattice mast. W4RS and W4OH are heading the A.A.R.S. The SCM blew a '66. W4BEO has a large class at the "Y." W4VC says conditions rotten. W4PDX is the National Guard Station at Guntersville.

Traffic: W4AGI 248, W4BAI 57, W4ALA 23, W4DD 21, W4BFP 13, W4AJJ 12, W4DS 9, W4AP 7, W4AJY 5, W4BEP 5, W4APJ 4, W4AWM 4, W4APU 2.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES-PORTO RICO-VIRGIN ISLANDS - SCM, Chas. W. Davis, W4PM - W4SM is setting a fast pace. W4WZ gives him a run for his money. W4ABS has a new Collins 1000-watt rig. The SCM would like all ORS to report their exact operating frequencies. Look for W4PM on 3633; W4WZ, 3810, 7002; W4SM, 3625; W4MA, 3615; W4UT, 7265; W4SS, 3630; W4AAV, 3800. CM8AZ wants traffic for Jamaica, Haiti, Cuba. W4BW's new mast is ready to go up. W4AZT moved to Augusta. W4SS is radiating as much as possible. W4AAV says Augusta Club is growing. W4BBY visited Augusta in Vaudeville. W4ATZ wants schedules. W4BBR worked 18 countries in 4 continents. W4UT worked OA4AL and LU5FV. W4GY is now Lt. U.S.N.R. VC(S). W4AAR is on 3582 c.c. W4BGE tried to rub his crystal down on buffer amp. W4WC's 3.7-mc. 'phone was reported Q5 R6 in Berlin. The Atlanta Club met at the SCM's, October 20th. Let's all pull together for a better Section.

Traffic: W4WZ 151, W4PM 94, W4ABS 86, W4UT 50, W4AAV 39, CM8AZ 20, W4BEY 25, W4BLQ 22, W4MA 14, W4SS 8, W4BBR 7, W4SM 211, W4BW 6, W4BAB 3, W4ATZ 3, W4KU 2.

WEST GULF DIVISION

OKLAHOMA - SCM, Emil Gisel, W5VQ - W5KB heads the list. W5ALD comes in second. W5BPM says too much QRN. W5BDX will be on 3.5 mc. soon. The Muskogee Radio Club promises a first-class organization. W5MU is on 7 and 3.5 mc. W5ALI is installing Class B modulation. W5BOE reports traffic. W5OJ handled a transcon and return in 14 minutes. W5PP is thinking of '04As push-pull linear. W5BAR sends first report. W5BVR gets R8-9 from west coast. W5AYK is rebuilding receiver. W5COD is working on transmitter. W5CKT wants 7-mc. schedules. W5WR boasts two fifties. The Tulsa Amateur Radio Club operated W5KB at the Tulsa State Fair. W5CEZ is pushing out FB. W5AKX is installing '60s. W5AUA has new c.c. rig. W5AHD recently got married. W5CJZ has a new receiver. W5ATO is on 1.75 mc. W5ATJ is on 3.5-mc. CW. W5BMM is planning on 1.75-mc. 'phone. W5BIM is QRL school. W5AVK is on 7 mc. W5ALJ is very interested in Army Amateur work. W5VQ is on 7, 3.5 and 1.75 mc. W5AIS is changing to Class B. Many Oklahoma hams were present at the West Gulf Convention at Fort Worth. W5BQA is awaiting license renewal.

Traffic: W5KB 328, W5VQ 113, W5GV 20, W5ALD 65, W5OJ 46, W5BVR 48, W5CEZ 33, W5BOE 26, W5BPM 18, W5BDX 16, W5BKK 13, W5AKX 10, W5CJZ 9, W5AUA 4, W5AND 3.

NEW MEXICO - SCM, Jerry Quinn, W5AUW - Clovis: W5BVC and his OW say they are going to win first prize in our contest. W5BUY promises big things next month. Roswell: W5ZU is hunting for schedules. W5AIIH is located at the Institute. W5ZM is putting in 1.75-mc.

'phone. Albuquerque: W5AOP doesn't like his new location. W5CPO is on regularly. W5AOE is putting in Class B mod. W5ASR has YLitis. W5AUW changed QRA to 420 West Lead Ave., Albuquerque. Santa Fe: W5CJP worked HH7C. W5AIC is QRL work. W5CGJ is building a new mast. Las Cruces: W5BVJ is heard from again. W5AGP is on 3.9-mc. 'phone. W5BQE is in Cruces at school. Surprise . . . The SCM got married this month. Hi.

Traffic: W5AUW 213, W5ZZQ 16, W5BVC 21, W5ZM 12, W5BUY 2, W5ZU 1, W5AOD 504.

SOUTHERN TEXAS - SCM, D. H. Calk, W5BHO - San Antonio: W5AMW and W5CRI are brothers. W5MN and W5CMO are back on the key. W5YL and W5BQU send nice report. W5LJ is attending S.A. Jr. College. W5OW reports bad skip. W5BVG is troubled with power leaks. El Paso: W5AEC is QRL BC work. W5AFS sends 73 to gang. W5AUI is going strong. W5AOT is building a c.c. job. W5BWJ has c.c. '10. W5CAW is in Chicago with call W5ZZAL. W5DE is quite active. W5ES moved again. W5NT is an Official Observer. W5GI took his portable on a trip. W5CGD is rebuilding. Corpus Christi: W5CII and W5BZW attended Ft. Worth Convention. W5MS wants schedules. W5MX is building a 'phone. W5TO is building portable. W5FH, W5BBB and W5CLP are at college at Kingsville. W5BZU moved to Memphis, Tenn. W5ALV keeps Army schedules. W5ZN is QRL Western Union. W5QO and W5CMO operate at the Corpus Christi Club station. Brownsville: W5ATU is "Particeps Criminis" at W5CGO. W5BQI is burning out his house lamps with RF. W5PR is on now and then. We extend our heartfelt sympathy to W5CKS in his bereavement at the loss of his wife. W5CGO is A.A.R.S. W5BFS is building 50-watter. W5BHJ attended the Convention. W5PM is getting out nicely. W5CKF is a newcomer. W5ATW has his rig panel style. W5CNA wants traffic. W5CMY is a DX hound. W5CQH does nice work. W5AGG has YL troubles. San Benito: W5CQG is getting out. W5AEV-W5ZZI had his FB portable at the Ft. Worth Convention. Bay City: W5BZO is building MOPA. W5CHM is rebuilding. W5CNX is attending Rice Institute. W5ABH hounds DX. W5CQE moved to Bay City. Austin: W5VV plans schedules with Allison during latter's trip through Hawaii and Australia. W5BJL went to sea. W5BDA and W5ATQ are on 3.5 mc. W5KA and W5BXH hope to be on 3.9-mc. 'phone. W5AXY and W5BWQ took exam at the Convention. W5CT is victim of a call swiper. W5CEI is on 1.9-mc. 'phone. College Station: W5AQY is rebuilding 500-watt rig. Fort Clark: W5BLY-GJ burnt out power transformer. Port Arthur: W5BZU is building a bigger and better BUZ. W5BCF lacks power supply. W5CNI is new ham. W5BKF is an A.A.R.S. K6DVZ is now W5BRM. W5AZS is on regularly. W5CCT will be on with MOPA. Beaumont: W5CDM will be changed to W5APX. Huntsville: W5DS is back on. W5ABY is attending Texas University. Houston: W5ADZ is rebuilding for c.c. W5ANW has 'phone break-in working FB. W5AMX went to sea. W5ON is the daddy of radio in Houston. W5BTD is Net Control Station. A.A.R.S. W5BKW is back home. The police transmitter keeps W5OX busy. W5BRC is on 3.9-mc. 'phone. W5LP is attending Rice. W5CA is getting out well. W5BHO is rebuilding.

Traffic: W5OW 588, W5YL 24, W5MN 2, W5ADZ 2, W5ANW 5, W5AEV-ZZI 52, W5BZW 14, W5DS 2, W5APX 25, W5AQY 6, W5ON 8, W5MS 58, W5ABA 37, W5FH 15, W5BKF 5, W5CGO 12, W5CNA 1, W5CMY 1, W5AOT 22, W5BWJ 6, W5BQU 76, W5DE 9, W5ES 8, W5NT 182, W5GI 5, W5BLJ 48.

NORTHERN TEXAS - SCM, Roy Lee Taylor, W5RJ - Dallas State Fair Station W5FC leads in traffic. RM W5BII is second. W5AMK reports for the Cen-Tex Amateur Radio Club. W5AHZ is going on c.c. W5LM-W5CKP uses all bands. W5BEQ is interested in 1.75-mc. 'phone. W5RXV is stepping out. W5BCQ puts Taylor on the map. W5NW is active A.A.R.S. W5AVF is pounding brass on the Mississippi. W5RH has new receiver. Traffic reports received from W5CAV, W5ARS, W5AJG, W5CIJ, W5AHC, W5BEF, W5BGW, W5ALK, W5COJ, W5CLO,

W5IT and W5AVY. W5AID and W5CFM enjoyed the Convention. W5BCW reports Olney hams are planning a radio club. W5CPT and W5CPB have new Zepps. W5CHJ worked W9CHJ. Jack Dumas is new operator at W5SU, making total of four. W5ANU has portable W5AJI. W5DO found a stopper for the hole in the 250-watter. W5CJG suffers from YLitis. W5BEY visited W5AXK. W5BWT from New Mexico is in Afton now. W5JM answered the call for reports made by the SCM at the Convention. FB! W5BNF-W5CLO sends the Texon news. W5AFQ has new "side control" receiver. W5CU has his c.c. rig on 14 mc. W5CJX will be on 3.5 and 7 mc. soon. W8TK is still in Texon. W5BOC is going strong on 14-mc. 'phone.

Traffic: W5CLO 8, W5AVY 8, W5AID 40, W5BGW 29, W5FC 405, W5AJG 37, W5ARS 111, W5CAV 11, W5NW 108, W5BII 239, W5COJ 11, W5ALK 4, W5BEF 8, W5AHC 31, W5CLJ 33, W5BCW 22, W5ANU 175, W5IT 155.

MARITIME DIVISION

NOVA SCOTIA — SCM, A. M. Crowell, VE1DQ — VE1CY heads the list. VE1ER sends in nice total. VE1BV says daily grind keeps him busy. VE1AX has High-C Hartley. VE1DQ has receiver complex. VE1EA works FB DX. A new ham in Halifax is VE1EP. VE1EL, Moncton, is another new call. Let's boost our reports next month. ORS *must* report.

Traffic: VE1CY 52, VE1ER 26, VE1BV 13, VE1EA 8.

ONTARIO DIVISION

ONTARIO — SCM, H. W. Bishop, VE3HB — The Ontario Divisional Convention is over, and can certainly be proclaimed a success. Note: The SCM's new QRA is 258 Egerton St., London, Ont. Send future reports there. VE3LY is arranging schedule with VE4GC. VE3WK, an old-timer, reports. VE3AD heads the traffic list. VE3GA's new transmitter is 3'x4½". How come Mrs. VE3DW did not make a speech Banquet night? VE3CE's new QRA is Toronto. VE3DG has had location. VE3MH is new in Chapleau. VE3HO complains of non-delivery of traffic. VE3LX had bad luck with filter condensers and '81s. VE3AL captured the Burgess Trophy at over 42 WPM. VE3CP has a good total. VE3PN's hybrid ant is not so hot. VE3HW, returning from the Convention, ran into severe snow storms 250 miles from home, and had to continue by rail. VE3HY is QRL rebuilding. VE3ID is at loggerheads with his '71A rig. VE3IM is new at Cochrane. VE3MX came second in the speed contest at 42½ WPM. VE3DX reports traffic. VE3JI wants schedules. VE3HA says the paperhangers papered around his ORS. Hi. VE3NU and VE3PM are newcomers at Weston and Mount Dennis. Congrats to VE3PM and wife for the new junior op. VE3RH is in new QRA. VE3SI is an old-timer with a new call. VE3LJ is trying hard for WAC. VE3JM has rebuilt. VE3CF is QRL Class B mod., with VE3EZ as an able assistant. VE3IB wants traffic. VE3LS is interested in traffic. VE3LJ wants a 7-mc. schedule after 11 p.m. E.S.T. VE3BV and VE3IR are rebuilding. VE3RT had great time at Convention. VE3JS is QRL dance orchestra. VE3OF has lots of QSOs. VE3GL handled traffic from Y.M.C.A. VE3LM is c.c. VE3RG and VE3BG are in need of high explosive to loosen things up. VE3TM enjoys a VE contact. VE3HP reports activities increasing. VE3QB Betts have run down. VE3FJ and VE3WA are working hard for WAC. VE3OM and VE3HV are on 1.75-mc. 'phone. VE3OC is on 3.5-mc. 'phone. VE3EC is QRL gas station. VE3XA is experimenting on 56 mc. VE3BV is putting in remote control. VE3IY got a card from VK addressed "VE3IY Canada"! VE3BV is QRL service work. VE3GP has moved from Windsor to Guelph. VE3WX strained his ant with flea power. VE3LA and VE3MY are new hams in Windsor. VE3MW is a newcomer at Turbine. VE3GT is back with us. VE3CM is remote control. VE3GC has a new 60-footer. VE3KC worked a "D." VE3HB is QRL changing QRA. VE3IH says VE3GP is staying at his QRA. VE3JB has finished a new receiver. All reports must be mailed on the 16th of the month.

Traffic: VE3AD 467, VE3CP 111, VE3IH 107, VE3WX 104, VE3DW 98, VE3GL 48, VE3HB 27, VE3HV 16,

VE3GT 24, VE3CE 16, VE3JS 13, VE3WK 10, VE3AL 9, VE3OM 7, VE3HO 7, VE3IB 6, VE3HA 5, VE3JI 5, VE3BV 2, VE3LS 1, VE3DX 9, VE3GT 62, VE3AU 18.

QUEBEC DIVISION

QUEBEC — Acting SCM, John C. Stadler, VE2AP — Montreal amateurs operated a booth in the local Radio Show. VE2CX looked after arrangements. Nine VE2s attended Toronto Convention. VE2DB brought the bacon home in the form of a '45. VE2AA will shortly appear on 3.5-mc. 'phone. VE2CQ recommends the Franklin circuit on 14 mc. VE2CP announces a bumper season. VE2AB is putting Dr. Woodruff's advice to use. VE2BB reports traffic schedules. VE2BD is on again. VE2BH and VE2DX have joined outfits. VE2CU is rebuilding. Welcome to VE2FG and VE2ES. All VE2s please report to VE2AP (Westmount 5947, or drop a line).

Traffic: VE2BB 291, VE2AP 9, VE2CO 9, VE2DR 6, VE2CX 184, VE2CP 282, VE2CA 26, VE2CQ 50, VE2BG 11, VE2BT 2, VE2CL 9, VE2BE 36, VE2EL 2.

VANALTA DIVISION

ALBERTA — SCM, C. H. Harris, VE4HM — VE4GY harvested a good crop. VE4BD is getting out well. VE4BI expects a good season. VE4BZ is new ORS. VE4CY uses Class B modulation. VE4DQ is building electron coupled MOFA. VE4EA gets good reports on 3.5-mc. 'phone. VE4EC gets flocks of QSLs every mail. VE4FR deserves credit for the work on his new transmitter. VE4GD sent Calgary report to VE4HM by a 'phone QSO. VE4JK worked DX. VE4HQ is experimenting with condenser mike. VE4I returned from the north. VE4KT is new ham at Wetaskiwin. VE4HM schedules VE5RM in the Arctic. VE4BV has fallen in love with a guitar. VE4DT is QRL grain business.

Traffic: VE4BZ 34, VE4DQ 18, VE4BD 8, VE4JK 5, VE4EA 2, VE4HM 2, VE4EC 2.

