The Catalog Section

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In the following pages is a catalog-file of products of the principal manufacturers who serve the short-wave field. Appearance in these pages is by invitation—space has been sold only to those dependable firms whose established integrity and whose products have met with the approval of the American Radio Relay League.

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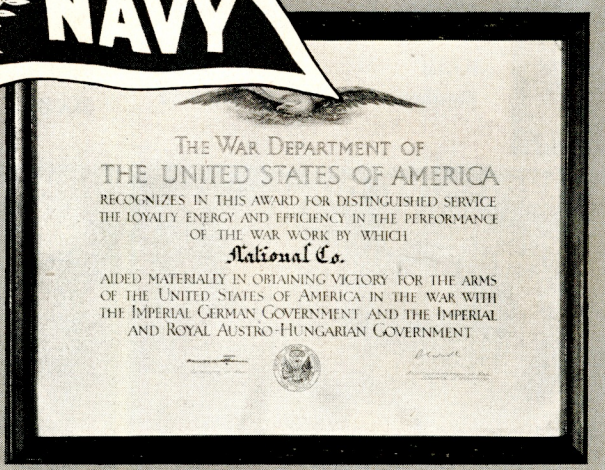
NATIONAL RADIO PRODUCTS 1944



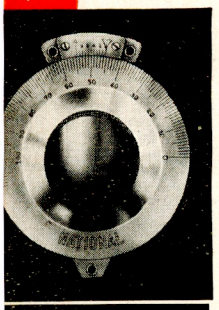
THE WAR DEPARTMENT OF
THE UNITED STATES OF AMERICA
RECOGNIZES IN THIS AWARD FOR DISTINGUISHED SERVICE
THE LOYALTY ENERGY AND EFFICIENCY IN THE PERFORMANCE
OF THE WAR WORK BY WHICH
National Co.
AIDED MATERIALLY IN OBTAINING VICTORY FOR THE ARMS
OF THE UNITED STATES OF AMERICA IN THE WAR WITH
THE IMPERIAL GERMAN GOVERNMENT AND THE IMPERIAL
AND ROYAL AUSTRO-HUNGARIAN GOVERNMENT

1918-1943

The men and women of National Company take great pride in the reception of the Army-Navy "E" Award for excellence in production. To us it brings a special satisfaction, for twenty-five years ago we received a similar award for service to the Nation in World War I. Old timers have set the pace in winning both awards, but new members have brought eager hands to join with old skills to supply our boys with the tools of Victory. We are grateful to the armed forces for the confidence they have placed in us. We will not fail them.

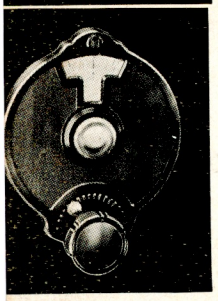
NATIONAL COMPANY, INC.
MALDEN, MASS.

NATIONAL DIALS



The four-inch N Dial has an engine divided scale and vernier. The vernier is flush with the scale. The planetary drive has a ratio of 5 to 1, and is contained within the body of the dial. 2, 3, 4 or 5 scale. Fits ¼" shaft. **Specify scale.**

N Dial **List $7.50**



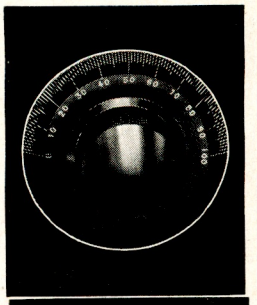
"Velvet Vernier" Dial, Type B, has a compact variable ratio 6 to 1 minimum, 20 to 1 maximum drive that is smooth and trouble free. An illuminator is available. The case is black bakelite. 1 or 5 scale. 4" diam. Fits ¼" shaft. **Specify scale.**

B Dial **List $3.00**

Illuminator, extra **List $.55**

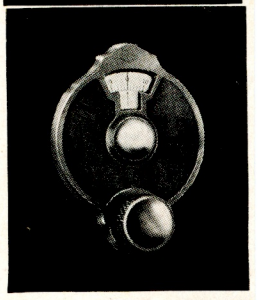
The original black bakelite "Velvet Vernier" Dial, Type A, is still an unchallenged favorite for general purpose use. The planetary drive has a ratio of 5 to 1. In 4 inch diameter with 2, 4 or 5 scale, and in 3⅜ inch diameter with 2 scale. Fits ¼" shaft. **Specify scale.**

A Dial **List $3.30**

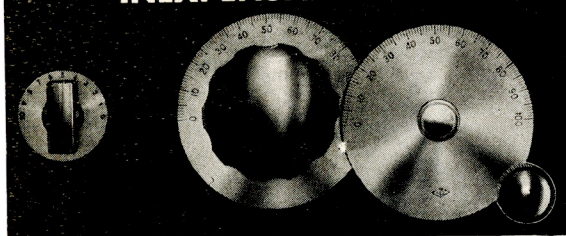


The BM Dial is a smaller version of the B Dial (described in the opposite column) for use where space is limited. The drive ratio is fixed. Although small in size, the BM Dial has the same smooth action as the larger units. 1 or 5 scale. 3" diam. Fits ¼" shaft. **Specify scale.**

BM Dial **List $2.75**



INEXPENSIVE DIALS



TYPE R
List $.85
1⅝" Dia.
Etched Nickel Silver

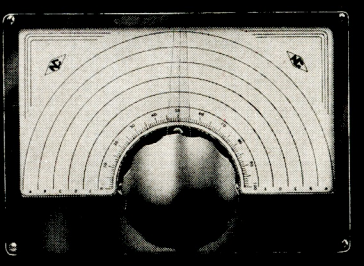
TYPE O
List $1.65
3½" Dia.

TYPE K
List $1.65
3½" Dia.

TYPE L
List $2.75
5" Dia.

TYPE M
List $2.75
5" Dia.

NEW! FOR INDIVIDUAL CALIBRATING



For experimenters who "build their own" and desire direct calibration. Fine for Freq. Monitors and ECO's.

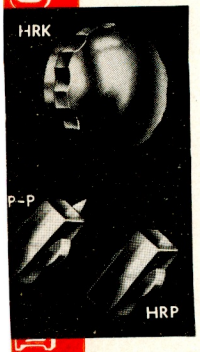
- **Dial bezel size 5" x 7¼"**
- **Five blank scales for direct calibration**
- **Employs Velvet Vernier Drive**
- **Easy to mount**

TYPE ACN List $5.00

R Dial scale 3 only but marked 10-0; O, K, L, M scale 2. All fit ¼" shafts.

KNOBS

HRK (Fits ¼" shaft) **List $.95**
Black bakelite knob 2⅜" diam.



HRP-P (Fits ¼" shaft) **List $.40**
Black bakelite knob 1¼" long and ½" wide. Equipped with pointer.

HRP **List $.30**
The Type HRP knob has no pointer, but is otherwise the same as the knob above.

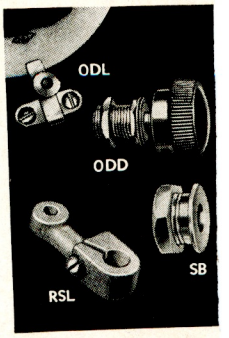
ACCESSORIES

ODL **List $.55**
A locking device which clamps the rim of O, K, L and M Dials. Brass, nickel plated.

ODD **List $.70**
Vernier drive for O, K, L, M or other plain dials.

SB (Fits ¼" shaft) **List $.30**
A nickel plated brass bushing ½" dia.

RSL (Fits ¼" shaft) **List $.95**
Rotor Shaft Lock for TMA, TMC and similar condensers.

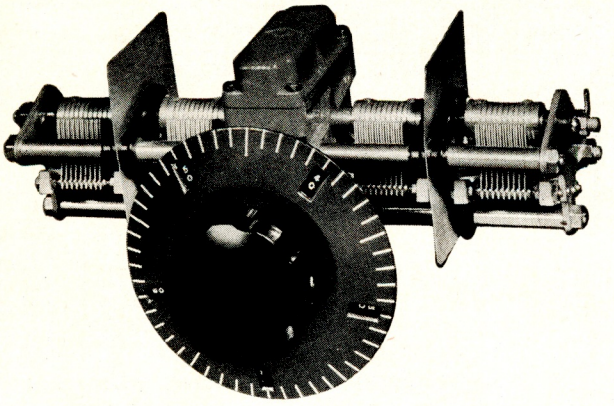


DIAL SCALES

Scale	Divisions	Rotation	Direction of Condenser Rotation for increase of dial reading
1	0-100-0	180°	Either
2	0-100	180°	Counter Clockwise
3	100-0	180°	Clockwise
4	150-0	270°	Clockwise
5	200-0	360°	Clockwise
6	0-150	270°	Counter Clockwise

All prices subject to change without notice

NATIONAL PRECISION CONDENSERS



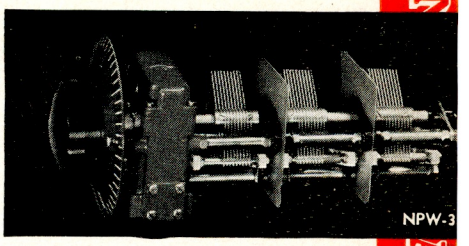
The Micrometer dial reads direct to one part in 500. Division lines are approximately ¼" apart. The dial revolves ten times in covering the tuning range, and the numbers visible through the small windows change every revolution to give consecutive numbering by tens from 0 to 500. The condenser is of extremely rigid construction, with four bearings on the rotor shaft. The drive, at the mid-point of the rotor, is through an enclosed preloaded worm gear with 20 to 1 ratio. Each rotor is individually insulated from the frame, and each has its own individual rotor contact. Stator insulation is Steatite. Plate shape is straight-line-frequency when the frequency range is 2:1.

PW Condensers are available in 2, 3 or 4 sections, in either 160 or 225 mmf per section. Larger capacities cannot be supplied.

A single-section PW condenser with grounded rotor is supplied in capacities of 150, 200, 350 and 500 mmf, single spaced, and capacities up to 125 mmf, double spaced.

PW condensers are all with rotor shaft parallel to the panel.

PW-1R	Single section right	**List $16.50**
PW-1L	Single section left	**List $16.50**
PW-2R	Double section right	**List $22.00**
PW-2L	Double section left	**List $22.00**
PW-2S	Single section each side	**List $22.00**
PW-3R	Double section right; single left	**List $26.50**
PW-3L	Double section left; single right	**List $26.50**
PW-4	Double section each side	**List $30.00**
PW-DO	Dial and knob only	**List $ 7.25**



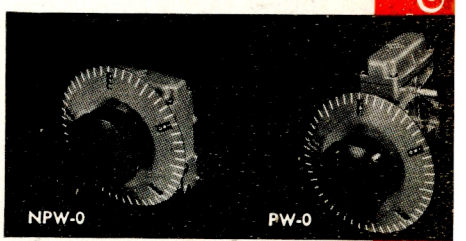
NPW MODELS

With micrometer dial

NPW-3. Three sections, each 225 mmf. **List $26.50**

NPW-X. Three sections, each 25 mmf. **List $22.50**

Both condensers are similar to PW models, except that rotor shaft is perpendicular to panel.



GEAR DRIVE UNITS

With micrometer dial

NPW-O **List $12.00**

Uses parts similar to the NPW condenser. Drive shaft perpendicular to panel. One TX-9 coupling supplied.

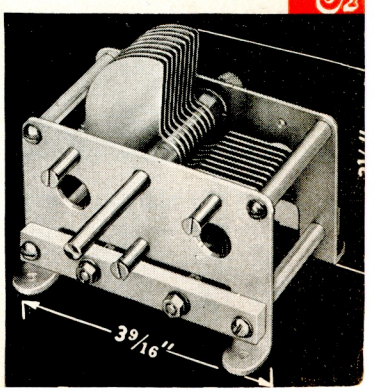
PW-O **List $15.00**

Uses parts similar to the PW condenser. Drive shaft parallel to panel. Two TX-9 couplings supplied.

NATIONAL GENERAL PURPOSE CONDENSERS

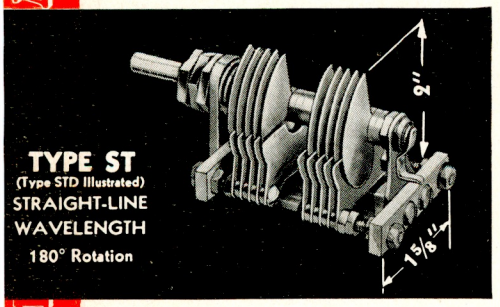
National EMC Condensers are made in large sizes for general purpose uses. They are similar in construction to the TMC Transmitting condenser, and have high efficiency and rugged frames. Insulation is Isolantite, and Peak Voltage Rating is 1000 Volts. Plate shape is Straight-Line Wavelength.

Capacity	Minimum Capacity	No. of Plates	Length	Catalog Symbol	List
150 Mmf.	9	9	4"	EMC-150	$4.50
250	11	15	2 15/16"	EMC-250	5.50
350	12	20	2 15/16"	EMC-350	6.75
500	16	29	4 3/8"	EMC-500	8.50
1000	22	56	6 3/4"	EMC-1000	12.50
SPLIT-STATOR MODEL					
350–350	12–12	20–20	6"	EMCD-350	$13.00



All prices subject to change without notice

NATIONAL RECEIVING CONDENSERS

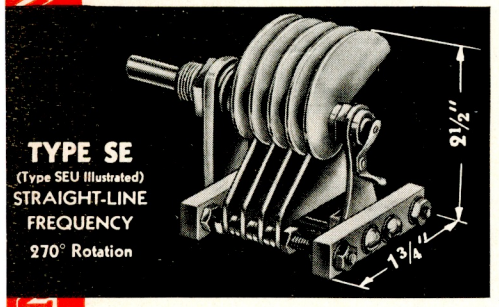


TYPE ST
(Type STD Illustrated)
STRAIGHT-LINE
WAVELENGTH
180° Rotation

Capacity	Minimum Capacity	No. of Plates	Air Gap	Length	Catalog Symbol	List
SINGLE BEARING MODELS						
15 Mmf.	3 Mmf.	3	.018"	1 3/16"	STHS- 15	$1.50
25	3.25	4	.018"	1 3/16"	STHS- 25	1.65
50	3.5	7	.018"	1 3/16"	STHS- 50	1.75
DOUBLE BEARING MODELS						
35 Mmf.	6 Mmf.	8	.026"	2 1/4"	ST- 35	$1.65
50	7	11	.026"	2 1/4"	ST- 50	2.00
75	8	15	.026"	2 1/4"	ST- 75	2.25
100	9	20	.026"	2 1/4"	ST-100	2.50
140	10	27	.026"	2 3/4"	ST-140	2.75
150	10.5	29	.026"	2 3/4"	ST-150	2.75
200	12.0	27	.018"	2 1/4"	STH-200	3.00
250	13.5	32	.018"	2 3/4"	STH-250	3.30
300	15.0	39	.018"	2 3/4"	STH-300	3.50
335	17.0	43	.018"	2 3/4"	STH-335	4.00
SPLIT STATOR DOUBLE BEARING MODELS						
50–50	5–5	11–11	.026"	2 3/4"	STD- 50	$4.00
100–100	5.5–5.5	14–14	.018"	2 3/4"	STHD-100	5.00

NOTE — Type SS Condensers, having straight-line-capacity plates but otherwise similar to the Type ST, are available. Capacities and Prices same as Type ST.

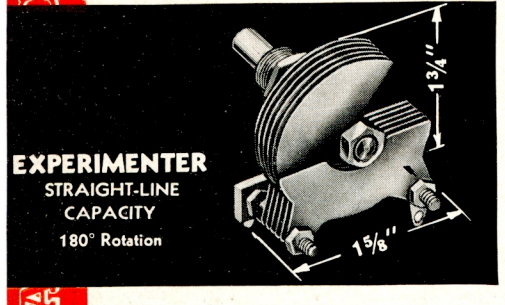
The ST Type condenser has Straight-Line Wavelength plates. All double-bearing models have the front bearing insulated to prevent noise. On special order a shaft extension at each end is available, for ganging. On double-bearing single shaft models, the rotor contact is through a constant impedance pigtail. Isolantite insulation.



TYPE SE
(Type SEU Illustrated)
STRAIGHT-LINE
FREQUENCY
270° Rotation

Capacity	Minimum Capacity	No. of Plates	Air Gap	Length	Catalog Symbol	List
15 Mmf.	7 Mmf.	6	.055"	2 1/4"	SEU- 15	$2.75
20	7.5	8	.055"	2 1/4"	SEU- 20	3.00
25	8	9	.055"	2 1/4"	SEU- 25	3.00
50	9	11	.026"	2 1/4"	SE- 50	2.50
75	10	15	.026"	2 1/4"	SE- 75	2.75
100	11.5	20	.026"	2 1/4"	SE-100	3.00
150	13	29	.026"	2 3/4"	SE-150	3.25
200	12	27	.018"	2 1/4"	SEH-200	3.25
250	14	32	.018"	2 3/4"	SEH-250	3.50
300	16	39	.018"	2 3/4"	SEH-300	3.50
335	17	43	.018"	2 3/4"	SEH-335	3.85

TYPE SE — All models have two rotor bearings, the front bearing being insulated to prevent noise. A shaft extension at each end, for ganging, is available on special order. On models with single shaft extension, the rotor contact is through a constant impedance pigtail. The SEU models (illustrated) are suitable for high voltages as their plates are thick polished aluminum with rounded edges. Other SE condensers do not have polished edges on the plates. Isolantite insulation.



EXPERIMENTER
STRAIGHT-LINE
CAPACITY
180° Rotation

Capacity	Minimum Capacity	Length	Air Gap	No. of Plates	Catalog Symbol	List
15 Mmf.	3.5	1 5/16"	.045"	5	EX- 15	$ .95
25	3.75	1 5/16"	.045"	7	EX- 25	.95
35	3.75	1 5/16"	.045"	10	EX- 35	1.10
50	4	1 5/16"	.017"	6	EX- 50	1.00
100	4.75	1 5/16"	.017"	12	EX-100	1.10
140	5.5	1 5/16"	.017"	15	EX-140	1.40

The National "Experimenter" Type Condensers are low-priced models for general experimental work. They are of all-brass construction. The rotor has only one bearing. Plates can be removed without difficulty. Bakelite insulation.

All prices subject to change without notice

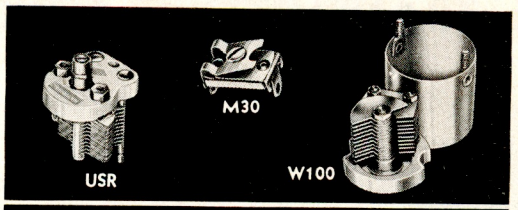
NATIONAL MINIATURE CONDENSERS

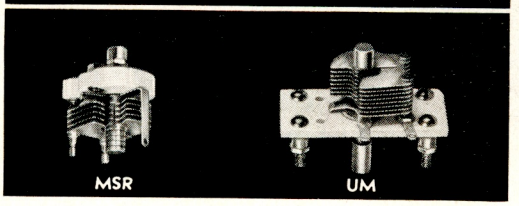
USR — *See table* — Type USR condensers are small, compact, low-loss units. Their soldered construction makes them particularly suitable for applications where vibration is present. Adjustment is made with a screw driver. Steatite base.

USE — *See table* — Type USE condensers are similar to Type USR, but are provided with a ¼" diameter shaft extension at each end.

USL — *See table* — Type USL condensers are similar to Type USR, but are provided with a rotor shaft lock, so that the rotor can be clamped at any setting.

MSR, MSE, MSL — *See table* — Condensers of the MS series are similar in appearance to the US series described above, but they differ in making use of plates which are the same as those of the UM condenser. This and other small changes results in a more robust and rigid assembly. Other details of the MSR, MSE, and MSL are the same as the USR, USE, and USL respectively.





Capacity	Catalog Symbol			List
25 mmf.	USR-25	USE-25	USL-25	$1.45
50	USR-50	USE-50	USL-50	1.65
75	USR-75	USE-75	USL-75	1.90
100	USR-100	USE-100	USL-100	2.10
140	USR-140	USE-140	USL-140	2.50

Capacity	Catalog Symbol			List
25 mmf.	MSR-25	MSE-25	MSL-25	$1.45
50	MSR-50	MSE-50	MSL-50	1.65
75	MSR-75	MSE-75	MSL-75	1.90
100	MSR-100	MSE-100	MSL-100	2.10

Capacity	Minimum Capacity	No. of Plates	Air Gap	Catalog Symbol	List
15 mmf.	1.5	6	.017"	UM-15	$1.40
35	2.5	12	.017"	UM-35	1.65
50	3	16	.017"	UM-50	1.75
75	3.5	22	.017"	UM-75	1.90
100	4.5	28	.017"	UM-100	2.10
25	3.4	14	.042"	UMA-25	2.00
BALANCED STATOR MODEL					
25	2	4-4-4	.017"	UMB-25	$2.00

M-30 **List $.35**

Type M-30 is a small adjustable mica condenser with a maximum capacity of 30 mmf. Dimensions $1\frac{3}{16}$" x $\frac{9}{16}$" x ½". Isolantite base.

W-75, 75 mmf. **List $2.50**
W-100, 100 mmf. **List $2.75**

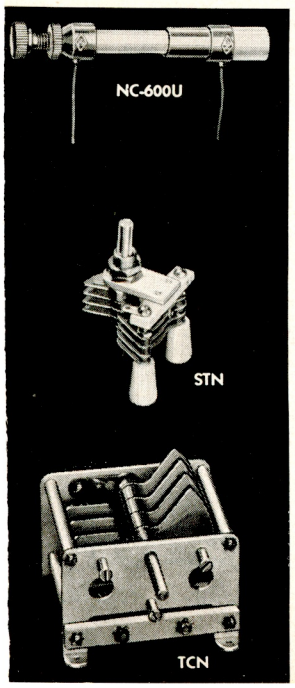
Small padding condensers having very low temperature coefficient. Mounted in an aluminum shield 1¼" in diameter.

The **UM CONDENSER** is designed for ultra high frequency use and is small enough for convenient mounting in PB-10 and RO shield cans. They are particularly useful for tuning receivers, transmitters, and exciters. Shaft extensions at each end of the rotor permit easy ganging when used with one of our flexible couplings. The UMB-25 Condenser is a balanced stator model, two stators act on a single rotor. The UM can be mounted by the angle foot supplied or by bolts and spacers. See table for sizes.

Dimensions: Base 1" x 2¼", Mounting holes ⅝" x $1\frac{23}{32}$", Axial length 2⅛" overall.

Plates: Straight line capacity, 180° rotation.

NATIONAL NEUTRALIZING CONDENSERS



NC-600U **List $.60**
With standoff insulator

NC-600 **List $.50**
Without insulator

For neutralizing low power beam tubes requiring from .5 to 4 mmf, and 1500 max. total volts such as the 6L6. The NC-600U is supplied with a GS-10 standoff insulator screwed on one end, which may be removed for pigtail mounting.

STN **List $2.00**

The Type STN has a maximum capacity of 18 mmf (3000 V), making it suitable for such tubes as the 10 and 45. It is supplied with two standoff insulators.

TCN **List $4.00**

The Type TCN is similar to the TMC. It has a maximum capacity of 25 mmf (6000 V), making it suitable for the 203A, 211 and similar tubes.

NC-800 **List $3.00**

The NC-800 disk-type neutralizing condenser is suitable for the RCA-800, 35T, HK-54 and similar tubes. It is equipped with a micrometer thimble and clamp. The chart below gives capacity and air gap for different settings.

NC-75 **List $4.50**

For 75T, 808, 811, 812 & similar tubes.

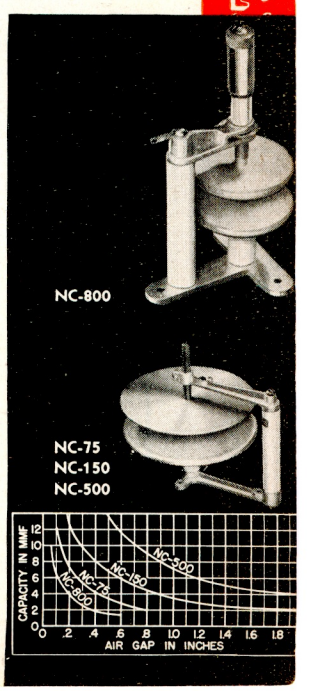
NC-150 **List $7.25**

For HK354, RK36, 300T, 852, etc.

NC-500 **List $13.75**

For WE-251, 450TH, 450TL, 750TL, etc.

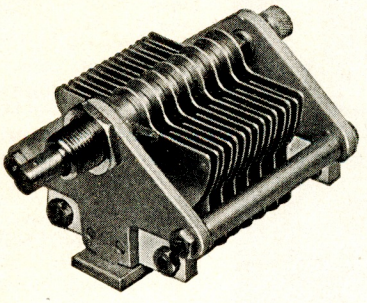
These larger disk type neutralizing condensers are for the higher powered tubes. Disks are aluminum, insulation steatite.



All prices subject to change without notice

NATIONAL COMPANY, INC., MAL

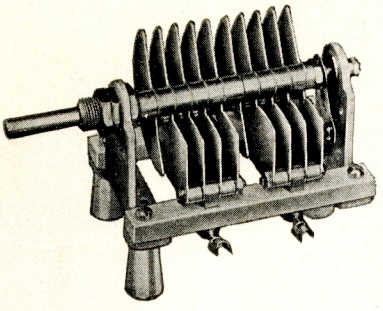
NATIONAL TRANSMITTING CONDENSERS



TYPE TMS

is a condenser designed for transmitter use in low power stages. It is compact, rigid, and dependable. Provision has been made for mounting either on the panel, on the chassis, or on two stand-off insulators. Insulation is Isolantite. Voltage ratings listed are conservative.

Capacity	Minimum Capacity	Length	Air Gap	Peak Voltage	No. of Plates	Catalog Symbol	List Price
SINGLE STATOR MODELS							
100 Mmf.	9.5	3″	.026″	1000v.	9	**TMS-100**	**$2.75**
150	11	3″	.026″	1000v.	14	**TMS-150**	**3.00**
250	13.5	3″	.026″	1000v.	22	**TMS-250**	**3.30**
300	15	3″	.026″	1000v.	27	**TMS-300**	**4.00**
35	8	3″	.065″	2000v.	7	**TMSA-35**	**3.30**
50	11	3″	.065″	2000v.	11	**TMSA-50**	**3.60**
DOUBLE STATOR MODELS							
50–50 Mmf.	6–6	3″	.026″	1000v.	5–5	**TMS-50D**	**$4.25**
100–100	7–7	3″	.026″	1000v.	9–9	**TMS-100D**	**5.00**
50–50	10.5–10.5	3″	.065″	2000v.	11–11	**TMSA-50D**	**4.40**



TYPE TMH

features very compact construction, excellent power factor, and aluminum plates .040″ thick with polished edges. It mounts on the panel or on removable stand-off insulators. Isolantite insulators have long leakage path. Stand-offs included in listed price.

Capacity	Minimum Capacity	Length	Air Gap	Peak Voltage	No. of Plates	Catalog Symbol	List
SINGLE STATOR MODELS							
50 Mmf.	9	3¾″	.085″	3500v.	15	**TMH-50**	**$3.85**
75	11	3¾″	.085″	3500v.	19	**TMH-75**	**4.40**
100	12.5	5⅛″	.085″	3500v.	25	**TMH-100**	**5.25**
150	18	6½″	.085″	3500v.	37	**TMH-150**	**6.60**
35	11	5⅛″	.180″	6500v.	17	**TMH-35A**	**5.75**
DOUBLE STATOR MODELS							
35–35 Mmf.	6–6	3¾″	.085″	3500v.	9–9	**TMH-35D**	**$6.00**
50–50	8–8	5⅛″	.085″	3500v.	13–13	**TMH-50D**	**6.60**
75–75	11–11	6½″	.085″	3500v.	19–19	**TMH-75D**	**8.00**

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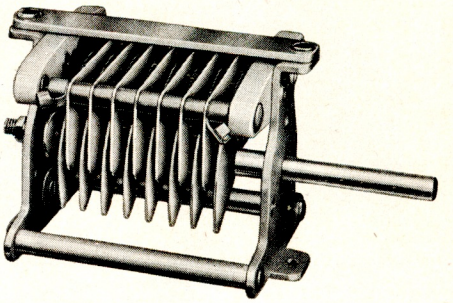
NATIONAL TRANSMITTING CONDENSERS

TYPE TMK

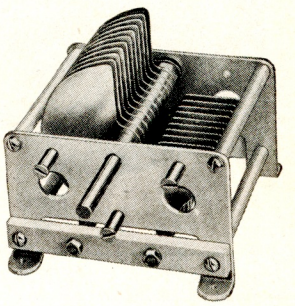
is a new condenser for exciters and low power transmitters. Special provision has been made for mounting AR-16 coils in a swivel plug-in mount on either the top or rear of the condenser, (see page 10). For panel or stand-off mounting. Isolantite insulation.



Capacity	Minimum Capacity	Length	Air Gap	Peak Voltage	No. of Plates	Catalog Symbol	List Price
SINGLE STATOR MODELS							
35 Mmf.	7.5	2 7/32"	.047"	1500v.	7	TMK-35	$3.60
50	8	2 3/8"	.047"	1500v.	9	TMK-50	3.85
75	9	2 11/16"	.047"	1500v.	13	TMK-75	4.15
100	10	3"	.047"	1500v.	17	TMK-100	4.40
150	10.5	3 5/8"	.047"	1500v.	25	TMK-150	5.00
200	11	4 1/4"	.047"	1500v.	33	TMK-200	5.50
250	11.5	4 7/8"	.047"	1500v.	41	TMK-250	6.00
DOUBLE STATOR MODELS							
35–35 Mmf.	7.5–7.5	3"	.047"	1500v.	7–7	TMK-35D	$5.75
50–50	8–8	3 5/8"	.047"	1500v.	9–9	TMK-50D	6.50
100–100	10–10	4 1/4"	.047"	1500v.	17–17	TMK-100D	8.00
Swivel Mounting Hardware for AR 16 Coils						SMH	$ .15

TYPE TMC

is designed for use in the power stages of transmitters where peak voltages do not exceed 3000. The frame is extremely rigid and arranged for mounting on panel, chassis or stand-off insulators. The plates are aluminum with buffed edges. Insulation is Isolantite. The stator in the split stator models is supported at both ends.



Capacity	Minimum Capacity	Length	Air Gap	Peak Voltage	No. of Plates	Catalog Symbol	List Price
SINGLE STATOR MODELS							
50 Mmf.	10	3"	.077"	3000v.	7	TMC-50	$4.40
100	13	3 1/2"	.077"	3000v.	13	TMC-100	5.00
150	17	4 5/8"	.077"	3000v.	21	TMC-150	5.75
250	23	6"	.077"	3000v.	32	TMC-250	6.60
300	25	6 3/4"	.077"	3000v.	39	TMC-300	7.25
DOUBLE STATOR MODELS							
50–50 Mmf.	9–9	4 5/8"	.077"	3000v.	7–7	TMC-50D	$7.25
100–100	11–11	6 3/4"	.077"	3000v.	13–13	TMC-100D	8.25
200–200	18.5–18.5	9 1/4"	.077"	3000v.	25–25	TMC-200D	11.00

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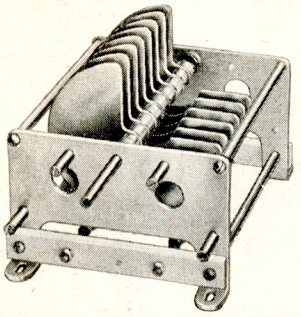
NATIONAL COMPANY, INC., MALDEN, MASS., U.S.A.

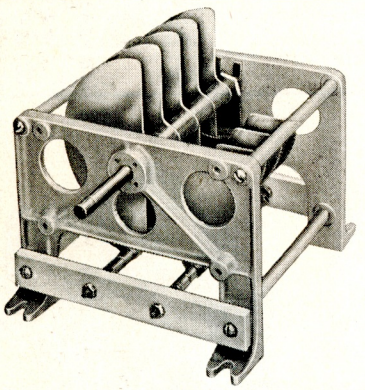
NATIONAL TRANSMITTING CONDENSERS



TYPE TMA

is a larger model of the popular TMC. The frame is extremely rigid and arranged for mounting on panel, chassis or stand-off insulators. The plates are of heavy aluminum with rounded and buffed edges. Insulation is Isolantite, located outside of the concentrated field.

Capacity	Minimum Capacity	Length	Air Gap	Peak Voltage	No. of Plates	Catalog Symbol	List Price
SINGLE STATOR MODELS							
300 Mmf.	19.5	4 9/16"	.077"	3000v.	23	TMA-300	$12.00
50	15	4 9/16"	.171"	6000v.	7	TMA-50A	6.50
100	19.5	6 7/8"	.171"	6000v.	15	TMA-100A	10.00
150	22.5	6 7/8"	.171"	6000v.	21	TMA-150A	12.00
230	33	9 5/16"	.171"	6000v.	33	TMA-230A	16.00
100	30	9 1/4"	.265"	9000v.	23	TMA-100B	13.50
150	40.5	12 1/2"	.265"	9000v.	33	TMA-150B	17.00
50	21	7 1/8"	.359"	12000v.	13	TMA-50C	8.00
100	37.5	12 7/8"	.359"	12000v.	25	TMA-100C	14.50
DOUBLE STATOR MODELS							
200-200 Mmf.	15-15	6 7/8"	.077"	3000v.	16-16	TMA-200D	$15.00
50-50	12.5-12.5	6 7/8"	.171"	6000v.	8-8	TMA-50DA	11.00
100-100	17-17	9 5/16"	.171"	6000v.	14-14	TMA-100DA	17.50
60-60	19.5-19.5	12 1/2"	.265"	9000v.	15-15	TMA-60DB	18.50
40-40	18-18	12 7/8"	.359"	12000v.	11-11	TMA-40DC	13.50



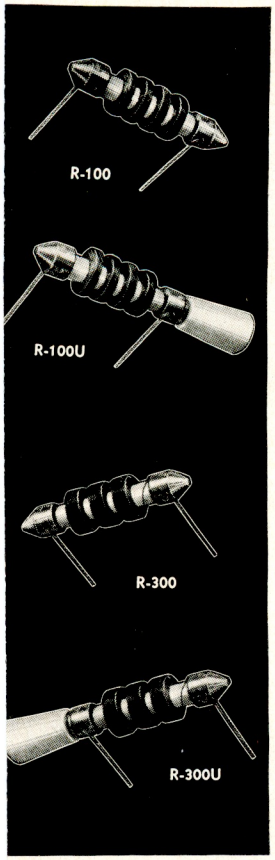
TYPE TML

condenser is a 1 KW job throughout. Isolantite insulators, specially treated against moisture absorption, prevent flashovers. A large self-cleaning rotor contact provides high current capacity. Thick capacitor plates, with accurately rounded and polished edges, provide high voltage ratings. Sturdy cast aluminum end frames and dural tie bars permit an unusually rigid structure. Precision end bearings insure smooth turning and permanent alignment of the rotor. End frames are arranged for panel, chassis or stand-off mountings.

Capacity	Minimum Capacity	Length	Air Gap	Peak Voltage	No. of Plates	Catalog Symbol	List Price
SINGLE STATOR MODELS							
75 Mmf.	25	18 1/16"	.719"	20,000v.	17	TML-75E	$28.75
150	60	18 1/16"	.469"	15,000v.	27	TML-150D	29.00
100	45	13 5/8"	.469"	15,000v.	19	TML-100D	26.00
50	22	8 5/16"	.469"	15,000v.	9	TML-50D	18.00
245	54	18 1/16"	.344"	10,000v.	35	TML-245B+	31.50
150	45	13 5/8"	.344"	10,000v.	21	TML-150B+	28.75
100	32	10 15/16"	.344"	10,000v.	15	TML-100B+	27.50
75	23.5	8 5/16"	.344"	10,000v.	11	TML-75B+	20.00
500	55	18 1/16"	.219"	7,500v.	49	TML-500A+	38.50
350	45	13 5/8"	.219"	7,500v.	33	TML-350A+	30.75
250	35	10 15/16"	.219"	7,500v.	25	TML-250A+	28.75
DOUBLE STATOR MODELS							
30-30 Mmf.	12-12	18 1/16"	.719"	20,000v.	7-7	TML-30DE	$29.00
60-60	26-26	18 1/16"	.469"	15,000v.	11-11	TML-60DD	31.50
100-100	27-27	18 1/16"	.344"	10,000v.	15-15	TML-100DB+	35.00
60-60	20-20	13 5/8"	.344"	10,000v.	9-9	TML-60DB+	30.00
200-200	30-30	18 1/16"	.219"	7,500v.	21-21	TML-200DA+	38.50
100-100	17-17	10 15/16"	.219"	7,500v.	11-11	TML-100DA+	31.50

All prices subject to change without notice

NATIONAL RF CHOKES



R-100 **List $.50**
Without standoff insulator

R-100U **List $.60**
With standoff insulator

R.F. chokes R-100 and R-100U are identical electrically, but the latter is provided with a removable standoff insulator screwed on one end. Both have Isolantite insulation and both have a continuous universal winding in four sections. Inductance 2½ m.h.; distributed capacity 1 mmf.; DC resistance 50 ohms; current rating 125 ma.

R-300 **List $.50**
Without insulator

R-300U **List $.60**
With insulator

R.F. chokes R-300 and R-300U are similar in size to R-100U but have higher current capacity. The R-300U is provided with a removable standoff insulator screwed on one end. Inductance 1 m.h.; distributed capacity 1 mmf.; DC resistance 10 ohms; current rating 300 ma.

R-152 **List $2.50**

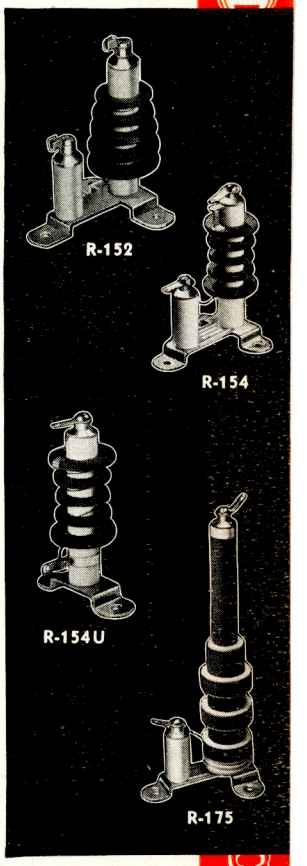
For the 80 and 160 meter bands. Inductance 4 m.h., DC resistance 10 ohms, DC current 600 ma. Coils honeycomb wound on Isolantite core.

R-154 **List $2.50**
R-154U **List $2.00**

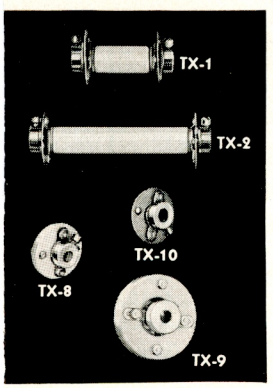
For the 20, 40 and 80 meter bands. Inductance 1 m.h., DC resistance 6 ohms, DC current 600 ma. Coils honeycomb wound on Isolantite core. The R-154U does not have the third mounting foot and the small insulator, but is otherwise the same as R-154. See illustration.

R-175 **List $3.00**

The R-175 Choke is suitable for parallel-feed as well as series-feed in transmitters with plate supply up to 3000 volts modulated or 4000 volts unmodulated. Unlike conventional chokes, the reactance of the R-175 is high throughout the 10 and 20 meter bands as well as the 40, 80 and 160 meter bands. Inductance 225 μh, distributed capacity 0.6 mmf., DC resistance 6 ohms, DC current 800 ma., voltage breakdown to base 12,500 volts.



NATIONAL SHAFT COUPLINGS



TX-1, Leakage path 1"
List $1.10
TX-2, Leakage path 2½"
List $1.25
Flexible couplings with glazed Isolantite insulation which fit ¼" shafts.

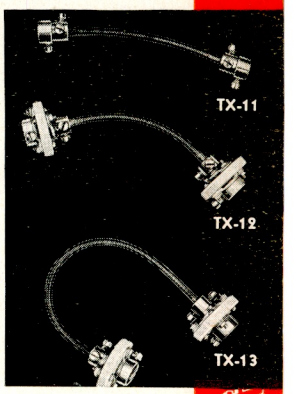
TX-8 **List $.85**
A non-flexible rigid coupling with Isolantite insulation. 1" diam. Fits ¼" shaft.

TX-9 **List $1.25**
This small insulated flexible coupling provides high electrical efficiency when used to isolate circuits. Insulation is Steatite. 1⅝" diam. Fits ¼" shaft.

TX-10 **List $.60**
A very compact insulated coupling free from backlash. Insulation is canvas Bakelite. 1 1/16" diam. Fits ¼" shaft.

TX-11 **List $.70**
The flexible shaft of this coupling connects shafts at angles up to 90 degrees, and eliminates misalignment problems. Fits ¼" shafts. Length 4¼".

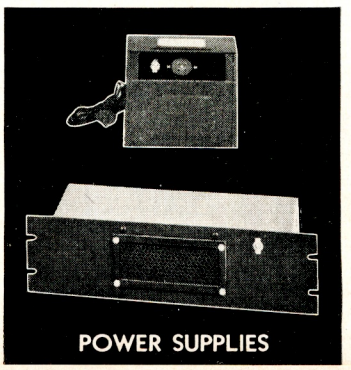
TX-12, Length 4⅝" **List $1.40**
TX-13, Length 7⅛" **List $1.65**
These couplings use flexible shafting like the TX-11 above, but are also provided with Isolantite insulators at each end.



All prices subject to change without notice

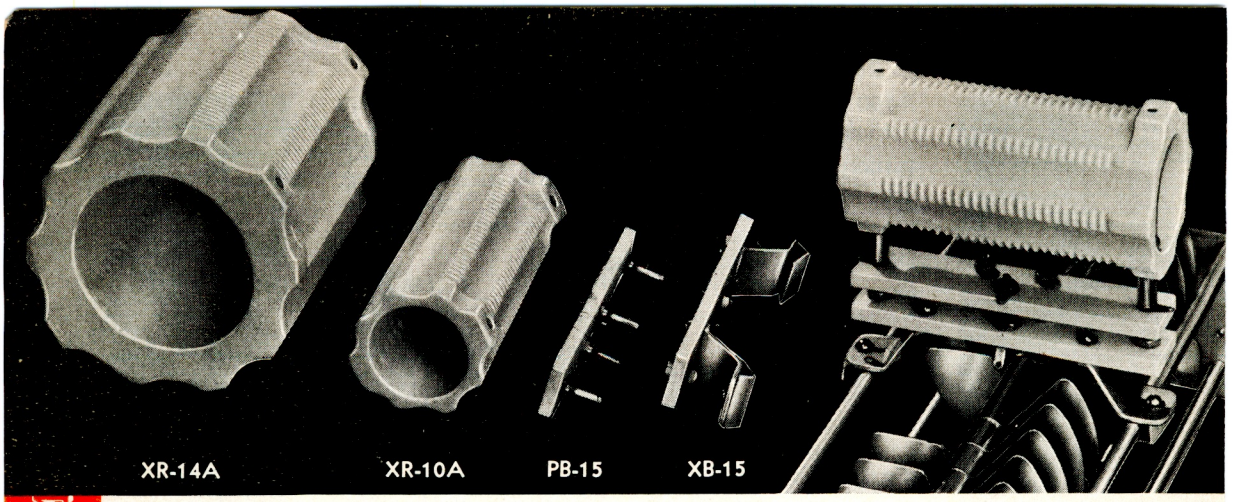
NATIONAL POWER SUPPLIES

National Power Supplies are specially designed for high frequency receivers, and include efficient filters for RF disturbances as well as for hum frequencies. The various types for operation from an AC line are listed under the receivers with which they are used.



High voltage power supplies can be supplied for National Receivers for operation from batteries. These units are of the vibrator type.

686, Table model, (165 V., 50 MA.) for operation from 6.3 volts DC, with vibrator.
List $49.50



NATIONAL COMPANY, MALDEN, MASS.

TRANSMITTER COIL FORMS

The Transmitter Coil Forms and Mounting are designed as a group, and mount conveniently on the bars of a TMA condenser. The larger coil form, Type XR-14A, has a winding diameter of 5", a winding length of 3¾" (30 turns total) and is intended for the 80 meter band. The smaller form, Type XR-10A, has a winding length of 3¾" and a winding diameter of 2½" (26 turns total). It is intended for the 20 and 40 meter bands.

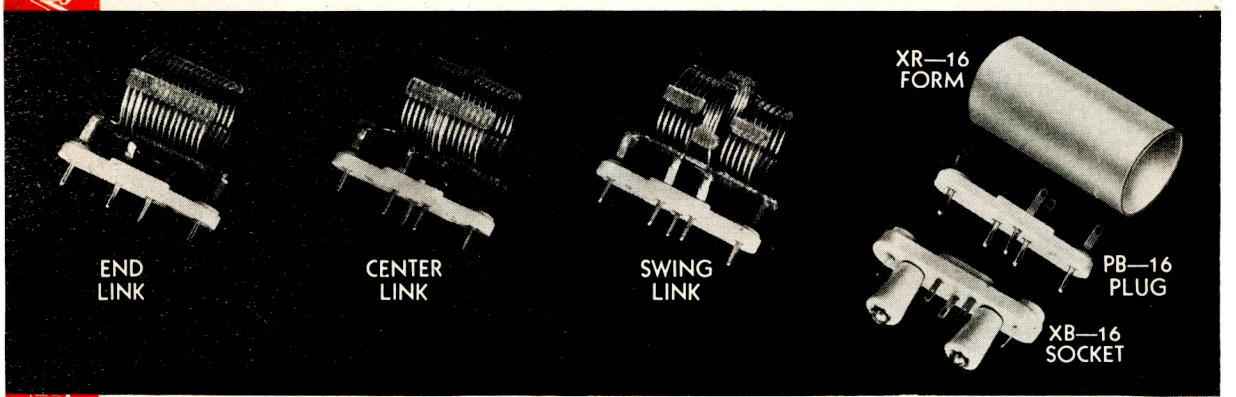
Either coil form fits the PB-15 plug. For higher frequencies, the plug may be used with a self-supporting coil of copper tubing. The XB-15 Socket may be mounted on breadboards or chassis, as well as on the TMA Condenser.

SINGLE UNITS

XR-10A, Coil Form only	**List $1.65**
XR-14A, Coil Form only	**List $4.00**
PB-15, Plug only	**List $1.50**
XB-15, Socket only	**List $2.00**

ASSEMBLIES

UR-10A, Assembly (including small Coil Form, Plug and Socket)	**List $5.00**
UR-14A, Assembly (including large Coil Form, Plug and Socket)	**List $7.00**



EXCITER COILS AND FORMS — TYPE AR-16 (Air Spaced)

These air-spaced coils are suitable for use in stages where the plate input does not exceed 50 watts and are available in the sizes tabulated below. Capacities listed will resonate the coils at the low frequency end of the band and include all stray circuit capacities. All have separate link coupling coils and all fit the PB-16 Plug and XB-16 Socket.

The XR-16 Coil Form also fits the PB-16 Plug and XB-16 Socket. It has a winding diameter of 1¼" and a winding length of 1¾".

TEMPORARILY DISCONTINUED

Order by Catalog Symbol Shown in This Table

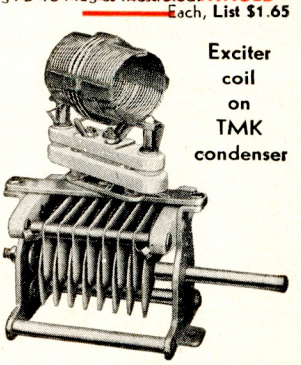
Band	End Link	Cap Mmf	Center Link	Cap Mmf	Swinging Link	Cap Mmf
5 meter	AR16-5E	20	AR16-5C	20	——	—
10 meter	AR16-10E	20	AR16-10C	20	AR16-10S	25
20 meter	AR16-20E	26	AR16-20C	26	AR16-20S	40
40 meter	AR16-40E	33	AR16-40C	33	AR16-40S	55
80 meter	AR16-80E	37	AR16-80C	37	AR16-80S	60
160 meter	AR16-160E	65	AR16-160C	65	——	—

TEMPORARILY DISCONTINUED

XR-16, Coil Form only	**List $.70**
PB-16, Plug-in Base only	**List $.45**
XB-16, Plug-in Socket only	**List $.55**

AR-16 Coils — Any type (see table). Including PB-16 Plug as illustrated. Each, **List $1.65**

TEMPORARILY DISCONTINUED



Exciter coil on TMK condenser

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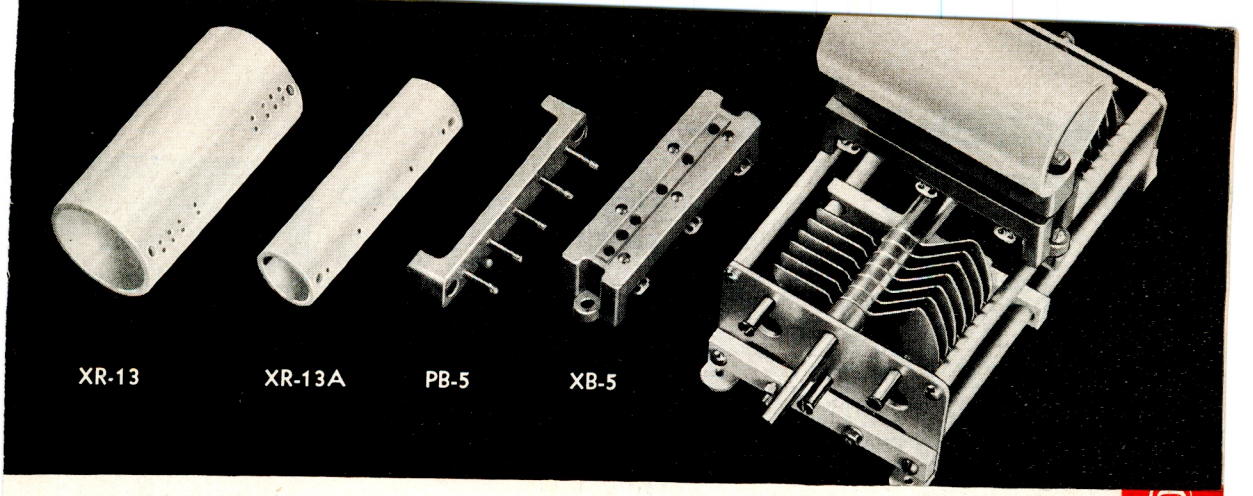


BUFFER COIL FORMS

National Buffer Coil Forms are designed to mount directly on the tie bars of a TMC condenser using the PB-5 Plug and XB-5 Socket. Plug and Socket are of molded R-39.

The two coil forms are of Isolantite, left unglazed to provide a tooth for coil dope. The larger form, Type XR-13, is 1¾" in diameter and has a winding length of 2¾". The smaller form, Type XR-13A, is 1" in diameter and provides a winding length of 2¾". Both forms have holes for mounting and for leads.

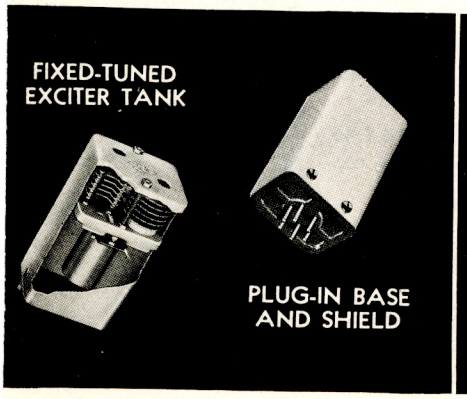
SINGLE UNITS

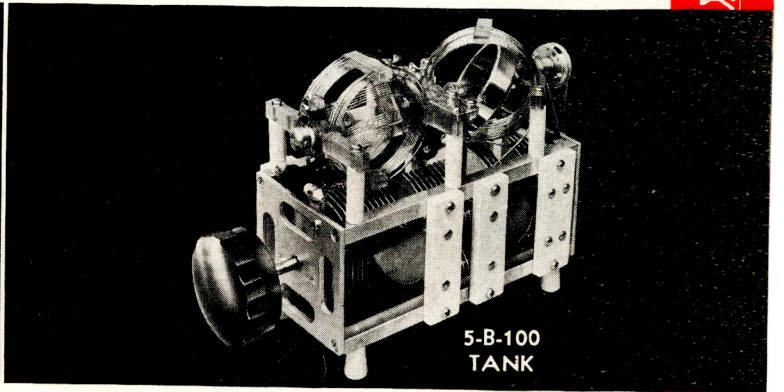
XR-13, Coil Form only **List $1.25**
XR-13A, Coil Form only **List $ .70**
PB-5, Plug only **List $ .85**
XB-5, Socket only **List $ .85**

ASSEMBLIES

UR-13A, Assembly (including small Coil Form, Plug and Socket) **List $2.25**

UR-13, Assembly (including large Coil Form, Plug and Socket) **List $2.75**





FIXED TUNED EXCITER TANK

Similar in general construction to National I.F. transformers, this unit has two 25 mmf., 2000 volt air condensers and an unwound XR-2 coil form.