BRITISH COLUMBIA — SCM, J. K. Cavalsky, VE5AL — VE5FG is now a proud father. VE5BH's second op. is away on a honeymoon. VE5EW uses a pentode. VE5AC plans a new rig. VE5AL has new rig. VE5BI has new receiver. VE5FE has nice c.c. rig. VE5FI will work from VE9AJ. VE5GT skeds Vancouver. VE5HP is a busy man. VE5EC has new a.c. receiver. VE5CO is looking for DX. VE5FH is on again.

Traffic: VE5FE 123, VE5HP 88, VE5EC 42, VE5GT 40, VE5AC 38, VE5AL 20, VE5FG 66, VE5DQ 2, VE5HT 2, VE5BI 33, VE5EW 43.

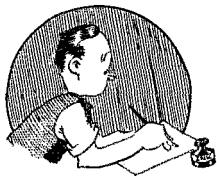
PRAIRIE DIVISION

MANITOBA — SCM, J. L. Green, VE4BQ — The M.W.E.A. operated a booth-station at the Winnipeg Radio Show. Look at VE4AG's total. VE4CI is a good second. VE4LH worked Cuba and Belgium on 14 mc. Cooler WX curtailed VE4FT's activities. VE4DJ hooked ZL2CI and CM2JM. VE4DK, VE4FP and VE4CS are at the "U." VE4LH is thinking of a fifty. VE4BQ pinned plenty DX. Watch for VE4GC's high power. VE4FN, VE4HR and VE4JB are heard occasionally. VE4KU finally "got going" on 14 mc. VE4TD, VE4KX and VE4AE pound brass on 7 mc. VE4KW left for B.C. VE4AC wants a Winnipeg schedule.

Traffic: VE4AG 187, VE4CI 138, VE4FT 84, VE4BQ 76, VE4DJ 26, VE4DK 16, VE4GC 8, VE4KU 2, VE4AC 19.

SASKATCHEWAN — SCM, W. Skafie, VE4EL — VE4JG will share time with VE4DI. VE4CV wants local traffic weekends. VE4AU gets crystal reports. VE4BB had visit from VE4CQ and VE4CN. VE4HX said goodbye to his filter condensers. VE4BF is DXing. VE4GR says his middle name is QSP. VE4EH is covering Section on 'phone. VE4HM will be on soon. New ham at Moose Jaw, VE4BH. VE4CM is doing consistent work. VE4GA makes plenty contacts on 'phone. VE4EL is helping the traffic along. Say, gang, get on 3.5 mc. for local rag-chew.

Traffic: VE4CM 114, VE4EH 85, VE4GR 42, VE4CV 33, VE4BB 31, VE4HX 23, VE4EL 16, VE4FF 15, VE4AU 14, VE4AT 8, VE4GA 4.



CORRESPONDENCE

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

WIXP in British Isles

183 Ilderton Road, South Bermondsly,
London, S. E. 16

Editor, QST:

I was recently looking through some back numbers of QST and in one of them was interested by a description of WIXP.

Some little time ago my calibration for the 3.5-mc. band went haywire and I was extremely anxious to get another reliable calibration, owing to having a sked on that frequency with W8DBX, who is heard here occasionally. Calibration services over here are few in number and are only of the "two point" variety — giving solely the high- and low-frequency limits of the various ham bands — and are thus of limited utility.

In the small hours on August 27th last, I happened to be having a look around on 3.5 mc. and, finding the "W" signal-strength-to-QRN ratio decidedly favorable, decided to spend an hour or so in the hope of hearing one or two friends of mine on your side of the ditch. So it was that, purely by luck, I happened to be pottering around at the low-frequency end of the band at 0200 BST when, wham! I hit onto an R7-8 signal signing "Standard Frequency de WIXP," with the characteristic letter "G." Of course, with a QSA5 signal of that strength, it was child's play getting the six points at 100-ke. intervals that followed, and the resultant curve sure looks very FB! I can do no less than pen these few lines in appreciation of such an excellent service, as requested at the conclusion of the aforementioned "QST" article.

I should add, too, that I consider the "W" hams are lucky to be able to avail themselves of such FB calibration services as those arranged for them by A.R.R.L., and that it is sure a mystery how any of them ever manage to get off wave!

— G. C. Allen, ex-BRS250

Cure the Long CQ's!

279 Park Place, Brooklyn, N. Y.

Editor, QST:

The other night I listened to an 8th district station sending CQ for fully 4 minutes. Instead of impatiently tuning him out for some other signal, I waited until he finished, gave him a call,

and when I established communication, this is the first thing I said (and it is literally true): "It's a shame OM that a station with a note as steady and good as yours should send a CQ that is so disgustingly long."

In the course of the conversation that followed, he admitted his abuse of the "CQ" privilege, and I feel that one ham may have been cured.

This brings me to the point I wish to emphasize. How many of us fail to call a station's attention to his discourteous violation of amateur transmitting ethics?

I can cite an analogy in a matter concerning our municipal government. There was a ditch in the asphalt pavement near my home, and it was so deep that every time a truck went past and ran into the ditch it shook the whole house. This went on four months and nothing was done. All the neighbors complained to one another about the thing, but all of them were too indolent to write to the Commissioner of Highways, until "yours truly" wrote the necessary letter. Contrary to general belief, the Department took prompt notice of the complaint, and the ditch was repaired within the next three or four days.

I am going to sign off by saying it should be the duty of every ham to call another's attention to his abuse of the CQ privilege at the very time communication is established. There are some things about which we can have an open mind, but the lengthy CQ is not one of them.

— Charles F. Jacobs, W2EM

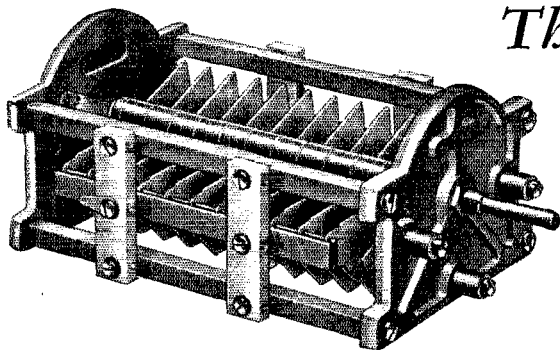
Tommy Baird

Spokane Radio Operators Club,
Spokane, Wash.

Editor, QST:

I don't know exactly how to write this letter, but it must be done. We can't always do the things we like, you know. I'm writing a little obituary for Thomas W. Baird, Jr., W7VL.

Tommy was born in Chicago, at an early age moved to Spokane, and attended grade and high school here. At the close of his high school years he was stricken by a form of rheumatism which kept him in bed for three or four years. At this time he became interested in radio and started out on 160 meters with an old UV-202 and an entire layout of home-made apparatus. The plate transformer was wound by hand while he was flat on his back in bed.



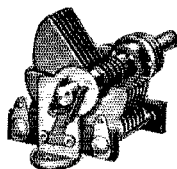
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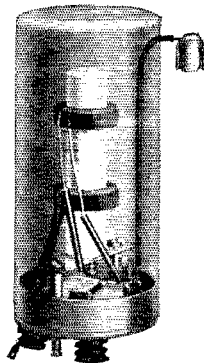
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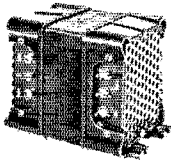
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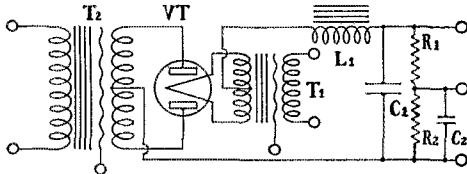
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Regulation from bleeder load to full load — 12 1/4%. **Ripple** — 5%.

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R 1 — 2000 ohms, 25 watts; R 2 — 23000 ohms, 25 watts

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Soon he was able to be up and around even though the effects of the disease had left him a cripple. His back and hips were entirely stiff and could not be moved. His neck also was stiff and he was bent forward in practically a half circle. His amateur station grew and grew till he had a single 852, with which he worked all continents except Africa, and became perhaps the Northwest's best known amateur. Despite his crippled condition he went to work at KFPY in 1927 and became chief engineer in 1928. At this time the Spokane Radio Operators Club was organized and he became President, succeeding himself each year till his death, August 1st of this year.

Tommy met his death as a result of a fall at KFPY. He came down to the station about 2 a.m. to do some work and after completing it went to the studio to sleep on a davenport. In some way he tripped on a level floor (not improbable because of his stiff hips) and fractured a vertebra. One side became paralyzed, though he was not in much pain and no doubt would have lived. Faced with spending the rest of his life in bed, he chose to take a chance on an operation. The operation was successful and all seemed well until ether pneumonia set in, and he passed away at 3:30 p.m. on August 1st.

Thus we briefly record the life and death of one of the greatest fellows ham radio has ever known, and also the best radio expert in this Northwest Division. Tommy was the kind of a man that had many friends with never an enemy. Every friend was a strong friend.

— Wes Bell, W7ADU

R.A.C.

Plymouth, Mass.

Editor, QST:

I'm a beginner, and perhaps I speak out of turn; however, a QSO is a big thing to me yet, so here goes!

Books, magazines, articles and items have all given to me one seemingly important factor in amateur radio work; the value of a clean, sharp signal. Now, I think someone is kidding me. The thing to do is to get a good husky r.a.c. note on the air — one that's able to cover and blot out all the signs on my end of the band at least. Then when I answer a CQ they have to listen or go out of business!!

Ethical? Lawful? Why not! Plenty of fellows with two-letter calls and the smell of old-timer about them are doing it and logging QSO's by the yard. If they can do it and nobody stops them — well, why can't I? Don't tell me that old one about the rules and regulations — I've heard it before, and it's certainly a wonderful consolation to know that we have such rules, etc., especially when you've hooked real DX and try for the nth time to get or give a report or QRA through the mellow, mud-like r.a.c. only 20 kc. away. What's the answer, OM? I'm just a beginner and I may be all wet!!

— Charles E. Winkley, Jr., W1E1F

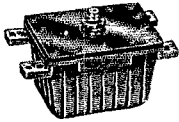
BARGAINS ARMY AND NAVY RADIO SURPLUS

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All equipment is guaranteed to be in first class operating condition—the great majority of it is new in manufacturer's original packing.



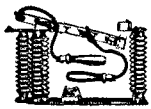
Western Elect. Condensers, Type 21 A, 1000 V. A.C. test, 1 mfd. Excellent for filters. Several can be used together for large capacity or high voltage. Each...\$1.75



Condensers, Mica, op. volts 12,500, cap. .004
 Dubilier, new... \$7.50
 together, used... 5.00
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 Condenser, Dubilier, mica, volts 40,000, cap. .0015-.001-0008 or .003 \$10.00
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Genuine Baldwin Headphones, Mica Diaphragm 2000 ohms. For years the most popular make of phones. Famous for accurate reproduction of speech. Regular \$15.00 value... \$3.50



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Western Elect. Relay and Army Signal Corps sander. Beautifully made instruments. Operate on 9 volts. Relay, \$3.50. Sander \$1.50.



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All the King's horses and all the King's soldiers couldn't have more attractive colors than those available only for

Section Communications Managers
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 Special red color for the S. C. M.
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Making 'Em QSL

Agana, Guam

Editor, *QST*:

I have discovered a system whereby I receive a much larger percentage of QSL cards from my QSO's. This announcement, I judge from the many cries of lamentation voiced regularly in *QST* over the failure of some fellows to QSL, will be hailed by some as a great boon to hamdom.

While the procedure is not productive of 100% results, its effectiveness is none the less amazing. Before I began the practice I received QSL cards from about 40% of my otherwise perfect QSO's. This percentage has been boosted to about 90.

I have, for enclosure with my QSL card, a printed notice the same size as my QSL, on which I inform the addressee that if his QSL card is not received in a reasonable time, his call letters and QRA are to be added in very legible letters to my non-Q list. This is a large white placard of sturdy quality, whereon are recorded all station calls belonging to those who have failed to exchange cards, but who are probably none the less pleased to have received mine. This system has been in effect about a year, and during that time very few QRA's have been added. If at any time a card is received from one whose name emblazons the placard, that name is promptly removed. My station is located where I have opportunity to display my rebels' mailing list to many visitors. All this is explained on the printed notice, and I am inclined to believe that even a hard-hearted non-QSL enthusiast is apt to break down under the pressure of the qualms of conscience when he knows that his call letters and QRA are held up in plain view of the rest of hamdom.

I intended to furnish a complete list of non-Q artists already listed with each QSL card, but the system outlined above was found sufficiently effective.

— Foster D. Brunton, K6LG

FB!

Tallapoosa, Ga.

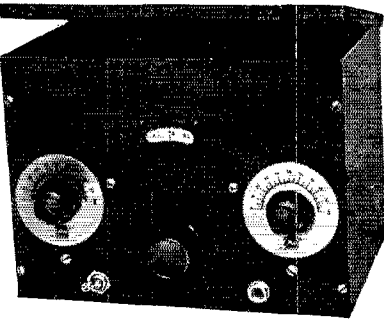
Editor, *QST*:

Just to prove that the venerated April, 1929 fone transmitter circuit is still hard to beat in spite of Class B high-power hookups, I am reporting that in five weeks during August and September W4QZ, using almost identically the same arrangement brought out in *QST*'s first 100% modulation circuit, has made 37 west coast contacts.

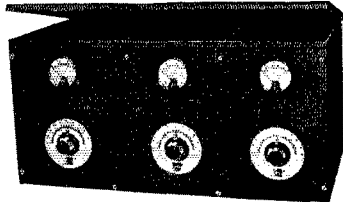
On the night of September 23rd I worked all U. S. districts, Canada, Mexico, and Hawaii on 75-meter fone. K6BAZ, Honolulu, gave me a QSA4 R7 report. So did X5N, Rodriguez Dam, Lower California, Mexico. W6GOH and W6CZ, Los Angeles, gave me QSA5 R8. Pendleton, Oregon, W7AQX, said I was QSA4 R6. I have worked all U. S. districts for four consecutive week-ends.

W4QZ's final amplifier is a couple of 852's,

Jerry announces 3 new numbers! **SENSATIONAL VALUES**



The
"Eagle"
a new
sensational
3 tube
S. W.
Receiver
\$16.95



The
Famous
GC-30
Crystal
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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.

CLASS "B" MODULATION UNITS — for modulating the GC-30 complete kit..... \$39.50

RELAY RACKS — fine for mounting the GC-30 or GC-100 and all power packs. Black crystalized finish, price..... \$12.50

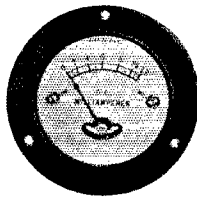
GC-100 — Same construction as GC-30 — a new higher powered job for use with 203-A or 211 in the output stage. Completely assembled..... \$39.50

NEW!!

Biley crystal holder, moulded bakelite job with chromium polished electrodes—crystal is hermetically sealed in, only \$1.50

Biley 40 meter crystals now only..... \$5.50

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Hot wire antenna meters 1 1/4 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 2 3/4" diameter, supplied in the following sizes: 10 m.a., 30 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

10 volt filament transformer, 7.5 amperes, extra special..... \$.95

Cased 2 1/2 volt—866 transformers, 10 amperes, extra special..... \$2.50

Chrissell condenser mike kit, contains all the parts necessary to assemble your own condenser mike, special..... \$2.85

Here at last is a short wave receiver embodying features comparable to those in sets selling at a much higher price. Unusually flexible, designed for continuous short wave broadcast coverage or ham band spreading. Constructed of finest material available, such as Hammarlund Isolantite Insulated Condensers, etc.

This Receiver was designed for the discriminate buyer desirous of purchasing the finest short wave receiver of its kind, and should not be compared with any of the "junk piles" selling at anywhere near the price of the "EAGLE."

The "EAGLE" is guaranteed to give you the satisfactory performance you would naturally expect from apparatus produced by JERRY GROSS.

Economical to operate. Employs the new 2 volt tubes which can be operated from two dry cells on the filaments for extended periods of time.

Altho the "EAGLE" is the ideal amateur receiver incorporating such features as full band spread, etc., it is not limited to this purpose alone, but is also an unusually efficient short wave broadcast or police alarm receiver. While full dial coverage on each ham band can be had, the "EAGLE" may be adjusted to cover continuous range from approximately 15 to 200 meters. This is very easily done by controlling the tank condenser which is operated from the front of the panel.

CHECK THESE FEATURES!!!
SCREEN GRID 232 R.F. and screen grid detector offering highest possible gain and most efficient regeneration.

PENTODE POWER AUDIO — 233 gives more audio gain than obtained from two ordinary transformer coupled stages. Will operate speaker on most stations.

TANK CONDENSER — is operated from the front of panel and eliminates the objectionable necessity of lifting the cover. Speedy range changes at your finger tips. The ADDITIONAL condenser employed here gives much finer tuning than is possible with the ordinary large condenser.

BAND SPREADING CONDENSER — very small capacity permits widest possible calibration spread over a multitude of ranges. This feature gives you really two receivers for the price of one.

DIAL — Latest design, real vernier control over any position of the frequencies covered. Absolutely will not jump or slip — very rugged.

REGENERATION CONTROL — Employs condenser for stability, ruggedness and velvet-like smoothness, not noisy like resistances.

POWER CABLE — Eliminates possibility of wrong connections and insures absolute electrical contact.

CABINET — Size 6" x 7" x 9 1/2", metal, compact, hinged cover, crystalized finish. Completely shields the receiver. Also ideal for portable use.

RANGE 15 to 200 meters — 4 plug-in coils are supplied with each receiver.

The "EAGLE" completely wired and tested. Price..... \$16.95
The "EAGLE" complete kit of parts with diagram. Price..... \$12.50

GE 1/2 & 1 watt Neons.....	\$.55
866 Heavy duty Tubes.....	\$2.50
281-M Mercury Tubes.....	\$1.75
281 Tubes.....	\$1.00
210 Tubes.....	\$1.40
DeForest 510 Tubes.....	\$3.90
888 or 871 Tubes.....	\$.95
Hiaron Midget Stand-Off Ins.....	\$.10
Fierlon Lead-in Bushings.....	\$.65
Egg Strain Insulators.....	6 for \$.35
Beehive Stand-Off Ins.....	\$.07
Isolantite 3" Zepp Spreaders.....	10 for \$.40
Bakelite 3" Zepp Spreaders, very husky.....	\$.25
3" K K Vernier Dials.....	\$.40
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Eby Bakelite UX & Y Sockets.....	\$.15
Eby Bakelite 6 prong Sockets.....	\$.18
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Fila. Transf. 6.3 V cased.....	\$1.75
Fila. Transf. 2 1/2-2 1/2 & 5 V.....	\$1.25

Fila. Transf. 2 1/2-2 1/2 & 7 1/2 V.....	\$1.35
Fila. Transf. 2 1/2-7 1/2 & 7 1/2 V.....	\$1.50
Midget Fila. Transf. 2.5 V c.t. 7 amp.....	\$.90
Midget Fila. Transf. 7.5 V C.T.....	\$.90
Midget Power Transf. 350-350 V C.T. 2 1/2 V & 5 V Fila.....	\$1.35
Midget Power Transf. heavy duty, 450 V at 100 M.A. DC, 5 V & 2 1/2 V Fila.....	\$1.95
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Polymer uncase 2 mfd. 1200 V DC.....	\$.65
Aerovox Dry Electrolytic Cond.....	\$.85
2 mfd. 2000 V work. Filter Cond.....	\$5.25
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Thord. 36 H. 250 M.A. Double Choke.....	\$6.75
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30 H. 80 M.A. Choke.....	\$.60
Isolantite Ins. Midget .0002 mfd. var. Cond.....	\$1.10
RCA single button Hand Mikes.....	\$1.75
Set of 4 NA-ALD 20-200 S.W. Coils.....	\$1.15
NA-ALD 4-5-6-prong coil forms.....	\$.15

PRICES CUT			
Plated copper tubing & inductances wound and ends drilled free			
Inside dia.	3/16"	5/8"	5/16"
1 1/4"	5c turn	5c turn	5c turn
2 1/2"	6c turn	6c turn	10c turn
3 1/2"	10c turn	10c turn	12c turn
Genuine Baldwin Type "C" Mica Diaphragm Phones..... \$3.75			
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ACME SOLID ENAMELED COPPER ANTENNA WIRE			
No. 14 (any length) per 100 ft.....	\$.30		
No. 12 (any length) per 100 ft.....	\$.45		
No. 10 (any length) per 100 ft.....	\$.80		
No. 8 (any length) per 100 ft.....	\$1.20		
Ebonite panels, beveled edges 3/4" thick (easily drilled).			
8 1/2" x 25".....	\$1.10	8 1/2" x 10".....	\$.60
8 1/2" x 20".....	\$.95	5" x 8 1/2".....	\$.10
8 1/2" x 15".....	\$.70	10" x 10 1/2".....	\$1.10

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

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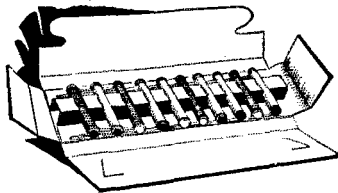
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FIXED RESISTORS

CENTRALAB FIXED RESISTORS are Bap-tised with Fire in the making and will withstand a greater load than any other composition resistor of equal size.

Packed in handy carton of 10. Your choice of resistance values.



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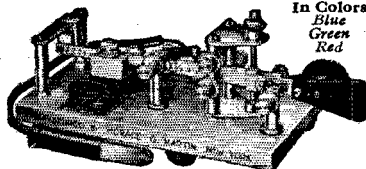
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VIBROPLEX

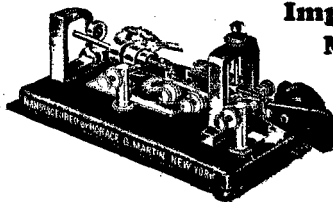
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Makes sending easy. Easy to learn. Easy to operate.



Black or Colored, \$17. Nickel Plated, \$19



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Black or Colored, \$17

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Special MARTIN RADIO Bug—Extra large Specially Constructed Contact Points for direct use without relay. Black or Colored. \$25

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Cable Address: "VIBROPLEX," New York

Class B linear, 2000 volts on the plate, plate current 50 mils per plate. The rest of the job is low power. According to the April, 1929, article, my carrier must be about 40 watts.

— Randal Julian Carnes, W4QZ

Ham Helpfulness

1350 Garfield Ave., San Marino, Calif.

Editor, QST:

Lucien Daufau is an ex-soldier who served the United States at a very early age, and is paying for his patriotic impulses by a life-time of continuous suffering. He is able to move about, and with the assistance of crutches makes his painful way from place to place about the house, all the while being wracked with excruciating pangs in his back.

For three years young Daufau has felt that life was almost unbearable. With nothing to do but lie in his bed, thinking of the doctors who, in tedious succession, have failed to cure him, he has been on the point of sacrificing his reason. Then, somehow, the thought occurred to him that about the only thing in which he could interest his mind was amateur radio telegraphy. Because his home is in the high mountains of northern Idaho, he was strictly limited as to available conveniences. Added to that, he had no means.

From somewhere Lucien obtained an old, discarded BCL receiver. He tore it apart. Writing to a technical magazine he obtained the blueprint of a short-wave receiver, and, without knowing anything at all of the principles of radio reception, set about building a 40-meter outfit. No one within many miles of him knew anything about short-wave "stuff," so Lucien worked alone.

For weeks his set refused to work. He couldn't get anything but blasts and squeals out of the headphones. At last, however (after dynamiting his tubes once!), he got in some signals, but found them to be away up on the lower end of the b.c. band. By whittling at his tuning condensers and otherwise reducing the electrical dimensions of the component parts, Lucien finally got down to 40 meters, where the hams were thickest.

Probably no ham in America spends as many hours a month with "cans" on his ears as does Daufau. When he can sit up he is in front of his instruments; when the pain forces him to recline, he sets his receiver at a likely point and lies down with the 'phones still on his head. He listens to everybody—especially to the ham telephone outfits, for he is only beginning to pick up code. One night Daufau heard a two-way telephonic conversation between Ernest Van Horn, of Kirkland, Washington, and some other ham in California. The Kirkland OM seemed so anxious to help the other fellow that next day Lucien wrote him a letter, asking certain questions anent the pile of junk that lay on the "DX Table" of his home in the Rocky Mountains.

UNCLE DAVE



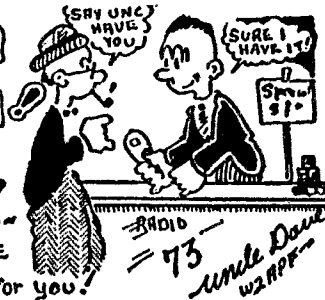
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Hey Gang! Wasn't the depression awful? But we didn't feel it at any time, as we had the lowest prices, guaranteed everything unconditionally, and because we're a real Ham Organization. The gang flocked to our door day and night to get that 100% service. Try us, and get acquainted. Send Your Problems in! UNCLE DAVE.

Arco Franklin Class "B" Transformers, per pair.....	\$7.00
HERE'S A REAL BUY. New Philco 3-Tube Short Wave Converter, A.C. Complete, List \$39.50, Net.....	\$17.95
Tungar 2 amp. Chargers (sl. used) complete.....	7.79
Gen. Radio Audio, latest model, each.....	1.79
Auto Aerials, mtd. \$1.75; 43 plate .001 Far. Cond.....	1.00
National sets and Hammarlund Comet Pros, complete 58 models in stock at lowest prices. Mfrs. forbid our advertising cut prices on same.	
1st quality 227, 245, 201A, 112A, 6 for.....	1.00
Gen. Baldwin type C Phones \$3.50 per set; Pigtail resistors, asstd. sizes, dozen.....	7.95
Chrissell-Acoustic Condenser Mike Kits \$2.90; Ass't'd. sizes fixed by-pass cond., dozen.....	1.00
Cardwell 147-B .00044 3000 volt trans. cond. \$5.95; No. 164-B .00023, 3000 v.....	2.98
Readrite Wide Range Milliammeters 0-25-50-100-150-200-300-400 mill., each 58c; 3 for.....	1.50
Readrite 0-10 v. or 0-15 v. A.C. meters \$1.50 each; 2 for Universal Baby Mikes, Sr. model, 25 ft. cord encl. switch, list \$7.50, special.....	2.50
American Double Button mikes. Gold spot, special \$4.95; Nickel plated Microphone case and stand.....	3.50
A.R.R.L. Log Books 3 for.....	2.80
G.E. 1/4-1/2 watt neon bulbs, each 40c; 1 watt.....	1.00
R.E.L. Short Wave 3 receiver No. 278.....	.50
Complete kit of parts for Single Signal Super Het.....	25.95
Complete kit of I.F. and audio frequency amplifier for above.....	50.00
Kurz-Kasch 4" Vernier dials, 2 for 90c. Navy 5-watters, C.G. 1162, doz.....	39.90
	1.00

Readrite Set analyzers, No. 110 — tests all tubes.....	\$14.00
Gen. Arco .00014 short wave cond. (can be ganged).....	1.49
100 Watt Grid leaks: 5,000; 10,000; 15,000; 20,000; 25,000.....	.79
Used RCA UP — 1016 750 watt 3000 v. c.t. and 2-10.5 v. Fil. Wind. Var. Primary, ea.....	11.00
6 tube A.C. Pilot Universal Super Wasps (fully wired).....	32.50
3 double 30 Henry Astal 160 mill chokes.....	2.10
Mfrs. Model relay, 40 WPM, unmounted \$9.25 for.....	.90
Input filter chokes 2-3 Henry, 300 mill, weight 14 lbs.....	1.25
Wafer UX and UV sockets, 2 doz. for \$1.00; 2000 mfd. mfrs. model A filter cond 3 for.....	1.00
Hammarlund I.F. transformers, adjustable from 425-525 kc.....	1.75
Our own Arco individually calibrated monitor comp. with tube, batteries, and coils, special.....	9.35
Arco wavemeter with individ. chart and coils for 20, 40 and 80 meter bands, special.....	6.25
BIG SCOOP! Why Buy Mongrel Tubes? Genuine RCA This Month Only from November 25 to December 25, First Quality Tubes, 50% OFF ON ALL TYPES!	
1000 hrs. uncond. guar. Triple Test	
15-watt 210's, each \$1.75; 250 and 281.....	\$1.75
15-watt 5-meter 210 with grid on top.....	3.50
281-M, each \$2.50; 280-M or 83, each.....	.90
New type 871 or 888, each \$1.90; 82-M, each.....	.75
Hytron 46 tube 75c; 50 — 65c; 57 or 58, each.....	.80
236 \$1.25; 237 — 90c; 238 — \$1.25; 239 — \$1.25.....	
RCA UX-240, 75c each; 3 for \$2.00; UX-250, big special.....	.65
DeForest 510 \$3.85; UX 320 or 231, each.....	.86
Rectobulbs R-81, \$3.45 each; R-3, each.....	5.90

25-watt tube. Just what the amateurs have been waiting for! 7 1/2 volts filament, 850 plate volts, grid volts 75-100, ONLY \$4.25

866 Heavy duty, mercury rectifier tubes.....	\$1.40
866 new type, spiral filament, circular plate, extra heavy duty, uncond. guar. 1000 hrs.....	3.35
FIRST QUALITY, 90 Day Guar.	
15-watt 210's, \$1.20; 250's and 281's.....	\$1.20
15-watt 5-meter 210 with grid on top.....	2.50
281-M, each \$1.60; 280-M or 83, each.....	.75
New type 871 or 888, each \$1.40; 82M.....	.59
Pyrex lead-in bowls.....	1.45
Pyrex 3" insulators — 27c; 7 1/2" — 70c; 12".....	2.00
Soldering irons — heavy duty, each, 95c; extra HD.....	1.65
Universal watch case model, single button mikes.....	1.20
Kodak microphone cases, each.....	1.49
Universal BB mike, New model.....	14.00
Universal BB bullet microphone, list \$50.00, our price, stand-off insulators, per dozen 89c; 2 doz.....	28.00
American type CD double button mike.....	11.75
Jefferson single-button mike xformers, fully shielded and fully mounted — \$1.95; Double button.....	2.95
CRYSTALS	
Unfinished crystal blanks, either X or Y cut.....	\$1.20
Finished oscillating blanks.....	2.00
80- or 160-meter crystal, ground to your frequency, accurate within 0.1%, with free bakelite adj. holder — \$4.50; 40-meter.....	8.00
Crystal grinding compound, per pkg.....	.25
Bakelite adj. crystal holder — 89c; Same but plug-in.....	1.15
Precision plug-in crystal holder.....	1.49

ARSCO XMITTERS AND RECEIVERS Wavemeters and Monitors

Arco Jr. single 245 TNT xmitter, complete with power pack, tubes, and mercury rectifier.....	\$12.95
Arco Senior Push pull TPTG 245 xmitter, complete with tubes and mercury rectifier built to Handbook specifications.....	18.00
Arco 2-tube bread board receiver, made of finest material with 2-Speed 230's \$8.75; in cabinet.....	9.25
TRANSFORMERS — THIS MONTH'S SPECIAL	
Thordarson — 2-7 1/2 volt CT windings, 1-1 1/4 volt CT winding, high voltage 1500 volts CT, Tapped primary; weight 11 1/2 lbs.; height 6"; width 4 1/2"; length 5", each.....	3.50
Arco power transformers, all fully mtd., encased in aluminum-bakelite posts — a real heavy job and a pride to any xmitter; 750 v. at 300 mills; 2-7 1/2 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
Arco filament transformers; 2 1/2 volt for pair of 808.....	1.45
5 volt 10 amp; 7 1/2 volt 7 amp; 10 volt 6 1/2 amp; 11 volt 6 1/2 amp; 12 volt 3 1/2 amp, each type.....	2.25
Teleplexes with three tapes, special, 10.00	
WIRE: GENUINE AGME, solid enameled aerial wire	
100 ft. No. 10 gauge 95c; No. 12 gauge 65c; No. 14 gauge 50c	
200 ft. No. 10 gauge 65c; No. 12 gauge 1.25; No. 14 gauge 90c	

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Proud of it?