FXT, without plug-in base **List $5.00**
FXTB-5, with 5 prong base **List $5.50**
FXTB-6, with 6 prong base **List $5.50**

PLUG-IN BASE AND SHIELD

The low-loss R-39 base is ideal for mounting condensers and coils when it is desirable to have them shielded and easily removable. Shield can is 2" x 2⅜" x 4⅛".

PB-10-5, (5 Prong Base & Shield) **List $.85**
PB-10-6, (6 Prong Base & Shield) **List $.85**
PB-10A-5, (5 Prong Base only) **List $.45**
PB-10A-6, (6 Prong Base only) **List $.45**

5-B-100 TANK

The National 5-B-100 is a complete tank circuit (including coils, condenser and R.F. choke), which tunes through five amateur bands with a single dial. The tank replaces the tuning condenser, set of five plug-in coils, plug-in coil socket and R.F. choke, without sacrificing efficiency or space, yet it costs no more.

The 5-B-100 is actually more compact than a tuning condenser and mounted plug-in coil for the same power capabilities. In addition to the compactness and wide tuning range advantages of the 5-B-100, the tank provides for the first time a real constant L/C ratio throughout the tuning range. Harmonics from the low-frequency bands are suppressed without sacrifice of efficiency on the high-frequency bands. Constant link loading or capacity coupling may be used.

The 5-B-100 is an ideal plate tank for R.F. amplifiers using such tubes as 35T, 809, 811, 812, RK-11, RK-12, HK-24, HY-30Z, HY-51Z, etc. with input up to 150 watts (1250 volts unmodulated or 750 volts modulated maximum). Also ideal for grid tank of amplifiers up to 2 KW plate input.

Four mounting insulators are supplied on the base. Overall dimensions are 4 inches wide, 6 inches high and 8 inches deep. Shipping weight, 5 lbs.

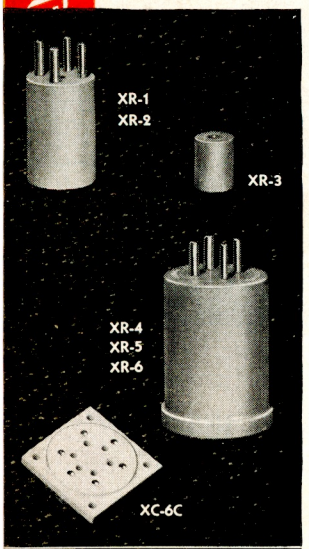
5-B-100 Tank, List $40.00

All prices subject to change without notice

TEMPORARILY DISCONTINUED

COMPANY
EN, MASS., U.S.A.

NATIONAL PARTS



COIL FORMS

XR-1, Four prong, **List $.55**
XR-2, without prongs **List $.40**

Molded of R-39, permitting them to be grooved and drilled. Coil form diameter 1", length 1½".

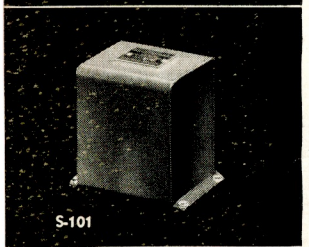
XR-3 **List $.35**

Molded of R-39. Diameter 9/16", length ¾". Without prongs.

XR-4, Four prong, **List $.85**
XR-5, Five prong, **List $.85**
XR-6, Six prong, **List $.85**

Molded of R-39, permitting them to be grooved and drilled. Coil form diameter 1½", length 2¼". A special socket is required for the six-prong form.

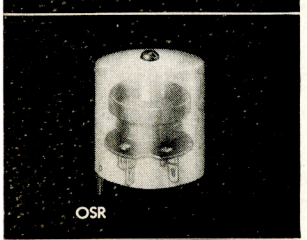
XC6C, Special six-prong socket for XR-6 Coil Form, **List $.85**



IMPEDANCE COUPLER

S-101 **List $6.60**

A plate choke, coupling condenser and grid leak sealed in one case, for coupling the output of a regenerative detector to an audio stage. Used in SW-3U.

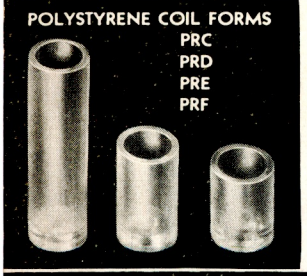


OSCILLATOR COIL

OSR **List $1.65**

A shielded oscillator coil which, with [illegible] with .00041 Mfd. Two separate [illegible] supplied. Excellent for interruption-frequency oscillator in super-regenerative receivers.

TEMPORARILY DISCONTINUED



POLYSTYRENE COIL FORMS

H. F. COIL FORMS

Symbol	Outside Diameter	Length	List
PRC-1	⅜"	⅜"	$.20
PRC-2	⅜"	½"	.20
PRC-3	⅜"	¾"	.20
PRD-1	½"	½"	.20
PRD-2	½"	1"	.20
PRE-1	9/16"	¾"	.25
PRE-2	9/16"	1"	.25
PRE-3	9/16"	2"	.35
PRF-1	¾"	¾"	.35
PRF-2	¾"	1¼"	.45

COIL SHIELDS

RO, coil shield **List $.40**
2" x 2⅜" x 4⅛" high

J30, coil shield **List $.40**
2½" dia. x 3¾" high

B30, coil shield **List $.40**
3" dia. x 3¾" high without mounting base.

B30-B, coil shield **List $.55**
Same as above, but with mounting base.

TEMPORARILY DISCONTINUED

TUBE SHIELDS

TS, tube shield **List $.45**
With cap and base.

T58, tube shield **List $.45**
With cap and base for 77, 78, etc. tubes.

T78, tube shield **List $.45**
With cap and base, for 77, 78, etc. tubes.

T14, tube shield **List $.45**
2⅛" high, for 814, RK-20, etc.

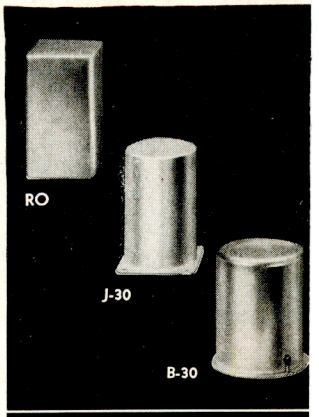
T07, tube shield **List $.45**
3" high, for 807, RK-23, etc.

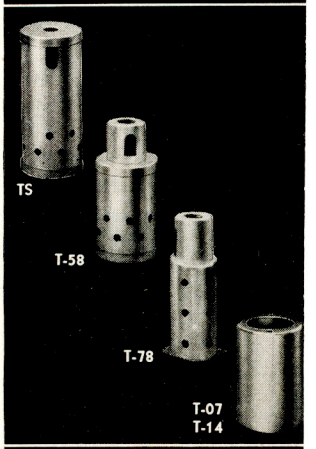
TEMPORARILY DISCONTINUED

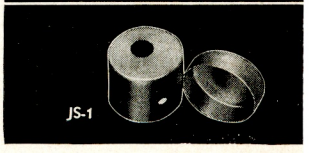
JACK SHIELD

JS-1, jack shield **List $.40**
For shielding small standard jacks mounted behind a panel, or on the ends of extension cords.

TEMPORARILY DISCONTINUED



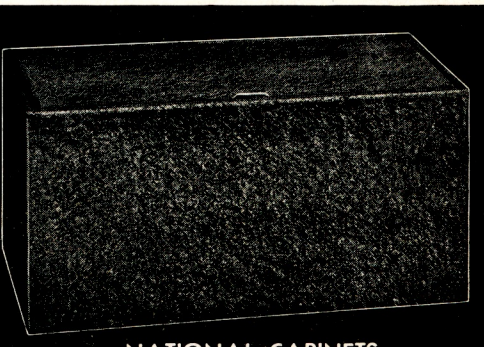




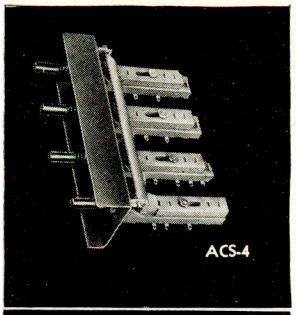
NATIONAL CABINETS

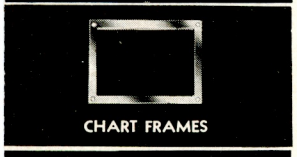
The National Cabinets listed below are the same as those used in National Receivers, except that they are supplied in blank form. They are made of heavy gauge steel, and the paint is unusually well bonded to the metal. Sub-bases and bottom covers are included in the price.

	Width	Height	Depth	List Price
Type C-SW3	9¾"	7"	9"	$6.00
Type C-NC100	17¼"	8¾"	11¼"	9.50
Type C-HRO	16¾"	8¾"	10"	9.50
Type C-One-Ten	11"	7"	7¼"	5.00
Type C-SRR	7½"	7"	7½"	4.00



NATIONAL PARTS





PUSH SWITCH

TEMPORARILY DISCONTINUED

ACS-4, Four gang, with trigger bar **List $5.50**

ACS-1, Single section, less trigger bar **List $1.40**

The National Interlocking Push Switch has low losses, complete reliability and positive contacts. Insulation is R-39. The silverplated contacts are double pole, double throw.

CHART FRAME

The National Chart Frame is blanked from one piece of metal, and includes a celluloid sheet to cover the chart. Size 2¼" x 3¼", with sides ¼" wide.

Type CFA **List $.55**

COIL DOPE

TEMPORARILY DISCONTINUED

CD, Non-hygroscopic **List $1.65**

Liquid Polystyrene Cement — is ideal for winding coils. It will not spoil the properties of the best coil form.

SPEAKER CABINETS

NDC-8 for 8" speaker **List $5.50**

NDC-10 or 10" speaker **List $6.60**

NDC-2 for 10" speaker **List $8.50**

These metal speaker cabinets are acoustically correct. They are lined with acoustic felt, and are of welded construction to eliminate rattles. Finish is black wrinkle on NDC-8 and NDC-10. NDC-2 is finished in two-tone gray to match the NC-200 TG receiver.

I. F. TRANSFORMERS

IFC, Transformer, air core **List $5.50**

IFCO, Oscillator, air core **List $5.50**

Air dielectric condensers isolated from each other by an aluminum shield. Litz wound coils on a moisture proofed ceramic base. Shield can 4⅛" x 2⅜" x 2". Available for either 175 KC or 450–550 KC. Specify frequency.

IFD, Diode Transformer, air core **List $3.85**

TEMPORARILY DISCONTINUED

Tuned primary and untuned, closely-coupled secondary for full wave diode rectifier. For noise silencing circuits, etc. 450–550 KC, air core only.

IFE, Transformer. Same as IFC but iron core, 450–550 KC only **List $5.50**

NATIONAL HIGH FIDELITY TRF UNITS

TEMPORARILY DISCONTINUED

Each chassis provides a three-stage RF Amplifier tuned to one station only.

Each RF Transformer is tuned both primary and secondary (8 tuned circuits). The coupling is adjustable to include 10 KC with less than 1 db variation in the audio range. Sensitivity is adjustable from 5 microvolts to one volt. Three models cover ranges of 540–875, 740–1230, and 1100–1700 KC. The chassis fits a standard 3½" relay rack panel.

DLUS, Tuner, wired and tested unit on ⅛" steel, wrinkle finish, **less tubes,** **List $82.50**

DLUA, Tuner, same as DLUS but has 3/16" aluminum panel, crackle finish, **less tubes** **List $86.50**

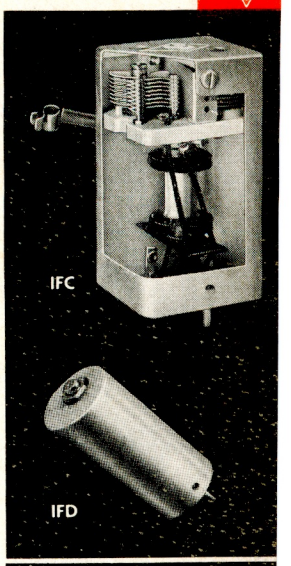
DLCA, Chassis as illustrated with sockets and terminals riveted in place **List $5.00**

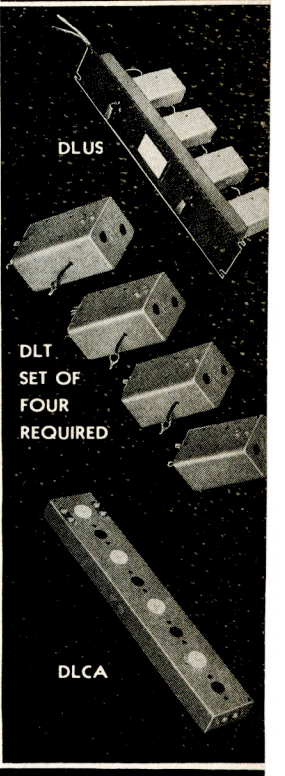
DLPS, Steel ⅛" panel **List $1.65**

DLPA, Aluminum 3/16" panel **List $5.50**

DLT, RF Transformer, set of four required **List, each $7.25**

(Specify operating frequency)





National Oscilloscopes have power supply and input controls built in. A panel switch permits use of the built-in 60-cycle sweep or external audio sweep for securing the familiar trapezoid pattern for modulation measurements.

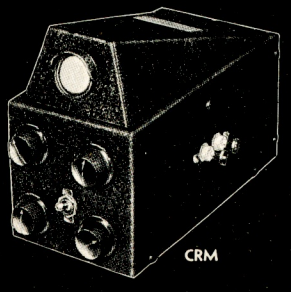
CRM, less tubes **List $21.00**

1" screen, using RCA-913 and 6X5 rectifier. Table model, 4⅛" x 6¼" x 8".

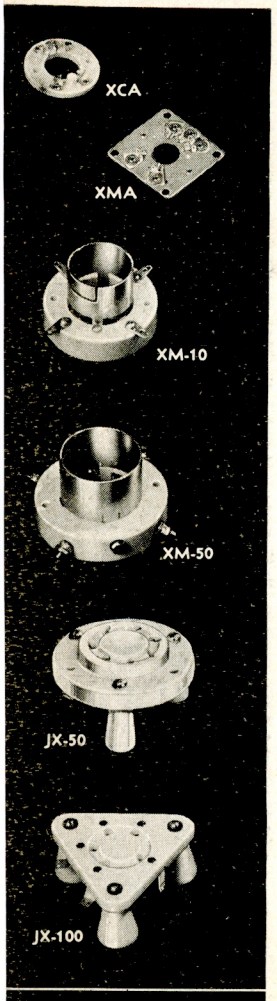
CRR, less tubes **List $35.00**

2" screen, using RCA-902 and 6X5 rectifier. Relay rack mounting.

NATIONAL OSCILLOSCOPES



NATIONAL LOW-LOSS SOCKETS AND INSULATORS



XCA **List $1.65**
A low-loss socket for acorn triodes.

XMA **List $2.20**
For pentode acorn tubes, this socket has built-in by-pass condensers. The base is a copper plate.

XM-10 **List $1.50**
A heavy duty metal shell socket for tubes having the UX base.

XM-50 **List $2.00**
A heavy duty metal shell socket for tubes having the Jumbo 4-pin base ("fifty watters").

JX-50 **List $1.35**
Without Standoff Insulators

JX-50S **List $1.65**
With Standoff Insulators

A low-loss wafer socket for the 813 and other tubes having the Giant 7-pin base.

JX-100 **List $3.30**
Without Standoff Insulators

JX-100S **List $4.00**
With Standoff Insulators

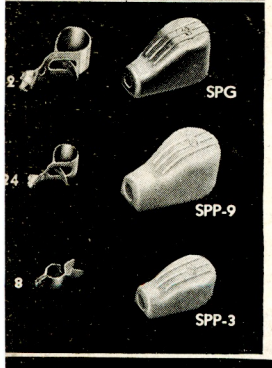
A low-loss wafer socket for the 803, RK-28 and other tubes using the Giant 5-pin base.

SAFETY GRID & PLATE CAPS

SPG **List $.40**
9/16" Cap, R-39 L. L. insulation. These offer protection against accidental contact with High Voltage lobe caps.

SPP-9 **List $.40**
9/16" Cap L. L. ceramic insulation.

SPP-3 **List $.35**
3/8" Cap L. L. ceramic insulation



GRID & PLATE GRIPS

12, for 9/16" Caps **List $.10**
24, for 3/8" Caps **List $.05**
8, for 1/4" Cap **List $.05**
12 & **24** suitable for glass tubes
8 is for metal tubes

GS-1, 1/2" x 1 3/8" **List $.40**

GS-2, 1/2" x 2 7/8" **List $.50**

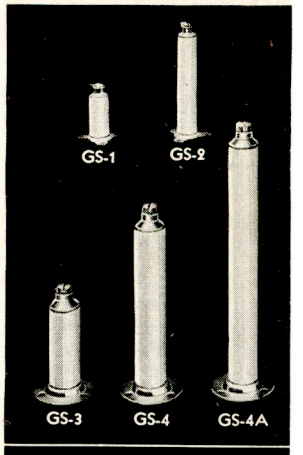
GS-3, 3/4" x 2 7/8" **List $1.00**

GS-4, 3/4" x 4 7/8" **List $1.25**

GS-4A, 3/4" x 6 7/8" **List $1.75**

Cylindrical low-loss steatite standoff insulators with nickel plated caps and bases.

GSJ, (not illustrated) **List $.10**
A special nickel plated jack top threaded to fit the 3/4" diameter insulators GS-3, GS-4 & GS-4A.



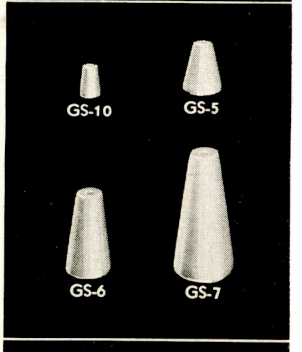
GS-5, 1 1/4" **List, each $.40**

GS-6, 2" **List, each $.70**

GS-7, 3" **List, each $1.25**

GS-10, 3/4", package of 10 **List $1.20**

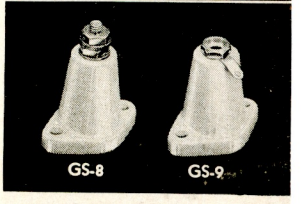
These cone type standoff insulators are of low-loss steatite. They have a tapped hole at each end for mounting.



GS-8, with terminal **List $.90**

GS-9, with Jack **List $1.25**

These low-loss steatite standoff insulators are also useful as lead-through bushings.

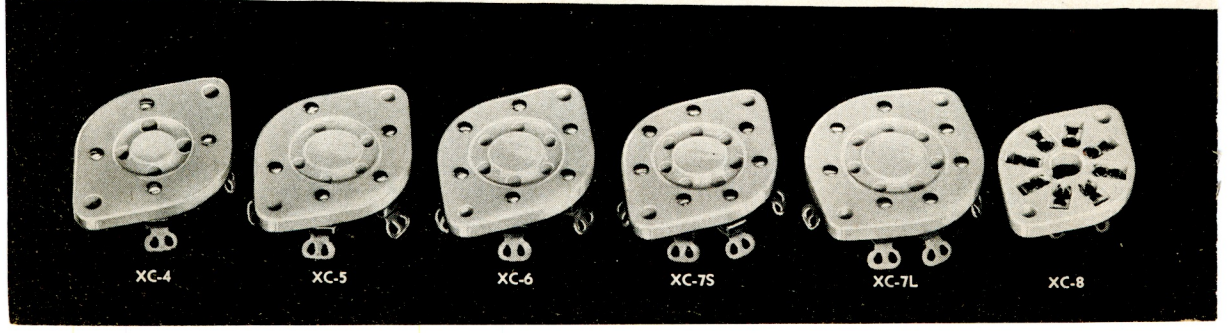


XC Series Sockets

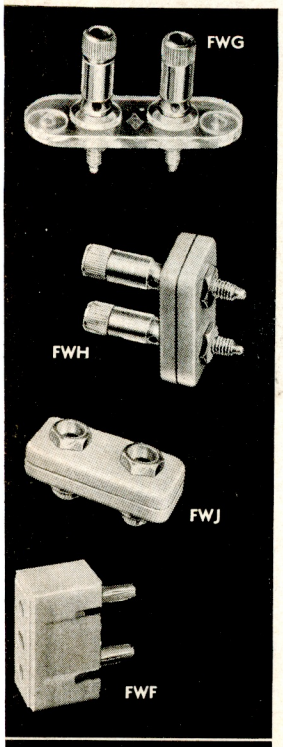
XC-4	List $.60
XC-5	List $.65
XC-6	List $.70
XC-7S	List $.75
XC-7L	List $.75
XC-8	List $.65

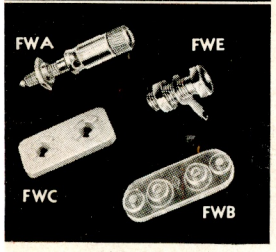
National wafer sockets have exceptionally good contacts with high current capacity together with low loss Isolantite insulation. A l types have a locating groove to make tube insertion easy.

All prices subject to change without notice



NATIONAL LOW-LOSS SOCKETS AND INSULATORS





FWG **List $.70**

A Victron terminal strip for high frequency use. The binding posts take banana plugs at the top, and grip wires through hole at the bottom, simultaneously, if desired.

FWH **List $.95**

The insulators of this terminal assembly are molded R-39 and have serrated bosses that allow the thinnest panel to be gripped firmly, and yet have ample shoulders. Binding posts same as FWG above.

FWJ **List $.75**

This assembly uses the same insulators as the FWH above, but has jacks. When used with the FWF plug (below), there is no exposed metal when the plug is in place.

FWF **List $1.10**

This molded R-39 plug has two banana plugs on ¾" centers and fits FWH or FWJ above. Leads may be brought out through the top or side.

FWA, Post **List, each $.30**
Brass Nickel Plated

FWE, Jack **List, each $.20**
Brass Nickel Plated

FWC, Insulator
List, per pair $.40
R-39 Insulation

FWB, Insulator **List, each $.10**
Polystyrene insulation

CIR Series Sockets

Any Type **List $.45**

Type CIR Sockets feature low-loss isolantite or steatite insulation, a contact that grips the tube prong for its entire length, and a metal ring for six position mounting. The sockets are supplied with two metal standoffs.

AA-3 **List $.60**

A low-loss steatite spreader for 6 inch line spacing. (600 ohms impedance with No. 12 wire.)

AA-5 **List $.50**

A low-loss steatite aircraft-type strain insulator.

AA-6 **List $.90**

A general purpose strain insulator of low-loss steatite.

XS-6 **List, each $.20**

A low-loss isolantite bushing for ½" holes.

XP-6

Same as above but Victron.
List, box of ten $.85

TPB **List, per dozen $.85**

A threaded polystyrene bushing with removable .093 conductor moulded in, ¼" diam., 32 thread.

XS-7, (⅜" Hole) **List $.55**
XS-8, (½" Hole) **List $.75**

Steatite bushings. Prices include male and female bushings with metal fittings.

XS-1, (1" Hole) **List $1.20**
XS-2, (1½" Hole) **List $1.35**

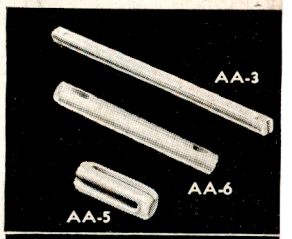
Prices listed are per pair, including metal fittings. Insulation steatite.

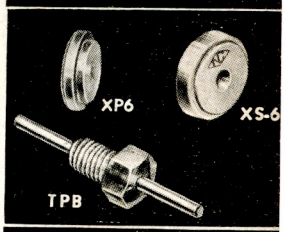
XS-3, (2¾" Hole) **List $6.00**
XS-4, (3¾" Hole) **List $7.25**

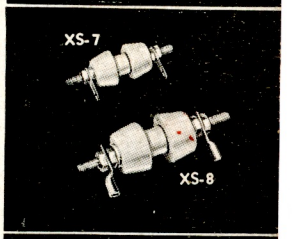
Prices are per pair, including metal fittings. These low-loss steatite bowls are ideal for lead-in purposes at high voltages.

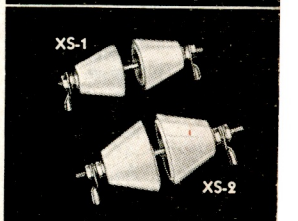
XS-5F, With Fittings
List, per pair $17.00

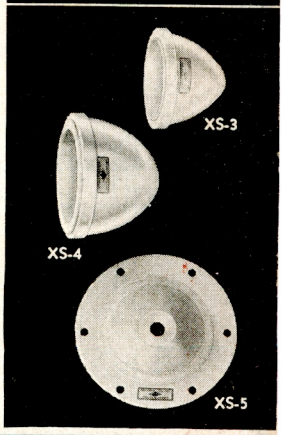
These big low-loss bowls have an extremely long leakage path and a 5¼" flange for bolting in place. Insulation steatite.

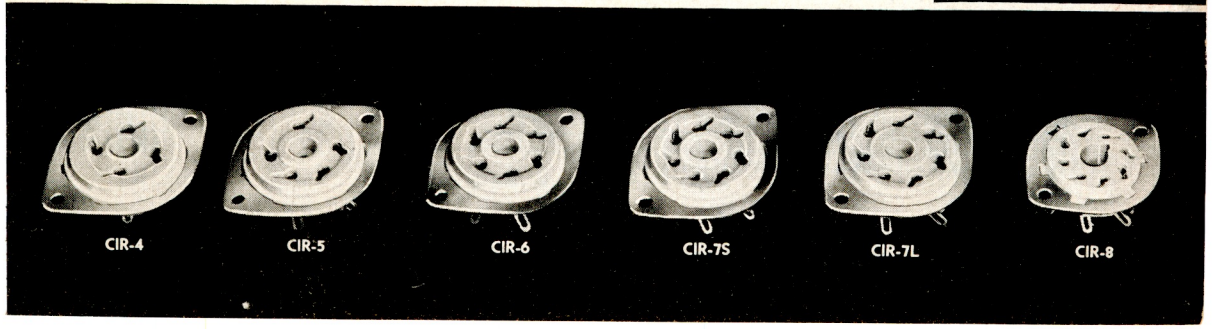




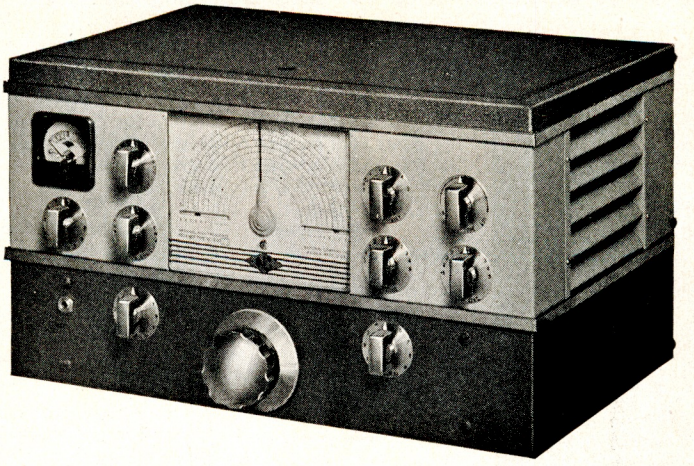








NATIONAL NC-200



The National NC-200 is a new communications receiver having a number of features not previously available. Twelve tubes are used in a highly perfected circuit that includes an extremely effective noise limiter. The crystal filter has an exceptionally wide selectivity range for use on both CW and phone, as well as a phasing circuit that makes rejection ratios as high as 10,000 to 1 available even when the interfering signal is only a few hundred cycles from the desired signal. The AVC holds the audio constant within 2 db for signals from 10 microvolts to 100,000 microvolts. The sensitivity of the NC-200 is particularly high, requiring only 1 microvolt input for 1 watt of audio output on the highest frequencies covered by the receiver. Signal-to-image ratio is better than 30 db at ten meters.

There are ten calibrated coil ranges, each with its own scale on the direct-reading dial. Six of these ranges provide continuous coverage from 490 KC to 30 MC. The remaining four ranges cover the 10, 20, 40 and 80 meter bands, each of which is spread over the major portion of the dial scale. Ranges are selected by a panel control knob. A movable-coil system similar to the NC-100 is used. The inertia-type dial drive has a ratio of about 20 to 1.

All models of the NC-200 are suitable for either AC or battery operation, having both a built-in AC power supply and a special detachable cable and plug for battery connection. Removal of the speaker plug disconnects both plate and screen circuits of the audio power stage thus providing maximum battery economy. The B supply filter and the standby switch are wired to the battery terminals, so that the filter is available for vibrator or dynamotor B supplies.

The ten-inch speaker is housed in a separate cabinet specially designed to harmonize with the trim lines of the receiver. The undistorted output is 8 watts.

All features expected in a fine communication receiver are provided. These include CW oscillator, Signal Strength Meter, B-supply switch, etc. A phonograph input jack is provided.

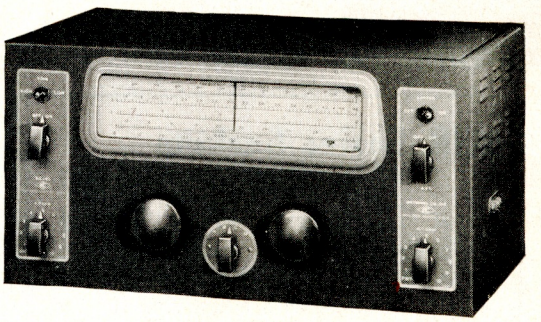
NC-200 TG, Table Model, two tone gray wrinkle receiver only. **List $265.83**

NC-2 TS, Table mounting 10" P.M. Loud Speaker in cabinet to match NC-200 TG above. **List $25.00**

NC-200 RG, Rack Model, gray wrinkle 3/16" aluminum panel receiver only. **List $289.33**

NC-2 RS, Rack Mounting 10" P.M. Loud Speaker on 10½" panel to match NC-200 RG above. **List $25.00**

NATIONAL NEW NC-45



The NC-45 receiver is an eight tube superheterodyne combining capable performance with low price. Features include a series valve noise limiter with automatic threshold control, tone control, CW oscillator, separate RF and AF gain controls, and AVC. Power supplies are self contained except for the battery model which must have an external source of heater and plate power, such as batteries or vibrapack.

A straight-line-frequency condenser is used in conjunction with a separate band spread condenser. This combination plus the full vision dial calibrated in frequency for each range covered and a separate linear scale for the band spread condenser, makes accurate tuning easy. Both condensers have inertia type drive. A coil switch with silver plated contacts selects the four ranges from 550 KC to 30 MC. Provision is made for either headphone or speaker.

Like all receivers which have no preselector stage, the NC-45 is not entirely free from images. However, where price is an important consideration, the NC-45 will be found a very satisfactory receiver.

NC-45 — Receiver only, complete with tubes, coils covering from 550 KC to 30 MC for 105–130 volts AC or DC operation — black finish. **List $84.17**

NC-45B — Receiver only, same as above but for battery operation, less batteries. **List $84.17**

NC-45A — Receiver only, same as above but for 105–130 volts AC only. **List $84.17**

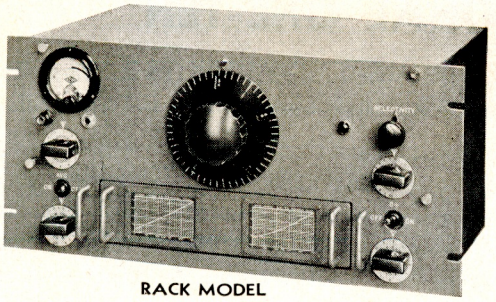
NC-44TS — Loud Speaker in table mounting cabinet to match above receivers. **List $11.66**

RRA — Relay Rack Adapters designed for mounting these receivers in a standard relay rack. **List $2.75**

Shipping Weights: All models, 45 pounds, including speaker.

All prices subject to change without notice

NATIONAL HRO



RACK MODEL

The HRO Receiver is a high-gain superheterodyne designed for communication service. Two preselector stages give remarkable image suppression, weak signal response and high signal-to-noise ratio. Air-dielectric tuning capacitors account, in part, for the high degree of operating stability. A crystal filter with both variable selectivity and phasing controls makes possible adjustment of selectivity over a wide range. Heterodynes and interfering c.w. signals may be "phased out" (attenuated) by correct setting of the phasing control. A signal strength meter, connected in a vacuum tube bridge circuit, is calibrated in S units from 1 to 9 and in db above S9 from 0 to 40. Also included are automatic and manual volume control features, a beat oscillator, a headphone jack and a B+ stand-by switch. Power supply is a separate unit. The standard model of HRO is supplied with four sets of coils covering the frequencies from 1.7 to 30 megacycles. Each coil set covers two amateur bands and the spectrum between. The higher frequency amateur band of each range, by a simple change-over operation, may be expanded to occupy 400 divisions of the 500 division PW instrument type dial.

For those who require the high performance of the HRO but do not need its extreme versatility, the HRO Jr. is offered. The fundamental circuit and mechanical details of both receivers are identical, but the HRO Jr. is simplified by omitting the crystal filter, signal strength meter and by supplying coils less the band-spread feature.

The frequency range of both the HRO and HRO Jr. may be extended to 50 kilocycles by using additional coil sets.

All models of the HRO are supplied with 6.3 volt heater type tubes. Table models and accessories are finished in black wrinkle enamel.

A technical bulletin covering completely all details will be supplied upon request.

HRO table model, receiver only, complete with four sets of coils (1.7–4.0, 3.5–7.3, 7.0–14.4, 14.0–30.0 MCS). **List $329.50**

HRO Jr., table model, receiver only, with one set of 14 to 30 mc. coils. **List $198.00**

COILS

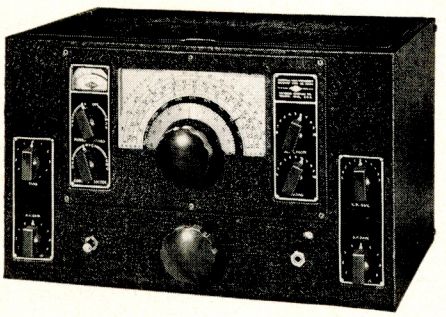
HRO Type	**E,** Range 900–2050 kc	**List $22.00**
HRO Type	**F,** Range 480–960 kc	**List $22.00**
HRO Type	**G,** Range 180–430 kc	**List $30.00**
HRO Type	**H,** Range 100–200 kc	**List $33.00**
HRO Type	**J,** Range 50–100 kc	**List $40.00**
HRO Jr. Type JA, Range 14.0–30.0 mc		**List $18.25**
HRO Jr. Type JB, Range 7.0–14.4 mc		**List $18.25**
HRO Jr. Type JC, Range 3.5–7.3 mc		**List $18.25**
HRO Jr. Type JD, Range 1.7–4.0 mc		**List $18.25**

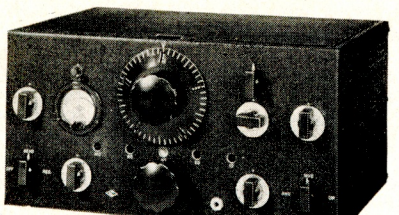
MCS table model cabinet, 8" PM dynamic speaker and matching transformer **List $18.25**

697 Table power unit; 115 volt, 60 cycle input; 6.3 volt heater and 230 volt, 75 m.a. output, with tube **List $29.50**

See our 1942 catalogue No. 500 for relay rack mounting, coil containers and accessories.

NATIONAL NC-100A NC-101X





These 11 tube superheterodyne receivers are self-contained (except for the speaker) in a table model cabinet that is readily adapted to relay rack mounting. One stage of R.F. and two stages of I.F. are used. Low loss insulation and high-Q coils give ample sensitivity and selectivity. Separate R.F. and Audio Gain Controls and a signal strength meter are mounted on the panel. Other controls are tone, CW Oscillator, AVC with amplified and delayed action, a B+ switch, and a phone jack. A self-contained power supply provides all necessary voltages including speaker field excitation. The range changing system is unique in that it combines the mechanical convenience of a coil switch with the electrical efficiency of plug-in coils.

All **NC-100** series receivers are fitted with a noise limiter of truly remarkable effectiveness.

The **NC-100A,** illustrated above, covers the range from 540 KC to 30 MC. The large full vision dial is calibrated directly in megacycles and a separate high speed vernier scale provides high precision in logging. The **NC-100XA** is similar but equipped with a crystal filter.

The **NC-101X,** illustrated below, is built strictly for the amateur bands and covers only the following ranges: 1.7–2.05 MC, 3.5–4.0 MC, 7.0–7.3 MC, 14.0–14.4 MC, and 28.0–30.0 MC. The NC-101X is equipped with a crystal filter, S-meter, and the PW type instrument dial.

The **NC-101XA** has the same features as the NC-101X, except for the direct reading dial and the cabinet, which are similar to the NC-100XA.

NC-100A — complete with tubes. AC model — 10" speaker in cabinet. **List $220.00**

NC-100XA — complete with tubes and crystal filter. AC model — 10" speaker. **List $261.25**

NC-101X — complete with tubes. AC model — 10" speaker in cabinet. **List $236.50**

NC-101XA — complete with tubes. AC model — 10" speaker in cabinet. **List $236.50**

See our 1942 catalogue No. 500 for battery models, 12 inch speakers, 200–400 kc range, etc.

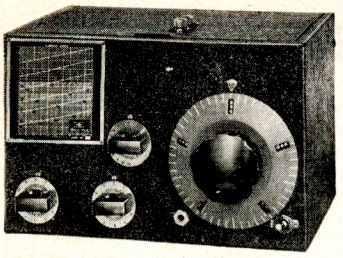
NOTE: *Special models of the NC-100 receiver with bands covering a 200–400 KC range are available. Prices furnished upon request. Battery models can be operated from 686 Vibrapak.*

All prices subject to change without notice

NC-101X and NC-101XA are temporarily discontinued.

NATIONAL COMPANY, INC., MALDEN, MASS., U.S.A.

ONAL COMPANY, INC., MALDEN, MASS., U.S.A.



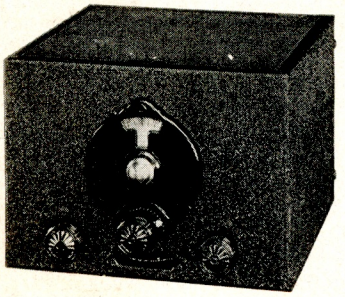
110 Receiver and 6 sets of coils, without tubes, speaker or power supply. **List $93.50**

5886 Power Supply for above receiver, with tube. **List $32.50**

NATIONAL ONE-TEN

The One-Ten Receiver fulfills the need for an adequate receiver to cover the field between one and ten meters.

A four-tube circuit is used, composed of one tuned R.F. stage, a self-quenching super-regenerative detector, transformer coupled to a first stage of audio which is resistance coupled to the power output stage. Tubes required: 954-R.F.; 955-Detector; 6C5-1st Audio, 6F6-2nd Audio.



NATIONAL SW-3

The SW-3U Receiver employs a circuit consisting of one R.F. stage transformer coupled to a regenerative detector and one stage of impedance coupled audio. This circuit provides maximum sensitivity and flexibility with the smallest number of tubes and the least auxiliary equipment. The single tuning dial operates a precisely adjusted two gang condenser; the regeneration control is smooth and noiseless, with no backlash or fringe howl; the volume control is calibrated from one to nine in steps corresponding to the R scale.

ONE UNIVERSAL MODEL — The circuit of the SW-3U is arranged for either battery or AC operation without coil substitution or circuit change. Battery operation utilizes two 1N5-G and one 1A5-G tubes. AC operation utilizes two 6J7-G and one 6C5-G tubes. Type 5886 AB power supply is recommended.

SW-3U, Universal model, without coils, phones, tubes or power supply. **List $38.50**

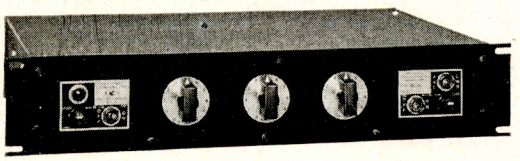
5886-AB, Power Supply, 115 V, 60 cycle, with 80 Rectifier. **List $32.50**

General Coverage Coils

Cat. No.	Range — Meters	List Per Pair
30	9 to 15	**$3.85**
31	13.5 to 25	**3.85**
32	23 to 41	**3.85**
33	40 to 70	**3.85**
34	65 to 115	**3.85**
35	115 to 200	**3.85**
36	200 to 360	**4.40**
37	350 to 550	**4.40**
38	500 to 850	**5.50**
39	850 to 1200	**7.25**
40	1200 to 1500	**7.25**
41	1500 to 2000	**7.25**
42	2000 to 3000	**9.50**

Band Spread Coils

30A	— 10 meter	**$3.85**
31A	— 20 meter	**3.85**
33A	— 40 meter	**3.85**
34A	— 80 meter	**3.85**
35A	— 160 meter	**3.85**



NATIONAL SCR-2

The SCR-2 is an extremely compact crystal controlled receiver for single channel reception mounted on a 3½" relay rack panel. It has two stages of tuned RF amplification, a dual purpose converter with crystal controlled oscillator, two stages of IF amplification, a detector and one audio stage. Auxiliary circuits are AVC, CW oscillator and noise limiter. Nine tubes are used, and the power supply is self-contained.

The SCR-2 is definitely a high performance receiver. Signal-to-noise ratio averages 10 db for an input of 2.5 microvolts. The AVC is flat within 4 db for inputs from 1 microvolt to well over 1 volt. Being crystal controlled, the frequency stability is excellent. The IF channel has a bandspread characteristic to allow for slight transmitter drift, etc.

As the SCR-2 receiver is intended for communication work, the audio channel has been deliberately made flat only from 100 to 1500 cycles, with increasing attenuation of higher frequencies, thus providing good intelligibility with maximum reduction of unwanted signals and noise.

SCR-2 receivers are available for use at fixed frequencies between 100 kcs and 18 mcs. A free booklet describing this receiver will be mailed on request. **List, less crystal, $**

All prices subject to change without notice

NATIONAL COMPANY

61 SHERMAN STREET, MALDEN, MASS., U. S. A.

ARMY
E
NAVY
McElroy
MANUFACTURING
CORPORATION
82 BROOKLINE AVENUE
BOSTON, MASS.

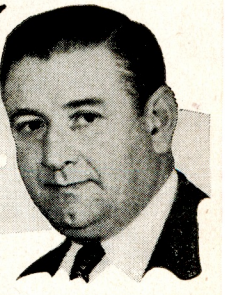
Proudest moment

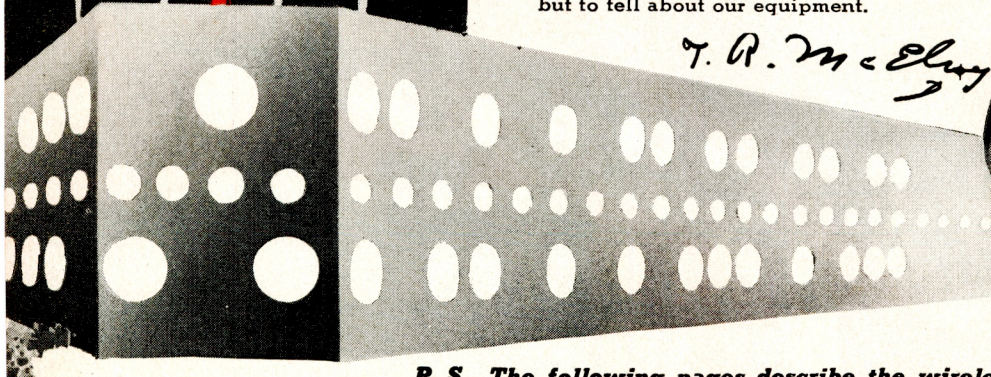
As much as we'd like to boast about our products, nothing means so much to us as that wonderful day of November 8, 1943, when we received the Army-Navy "E". We're thrilled . . . we're forever grateful to the Army and Navy . . . and we're going to try awfully hard to live up to this honor.

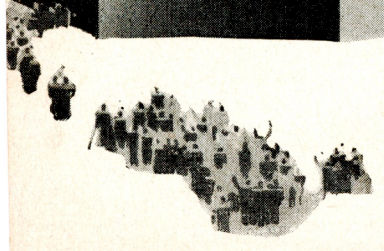
We've got a happy factory, staffed by a couple of hundred fine American girls and fellows. And we put all the ability we have into each job we do. On the basis of thirty years' experience, I have ideas as to what constitutes good telegraph apparatus. Our engineers, under Tom Whiteford, design the original working models. Our girls and fellows build them.

Now a few words about our selling policy. We have no salesmen, but we do have some resident representatives at points where they may be helpful. For example, in Chicago, there's Joe Goode at 325 West Huron Street. He knows the business of distributing communications equipment through commercial outlets. In New York, there's Frank Rigby who has been my friend since our Marine days in the last World War, and who helps me by passing along information in that vicinity. And we have Hoyt Haddock whom I've known as a wireless operator for twenty years. Hoyt is in Washington not to "sell" but to tell about our equipment.

T. A. McElroy



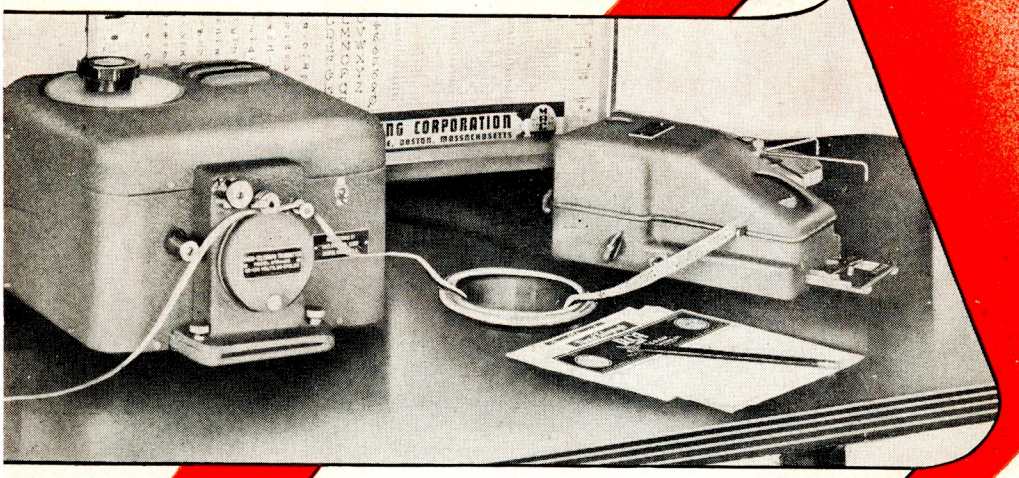


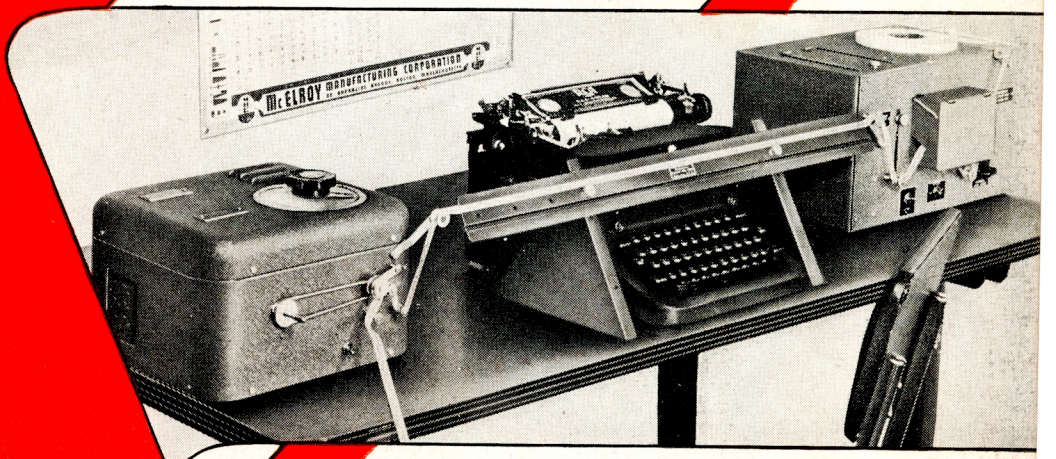


P. S. The following pages describe the wireless telegraph apparatus that we manufacture. The only thing that I can add to the pictures and descriptions of our equipment is this: "We never imitate. We never copy. We design and build. And we can deliver."

McElroy **MANUFACTURING CORP.**
82 BROOKLINE AVE., BOSTON, MASS.

WORLD'S LARGEST MANUFACTURER OF AUTOMATIC RADIO TELEGRAPH APPARATUS





McELROY

High-Speed Automatic Radiotelegraph Assemblies

The photograph in the top panel illustrates a complete McElroy automatic transmitting assembly . . . in the lower panel you see a McElroy automatic receiving assembly. These installations are typical of the high-speed radio telegraph equipment we supply to such international companies as R.C.A. Communications, Mackay Radio, Globe Wireless, Press Wireless . . . as well as to Army and Navy services everywhere.

On the following pages, each piece of equipment is individually illustrated and described. Technical manuals and operating instructions may be secured by writing direct to us.

ARMY E NAVY

McElroy MANUFACTURING CORPORATION

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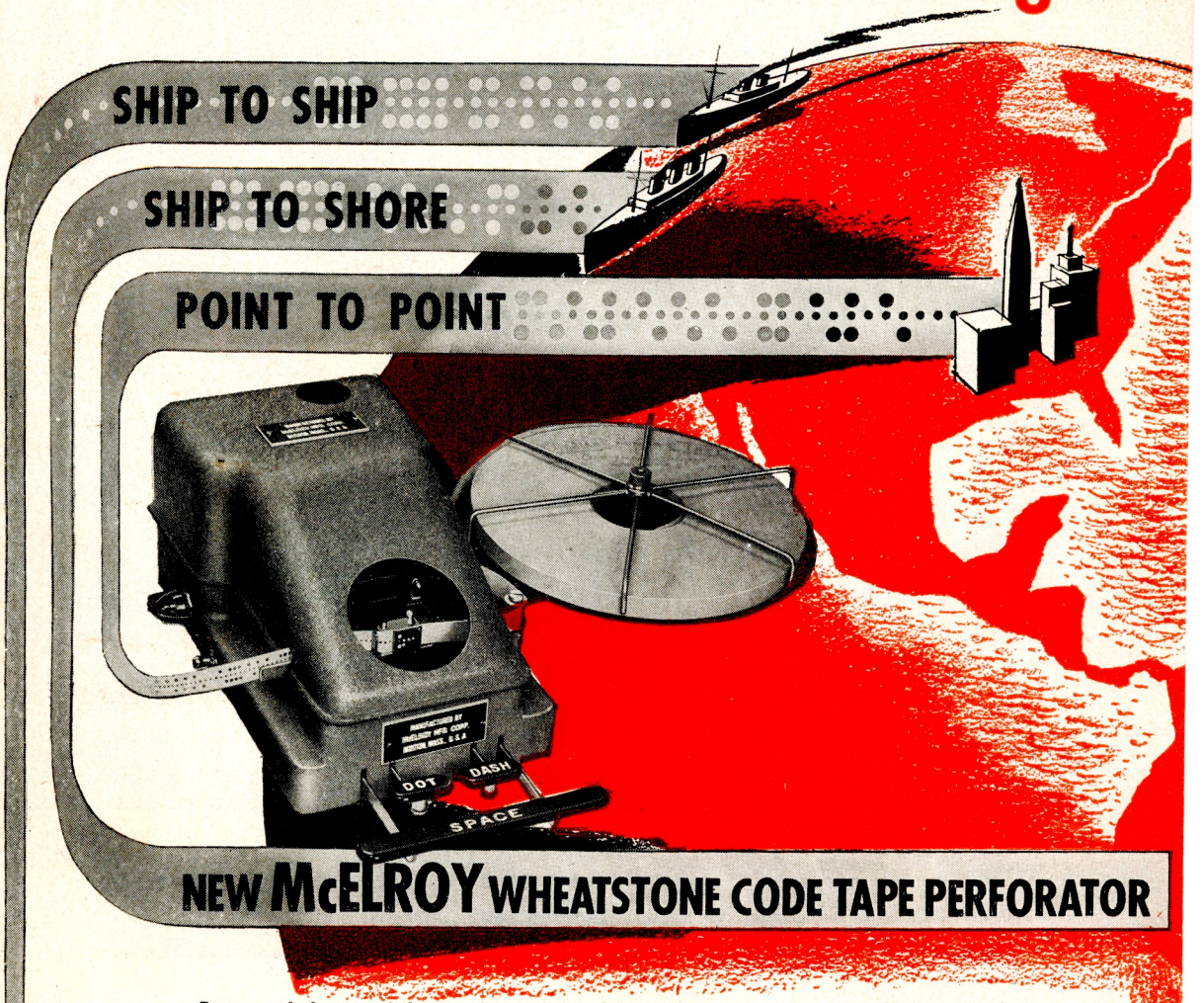
BOSTON, MASS.