Are you proud that you are an amateur — proud of your A.R.R.L. membership? Then proclaim it! Let the hams who meet you on the street, in the radio store, or traveling, know it. Wear your A.R.R.L. emblem!

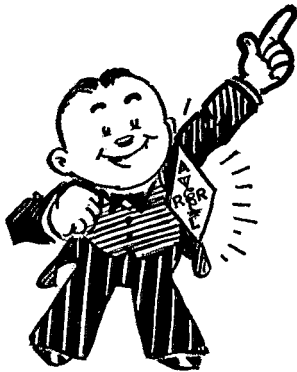
The distinctive League emblem comes in four different forms. Its use by *members* is endorsed and encouraged by the League. Every member should endeavor to display the insignia of his organization in every possible way.

THE PERSONAL EMBLEM, in extra-heavy rolled gold and black enamel, just $\frac{1}{2}$ " high, supplied in lapel button or pin-back style, is recognized as the sign of a good amateur. Wear your emblem, and feel proud of having taken your rightful place in the radio fraternity. Either style, \$1.00, postpaid.

THE AUTOMOBILE EMBLEM, heavily enameled in yellow and black on sheet metal, will gain you friends. On the road, traveling, it identifies you as a real amateur. $5 \times 2\frac{1}{2}$ ", holes top and bottom. 50c each, postpaid.

THE EMBLEM CUT, a mounted printing electrotype, the same size as the personal emblem, is for use by members on amateur printed matter, letterheads, cards, etc. \$1.00 each, postpaid.

THE "JUMBO" EMBLEM, an attention-getter for the shack wall or that 100-footer, is a big yellow-and-black affair $19 \times 8\frac{1}{4}$ ", same style as the Automobile Emblem. \$1.25 each, postpaid.



The
**AMERICAN RADIO
RELAY LEAGUE**
WEST HARTFORD, CONN.

In a week Van Horn wrote back saying to listen in for him at a scheduled time, and he'd tell him all about it. At the appointed time he was on the air, coming in with: "Hello, Lucien Daufau, Hello Two Creek Rancho, hello Porthill Idaho, hello Lucien Daufau!" He answered all questions, giving minute instructions, and said that if he had overlooked anything to ask him again.

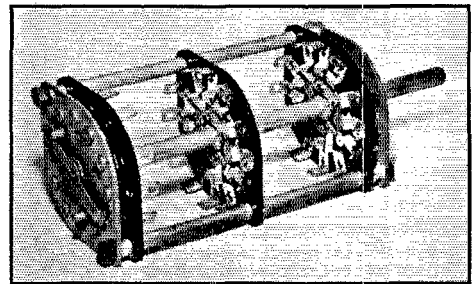
A few days after this occurrence a big box arrived by express at Porthill, Idaho. It was addressed to Lucien Daufau, and came from Ernest Van Horn. The contents was as assorted a bunch of old wireless junk as ever a man gazed upon, but it was a treasure to young Daufau. From the equipment sent him by the Kirkland chap, whom he never has seen, Lucien now has a new receiver in service, and with it is reaching out as never before. He is boning the code, too, and can copy parts of weather reports already. Forging ahead toward the day when he actually will be on the air, Lucien Daufau has built a transmitter and, although he has not been able to get to a place where he can take the exam for a ham ticket, he has tuned up his one-tube dry-cell-power-supply outfit, and has magnetized all the watches in the house!

The writer of this letter is a friend of the Daufau family who went to school with them 24 years ago. He wants to express thanks to Ernest Van Horn for the splendid thing that young man has done. Such unselfishness and magnanimity and helpfulness deserve citation.

—Geo. Roger Chute

Inductance Switch

ALTHOUGH coil-switching arrangements for band-changing have attained little popularity in amateur receivers, possibly part of the reason has been the lack of a suitable multi-point and multi-blade switch, especially since home



construction of such a switch becomes a rather difficult proposition mechanically. It is common practice to use switches of this type in commercial converters and combine short- and long-wave broadcast receivers, however, and it is now possible for the amateur experimenter to obtain switches at a reasonable cost. The photograph illustrates a switch of this type.

The switch shown is a three-section five-position affair, which means that it will handle three

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we have been supplying radio apparatus to "hams" and commercial "ops" in all parts of the world. Beginners and old-timers alike know that they can buy everything they need from Harrison's and save money without sacrificing quality or service!
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ROYAL MONITOR FREQUENCY METER

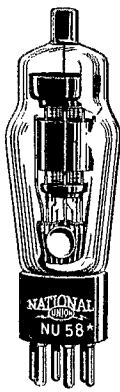
20, 40, 80, and 160 meter band. Without Plug-in (see October Page 77 for full description)

PUSH BACK WIRE

No danger of shorts or leakage with this high grade push-back wire. Heavy stranded wire, equivalent to No. 14, tinned for easy soldering. Spaghetti insulation covered by black braid that will not unravel. Both insulations push back for neat connections. Ideal for wiring amplifiers, transmitters, receivers, etc.
25 foot coils 25c | 200 feet for \$1.50
40 foot coils 35c | 500 feet for \$2.75

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General Electric Milliammeters
Jeweled D'Arsonval movement with zero adjuster. 3" diameter. Panel Mount. Every one brand new! A rare opportunity to buy genuine G.E. meters at one-third the regular price.
0-100, 0-200, or 0-300 DC MA. \$2.95
New type meters. New design using large chrome steel magnet insuring perfect damping (needle comes to rest immediately). Zero adjuster on DC meters, a feature found only in higher priced instruments. Black case and mounting flange 2 1/4" diameter. Very accurate.
DC Milliammeters, 0-5 \$1.75. 0-10 . . . \$1.50
0-15, 25, 100, 150, or 200 \$1.00
0-15 AC Volts . . . \$1.40. 15 AC Volts . . . \$1.90
0-15 or 50 AC MA. \$1.75
JEWELL Pattern No. 88 Meters 1, 1 1/2, 2, or 3 DC MA. \$6.45
All other DC Milliamperes \$5.35
All other JEWELL and WESTON instruments at lowest prices



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Every tube tested and dated before shipment. Only perfect tubes are shipped by Harrison! Every tube fully guaranteed.
1. Special — A good tube guaranteed by Harrison for five days. Usually tubes at these prices are seconds, defects, or plain "junk." But Harrison's careful testing and real five day guarantee insures good tubes, positively better than any other tube selling near these prices.
2. RCA Licensed — High quality tubes of superior construction built to stand hard usage. Manufactured under RCA Licenses. We know that these tubes are GOOD and we guarantee them for three months.
3. RCA — Genuine Radiotrons manufactured by the Radio Corp. of America. Brand new and guaranteed by RCA for six months.

Type	Spec.	RCA Lic.	RCA	Type	Spec.	RCA Lic.	RCA
46	\$.62	\$.70	\$.89	226	\$.32	\$.38	\$.49
55	\$.62	\$.70	\$.92	227	\$.28	\$.35	\$.61
75	\$.62	\$.60	\$.75	230	\$.51	\$.75	\$.95
97	\$.62	\$.70	\$.95	231	\$.51	\$.75	\$.95
58	\$.62	\$.70	\$.95	232	\$.55	1.05	1.34
82	\$.44	\$.60	\$.75	233	\$.65	1.20	1.60
83	\$.62	\$.70	\$.89	234	\$.65	1.20	1.60
89	\$.72	\$.88	1.03	235	\$.38	\$.70	\$.94
112A	\$.43	\$.70	\$.90	236	\$.62	1.20	1.60
120	\$.90	1.30	1.74	237	\$.53	\$.79	1.03
171A	\$.32	\$.42	\$.54	238	\$.62	1.20	1.60
UX109	\$.42	1.15	1.48	239	\$.62	1.20	1.60
UV199	\$.42	1.25	1.60	240	\$.42	1.10	1.80
200A	\$.38	1.45	2.30	245	\$.38	\$.49	\$.65
210	\$.94	1.95	4.00	247	\$.38	\$.69	\$.91
222	\$.74	1.35	1.83	250	\$.58	1.75	3.57
224A	\$.43	\$.70	\$.95	280	\$.32	\$.45	\$.60
201A	\$.37	\$.76	\$.45	281	\$.88	1.75	2.98
224	\$.33	\$.74	\$.55	866	1.38	1.85	3.88
280M	\$.85	1.35	..	871	\$.92	1.65	..
281M	1.45	2.25	..	BH	1.00	1.50	..

NEW 25 Watt (actual rating) oscillators. Rated at 850 Volt plate (will stand 1200) and 7 1/2 Volt filament. Plate lead at top of tube. Harrison special introductory price. \$4.25
Special 15 Watt 210 transmitting tubes. \$1.40
Extra heavy duty 866 with spiral filament and cylindrical plate. \$2.95
Heavy duty 866 Rectifier. \$2.25
GENUINE RCA UX-216-B high voltage half-wave rectifier. Use in place of 281. List price \$7.25. \$9.95

ROYAL SHORT WAVE RECEIVERS — SEND FOR LITERATURE

Transformer Specials —

THORDARSON Heavy Duty. Delivers 750-0-750 at 300 mls, 7 1/2 c.t., 2 1/2 c.t. Adjustable primary. Completely mounted. 15 lbs.
Others sell it for \$8.75. Harrison sells it for \$4.25
Midget power transformers 350-0-350 5 Volt, 2 1/2 Volt — 8 amps. \$1.30
Thordarson. Delivers 1100 Volts at 150 MA, 7 1/2, 7 1/2 and 1 1/2 at 7 amps. All center tapped. Completely shielded with leads to terminal board. 200 Watts 9 lbs. \$2.95

Resistors

Actual wattage ratings! Will not open or develop noise.
H-H 20,000 ohm, 50 watt Bleeder resistors with 5 taps. Put two in series for up to 40,000 ohm at 100 Watt with 9 taps.
Two for 98c
100 Watt Bleeders, 9 1/2" x 1". Center-tapped. Mounted.
5000, 10,000, or 20,000 ohms. \$1.25
50,000 or 100,000 ohms. \$1.35
25,000 variable with six sliders . . . \$1.70
50,000 or 100,000 with six sliders. \$1.80
GREBE Transmitting RF Chokes 1" x 4". Will pass 300 MA. Each. . . . \$2.3c

Filter Choke Specials —

Every item an outstanding bargain! You get more for your money at Harrison's.
An excellent high inductance choke, to provide maximum filtering in any power pack. Consists of a 50 Henry 100 Mil and a 30 Henry, 125 MA choke in a silver finished metal case. In parallel will handle heavier currents and still have high inductance. No choke as good as this one has ever been offered at the low price of \$1.95
Heavy Duty 20 Henry, 400 Milliamperes Power Choke. FB for choke input to filter. 3000 Volt Insulation. 70 Ohms. Open frame mounting. 8 1/2 lbs. Another Harrison "buy" — \$4.95
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.
30 Henry 125 MA Chokes — \$5.50
Polymert Permalloy core chokes. A "real" choke. Type TC-415. 15 Henry, 130 MA. List \$8.00. Special. \$2.50
Keying Relays. Three silver contacts. Make two — break one. Works on single dry cell. Harrison's Price. \$5c

Condenser Specials

Real values that can't be beat! All ratings are DC working voltages and every condenser is tested at double voltage. It pays to buy at Harrison!
Aerovox 2 mfd. 1500 volt and 4 mfd. 1250 volt in single case. \$4.25
Aerovox 2 mfd. 2000 volt. 3.60
Faradon 2 mfd. 1750 volt. 2.95
RCA Blocks containing 6 to 12 mfd, 600 to 1000 volt tapped sections. No selection. Three for \$1.55
General Electric Fibre Cased Condensers
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2 Mfd. 1000 Volt .95 15 Mfd. 800 Volt 1.95
Faradon 1 Mfd. 1500 Volt. 1.25
Faradon 2 Mfd. 1000 Volt.85
General Electric War-Dipt Uncased Units. Easy Soldering Tabs
4 mfd. 1000 Volt 55c each, three for \$1.40
4 mfd. 1250 Volt 60c each, three for \$1.50
3 mfd. 1000 Volt 42c each. 2 mfd. 1500 Volt \$1.60
A * * * Special Compact metal case containing three 1 mfd. and one 2 mfd. units. All 1000 Volt DC Working! Case is common ground connection.
Six .25 mfd. 500 Volt bypass units in metal case 2 x 2 1/4 x 1. Case is common ground connection. At least one is needed in every set!
43c each, ten for \$3.95
Same, but with six .1 mfd. 39c each, 12 for \$4.10

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Copper Oxide Rectifier	3.00
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D.C. Ammeters, 0-2; 0-3; 0-5; 0-7.5; 0-15	
D.C. Voltmeters, 0-15; 0-20; 0-25	
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301 D.C. V. Meters, 0-10	3.75
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74 A.C. Ammeter, 0-75/5 Amps. F.P.	3.75
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Ratio 15 to 1. Volt Amperes 15	11.20
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J. & A. Type T-20 Microphone Trans.	6.00
Cardwell Type S-166BR Var. Cond., .000297 MF.	20.00
Cardwell T-183 Var. Cond., Mod., .00011 MF.	3.00
Cardwell S-202 Fixed Air Cond., .000245 MF.	75.00
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Hammarlund ML-11 Var. Cond., .00025	1.25
Hammarlund MC-9 Var. Cond., .000032	.40
Dubilier 667 Mica Trans. Cond., 700 V., .04 MF.	2.30
Dubilier 667 Mica Trans. Cond., 2500 V., .02 MF.	3.00
Dubilier 662 Mica Trans. Cond., 4000 V., .02 MF.	5.00
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Paradon UC 2313 Mica Trans. Cond., 25,000 V., .003 MF.	20.00
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Mtg. feet for "D" Resis., Pr.	.05
W.L. Rheostats, 1.1 Ohm, 10-5 Amp.	1.00
W.L. Rheostats, 2.5 Ohm, 12-6 Amp.	1.00
Johnson 154, 15 turn 4 1/2" Edgewound Cop. Ind.	1.00
Johnson Ind. Cpls.	1.00
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Pyrex 6" Lead-in Bowls	1.00
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Packard 7 MM Cable, 100 Ft.	3.00
Univ. 80 or 160 turn R. F. Chokes, pie wdl.	.50
Acme, Parvot, Aerovox, or Polymet Cond.	
1 MF 200 V.D.C.	.20
2 MF 200 V.D.C.	.40
Relay Racks: 2 1/2" Wd, 7 1/2" Hgh, Chan. & Angl. Iron	8.00
Slotted Steel Rack Panels: 3/16" Thick x 21 1/4" Lg.	
5 1/4" Wide	.50
3 1/4" "	.60
5 1/2" "	.75
7 1/4" "	1.00
10 1/4" "	1.50
11 1/4" "	1.50
Sltd. Bkltte. Rack Panels: 3/16 x 7 x 21 1/4 Lg.	.75
Centralab 500,000 Ohm Potentiometers	.65
Globar Resistors, 500, 5M, 25M, 50M, 100M, 150M Ohm	.05
Spec. Fric. Dr. Dial for turn. Ig. Card. Var. Cond. Comp. with lock. Vise. scale, ptr., coils 5 to 12" Ins. shaft	3.00
Jeff. Trans. 250 w-220-3 Ph.-2500 V bet phases	5.00
Jeff. Trans. 1500 w-220-3 Ph.-5000 V bet phases	10.00
Jeff. Trans. 150 w-220-3 V. Fil., 6000 V. Ins.	5.00
High Volt. Motor Gen. Sets. Prices on application.	
General Radio Hear. Temp. Control Unit. G.R. P-199	
A.S. & G.S. Cost \$700. Net.	100.00

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412 N. Leavitt Street Chicago, Illinois

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separate circuits and has five contacts available for each circuit. Wiping contacts with spring action are used throughout; there are no pigtails or bearing contacts on the rotating member. The switch can be mounted on a panel in the same way as a variable resistor or single-hole mounting variable condenser, and is controlled by the same kind of knob.

The multi-section switch illustrated is made by the Oak Manufacturing Company, 308 West Washington St., Chicago.

Silent Keys

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

Harold W. Fowlkes, W2BFF, Yonkers, N. Y.

A. A. Gayton, VE1CE, Sydney, N. S.

Louis A. Giamarco, W1ALH, Milford, Mass.

Geoff. Helicar, VK2AX, Wolstonecroft, N. S. W.

Francis V. Joseph, W6BTO, San Francisco, Cal.

A. L. Machesney, ex-8EW, Pittsburgh, Pa.

Clinton G. Mott, WSDGB, Wilkes-Barre, Pa.

S. Sugita, J1DN, Tokyo.

Kenneth Wolfe, ex-W9CAJ, Pipestone, Minn.

Dr. E. S. Yeck, W9EBP, St. Louis, Mo.

W2PF

(Continued from page 45)

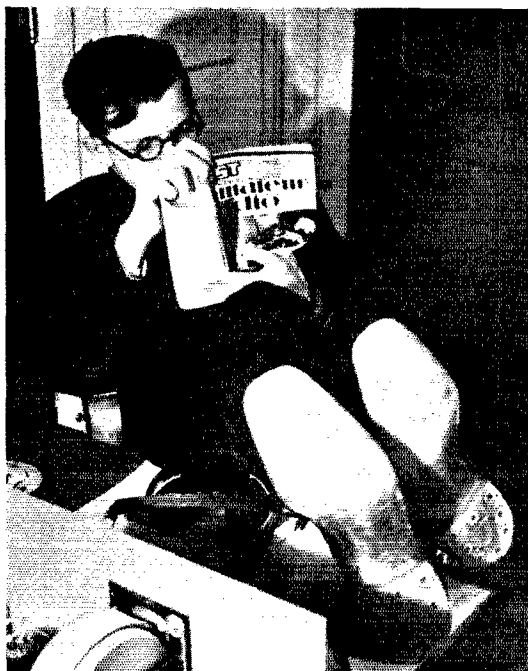
The crystal oscillator tube is a 510, the whole unit, with filament voltmeter, plate milliammeter and tank ammeter being built in an aluminum box which occupies the left-hand side of the lowest shelf in the photograph. To the right of the oscillator is the buffer stage, also using a 510 tube, and similarly shielded. The power amplifier, a 503-A, is on the shelf just above, together with the necessary meters and tuning condenser. Antenna condensers and a radio-frequency ammeter are mounted on the top panel.

A 750-volt power supply using a 281 rectifier furnishes plate power for the oscillator and buffer stage as well as "C" bias for the buffer and final amplifier. Plate power for the 503-A is obtained from a Thordarson 1500-volt transformer, a pair of 566 rectifiers, and an 8-ufd. bank of filter condensers. The voltage at the plate of the tube is 1850. Keying is done in the center-tap of the final amplifier, a large click filter being used for the benefit of local b.c.l.'s.

The receiver at W2PF is a National SW-3, using a.c. tubes with "B" battery plate supply. The usual monitor is on hand for checking up on the signals from the transmitter. The antenna is

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Your
Christmas
List



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Deduct 10% from all advertised merchandise and send your money order for the balance

PURADYNE Power Transformers are designed for continuous operation at full load. The insulation test at a potential of 10,000 volts insures satisfactory operation under all possible conditions.

No.	Out Put Voltage	Filament Voltages	Watts	Price
80	2500-0-2500		850	\$12.50
	1500-0-1500			
	1000-0-1000			
50	1000-0-1000		500	9.00
	1500-0-1500			
48	1000-0-1000		400	8.40
	750-0-750			
40	1000-0-1000		400	7.50
10	750-0-750	7 1/4 V. c.t.-7 1/4 V. c.t.	325	5.00
10A	600-0-600	7 1/4 V. c.t.-7 1/4 V. c.t.	200	4.00

Shielded with stand-off insulators
No. 80..... \$14.00 No. 40..... \$9.00 No. 48..... \$9.90
No. 50..... 10.50 No. 10..... 6.00 10A..... 5.00

PURADYNE Filament Transformers, 10,000 v. insulation in metal cases with stand-off insulators: All guaranteed for six months against any defects.

ALL CENTER TAPPED:

Type	Volts	Amps	For Tube No.	Price
A	2 1/2	12	866's	\$3.50
B	2-2 1/2	10 each		4.50
C	5	20		6.00
D	7 1/2	7	210, 250, 281's	4.50
E	7-7 1/2	6 each		4.50
F	3-7 1/2	6 each		6.50
G	10	7 1/2	203, 211, 852's	4.00
H	12	12	204, 212 Ds	4.50
I	4	12		5.50
J	2 1/2 V and 10 V	10-7 1/2	Special	6.50

PURADYNE CHOKES in metal cases with stand-off insulators

Type	Henries	Mills	D.C. Resistance	Price
200 Single	30	125	260 Ohms	\$1.00
201 Double	30 ea.	125 ea.	260 Ohms ea.	1.50
202 Single	20	250	110 Ohms	3.00
203 Double	30 ea.	250 ea.	110 Ohms ea.	5.00
204 Single	20	500	90 Ohms	7.50
205 Single	20	750	110 Ohms	10.00
206 Single	20	200	320 Ohms	2.00
207 Double	200 ea.	200 ea.	320 Ohms ea.	3.50

Type 200 and 201 no stand-off insulators
PURADYNE guaranteed transmitting filter condensers, metal cased with stand-off insulators. All condensers rated at a continuous working voltage:

Capacity	1000V.	1500V.	3000V.	3000V.	4000V.
1 mfd.	\$1.25	\$2.00	\$3.00	\$6.00	\$10.00
2 mfd.	2.00	3.00	5.00	11.00	18.00
3 mfd.	2.50	4.25	6.50	18.00	27.00
4 mfd.	3.25	5.50	8.00	22.00	36.00

PURADYNE Double Button Microphones, broadcast type A REAL BUY..... \$9.50

PURADYNE 50 Watt Sockets, heavy duty SPECIAL \$.75
Power Supply for 210 Transmitter will supply 700 volts at 250 Mils. of pure D.C. current and will also supply 7 1/2 V. for 210 tubes, completely wired \$17.50; in kit form \$14.00
Power Supply for 50 Watt Transmitter will supply 1200 Vts. at 400 Mils. of pure D.C. Current and will also supply 10V. for 50 Watt Tubes; completely wired and guaranteed \$32.50

AMERTRAN 250 P.P. Power Transformers 700-0-700 Volts, 7 1/4 V. c.t. 7 1/4 V. c.t. 225 Mils. 325 Watts..... \$4.75

MERSHON Electrolytic Condensers, metal cases 8 mfd. 450 Volts..... \$.45
Voltage Dividers 18,000 Ohms for 245 P.P. 5 taps..... \$.35
Voltage Dividers 21,600 Ohms for 210 Packs tapped..... \$.45

AMERTRAN Power Supply Block mounted in neat metal case 600-0-600 V. 2-30 Henry 150 mil chokes, 2-2 1/2 V. Fil. for 866's or the new type 83 M. Tubes..... \$7.50

Bleeder Resistor 75000 Ohms..... 1.30
Tube Shields Aluminum for 57 or 58 Tubes..... .10
43 Plate Condensers .001 for Double Spacing..... .39

JEWELL RECORDER for Cutting and Recording on Aluminum Record Blanks..... \$6.95

WEBSTER 3-Stage Amplifier ideal for above..... \$20.00

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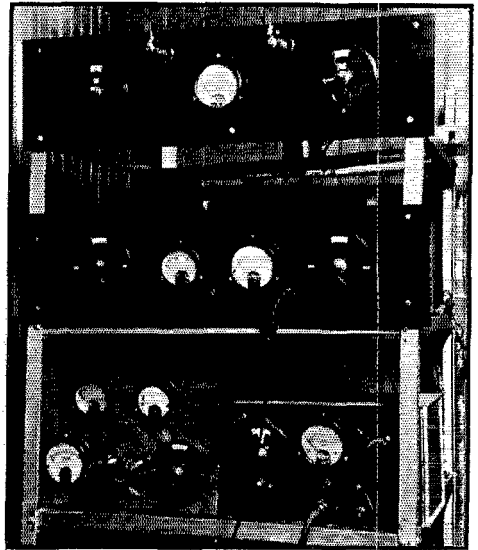
110 Chambers St., N. Y. City

Phone Barclay 7-8937

Dept. S

108 feet long, and is used in conjunction with a two-wire 35-foot counterpoise.

The transmitter was designed chiefly for use



W2PF

on 3510 kc. for Army-Amateur work, but can also be used on 7020 kc. by changing the power-amplifier plate inductance. It is also used occasionally on 6990 kc. under the call WLN1.

Talley holds a commission as Captain in the Signal Corps Reserve, and is Radio Aide for the Second Corps Area as well as Alternate Net Control Station. W2PF is also an OBS, ORS and OO.

I. A. R. U. News

(Continued from page 47)

Dougall Whitburn, Fullerton, South Australia, well known DX station of 32 meter days — and now..... Congratulations, OM..... European 28 mc. activity still continues. HAF, VO, G and PA are all active in this field..... A few good weekends, but in general conditions have been poor..... It looks like New Zealand's prize radio family, which already boasts YL's ZL4CL, ZL4DT and ZL4FN, and OM ZL4BJ, will soon be augmented by the licensing of a younger brother, who has been learning his dots and dashes under big sister's watchful tutelage..... Nancy, ZL4FN, qualified for RCC the first night she spent on the air..... VK4HW, H. Walsh, of Toorak Hills, Queensland, who is a qualified pilot, met with an accident while flying on July 25th, but escaped serious injury..... While in flight above the Archerfield (Qld) 'drome the engine of the ship failed and it crashed to earth..... The plane was smashed to bits, but VK4HW fortunately suffered only minor abrasions..... Code practice transmissions are sent on Monday, Wednesday and Friday evenings at 2230 G.C.T. on a wavelength of 3325.9 meters from GYB, Cleethorpes, England..... Southern

"HOW CAN I BECOME A RADIO AMATEUR?"

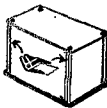
Are you ever asked that question?

Does your answer come easily, freely, briefly? No blame to you if it doesn't — amateur radio is a complex and diversified pursuit, and it cannot be considered in a word.

● The easiest way to answer that question is to suggest that your inquirer secure a copy of the League's special beginner's booklet. It is by far the best answer you could possibly give him, too, for the 32 pages of the new second edition of "How to become a Radio Amateur" outline the entire field of amateur radio, make learning the code easy, and tell how to build a simple station, with clear illustrations and easily followed building instructions — and there's concise dope on getting licenses and operating properly, too. In short, it answers the question — thoroughly, yet simply. An inexpensive introduction to amateur radio and preliminary to the Handbook. The price is 25c, postpaid.

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Genuine "ALCOA" stock, silverdip finish.
 5 x 9 x 6 \$1.75
 10 x 6 x 7 2.95

ANY SIZE TO ORDER

National Velvet-Vernier type F dial. Reg. Price \$4.30, Special \$1.50.
 National Equitone 500 mmf. Cond. Reg. Price \$5. Special \$1.50. Please include Postage.

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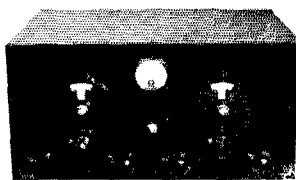
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The REL cat. No. 312 amplifier unit shown illustrates the general appearance of rack panels. The "312" panel measures 10 1/2" x 19" — aluminum construction throughout — class "B" push-pull modulator with class "A" amplifier — 25 watts undistorted audio output power — operates with single button microphone or can be connected to additional pre-amplification for use with two button or condenser microphones — uses three type 46 tubes — ready for immediate use — the ideal modulator — finest parts used — very reasonably priced. Write for information.



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Uses 232 and 233 tubes.
Tunes from 15 to 200
meters in special shield
case.

Complete Line of Lynch Resistors. "Pig Tail." 1 Watt, 19c.
2 Watt, 29c. 3 Watt, 39c.

Kellogg Single Button Hand Mike. For phone transmitter,
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Chrissel Acoustic Condenser Mike Kit. Complete kit of parts
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600-Volt Power Supply Kit. One power transformer, two
chokes, two sockets, six condensers, one metal base. \$12.45

Will supply 600 volts d.c. 150 mills with two 7 1/2-volt
windings and one 2 1/2 volt. \$5.95

Plate transformer, 600-0-600 2-7 1/2 fil. c.t. \$5.95

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Anti-Capacity Switches, "Stromberg" .59

8 Mfd. dry elect. cond., 500-volt. .59

Transmitting and practise key. .50

Genuine Baldwin phones. 3.75

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Sangamo input and output P.P. Trans. pair. 2.79

Isolantite 5-prong coil forms. Six for. 1.00

Jackson soldering irons. .59

Stand off insulators, doz. .50

2 1/2 volt Fil. trans., two windings. 1.49

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5 x 5 x 6 .80 8 x 8 x 6 1.50

5 x 5 x 6 1.10 5 x 6 x 9 1.70

6 x 6 x 6 1.25 10 x 8 x 6 2.25

6 x 10 x 7. \$2.75

Also aluminum cans and sheets cut to your order. 2.75

Philco power trans. No. 37. .79

Colonial input P.P. trans. .79

Mershon cond. 8-8 Mid. .79

Kelford No. 300 gain trans. Transformer and choke in
one unit. 1.19

Kelford output impedance. .99

Baldwin units. .79

Kelford output trans. Protect your speaker. .99

Thordarson 1-1 trans. 1.39

R.C.A. power trans. 1500-0-1500, 200 watts. 7.95

G.E. 3-cord mike connectors, male and female. 1.79

Kola output trans., P.P. pentodes. 1.19

R.C.A. rectifier, heavy duty. 4.19

Karas output trans. .95

Thordarson interstage push-pull trans. 1.95

Tube shields for new tubes, 56-57-58. .15

Eby Bolt sockets, 4-5-6 prong. .29

7-prong. .49

Eveready Rosin core solder, lb. .49

Benjamin sockets, 4-prong. \$.29 5-prong. .35

DeForest tubes

56 .74 58 .58 .95

57 .95 82 .74

Bond 250 tubes. 1.95

S-H. Lamp socket antenna. .59

DeJur Amisco condensers .00035

2 Gang. \$1.19 3 Gang. 1.49

Panel mount tone control. .95

Morrill transmitting condensers. Special

Set of 4 short wave coils, 15-200 meters. \$1.29

Set of 2 coils, broadcast band. .99

.0001

.00014 } Hammarlund midget cond. Special

.0002 } .00025

American mikes. Special

Universal mikes. Special

Cardwell condensers. Special

Weston meters. Special

Jewell meters. Special

Readrite meters. \$.69 up

Flechteim meters. \$1.95

Single button mike trans. 1.49

former. 1.49

Double button mike transformer. 1.95

Kenyon Transformers. \$2.25 up

Powertone amplifier three stage 50 P.P. 28.95

Mike control boxes for single or double. 4.95

Mike floor stands from \$3.95 to 12.95

Trymo Radio carries the most complete line of speakers. Why
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ment? Tell us your make of set and we will advise you how.