McELROY does it again!



NEW McELROY WHEATSTONE CODE TAPE PERFORATOR

Aware of the need for an instrument that would provide more efficient marine radiotelegraph communications, Ted McElroy* and his creative engineers have perfected the Model PFR-443 Wheatstone Code Tape Perforator.

Speed limitations of hand sending coupled with certain restrictions of manual operation have oftimes proved costly in time, money, and lives. Now, because of precise electrical and mechanical features, this new Perforator practically eliminates the human margin of error. These prepared tapes feed through automatic radiotelegraph transmitters.

Simple to operate, the PFR-443 performs automatically or semi-automatically. Anyone with a basic knowledge of signal codes can prepare tapes cleanly and accurately at speeds up to 50 words per minute . . . not only in International Morse, but in all other codes used throughout the world. Wheatstone Perforated Tapes also serve as file records of all transmissions. Additional information may be obtained by writing to McElroy Manufacturing Corporation.

* WORLD CHAMPION RADIO TELEGRAPHER FOR MORE THAN 20 YEARS

Hasten the peace . . . keep buying war bonds

McElroy MANUFACTURING CORP.
82 BROOKLINE AVE., BOSTON, MASS

WORLD'S LARGEST MANUFACTURER OF AUTOMATIC RADIO TELEGRAPH APPARATUS

PFR-443, Wheatstone Code Tape Perforator

Well may Ted McElroy be proud of this remarkable unit. The Wheatstone Code Tape Perforator is unquestionably one of the outstanding contributions to the art of radio telegraphy. Actuated by 110 volt AC, this model PFR-443 prepares tapes cleanly and accurately at speeds up to 50 words per minute . . . for feeding through automatic transmitters.

The Wheatstone Code Tape Perforator assures perfect transmission of radio telegraph signals, thereby replacing inadequate hand-sending which often results in errors and repetition requests. Manual deficiencies contribute largely to unnecessary use of radio transmitters, with consequent congestion of the radio spectrum.

An experienced radioman is not needed to effectively operate this Perforator. Anyone with a basic knowledge of the dots and dashes comprising signal codes can prepare perfect tape for transmission . . . not only in International Morse but also in other codes used throughout the world including Japanese, Russian, Turkish, Arabic, Greek, etc.

It's extremely simple to operate. The unit is placed in position similar to a hand telegraph key, and may be operated with a feather-light touch of the index finger, middle finger and thumb of the right hand. Depressing the dot, dash or space closes electrical contacts actuating a powerful die mechanism.

This Perforator may be used fully automatic, providing a continuous series of characters, and with a variable speed control . . . or it may be operated semi-automatically to form only one character at a time.

This method of machine sending will prove of great value in improving the efficiency of radio communications on ships and at all other radio stations.

ARMY E NAVY

McElroy MANUFACTURING CORPORATION

82 BROOKLINE AVENUE
BOSTON, MASS.

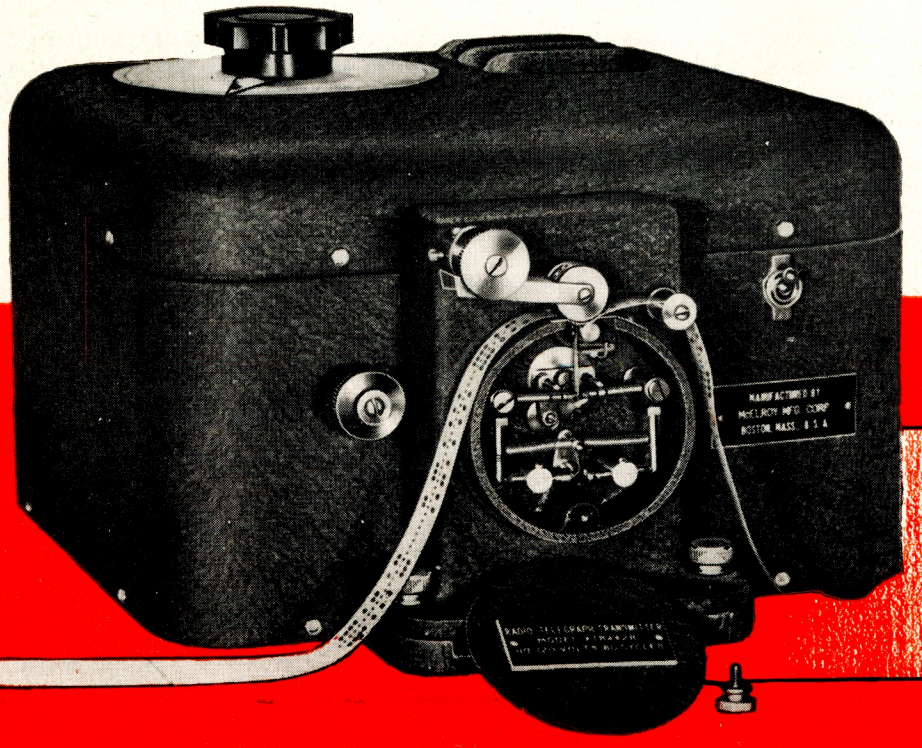
new

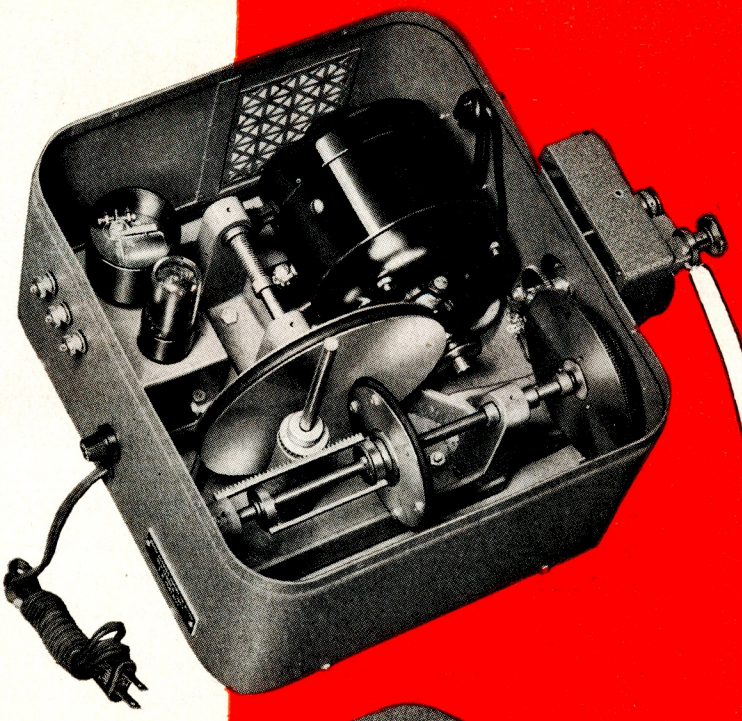
Model XTR-442 B
Automatic Transmitter

One of Ted McElroy's proudest achievements, the new XTR-422 B Automatic Transmitter is the answer to the problem of transmissions which must be calibrated exactly in words per minute, and kept for indefinite periods at a fixed rate.

The XTR-442 B opens and closes any keying circuit to form mechanically precise signal elements, dots and dashes, in response to Wheatstone perforated tape. This unit will key either the intermediate relay of a radiotelegraph station or an audio oscillator for training radiotelegraph operators.

The auto head is operated by a rugged friction drive, powered by a heavy duty, constant speed induction motor. The speed control is calibrated directly in words per minute. The speed, in words per minute, for which the speed control is set by the operator, is absolutely constant . . . voltage fluctuations of the power, and temperature rises, do not affect the transmission rate of the unit.





ARMY E NAVY

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MANUFACTURING CORPORATION

82 BROOKLINE AVENUE
BOSTON, MASS.

"NEVER BE SATISFIED WITH MEDIOCRITY"

From telegraph boy to head of the world's largest plant producing automatic radiotelegraph apparatus . . . is Ted McElroy's* own success saga. And the creed that drove him on—NEVER BE SATISFIED WITH MEDIOCRITY. This same spirit prevails throughout the McElroy organization where inquisitive engineers never copy and never imitate. They create, design, build . . .

Typical of the work they do is the new McELROY MODEL SR-900 SL-990 . . . a superior commercial recorder including an automatic noise limiter and signal leveller. Embodying new principles of design and operation, it will record clean, readable signals at speeds up to 350 words a minute under the most adverse conditions.

Your inquiries are invited. If a McElroy engineer can be of service to you, ask for one.

*WORLD CHAMPION RADIO TELEGRAPHER FOR MORE THAN 20 YEARS

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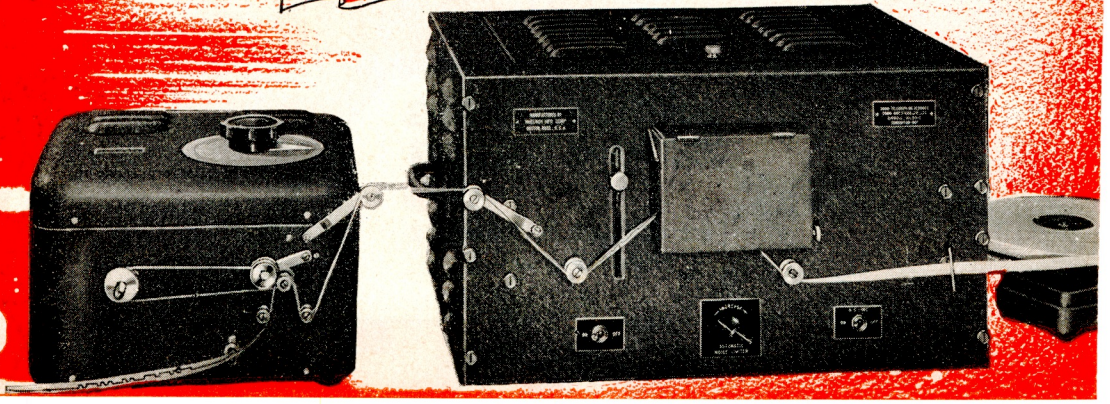
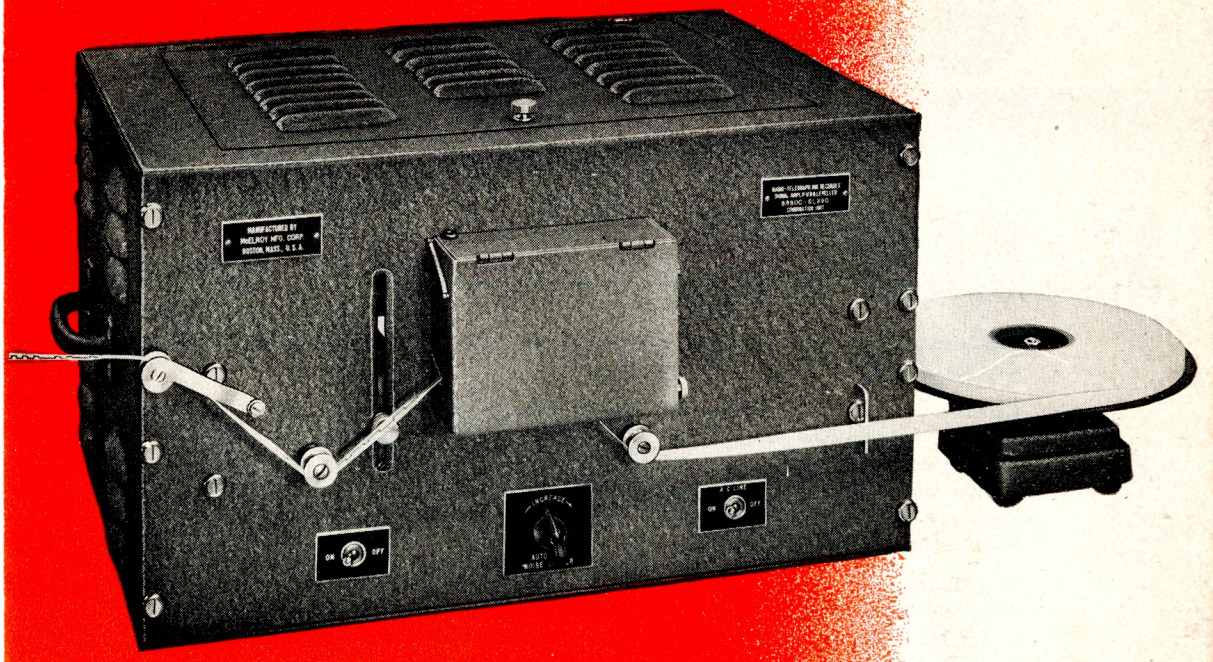
WORLD'S LARGEST MANUFACTURER OF AUTOMATIC RADIO TELEGRAPH APPARATUS

BUY MORE WAR BONDS





McELROY

Medium Speed Recorder-Combination
Model SR-900 SL-990

This new McElroy development is an excellent all-purpose Recorder suitable for speeds up to approximately 350 words per minute. It is a complete unit except for the Tape Puller, and is simply, yet ruggedly, designed. The circuit comprises an automatic noise limiter and signal leveller terminating in a push-pull amplifier which drives a lightweight low impedance moving coil through a heavy duty copper oxide rectifier.

Designed primarily to withstand the strain of constant operation, this model will record clean and readable signals even under most adverse conditions. It may be operated directly from the tone signal of any communication receiver . . . having a 5000 ohm or 5 to 50 ohm output. The amplifier and selector incorporated in the Recorder is capable of rejecting background noises, weaker interfering signals and static. Only the signal of the highest level is recorded.

The inkwell, mounted in the back of the panel under the cabinet cover, controls the flow of ink by being raised and lowered in a vertical position feed. This is accomplished by a control knob working through a slot on the front panel . . . and is a distinct advantage over other designs that operate with the stylus approaching the tape from a horizontal position.

Where performance and consistent dependability are the prime considerations, the Model SR-900 SL-990 Recorder should be used with the McElroy Tape Puller Model TP-890-B.

ARMY E NAVY

McElroy

MANUFACTURING CORPORATION

82 BROOKLINE AVENUE
BOSTON, MASS.

McElroy MANUFACTURING CORPORATION
82 BROOKLINE AVENUE
BOSTON, MASS.

ARMY E NAVY

McELROY High-Speed Recorder, Model SR-900-A

This entirely new recorder has many unique advantages . . . and it is specifically designed for operation at ultra-high-speeds.

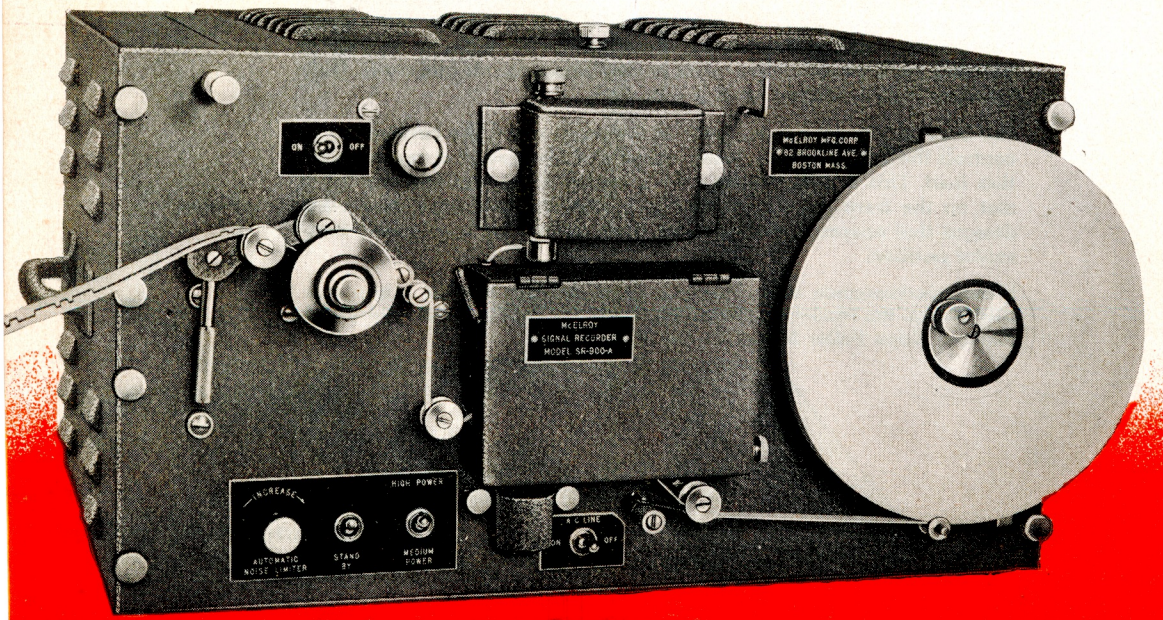
Recorders of standard design are limited because signals to be recorded are required to overcome mechanical inertia. In the McElroy SR-900-A, the return of the exciter coil and ink stylus to the signal base is not dependent upon mechanical action. Consequently, there is no resistance to the movement of the ink stylus. Lightly balanced and delicately, but sturdily, pivoted, the coil and inking stylus float freely without restriction.

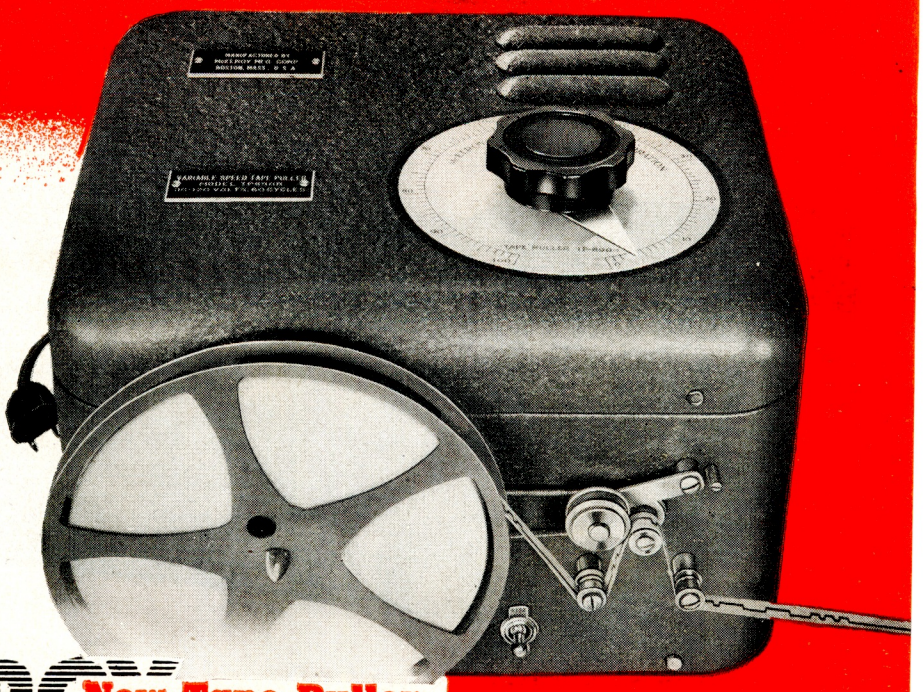
The Model SR-900-A operates directly from the tone signal of any radio receiver, rejecting all but the signal of the highest level, reducing the effects of interference to minimum. Background noises, weaker interfering signals and static are rejected by the amplifier and selector incorporated in this Recorder.

The inking mechanism feeds directly down with the pen recording in a vertical position, presenting a distinct advantage over other types which record with the pen touching the tape in a horizontal position. While the tape puller with adjustments for three speeds is built-in, the tape reel is mounted on the panel.

Designed to accommodate mounting in a standard radio rack, if desired, for monitoring purposes, the Recorder is nevertheless completely enclosed for table operation at high speeds. In addition, a separate pullmotor can be utilized for normal speeds when the operator desires to transcribe signals direct.

With the McElroy High-Speed Recorder, clean and readable signals are assured where other Recorders might respond with hopelessly jumbled and undecipherable copy.

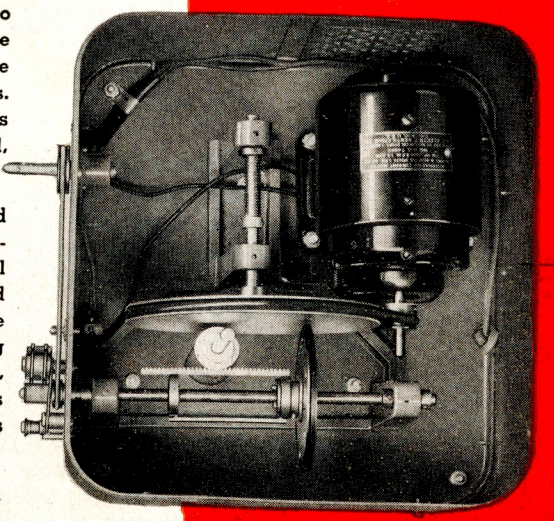




McELROY

New Tape Puller
Model TP-890 B

The new McElroy Tape Puller TP-890 B is used to give traction to standard ⅜-inch wide paper tape inked with a radiotelegraph line, and to wind the tape on standard 16mm 400-ft. motion picture reels. An outstanding advantage of this Tape Puller is its constant speed, controlled accurately from a dial, calibrated in words per minute.



The rate at which the tape is drawn is unchanged by load differences, power line fluctuations or temperature variations. A knob, pointer and a dial graduated from 0 to 100, permit the rate to be varied within wide limits, but the rate is always the same when the pointer is returned to any given setting on the dial. The operator, without stopping the motor, can idle the tape puller so that no traction is applied to the tape, and the take-up reel does not revolve.

The unit is used with high-speed radiotelegraph recorders, school practice recorders and phototube keying units. This latest achievement by Ted McElroy and his crew of creative telegraphic engineers is another shining example of the famous McElroy tradition of creating . . . designing . . . building . . . and delivering. It will operate at maximum efficiency with a minimum of required maintenance.

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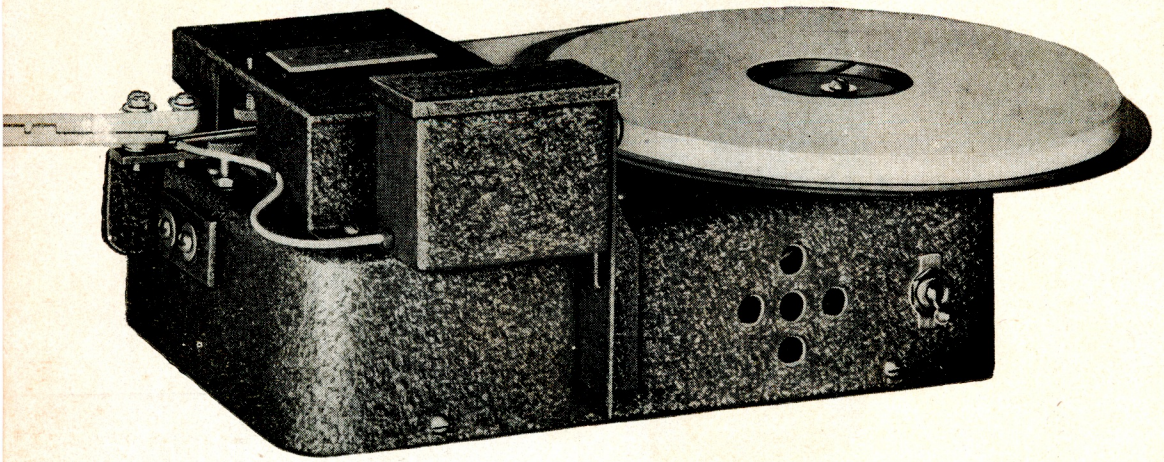

McELROY Model G-913-A School Recorder

The School Recorder is indispensable for teaching, since operators are enabled to examine actual printed examples of their own techniques. It demonstrates visually to the student any defects in his hand sending, and can also re-transmit to him accurate reproductions of the signals he has sent. With the faithfulness of a sound recording mechanism, the School Recorder offers the operator the opportunity to study and improve the rhythm and spacing of his keying.

The Model G-913-A combined with the Tape Puller TP-890B will operate at speeds up to 100 words per minute, recording clearly signals of readable strength from any radio communication receiver. It is ruggedly built but should be given the care and attention normally accorded to laboratory equipment. Properly operated, this instrument will be found trouble-free. Forty-eight of these Recorders are in daily operation, 24 hours a day, in the production of G-15-AA sets of practice tapes at our factory.

McElroy MANUFACTURING CORPORATION
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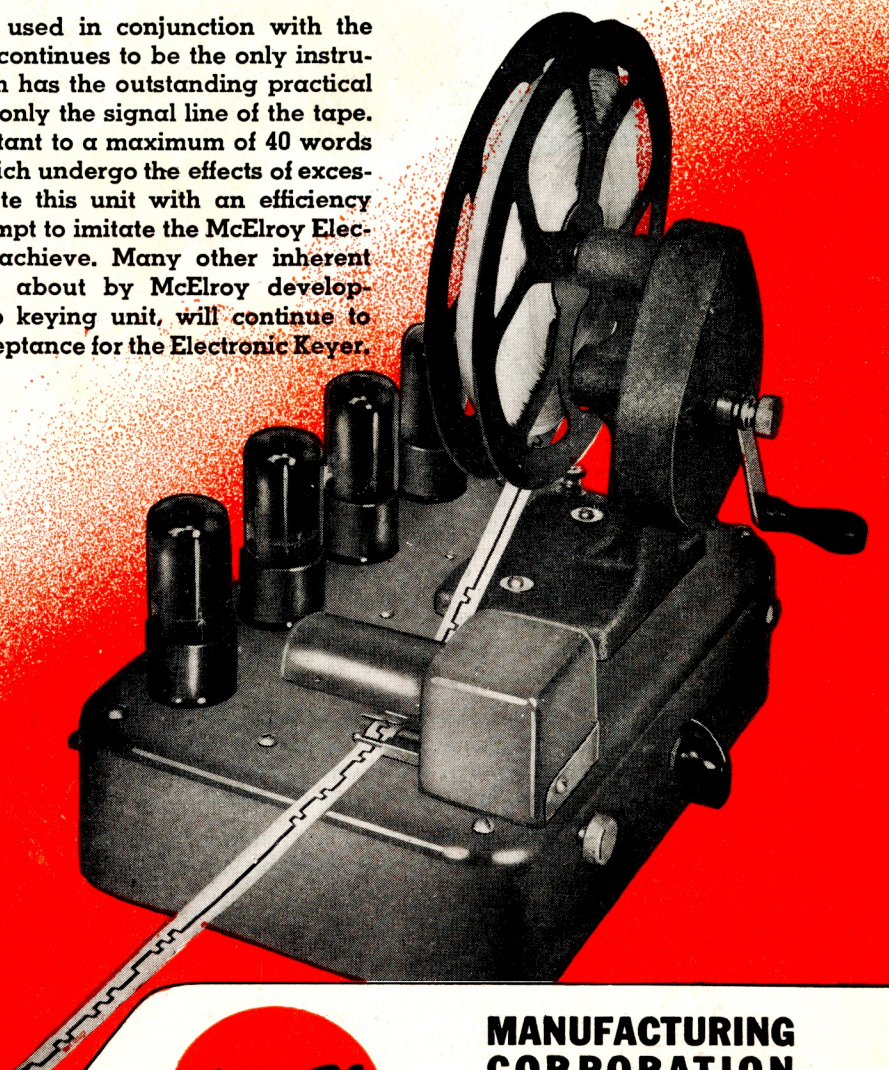
BOSTON, MASS.

McELROY Model G-813-A Electronic Keyer

This is another original McElroy development . . . it converts into sound the code signals which have been transcribed in ink on standard 3/8-inch paper tape at any speed chosen by the operator. The clarity and even spacing with which the signals are reproduced will assist students in rapidly mastering correctly sent code.

The Model G-813-A, used in conjunction with the Tape Puller TP-890B, continues to be the only instrument of its kind which has the outstanding practical advantage of keying only the signal line of the tape. Speed control is constant to a maximum of 40 words per minute. Tapes which undergo the effects of excessive wear will operate this unit with an efficiency which those who attempt to imitate the McElroy Electronic Keyer fail to achieve. Many other inherent advantages, brought about by McElroy developments with the photo keying unit, will continue to build widespread acceptance for the Electronic Keyer.



ARMY E NAVY

McElroy MANUFACTURING CORPORATION

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McElroy Radio Beam Keyer, Model RBK-1142

The McElroy Radio Beam Keyer was developed to fill the need for a reliable instrument which would operate as a constant source of specific information , . . repeating that information in code characters at any speed within a range of from 5 to 75 words per minute.

The Keyer can be adjusted quickly for continuous and timed transmissions, without tape or other media of limited durability, of signals in any required order. In addition, it can open or close the circuit it keys for a determined length of time to provide either a period of uninterrupted silence or a dash of specified length.

The most obvious commercial applications for an instrument of this type are keying high-frequency beam transmitters for blind landings . . . keying station and frequency calls, etc. However, its adaptability to almost any requirement makes it a most flexible instrument for a multitude of other needs.

The Model RBK-1142 is designed to fit standard rack assemblies and may be mounted with the same fixtures which secure it in its sturdy, enclosed housing.

McElroy

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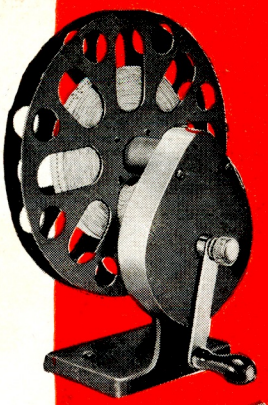
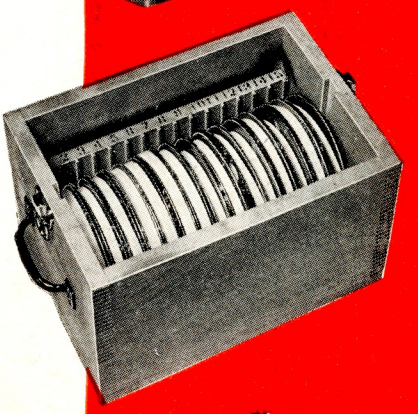
ARMY E NAVY

McELROY ACCESSORIES



McElroy Re-winds

Compare this rugged re-wind with any of the type now available. Husky gears . . . both on shafts running through extra size oilite bearings.



Practice Tapes

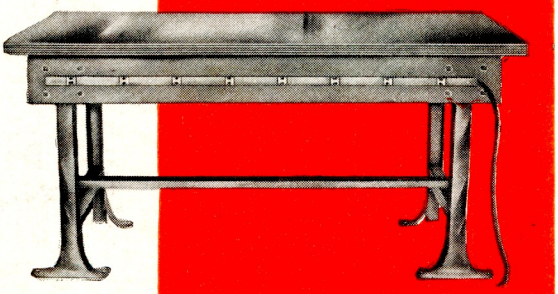
15-roll set practice tapes. G15L for sight reading; G15AA, U. S. Army tapes for photo-tube keying; G15AM American Morse tapes for telegraph sounder practice.

Tape Bridge TG-815

Provides a convenient channel across which standard 5/16- or 3/8-inch white paper tape bearing an inked radiotelegraph signal line is drawn for sight reading and typewriter transcription. Used extensively in radiotelegraph receiving stations and monitoring stations.

Operating Position Tables and Posture Chairs

Especially designed for use with high-speed automatic radiotelegraph apparatus, such as perforators, auto transmitters, recorders and tape bridges.



Blank Perforator and Recorder Tape, McElroy's Telegraph Blue Ink, Etc.

Tape for perforators and recorders. Ink is free-flowing, fast-drying, developed by Fred Spieske of New York, perhaps the outstanding ink specialist. Also many other miscellaneous items associated with communication equipment . . .

ARMY E NAVY

McElroy

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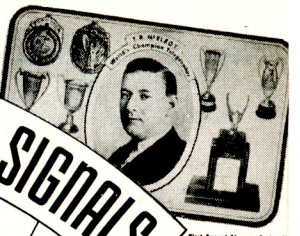
McELROY CHART OF CODES AND SIGNALS



RESPECTFULLY DEDICATED TO THE RADIOMEN OF OUR ARMED FORCES AND MARITIME SERVICE

18th Anniversary Dinner-Cruise, February 11, 1940
Vatican Wireless Operators Association.

First Record 66 wpm. Boston 19
Latest Official Record 75 wpm. Asheville 1939

INTERNATIONAL FLAG SIGNALS

A — Undergoing speed trial
B — Taking on or discharging explosives
C — Yes (Affirmative)
D — Keep clear, I am maneuvering with difficulty
E — Directing course to starboard
F — Disabled, communicate with me
G — A pilot is required
H — I have a pilot on board
I — Directing course to port
J — Sending a message by semaphore
K — Stop your vessel instantly
L — Stop, something important to communicate
M — I have a doctor on board
N — No (Negative)
O — Man overboard
P — About to sail AT SEA. True lights are out
Q — Vessel healthy; I request free pratique
R — Way is off my ship; you may feel your way past
S — Going full speed astern
T — Do not pass ahead of me
U — You are standing into danger
V — I require assistance
W — I require medical assistance
X — Stop your intentions and watch for my signals
Y — I am carrying mails
Z — Used to address or call shore stations

1st Repeat
2nd Repeat
3rd Repeat

Code Pennant

INTERNATIONAL MORSE
(CONTINENTAL CODE)

LETTERS		OPTIONAL LETTERS		PUNCTUATIONS AND OTHER SIGNS	
A	·–	ä	·–·–	Period	·–·–·–
B	–···	ch	–––·	Comma	––··––
C	–·–·	é	··–··	Colon	–––···
D	–··	ñ	––·––	Question mark	··––··
E	·	ö	––––·	Apostrophe	·––––·
F	··–·	ü	··––	Hyphen	–····–
G	––·			Fraction bar	–··–·
H	····	FIGURES		Brackets	–·––·–
I	··	1	·––––·	Double hyphen	–····–
J	·–––	2	··–––	Underline	··––·–
K	–·–	3	···––	Understood	···–·
L	·–··	4	····–	Error	·····
M	––	5	·····	End of message	···–·–
N	–·	6	–····	Invitation to transmit	–·–
O	–––	7	––···	Wait	·–···
P	·––·	8	–––··	End of work	···–·–
Q	––·–	9	––––·	Starting signal	–·–·–
R	·–·	0	–––––	Separation signal	–···–
S	···	FIGURES IN ROUTINE REPETITIONS		*Semicolon	–·–·–·
T	–	1	·–––	*Quotation mark	·–··–·
U	··–	2	··–––		
V	···–	3	···––		
W	·––	4	····–		
X	–··–	5	·····		
Y	–·––	6	–····		
Z	––··	7	––···		
		8	–––··		
		9	––––·		
		0	–––––		

Numerals and punctuation marks are the same in the codes for all languages.
*Non official but in general use.

COMMERCIAL "Z" SIGNALS

Signals take the form of entries when question mark is omitted. These signals are used on commercial radiotelegraph circuits throughout the world.

ZAL	Alter your ownership.	ZTA	Transmit by auto.
ZHC	How are you receiving conditions?	ZBT	Break, go back and stand by. (Navy.)
ZAN	My ear drums absolutely ruptured.	ZBN	Break, I am ahead with new ship.
ZSU	Your signals are unreadable.	ZPR	Return ship at present running.
ZWR	Your signals need fast variation.	ZBL	Return ship before sea now running.
ZSR	Your signals strong—variable.	ZPP	Punch paper only.
ZGU	Signals good for ——— o'clock.	ZTB	Transmit by trailing loops.
ZGS	Your signals getting stronger.	ZYA	Taking note.
ZGW	Your signals getting weaker.	ZRA	Received audio tone.
ZVS	Signals varying in intensity.	ZTS	What is your speed of transmission?
ZSH	Static heavy here.	ZSV	Your speed varying.
ZLS	Signals suffering from a lightning storm.	ZBS	Your signals blurring.
ZWC	Wipers or slides here.	ZDH	Your date on last heavy (long) adjust.
ZVF	Send it's pleasure.	ZDL	Your date on last light (short) adjust.
ZWO	Send words once.	ZDM	Your date on last medium adjust.
ZWT	Send words twice.	ZDV	Your date on last variable adjust.
ZCT	Send code twice.	ZFS	Signals are fading slightly.
ZPO	Send your service.	ZTH	Transmit by hand.
ZPT	Send your twice.	ZHS	Send high speed auto ——— prep.
ZCD	Your collation is different.	ZSO	Transmit slow once.
ZCO	Your collation correct.	ZST	Transmit slow twice.
ZSF	Send faster.	ZOR	Transmit two continuously.
ZSS	Send slower.	ZLB	Give long breaks, please.
ZRO	Are you receiving all?	ZUB	We have been unable to break you.
ZOR	We are receiving all.	ZNB	We have not yet seen you, but will do so.
ZIR	Your transmitter has strong site radio interference.	ZLD	We are getting long dash from you.
ZRC	Can you receive code?	ZAP	Acknowledge, please.
ZNG	Receiving conditions good for code.	ZMQ	Send to for ———
ZNN	All clear of traffic.	ZNR	Send to moment.
ZHT	We are getting your ———	ZKQ	Say when ready to receive.
ZCS	Cease sending.	ZOH	What traffic have you on board?
ZMP	Mispunch or perforator failures.	ZNF	Signals receiving and keeping.
ZCW	We are in strong communication with ———	ZFF	Signals receiving and keeping from trade code ——— and frequency. Binoculars. We have checked transmitter call for ——— Signals are ———
ZHA	How are your conditions for duty re: ———	ZOA	Transmitting on air ok.
ZUA	Your conditions unsuitable for publication or economic recording.	ZCP	Your conditions poor; please increase to maximum.

AERONAUTICAL "Q" SIGNALS

Used Especially in Airways Communications by Authority of the FCC.

QAA	At what time do you expect to arrive at ———	QBC	Can you transmit to me the remaining ——— groups of my message? Send ——— groups.
QAB	What is the visibility at ———	QBE	I am also: to send in my aerial.
QAC	Are you receiving me ———	QBF	Are you fix (cycle-chart)
QAD	Are you receiving me and will you keep ——— space at department?	QBG	Are you fix: store-chart
QAE	Are you receiving me and will you keep ——— space at ———	QBH	Are you flying below cloud
QAF	At what time did you pass ———	QBI	Are you receiving signatures are in ———
QAG	Arrange with Flight in order to arrive at ——— at ———	QBJ	At what hour — the upper limit of ———
QAH	What is your height	QBM	Has ——— sent a message for me?
QAI	Has my ground been cancelled in the ———	QBN	Are you flying between two layers of ———
QAJ	Shall I try to search for an aircraft in the ——— or for any other object	QBT	You are receiving your code
	Shall I try to search for aircraft	QBU	Are you sure of the accuracy of your ———
	Shall I try to search for aircraft	QBW	Have you received Program sent at ———
QAK	Is another aircraft flying in my vicinity	QCA	You are causing delay by answering ———
	Is another aircraft flying in my vicinity	QCB	You are causing delay by answering
QAL	Are you going to land at ———	QCG	Shall I send parcels for you on the ———
QAM	Can you give me the latest meteorological report for ———	QCM	Three words to be a dozen in your ———
QAN	Can you give me the mean ———	QCP	Your name is bad.
	Can you give me the mean ———	QCS	Telephone no long-wave has broken down.
	Can you give me the mean ———	QCT	Interception on short waves has broken down.
QAO	Can you give me the ———	QCY	Wait on trailing aerial. Off
QAP	Shall I listen on the ———	QDB	Wait on trailing aerial. On
QAQ	Am I in the vicinity of a prohibited ———	QDC	Telegram ——— has been sent by wire.
QAR	Are you ready to receive ———	QDD	Telegram No. ——— has been refused by ———
QAS	Are you flying in the vicinity of prohibited areas	QDH	What is causing the present ———
QAT	Shall I continue to send	QDK	Answer in the alphabetical order of the ———
QAX	Have you in your aircraft the following ——— radiotelegraph? How many ———	QDL	No telegram to set me for a series of ———
	Have you in your aircraft the following ——— radiotelegraph? How many ———	QDM	Your message is not in order. Please re-arrange it.
QAZ	Are you flying in a thunderstorm	QDO	Can you have transmitted by ———
QBA	What is the visibility at ———		Can you have transmitted by ———
QBB	What is the height of the cloud base at ———	QDR	What is my magnetic bearing (-ratio) from ———

(Complete code available on request)

Certain other codes and signals are omitted because of present day restrictions.

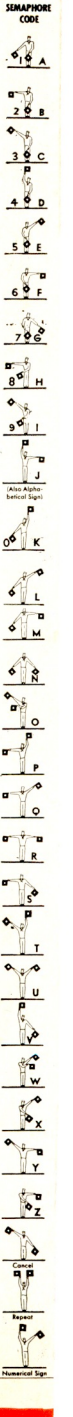
AMERICAN MORSE

A	·–	1	·–––
B	–···	2	··–––
C	–·–·	3	···––
D	–··	4	····–
E	·	5	·····
F	··–·	6	–····
G	––·	7	––···
H	····	8	–––··
I	··	9	––––·
J	·–––	0	–––––
K	–·–		
L	·–··	Period	·–·–·–
M	––	Comma	––··––
N	–·	Hyphen	–····–
O	–––	Question mark	··––··
P	·––·	Exclamation mark	–·–·–·
Q	––·–	Colon	–––···
R	·–·		
S	···		
T	–		
U	··–		
V	···–		
W	·––		
X	–··–		
Y	–·––		
Z	––··		
&	·–···		

Parenthesis (–·––·–)
Quotation ·–··–·
End of quotation ·–··–·
Colon dash –···–·
Capitalized letter ··––·
Small letter ·––·–
Colon followed by numbers –·–···
Semicolon –·–·–·
Paragraph ·––·–
Apostrophe ·––––·
Dollar ···–··–
Cents –·–·
Pound Sterling ·––·––
Shilling –···–
Percent –··–·–·

Punctuation composed by Walter P. Phillips in 1876. He also made a compilation of five letter abbreviations of about 2000 commonly used words. This "Phillips Code" is used by newspaper telegraphers.

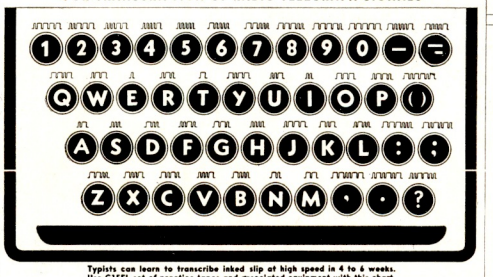
SEMAPHORE CODE



(Also Alphabetical Signs)

Cancel
Repeat
Numerical Sign

THE McELROY METHOD
FOR TRANSCRIPTION OF RADIO TELEGRAPH SIGNALS



Typists can learn to transcribe inked slip at high speed in 4 to 6 weeks.
Use G1SFL set of practice tapes and associated equipment with this chart.

GREEK

CAPS	MORSE	LETTER	SYMBOL
A	·–	Alpha	
B	–···	Beta	
Γ	––·	Gamma	
Δ	–··	Delta	
E	·	Epsilon	
Z	––··	Zeta	
H	····	Eta	
Θ	–·––·	Theta	
I	··	Iota	
K	–·–	Kappa	
Λ	·–··	Lambda	
M	––	Mu	
N	–·	Nu	
Ξ	–··–·	Xi	
O	–––	Omicron	
Π	·––·	Pi	
P	·–·	Rho	
Σ	···	Sigma	
T	–	Tau	
Y	–·––	Ypsilon	
Φ	··–·	Phi	
X	––––	Chi	
Ψ	––·–	Psi	
Ω	·–––	Omega	
HY	····	Eta Ypsilon	
YI	–·––	Ypsilon Iota	
OY	–––	Omicron Ypsilon	
AI	·–·–	Alpha Iota	
AY	·–·–	Alpha Ypsilon	
EY	·––·	Epsilon Ypsilon	
OI	–––	Omicron Iota	

RUSSIAN

RUSSIAN LETTER	MORSE SYMBOLS	
А	·–	A
Б	–···	B
В	·––	V
Г	––·	G
Д	–··	D
Е,Э	·	E
Ж	···–	J
З	––··	Z
И	··	I
Й	·–––	Y
К	–·–	K
Л	·–··	L
М	––	M
Н	–·	N
О	–––	O
П	·––·	P
Р	·–·	R
С	···	S
Т	–	T
У	··–	U
Ф	··–·	F
Х	····	KH
Ц	–·–·	TS
Ч	––––·	CH
Ш	––––	SH
Щ	––·–	SHCH
Ъ,Ь	–··–	Mute
Ы	–·––	I
Ю	··––	YU
Я	·–·–	YA

ARABIC

ARABIC LETTER	MORSE SYMBOL	
ا	·–	Alif
ب	–···	Ba
ت	–	Ta
ث	–·–··	Tha
ج	·–––	Jeem
ح	····	Ha
خ	–··–	Kha
د	–··	Dal
ذ	––··	Dhal
ر	·–·	Ra
ز	····	Zay
س	···	Seen
ش	····	Sheen
ص	···–	Sad
ض	···–	Dad
ط	··–	Ta
ظ	··–	Za
ع	·–	Ain
غ	··–·	Ghain
ف	··–·	Fa
ق	––·–	Qaf
ك	–·–	Kaf
ل	·–··	Lam
م	––	Meem
ن	–·	Noon
ه	····	He
و	·––	Wa
ي	··	Ya
ـــ	·–·–·	Lam-Alif

TURKISH

A	·–
B	–···
C	–·–·
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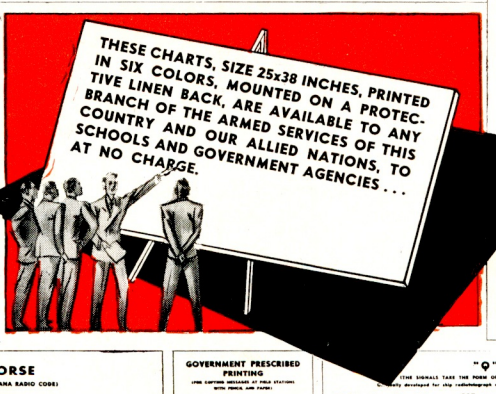
POSTAL TELEGRAPH — WESTERN UNION PHONETIC ALPHABET

Adams	Henry	Queen	Union
Boston	Ida	Peter	Victor
Chicago	John	Queen	William
Denver	King	Robert	X-ray
Edward	Lincoln	Sugar	Young
Frank	Mary	Thomas	Zero
George	Newyork		

U. S. ARMY AND U. S. NAVY PHONETIC ALPHABET

Able (Affirm)*	Item (Figure)*	Oboe (Option)*	Victor
Baker	Inter	Peter (Prep)*	William
Charlie (Cast)*	Jig	Queen	X-ray
Dog	King	Roger	Yoke
Easy	Love	Sugar (Suff)*	Zebra (Zed)*
Fox	Mike	Tare	Uncle (Unit)*
George	Nan (Negat)*		

* Used as appendages in many procedures.
** In phonic transmission Roger R is used; confusion with letter R.



JAPANESE MORSE
(SOMETIMES REFERRED TO AS KATA KANA RADIO CODE)

	A	KA	SA	TA	NA	HA	MA	YA	RA	WA
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	E	KE	SE	TE	NE	HE	ME	E	RE	(W)E
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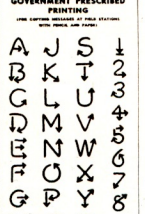
GOVERNMENT PRESCRIBED PRINTING

(ONE CAPTURE MESSAGE AT FIELD STATIONS WITH NORMAL HAND SUPPLY)



"Q" SIGNALS

(THE SIGNALS TAKE THE FORM OF ADVICES WHEN THE QUESTION MARK IS OMITTED)
Officially developed for ship radiotelegraph communications. They are now used in all radiotelegraph services.

QRA	What is the name of your station?	QRZ	Who is calling me?
QRB	How far approximately are you from my station?	QSA	What is the strength of my signals (1 to 5)?
QRC	What company (or State Administration) settles the accounts for your station?	QSB	Does the strength of my signals vary?
QRD	Where are you bound and where are you coming from?	QSC	Is my firing correct, are my signals distinct?
QRE	Will you tell me my exact frequency (wave length) in kc. (or m.)?	QSD	What is wrong with my signals (1 to 5)?
QRF	Does my frequency (wavelength) vary?	QSE	Shall I transmit my call sign?
QRG	Is my note good?	QSF	Shall I transmit my call sign?
QRH	Do you receive me badly? Are my signals weak?	QSG	Can you give me acknowledgment of receipt?
QRI	What is the readability of my signals (1 to 5)?	QSH	Shall I transmit the last telegram I sent you?
QRJ	Are you busy?	QSI	Can you communicate with ——— direct (or through the medium of)?
QRK	Are you receiving me well?	QSJ	Will you remember to ——— free of charge?
QRL	Are you interfered with?	QSK	May the distress call received from ——— be cancelled?
QRM	Are you troubled by atmospherics?	QSL	Will you send me an acknowledgment?
QRN	Shall I increase power?	QSM	Shall I send a series of VVV ?
QRO	Shall I decrease power?	QSN	Shall I send a series of VVV ?
QRP	Shall I send faster?	QSO	Shall I send an answer of type (1, A2, A3, or B) ?
QRQ	Shall I send more slowly?	QSP	Shall I send an answer of type (1, A2, A3, or B) ?
QRS	Shall I stop sending?	QSQ	Shall I change to transmission on another wave?
QRT	Shall I stop sending for me?	QSR	Shall I change to transmission on another wave?
QRU	Are you ready?	QSS	Shall I change to transmission on another wave?
QRV	Am I ——— that you are calling me (or ———)?	QST	Shall I send the following telegram ——— first and then next?
QRW	Shall I inform ——— that you are calling him on ——— kc. (or m.)?	QSU	Do you agree with my number of words?
QRX	When will you call me again?	QSV	How many telegrams have you to send?
QRY	What is my turn?	QSW	Will you send on a wave of ——— m.?
QRZ	Who is calling me?	QSX	What is the true bearing of ——— from ——— at ——— GMT?
		QTA	Shall I cancel telegram ——— as if it had not been sent?
		QTB	Do you agree with my number of words?
		QTC	How many telegrams have you to send?
		QTE*	What is my true bearing (-ratio) from ——— at ——— GMT?
		QTF	Will you give me the position of my station according to the bearings taken by the radiogoniometric stations which are under your control?
		QTG	Will you transmit a series of ——— dashes for ——— seconds, then my call sign?
		QTH	What is your position in latitude and longitude (or according to any other indication)?
		QTI	What is your true course?
		QTJ	What is your speed?
		QTM	Send radiotelegraphic signals and submarine sound signals on the same wave as those which I am sending
		QTO	Have you left dock (or port)?
		QTP	I am going to enter dock (or port)
		QTQ	Can I communicate with the station by means of the International Code of Signals?
		QTR	What is the exact time?
		QTU	What are the hours during which your station is open?
		QUA	Have you news of ——— (last sign of the call)?
		QUB	Can you give me, in this order, information concerning: visibility, height of clouds, ground wind direction and velocity, sea conditions, swell direction, period and height of waves?
		QUC	What is the last (or what is the first) number received by you?
		QUD	Have you received the urgency signal sent by ——— at ——— GMT?
		QUE	Can you speak in ———?
		QUF	Have you received the distress signal sent by ——— at ——— GMT?
		QUG	Will you be forced to attack in the next ——— minutes?
		QUH	Will you indicate the present barometric pressure?
		QUJ	What are the true course and speed of ——— ?
		QUK	Have you received the last message sent by ——— ?
		QUL	Have you received all the signals sent by ——— ?
		QUM	Is the distress traffic ended?

* In certain aeronautical services true course and true bearing are called "geographic course" and "geographic bearing".

McELROY MANUFACTURING CORPORATION
82 BROOKLINE AVENUE, BOSTON, MASSACHUSETTS

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SCR-299
RIDES THE CREST OF THE INVASION WAVE!

The SCR-299 helped pave the way for the Allies in the Mediterranean theatre from El Alamein to Italy. In Africa alone it operated on five networks, including circuits from Oran to England, Casablanca, Gibraltar, Algiers and Accra. On whatever front the Allies are fighting, the SCR-299 will be a familiar sight to our fighting men.

Whether set up as a fixed radio station or used as a fast-moving mobile unit, the SCR-299 has done an excellent job transmitting commands while in action, no matter how difficult the conditions . . . thus proving that communications systems were adaptable to the "Blitz" tactics of modern warfare.

The World's Largest Exclusive Manufacturers of Short Wave Radio Communications Equipment

the hallicrafters co.

CHICAGO, U.S.A.

BUY MORE BONDS!

BUY MORE BONDS!

the hallicrafters co.
CHICAGO, U.S.A.