We can solve your Radio Problems. Let us know your needs

TRY-MO RADIO CO.

Main Store, 85 Cortlandt St.

178 Greenwich St.
Cor. Dey St.

179 Greenwich St.
Near Cortlandt St.

NEW YORK CITY

SEND FOR OUR LATEST CATALOG

and Central districts of the N.V.I.R. held a fox
hunt recently — with direction finders.
The Hague section had a field day with portable
3.5-mc. apparatus. Geoffrey Builder, former-
ly operator of VK6MO, Watheroo, W.A.
(see May, 1931, *QST*) has been included in the
personnel of a scientific expedition to the North
Polar regions.

The Right Way to Do It

(Continued from page 37)

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 Tues-
day from 10:00 a.m. to 12 noon and from 8:00 to
10:00 p.m., E.S.T. The accuracy of these trans-
missions is to better than 1 cycle (one in five mil-
lion). Information on how to receive and utilize
the signals is given in Letter Circular LC-335,
obtainable on request from the Bureau. Commu-
nications concerning these transmissions and
reports on their reception should be addressed to
Bureau of Standards, Washington, D. C.

— J. J. L.



Dr. C. L. Fortescue, of Westinghouse, in a
paper presented before the International Elec-
trical Congress in Paris, stated that there is no
possibility of counteracting the destructive
effects of a direct stroke of lightning. Lightening-
protective devices are useful chiefly to carry in-
duced surges to ground and in draining off the
"static" so that direct strokes are less likely to
occur. We wish now that somebody would come
along and take a crack at the idea that an antenna
is a hazard to life and property, while a wire
clothesline is perfectly safe.

High-power wavelengths! According to a San
Francisco paper, KJBS of that city is coming up
in the world, having increased its wavelength
from 5 watts to 100 watts. W6BNA says they use
a temperature-controlled wattmeter to keep on
frequency!

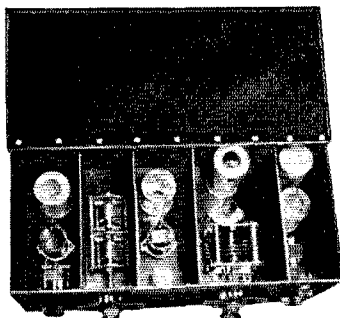
Some people have queer ideas of humor.
Not long ago we received a letter, ostensibly
from Mrs. W. C. Darracott, reporting the death
of K6CQZ. It was duly reported in Silent Keys,
and then comes a letter hot-foot from Darracott
himself, very much alive—and wanting to

Merry Christmas, OM!

Headquarters for Single Signal Superheterodynes
—Why Not Start 1933 Right?



Front View of H. F. Tuner



Open View of H. F. Tuner

S. S. High Frequency Tuner & I. F. Filter

The New M. & H. High Frequency and I. F. Filter Unit for the Single Signal Type Superhet, as described by Don Lusk in November QST, is now available to Amateurs in kit form. All parts assembled but not wired. A pair of pliers, a screw driver and soldering iron are only tools required.

\$90.75 Complete, Less Tubes

I. F. & Audio Frequency Companion Unit

A fitting companion to the High Frequency Tuner and I. F. Filter Unit, constructed along same lines as the H. F. Tuner and provides for either C. W. or phone reception. Both units housed in heavy aluminum cabinets, finished in beautiful black crinkle lacquer.

\$57.

Completely Assembled, But Not Wired

Send for New 1933 Catalog. Just off the Press

M. & H. SPORTING GOODS CO.

36 Years of Service. Buy with Confidence

512 MARKET STREET PHILADELPHIA

Southern Products Announces

An Improved Southern Band Spread Amateur Receiver. Four tubes, all AC with power pack. Plug-in coils. Complete with tubes, \$18.90. 3-tube DC, \$13.90. 2-tube SW, \$7.45. Get our Radio Magazine list.

TUBE SALE. We have extended our tube sale another month. See Nov. QST, page 91. AMATEUR CALL BOOKS, new 90c. Postpaid.

Special Tubes for 5 meter and 1/4 meter Trans. and Rec. TNT transmitter with power supply and tube, \$17.50. Push Pull with 2-245's, \$19.50.

Condenser Mike Kits. Complete units \$3.00. Assem'd. \$8.00. Also Moving Coil Dynamic Mike Kits.

Complete kit for the BEGINNER'S CRYSTAL CONTROL TRANSMITTER DESCRIBED IN NOV. QST — ready to wire. Write for price.

SOUTHERN PHOTO QSL's. Have you seen these new clever cheap photo cards? Send 3c for samples and prices.

ATTENTION HAMs!! Write for our new plan HAM CATALOG. Please include Postage. 20% deposit on C.O.D.'s

SOUTHERN PRODUCTS

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Little Percy had a call
He hasn't got it now
The Supervisor said to him,
"You simply don't know how."

Moral—

Send a dollar today for your copy of the Radio Amateur's Handbook 242 pages of invaluable ham dope.

American Radio Relay League, Inc.
West Hartford, Conn.

"Round the World Clock"

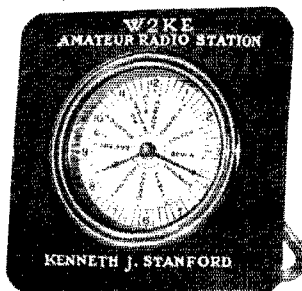
Tells time, at a glance, in all parts of the world

The ideal timepiece for an amateur radio station. 24-hour guaranteed movement. Mounted in a genuine black leather plaque with gold lettering as shown, individually for your own station. A beautiful and highly useful addition to your station. Supplied with either 12 zone (12 hours) or 24 zone (24 hours) dials. Illustration shows 12 zone dial.

Price \$5.00 Plain — \$6.00 Lettered — Shipping charges prepaid
40% Discount to Hams

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An Ideal
XMAS PRESENT

The
Radio
Amateur's
HANDBOOK

Swell Idea, Isn't It?

USE THE HANDY COUPON BELOW

*We'll see that the book arrives
at the right time*

A.R.R.L.
38 LaSalle Road
West Hartford, Connecticut

Enclosed \$1.00. Send Handbook,
with gift card, to

(Name)

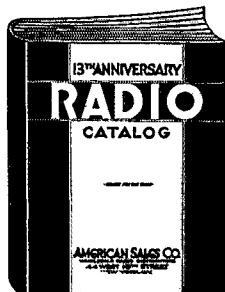
(Street or box)

(City and state)

Gift of _____

FREE

13th Anniversary Catalogue



124 pages containing the most complete listing of radio items for the amateur and experimenter at real bargain prices.

Send for your copy now!

AMERICAN SALES COMPANY

Wholesale Radio Distributors

Q-44 W. 18th St., N. Y., N. Y.

*The Oldest Amateur Supply House
Established 1919*

know what it was all about. That sort of thing is in pretty poor taste. Save the jokes for Strays.

While CQ'ing W2AZN detected a change in frequency, and upon scanning the horizon found a kitten QRQ'ing from the plate tank. No doubt that accounts for the squeal in his note!

W1ADF's call was the first one listed in "Calls Heard" in June QST, and he's willing to bet that the bird using his call on the 3500-ke. 'phone band on March 21st wishes he had used his own call — if he has one.

Pacific Coast Amateurs Dig Into 56-MC.

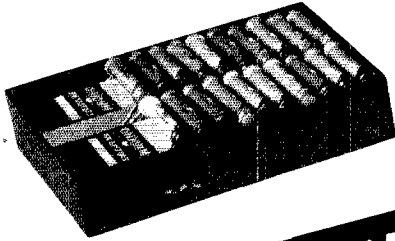
(Continued from page 27)

permits, passes, for locations, autos for the trips; to Mr. Aitken, Director of the Lick Observatory for giving the bunch stationed there all the comforts of home; to Commander Powers, Captain Porterfield, and Lt. Nelson, U. S. Navy, of Yerba Buena Island, San Francisco Bay, for assisting us at that location.

Radio Commission Reorganizes Field Force

(Continued from page 33)

- dino of the State of California; the County of Clarke of the State of Nevada, and the State of Arizona.
- Radio District No. 12:** Headquarters, San Francisco, Cal. The State of California, except the Counties of Monterey, Kings, Tulare, San Luis, Obispo, Kern, Santa Barbara, Ventura, Los Angeles, Orange, San Diego, Imperial, Riverside and San Bernardino, and the State of Nevada, except the County of Clark.
- Radio District No. 13:** Headquarters, Portland, Oregon. The State of Oregon and the State of Idaho, except the Counties of Boundary, Bonner, Kootenai, Shoshone, Benawah, Letah, Clearwater, Nex Perce, Lewis and Idaho.
- Radio District No. 14:** Headquarters, Seattle, Wash. The State of Washington, the Counties of Boundary, Donner, Kootenai, Shoshone, Benawah, Latah, Clearwater, Nex Perce, Lewis and Idaho of the State of Idaho, and the Counties of Lincoln, Flathead, Glacier, Toole, Pondera, Teton, Lake, Sanders, Mineral, Missoula, Powell, Lewis and Clarke, Cascade, Meagher, Broadwater, Jefferson, Granite, Ravalli, Deerlodge, Silver Bow, Beaverhead, Madison, Gallatin of the State of Montana.
- Radio District No. 15:** Headquarters, Denver, Colo. The States of Colorado, Utah, Wyoming, and Montana except the Counties of Lincoln, Flathead, Glacier, Toole, Pondera, Teton, Lake, Sanders, Mineral, Missoula, Powell, Lewis and Clarke, Cascade, Meagher, Broadwater, Jefferson, Granite, Ravalli, Deerlodge, Silver Bow, Beaverhead, Madison and Gallatin.
- Radio District No. 16:** Headquarters, St. Paul, Minn. The States of South Dakota, North Dakota, Minnesota, the northern peninsular of Michigan, and the State of Wisconsin, except the Counties of Crawford, Richland, Sauk, Columbia, Dodge, Washington, Ozaukee, Milwaukee, Waukegan, Jefferson, Dane, Iowa, Grant, Lafayette, Green Rock, Walworth, Racine and Kenosha.
- Radio District No. 17:** Headquarters, Kansas City, Mo. The States of Nebraska, Kansas, Missouri and Iowa, except the Counties of Winneshiek, Allamakee, Fayette, Clayton, Buchanan, Delaware, Dubuque, Linn, Jones, Jackson, Clinton, Cedar, Johnson, Washington, Muscatine, Scott, Louisa, Des Moines, Henry and Lee.
- Radio District No. 18:** Headquarters, Chicago, Ill. The States of Indiana, Illinois, and the Counties of Winneshiek, Allamakee, Fayette, Clayton, Buchanan, Delaware, Dubuque, Linn, Jones, Jackson, Clinton, Cedar, Johnson, Washington, Muscatine, Scott,

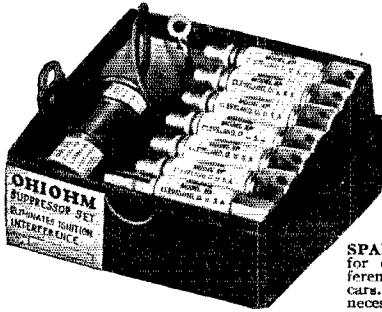


FIRST-AID RESISTOR KIT
Pocket size. Furnished in 1-watt and 2-watt types. Protect-O-Packed to keep wire-leads straight. Each unit stamped with value. Includes free supply of service labels.

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5000 RADIO MEN WHO WANT TO MAKE EXTRA MONEY

Since radio receivers have become so popularly equipped with resistors, a new service has been created — for resistors, like other parts, cannot go on forever. "Look to your resistors" has become an important by-word when sets are not performing satisfactorily. This is but one of the opportunities OHIOHMS offer the service man.



OHIOHM RESISTORS

THE OHIO CARBON COMPANY
12508 Berea Rd. Cleveland, Ohio

SPARK SUPPRESSOR SETS for eliminating ignition interference on 4, 6, or 8 cylinder cars. Contain condenser and necessary suppressors.

OHIOHM Resistors are made in Canada by C. Meredith & Co., Ltd., Toronto.

Something New
CLEANAIRE
Ice-Box and Refrigerator
DEODORIZER
Absorbs and destroys food odors
ASK FOR DETAILS

When you see insulators like these . . .



No. 60

you'll know it's a **JOHNSON** idea

They are good—we admit it. And anything good enough to be so widely copied is good enough for you to demand the original. If your jobber hasn't them—won't get them—order direct. Prices are right.



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80 and 160 meter bands, "X" or "Y" cut, our calibrations guaranteed accurate to .001% —
Approximate frequency specified by you \$5.00
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Oscillating blanks . . . \$3.00 Dustproof holders . . . \$2.00
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BROADCAST AND TOURMALINE CRYSTALS
QUOTATIONS ON REQUEST

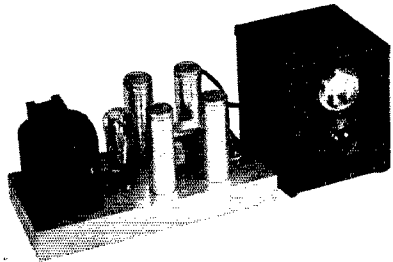
All calibrations made with General Radio Frequency Standard and checked with Bureau of Standards transmissions and U. S. Naval Observatory time signals.

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FOR LESS THAN \$20!

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Price to be advanced Jan. 1, 1933



**"GIMME ONE,
me sister's got it"**

A ragged, dirty news-boy blurted, "Gimme one, me sister's got it," and dropped on the marble counter* a single penny that tinkled lonesomely. He was buying one of the first Christmas Seals sold in the United States for anti-tuberculosis work. The need was great. He knew. His sister had it.



Today, Christmas Seals help protect you and your family, for although the death rate from tuberculosis has been reduced two-thirds it still kills more people between 15 and 45 than any other disease. Your pennies make possible free clinics, nursing service, preventorium, and educational work that mean cure for some, relief for many, and hope for all.

*In the lobby of the Philadelphia "North American," Dec. 13, 1907

THE NATIONAL, STATE AND LOCAL
TUBERCULOSIS ASSOCIATIONS
OF THE UNITED STATES

BUY CHRISTMAS SEALS

RADIO INSULATORS



No. 14



No. 82
Midget



No. 318-618-1218
3 in. 6 in 12 in.



No. 15



No. 33 No. 25



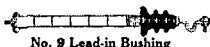
No. 159 Lead-in



No. 88 Aerial Tightener



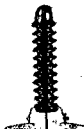
No. 83
Heavy Duty



No. 9 Lead-in Bushing



No. 40



No. 8
Heavy Duty
TRENTON
NEW JERSEY

M. M. FLERON & SON

Louis, Des Moines, Henry and Lee of the State of Iowa; and the Counties of Crawford, Richland, Sauk, Columbia, Dodge, Washington, Ozaukee, Milwaukee, Waukesha, Jefferson, Dane, Iowa, Grant, Lafayette, Green, Rock, Walworth, Racine and Kenosha of the State of Wisconsin.

Radio District No. 19: Headquarters, Detroit, Mich.

The State of Michigan, except the northern peninsular and the States of Ohio, Kentucky and West Virginia.

Radio District No. 20: Headquarters, Buffalo, N. Y.

The State of New York, except the City of Greater New York and the Counties of Suffolk, Nassau, Westchester, Rockland, Putnam, Orange, Dutchess, Ulster, Sullivan, Delaware, Greene, Columbia, Albany and Rensselaer; the State of Pennsylvania, except the City of Philadelphia, and the Counties of Bucks, Montgomery, Philadelphia, Chester, Delaware, Lancaster, York, Adams, Cumberland, Perry, Dauphin, Lebanon, Berks, Schuylkill, Lehigh, Northampton, Carbon and Monroe.

The Pacific Division Convention

PEP, vim, and vigor — plus the spirit of progressiveness over all. A good time! From start to finish something was doing every minute. Every committee had done its duty well. California sunshine at its best greeted a record-breaking attendance on September 2nd and 3rd. The affair put over by the Associated Radio Amateurs of Long Beach under the able direction of Convention Manager W6HT will be long remembered as outstanding in the annals of conventions.

The Registration Committee (Mrs. W6HT and Mrs. W6EKS) were greeted bright and early by a long line of waiting hams — led by W6BXE, who hiked all the way from Huntington Park (1.00 a.m.) in order to be "first to register." Col. Clair Foster, Pacific Division Director, formally opened the convention. All the delegates got acquainted and events came thick and fast. Code contests, visits to ham shacks, pike amusements (the convention ticket admitted one to dozens of interesting beach-places), etc. There was entertainment and enjoyment in varied forms, and colorful incidents too numerous to record in detail.

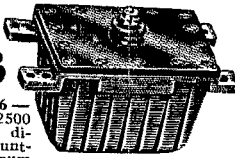
Club stunts, QLF, CQ, Whistling, liars' contests arranged by W6VH were followed by a whopping big smoker, W6DQI master of ceremonies . . . and then a "surprise trip" to the good (?) ship *Johanna Smith II*, a moonlit sail in swift motor taxis 'way out past the big battle-wagons riding at anchor! Sunday, the convention got down to the more serious side of amateur radio. Technical and communications meetings with talks by authorities on many subjects were the order of the day. Wallace, W6AM; Routh, W6CJQ; Gordon, W6CLH; Swift, W6CMQ; Messrs. Moore and Whittemore; Handy, W1BDI-A.R.R.L.; Dr. Waters, W6EC-U.S.N.R.; Martin, W6AAN-A.A.R.S.; Section Communications Managers and RMs were on the program preceding the "open forum" which concluded in time for all delegates to take a dip — before the banquet. Music, novelty numbers, addresses by the Director, and Assistant Director Culver, W6AN, by the popular and efficient Radio Supervisor, Mr. Chapple, by Coms. Mgr. Handy, "Bill" Lippman, Jr., W6SN-W6USA, and others featured the banquet. Prize awards were made

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Dubilier Transmitting Condensers Regular Price \$65

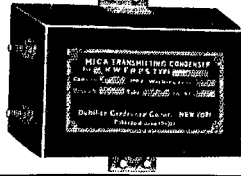
M. & H. Special Price \$3

Type GD956— .004 Mfd.—12500 volts. Mica dielectric—Mounted in aluminum cases. Tested and guaranteed.



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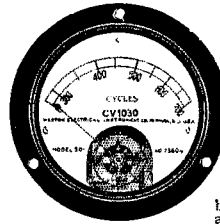
1. mfd. MICA 1750-volts working\$2.50
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Model 301

\$2.50 Each



Navy type, CV 1030 Frequency Meter, 0 to 700 cycles. Can be made into a D.C. milliammeter for any range above 25 MA, by removing 1 ampere shunt.

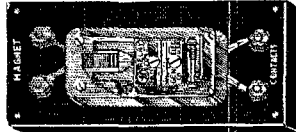
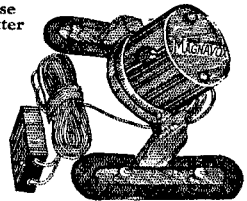
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Ammeters
0 to 1 1/2 amps. Radio frequency.
Limited quantity.

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\$1

With head straps
Single button
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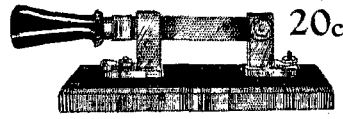


Gen. Electric Relays \$2
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—Enclosed in dustproof cover.

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Phones 2200 ohms.

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Johnny Jones groans and groans,
There are no signals in his phones.
Tomorrow night he'll be all right,
His Handbook's in the mail tonight.

Moral—

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For the first time, a device is offered for the protection of valuable amateur transmitting equipment.

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Designed especially for the amateur at an amateur's price. Whether you operate a pair of '10's or an '04-A, the SENTINEL pays for itself the first time it operates. Provides reliable protection for TUBES, METERS, RECTIFIERS, TRANSFORMERS against damage caused by IMPROPER CIRCUIT ADJUSTMENTS, ERRORS IN PLATE VOLTAGE, FAILURE OF NEUTRALIZATION, RECTIFIER OVERLOAD, BIAS FAILURE, TRANSFORMER OVERLOAD, and other unexpected causes. Indispensable in remote control work. Entirely automatic and instantaneous in action. No attention. No renewals. Tripping range 50 to 400 m.a. Handles all amateur tubes and loads. Back of panel mounting. 5 1/2" x 3" x 2". Shipping weight 3 lbs. Breakers for higher powers on order. SEND FOR CIRCULAR A. Cash with order or C.O.D. only — \$5.85 plus postage.

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5%	\$5
1%	\$6
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.25%	\$10
.1%	\$15
.05% *	\$20
.03% *	\$30
.01% *	\$45

* Can only be guaranteed when calibrated in oscillator the crystal will control.

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If you want to be a High Speed, Expert Operator write CANDLER for Free Advice

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CANDLER
World's Only
Code Specialist,
Instructs You Personally



by WGANZ — oh what prizes! Enthusiastic bids for the next convention were made by Fresno and San Jose. The latter group won. They invite you. Don't miss it. The gang will see you there — San Jose, 1933! —F. E. H.

Information Service Rules

PPROMPT handling of inquiries concerning amateur equipment and problems will be greatly facilitated if the following rules are observed when writing to the A.R.R.L. Technical Information Service:

1. Before writing, consult *The Radio Amateur's Handbook* and your files of *QST*. Nine times out of ten you will be able to find the answer in *QST* or the Handbook.

2. If reference is made to the Handbook, mention the page and the edition to which you refer. If reference is made to *QST* mention the page and issue you have in mind.

3. Write on one side of the paper only, and use a typewriter if possible.

4. Number the questions and make a separate paragraph for each question. Make the questions as brief and as direct as possible.

5. Make diagrams on separate sheets of paper and fasten them to your letter with a pin or paper clip. All diagrams should be schematic — do not send pictorial diagrams.

6. Print your name and address in full on each sheet of paper. A return address on the envelope is not sufficient, as the envelope is destroyed by the office manager as soon as the letter is opened.

7. Keep an exact copy of your questions and diagrams, and mention that you have done so.

8. Do not ask for opinions on, or comparisons of, business concerns or their products.

9. Enclose postage for the reply but do not send an envelope. It is much more convenient for us to use our own envelopes with our stationery.

10. Address all questions to the Technical Information Service, American Radio Relay League, 38 La Salle Road, West Hartford, Conn.

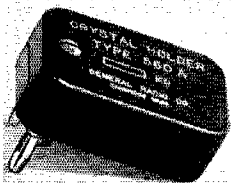
Any back copies of *QST* to which we refer you may be obtained from our Circulation Department for twenty-five cents each.

The observance of the above rules will be mutually beneficial.

New Plug-in Crystal Holder

ALTHOUGH there are many varieties of plug-in crystal holders on the market, the one which was shown in the photograph of the low-power transmitter on page 9 of November *QST* is unusual in that it is made of a new alloy which is beneficial in reducing corona discharge. This alloy, which is named "Tinicosil," is a white metal which takes a polish like that of nickel, but will not corrode or tarnish.

Tests with crystal holders using Tinicosil plates have shown them to be much superior to the usual brass plates. Corona forms at much lower oscillator plate voltages with brass plates, with consid-



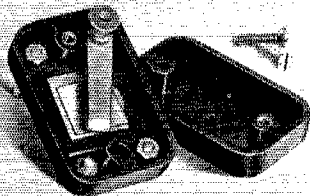
GET MORE POWER—BETTER FREQUENCY STABILITY

FROM YOUR CRYSTAL-CONTROLLED TRANSMITTER

Examine your present crystal holder—Compare it carefully with the new General Radio holder designed for amateur and experimental transmitters.

SPECIFICATIONS:

1. **Dust and moisture proof bakelite case**, protecting crystal from unnecessary and harmful handling. 2. **Holds any amateur crystal**—Mounts 160-80-40-20 meter crystals, round or square, thick or thin. 3. **Adjustable spring tension**—Assures correct pressure on any crystal for maximum output—Spring tension easily changed. 4. **Three blank bakelite retention plates supplied**—Hold crystal correctly for best frequency stability—Readily cut with knife to fit your crystals. 5. **Chromium-plated brass plates**—Cut flat and lapped smooth—Prevent tarnish and corrosion—Insure reliable operation—Plates have ample surface for largest crystal. 6. **Opened by loosening only two screws**. 7. **Standard plug-in terminals**—Standard G.R. (3/8-inch) spacing. If your present holder does not have every one of these features, you can well afford to spend \$2.25 for a holder which will insure better performance from your transmitter.



TYPE 560-A Crystal Holder—\$2.25

Send cash with your order and we'll pay the postage to any point in the U. S. or Canada. Address General Radio Company, 30 State Street, Cambridge, Massachusetts, or our San Francisco branch at 274 Brannan Street.

GENERAL RADIO Co.

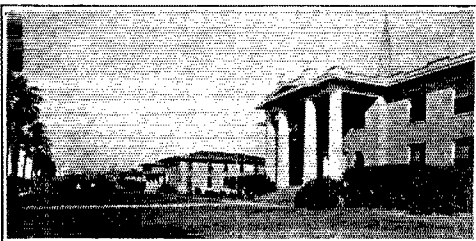
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PAPER DIELECTRIC CAPACITORS for radio, television and ignition, and RESISTORS for radio and television. Also Filter and By-Pass Condensers and Interference Filters. Write for your free copy of our Catalog A.

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PORT ARTHUR, TEXAS

It PAYS
to keep your
**CRYSTALS
WARM**
with a
**WARD LEONARD
OVEN CONTROL**



It not only works but is economical. You get perfect control of wave length by keeping crystals at a uniform temperature. Send for new FREE bulletin No. 507, telling about the oven control, remote control relays and other Ward Leonard necessities.

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Please send me complimentary copy of Bulletin No. 507:

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CONDENSER
MICROPHONE
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can afford*

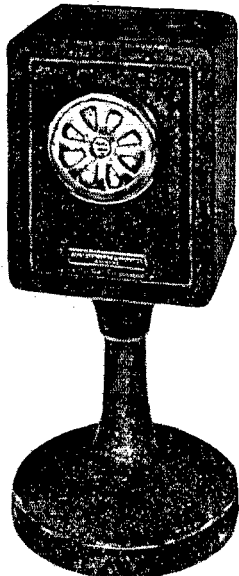
Model S-2
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Comes complete with
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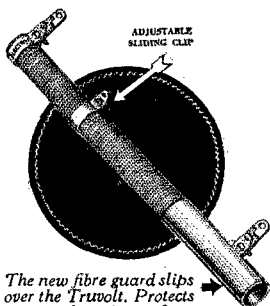
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you and resistor from
accidental contact with
hands or tools.

A New Safety Feature !

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Resistors have always had these *exclu-
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struction:

- 1 — Open, spiral winding, giving greater radiation, longer life and better electrical contact.
- 2 — Adjustable sliding clips for setting exact voltage values.

Now, a *safety* feature is added: A full-length fibre guard protects the resistor and operator from contact with tools or hands.

No finer resistors are made. *Ask your dealer.*

Write Dept. Q-12 for
Complete, New Catalog

175 Vastack St., New York, N.Y.
ELECTRAD

erable danger of burning a hole in the crystal. With Tincosil plates it has been found possible to apply voltages as high as 700 to a 3500-ke. oscillator with only a trace of corona and no indication of harming the crystal.

The new holder has a round top-plate with a small pin centered in it. The spring contact has a hole drilled in one end to fit over the pin in the top plate so that the latter always rests flat upon the crystal and cannot move laterally in the holder. The holder is fitted with G. R. pins which fit into the standard G.R. mounting ($\frac{3}{4}$ -inch between plugs). Crystals up to $1\frac{1}{4}$ inches square can be accommodated.

The holder is being manufactured by the Bellefonte Radio Engineering Laboratory, formerly Fridgen and Barnes Radio, of Bellefonte, Penna. The parts making up the holder can be purchased separately.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, published monthly at Hartford, Conn., for October 1, 1932.

State of Connecticut } ss:
County of Hartford }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared David H. Houghton, who, having been duly sworn according to law, deposes and says that he is the acting business manager of QST and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, The American Radio Relay League, Inc., West Hartford, Conn.; Editor, Kenneth B. Warner, West Hartford, Conn.; Managing Editor, Clark C. Rodimon, West Hartford, Conn.; Business Manager, Kenneth B. Warner, West Hartford, Conn.

2. That the owners are: (Give names and addresses of the individual owners, or if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent. or more of the total amount of stock.) The American Radio Relay League, Inc., an association without capital stock, incorporated under the laws of the State of Connecticut, President, Hiram Percy Maxim, Hartford, Conn.; Vice-President, Chas. H. Stewart, St. David's, Pa.; Treasurer, A. A. Hebert, West Hartford, Conn.; Communications Manager, F. E. Handy, West Hartford, Conn.; Secretary, K. B. Warner, West Hartford, Conn.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: (if there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear on the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also, that the said two paragraphs contain statements, embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct, or indirect in the said stock, bonds, or other securities, than as so stated by him.

DAVID H. HOUGHTON,
Acting Business Manager.

Sworn to and subscribed before me this 14th day of October, 1932.

Alice V. Scanlan,
(My commission expires February, 1934.)

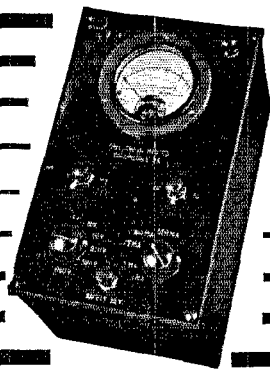
How to Calibrate Your Frequency Meter from WWV

(Continued from page 30)

should be used. One should be tuned to WWV, and a monitoring operator should do nothing but keep the oscillator to zero beat with WWV. The second operator, using a second receiver, makes all other adjustments as above.

The method described is most useful for marking the limits of the 3500- to 4000-band; the new

The New SHALLCROSS General Purpose Meter No. 610



provides facilities for a wide range of electrical measurements not usually possible in one instrument.

Employing a No. 610 Shallcross Resistor Kit and the Weston Model 301 Universal Meter, this combination meter measures 4 D.C. Voltage Ranges, 4 D.C. Current Ranges, 4 A.C. Voltage Ranges, Resistance measurements of 1 ohm to 3 megohms. Inductance measurements, 1 to 10,000 henrys. Capacity measurements, .001 to 10 mfd. Output Meter.

Send 6c in stamps for Bulletin 152.C which contains a diagram of this circuit and information on its construction.



EXPERIMENTAL RADIO

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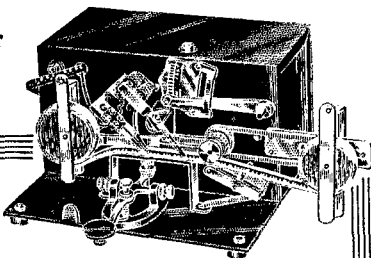
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RECORDS your own sending in visible dots and dashes and then repeats it to you audibly on the headphones. 5000 words on each tape. Number of tapes unlimited. This marvelous new invention revolutionizes the teaching of code — makes learning easy, rapid and interesting. No previous experience necessary. *The New Master Teleplex is the only instrument ever made that will record your own sending and then repeat it back to you exactly as it was sent.* Radio and electrical engineers agree that this is the most marvelous instrument of the kind ever produced. Originally not intended for individual instruction because it was too expensive. It was developed for the U. S. Signal Corps for classroom instruction. However, we have formulated a plan whereby you may master the code without buying the machine.