MAKERS OF

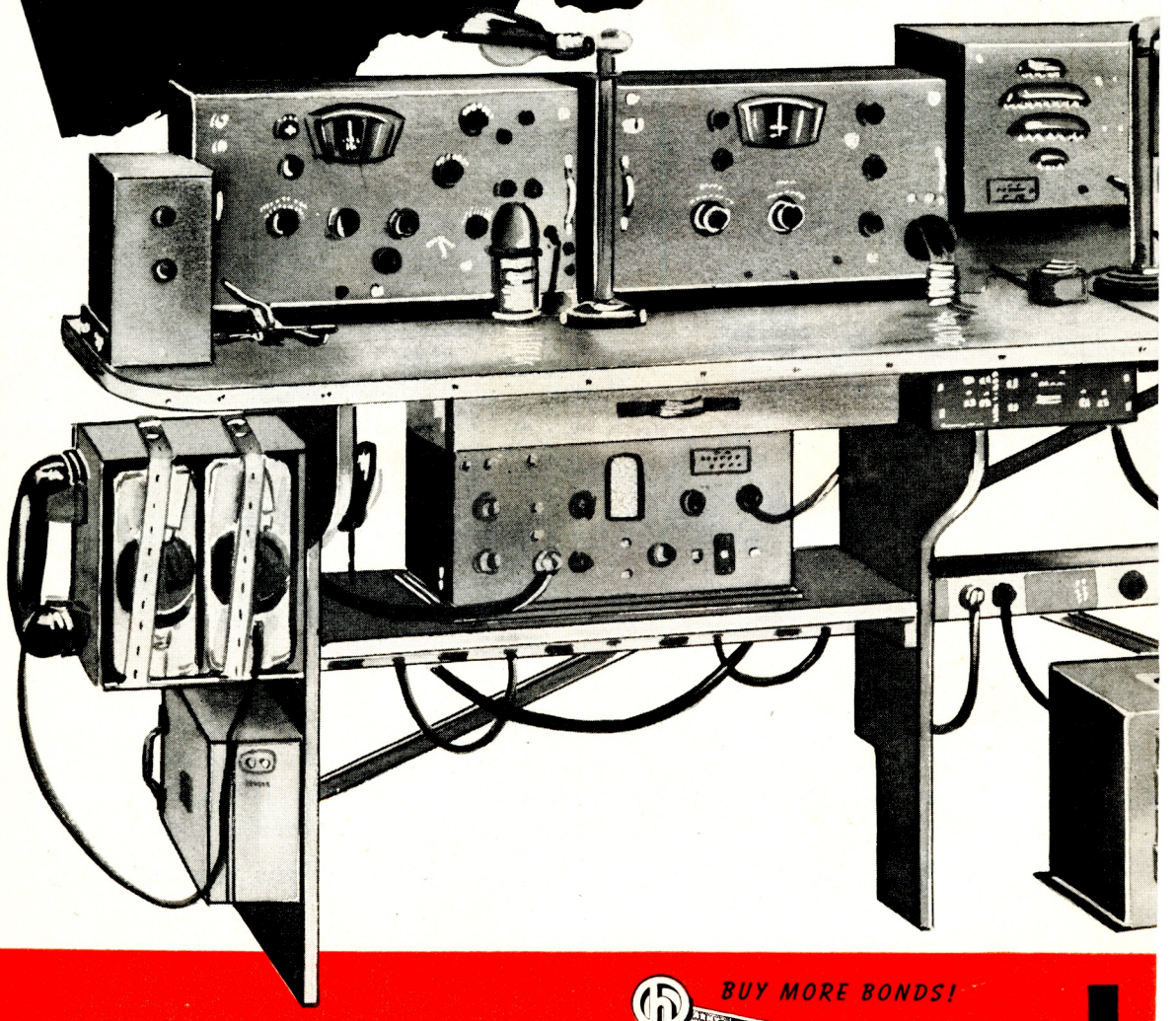
EREVER THEY FIGHT!

Wherever our troops fight throughout the world, the SCR-299 is seeing service! Designed for instantaneous and continuous service as a fixed or mobile radio station, the high powered mobile transmitter built by Hallicrafters has distinguished itself in the Pacific with MacArthur and with the Allies in the Mediterranean.

The SCR-299 fought in the jungles of Guadalcanal and was flown into China where it is fighting with General Stilwell.

THE FAMOUS SCR-299 COMMUNICATIONS TRUCK

BEST EQUIPPED FIGHTING FORCE



BUY MORE BONDS!

40

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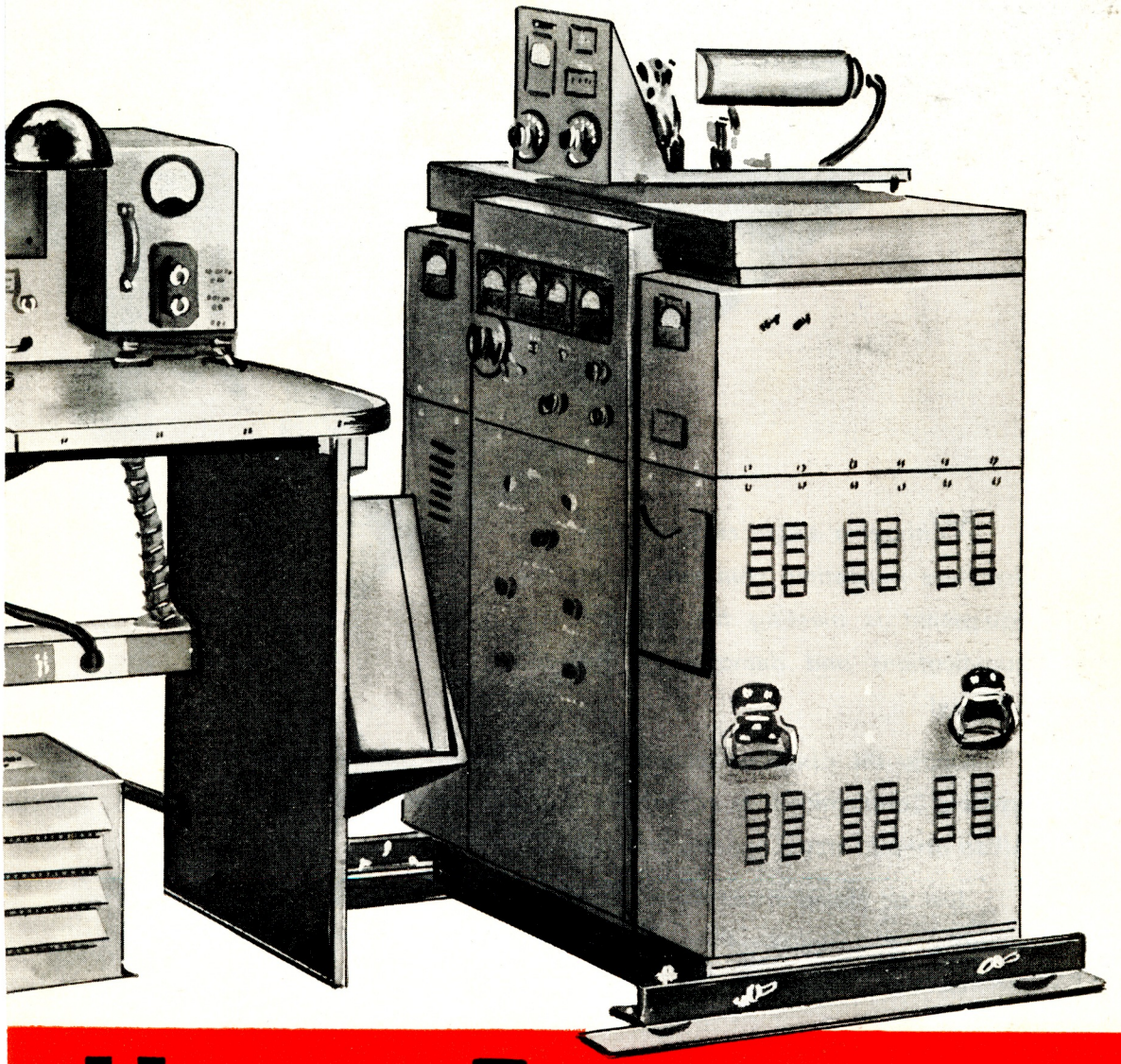
MAKERS OF THE FAMOUS SCR-299

The U. S. Army Signal Corps are world leaders in Military Communications . . . their equipment must be the finest that electronic research can produce.

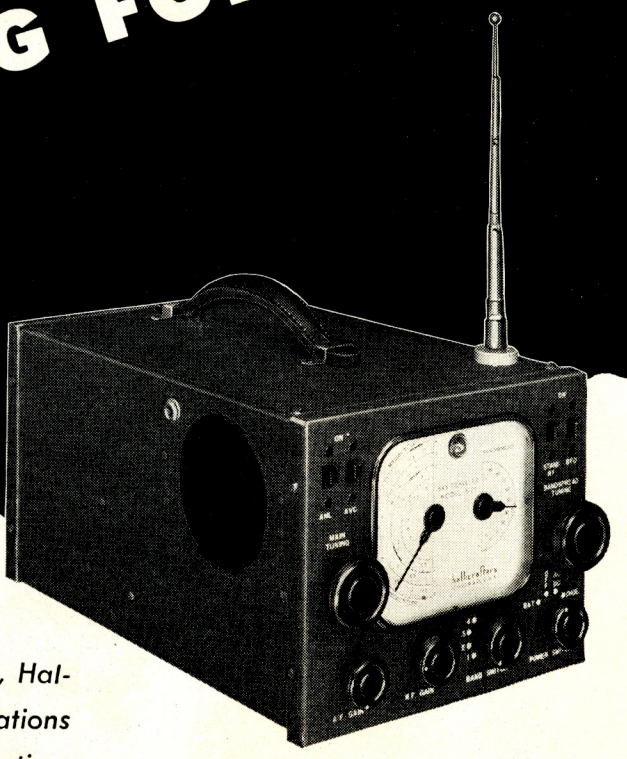
The equipment for the SCR-299 is designed to withstand every climatic condition and give instantaneous and continuous performance under the most extreme conditions.



allicrafters co.

COMMUNICATIONS TRUCK

BUILT FOR PEACE . . . FIGHTING FOR PEACE!

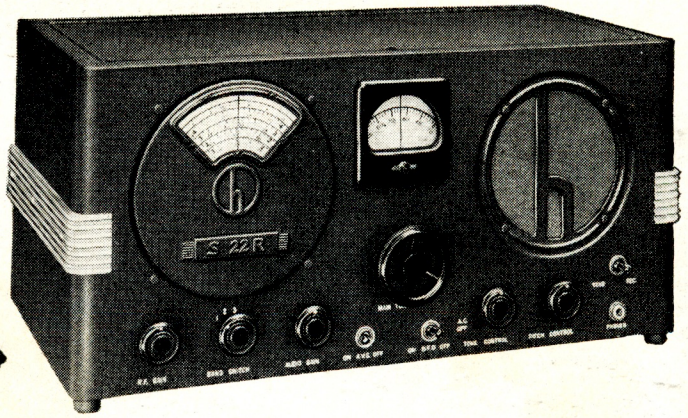


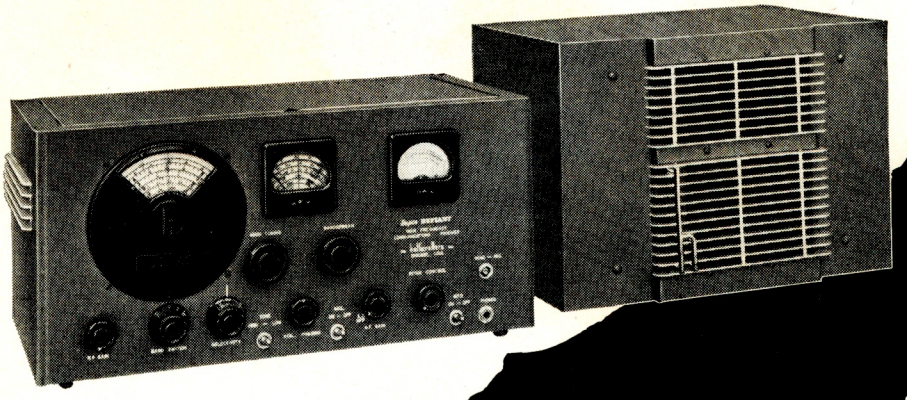
Without a single revision, Hallicrafters peacetime communications equipment is meeting the wartime qualifications and demands of the Military!

Under the abnormal climatic and operating conditions of war, Hallicrafters Communications equipment is providing peak performance for the Allied armed forces, fighting throughout the world.

Just as Hallicrafters Communications receivers are meeting the demands of war Today—they shall again deliver outstanding reception for the Peace—Tomorrow!

WORLD'S LARGEST EXCLUSIVE MANUFACTURER OF SHORT WAVE RADIO COMMUNICATIONS EQUIPMENT





BUY
MORE
BONDS!

the hallicrafters co.
CHICAGO, U.S.A.

. . . . AND EVEN GREATER TOMORROW!

The SX-28 is the most popular of all Hallicrafters communications receivers. It reflects Hallicrafters supremacy in the communications field through its top quality performance with our armed forces.

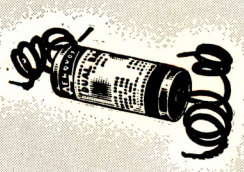
NOW . . . and even greater TOMORROW, shall be its popularity and supremacy in civilian uses, because of the many important engineering advancements being made for better performances!

the hallicrafters co.

CHICAGO, U.S.A.

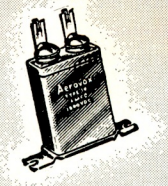
WORLD'S LARGEST EXCLUSIVE MANUFACTURER OF SHORT WAVE RADIO COMMUNICATIONS EQUIPMENT

FOR THE WAR . . . *and after*



"Dandees" are meeting most wartime electrolytic requirements. PBS single-section units. 25 to 450 v. Also dual-section PRS-A concentrically-wound, three leads, and PRS-B separate-section, four leads. Polarity-indicating colored leads.

Metal-case paper condensers may still be available in some types, such as Type 1080, 1000 v., .5 to 4 mfd. Also the stamped-metal-case '60, in 200 and 400 v., and particularly the uncased paper sections Type UC, 400 to 1000 v.



Oil-filled capacitors still available against high priorities. Type '16 upright or inverted mounting, 400 to 1000 v. Also Type '30 "bathtub" for flat mounting with terminals on top, bottom or side, 400, 600 and 1000 v.

Oil-filled transmitting capacitors are available on high priorities. In addition to large round-can '05, there is the inverted-screw-mounting '10 type with new double-terminal feature. Also rectangular-can '09 in voltages up to 7500, and '20 series up to 50,000 v.

● These "Victory" Type '05 oil-filled transmitting capacitors are typical of the Aerovox line in wartime dress. The ribbed steel can, finished in battleship gray lacquer, replaces the former aluminum can. A substitute, yes, but just as tough as ever for wartime service.

No matter where this war may take you, whether on the fighting front, production front or home front, you can continue to count on Aerovox for essential capacitors. For no matter what shortages may develop, no matter what types may become unavailable, Aerovox engineers will have a "Victory" type—a satisfactory substitute just for the duration.

Ask your Aerovox jobber for the "Victory" catalog. Ask for free subscription to the monthly Aerovox Research Worker. Or write direct.

AEROVOX *Capacitors*

INDIVIDUALLY TESTED

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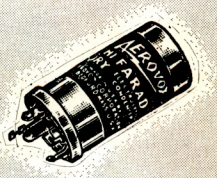
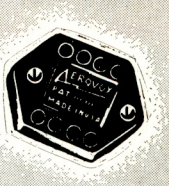
Export: 100 VARICK ST., N. Y. C. • Cable: 'ARLAB'

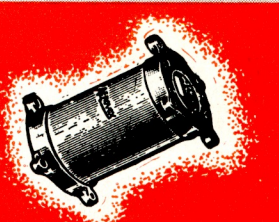


Aluminum-can electrolytics, still available in certain types, especially on high-priorities. Prong-base F type is typical of extensive Aerovox electrolytic line. Wherever possible, substitute Dandees or cardboard-case PBS.

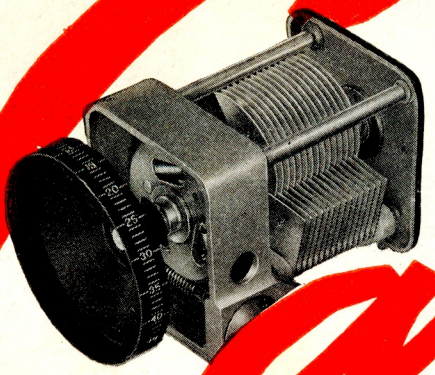
Tubular paper condensers Type '84 will be found highly satisfactory for most functions. Highly refined construction including extra-heavy-waxing insures excellent performance and life. 400 to 1600 v.



Mica capacitors are mighty scarce. Available only on highest priorities, whether it be the tiny molded-in-bakelite capacitors or the large bakelite-case medium-duty units.



Heavy-duty transmitting and electronic requirements are met by the stack-mounting 1550 series units, and also the cast-aluminum-case 1870. Ultra-high-frequency requirements are met by the sulphur-filled 1860 series. Available on high priorities.



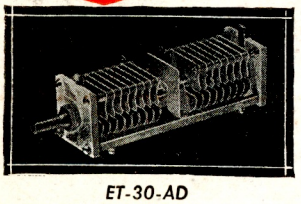
At Cardwell, we deal with truisms. Here . . . fresh, sound, original designs are combined with materials of merit, and collated by skilled craftsmen . . . for use in practically every type of communications equipment . . . amateur, commercial, and military.

Material things, however, are not sufficient to make Cardwell condensers the quality products that they are. Into them go an additional ingredient—a heritage of pioneering, patience, and judgment.

Cardwell

. . . THE CONDENSER LINE WITH BUILT-IN HERITAGE

NEW TRIM-AIR MIDGET CONDENSERS

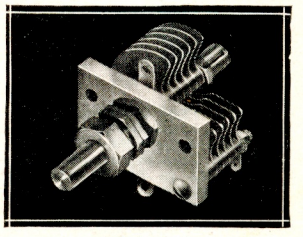


ET-30-AD

"TRIM-AIR" Accessories:

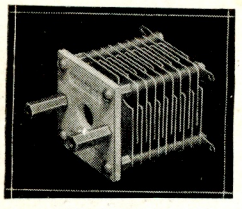
Trim-Air singles are equipped for single hole mounting. Dual Trim-Airs for single hole or base mounting. Additional brackets and mounting posts are sold separately.

An improved line of single and double section midgets. End plates 5/32" thick Isolantite. Long bushing permits single hole mounting in 3/8" diameter hole on panels up to 1/4". (Stub shaft with screw driver slot available special order only.) Singles have new thick nut for rotor shaft lock for fixed tune. Require 1 5/16" x 1 13/32" panel mounting space — duals, 1 45/64" x 1 13/32". All duals have double bearings, shaft extended at rear for ganging and have removable inter-section shields. All Trim-Airs have 1/4" brass shafts, nickel plated. Aluminum plates with nickeled brass spacers. Trim-Air accessories fit duals, singles, band-spread types, as well as "E" type fixed air midgets. Airgaps .020", .030", and .070" in dual and singles, with capacities to 140 MMFD. Fixed midgets capacity range to 200 MMFD. in .020", .030", and .050" airgaps. One type EE-60-FS has 60 MMFDS., airgap .100".



ZR-35-AS

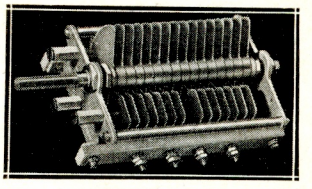
MIDWAY TRANSMITTING CONDENSERS



EO-100-FS

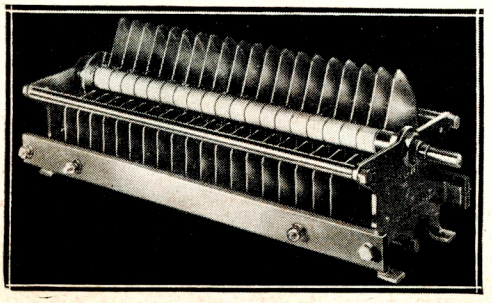
TYPE "E" MIDGET FIXED AIR CONDENSERS

For low and medium power transmitters and receivers, where light weight and small space are factors. Ideal for portable and aircraft equipment. Panel mounting space only 2 1/8" x 3" condenser open. 1/4" steel shaft; aluminum frame; brass bearings; plates buffed, rounded on all airgaps .070" or over. Aluminum mounting feet extra. Mycalex insulation. For "upside-down" mounting, use new type "M" mounting brackets; perfect layout for high efficiency, short lead P.P. amplifier permits low stator to chassis capacity. Capacity ranges, single section types, 365 MMFD. for .030" airgap, 150 for .070" airgap. Duals range 260 MMFD. per section for .030" gap, 180 for .050" gap, and 100 MMFD. for .070" airgap.



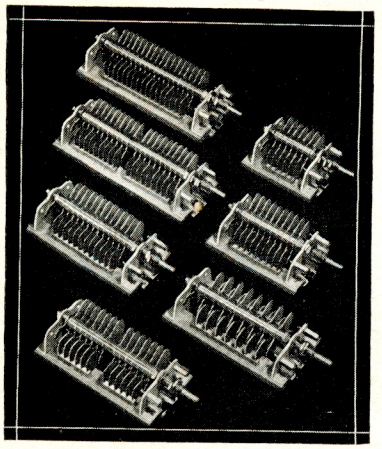
MT-150-GS

"T" TYPE HEAVY DUTY TRANSMITTING CONDENSERS



Special TK-300-US

No finer stock condenser made. In commercial service the world over. 6 1/4" wide, 5 3/8" high, plates unmeshed. Corona shields on stators for wider airgap types. End plates 1/8" thick, heavy nickel plated. Massive bearings, 3/8" stainless steel shafts; heavy, two finger phosphor bronze rotor contactor bears on sturdy contact ring built to carry very heavy current without loss. Rotor plates 4 1/2" diameter, .050" thick aluminum. Heavy mounting feet formed as part of end plates. Ball thrust rear bearing. Mycalex insulation. Truly the finest stock condenser money can buy. Capacity ranges: to 315 MMFD. for .168" airgap, 300 for .230", 160 for .294" and 80 MMFD. for .500" airgap. Equivalent duals for nearly all single section types.



New ULTRA-HIGH FREQUENCY Transmitting Condenser Series

Specifications of "N" TYPE U.H.F. SERIES

FRAME—*No frame or tie rods. Aluminum end plates supported directly on heavy lateral ceramic bars which carry stators.*

SHAFT—*¼" cadmium plated steel on which rotor assembly is securely locked.*

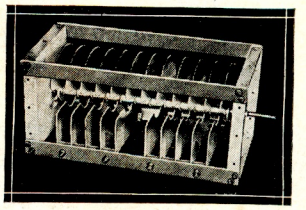
PLATES—*Aluminum alloy .040" thick with edges rounded.*

BEARINGS—*Long, nickel-plated brass, shoulder type front bearing, with ball thrust rear bearing. Laminated phosphor bronze rotor contactor.*

AIRGAP—*.070"—3000V. peak—(NT)*
.084"—4200V. peak—(NP)
.171"—6000V. peak—(NG)

MOUNTING—*Single hole, front panel, with mounting posts or chassis mounting on feet which form part of end plate. Or use type "M" bracket and mount upside down for lowest capacity to ground.*

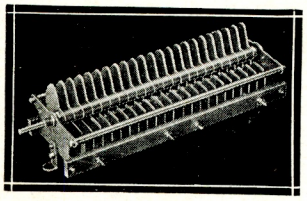
CAPACITY RANGES—*To 150 MMFD. in singles, 75 in duals for .084" airgap, single NG-35-DS has 171" airgap.*



TYPE "P" LIGHT WEIGHT CONDENSERS

For Commercial Transmitters and Induction Heating Units

END PLATES — Stamped and folded ⅛" aluminum 7½" square, satin finish. INSULATION — Mycalex. No metal tie rods. ROTOR PLATES — .0625" thick, 6¾" diameter, buffed and polished aluminum. All "P" types are special order.



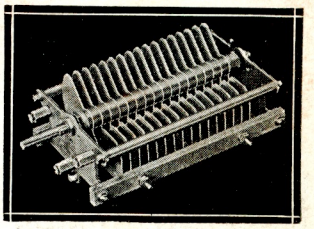
XG-110-XD

"X" TYPE TRANSMITTING CONDENSERS

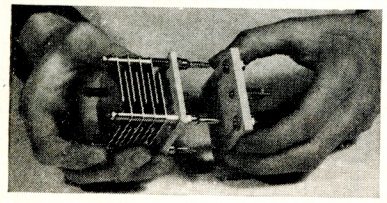
Standard of Comparison for Years

Rounded edges, polished aluminum plates, .040" thick on all but "XT" and "XR" types.

Frames, tie rods, bearing bushings, spacers and stator blocks, nickel plated brass. Cadmium plated ¼" steel shaft supports securely locked rotor assembly. Mycalex insulation. Panel space 4⅜" x 3⅜". Panel or chassis mounting. N.P. brass mounting feet extra. Capacity ranges to 1500 MMFD. for .030" gap, 440 MMFD. for .070", 330 MMFD. for .084", 240 for .110", 100 for .200" airgap. Equivalent dual section types for nearly all single section types.



XE-240-XS

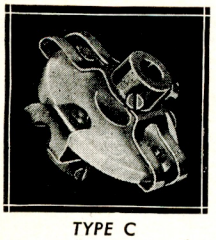


TYPE "J" PLUG-IN FIXED AIR CONDENSERS

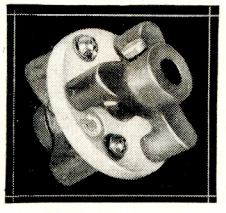
For Fixed Capacity Loading

Connect Jack Base across high frequency class "C" tank and plug in proper "J" capacitor to load circuit to lower frequency; proper "C" means highest operating efficiency. Plates easily removed. All "J" types have 2¼" square x ¼" Alsimag No. 196 ceramic end plates. Supplied with banana plugs to fit "JB" Jack Base, sold separately. On special order provided with hexagonal brass mounting pillars and mounting screws for permanent installation.

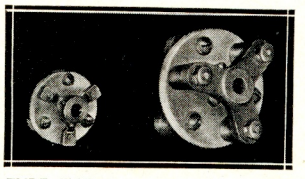
Capacity range: to 100 MMFD. for .125" airgap, 50 for .250" gap and 50 MMFD. for .350" airgap.



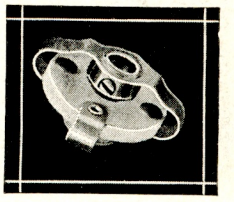
TYPE C



NEW TYPE ENF



TYPE FNF TYPE CNF



TYPE A

INSULATED COUPLINGS

MOST COMPLETE LINE OF FINEST FLEXIBLE AND RIGID COUPLINGS

Alsimag No. 196 insulation throughout. All flexible couplings have N.P. phosphor bronze springs, nickel plated brass hubs, permanently swaged into the springs. Two case hardened steel set screws on each hub insure positive lock to shaft. Type "B" is like type "A" except hubs turned OUT for increased flash-over rating. Type "E" like type "C" except smaller. Type "D" like "C" except hubs turned IN. Type "F" like "E" except hubs turned IN. New "ENF" like "FNF" except long spider legs.

All rigid types are redesigned and have three point suspension, solid brass castings, absolutely rigid.

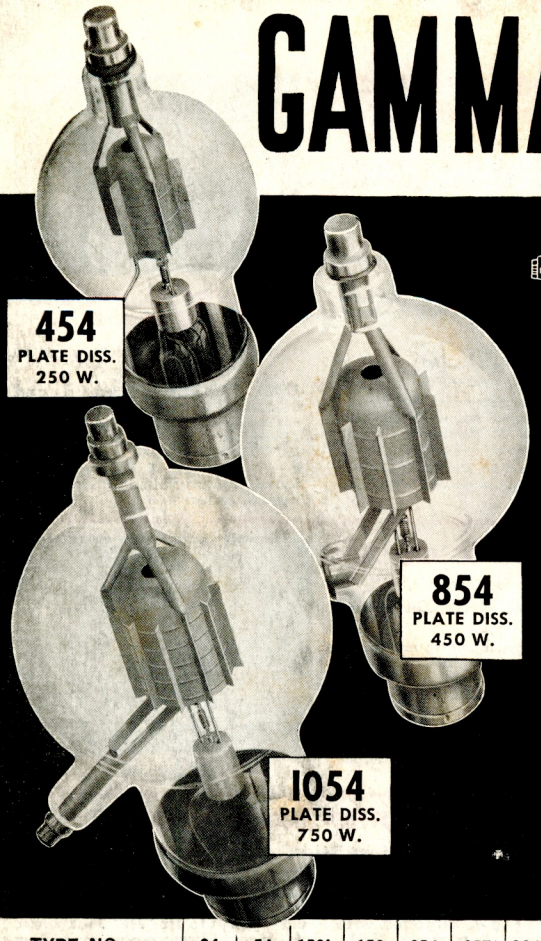
Buy More War Bonds and Stamps

CARDWELL CONDENSERS

THE ALLEN D. CARDWELL MANUFACTURING CORPORATION

81 PROSPECT STREET • BROOKLYN 1, N. Y.

GAMMATRON TUBES



Developed in the Gammatron plant the new types 454, 854 and 1054 have copper to glass seals and special plate, grid and filament design to give a new high in UHF performance. Other features: ability to stand high plate voltages, complete protection against failure through overloads and extra long life.

Fourteen years of pioneering and experience in tantalum tubes are built into this complete line covering a power range of 50 to 5000 watts. Also available are variations of these types and high vacuum tantalum rectifiers.

The Gammatron engineers responsible for these developments will be glad to help with your special problems.

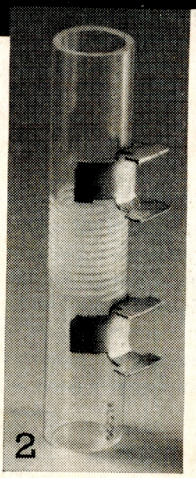
HEINTZ AND KAUFMAN
SOUTH SAN FRANCISCO LTD. CALIFORNIA U·S·A·

TYPE NO.	24	54	152L	158	254	257*	304L	354C	354E	454L	454H	654	854L	854H	1054L	1554	2054A	3054
MAX. POWER OUTPUT: Class 'C' R.F.	90	250	610	200	500	230	1220	615	615	900	900	1400	1800	1820	3000	3600	2000	5300
PLATE DISSIPATION: Watts	25	50	150	50	100	75	300	150	150	250	250	300	450	450	750	1000	1200	1500
AVERAGE AMPLIFICATION FACTOR	25	27	10	25	25		10	14	35	14	30	22	14	30	13.5	14.5	10	20
MAX. RATINGS: Plate Volts	2000	3000	3000	2000	4000	4000	3000	4000	4000	5000	5000	4000	6000	6000	6000	5000	3000	5000
Plate M.A.	75	150	500	200	225	150	1000	300	300	375	375	600	600	600	1000	1000	800	2000
Grid M.A.	25	30	75	40	40	25	150	60	70	60	85	100	80	110	125	250	200	500
MAX. FREQUENCY, Mc.: Power Amplifier	200	200	175	100	175	150	175	50	50	150	150	50	125	125	100	30	20	30
INTERELECTRODE CAP: C g—p u.u.f.	1.7	1.8	5	4.6	3.6	0.04	9	3.8	3.8	3.4	3.4	5.5	5	4	5	11	18	15
C g—f u.u.f.	2.5	2.1	7	4.7	3.3	13.8 In.	12	4.5	4.5	4.6	4.6	6.2	6	8	8	15.5	15	25
C p—f u.u.f.	0.4	0.5	0.4	1.0	1.0	6.7 Out.	0.8	1.1	1.1	1.4	1.4	1.5	0.5	0.5	0.8	1.2	7	2.5
FILAMENT: Volts	6.3	5.0	5-10	12.6	5.0	5.0	5-10	5	5	5	5	7.5	7.5	7.5	7.5	11	10	14
Amperes	3	5	13-6.5	2.5	7.5	7.5	13-26	10	10	11	11	15	12	12	21	17.5	22	45
PHYSICAL: Length, Inches	4¼	5 7/16	7¾	4¾	7	6¾	7¾	9	9	10	10	10⅜	12½	12½	16½	18	21¼	30¾
Diameter, Inches	1⅜	2	2½	2	2⅝	2⅝	3½	3⅜	3⅜	3¾	3¾	3¾	5	5	7	6	6	9
Weight, Oz.	1½	2½	8	4	6½	6	9	6½	6½	7	7	14	14	14	42	56	66	200
Base	Small UX	Std. UX	John-son #213	Std. UX	Std. 50 Watt	Giant 7 Pin	John-son #213	Std. 50 Watt	Std. 50 Watt	Std. 50 Watt	Std. 50 Watt	Std. 50 Watt	Std. 50 Watt	Std. 50 Watt	John-son #214	HK 255	W.E. Co.	HK 255
*Beam Pentode.																		
NET PRICE	4.75	8.00	30.00	18.50	13.50	27.50	65.00	24.50	24.50	27.50	27.50	75.00	75.00	75.00	175.00	225.00	300.00	395.00

WRITE FOR FULL DATA ON ALL GAMMATRONS

YOU'VE got enough on your mind without worrying about the quality of your electrical glassware. Let Corning do that for you on everything you need. For example, Corning now makes the following items:

- Entering, Strain and Stand-Off Insulators in the antenna or power supply system. (A few are illustrated in Fig. 1)
- Coil Forms (Figs. 2 and 4)
- Bushings for Transformers (Illustrated in Fig. 5)
- Jackets for Wire Wound Resistors (Not illustrated)
- Miscellaneous Bushings, Spacers, Insulating Bases used throughout the entire installation (Fig. 3)
- Corning can also furnish Fuse Tubing, Fuse Plug Bodies, Ozone Cylinders, Cyclotron Insulators, Precision Bore Tubing, and almost every type of electrical insulating specialty.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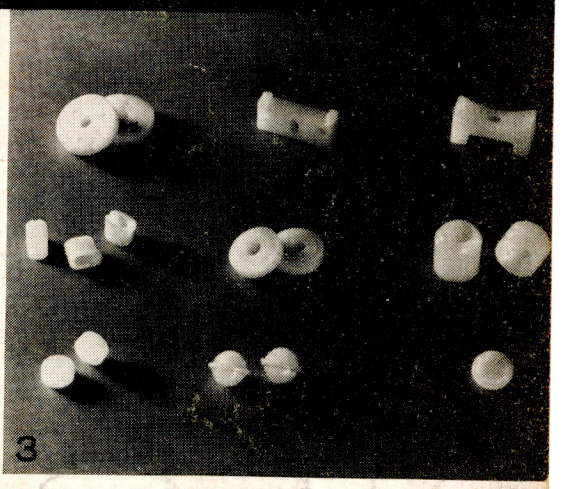
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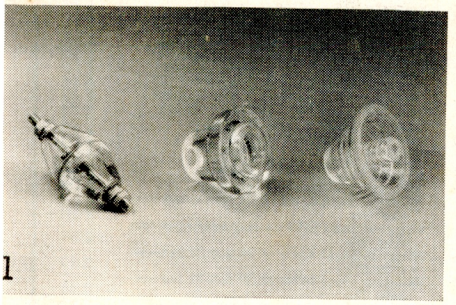
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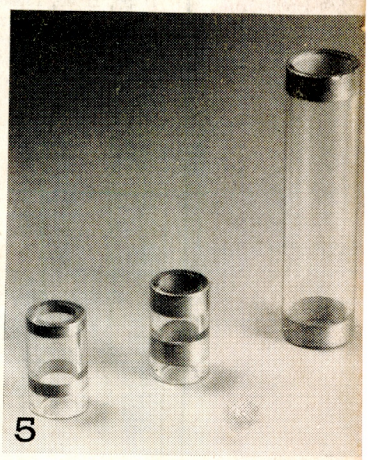
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Pyrex Insulators
BRAND

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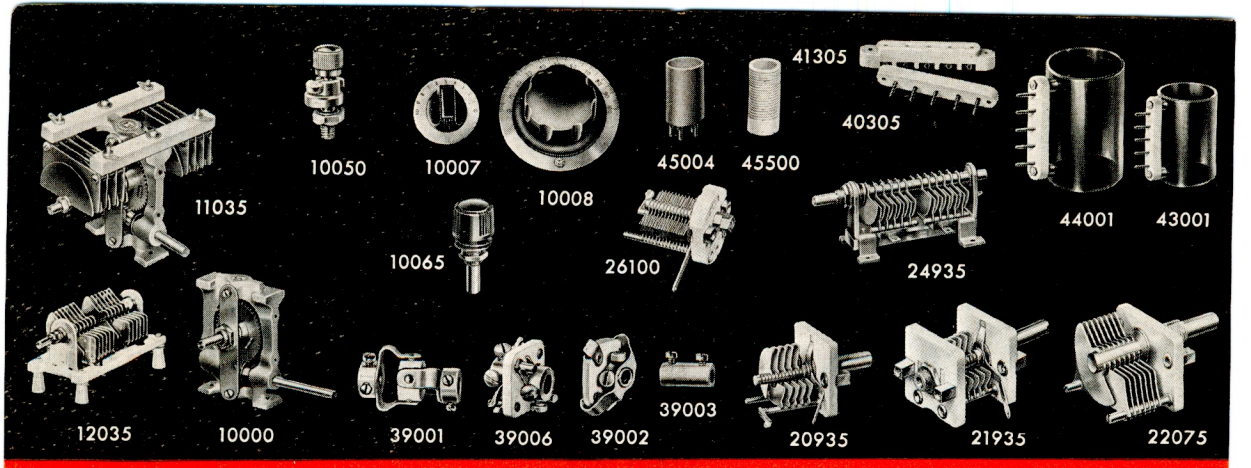

MILLEN MODERN PARTS

MILLEN RADIO PRODUCTS are well designed MODERN PARTS for MODERN CIRCUITS, attractively packaged, moderately priced, and fully guaranteed. They have been designed with a view toward easy and practical application as well as efficient performance. For instance, the terminals are located so as to provide shortest possible leads, mounting feet are designed for easy insertion of screws and socket contacts, so that the solder won't run down inside them and make impossible the insertion of the tube, etc. Thus our slogan, "Designed for Application." Our general catalog is available for the asking either from your favorite parts supply house or direct from the factory.

11000, 12000, 13000, 14000 SERIES CONDENSERS
.077" air gap is for 3000 volt peak rating

MILLEN TYPE

Code	Capacity per side		Air Gap	Voltage Rating	Net Price
	Max.	Min.			
11035	36	4.6	.077"	3000	$6.90
11050	51	6.5	.077	3000	7.14
11070	74	9.5	.077	3000	7.80
13035	35	4.9	.077	3000	4.56
13050	49.5	6.3	.077	3000	5.20
13070	71	7.3	.077	3000	5.88
14200	204	10.7	.077	3000	7.80
14100	90.5	12.9	.171	6000	12.00
14050	50		.171	6000	7.20
14060	60		.265	9000	12.00

CONVENTIONAL SINGLE SECTION TYPE

Code	Capacity per section		Air Gap	Finish on Plates	Net Price
	Min.	Max.			
12935	9	37	.176"	Polished	$4.32
12936	9	37	.176	Plain	3.90
12536	6	43	.077	Plain	2.40
12551	7	55	.077	Plain	2.70
12576	9	76	.077	Plain	3.00
12510	12	101	.077	Plain	3.60
12515	18	151	.077	Plain	4.50

CONVENTIONAL DOUBLE SECTION TYPE

Code	Capacity per section		Air Gap	Finish on Plates	Net Price
	Min.	Max.			
12035	6	43	.077"	Polished	$4.32
12036	6	43	.077	Plain	3.90
12050	7	55	.077	Polished	5.10
12051	7	55	.077	Plain	4.32
12075	9	76	.077	Polished	5.61
12076	9	76	.077	Plain	5.40

Code	Description	Net Price
10000	Worm Drive Unit	$4.50
10001	Drum Meter Dial-0-100	1.85
10007	1⅝" Nickel Silver Inst. Dial-0-100	.50
10008	3½" Nickel Silver Inst. Dial-0-100	1.00
10050	Dial Lock	.45
10060	Shaft Lock for ¼" Shafts	.36
10065	Vernier Drive Unit	.36
10067	Shaft Bearing, ¼"	.21
15001	Neutral Condenser 0.7–4.3	.90
15002	Neutral Condenser 0.5–13.5	1.05
15003	Neutral Condenser 1.5–8.5	.90
15005	Neutral Condenser 3.4–14.6	2.00
15006	Neutral Condenser 2.8–9.1	3.00
20015	Steatite Ultra Midget 15 mmfd SS	.75
20035	Steatite Ultra Midget 35 mmfd SS	1.00
20050	Steatite Ultra Midget 50 mmfd SS	1.20
20100	Steatite Ultra Midget 100 mmfd SS	1.50
20140	Steatite Ultra Midget 140 mmfd SS	1.70
20920	Steatite Ultra Midget 20 mmfd DS	1.20
20935	Steatite Ultra Midget 35 mmfd DS	1.40
21050	Steatite Ultra Midget 50 mmfd SS	1.75
21100	Steatite Ultra Midget 100 mmfd SS	1.90
21140	Steatite Ultra Midget 140 mmfd SS	2.10
21935	Steatite Ultra Midget 35 mmfd DS	1.90
22075	Steatite Midget 75 mmfd SS	1.32
22100	Steatite Midget 100 mmfd SS	1.38
22140	Steatite Midget 140 mmfd SS	1.62
22915	Steatite Midget 15 mmfd DS	1.20
22935	Steatite Midget 35 mmfd DS	1.30
22950	Steatite Midget 50 mmfd DS	1.50
23075	Steatite Dual Midget 75 mmfd per section SS	2.60
23100	Steatite Dual Midget 100 mmfd per section SS	2.50
23925	Steatite Dual Midget 25 mmfd per section DS	2.25
23950	Steatite Dual Midget 50 mmfd per section DS	2.50
24100	100 mmfd per section, Single spaced	2.75
24935	35 mmfd per section, Double spaced	2.75
25130	93–130 Air Padder	1.50
26025	3.2–25 Air Padder	.96
26050	4–50 Air Padder	1.08
26075	4.3–76 Air Padder	1.20
26100	5–97 Air Padder	1.32
26140	6.5–140 Air Padder	1.60
26920	4.5–20 Air Padder	1.40
26935	5.5–36 Air Padder	1.50
27010	10 mmf Silver on Mica	.36
27025	25 mmf Silver on Mica	.36
27050	50 mmf Silver on Mica	.36
27100	100 mmf Silver on Mica	.36

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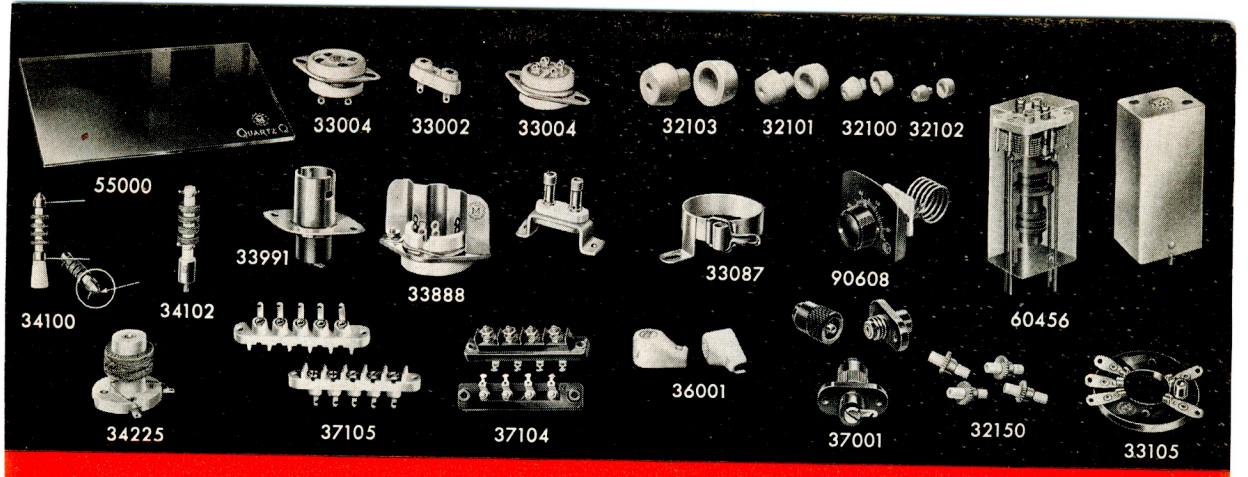
MALDEN, MASSACHUSETTS, U.S.A.



DESIGNED for APPLICATION

Code	Description	Net Price
27150	150 mmf Silver on Mica	$ .42
28030	30 mmfd Mica Padder	.15
30001	Standoff, ½ x 1¾, QuartzQ	.15
30002	Standoff, ½ x 2⅞, QuartzQ	.21
30003	Standoff, ¾ x 2⅞, QuartzQ	.55
30004	Standoff, ¾ x 4⅞, QuartzQ	.65
31001	Standoff, ½ x 1, Isolantite	.20
31002	Standoff, ½ x 2½, Isolantite	.27
31003	Standoff, ¾ x 2, Isolantite	.30
31004	Standoff, ¾ x 3½, Isolantite	.42
31011	Cone, ¾ x ½, Steatite	.10
31012	Cone, 1 x 1, Steatite	.21
31013	Cone, 1½ x 1, Steatite	.27
31014	Cone, 2 x 1, Steatite	.75
31015	Cone, 3 x 1½, Steatite	.45
32100	Steatite Bushing for ⅜" hole	.30
32101	Steatite Bushing for ½" hole	.35
32102	Steatite Bushing for ¼" hole	.20
32103	Steatite Bushing for ¾" hole	.45
32150	Isolantite Thru-bushing, for ¼" hole	.05
32201	Steatite Bushing and Hardware	.75
32203	Steatite Bushing and Hardware	3.60
32300	Isolantite Bushing	1.80
33002	Crystal Socket	.25
33004	4 Prong Socket	.24
33005	5 Prong Socket	.24
33006	6 Prong Socket	.24
33007	7 Prong, Large, Socket	.24
33008	8 Prong, Octal, Socket	.24
33087	Base Clamp for 807 etc.	.30
33105	Acorn Socket, QuartzQ	.90
33888	Aluminum Shield for 33008	.18
33991	Socket for 991 etc.	.45
34010	Shielded 10 MH receiving	.75
34100	Universal 2.5 MH	.36
34101	Universal 2.5 MH, less Standoff	.30
34102	Commercial type 2.5 MH	.36
34140	Universal air core Transmitting	1.00
34150	Amateur Band Iron Core	1.75
34210	General Purpose RFC 10 MH	.60
34225	General Purpose RFC 25 MH	1.75
34240	General Purpose RFC 40 MH	.75
34285	General Purpose RFC 85 MH	1.25
34800	Interruption Frequency Oscillator Coil	1.20
36001	Ceramic Plate Cap, 9/16" for 866 etc.	.21
36002	Ceramic Plate Cap, ⅜" for 807 etc.	.21
37001	Black Bakelite Safety Terminal	.40
37104	Four Terminal, Black Bakelite	.60
37105	Five Terminal, Steatite	.75
37202	Steatite Plates, Pr.	.30
37211	Bracket	.15
37222	Terminal Posts, Pr.	.30
37501	Low Loss Mica Bakelite Safety Terminal	.55
38001	Isolantite 3/16" O.D. Beads (Pk of 50)	.30
38500	100 Beads, 5/16" dia., QuartzQ	.60
39001	Truly Flexible Isolantite	.36
39002	Conventional	.36
39003	Solid Brass N.P.	.21
39005	Universal Joint, Non-Insulated	.36
39006	Slide Action	.36
40205	Midget Plug	.24
40305	Intermediate size plug	.45
41205	Midget Socket	.30
41305	Intermediate size socket	.45
43001	QuartzQ blank form and plug	.90
43011		.90
43021	Midget coils for each	.90
43041	band. Mounted on No. 40205	.90

Code	Description	Net Price
43081	plug. No. 1 at end of code means	$ .90
43161	center link. No. 2, end link.	.90
44000	QuartzQ form 1¾" dia. x 3¾"	.75
44001	QuartzQ blank form and plug	1.20
44005		1.50
44010		1.50
44020		1.50
44040	"100 watt" coils	1.50
44080	for each band. Mounted on	1.90
44160	No. 40305 plug	2.10
44500	Swinging link and socket	1.75
45000	Coil Form, 1" dia. no p., low loss mica base Phenolic	.21
45004	Coil Form, 1" dia. 4 p., low loss mica base Phenolic	.30
45005	Coil Form, 1" dia. 5 p., low loss mica base Phenolic	.30
45500	Coil Form, ⅝" dia., Steatite	.45
46100	Coil Form, 1½" dia. no p., QuartzQ	.45
47001	Coil Form, ½" dia., QuartzQ	.10
47002	Coil Form, ½" dia., QuartzQ	.15
47003	Coil Form, ¾" dia., QuartzQ	.35
47004	Coil Form, ¾" dia., QuartzQ	.45
55001	Sheet, 3 x 8½ x .1, QuartzQ	.45
58000	Coil Dope. 2 oz., QuartzQ	.30
77083	"83" Hash Filter 250MA	1.00
77866	"866" Hash Filter 500MA	1.25 pr.
77872	"872" Hash Filter	1.40 pr.
79020	14mc Band Wave Trap	.90
79040	7mc Band Wave Trap	.90
79080	3.5mc Band Wave Trap	.90
79160	1.7mc Band Wave Trap	.90

Air Trimmed

60454	456 Diode	Air Core	4.50
60455	456 Interstage (1)	Air Core	4.50
60456	456 Interstage (2)	Air Core	4.50
60501	5000 Interstage (2)	Air Core	4.50
60502	5000 Diode	Air Core	4.50
60503	5000 FM Interstage	Air Core	4.50
60504	5000 FM Disc	Air Core	4.50
62161	1600 Interstage	Iron Core	4.50
62162	1600 Diode	Iron Core	4.50
62454	456 Diode	Iron Core	4.50
62456	456 Interstage	Iron Core	4.50
63163	1600 BFO	Air Core	4.50
63456	456 BFO	Air Core	4.50
63503	5000 BFO	Air Core	4.50

Mica Trimmed

67454	456 Diode	Iron Core	1.25
67456	456 Interstage	Iron Core	1.25
67503	5000 FM Interstage	Air Core	1.50
67504	5000 FM Disc	Air Core	1.50

Permeability Tuned

64454	456 Diode (2)	1.50
64456	456 Interstage (2)	1.50
65456	456 BFO	1.35

Triple Tuned

66454	456 Diode	1.75
66456	456 Interstage	1.75
90600	Complete set of four Wavemeters, in case	12.00
90605	Range 2.8 to 9.7 mc. Wavemeter	3.00
90606	Range 9.0 to 28 mc. Wavemeter	3.00
90607	Range 26 to 65 mc. Wavemeter	3.00
90608	Range 50 to 140 Wavemeter	3.00
90721	Hetrofil	4.00

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···BLILEY

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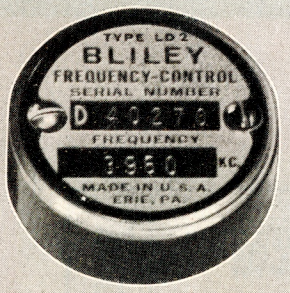
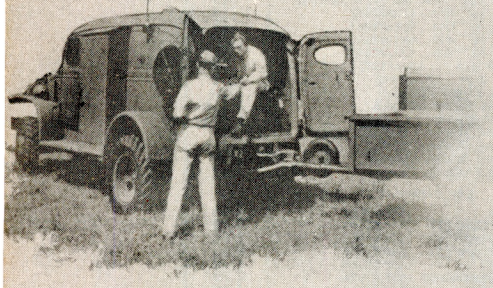
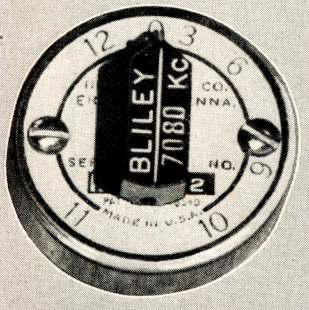


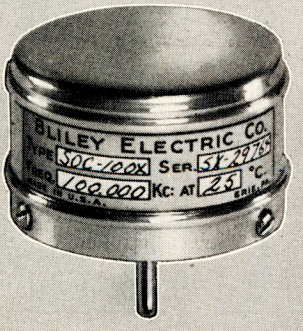
TODAY, the entire output of Bliley Crystal Units is directed to vital communications equipment for war purposes. When the United Nations win the last battle, as they most certainly will, the fruits of increased engineering knowledge, expanded facilities and improved production technique, will be available to a peace time world . . . a new world of greater human comfort through applied engineering and science.