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866 Extra Heavy Duty M.V. Rectifiers.....	\$3.25
Signal Corps Bugs — vibrating type.....	8.25
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BIGGEST SCOOP of season — genuine DE FOREST tubes — brand new, guaranteed: 410, 481, 450 types, each 1.98	
Stand-off insulators — beehive type. Doz.....	.95
Midget type stand-off insulators — just out. Each.....	.09
BLILEY XTALS stocked. Prices \$5.50 upwards.	
Hammarlund Comet "PRO" receivers — less tubes — brand new model.....	88.20
Electralloy Shield Cans, silver finish, 8 x 8 x 3 with sub-base 1.50	
Xmitting Keys. Very special.....	.79

Write for quotations on items that you are interested in. Lowest Prices Quoted! All nationally advertised parts stocked.

20% deposit on all C. O. D. orders. Postage extra.

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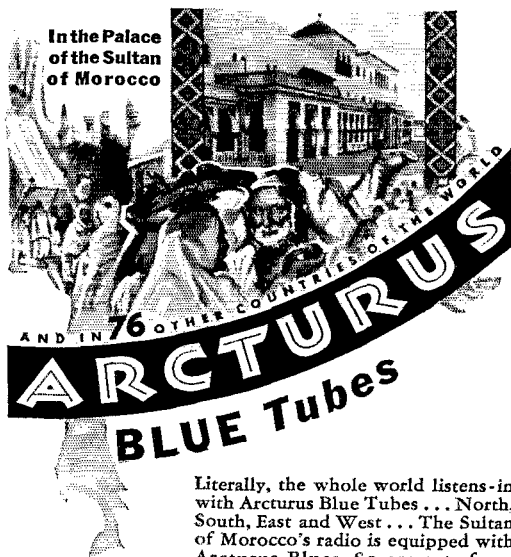
We can supply all parts for
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In the Palace
of the Sultan
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ARCTURUS BLUE Tubes

Literally, the whole world listens-in with Arcturus Blue Tubes . . . North, South, East and West . . . The Sultan of Morocco's radio is equipped with Arcturus Blues. So are sets from

Mexico to Madagascar; from Spitzbergen to Melbourne. Not only have the people of 77 countries adopted Arcturus as their own . . . it is also a fact that more American set manufacturers use Arcturus as standard equipment than any other tube . . . signal tribute to the outstanding quality of Arcturus. It is no wonder that more and more radio dealers and jobbers depend upon the BLUE tube to win the approval of their customers.

ANY Set is Better with Arcturus Blue

PASSING the EXAM is more important than merely taking it

MAKE sure you do not flunk out; be prepared for any question you may be asked. Typical questions, and their answers, are given in the new reprint of QST's popular articles on "Passing the Government Examination for Amateur Operator's License." Originally these articles appeared in the January and February, 1930 issues; so popular were they that the entire back copy supply of these issues was exhausted within a year. Rewritten, they were again published in October and November, 1931 and reprints prepared for distribution. This supply has again been exhausted, and now —

Revised in terms of latest amateur practice, with complete information on the new amateur regulations, a new reprint of the "Passing" articles is ready for distribution. In convenient, economical pamphlet form, you can find the answer to every exam question in it. 20c per copy postpaid.

The American Radio Relay League
West Hartford, Connecticut

'phone band 1875- to 2000-kc.; the center of the 3.5-mc. band, 3750 kc. (which has harmonics marking the high frequency ends of the "10-meter" and "5-meter" bands); and 7000 kc. (which has harmonics marking the low frequency end of the "10-meter" and "5-meter" bands). Calibrations from WWV made using one receiver and compared with calibrations made from transmissions by WIXP and W9XAN agree with each other to within a notch on the frequency meter dial.

Break-In Operation with Crystal Control

(Continued from page 32)

the full plate voltage when the key is closed. The values of these resistors must be sufficiently high to keep the current below their rating; for instance, for 25-watt resistors, 5000-ohm units would be used. Each resistor is rated at 70 ma. maximum; there are six in series, or 30,000 ohms; the plate voltage is 1500, and by applying Ohm's Law, the current through each resistor is found to be 50 ma. — which allows a reasonable safety factor.

The ratio of R_1 to R_2 will usually be about one to five. In the example given above, we would make R_1 about 7000 ohms. The resistors making up R_1 must have almost the same current rating as those used in R_2 , since the additional resistance introduced in the circuit does not greatly lower the current through each resistor, especially with poor regulation, because the voltage rises with the key up. It will be noted that R_1 plus R_2 constitute a "bleeder" resistor; consequently, if a bleeder resistor is already in use it may serve as R_2 , and additional resistance may be inserted for R_1 .

There is no reason why this break-in system should be limited by any power legal for amateur use, especially if relay No. 3 is used to ground the receiving antenna. In any effective transmitter, the crystal oscillator tube should be isolated by a buffer, which may be a low-powered tube; the higher powered tubes can be blocked by the keying method described, and the receiver will be in operation when the key is open. The system requires no elaborate filters, it involves no expensive apparatus (second-hand automobile circuit-breakers are used for relays at W9ZZE), and it necessitates no great change in transmitter arrangement. Its effectiveness is attested by the fact that with an antenna input of 260 watts, only a faint click can be heard in the screen-grid, fully a.c. operated BC receiver 40 feet distant, operating on the same a.c. supply line!

Modulating the Screen-Grid Amplifier

(Continued from page 22)

tained with an audio grid swing of the order of 20 volts r.m.s. across an input impedance of 30,000 ohms. However, the adjustments to obtain this performance are somewhat critical and are greatly influenced by changes in the r.f. excitation, electrode voltages and loading.

The second and final part of this article will appear next month.

BEAM December Bargains

New Short Wave Variable Condensers, small but not a midget. XXXAA, low loss insulation, ideal curve for ham band separation, ball bearing. A sweet job, .00022.....\$1.05
.0001 to .00035, all sizes.....\$1.27

COLORTUNE Receivers — three- and four-tube, using latest screen grids and pentodes throughout, band spread, beautiful appearance, good sock, low noise level, full vision. COLORTUNE using "Beam's" latest special S.V. condensers and coils. An asset and adornment to any ham shack, 3-tube battery.....\$11.49
Humless AC.....\$11.90

With self-contained power supply.....\$19.50
110 DC self-contained power supply.....\$18.50

For four-tube jobs add \$3.10 in each case

KITS — For COLORTUNE kit prices deduct \$3.20 in each case.
IFKIE-FOOFKE II — this sensational two-tube outfit in new improved form. Screen grid, band spread, using best of parts, easy to build, complete with instructions and diagram.....\$4.15

Transmitters — Hartley TGIT, TNT, beautifully built with copper tubing coils for 40 and 80 meters. With meter, less tubes and power supply.....\$9.10

750 V — DC. 7 1/2 V. — AC power supply.....\$8.90
P.A. Amplifier, uses one '24, one '56, two Triple-Twin 295's and one '83. Capable of delivering 15.5 watts undistorted output. Supplies field for one to four speakers. Universal input arrangement. Complete with tubes.....\$28.10

Jensen auditorium speaker to match.....\$6.55

R.C.A. photophone speaker to match.....\$9.25

Miles' double-button mike with 25-foot cable.....\$13.50

Electron coupled monitors, complete.....\$8.78

Aluminum cans, 5 x 6 x 9.....\$1.45

RCA Hand Mikes.....\$2.10

6-prong wafer sockets.....\$.04

50-watt W.E. 211E's.....\$2.75

Standoff insulators, \$.10 ea.....dos. \$.75

K.K. small dials, ea.....\$.35

Pilot audios, 3/4" to 1, ea.....\$.52

Copper tubing, 1/4", turn.....\$.05

Hundreds of ham parts at real low prices

Catalog upon request

BEAM SUPPLY CO., 547 E. 180th St., New York



AERO TRANSMITTER

15 to 30 Watts

Complete Phone and \$39.50

C. W. Transmitter

Transcontinental Transmission

Price Less Tubes and Power Pack

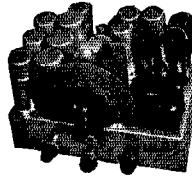
Complete power pack for this

transmitter. Price.....\$14.75

Complete set of 6 tubes for this

transmitter.....\$12.85

Write for quotations on special transmitters built to your specifications



AERO INTERNATIONAL

ALL WAVE 11-TUBE

SUPER-HETERODYNE DELUXE

Completely assembled with two matched full dynamic speakers from 15 to 350 meters. One-dial control. No plug-in coils. Latest superphonic tubes.

Attention Hams! This set can be furnished for operation on the ham band only, for \$10.00 extra.

Price \$29.75



AERO WORLDWIDE

1-TUBE SHORT WAVE SET

For Headphone Operation

Listen in direct to London, Paris, Berlin, Buenos Aires and other broadcasting stations throughout the world via short waves. WORLDWIDE RECEIVER gets 14 to 550 meters. Aero 2-Tube Short Wave Set, \$8.75. The same as above set but it has one stage of audio frequency added to it.

Aero 4-Tube Midget Radio.....\$10.90

Aero 5-Tube Midget Radio.....\$11.90

Aero 6-Tube Super-Heterodyne 18.50

Send for catalogue

Price \$5.95

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6 x 5 x 9, \$1.70 — 6 x 10 x 7, \$2.75 —

7 x 9 x 14, \$4.45 and many other sizes

Special sizes to order

ALUMINUM CHASSIS

Threaded brass studs for 6/32 screws

Lengths from 1/2" to 6" — price 5c to 30c



Insulating bushings for all size shafts from 75c to \$1.90 per dozen



Couplings in brass or bakelite — 15c



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QST Oscillating Crystals

"SUPERIOR BY COMPARISON"

SINCE 1925

COMMERCIAL AND BROADCAST STATIONS

We are at your service to supply you with HIGH GRADE CRYSTALS for POWER USE, said crystals ground to an ACCURACY of BETTER than .03% fully mounted in our Standard Holder. TWO DAY DELIVERIES. Prices as follows:

FREQUENCY RANGE

100 to 1500 Kilo-cycles	\$40.00
1501 to 3000 Kilo-cycles	\$45.00
3001 to 4000 Kilo-cycles	\$50.00
4001 to 6000 Kilo-cycles	\$60.00

Special Prices Quoted for Quantities of Ten (10) or More Crystals

AMATEUR BAND CRYSTALS

Prices for grinding crystals in the Amateur Bands below are for a crystal ground to within 10 Kilo-cycles of your specified frequency unmounted. Mounted in our Standard Holder \$5.00 additional. Frequency calibration of the crystals are BETTER than .1%. Immediate delivery.

1715 to 2000 Kilo-cycles, \$12.00 each. Two for \$20.00
3500 to 4000 Kilo-cycles, \$15.00 each. Two for \$25.00

LOW FREQUENCY CRYSTALS

Low frequency crystals available to as low as 13,000 CYCLES. Prices upon receipt of specifications.

SCIENTIFIC RADIO SERVICE

"The Crystal Specialists"

124 Jackson Ave., University Park, Hyattsville, Md.

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, LX 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, 50c postpaid. Beyond Rockies, 75c. Kladag, Kent, Ohio.

WANTED: Burnt out 222A tube. W6RW.

ECONOMICAL crystal control! Finished crystals 0.1% accurate. \$3.00. Oscillating blanks, \$1.50. All absolutely guaranteed. W8AKU-W8CTN, 320 South Aiken Ave., Pittsburgh, Pa.

BUILT to order — transmitter with electron coupled oscillator, '46 amplifier and '46 doubler p.a. As recommended in QST, October 1932. Less tubes and power supply, \$60. Hendricks and Harvey, 408 Main St., Hartford, Conn.

BUILT to order — electron coupled type, oscillating frequency meter. As recommended in QST, July 1932. Less tube and power supply, \$30. Hendricks and Harvey, 408 Main St., Hartford, Conn.

FOR phone — special power pack, 500 volts pure d.c. and 7½ a.c. filaments. Special at \$15. Request bulletin. General Eng. Corp., Charlotte, Mich.

CHRISTMAS Gift! A Real Short-wave receiver. Get our special on National SW-58's, SW-3's. Act now, don't delay. Only during December. We sell Weston, Jewell, National, Cardwell, Cunningham, DeForest, Aerovox, Electrad, Pilot. Amateur special prices. Hatry & Young, Hartford.

SPECIAL Price, December only. Modern Radio magazine edited by Kruse and Hatry. Two one year subscriptions only \$2.95. Regular \$2.00 per year. Are you reading the new radio-phone series? Trial, three months for 50c. Modern Radio Co., Hartford.

1000 watt transformers, 1100-2200-4400 volts each side center on marble base, oilless. Guaranteed. Dawson, 5740 Woodrow, Detroit, Mich. \$12.50. Twelve left.

IMMEDIATE shipment: SW3s \$20.88, SW58s \$40.88, National AGS; Comet Pro on trial \$79.38; Thermionic 866s \$1.95, 281Ms \$1.75; Rectobulbs \$6.75. Teleplex, Omnigras rented \$1 a week. Distributors for Thordarson, Delta, National, Hammarlund, REL, Weston-Jewell, Morrill, Bliley, Universal, others. List free. Inquiries welcome. — Henry's Radio Shop, Butler, Mo.

SELL or trade: RCA211, 852, 860, 204-A, 851, 861; WE212D, 261A; MCGs, dynamotors, receivers, meters, any apparatus. W9ARA, Butler, Mo.

WANTED — old spark set equipment. A Haupt, 2442 Ogden Ave., Chicago, Ill.

TRADE, buy, sell, anything. W9ER, Timken, Kans.

211Es, 211Ds, 212Ds, 866s, 872s, 860s, WE261As, 276As, 242As, 852s. At ridiculous prices. W9ER.

WANTED — shortwave receiver. W9ER.

ATTENTION phone hams. A condenser mike as low as \$8. Complete with amplifier. Sent to responsible parties on trial. W9ER.

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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

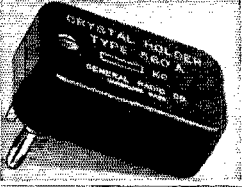
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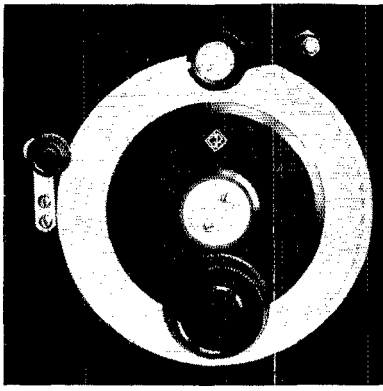
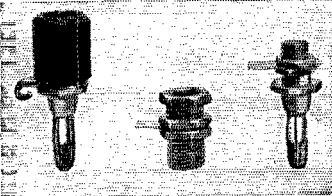


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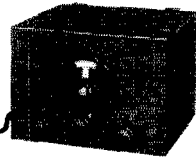
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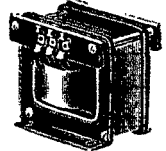
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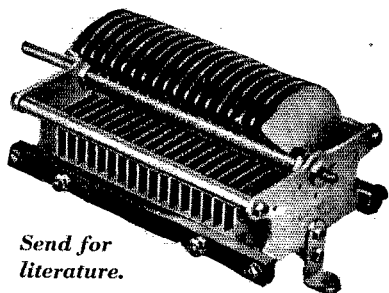
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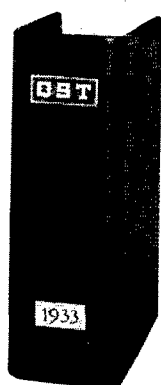
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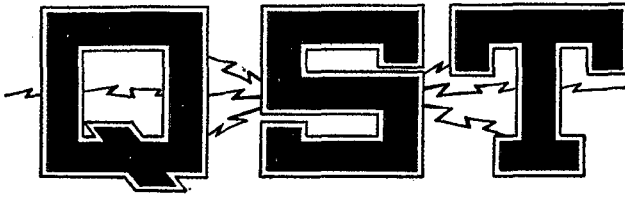
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