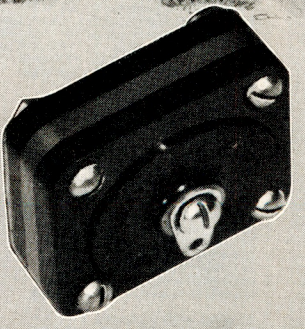
In this new world, Bliley Crystals will take their rightful place with their pre-war record of dependability, accu-

SPECIFY BLILEY FOR ACCURACY ◆







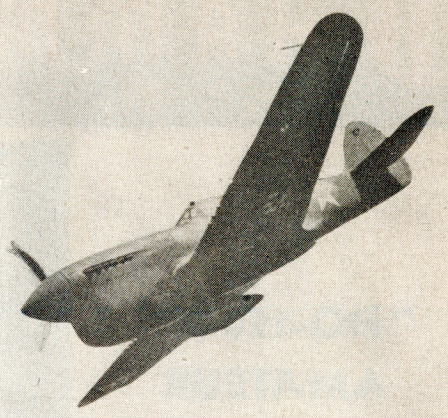


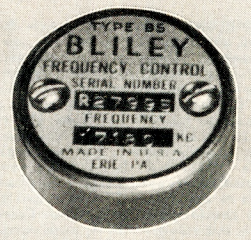
CRYSTALS

EXCELLENCE

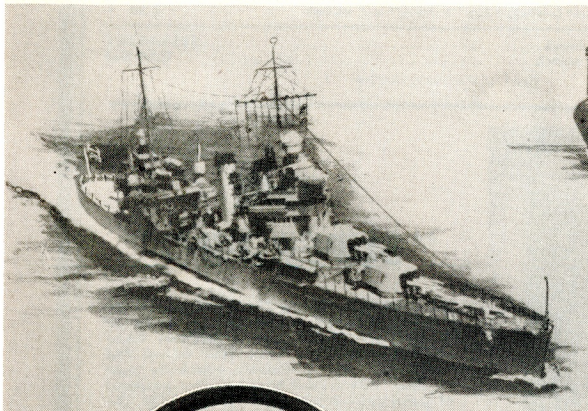
PIEZOELECTRIC APPLICATIONS

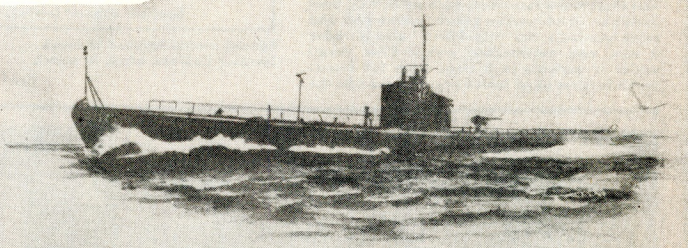
racy and user acceptance. Not counting applications covered by war time secrecy necessities, there will be Bliley Precision-made Crystals for diathermy, ultrasonic generators, pressure gauges, carrier-current communications systems, radio frequency filters, and precision interval timers. And, of course, in greater quantities than ever before, frequency controlling crystal units for all radio communication necessities, F. M. or A. M., fixed, portable, mobile or air borne. As always, Bliley Engineers are ready to extend their assistance to you . . . call on them freely.





DEPENDABILITY ◆ PERFORMANCE





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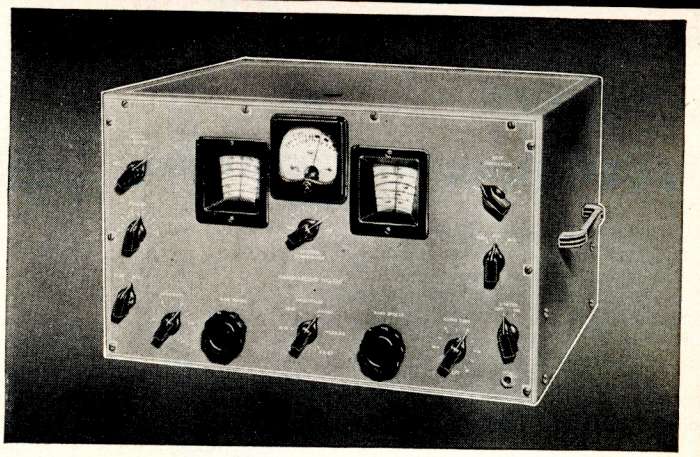
HAMMARLUND

PRECISION PRODUCTS FOR BETTER RADIO

"HQ-120-X" AMATEUR RECEIVER



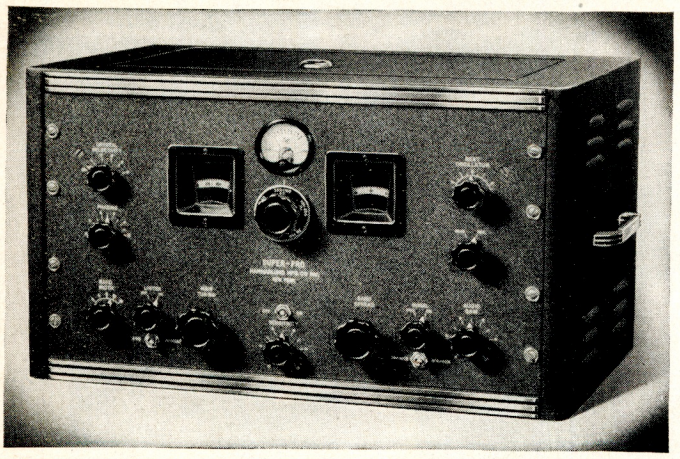
THE HAMMARLUND "HQ-120-X" meets the most critical demands of amateur and professional operators. Hammarlund engineers have gone beyond ordinary practice in designing this new and outstanding receiver. This ultra-modern 12-tube superheterodyne covers a continuous range of from 31 to .54 mc. (9.7 to 555 meters) in six bands, taking in all important amateur, communication, and broadcast channels. The "HQ-120-X" is not to be confused with modified broadcast sets. Two years were required to develop it. This is a special receiver with special parts throughout. Every wave range is individual—that is, each range has its own individual coil and a tuning condenser of proper value for maximum efficiency; thus, including the broadcast band does not decrease efficiency at high frequencies. Besides having all the necessary features for perfect short wave reception, such as A.V.C., beat oscillator, send-receive switch, phone jack and relay terminals, the "HQ-120-X" also includes a new and outstanding crystal filter circuit which is variable in 6 steps from full bandwidth to razor edge selectivity. This permits the use of the crystal filter for the reception of both voice and music. It is no longer necessary to contend with serious heterodyne interference. These annoying disturbances can be phased out with the phasing control on the panel. Other features include drift compensation for improved stability; a new and accurate "S" meter circuit for measuring incoming signal strength; antenna compensator to compensate for various antennas, and 310 degrees band spread for each amateur band from 80 to 10 meters. The band spread dial is calibrated in megacycles for each of these amateur bands. The main tuning dial is calibrated in megacycles throughout the entire range of the receiver. Gray finish. Rack adapter $6.00 extra.

Prices include Speaker and Tubes

Code	Type	Tuning Range	Speaker	Net Price
HQ-120-X	Crystal	31—.54 mc.	10" P.M. Dyn.	$168.00
Speaker cabinet (metal) 12½" x 12½" x 7 inches				3.90

Special model finished in black..... $168.00 Net
Speaker Cabinet, black to match..... 3.90 Net

Send for Descriptive Booklet!



THE "SUPER-PRO"

Code	Type	Spkr.	Tuning Range	Net Price
SP-210-X	Crystal	10"	15—560 meters	$318.00
SP-210-SX	Crystal	10"	7½—240 meters	318.00
SP-220-X	Crystal	12"	15—560 meters	330.00
SP-220-SX	Crystal	12"	7½—240 meters	330.00
PSC	10" speaker cabinet to match receiver			5.10

Special Models Covering Other Wave Ranges Available On Order

THIS 18-tube "SUPER-PRO" includes all the outstanding features which have made the "Super-Pro" famous, and in addition many recent developments have been added. The "Super-Pro" has a variable selectivity crystal filter. This crystal filter has five positions of selectivity—3 for phone and 2 for CW. The variable crystal filter, in addition to the variable band width I.F., provides a selectivity range of from less than 100 cycles to approximately 16 kc. The new "Super-Pro" also has an improved noise limiter designed to minimize interference caused by automobile ignition systems and disturbances of similar nature. Maximum image suppression is obtained with two stages of high selectivity tuned R.F. ahead of the first detector. Three stages of I.F. are employed and there are three stages of high fidelity audio amplification resulting in an output of approximately 14 watts. A new and improved "S" meter has been installed in the "Super-Pro" for accurately reporting relative signal strength. Other features include full band-spread on all bands; beat oscillator; send-receive switch; relay connections; phone connections; connections for phono-pickup; beautifully finished modernistic cabinet. The sensitivity of the "Super-Pro" is better than 1 microvolt. Available in rack mounting type at $10.50 extra.

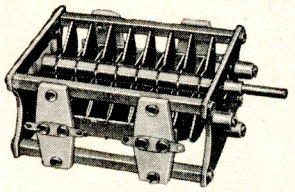
Write for Circular!

HAMMARLUND MANUFACTURING CO., INC. • 460 West 34th Street • New York City

HAMMARLUND

PRECISION PRODUCTS FOR BETTER RADIO

"TC" TRANSMITTING CONDENSER

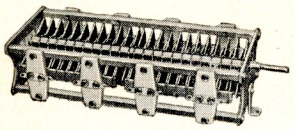


A moderately priced, heavy duty transmitting condenser, featuring heavy aluminum and plate, Isolantite insulation, non-inductive, self-cleaning silver plated beryllium contacts, full floating rotor bearing, non-magnetic rotor assembly, polished heavy aluminum plates accurately spaced. All, except type "L," have round edge plates of .040" thickness. Type "L" has .025" plates with plain edges. Type "F" has .230", 7500 V. air gap. Type "G," .200", 6750 V. Type "H," .171", 6000 V. Type "J," .100", 4250 V. Type "K," .084", 3750 V. Type "L," .070", 2000 V. air gap.

Available in a wide variety of capacities and working voltages, these condensers are ideal for modern up-to-date transmitters with power outputs ranging from 200 watts to 1 kw.

Type	Capacity	Overall Length	List
TC-220-L	220 mmf.	4 1/16	$ 6.30
TC-440-L	465 mmf.	5 7/8	9.10
TC-90-K	95 mmf.	2 15/16	5.70
TC-165-K	167 mmf.	4 1/16	6.50
TC-220-K	222 mmf.	4 5/8	8.00
TC-330-K	335 mmf.	6 1/2	10.00
TC-240-J	250 mmf.	6 1/2	10.20
TC-25-H	23.5 mmf.	2 15/16	5.10
TC-50-H	53 mmf.	4 1/16	6.00
TC-110-H	115 mmf.	6 1/2	9.00
TC-40-G	46 mmf.	4 1/16	7.00
TC-65-G	75 mmf.	5 7/8	8.80
TC-100-G	110 mmf.	7 1/2	11.20
TC-150-G	165 mmf.	10 5/8	14.80
TC-55-F	60 mmf.	5 7/8	8.00

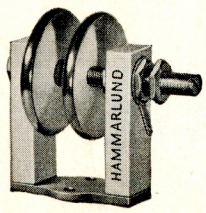
"TCD" SPLIT STATOR TYPES



These split stator transmitting condensers are identical to the singles shown above, except that the stator sections are individual. Ideal for push-pull power amplifiers ranging in power up to 1 kw. They are of convenient size and lend themselves to construction of compact apparatus. Overall dimensions in back of panel are given in the accompanying table. The capacity values listed are for each section. The last letter in the code represents plate spacing and voltage rating. These are identical to those given above. Type "M"—plain plates, .030" air gap.

Type	Capacity	Overall Length	List
TCD-500-M	490 mmf.	4 1/16	$10.30
TCD-80-L	90 mmf.	4 1/16	8.30
TCD-210-L	215 mmf.	5 7/8	10.40
TCD-90-K	95 mmf.	4 5/8	9.40
TCD-165-K	167 mmf.	6 1/2	11.50
TCD-325-K	335 mmf.	11 1/16	20.50
TCD-240-J	250 mmf.	11 1/16	19.00
TCD-50-H	53 mmf.	6 1/2	9.80
TCD-110-H	115 mmf.	11 1/16	16.00
TCD-40-G	46 mmf.	7 1/2	10.50
TCD-75-G	85 mmf.	11 1/16	14.50
TCD-55-F	60 mmf.	11 1/16	13.70

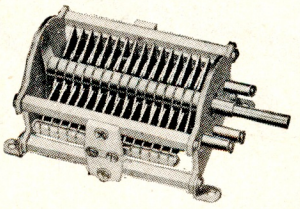
"N" NEUTRALIZING CONDENSERS



Improved neutralizing condensers with heavy polished aluminum plates. Rounded edges. Isolantite. Fine adjusting screw. Positive lock. Horizontal adjustment. Type "N-10", 2 5/8" high x 1 3/16" deep. "N-15" 4 15/16" high x 3 1/2" deep. "N-20", 5 11/16" high x 4" deep.

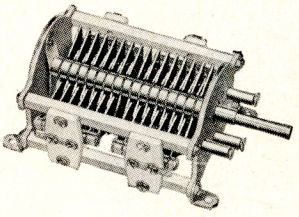
Code	List
N-10—(2.1—10 mmf.)	$4.60
N-15—(3.2—14 mmf.)	8.70
N-20—(3.8—14 mmf.)	9.30

"MTC" TRANSMITTING CONDENSERS



Compact types, Isolantite insulation. Base or panel mounting. Polished aluminum plates. Stainless steel shaft. Size of 150 mmf. with .070" plates spacing only 4 5/8" behind panel. All type "B" condensers have round edge plates .025" in thickness. Type "C" has plain edge plates .025" thick. Self-cleaning wiping contact.

Code	Capacity	List
MTC-20-B	22 mmf.	$4.10
MTC-35-B	33 mmf.	4.30
MTC-50-B	50 mmf.	4.60
MTC-100-B	100 mmf.	5.30
MTC-150-B	150 mmf.	6.10
MTC-50-C	46 mmf.	4.10
MTC-100-C	105 mmf.	4.40
MTC-150-C	150 mmf.	4.80
MTC-250-C	255 mmf.	5.30
MTC-350-C	360 mmf.	5.80

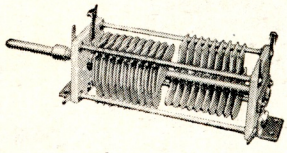


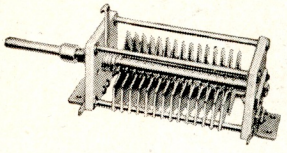
"MTCD" SPLIT-STATOR TYPES

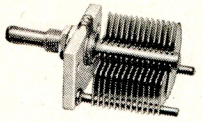
Same outstanding features as MTC singles except that stater sections are separate. Model 100-B with .070" plate spacing, only 5 3/4" behind panel. "B" models—rounded plates "C" models—plain plate edges.

Code	Capacity	List
MTCD-20-B	22 mmf. per sect.	$5.60
MTCD-35-B	33 mmf. per sect.	6.00
MTCD-50-B	50 mmf. per sect.	6.50
MTCD-100-B	100 mmf. per sect.	8.75
MTCD-50-C	46 mmf. per sect.	5.50
MTCD-100-C	105 mmf. per sect.	6.00
MTCD-150-C	150 mmf. per sect.	6.50
MTCD-250-C	255 mmf. per sect.	7.50

A NEW LINE OF TRANSMITTING AND RECEIVING CONDENSERS







The new HFA and HFB receiving and transmitting condensers are the latest in condenser design. The HFB transmitting condenser, for example, has fully insulated rotor and control shaft permitting higher operating voltage for a given plate spacing. This new design results in more compact and efficient condenser construction and the insulated control shaft reduces the danger of electric shock to the operator. The HFB's are made in both dual and single stator types and in all important capacities.

The HFA receiving condenser is a sturdier midget condenser intended for use in portable and aviation equipment where conditions of operations demand a better and more solid condenser. These, too, are available in a wide variety of size with both single and dual stators. All types, both HFA and HFB are of 100% soldered construction with brass plates, cadmium plated. Isolantite end plates.

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ELECTRIC PRODUCTS INC.

RADIO DIVISION

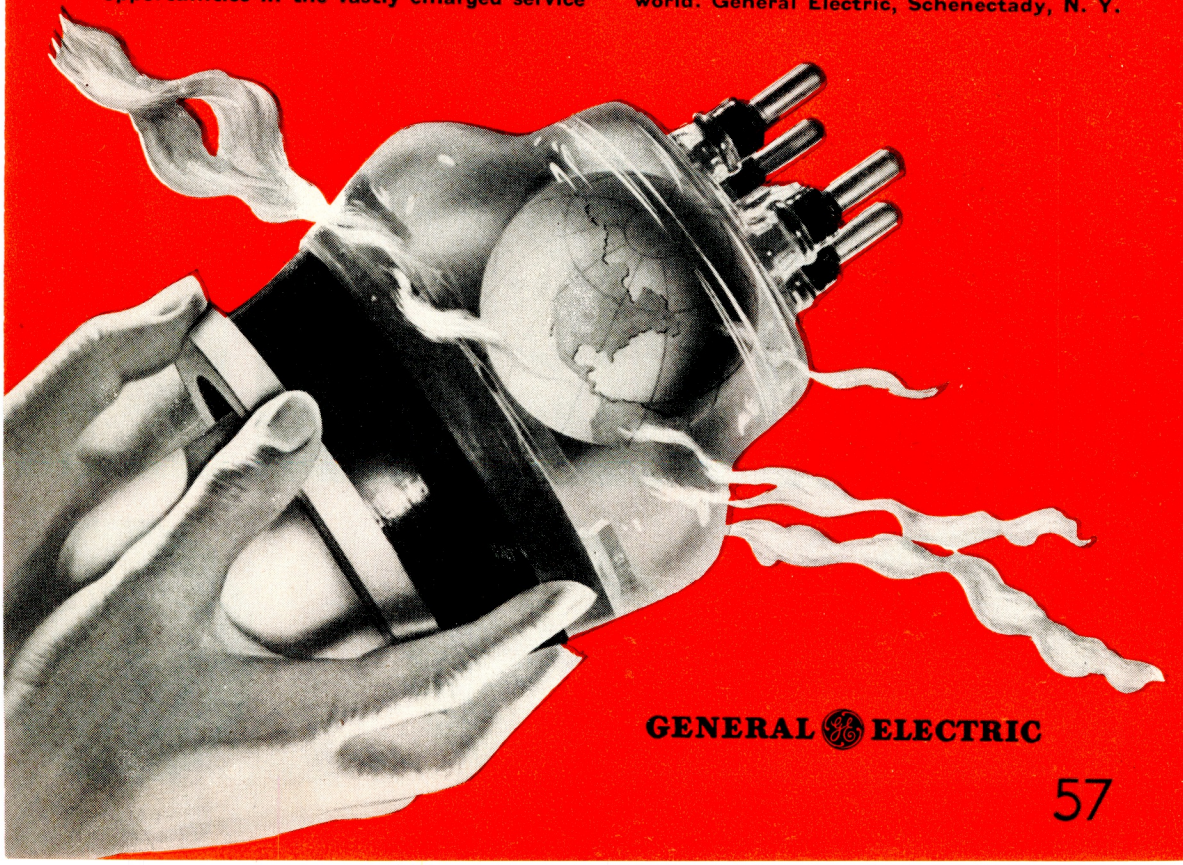
ELECTRONICS . . . post-war world of opportunity

WHEN this nation went to war, it was fortunate in having thousands of amateur radio enthusiasts who had a background of years of experiment and learning in electronics . . . the science that has revolutionized the transmission of sound and sight. For this training enabled them to provide vitally needed services in electronic industries, in the Armed Forces, and in war communications. In no other country was this situation duplicated on such a broad scale.

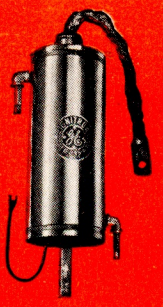
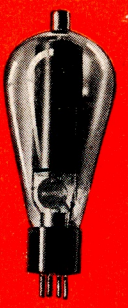
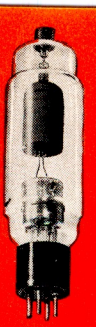
In the post-war era, these men and those now training in the Armed Forces will be the key men in the expanded fields of electronics —broadcasting, television, emergency communication, marine and air transport, and industrial applications. They will also find opportunities in the vastly enlarged service field which all this expansion must create.

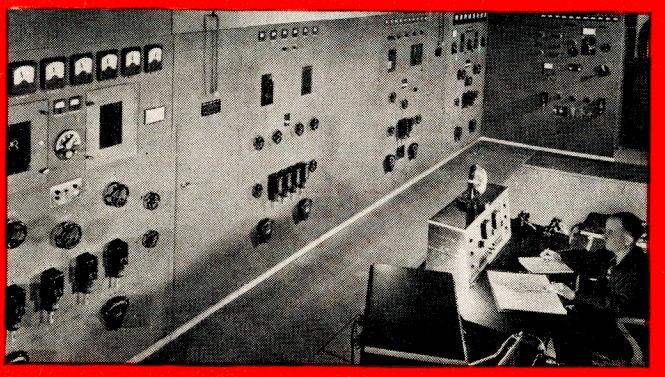
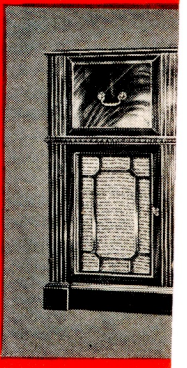
General Electric is now in the service of America-at-war, providing daily nearly $1,000,000 worth of electronic tubes, transmitting and receiving equipment for the Armed Forces. While all its manufacturing facilities are devoted to war production, G.E. is nevertheless preparing for the tremendous surge of peacetime activity . . . when products for the amateur will have a prominent place in G.E.'s manufacturing plan.

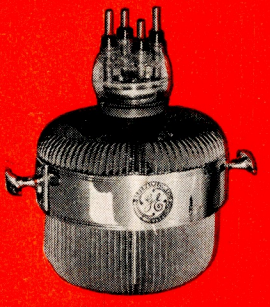
From G.E.'s unending research and electronic know-how will come many important post-war developments. From G.E.'s electronic achievements in many fields will come opportunities for those who plan to make the most of electronics in the post-war world. General Electric, Schenectady, N. Y.

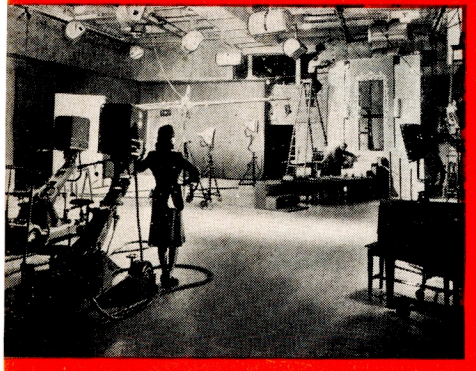
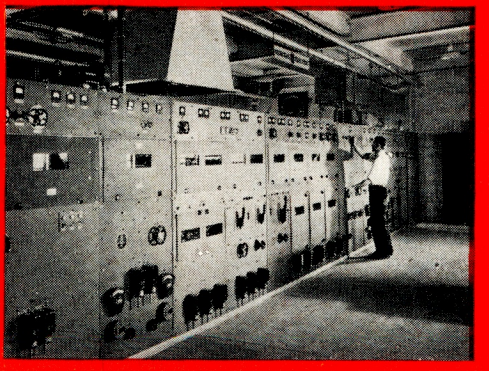
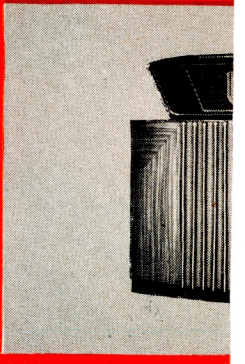


GENERAL ELECTRIC



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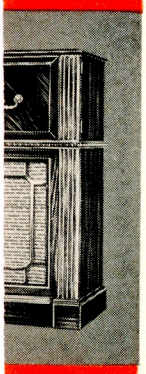
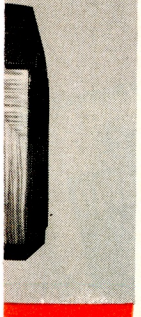
INDUSTRIAL ELECTRONIC TUBES. General Electric is equipped to manufacture all types of electronic tubes — from tubes used in heating and welding, to tubes that control motors and machinery; to tubes that transmit, receive and amplify sound and signals; to tubes that measure light, sort, count, "see" through solids. Long experience, modern manufacturing equipment, rigid control and inspection contribute to the exceptionally high quality and dependability of G-E tubes. Shown (left to right) are the ignitron, thyratron, and kenotron.



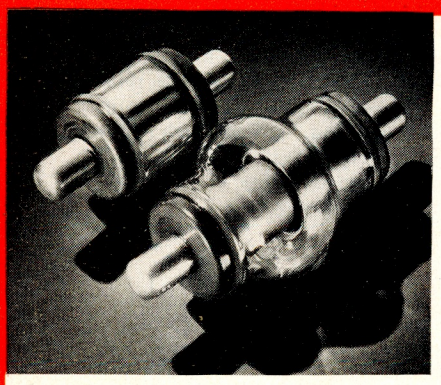
FM AND AM TRANSMITTERS AND RECEIVERS. General Electric's unequaled experience in short-wave broadcasting is well known . . . all of America's 100 kw international broadcast transmitters have been built by G.E. G.E. has equipped more than a third of existing FM broadcast stations, and supplied a large portion of the 600,000 FM receivers now in use. G.E., in fact, is the only manufacturer with experience in building the complete FM system — including transmitter, antenna, and home receiver. Shown (left to right) are G-E FM and AM transmitters and G-E radio-phonograph combination incorporating AM and FM.

TRANSMITTING TUBES. General Electric has probably made more important contributions to the development of transmitting tubes than any other manufacturer. For example: G.E. developed tubes and circuits that produced the high-frequency oscillations that make broadcasting possible. G.E. developed the first water-cooled transmitting tube which made high-power broadcasting possible. G.E. developed the hot-cathode mercury-vapor tubes which cut broadcasting power losses tremendously. Shown are four typical G-E transmitting tubes.



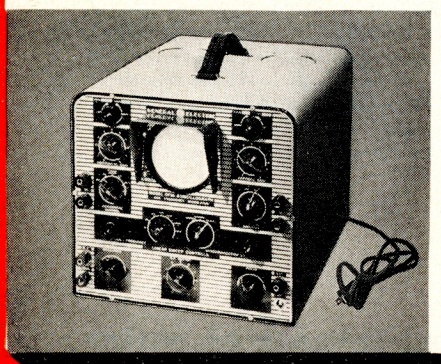
TELEVISION TRANSMITTER AND RECEIVERS. Evidence of G.E.'s leadership in studio planning and station equipping is Television Station WRGB, in Schenectady, New York. This televison "workshop" is one of the finest and most complete studios of its kind in the world. From WRGB will come much of programming knowledge and technical development which will bring the post-war expansion of television. Shown (left to right) are WRGB's studio, transmitter, and G-E AM and television receiver with FM for television sound.

EMERGENCY COMMUNICATION. It's coming! — two-way FM radio in every municipal police car. The G-E FM system for cities, towns, and public utilities provides amazing freedom from static and extremely low noise levels. General Electric AM police radio will be used in the wider areas covered by state and county public safety departments. Here, again, G.E.'s broad experience will provide unusually dependable emergency radio equipment.



CAPACITORS. General Electric has pioneered and developed a new, unique line of vacuum capacitors, rated from 7500 to 16,000 volts peak and from 25 to 100 mmfd. These circuits are common to military, aircraft, and amateur radio equipment.

The small size of the G-E vacuum capacitor is of especial importance in the design of high-frequency circuits. Only a tenth the size of similarly rated air capacitors, these capacitors also provide an internal voltage breakdown characteristic which is unaffected by altitude.



TESTING INSTRUMENTS. The new General Electric line of laboratory and testing equipment provides an extensive choice of portable, compact apparatus for accurate, rapid maintenance and testing of radio electronic circuits and parts. It includes G-E unimeters, tube checkers, bridges, signal generators, oscilloscopes, and other instruments — all planned for easy, error-free reading and long, dependable service. Shown at left is G-E oscillograph and frequency modulator for AM, FM, and television-receiver and transmitter trouble-shooting.

THE ELECTRONIC "BOOKS OF THE YEAR"

"How Electronic Tubes Work." Here's an electronics "first reader"—a simple explanation of the basic principles of electronic tubes . . . describes briefly important uses of tubes in industrial electronic equipment. *"How Electronic Tubes Work"* is *FREE*. Filing size—24 graphically illustrated pages.

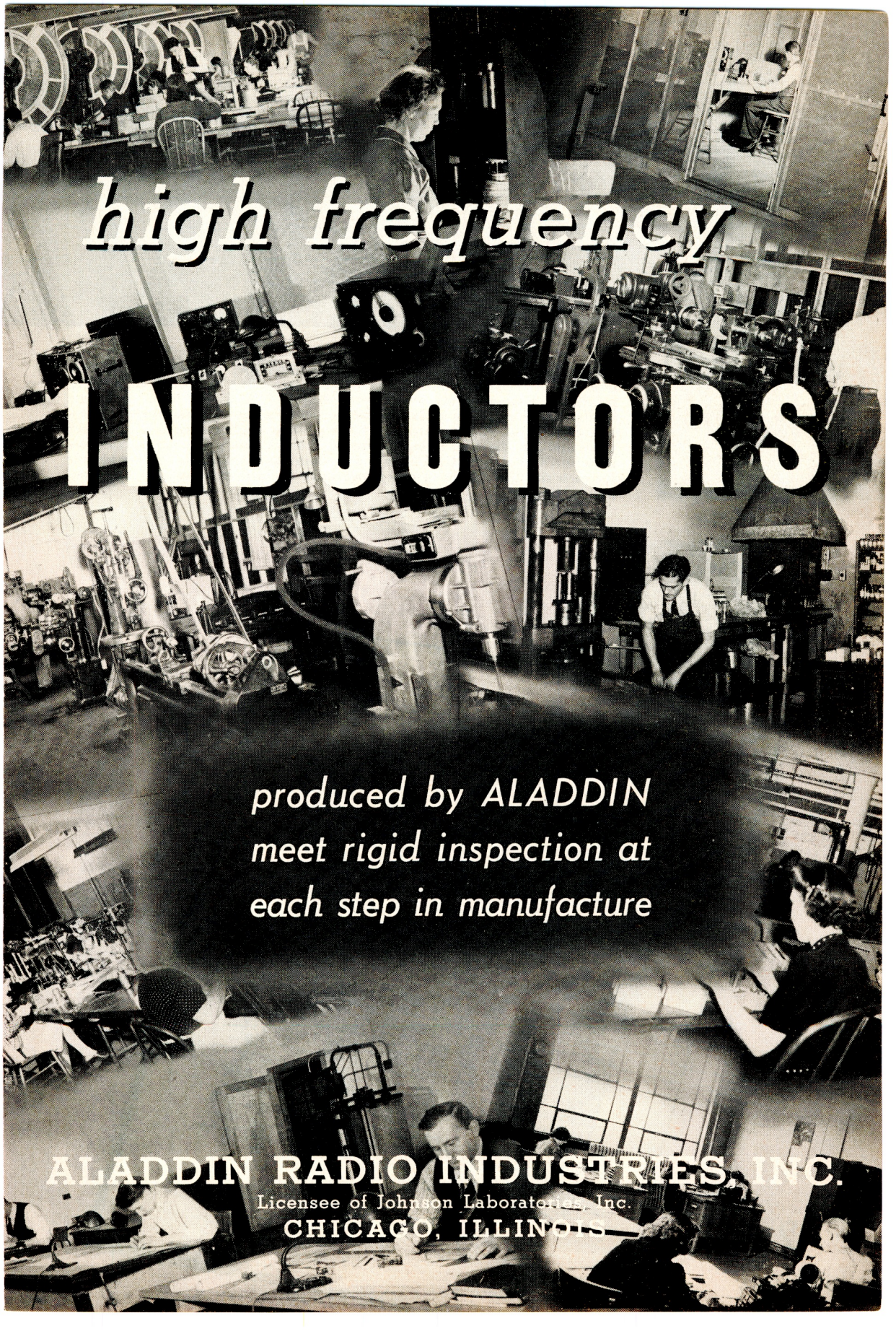
"The ABC's of Radio." Here's a simple, easy-to-understand "Primer" on radio and its basic circuits . . . how they are designed and how they perform . . . what the fundamentals are . . . the various principles and theories of radio receivers and their service . . . 68 pages, clearly illustrated. *"The ABC's of Radio"* is offered at twenty-five cents in stamps or coin.

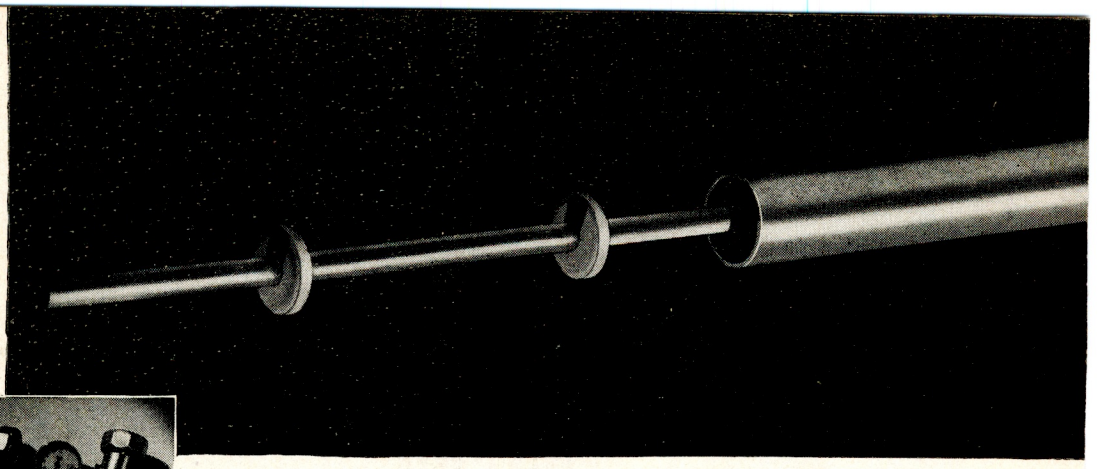
For either of these informative brochures . . . address Dept. 6-S, Electronics Department, General Electric, Schenectady, N. Y.

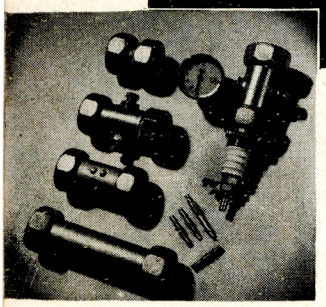
LEADER IN RADIO, TELEVISION, AND ELECTRONIC RESEARCH

GENERAL ELECTRIC

160-C1


high frequency
INDUCTORS
produced by ALADDIN
meet rigid inspection at
each step in manufacture
ALADDIN RADIO INDUSTRIES, INC.
Licensee of Johnson Laboratories, Inc.
CHICAGO, ILLINOIS





COMMUNICATION PRODUCTS COAXIAL TRANSMISSION LINE provides a radiation-free line of copper or aluminum, designed according to sound engineering principles. Four sizes are available: a flexible $\frac{1}{4}$-inch line with spun-glass insulation for receiving or low power purposes; a new and improved $\frac{3}{8}$-inch semi-flexible ceramic insulated line for low power applications; a $\frac{7}{8}$-inch rigid type; and a $1\frac{5}{8}$-inch ultra high frequency line for high power use. A complete assortment of standardized fittings and maintenance equipment is obtainable for each size line. Years of experience have enabled us to reduce tolerances to a minimum.

MEMORANDUM

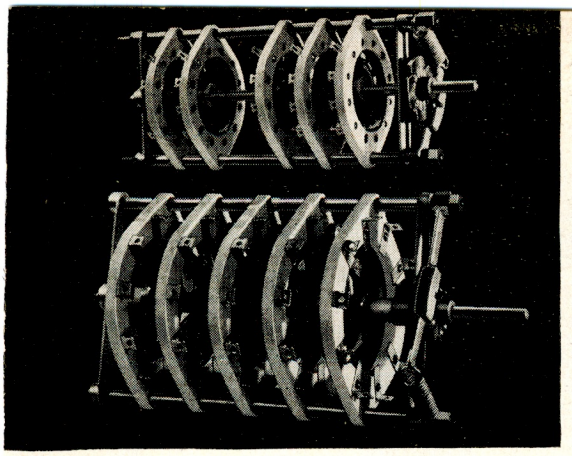
For many years now, we've been designing and producing radio equipment for broadcasting systems, commercial communication companies, manufacturers and such government agencies as the Weather Bureau, the Civil Aeronautics Authority and others.

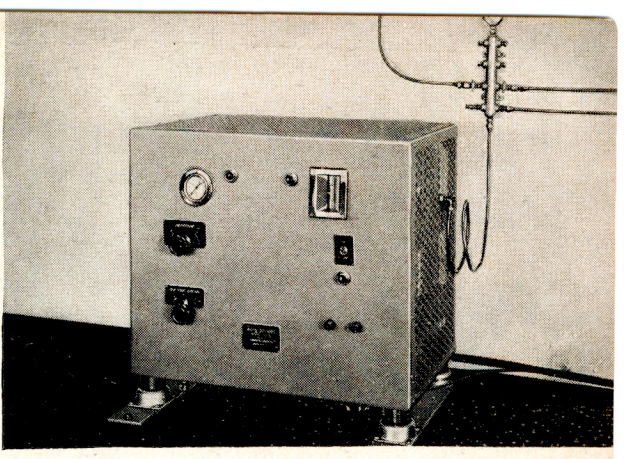
Today, of course, we're up to our necks — and glad to be — working for the United States Army, Navy and Coast Guard. We'd like to serve you now — and we can, if you've the proper priority. But if you haven't . . . we hope you'll be patient until the GA signal comes through and all of us can go ahead with our plans for better commercial and amateur radio.

We promise you, though, that the war's stimulus has prodded us into designing and producing many new items: Auto-Dryaire — an automatic coaxial line dehydrator, improved coaxial cable and fittings as well as much better HF and UHF band-change switches. Of course, Q-Max low-loss lacquer is still tops and we are always ready to supply UHF radiators for land, marine, aircraft and mobile services.

While we're all working for Victory why don't you plan for tomorrow in anticipation of new and improved C.P. gear?

COMMUNICATION PRODUCTS COMPANY

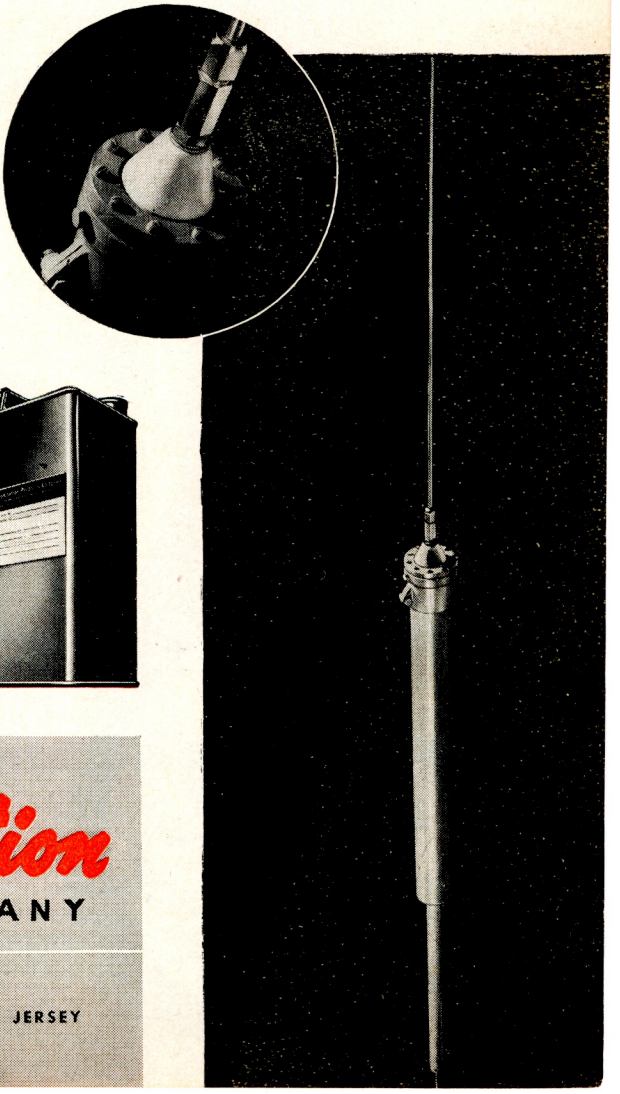




STERLING SWITCHES, with pure silver contacts, are available in two standard sizes for low and moderate power transmitters, laboratory instruments and various electronic devices. Of rugged mechanical design they are adaptable to many circuit arrangements, and are characterized by low turning torque, constant contact resistance and high current rating. Because all conducting paths are of pure silver, "hot-spots" do not develop at contact areas.

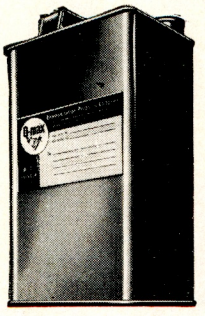
AUTO-DRYAIRE, an exclusive development of Communication Products, is a completely automatic device for maintaining coaxial transmission lines at pre-set pressures of moisture-free air. It will function for indefinite periods at the rate of 1000 cubic inches per minute (at such a rate, an "F" cylinder of nitrogen would be exhausted in two hours). Since AUTO-DRYAIRE utilizes the freest commodity—air—it is independent of critical gases and heavy cylinders.

ANTENNAS AND RADIATING SYSTEMS include: standard high frequency rotary beams, half-wave "foldbacks," vertical and horizontal coaxial radiators and ultra high frequency fixed and mobile directive arrays—as well as specialized units to meet individual specifications. Antennas and supporting structures are carefully designed to withstand high wind velocities. They are produced in most conventional metals—steel, copper, brass, and aluminum as well as the less common alloys in order to withstand prolonged exposure where salt water service results in excessive corrosion.



Half-wave coaxial antenna. Designed for maximum strength and minimum weight.

Q-MAX A-27 RADIO FREQUENCY LACQUER is a remarkable new, extremely low-loss, fast air-drying lacquer for use in the treatment or impregnation of radio frequency components. Q-MAX is used for both audio and radio frequency applications, giving protection against mechanical injury and moisture. It serves as a base for the embedment of wire on rigid coil forms, thus reducing slippage. It has high adhesive strength and is extremely flexible. Q-MAX is applied by dipping or brushing. Use multiple applications for extra heavy coating requirements.



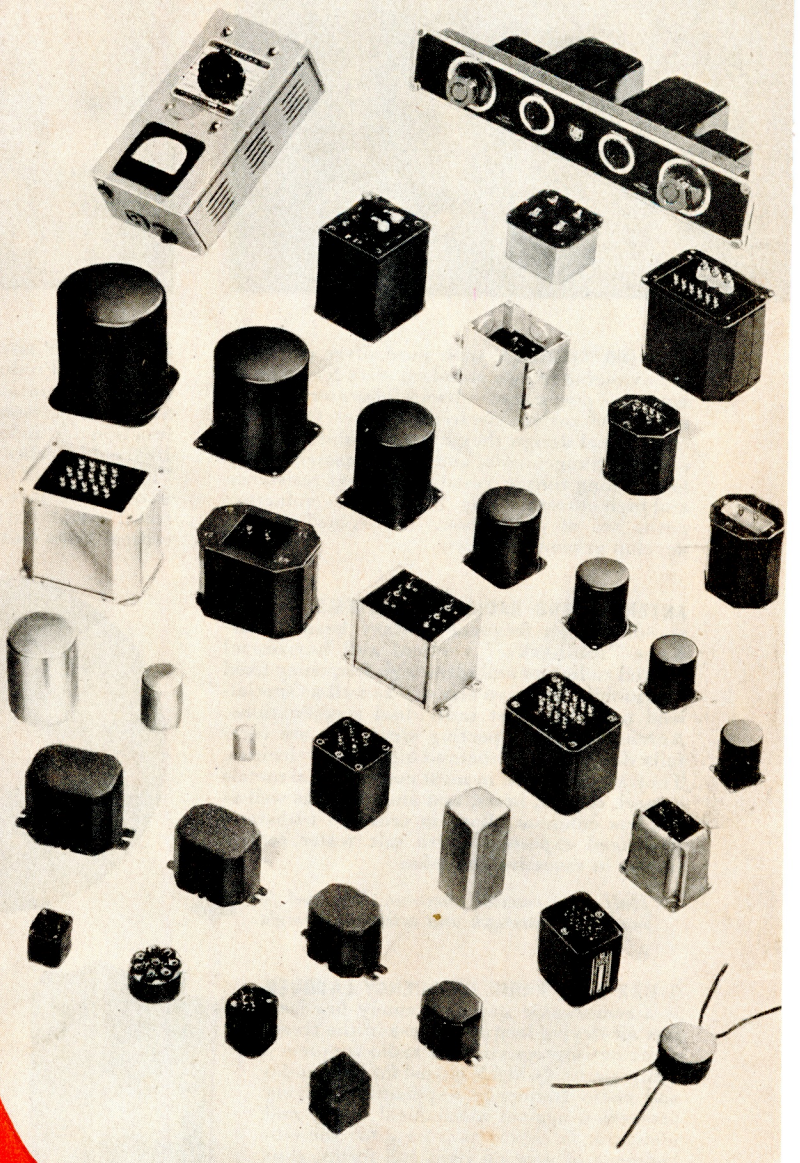
Communication

PRODUCTS CP COMPANY

744 BROAD STREET, NEWARK, NEW JERSEY

FACTORY: 346 BERGEN AVENUE, JERSEY CITY, NEW JERSEY

UTC LEADS THE FIELD



utc

UNITED TRANSFORMER CO.

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

Designs for War...

Hermetic Sealing

The hermetic sealing of transformers covers a wide range of problems, and an equally wide range of applications. The two units illustrated at the left, for example, represent a high voltage transformer for high altitude operation, and an audio unit weighing approximately one ounce.

There is more to hermetic sealing than meets the eye. The illustrations below show some of the factors contributing to the high quality of UTC hermetically sealed units.

May we design a war unit to your application?

For obvious reasons, the units illustrated are not actual war items.

Engineering . . . PRODUCT

Engineering starts with research, continues through the conference table, and then goes through the proving of electrical design, sealing methods, vibration test, etc.

ENGINEERING CONFERENCE

DESIGN PROVING . . . AUDIO

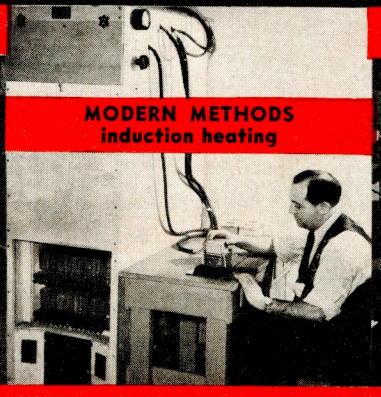
DESIGN PROVING . . . POWER

Engineering . . . PRODUCTION

The production of war units generally requires precise control. This requires the scientific choice of workers for specific operations . . . the use of modern methods throughout . . . and continuous control of quality and production flow.

APTITUDE TESTING assures worker suited to operation

MODERN METHODS induction heating



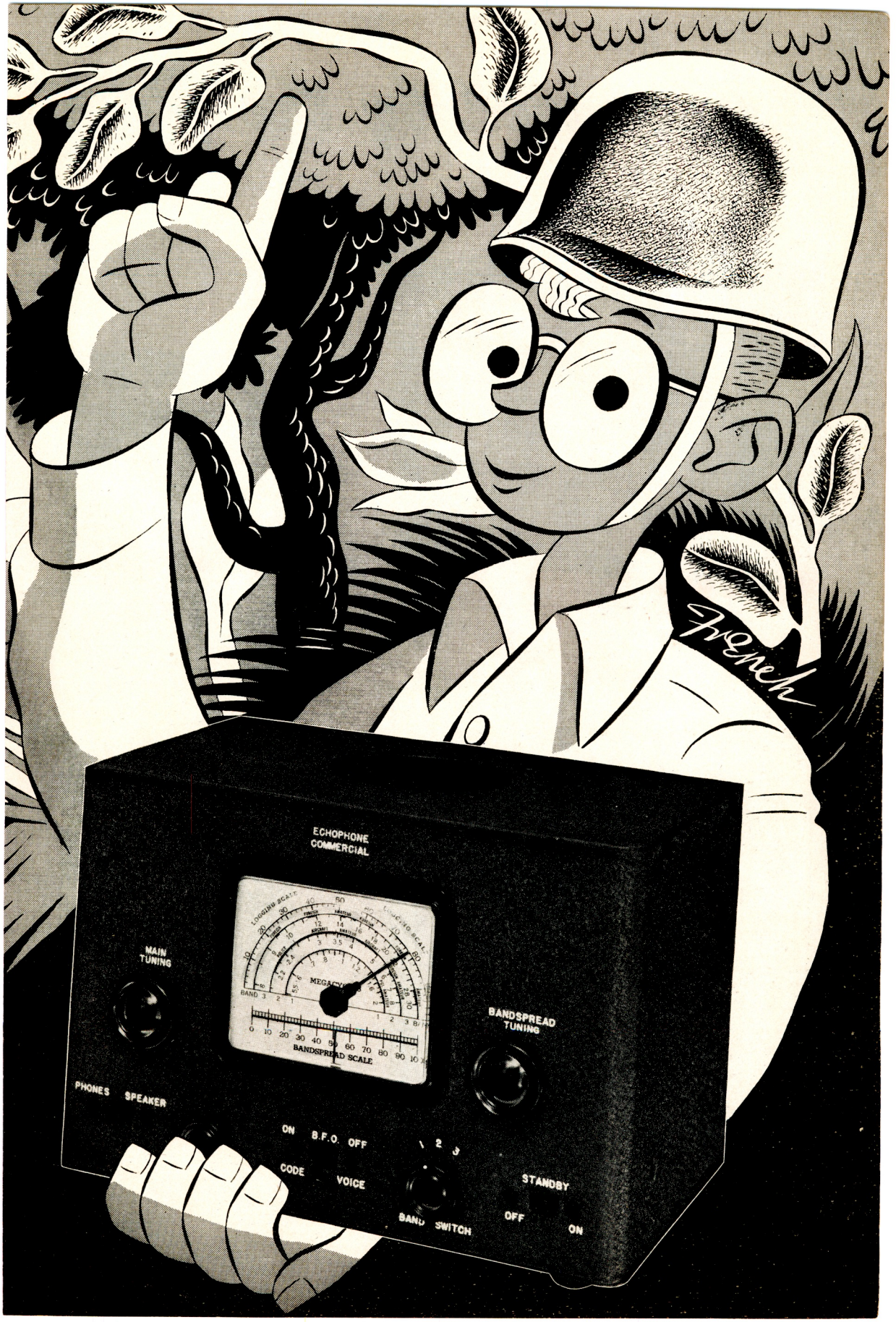
CONTINUOUS CONTROL for uniformity of production

UNITED TRANSFORMER CO.

150 VARICK STREET ★ NEW YORK, N. Y.

EXPORT DIVISION: 100 VARICK STREET NEW YORK, N. Y. CABLES: "ARLAB"

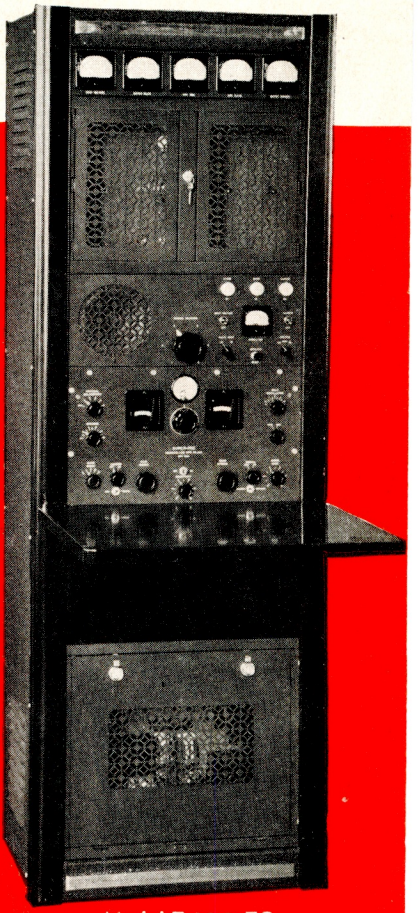
HOGARTH SAYS...
"Sure is swell, the enjoyment us guys way out here get from shortwave broadcasts from the States.
It's GOOD to hear from home... favorite programs... Bob Hope, Kaltenborn, Dinah Shore, Harry James, the Philharmonic, we get 'em all!
It takes a good set to pull 'em in but MY EC-1 never fails me!
A lot of Hams are going to find it easy to fill their logs, when they get an EC-1!
You can't get an Echophone EC-1 until after this fracas is finished— but after that... Oh! Boy!"
ECHOPHONE
COMMERCIAL
"The Ears of the World"
ECHOPHONE RADIO CO.
201 EAST 26TH ST., CHICAGO, ILLINOIS


French
ECHOPHONE
COMMERCIAL
MAIN
TUNING
BANDSPREAD
TUNING
BANDSPREAD SCALE
PHONES
SPEAKER
ON
B.F.O.
OFF
CODE
VOICE
1 2 3
BAND SWITCH
STANDBY
OFF
ON

Prepared by the Past..

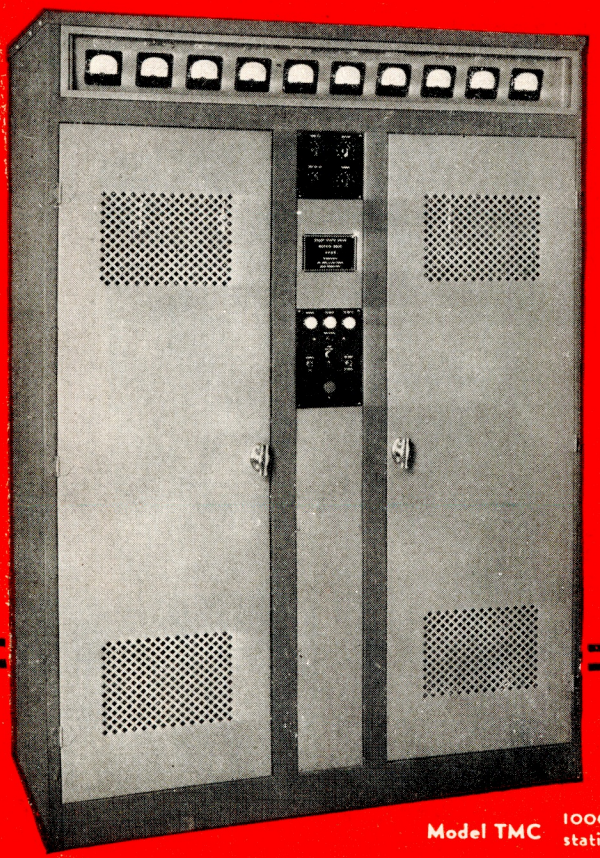
Model XN-25

6 channel transmitter-receiver unit capable of operation from 6-12-32-110 volts DC or 110-volts AC.



Model T-100-TC

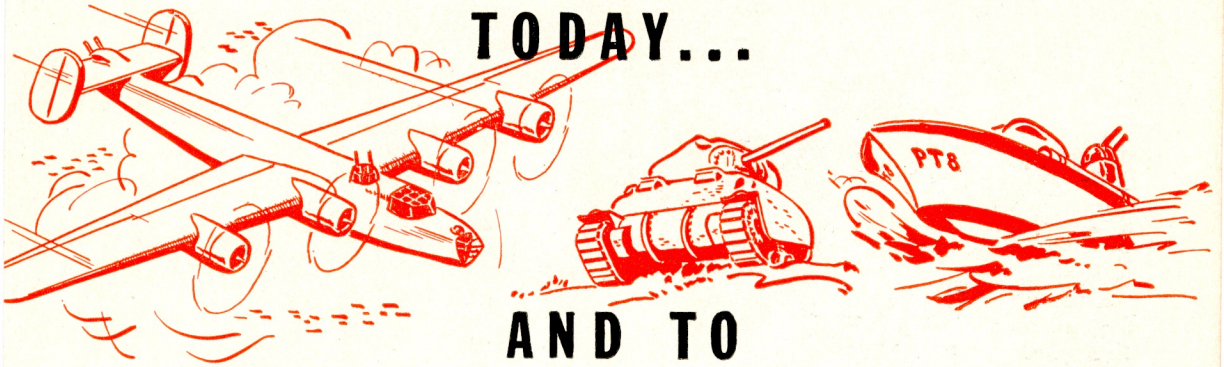
200-watt ground station unit with 6 pre-timed automatic shift channels.



Model TMC 1000- to 5000-watt high-fidelity ground station or broadcast transmitter.

Harvey—Wells

. . . TO PRODUCE FOR VICTORY TODAY . . .



AND TO PLAN YOUR COMMUNICATIONS . . .

For the Future!

When you plan future installations of communications equipment, you want time-tested and proven apparatus — that means HARVEY-WELLS engineered outfits . . . to do the job with sharp, clear and distortion-free transmission and reception, day-in and day-out.

"Prepared by the Past" — through the combined "know-how" of radio engineers, production experts and crystal craftsmen — and augmented now with knowledge broadened by war-time operation, you are assured of BETTER communications equipment, that will save time and multiply efficiency in your organization.

If we have planned for you in the past, let us plan for you in the future. Whatever your communications or special electronic problem, whether aircraft, industrial, ground or police equipment — we are prepared to solve it.

Radio . . .

TELEPHONES
TRANSMITTERS
HIGH-FREQUENCY GENERATORS
ELECTRONICS EQUIPMENT
CRYSTALS

HARVEY-WELLS
Communications inc.

HEADQUARTERS
For Specialized Radio Communications Equipment
SOUTHBRIDGE, MASS.

EXPORT OFFICE
13 EAST 40th ST.,
N. Y. 16, N. Y., U. S. A.

Cent

★

STEATITE
by
CENTRALAB

THE IDEAL HIGH FREQUENCY INSULATOR!

We are equipped to furnish Steatite Coil Forms up to 5 inches in diameter and pressed pieces to approximately 6 inches square. • Centralab's new Steatite plant is equipped to make delivery on orders for special parts in any form. • Our inventories of basic materials are ample . . . and our production facilities adequate to take care of your needs.

There is no shortage of STEATITE.

ralab

Parts by CENTRALAB

Centralab calls upon the resources of more than two decades of production and engineering to provide "parts" especially adapted to today's high frequency requirements.

Much of the engineering and production skill developed for war needs will make important contributions to post war radio.

★

STEATITE INSULATORS
HIGH FREQUENCY CIRCUIT SWITCHES
CERAMIC TRIMMERS

★

WIRE WOUND CONTROLS
VOLUME CONTROLS
CERAMIC CAPACITORS

★

Centralab

CRL

Division of GLOBE-UNION INC., Milwaukee

71

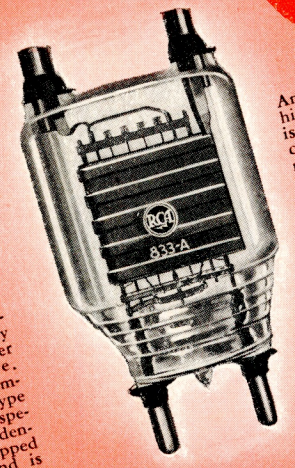
"Give Us Tubes That Last Longer"... Is The Cry

AND RCA ENGINEERS

RCA
872-A / 872
Half-Wave Mercury-Vapor Rectifier
$7.50

Replacing the 872 and 872-A, this new tube gives you better results for less money. A special alloy for the cathode base yields increased emission with lower tube drop, enables the tube to withstand larger surge currents without injury to cathode coating. And thermal efficiency has been greatly increased. Net result: better performance, longer life. (Note: RCA 8008 is a companion tube similar to type 872-A/872. The electrical specifications of each are identical. Type 8008 is equipped with heavy duty base and is particularly recommended for use in new equipment.) RATINGS: Filament Voltage, 5 volts; Filament Current, 7.5 amperes; Peak Inverse Voltage, 5 age, 10,000 volts, max.*; Peak Plate Current, 5 amperes, max.; Average Plate Current, 1.25 amperes, max.
*For condensed-mercury temperature of 20-60° C.

RCA
833-A
Transmitting Triode
$76.50



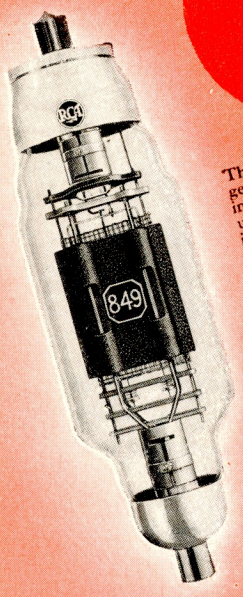
An outstanding feature of this high-power air-cooled triode is its famous RCA zirconium-coated anode, permitting 44% more input and 33% more plate dissipation under CCS conditions than were possible with its predecessor, the 833. Designed for use as an r-f amplifier, class B modulator, and oscillator. This is one of RCA's most powerful glass-type triodes. Built for long life. RATINGS: Filament Voltage, 10 volts; Filament Current, 10 amperes; Amplification factor, 35; D-C Plate Voltage, 4,000 volts, max.*; Plate Current, 500 milliamperes, max. Plate Dissipation, 400 watts, max.*
*CCS rating with forced-air cooling for Class C telegraph service.

ASK FOR THIS BOOK

"TIPS ON MAKING TRANSMITTING TUBES LAST LONGER." Helps you get maximum life from your old tubes. Ask for copy. Address: Radio Corporation of America, Commercial Engineering Section, 479 South 5th Street, Harrison, New Jersey.

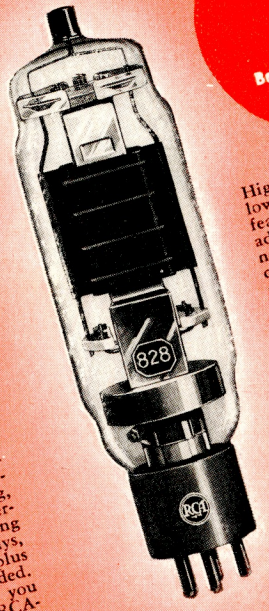
ARE DOING IT!

RCA 849
R-F and A-F Power-Amplifier, Oscillator, Modulator
$120



The real value that tube users get from many tube engineering improvements largely depends upon the manner in which the improvements are utilized in the overall designs. For example, the famous RCA zirconium-coated anode, used in the RCA-849, could have been applied primarily to the purpose of giving this tube a purpose increased rating. Or it greatly be utilized as RCA has done—to produce a tube which, operated at a conservative rating, would yield a very considerable increase in the operating life of the tube. In these days, dependable performance, plus long tube life, is most needed. And that is exactly what you get with the long-service RCA-849. RATINGS: Filament Voltage, 11 volts; Filament Current, 5 amperes; Plate Voltage, 2500 volts, max.*; Plate Dissipation, 400 watts, max.*
*For Class C telegraph service.

RCA 828
Beam Power Amplifier
$17.50



High output with extremely low driving power is the big feature of RCA 828. And in addition, this tube needs no neutralizing in well-shielded circuits. In ICAS class C telegraph service, the 828 will *deliver* 200 watts with only 2.2 watts driving power! Conservatively operated at CCS ratings, the RCA 828 provides high safety factor and long life. Its high power-sensitivity saves vital materials by eliminating intermediate amplifier stages. Maximum frequency—30 mc at full rating; 75 mc at reduced rating. RATINGS: Filament Voltage, 10 volts; Filament Current, 3.25 amperes; Plate voltage, 1250 volts, max.*; Screen Voltage, 400 volts, max.*; Plate Dissipation, 70 watts, max.*
*CCS rating for Class C Telegraph service.

HOW TO REDUCE TUBE REPLACEMENTS
first...
Choose the Right Tube
second...
Treat Your Tubes Right

RCA

RCA ELECTRON TUBES

PROVED IN COMMUNICATIONS' MOST EXACTING APPLICATIONS

RME

Dependability . . .

PROVED IN WAR AND

Since 1933, R M E radio communications equipment has served dependably in all corners of the globe.

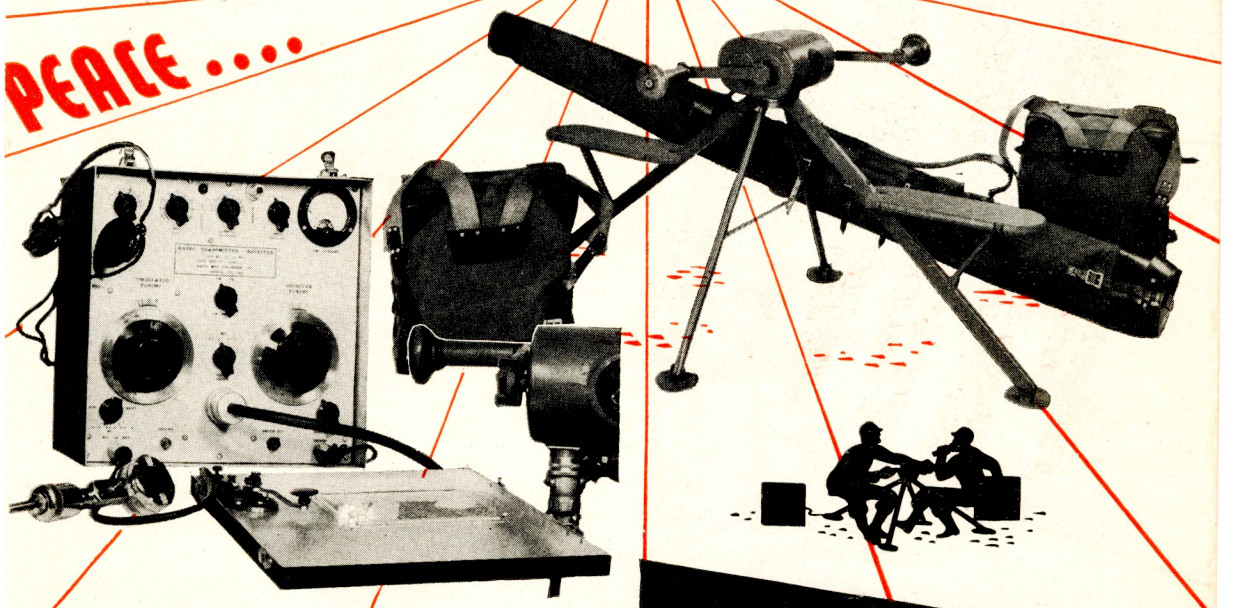
Now, with the world at war, this reliable equipment is proving the merits of the precision manufacturing processes used by its builder. R M E equipment and accessories are in the thick of the fight on land and sea.

Always it has been the policy at R M E to provide "the finest quality radio products at the lowest possible cost" and a tremendous following of friends and customers has been built as a result of this guiding rule.

The research and manufacturing skill that goes into each R M E product comes from engineers of long and practical experience. They are men who study and "live with" the problems and needs of both amateur and commercial radio. And they're determined to continue the reputation R M E has established for dependability and quality in its communications equipment.

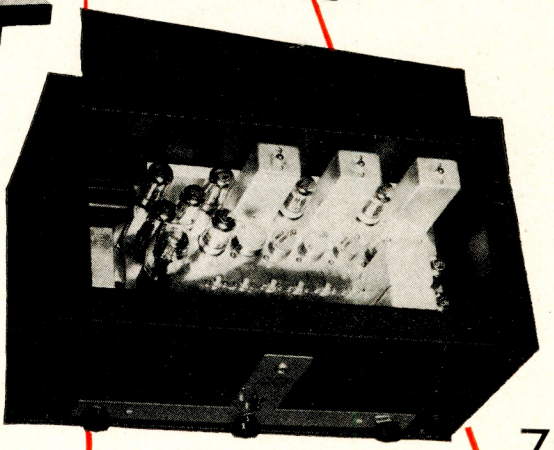
In the post-war world, R M E equipment will be the choice of thousands . . . make it your choice, too.

PEACE ....



Portable Transmitter-Receiver, Type SPD 27, ready for field use. Illustration shows this compact unit taken down and packed in carrying bags for easy transportation.

Here is the R M E SPD Series Fixed Frequency Receiver. It is in use by airports, barge lines, State Police, armed services and others requiring fixed tuning equipment.



75

RME

FINE COMMUNICATIONS EQUIPMENT

RADIO MFG. ENGINEERS, INC.

Peoria 6, Illinois U. S. A.

METAL HOUSINGS

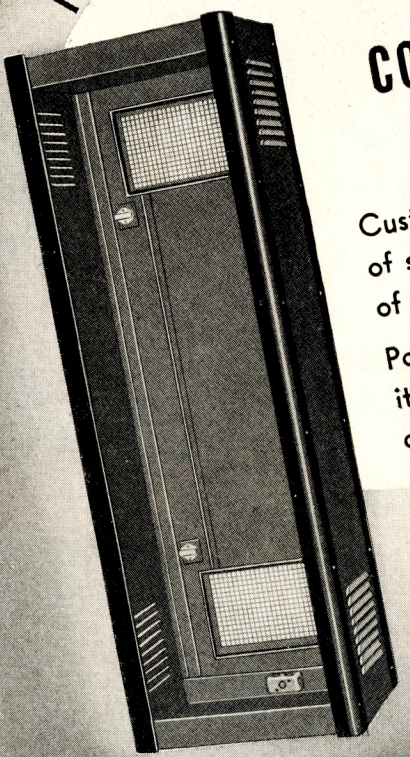
for

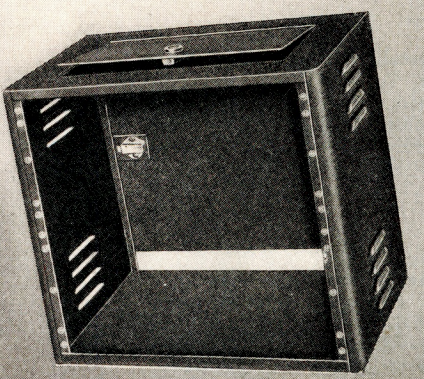
COMMUNICATION APPARATUS

Custom-quality is a characteristic of skillful workmanship—the result of years of specialization.

Par-Metal Products have this quality—plus the virtues of ruggedness and economy as well.

Write for Catalogue No. 41-A.





• CABINETS • CHASSIS
• PANELS • RACKS

PAR-METAL PRODUCTS CORPORATION

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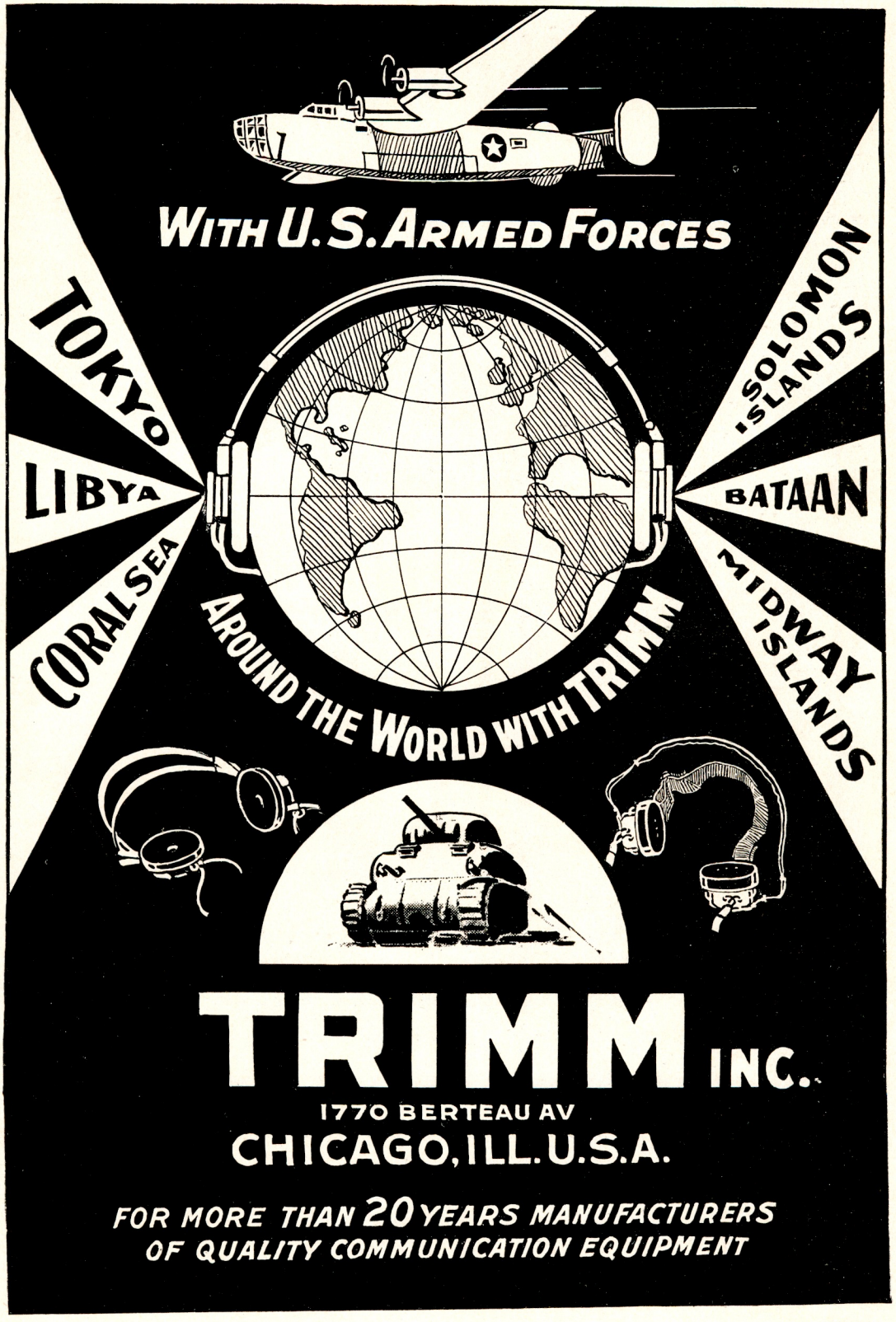
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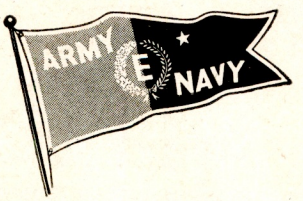

For Correct Use Consult the I. R. C. Resistor Chart.
Send for your copy.

INTERNATIONAL RESISTANCE COMPANY

401 N. BROAD STREET • PHILADELPHIA 8, PA.
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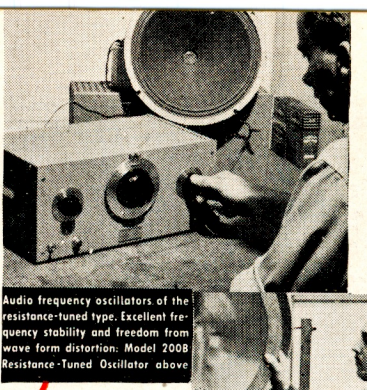
Instruments for measuring frequency including secondary frequency standard and electronic frequency meters. Model 500A Electronic Frequency Meter above

Instruments for measuring voltage in the audio and high frequency range. Model 400A Vacuum Tube Voltmeter above



Audio frequency oscillators of the resistance-tuned type. Excellent frequency stability and freedom from wave form distortion: Model 200B Resistance-Tuned Oscillator above

Research into the fields of electrical engineering, physics, chemistry and all phases of science is greatly aided by the use of modern electronic measuring devices. The accuracy with which measurements are made is the yardstick of progress. Time is always an important element. Thus, electronic instruments should combine speed of operation with accuracy.

To gain speed of operation without sacrifice of accuracy, all -*hp*- instruments are designed to operate with a minimum of adjustment. For the first time a variable frequency audio frequency oscillator which does not require a zero adjustment is available. The -*hp*- vacuum tube voltmeter is as simple to operate as a multi-range d.c. instrument.

To accomplish certain measurements more quickly -*hp*- model 205AG incorporates a resistance-tuned audio oscillator, input meter, output meter, attenuator and impedance matching system . . . all in a single unit.

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PROMPT DELIVERY. *Due to the demand of war, production facilities have been greatly expanded. Immediate delivery can be made in many cases where orders are covered by high priority ratings.*

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Instruments for making over-all measurements on audio equipment including total harmonic distortion, frequency response, and hum level. Model 325B Distortion Analyser above

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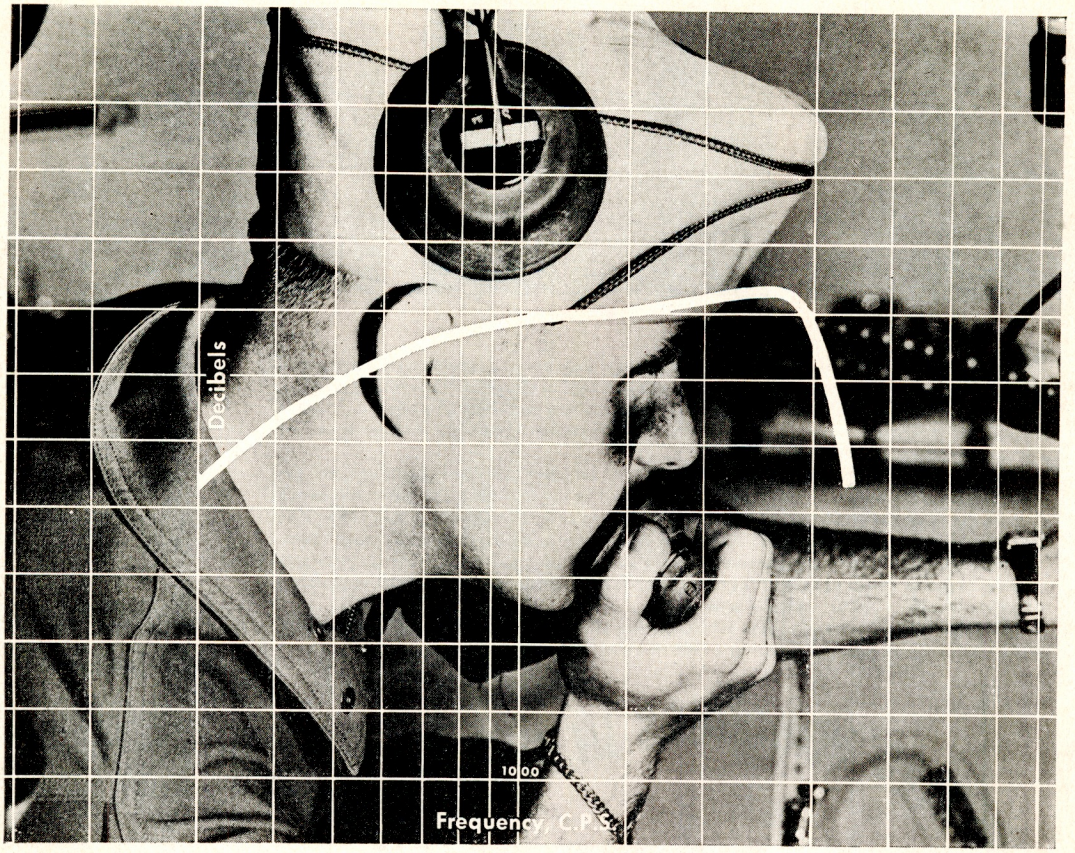

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designed to bring the message through . .

Microphone performance begins with design. Orders, instructions, information must come through—*audibly.* It is the designing engineer's job to bring the human voice through clearly—to eliminate as much as possible the engine noises and tumult that might garble a vital message.

The proven ability to design and manufacture microphones that serve under such conditions—as well as under other severe conditions that attend combat duty—has made Shure Brothers America's foremost manufacturer of microphones.

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SHURE MICROPHONES

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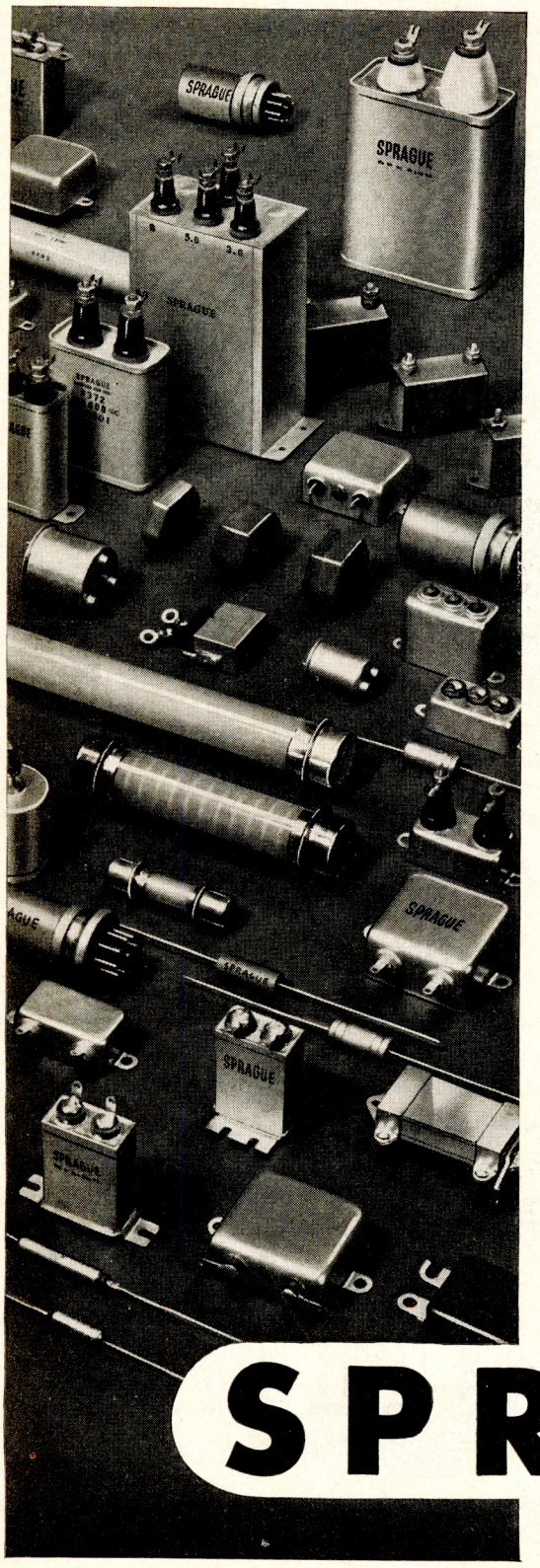

"Plus ça change plus c'est la même chose"*

*(THE MORE IT CHANGES, THE MORE IT IS THE SAME THING)

Over 95% of Sprague capacitors being produced today are different from those of pre-war days —and a lot of hard, painstaking and fast work has gone into making the necessary changes to meet wartime conditions. The primary insulation, the basic dielectric, the fundamental processes—these did not spring full fledged over night, but are "the long result of time." These processes produced good condensers before the war, are producing good condensers now to meet war specifications—and will produce good post-war condensers. Specifications change, the condensers change to meet them, but always Sprague condensers are good condensers. 'Plus ça change——' ".

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- Capacitors for Power-Factor Correction
- High-Voltage Pulse Networks
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...and so on, throughout the "alphabet" of boundless electronic applications

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UNITED 949-A
Efficient h. f. oscillator tube, one of a great many UNITED types now available.

Efficiency from A to Z

—is assured for long service life when you use UNITED Tubes. Despite the urgent demands upon us for tubes to fill military needs, we have done surprisingly well in keeping other essential requirements supplied.

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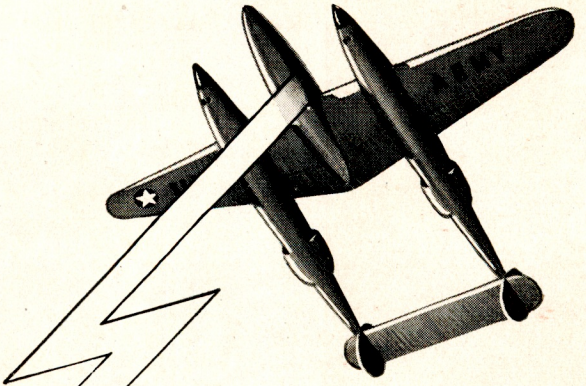
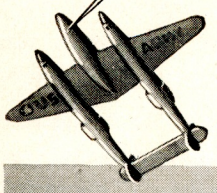
Transmitting Tubes Exclusively Since 1934



"ORANGE LEADER CALLING . . ." "ROGER!"

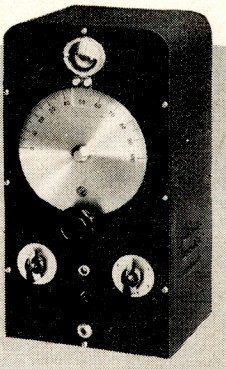


"Getting the message through" is the business of thousands of our ham friends these days.

Some of them are running into their old friend, the Browning Frequency Meter (shown below), which is helping keep certain war rigs accurate.

Some of them will be interested to know that Browning has perfected and proved-in-the-field a balanced-capacitance signal system which has helped relieve the manpower situation in many plants by reducing the need for armed guard patrols. (Descriptive literature on request.)

All of them can look forward to returning to their own shacks in the sure knowledge that when peace comes Browning will be adding to ham operating pleasure with new, even better gear.



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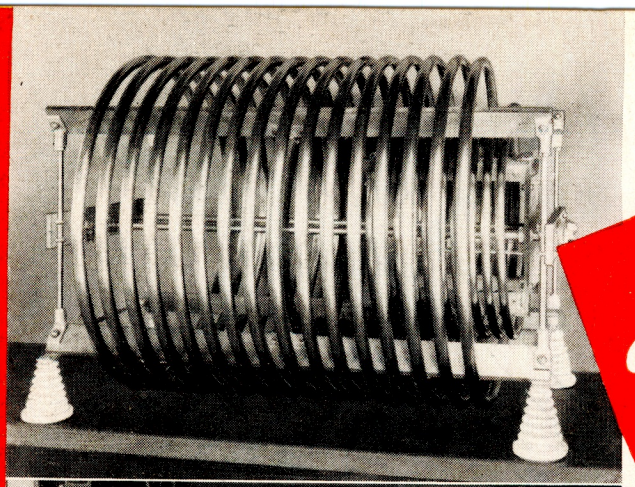
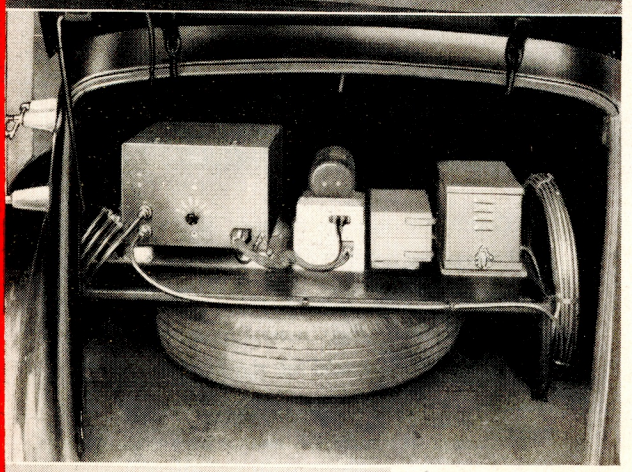


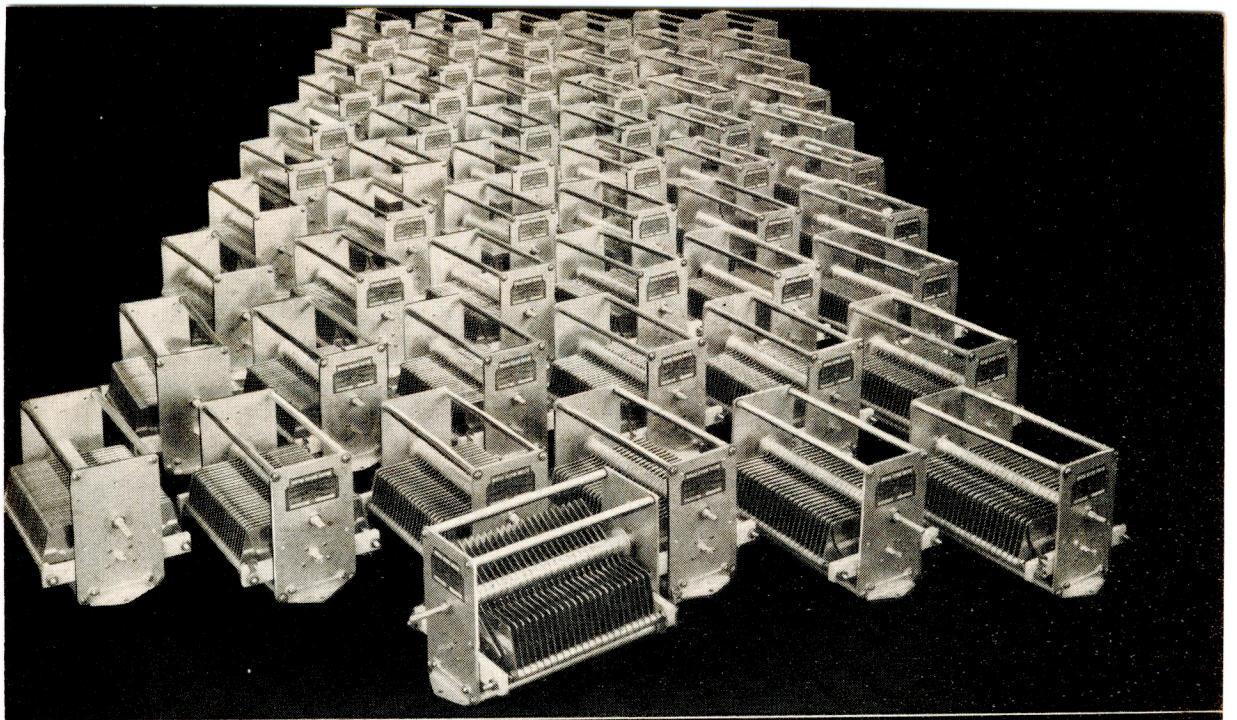


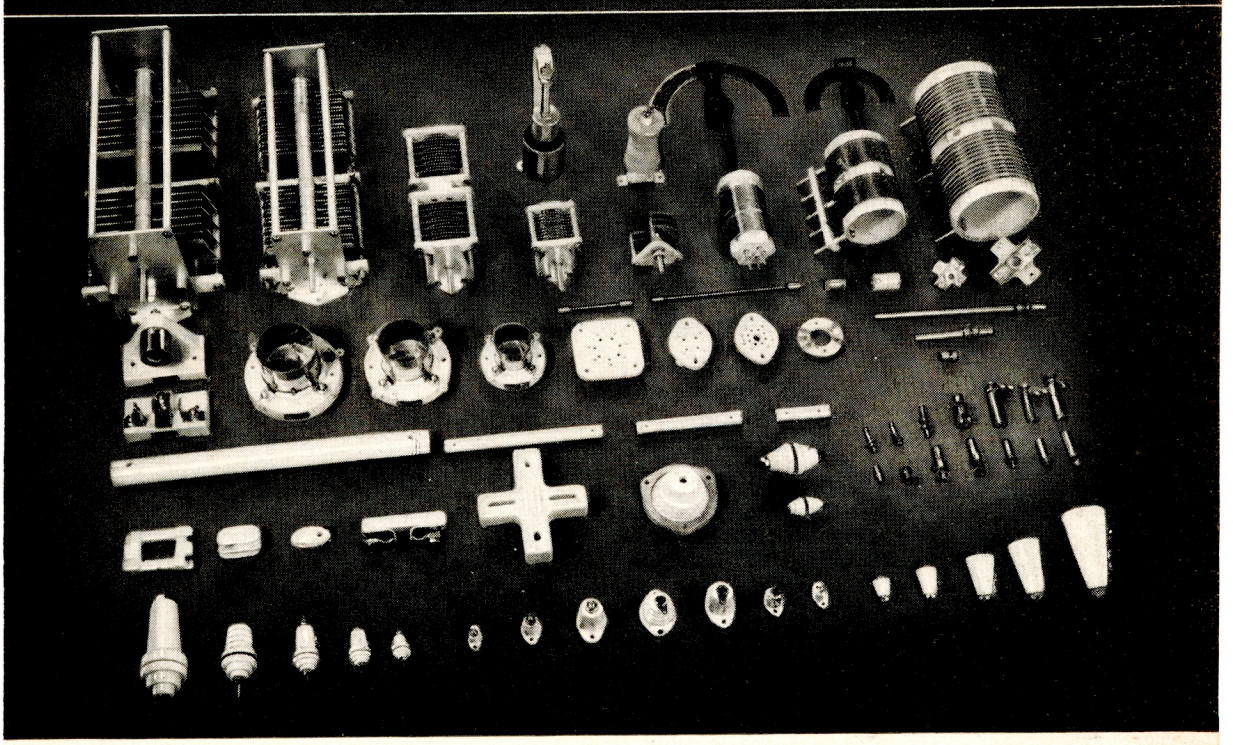
In our SMALL WAY

Shown on these pages are just a few of the products Johnson is contributing to the war effort. Johnson is well and favorably known the world over as a manufacturer of variable condensers, inductors, tube sockets, insulators, plugs and jacks, and miscellaneous transmitter parts.

For years Johnson has manufactured special parts and equipment for Broadcast and Police Stations—most of this equipment engineered and designed for specific applications. Demand for this type of equipment by the armed forces has been many times peace-time requirements.

With Johnson's "know how," research and experimental facilities, and intimate engineering knowledge of the requirements of "parts" it is only natural that Johnson has been called upon to furnish many complete assemblies incorporating these parts. Military secrecy demands that no detailed information be given at this time, but it will make an interesting story after hostilities cease.





JOHNSON

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They're in the Army, Now!..

. . . thousands of amateur radio operators have enlisted with the U. S. Army Signal Corps. And into service with them have gone those familiar black and white striped Burgess batteries. Burgess batteries are recognized by amateurs for quality and economical long life.

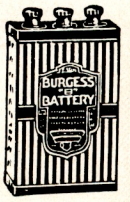
No. 4FA Little Six—1½ volts—replaces one round No. 6 cell. Radio "A" type; is recommended for the filament lighting of vacuum tubes. Size, $4\frac{15}{16}$" x $2\frac{5}{8}$" x $2\frac{5}{8}$". Weight, 1 lb. 6 oz.

No. 5308 — 45 volt "B" battery equipped with insulated Junior knobs. Taps at −, +22½, +45 volts. Size in inches, $5\frac{7}{8}$ x $4\frac{3}{16}$ x $2\frac{9}{16}$. Weight each —2 lbs. 15 oz.

No. 2308—A 45 volt super-service, standard size radio "B". Designed for receivers with plate current drain of 10 to 15 milliamperes. Size, $7\frac{1}{8}$" x 8" x $2\frac{7}{8}$". Weight, 7 lbs. 6 oz.

No. F4BP—A 6-volt heavy-duty portable battery, designed for Burgess X109 headlight. Contains four F cells connected in series. Screw terminals and brass knurled nuts. Size, $2\frac{21}{32}$" x $2\frac{21}{32}$" x $4\frac{7}{32}$". Weight, 1 lb. 6 oz.

No. Z30N—45 volt "B" battery. Improved small size. Adapted to radio, portable receivers and transmitters. Screw terminals. Size 3" x $1\frac{7}{8}$" x 5". Weight, 1 lb. 4 oz.



No. 2F2H—A 3-volt radio "A" battery used with portable radios, amplifiers, and special instruments. Size, $2\frac{5}{8}$" x $2\frac{5}{8}$" x $4\frac{3}{8}$". Weight, 1 lb. 6 oz.

No. W30BPX—45 volts. Extremely small and light in weight. Very suitable for personal transceivers used by amateur clubs and radio stations. Equipped with insulated junior knobs. Size, $1\frac{7}{32}$" x $2\frac{29}{32}$" x $4\frac{1}{16}$". Weight, 10 oz.

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REMEMBERED FOR THEIR SERVICE

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ALL POLICE · FIRE
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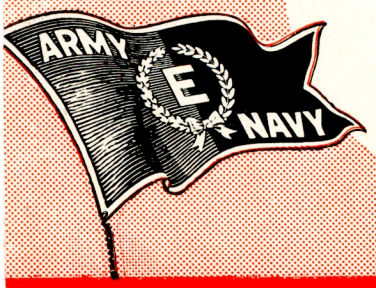

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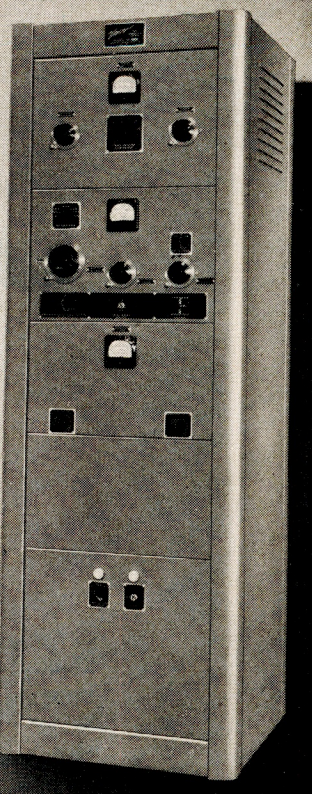

Communication equipment by TEMCO has long been outstanding and widely used where utmost dependability is required. Underlying this preference is the fact that TEMCO equipment is engineered and built with the perfectionist's greater investment of time, materials and wiring skill.

TEMCO equipment is proving its better-built qualities in every branch of military and governmental service . . . under the most rigorous wartime conditions.

Fresh from these exacting tests will come new and advanced transmitting equipment by TEMCO, to serve your civilian broadcasting needs with maximum efficiency.

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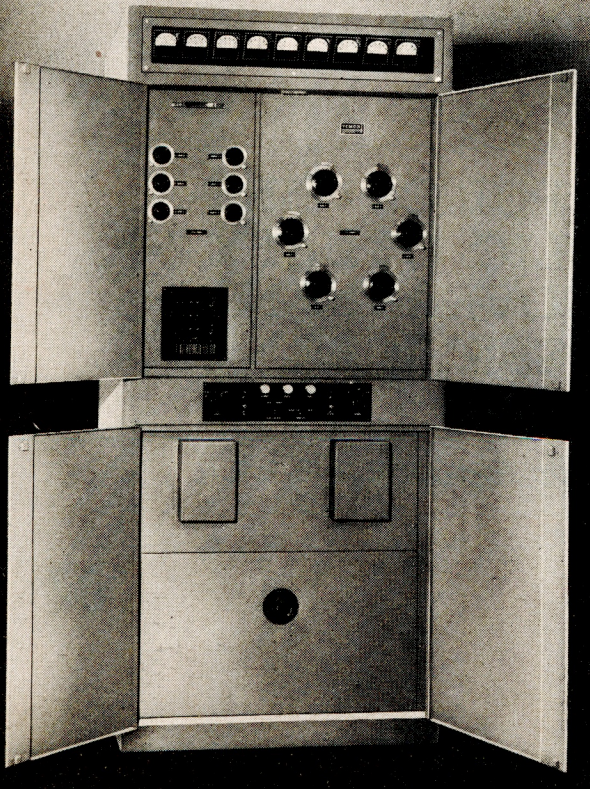

TEMCO Model 250-GSC, 200 watts output, A1, A2, A3 emission; frequency range 2 to 16 megacycles, with provision for 4 crystal controlled frequencies and electron coupled master oscillator.

TEMCO Model 1000-AG-CW—6 frequency motor-driven band changing radio telegraph transmitter. Power output 1000-1200 watts.

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RADIO COMMUNICATION EQUIPMENT

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From deep within the transparent beauty of Mother Quartz comes a thin radio-active crystal. When diamond-cut and perfectly fashioned it keeps frequency constant in spite of mechanical maladjustment—controls the destiny of our vital war communications!

Scores of scientific steps go into the finishing of each crystal—the kind of precision workmanship you'd expect of Wallace Craftsmen—the kind you'll find in Wallace Peace-time Products.

Cable Assemblies are a far cry from crystals but the same deft handling and enaineering dominates all work flowing through the Wallace Cable Assembly Plant.

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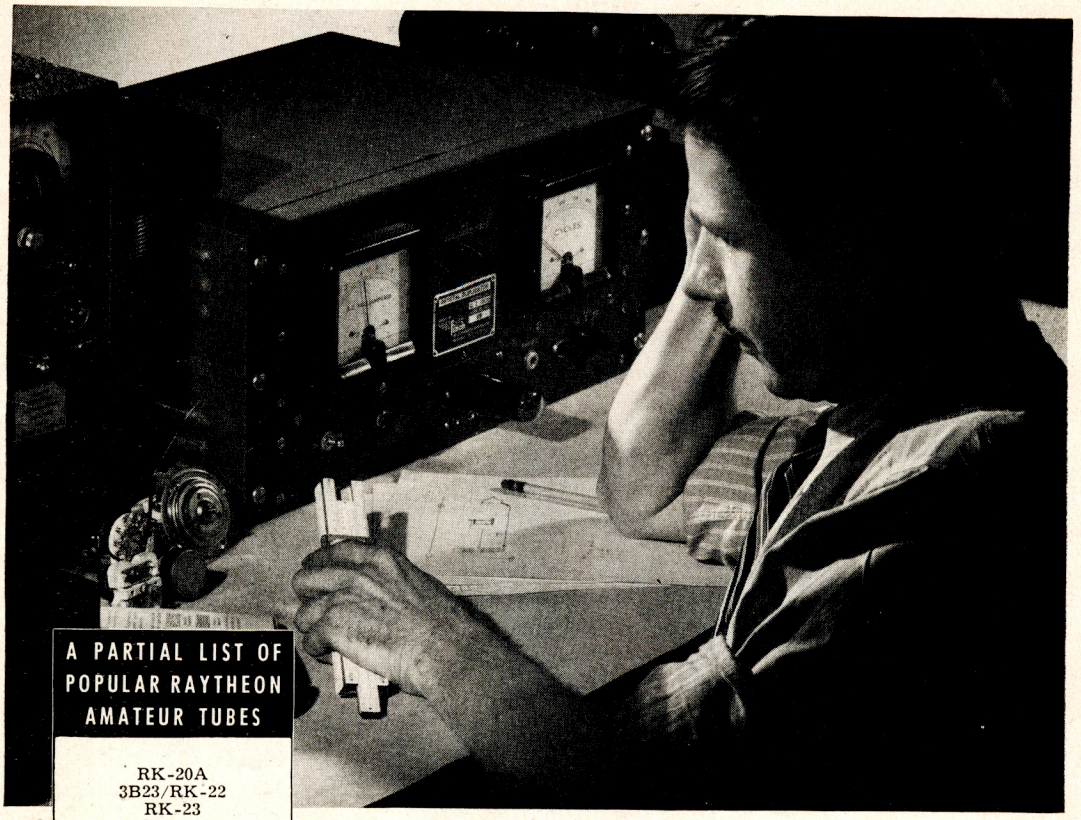

A PARTIAL LIST OF POPULAR RAYTHEON AMATEUR TUBES

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3B23/RK-22
RK-23
RK-24
RK-25
RK-28A
2C21/RK-33
2C34/RK-34
RK-38
RK-39
RK-48A
RK-49
RK-59
RK-60
RK-62
RK-63
RK-64
RK-65
RKR-72
RKR-73
RK-75
RX-120
RX-212
RX-215
RX-233A
RK-807
RK-829
RK-836
RK-837
866A/866
872A
954
955
956
957
CK-1003/0Z4A
1005/CK-1005
1006/CK-1006
CK-1007
RK-1625
2050
2051

Imagination . . . is the fountainhead of true progress in the radio industry. The results of the visions dreamed and the ideas projected by the Raytheon engineers is manifested in the practical and potential innovations in the Raytheon line of electronic tubes.

Wartime emergencies have, of course, greatly stepped up the pace of tube developments... progress since Pearl Harbor has equalled the ten preceding peace-time years.

When the next peace conference adjourns, all of these wartime engineering accomplishments will become available to amateurs and the whole radio industry. Raytheon electronic tubes will be built better than ever before: but, more important, the *engineering* of Raytheon tubes will afford undreamed of new horizons to both amateur and commercial radio.

Each of the Four Divisions of Raytheon has been awarded the Army and Navy "E"

RAYTHEON

RAYTHEON PRODUCTION CORP.
Newton, Massachusetts

DEVOTED TO RESEARCH AND THE MANUFACTURE OF TUBES FOR THE NEW ERA OF ELECTRONICS

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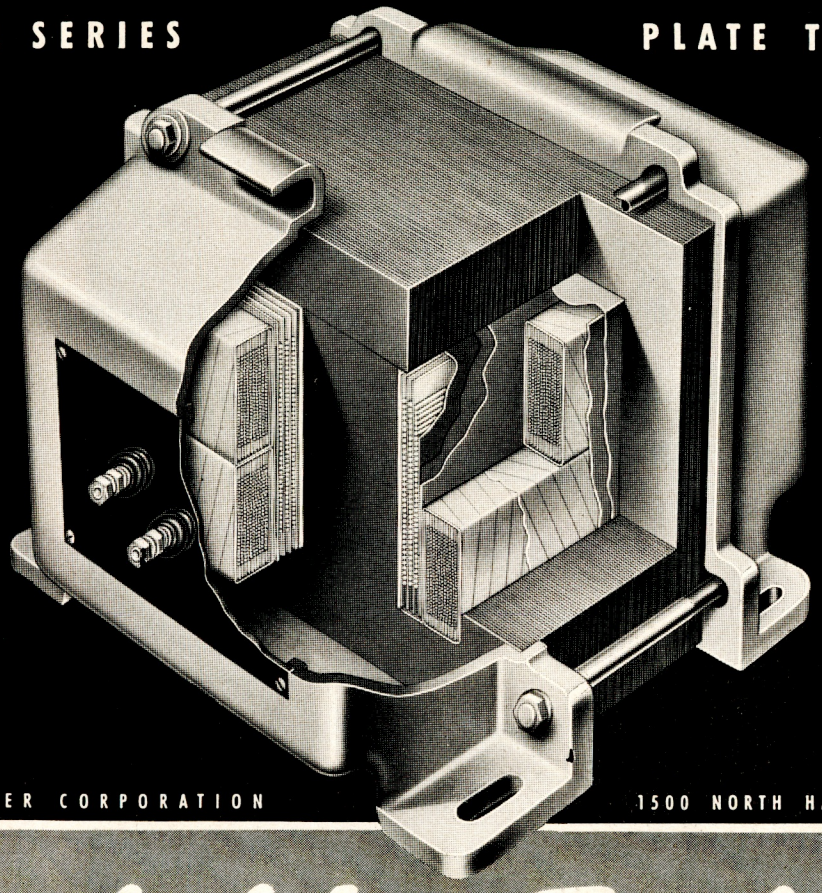
PROFESSIONAL SERIES PLATE TRANSFORMERS

The best of insulating and conducting materials scientifically applied thruout the coil afford generous margins of safety against electrical failure.

Phenolic side panels with heavy duty insulators insure excellent dielectric characteristics and easy accessibility.

Cast semi-steel end bells provide a rugged mounting and a symmetrically finished appearance.



Accurately processed high grade silicon steel stampings, carefully laminated, result in an efficient and low loss core structure.

Vacuum impregnation of coils and thorough penetration of potting compounds furnish complete protection against the effects of humidity and time.

Rigid inspection of materials and progressive testing thruout fabrication result in a quality product.

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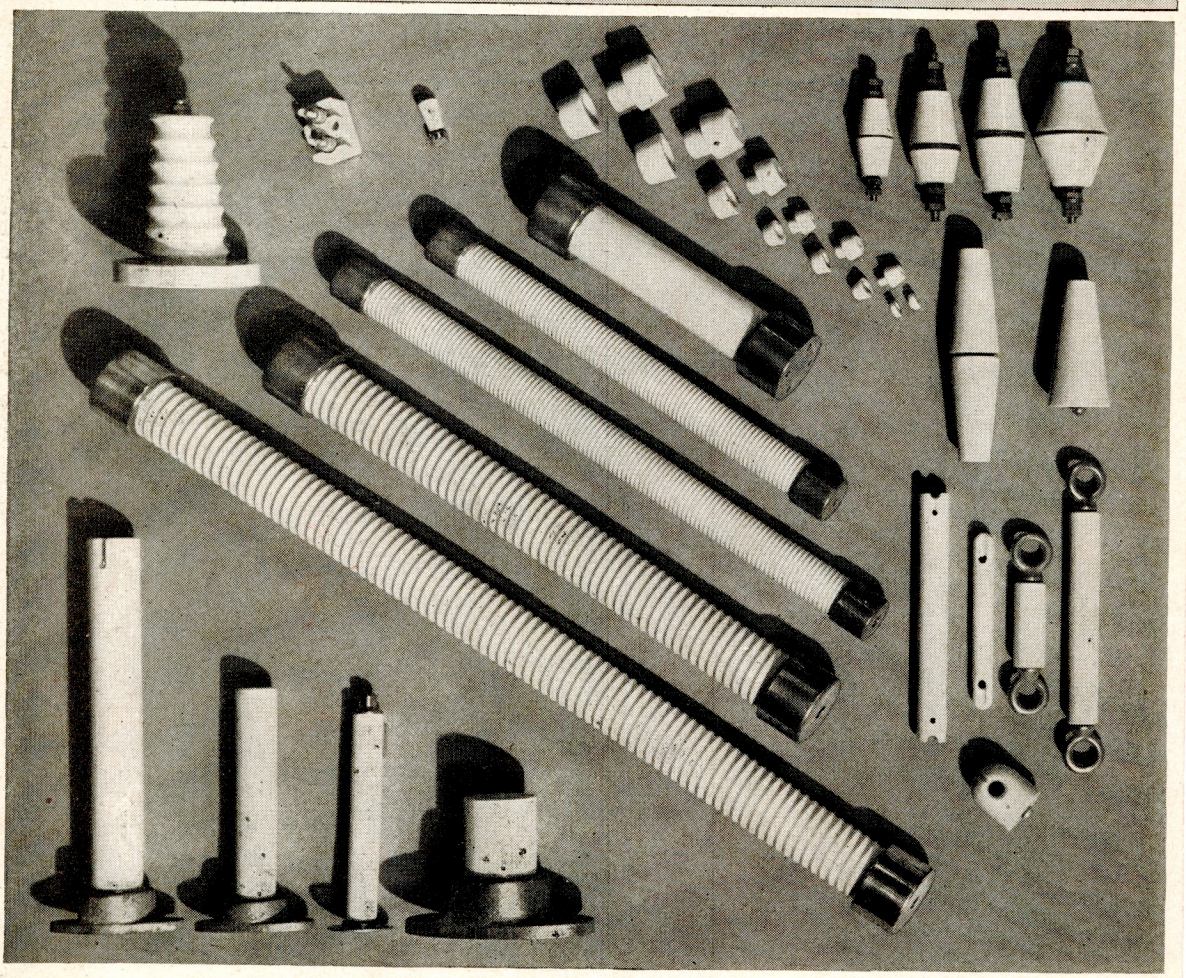

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In addition to thousands of styles and shapes of low loss Steatite Insulators, we also manufacture many with METAL FITTINGS ATTACHED, ready for use. These include standoff, lead in, strain and other standard lines of Steatite Insulators.

Stupakoff Steatite Insulators are made to your specifications with or without metal attached. In addition to attaching preformed metal fittings, we plate ceramic insulators with ferrous and non-ferrous metals. Subsequent to applying this metal to ceramics, we machine or grind the metal surfaces to precision tolerances, as required.

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Steatite

INSULATORS

ARMY (E) NAVY

"for great achievement"

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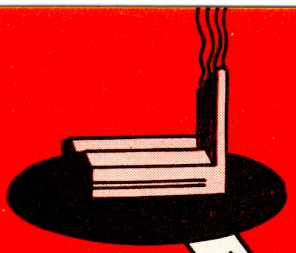
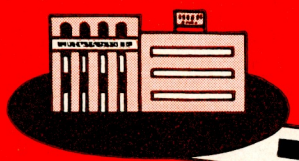
STUPAKOFF CERAMIC AND MANUFACTURING CO.
LATROBE, PA.



FACTORIES

LITTLE KNOWN SOURCES



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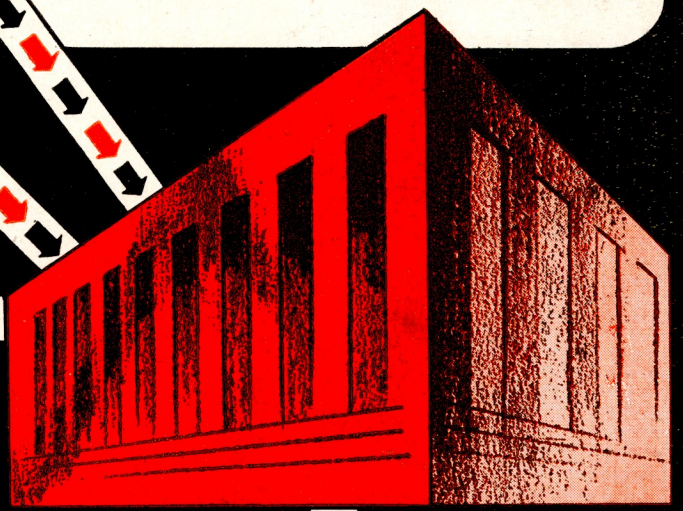
YOUR BEST SOURCE OF ALL RADIO AND ELECTRONIC EQUIPMENT

From the producing factories, from warehouse stocks and from little known sources, TERMINAL draws a steady flow of equipment. Experienced "civilian procurement men" thus keep rotating TERMINAL'S large, complete stocks; are thus able to supply rapidly your pressing needs. For quick and intelligent service, turn to **TERMINAL**



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Relays
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Receivers
Resistors
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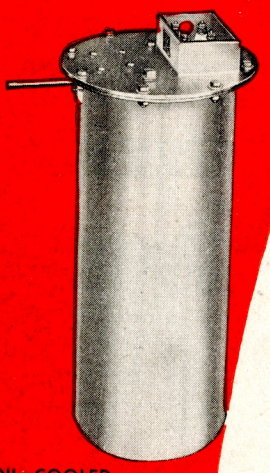
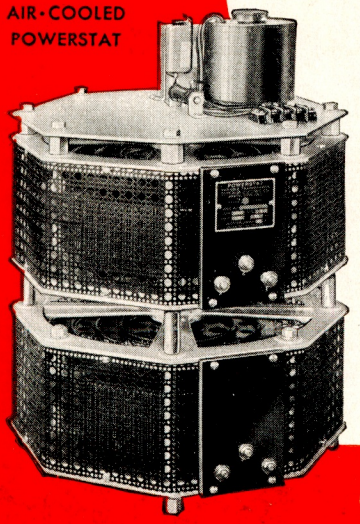
VARIABLE VOLTAGE TRANSFORMERS



OIL-COOLED POWERSTAT

AIR-COOLED POWERSTAT



MOTOR-DRIVEN AIR-COOLED POWERSTAT

FOR PUSH BUTTON OR MANUAL OPERATION

Designers of modern electronic equipment are specifying POWERSTAT variable voltage transformers for smooth, continuous control of voltage and power.

Transmitter engineers find POWERSTATS invaluable in the control of plate, filament and bias voltage to specified values. Power output is quickly and accurately adjusted to meet varying requirements. Other applications include telephone regulators, control of induction heating apparatus, X-ray devices, insulation testing, photographic equipment, visual testing panels and manufacture of high power vacuum tubes.

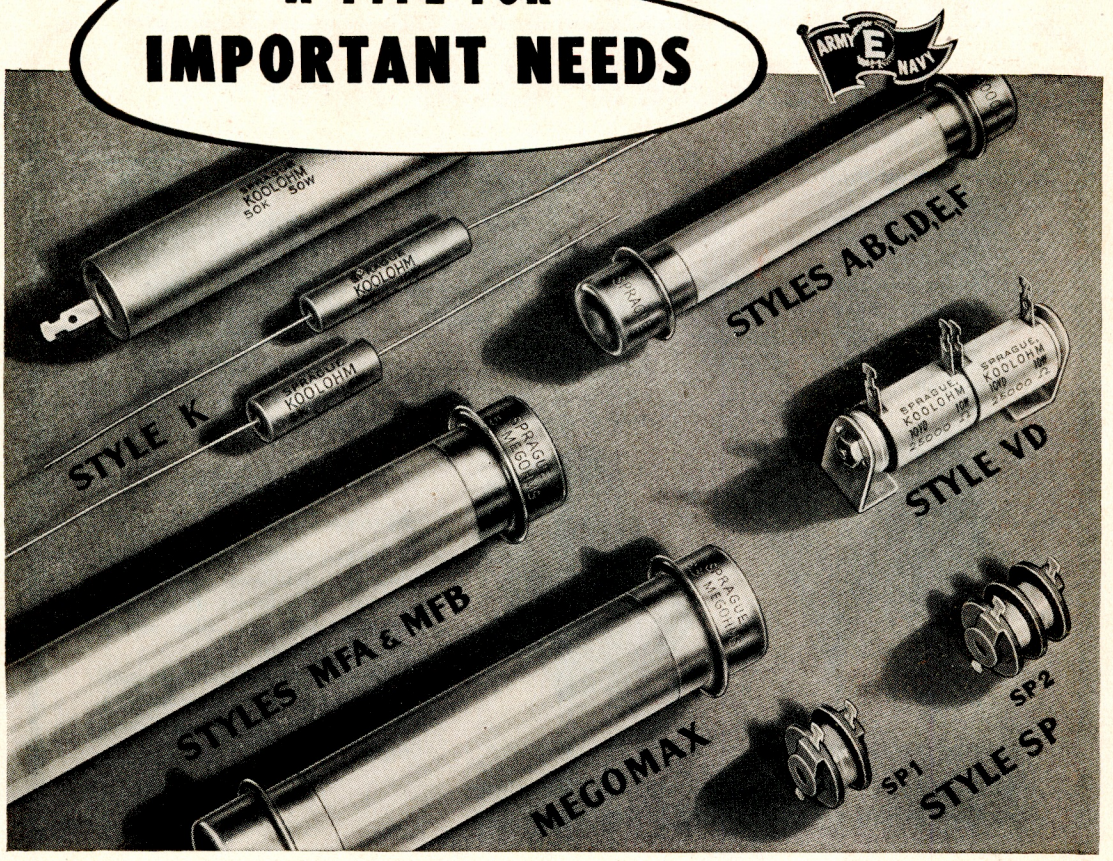
Wherever an efficient, well regulated source of voltage free from wave form distortion is required, specify POWERSTAT variable transformers. Units are available in Motor-Driven types for push button or automatic control, and Manually operated types with handwheel adjustment. Air-cooled and oil-cooled POWERSTATS in capacities up to 75 KVA are standard for single or polyphase operation.

Send for Bulletins
149 LA — POWERSTATS
163 LA — Voltage Regulators

SUPERIOR ELECTRIC CO.
10 LAUREL STREET, BRISTOL, CONNECTICUT

SUPERIOR *Electric Company*

A TYPE FOR IMPORTANT NEEDS



STYLE "K" RESISTORS: Power Wire Wound Resistors 5, 10, 25, 50, and 120 watts.

Wire lead or lug terminals on styles 5K and 10K.

Lug terminals only on styles 25K, 50K, 120K.

Non-inductive windings available.

Various types of mounting, shown in catalog.

STYLES A, B, C, D, E, F: 120, 90, 50, 35, 20, 10 watts.

Hermetically sealed power wire wound resistors. Designed to withstand salt water immersion tests.

Ferrule Terminals for fuse clip mounting.

Non-inductive windings available.

STYLE V. D.: 10 watt and 15 watt wire wound. Resistors designed to make voltage divider sections when mounted end to end on through bolt.

STYLES MFA, MFB and MFC: Precision Meter Multiplier Resistors. Hermetically sealed. Salt water immersion proof.

Type MFA—7.5 megohms max.
Type MFB—4 megohms max.
Type MFC—1 megohm max.

STYLE SP: Wire wound bobbin type resistors. Style SP-1, single section. Style SP-2, dual section.

2.5 watts, continuous rating, per section.

250,000 ohms max. per section.

MEGOMAX: High voltage, high temperature, composition resistor. Hermetically sealed.

Type 1—3400 ohms to 100 megohms
Type 2—6800 ohms to 100 megohms

Voltage and power ratings depend on resistance value.

SPRAGUE SPECIALTIES CO., Resistor Division, NORTH ADAMS, MASS.

SPRAGUE KOOLOHM RESISTORS

REGISTERED TRADEMARK

SIGMA *Instruments, Inc.*

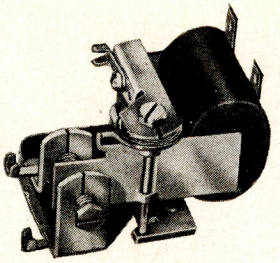
Specialists In Sensitive Relay Engineering and Manufacture

Standard Relay Types

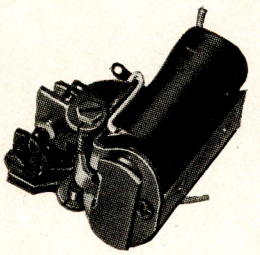
SERIES 4

Recommended for:-

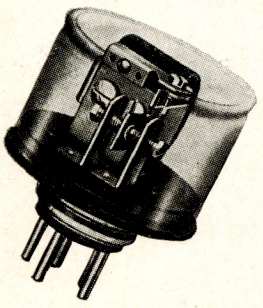
★ Economy
★ Light weight
★ High Speed
★ Moderately severe environment (temperature and vibration)
★ Moderate sensitivity, e. g. Aircraft performance on 30 milliwatt input.



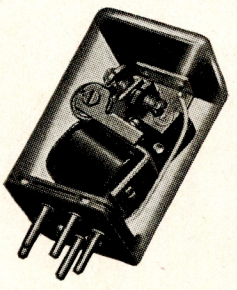
TYPE 4F 1⅜" x 1¾" x 1⅝"
Weight: 2 3/16 oz.



TYPE 5F 1⅜" x 1⅜" x 1⅝"
Weight: 3½ oz.



TYPE 4A 2 1/16" dia. x 2" high



TYPE 4R 1½" x 1½" x 2⅝"

Both Relays Available Mounted on 5 Pin Tube Base in Various Different Enclosures As Pictured Above

SERIES 5

Recommended for:-

★ Exceptionally severe environmental conditions, maintaining precise adjustment at extreme temperatures and after severe shocks (500 g's).
★ Maximum sensitivity in small space and weight, e. g. Aircraft performance on 5 milliwatt input.

Specialized Types

AC Input. Either with shaded pole construction or with midget instrument rectifiers.

High Speed and special chatter-free keying. These applications require special treatment by our engineering department in terms of your particular problem.

Polarized Relays, with 3 position single pole double throw switching (normally both legs open) operating on a small differential between the currents in two opposed coils, and having positive snap action in either direction and positive centering. Ample forces for aircraft conditions.

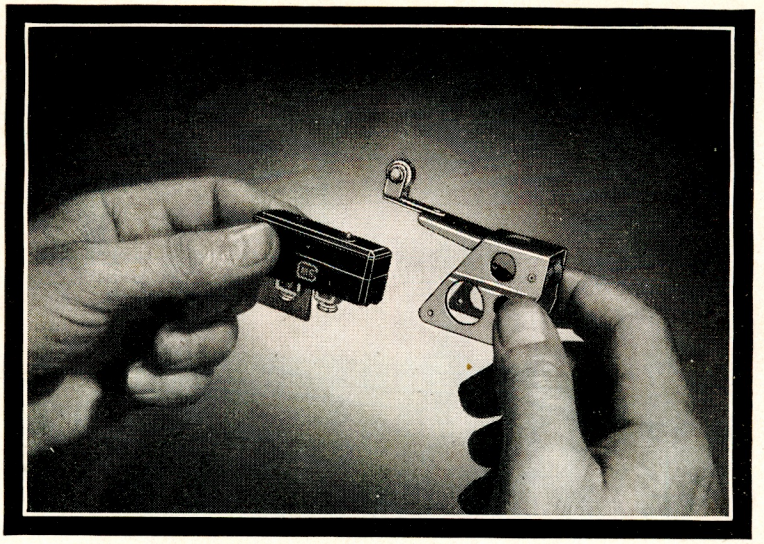
WRITE FOR COMPLETE DATA, STATING YOUR PROBLEM FOR OUR RECOMMENDATION

SIGMA

Sigma Instruments, inc.

Sensitive RELAYS

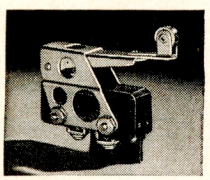
78 FREEPORT STREET, DORCHESTER 22, MASS.



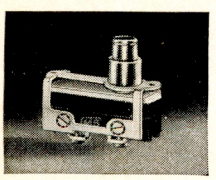
Dependable for Aircraft and Aircraft Radio

The Micro Switch is Small, Lightweight, and Sensitive

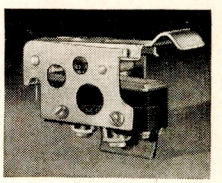
The Micro Switch is thumb-size and feather-light — weighs only .067 lbs. It is accurately built to exact standards from precisely made parts, and its performance characteristics can be changed to meet functional requirements. It is built to withstand extremes of temperature. The Air Corps approved Type R-31 Micro Switch illustrated above is specifically engineered for aircraft and is widely used in aircraft radio . . . The Type A actuator illustrated and described below is a new type designed for use with the Type R-31 Micro Switch. Operating force required, depending upon the return spring used, is approximately 6 ounces. This switch is available in single pole, normally open, normally closed and double throw construction . . . The actuator brackets illustrated below are specifically designed to accommodate the Type R-31 Micro Switch. They permit fast installation of the switch, and easy replacement in the field. They require no deviation permit.



The Type A actuator has a body of cold rolled steel with cadmium plate finish. The lever arm is of the same material. Pre-travel and over-travel values depend on location of spring in the bracket and are approximately ⅛″ pre-travel and ½″ over-travel. Movement differential is .031″ maximum and leverage ratio is 6.2:1. Values given are for roller position at the end of the arm . . . two other roller positions are optional.

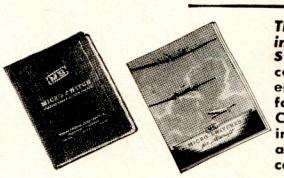


This new Type M-B skeleton bracket saves weight. The plunger on this bracket has a definitely controlled pre-travel and over-travel—a total of ¼″. The Type R-31 Aircraft Micro Switch is sturdily supported in this skeletonized bracket by flush headed screws with lockwashers. The mounting holes in the top of the bracket are on standard $1\frac{13}{16}$″ centers and accept No. 6-32 bolts.



The Type T series bracket has met instant adoption as a throttle warning switch, singly or in gangs. They are operated by cams on the throttle quadrant or dogs on the cables. Any switch held depressed can be instantly opened by the manual release without disturbing others in the gang. As a general use limit switch, the Type T bracket without the release is a sturdy mount and actuator for Type R-31 Aircraft Micro Switch. Two thru-bolts make replacement easy.

Micro Switch Corporation, Freeport, Ill. Branches: 43 E. Ohio St., Chicago (11) • 11 Park Place, New York City (7) • Sales and Engineering Offices: Boston • Hartford • Los Angeles



These two catalogs contain full information regarding all Micro Switches. **Catalog No. 60 contains complete details and cross references regarding all Micro Switches for all purposes except aircraft, Catalog No. 70 contains similar information regarding switches, actuators, and housings specifically designed for aircraft use.**

The trademark MICRO SWITCH is our property and identifies switches made by Micro Switch Corporation

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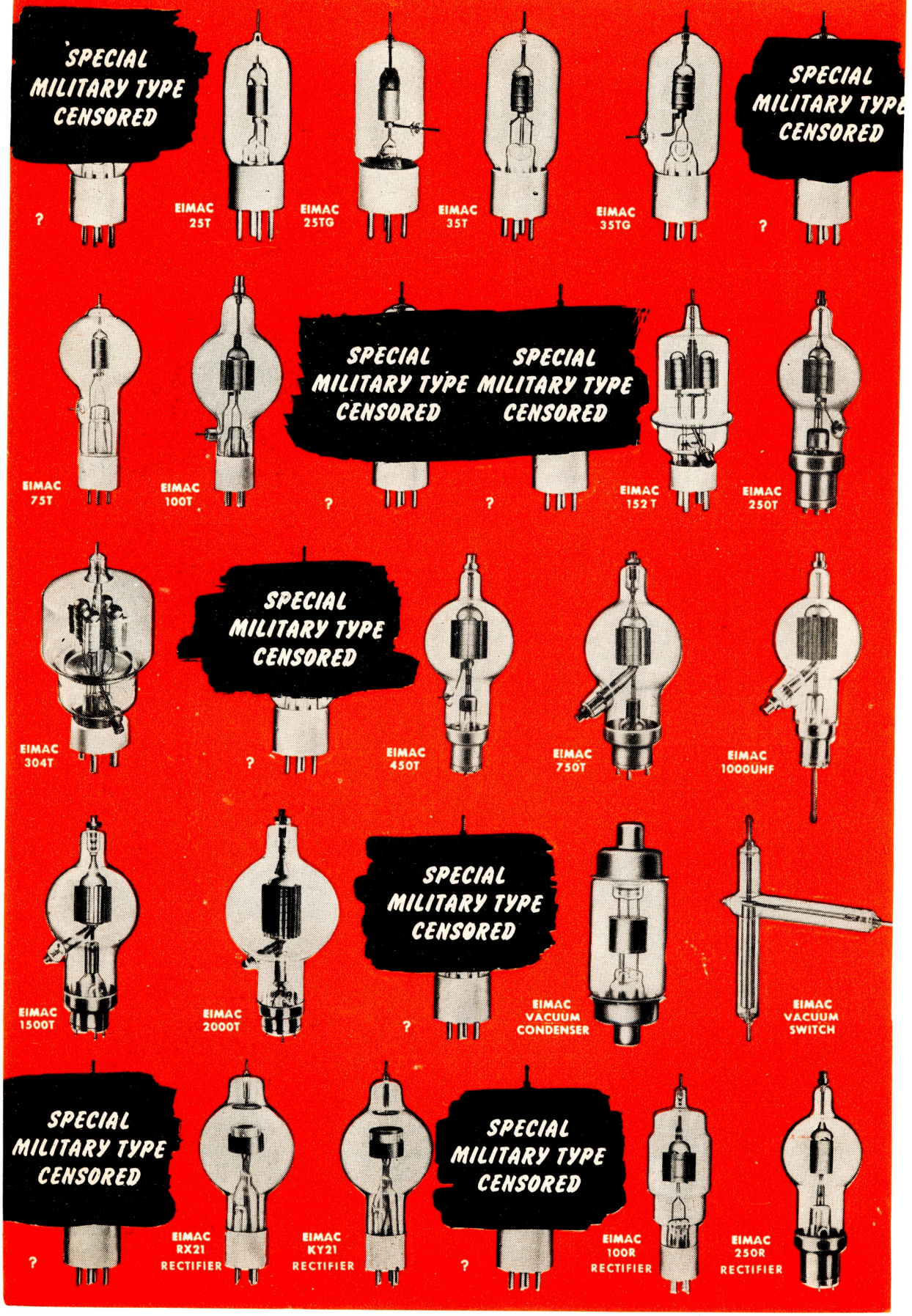
MICRO SWITCH

Made Only By Micro Switch Corporation . . . Freeport, Illinois


SPECIAL MILITARY TYPE CENSORED
?
EIMAC 25T
EIMAC 25TG
EIMAC 35T
EIMAC 35TG
SPECIAL MILITARY TYPE CENSORED
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EIMAC 75T
EIMAC 100T
SPECIAL MILITARY TYPE CENSORED
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SPECIAL MILITARY TYPE CENSORED
?
EIMAC 152T
EIMAC 250T
EIMAC 304T
SPECIAL MILITARY TYPE CENSORED
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EIMAC 450T
EIMAC 750T
EIMAC 1000UHF
EIMAC 1500T
EIMAC 2000T
SPECIAL MILITARY TYPE CENSORED
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EIMAC VACUUM CONDENSER
EIMAC VACUUM SWITCH
SPECIAL MILITARY TYPE CENSORED
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EIMAC RX21 RECTIFIER
EIMAC KY21 RECTIFIER
SPECIAL MILITARY TYPE CENSORED
?
EIMAC 100R RECTIFIER
EIMAC 250R RECTIFIER

first choice of the leading engineers throughout the world... First in the important new development in radio. The only tubes unconditionally guaranteed against premature failures caused by gas released internally.

- **Eimac Tubes in the Ground Stations of the Major Airlines.** Eimac 450T tubes are in use by practically every major airline today.

- **Eimac Tubes in Instrument Landing Equipment.** There are several of these systems in existence which use Eimac tubes.

- **Eimac Tubes and Frequency Modulation.** FM and Eimac tubes have been close companions from the very start of Major Armstrong's experiments.

- **Eimac Tubes in Police Radio Communications.** Police radio engineers from Connecticut to California are loud in their praise of the service of Eimac tubes.

- **Eimac Tubes have gone to War.** With almost machine gun rapidity, Eimac tubes have been adopted by one after another of the peacetime services. Naturally Eimac was among the first to be drafted into war.

- **Eimac is the proud possessor of two Army-Navy "E" Flags.** First to the San Bruno Plant in September, 1942. Second to the Salt Lake City Plant in July, 1943.

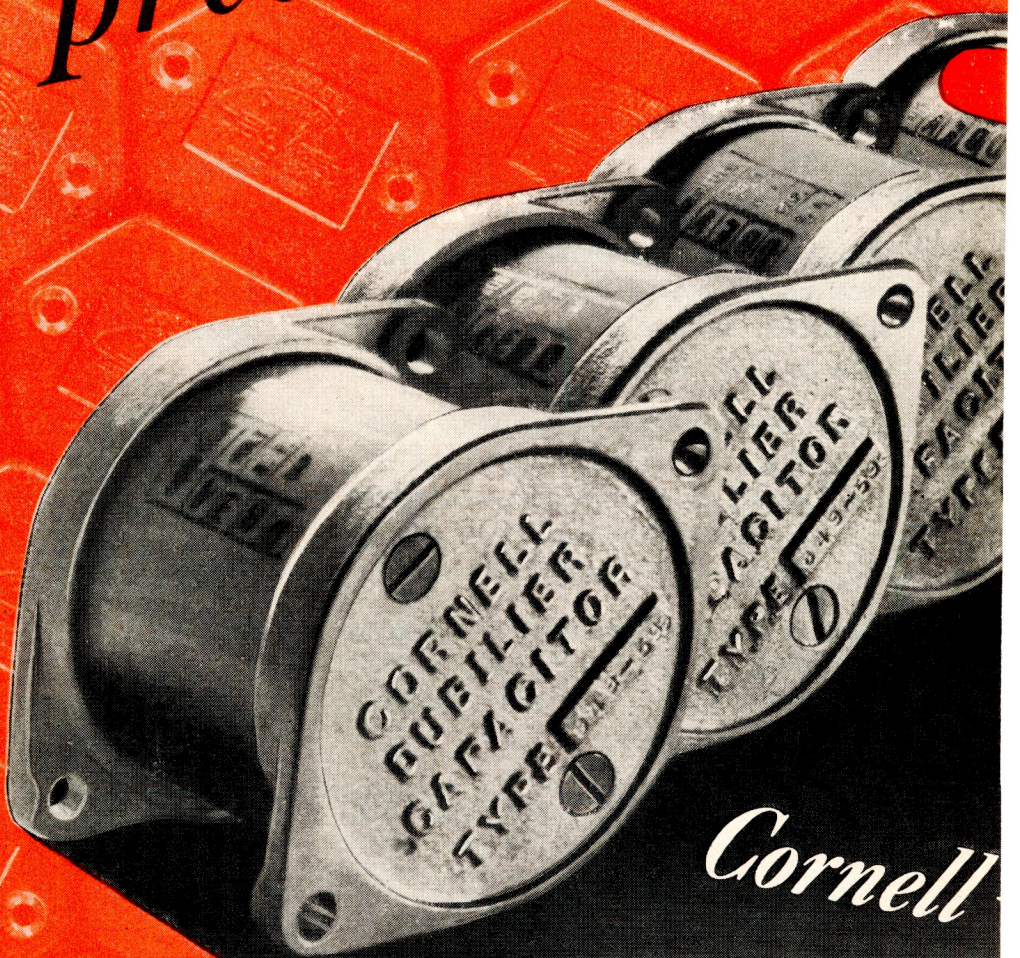
EITEL-McCULLOUGH, INC., SAN BRUNO, CALIF.

Plants Located at: San Bruno, Calif., Salt Lake City, Utah

Export Agents: FRAZAR & HANSEN, 301 Clay Street, San Francisco, California, U. S. A.

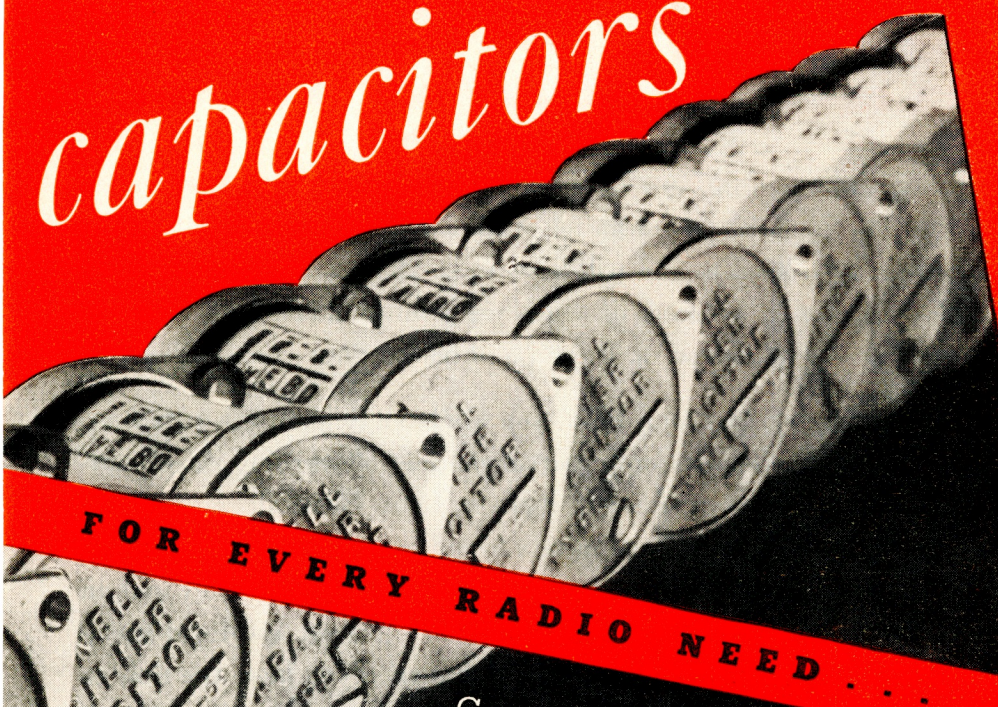
Follow the leaders to **Eimac** REG. U. S. PAT. OFF. **TUBES**

precision-built



Cornell

capacitors



FOR EVERY RADIO NEED . . .

Capacitor failure is a common trouble . . . but not a necessary one. C-D Capacitors have the inherent stamina that keeps radios operating at their best. Their quality results from precision manufacture backed by the knowledge and experience gained over thirty-three years by Cornell-Dubilier engineers and craftsmen. C-D Capacitors, today, are proving their superiority in wartime communications all over the world.

Send for descriptive bulletins.

Cornell Dubilier Electric Corporation
South Plainfield, New Jersey

C-D CAPACITORS . . . *Engineered for Dependability*

Dubilier
capacitors

MICA • DYKANOL • PAPER
WET & DRY ELECTROLYTICS

RADIO-TELEGRAPH APPARATUS

for LEARNING TO COPY— PRACTICING— CLASS INSTRUCTION— CODE • • • —

YOUR first objective in your radio career as a hobby or as a profession will be to learn the radio-telegraph code. In order to obtain the amateur and commercial licenses you will have to be able to pass a satisfactory code speed. The speed or the number of words per minute in code that you will have to copy will of course depend on the type of license that you apply for.

START off on the right foot. First, you will have to learn the code characters — but the only correct method of learning these characters is to hear them — not to memorize them by sight. Naturally if you have to learn them by sound you will have to have a friend send these code characters to you. He will have to do this manually with the aid of a telegraph key and an audio oscillator. Also . . . you had better choose a very patient and loyal friend — one that will be with you at all times — especially when you have the time to spare or are in the mood to copy code.

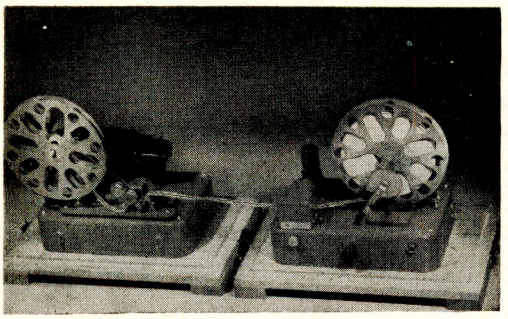
WILL you want to depend on someone else to struggle through weeks of infrequent practice sessions when you probably are in an awful rush to get your license?

BE up to modern developments. We have your "friend" here in our stockroom. He is better known as an Automatic Keyer or Code Machine. Being all electrically controlled and electronically keyed makes things easy for him. He will send to you at all hours of the day and night. The sending will be nice and *clear-cut — easy to listen to — easier even to learn on.*

EASY methods make learning quicker. The Automatic Keyer simply plugs into your electric socket. Place a roll of tape on the keyer, turn on the control switches — then set the code speed just where you want it. Then you will pick out the letters, then words — and you've got your start.

AYERS AUTOMATIC

711 BOYLSTON STREET



This is a short view of the machine completely set up and ready to go . . .

If you are going to learn the code or want to "brush-up" on your code this equipment will be the answer to your requirements.

The keying unit transcribes code characters that are inked on the paper tape that passes through an "electric eye." The keying unit is at the right side of the picture. The tape pulling unit will pull the tape through the keying unit at any speed that you desire.

TAPES

The tapes of course, carry the text of the material that will be sent to you through the keyer. Every character on the tape will be sounded out to you clearly and accurately. We believe that we have the largest selection of tapes available in the World. All types — over three hundred varieties. There are special tapes for beginners, a special set for slightly advanced students — and very intricate and high speed types for commercial practice and old-time operators that wish to engage in some high speed code practice.

SPECIAL TAPES MADE IN QUANTITIES FOR COMMERCIAL AND GOVERNMENT RADIO SCHOOLS

The Automatic Keyer is known commercially as the G-813-742, the G-813-A and is manufactured exclusively by the McElroy Mfg. Corp. This type unit is also known as the Army TG-10. The tape is the standard 3/8" recorder slip inked with dots and dashes. We make many varieties of this tape with the texts as specified by the many Schools devoted to training our men in the Armed Forces. Special tapes will be made upon request for any Government Service.

FOR GOVERNMENT AND COMMERCIAL USERS . . .

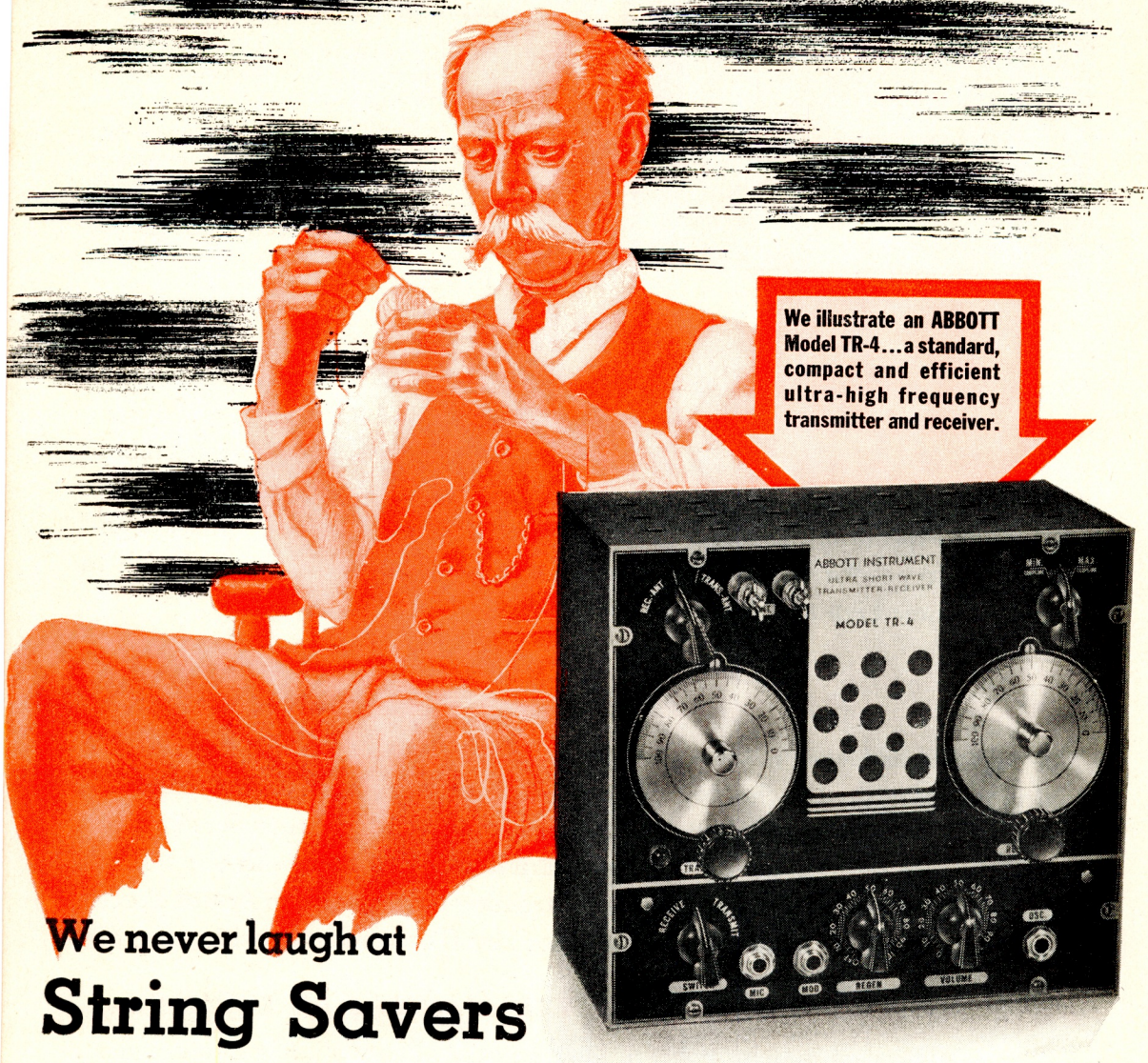
Prices of keying equipment and tapes will be quoted immediately upon request. Deliveries can be made very promptly.

FOR INDIVIDUAL USE . . .

If you want to learn the code quickly, easily and with a minimum of time, effort and expense, you can **RENT** an entire keying unit complete with tapes and earphones, ready to go to work for you. Drop a card for rental prices and further information.

CODE MACHINES CO., INC.

BOSTON 15, MASS., U. S. A.



We never laugh at String Savers

The man who saves string knows what he is doing . . . some day those treasured pieces may come in handy. So, rather than laugh, we encourage, for we, ourselves, know something about the value of putting away for a rainy day.

For example, the nuggets of knowledge stored up in yesterday's manufacture of ultra-high frequency transmitters and receivers have a definite bearing on the war work we are doing. And the ideas we're "banking" today will be mirrored in ABBOTT equipment of tomorrow.

104

ABBOTT INSTRUMENT, INC.

8 West 18th St., New York 3, N. Y.

Distributors of Radio and Electronic Equipment

We are and have been engaged 100%, since the outbreak of hostilities, in supplying the urgent requirements of the

ARMY · NAVY · AIR FORCE
LABORATORIES · SCHOOLS
INDUSTRY

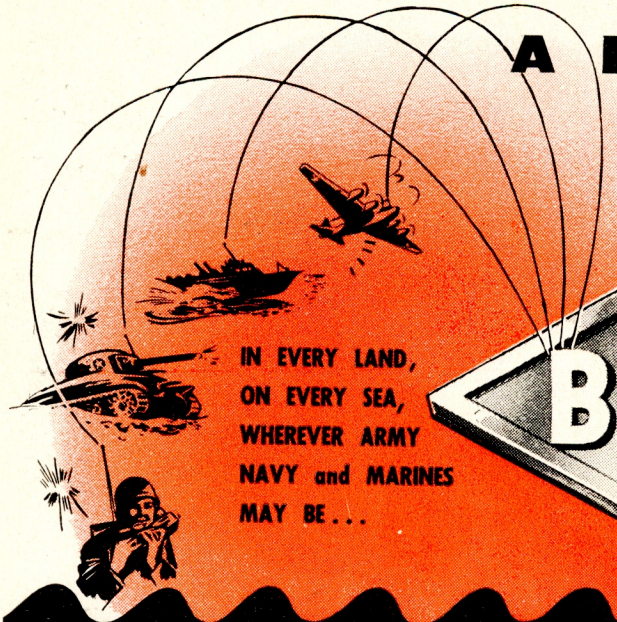
in order to bring victory that much sooner. We hope that soon we will be able to head the list with our tried and true friend — the amateur.

Send for free Catalog

The RADIO SHACK
167 WASHINGTON ST.,
BOSTON, MASS., U.S.A.

In war as in peace . . . . . .

A DEPENDABLE NAME



IN EVERY LAND,
ON EVERY SEA,
WHEREVER ARMY
NAVY and MARINES
MAY BE . . .

BRACH
EST. 1906

WORLD'S LARGEST and OLDEST MANUFACTURERS of

Antenna Systems

AND RADIO-ELECTRICAL PRODUCTS

- **Radio Direction-Finding Antenna Systems**
- **Radar Antenna Systems**
- **Junction Boxes**
- **Lightning Protective Devices**
- **Antenna Mounts and Other Radio-Electrical Accessories**

PRODUCTS FOR OTHER ESSENTIAL USES INCLUDE:

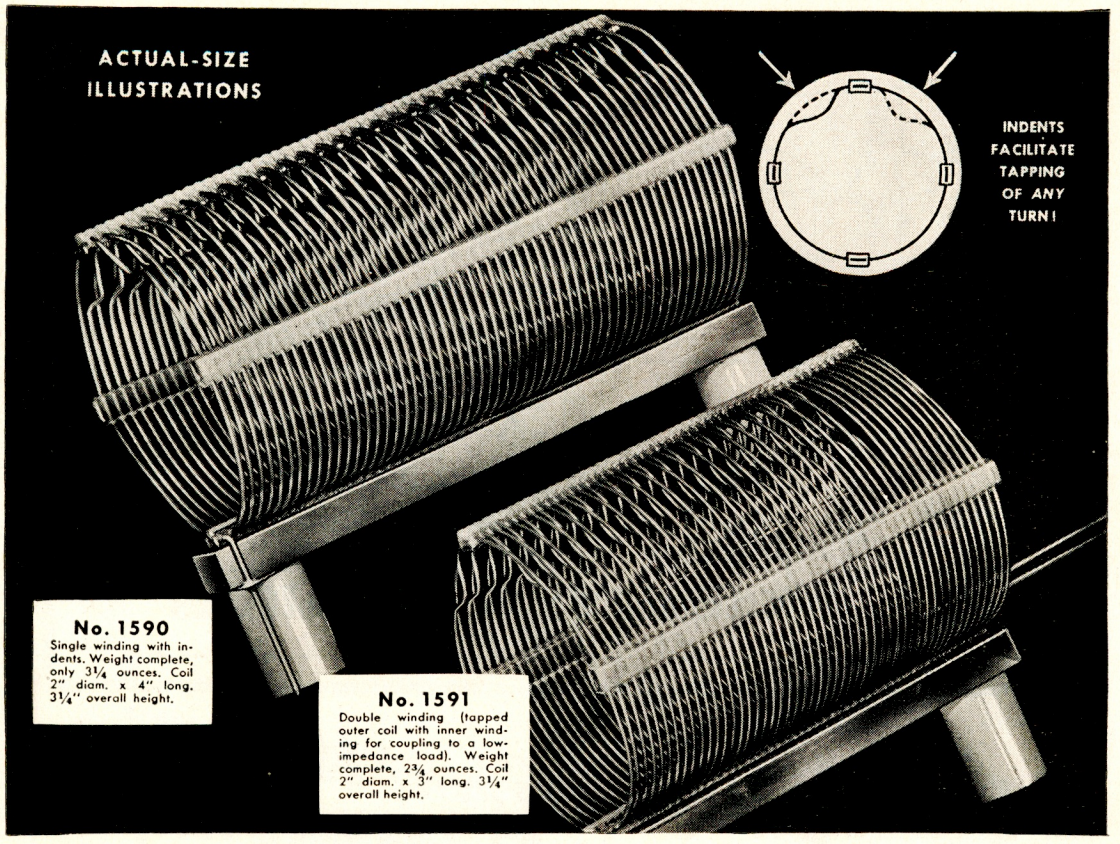
- **Potheads**
- **Gas Relays**
- **Arrester Housings**
- **Protective Panels**
- **Terminals & Housings**
- **High Tension Detectors**
- **Solderall & Flux**

Right now Uncle Sam's armed forces have first call. After Victory, our products will once again return to civilian service—improved by wartime experience and more dependable than ever.

L. S. BRACH MFG. CORP.

Antenna Designers & Manufacturers for Past 20 Years

Main Office & Factory: 55-65 Dickerson St., Newark, N. J.

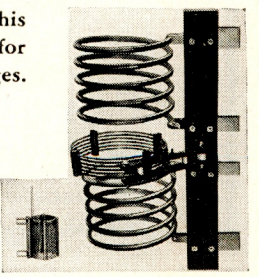


MADE "SPECIAL"—MADE FAST—*and* MADE RIGHT!

These two Air-Wound units, designed for ship-to-shore radio telephone transmitters, are typical of B & W small coils now being produced to meet exacting specifications by modern production methods *at the rate of 1200 a day!*

Many outstanding advantages accrue to these coils as a result of the famous B & W Air-Wound construction: Exceptionally light weight; mechanical ruggedness (they are not likely to be put out of commission by dropping or rough handling); adaptability to design or engineering changes in laboratory or field use; and the ease with which *ANY* of the closely-wound turns may be tapped, thanks to the special indent feature.

B & W Air Inductors of this general type are available for all normal frequency ranges. Literature on request.



BIG COILS, TOO! →

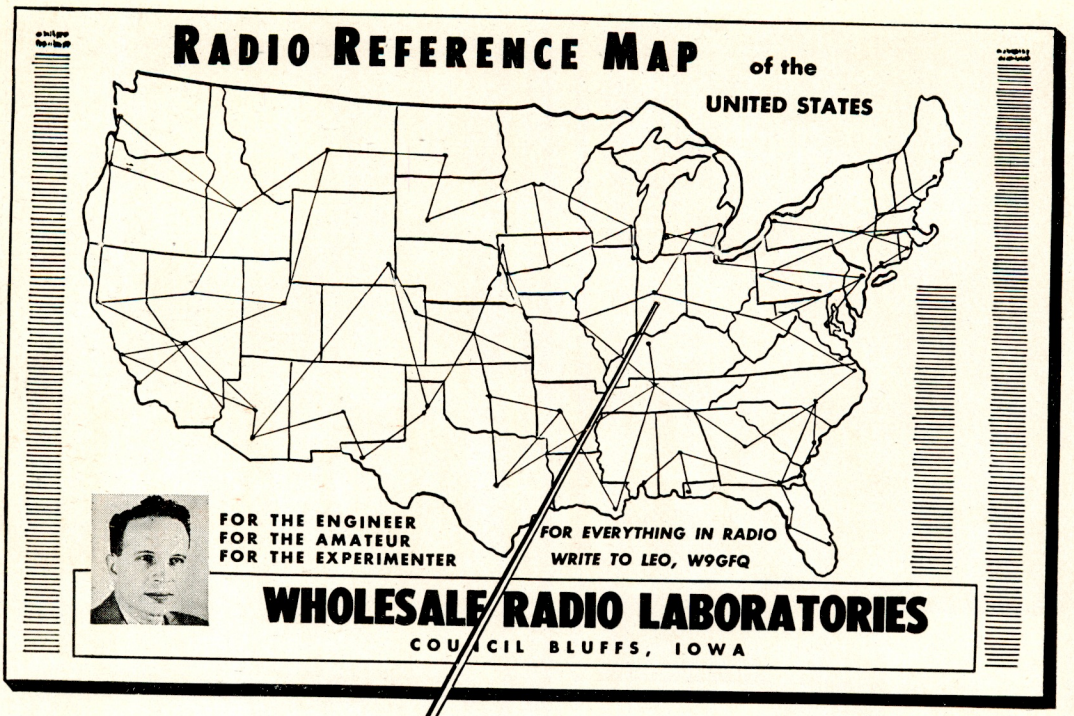
Here you see the small No. 1591 Air Inductor shown in comparison to a B & W high-power unit for 10 KW. service. Details on any type gladly sent.

B&W

AIR INDUCTORS

Air-Wound and Ceramic and Phenolic Form Types

BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa.



Get this Giant Wall-Size Radio Reference Map FREE from LEO

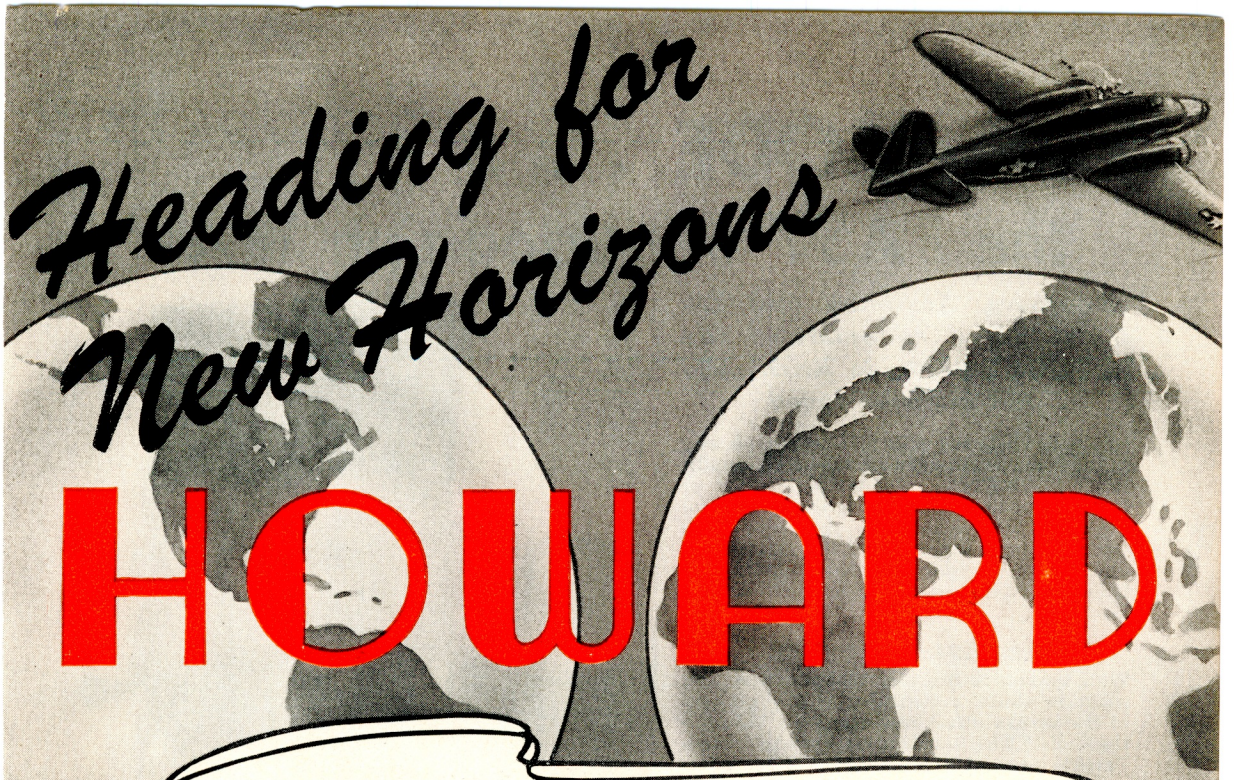
Here's the map that'll come in handy time and again. Leo, W9GFQ wants to send it to you absolutely free,—just to get acquainted.

Just right for your control room wall. Measures 4½ by 3½ feet, printed in three colors. Contains systems of four major networks, time zones, amateur zones, world's leading shortwave stations, all standard broadcast stations, monitoring stations, capitals, etc. Send 15 cents to cover packing and mailing. Get yours today. Write Leo, W9GFQ.

PARTS — SETS — REPAIR

My stock of parts is the most complete you'll ever find. Thousands of parts to build your own outfits or replace break-downs. Also quick, skillful repair service by our trained experts. Let us help you get your equipment in first-class shape. Don't forget, I pay highest prices for test equipment, communication receivers, transmitters and associated equipment. Also best trade-ins. Write today for big free catalog, full of everything needed by the amateur, serviceman and engineer. Write to Leo, W9GFQ.

Wholesale RADIO LABORATORIES
COUNCIL BLUFFS, IOWA



HOWARD

Improved Communication Receivers Will Come from the Tests of War!

America's communications take the lead in every action of this war. Through new and skillful engineering applications, laboratory performance standards are being carried right into the battle areas themselves.

Howard, as "America's Oldest Radio Manufacturer", is daily adding to its storehouse of knowledge and experience through its large production of precision-built military communications equipment. When Howard again turns to civilian manufacturing you can depend on getting the finest and most up to date radio equipment.

HOWARD RADIO COMPANY

1731-35 Belmont Ave., Chicago, Ill., Cable Address: HOWARDCO, U.S.A.

109

America's Oldest Radio Manufacturer

Learn CODE . . .

the EASY Instructograph *WAY*

Beginners, Amateurs and Experts alike recommend the **INSTRUCTOGRAPH,** *to learn code and increase speed*

Learning Code the easy Instructograph way gives you a decided advantage when qualifying for Amateur, Commercial, Civil or Military examinations. It is the quick, dependable way to increase your words per minute to the standard of an expert, enabling you to perform at your best when taking examinations from government machines.

ACQUIRING THE CODE

Well known is the fact that practice, and practice alone, constitutes ninety percent of the entire effort necessary to "Acquire the Code." The Instructograph supplies this "ninety percent" — taking the place of an expert operator in teaching the student. It can be adjusted to send slowly at first, then gradually faster and faster, until one is able to copy fast sending without conscious effort.

DIRECTING THE PRACTICE

Besides the practice afforded by the Instructograph, every student should have well directed practice instruction. This is supplied by the complete book of instructions that comes with every Instructograph Machine. This informative book provides the remaining "ten percent" necessary to obtain Code mastery. In simple, easy to understand language it guides the student, step by step, to best advantage, explaining the few important "short cuts" known to experienced operators. The Instructograph, the tapes that come with it and the book of instructions, gives you everything necessary to "Acquire the Code" as well as to increase and maintain speed.

CONVENIENT RENTAL PLANS

The Instructograph is made in several models, any of which may be rented on very reasonable terms. As government restrictions allow, it may also be purchased outright for cash or on convenient monthly payments — allowance being made for part of the rental paid. A large variety of tapes is always available to Instructograph users — elementary words, plain language, advanced messages and coded groups. Available too, is an "Airways" series of tapes for those interested in Aviation.

SPEED RANGE: 3 to 40 W.P.M.

The Instructograph

ACCOMPLISHES THESE PURPOSES:

FIRST: *It teaches you to receive telegraph symbols, words and messages.*

SECOND: *It teaches you to send perfectly.*

THIRD: *It increases your speed of sending and receiving after you have learned the code.*

With the Instructograph it is never necessary to impose on friends for practice. It is always ready and at your immediate service. And too, you are free from interfering Q.R.M. often experienced in listening through your radio receiver. The Instructograph is just as valuable to the advanced operator for increasing and maintaining his speed as to the beginner wishing to obtain his operating credentials.

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THANKS !!!
Our thanks, and the appreciation of the armed forces go out to the many customers who have lent or sold their receivers to us, to be distributed to the fighting fronts, where they can do a really important job. If you have a receiver you are not using, lend it or sell it to one of the services. They need them . . .

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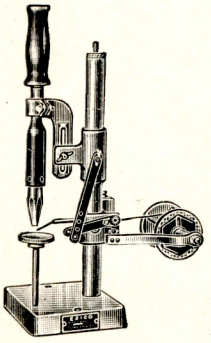
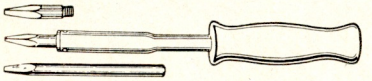


SOLDERING IRONS



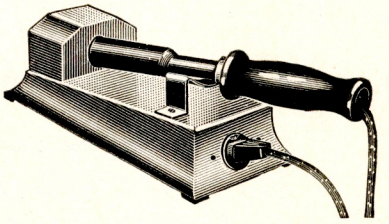
are widely used in industrial plants throughout the country. They are designed to withstand the strain of continuous service required of factory tools.

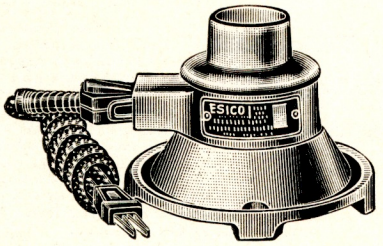
SPOT SOLDERING MACHINE

designed for treadle operation for advancement of iron and solder leaving operator's hands free for handling of product.

SOLDERING IRON TEMPERATURE CONTROLS

prevent overheating of soldering irons between soldering operations. Irons do not deteriorate when being used. The idle period causes oxidation and shortens life.





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ruggedly constructed pots of various sizes designed for continuous operation and so constructed that they are easily and quickly serviced, should elements have to be replaced.

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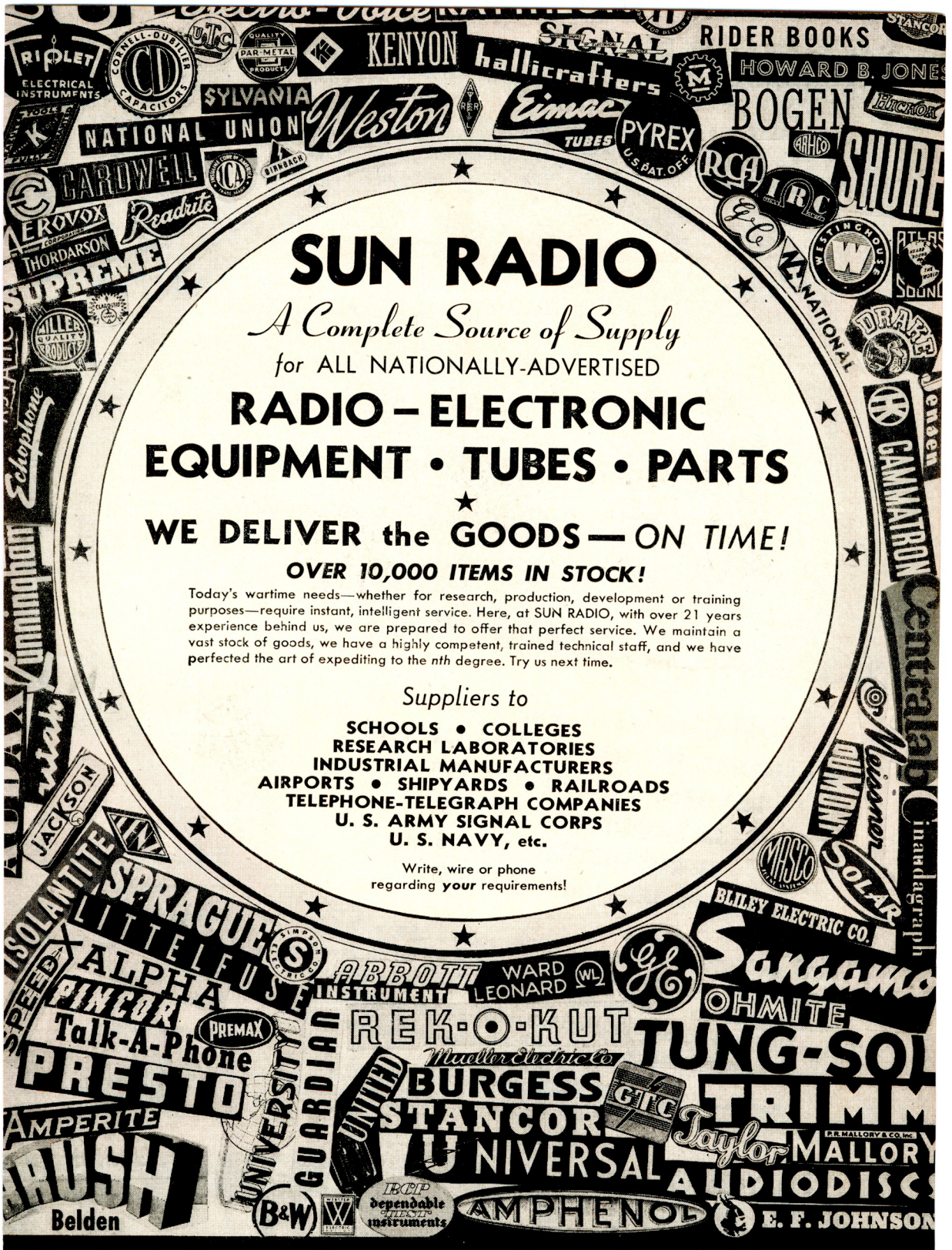

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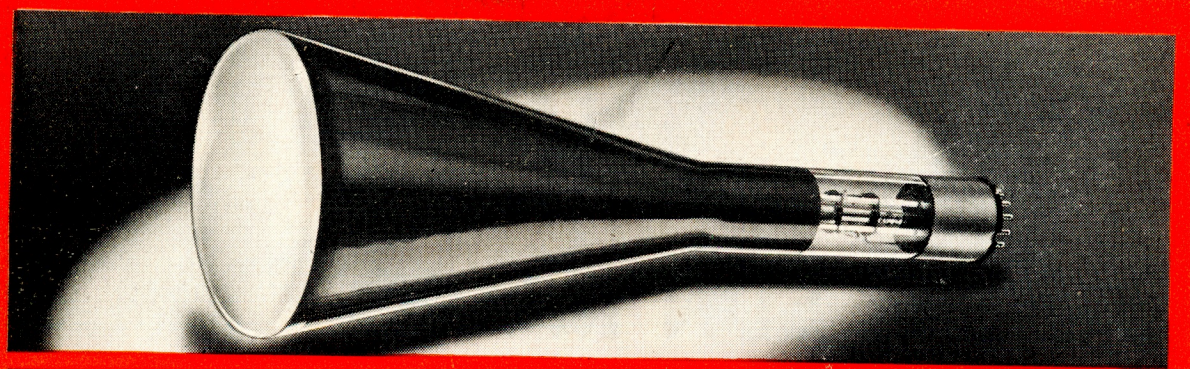

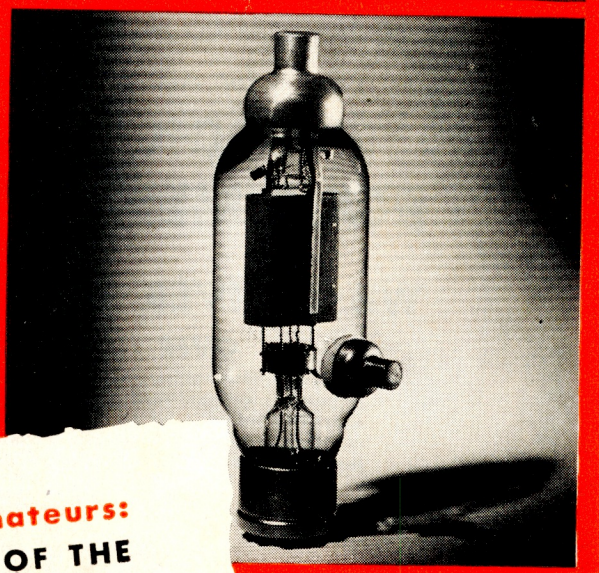

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- ★ **TRANSMITTING TUBES**
- ★ **SPECIAL PURPOSE TUBES**

Count on National Union as a major source of supply for the advanced types of tubes you'll be wanting when peace returns. Here you will find one of this industry's most complete Post-War lines of high grade tubes—built to war-time tolerances which assure better performance and longer life.

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- **Condensers**
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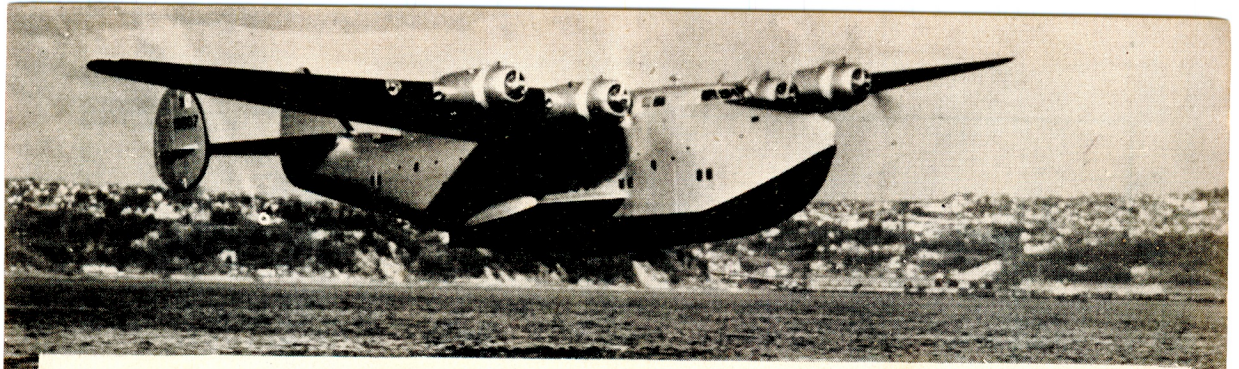
NATIONAL UNION

RADIO AND ELECTRONIC TUBES



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Are Serving the Allies on Land and Sea

YOU CANNOT SECURE Premax Tubular Antennas today because our entire production is going into the service of the Allied Nations, maintaining communications in every land . . . on every sea.

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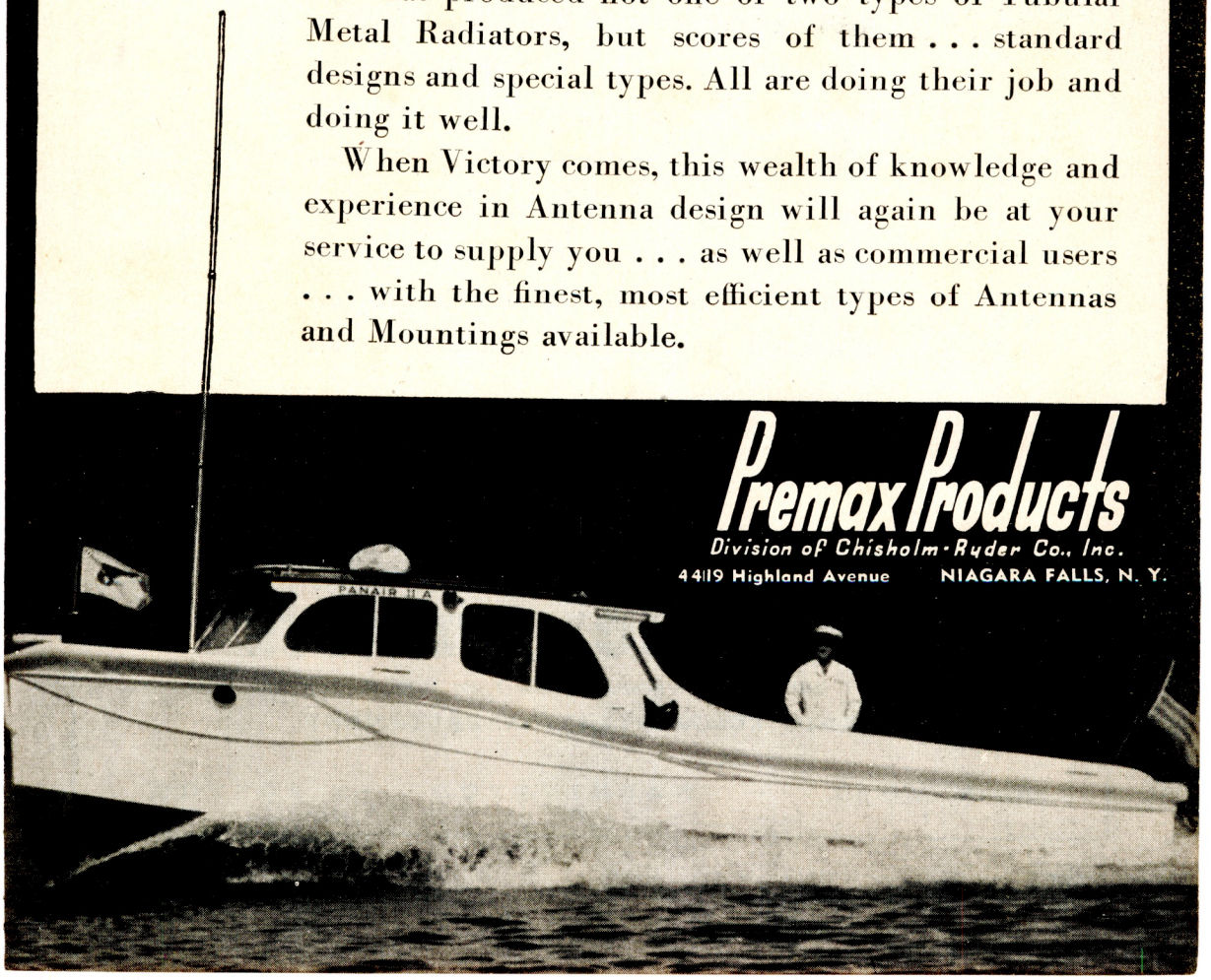
The skill and engineering ability of Premax Products has produced not one or two types of Tubular Metal Radiators, but scores of them . . . standard designs and special types. All are doing their job and doing it well.

When Victory comes, this wealth of knowledge and experience in Antenna design will again be at your service to supply you . . . as well as commercial users . . . with the finest, most efficient types of Antennas and Mountings available.



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Division of Chisholm-Ryder Co., Inc.

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Announcement!

Despite our complete preoccupation with war production, we at Jefferson-Travis have not lost sight of the role two-way radio-communication equipment will play in the better days to come. Our highly specialized engineering staff is devoting all available time and skill to the development of new equipment for the Armed Forces which will prove of great interest to the radio amateur. Accordingly, when peace is restored we will be prepared to offer you vastly improved equipment for your enjoyment. In the meantime, descriptive literature relating to our unrestricted equipment is available to all licensed amateurs.

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Men's lives depend on this perfection

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Perfection is what counts in a crystal. And perfection comes only through painstaking work—plus constant research to develop better and yet better methods of production.

At Scientific Radio Products Company we're developing those better methods. New methods of etching, edging, mechanically tumbling crystals into frequency . . . all aimed at producing a better finished crystal at lower cost.

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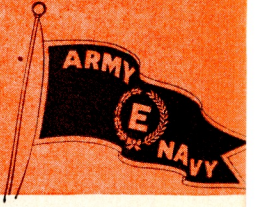

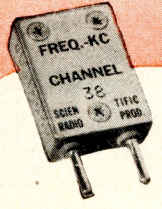

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You can concentrate and streamline your purchasing by depending upon Harrison—a single, dependable source for the products of over a hundred different manufacturers!

Our large and diversified stock, our technical sales assistance, and our eighteen years of procurement experience are at your service.

(Tomorrow — when Victory is won, we will be happy to again serve our friends, old and new, with the latest and best in equipment for peaceful purposes)

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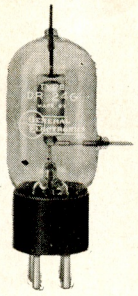

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Suitable for pulses of instantaneous high power at high frequencies. Also for ultra high frequency work.

DR 872 A

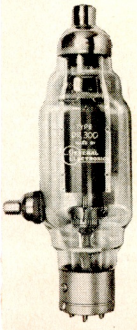
Medium power Rectifier. 10,000 volt inverse peak. Extensively used for power supplies from 1,000 to 5,000 volt output. Current output . . . 2 tubes . . . 2½ amperes.

DR 873

Similar to 872 A except that it's grid controlled. Can be used for the very smooth control of rectified DC voltage.

DR 1·7

Grid Control Rectifier similar in characteristics to 866.



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A rugged tube for rugged service. Made by pioneers in the use of graphite anodes which protect against excess anode temperature. 300 watt capacity.

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A permanent capacitance. Protected by vacuum from moisture, dirt, changing characteristics and mechanical injury. 50 mmf. 5,000 volt.

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FOR ELECTRONIC APPLICATIONS

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GENERAL ELECTRONICS INC.

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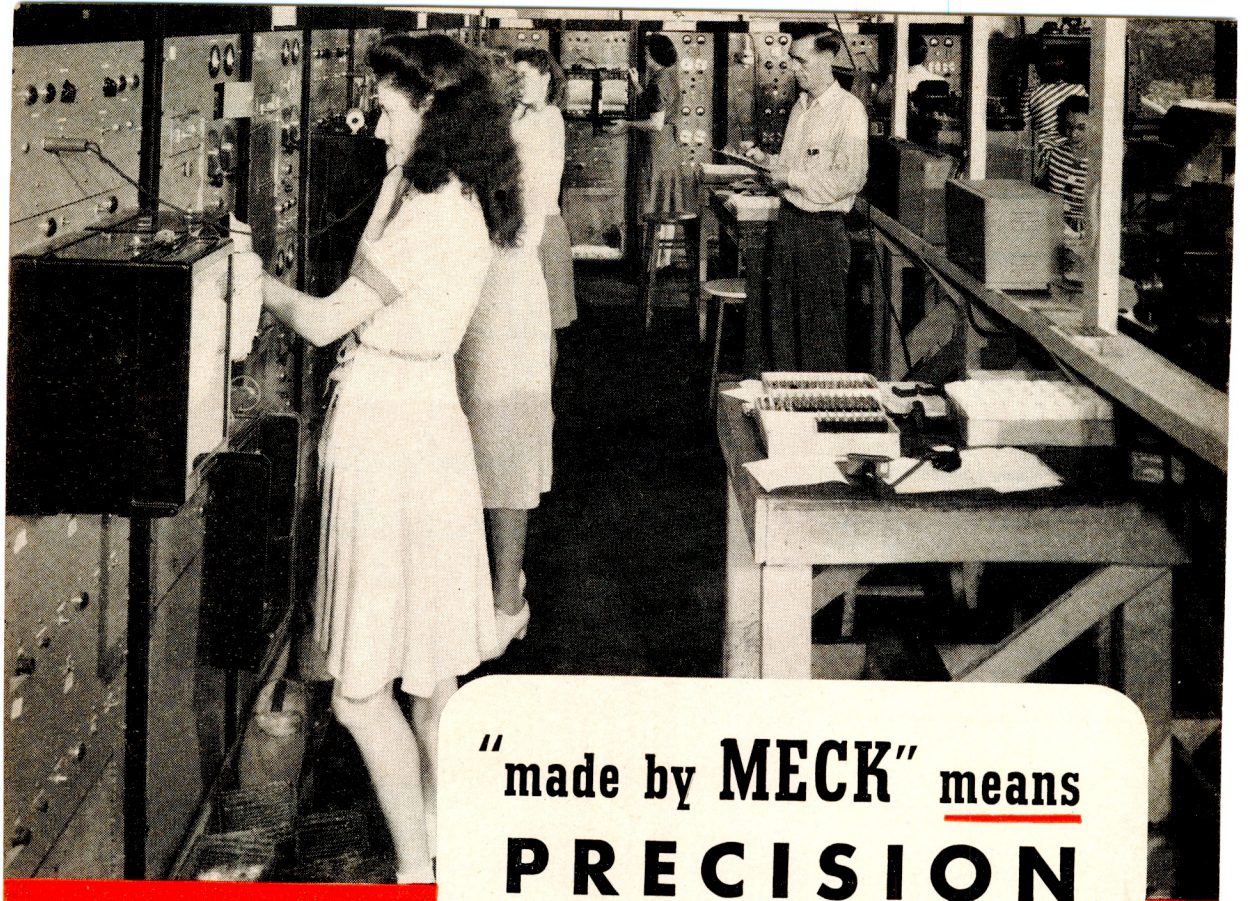

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Preparing now for the era of development before us, John Meck Industries are among the leaders in constructive planning. John Meck products are now — and always will be — characterized by high quality and rigid precision.

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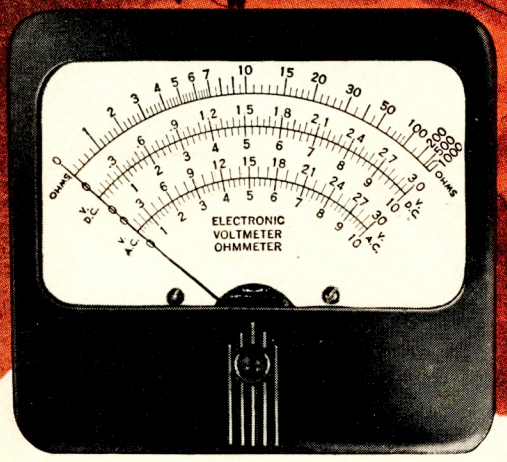
LITTLE KNOWN APPLICATIONS



Because of the secrecy encircling war production, little can be told of a meter's importance to almost every phase of the work. Suffice it to say that over a wide range of industrial electronic applications . . . heat treating, counting, refining, sound detection, color selection, and many others about which not a word has been spoken or written . . . electrical measuring instruments are universally used.

It is of interest to know . . . for present and future reference . . . that DeJur precision meters are built into the equipment employed by many war plants. Wherever used, these meters enjoy confidence from the standpoint of sensitivity, durability and dependability. Peace will usher in even more new uses for meters. To insure absolute satisfaction, specify DeJur.

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the Smoke has Cleared Away

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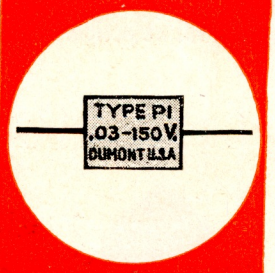

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VOLTAGES from 150 to 600 Volts

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buying and selling radio and electronic parts and equipment . . . representing and warehousing stock from America's leading manufacturers. Now, more than ever, we are in a strong position to help speed your production. We can supply the equipment you need in practically any quantity . . . if we haven't what you want in stock, we know where to get it for you quickly. Our experienced technical staff will gladly consult with you on any of your problems . . . and our trained expediters assure you the fastest possible delivery. Moreover, all of our merchandise is backed by an ironclad guarantee of satisfaction. ***It pays nowadays to see Harvey first.***

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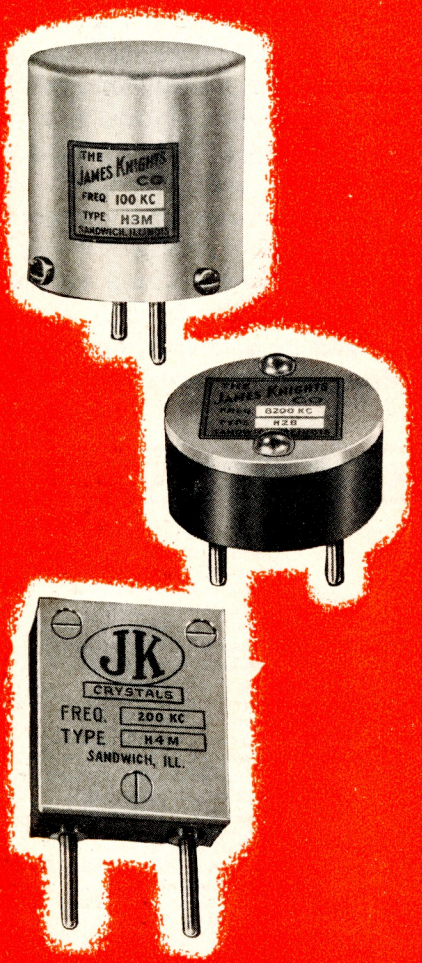
For Dependability Efficiency and Performance!



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The men of The James Knights Company are pioneers in the Radio Communications field — they have been designing and making Crystals since 1932. Today, all of the skill, experience and output of the James Knights staff is concentrated on Crystals exclusively — precision Crystals of all frequencies and all tolerances between 15 KC. and 10 MC.— Crystals for every conceivable purpose. And too, there will be J K Crystals for the Amateur when he is again back on the air.

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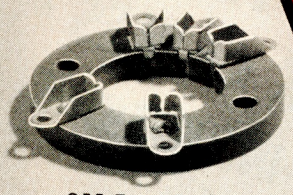
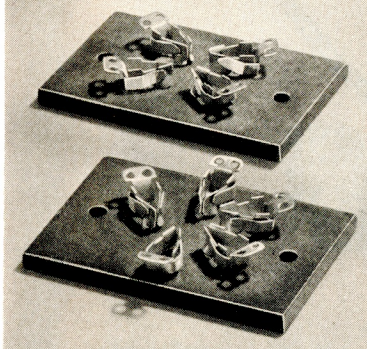
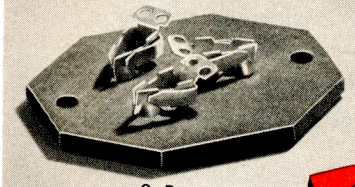
SPECIFY *Tomorrow's* PERFECT INSULATING MATERIAL . . . *Today*



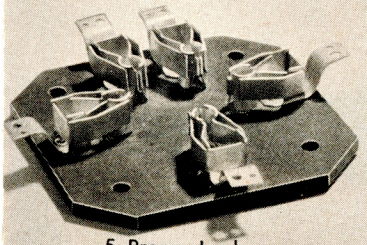
955 Type Socket



Standard 4 Prong and 5 Prong With CSK Rivets



3 Prong Crystal Socket



5 Prong Jumbo or 803 Socket

There is no insulating material more advanced than MYKROY . . . the perfect glass-bound mica product.

MYKROY will not pass or dissipate high frequencies, owing to its low loss characteristics. It is not organic, and will not carbonize under arc and create an electrical path.

MYKROY is non-porous . . . non-absorbent and non-adsorbent. It has exceptionally high surface resistivity and can withstand temperatures up to 1000 F. Mechanically it has strength comparable with cast iron . . . will not warp or change form. It can be machined to exceedingly close tolerances.

MYKROY is available in any quantities. Supplied in rods and sheets . . . or processed to your specifications in our plant. Let our engineers help solve your high frequency insulating problems with MYKROY.

MYKROY

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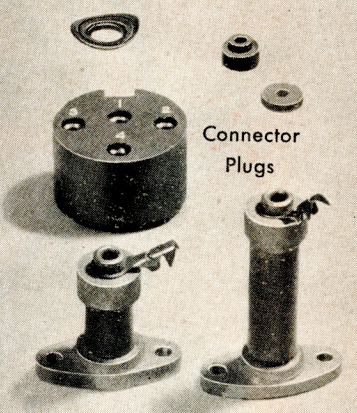
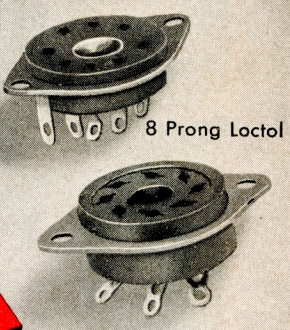
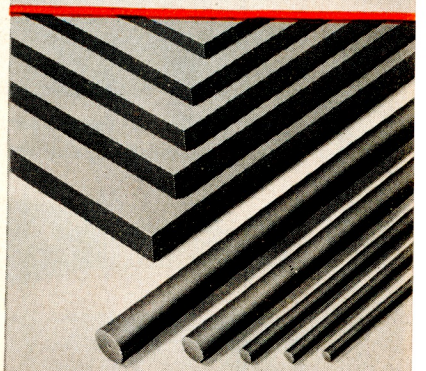


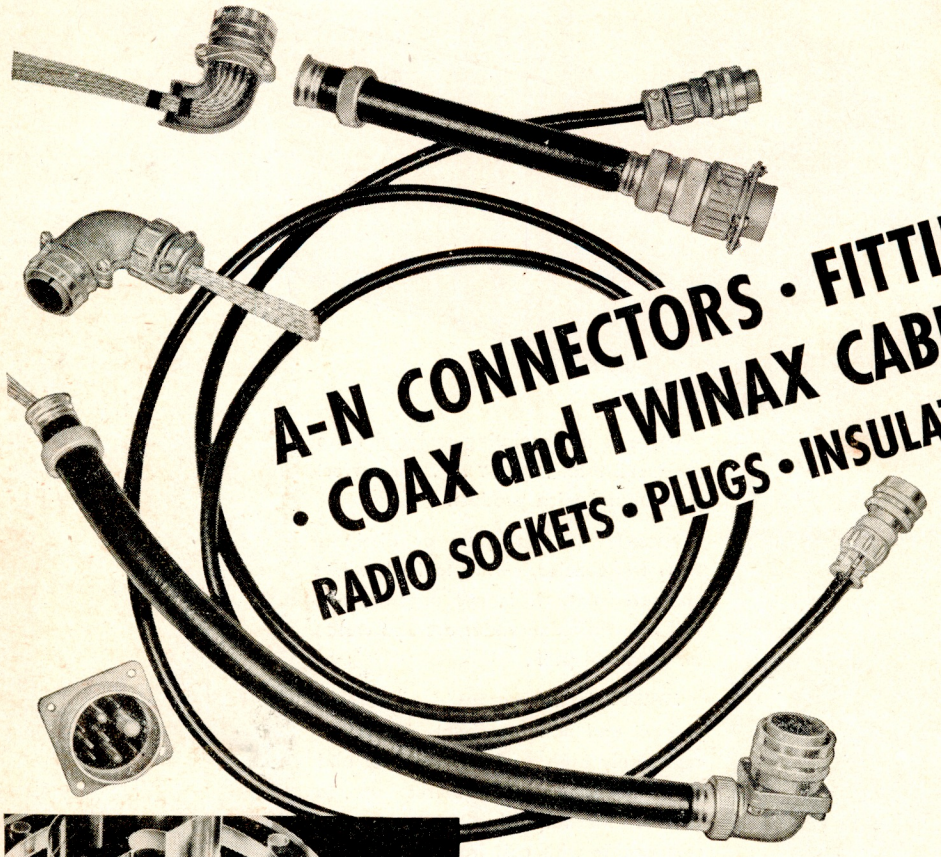
Stand-Off Insulators



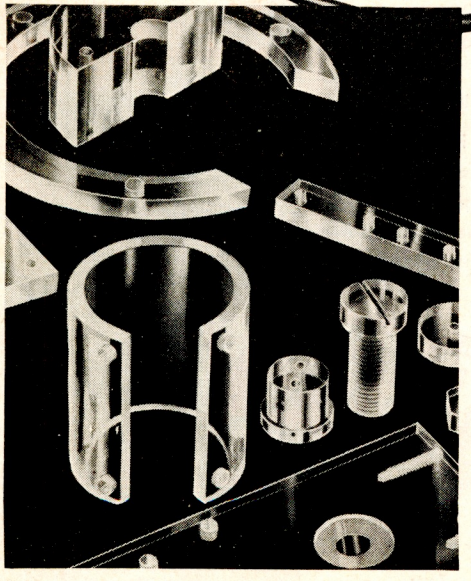
8 Prong Octal



Rods and Strip Stock Available



A-N CONNECTORS • FITTINGS • COAX and TWINAX CABLES • RADIO SOCKETS • PLUGS • INSULATIONS



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American Phenolic Corporation specializes in the design and construction of plastic parts and products for electrical and communications equipment of all types.

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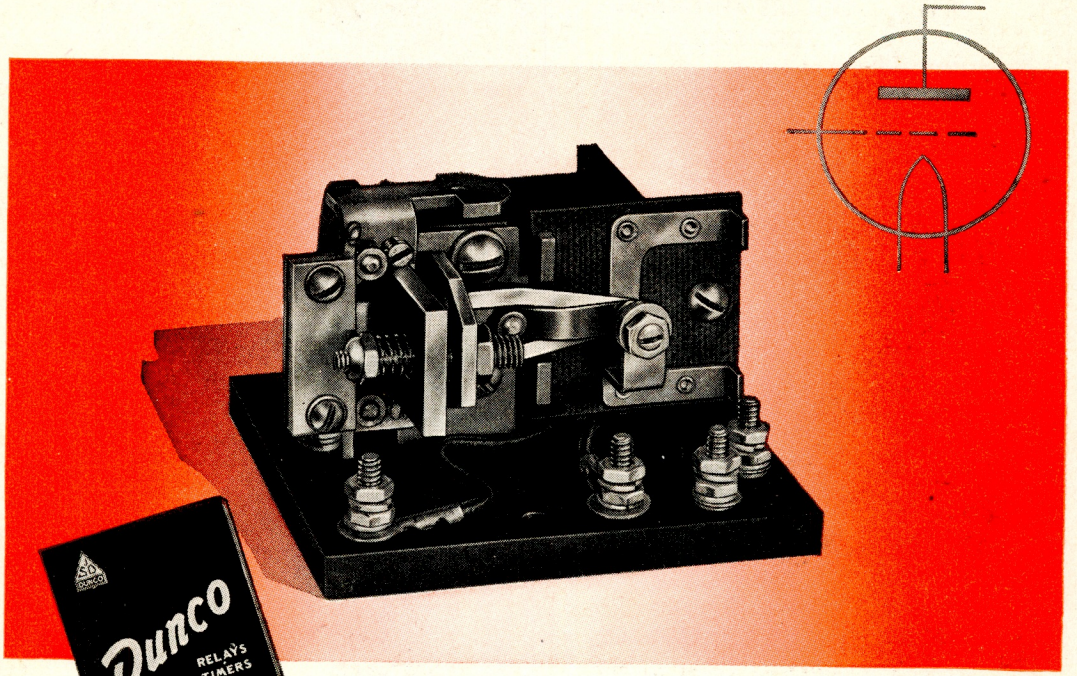
A SNAP-ACTION Sensitive Relay for Use on Slowly-Varying Coil Currents



WRITE FOR CATALOG and RELAY-TIMER DATA BOOK

Other Struthers-Dunn Relay types described include: 30 ampere • Sensitive • Instrument-Controlled • Low-Voltage, Heavy-Current D. C. • Mechanical Latch-in, Electrical Reset ("Memory" Relays) • Mercury Contact • Telephone Auxiliary • Lamp Controlling • Polarized • Overload • Timing • Sequence, Ratchet Type • Motor-Reversing, etc.

This new Struthers-Dunn Relay is ideally suited for a wide variety of electronic circuit applications calling for snap-action contacts combined with a high degree of sensitivity. Contact pressure remains constant despite slow variations in the coil current. Then, when this current reaches a certain point, the contact operates with a positive snap action.

The relay operates on as little as 10 milliwatts in its coil circuit, and is recommended for dozens of highly sensitive vacuum tube applications, and in detecting overloads at low current levels. Its greatest field of use lies in applications where current varies between various limits, rather than from 0 to rated value.

Details gladly supplied to electronic equipment manufacturers. Ask regarding Relay 79XAX.

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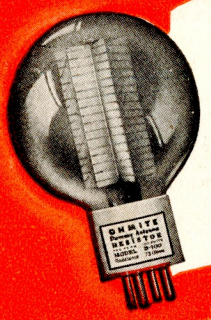
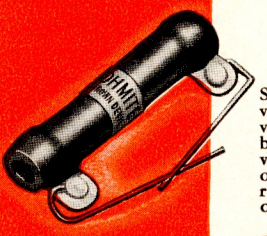


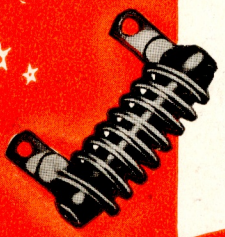
DUMMY ANTENNA RESISTORS

To check R. F. power, determine transmission line losses, check line to antenna impedance match. Helps tune up to peak efficiency. Non-inductive, non-capacitive, constant in resistance. 100 and 250 watt sizes in various resistances.



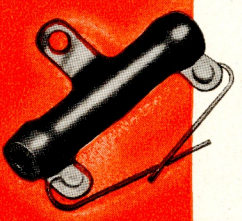
BROWN DEVIL RESISTORS

Small, extra sturdy, wire wound vitreous enameled resistors for voltage dropping, bias units, bleeders, etc. Proved right in vital installations the world over. 10 and 20 watt sizes in resistances up to 100,000 ohms.



PARASITIC SUPPRESSOR

Small, light, compact non-inductive resistor and choke, designed to prevent u.h.f. parasitic oscillations which occur in the plate and grid leads of push-pull and parallel tube circuits. Only 1¾" long overall and ⅝" in diameter.

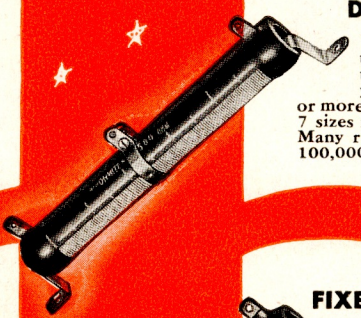


CENTER-TAPPED RESISTORS

For use across tube filaments to provide an electrical center for the grid and plate returns. Center tap accurate to plus or minus 1%. Wirewatt (1 watt) and Brown Devil (10 watt) units, in resistances from 10 to 200 ohms.

R. F. PLATE CHOKES

Single-layer wound on low power factor steatite cores, with moisture-proof coating. Built to carry 1000 M.A. 5 stock sizes from 2½ meters to 160 meters. 2½ and 5 meter chokes mount by wire leads. Larger sizes mount on brackets.



ADJUSTABLE DIVIDOHMS

You can quickly adjust these handy Dividohms to the exact resistance you want, or put on one or more taps wherever needed. 7 sizes from 10 to 200 watts. Many resistance values up to 100,000 ohms.

R. F. POWER LINE CHOKES

Keep R.F. currents from going out over the power line and causing interference with radio receivers. Also used at receivers to stop incoming R.F. interference. 3 stock sizes, rated at 5, 10 and 20 amperes.

FIXED RESISTORS

Resistance wire is wound over a porcelain core, permanently locked in place, insulated and protected by Ohmite vitreous enamel. Available in 25, 50, 100, 160 and 200 watt stock sizes, in resistances from 1 to 250,000 ohms.

Be Right with OHMITE

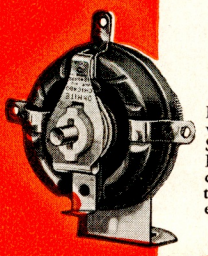
RHEOSTATS ★ RESISTORS ★ CHOKES ★ TAP SWITCHES

Ohmite Vitreous Enamel is unexcelled as a protective and bonding covering for resistors and rheostats.

OHMITE Rheostats ★ Resistors ★ Chokes ★ Switches

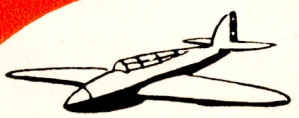
CLOSE-CONTROL RHEOSTATS

Insure permanently smooth, close control of electronic devices, communications and electrical equipment. Widely used in industry and in planes, tanks, ships. All ceramic, vitreous enameled. 25, 50, 75, 100, 150, 225, 300, 500, 750 and 1000 watt sizes. Approved Army & Navy types.



HIGH-VOLTAGE SWITCH

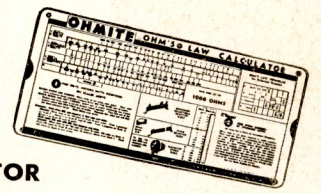
For general use where high voltage insulation is required. Suitable for circuits up to 1 K.W. rating. Used for band changing, meter switching, tapped transformer circuits, etc. Ceramic construction.



Many of you now engaged in vital war industries or in active service have long been familiar with the rugged dependability of Ohmite Products. Their wide use in planes, tanks and ships, in walkie-talkies and field units, in communications, electronic and electrical equipment, gives you added assurance in dealing with today's resistance-control problems. This is well worth remembering when you build original equipment or make vital replacements — *today and tomorrow.*

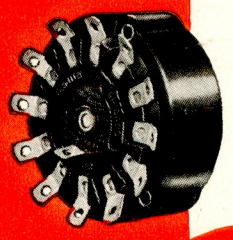
Besides the units shown here, there are Ohmite Non-Inductive Vitreous Enameled Resistors, Riteohm Precision Resistors, Hermetically-Glass-Sealed Resistors, Direction-Indicator Rheostats, Attenuators, and many others.

HANDY OHMITE OHM'S LAW CALCULATOR



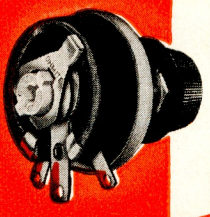
Very useful in training schools, in laboratories and in industry. Figures ohms, watts, volts, amperes — quickly, easily. Solves any Ohm's Law problem with one setting of the slide. All values are direct reading. No slide rule knowledge is necessary. Scales on two sides cover the range of currents, resistances, wattages and voltages commonly used in radio and electronic applications. Size only 4⅛" x 9". Send only 10¢ in coin to cover handling cost.

AUTHORIZED DISTRIBUTORS EVERYWHERE



HIGH-CURRENT TAP SWITCHES

Compact, all ceramic, multi-point rotary selectors for A.C. use. Silver to silver contacts. Rated at 10, 15, 25, 50 and 100 amperes with any number of taps up to 11, 12, 12, 12, and 8 respectively. Single or tandem assemblies.



LC-2 LINK CONTROL

Simplified, compact, convenient panel regulation of the transfer of R.F. energy thru the link or low impedance line used in many transmitters. Eliminates swinging coupling coils. All ceramic vitreous enameled construction.

SEND FOR FREE CATALOG 18 — Gives helpful information and data on Ohmite stock units for essential applications — lists hundreds of stock values. Very handy for quick reference.

OHMITE MANUFACTURING COMPANY

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CRYSTALS

by

DX XTALS

'the heart of a good transmitter'

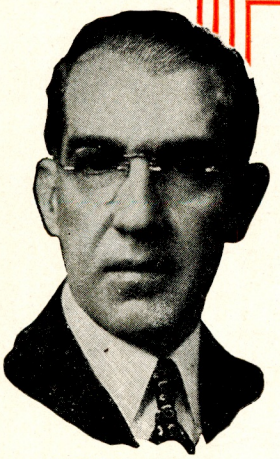
Complete automatic production plus electronic measuring and testing in temperature ranges from —30° to 130° F. make DX Xtals perfect, modern, tele-communication instruments. Ample production of these "battle-tested" types allow for civilian delivery of many cuts and frequencies — priorities, of course.

DX CRYSTAL CO.

GENERAL OFFICES: 1841 W. CARROLL AVE., CHICAGO, ILL., U.S.A.

DX XTALS

'the heart of a good transmitter'



WALTER H. CANDLER

Originator of the famous Candler System and founder of the Candler System Company.

Radio Operators

ARE URGENTLY NEEDED IN PRACTICALLY EVERY BRANCH OF THE SERVICES . . . .

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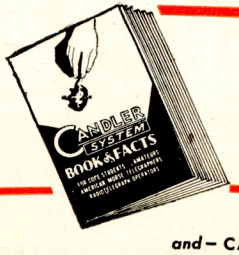
T. R. McELROY

Official Champion Radio Operator, Speed 75.2 wpm., won at Asheville Code Tournament July 2, 1939, says: "My skill and speed are the result of the exclusive, scientific training Walter Candler gave me. Practice is necessary, but without proper training to develop Concentration, Co-ordination and a keen Perceptive Sense, practice is of little value. One likely will practice the wrong way."

SEND TODAY FOR THIS

FREE Book of Facts

It gives you the story of CANDLER CODE CHAMPIONS, and many inside tips that will help you. It is FREE. A post-card will bring it to you. No obligation.



YOU can LEARN RADIO CODE and prepare for an interesting career or improve your present speed and proficiency with the CANDLER SYSTEM which trains you to meet all code speed requirements for these services, also Amateur and Commercial License.

YOU CAN LEARN CODE RIGHT, from the beginning, as you will be using it as an operator, with the CANDLER SYSTEM TRAINING in half the usual time.

YOU CAN SPEED UP YOUR CODE and obtain your LICENSE or qualify for HIGHER RATING and a GOOD JOB by taking CANDLER TRAINING in your home or present location.

The excellence of CANDLER SYSTEM TRAINING has accounted for the SUCCESS of many thousands of present day HIGH SPEED — HIGH RATED — HIGH PAID OPERATORS. It is surprisingly easy and inexpensive. Numerous Amateurs and Members of the A.R.R.L. and R.S.G.B. are CANDLER TRAINED.

It takes more than memorizing the code and merely sending and receiving to become a skilled radio operator. Ask any good operator. He will tell you CANDLER teaches you quickly, thoroughly, the technique of fast, accurate telegraphing, and trains you to meet all requirements.

LEARN WHEREVER YOU ARE to send and Receive Code at HIGH SPEED.

Let CANDLER give you SPEED — ACCURACY — TELEGRAPHING TECHNIQUE, and eliminate all worry and code problems.

★ **COURSES FOR BEGINNERS *and* OPERATORS**

THE SCIENTIFIC CODE COURSE *is a complete radio-code course for beginners. It teaches all the necessary fundamentals scientifically.*

THE HIGH SPEED TELEGRAPHING COURSE *is for operators who want to increase their w.p.m. and improve their proficiency.*

THE TELEGRAPH TOUCH TYPEWRITING COURSE *is specially prepared for those who want to become expert in the use of the typewriter for copying code.*

NO EXPENSIVE PRACTICE EQUIPMENT NEEDED

Learning Code or Improving Speed and Accuracy are Mental Processes that require Special Training, which vast experience in developing high-speed operators enables CANDLER to give you simply, thoroughly, interestingly. Practice without understanding these laws and fundamentals governing speed and skill is always hard, and wastes much valuable time. CANDLER shows you the EASY, BETTER WAY to SPEED, SKILL and CODE PROFICIENCY, quickly.

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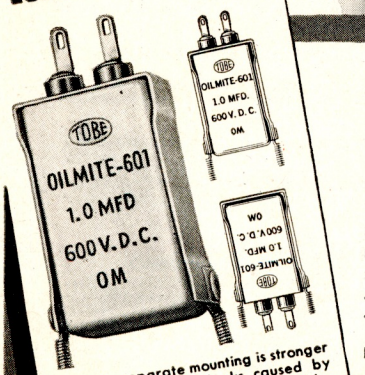
The Great Wall of China—2550 miles long—built about 3000 B.C.

Throughout every step of manufacture long life is built into Tobe Capacitors. And before manufacture begins, Tobe engineers have shown great ingenuity in pioneering new and advanced designs. The original capacitor (Tobe OM-601) with hold-down bracket is shown below. It has many outstanding advantages over certain other types and shapes of capacitors. This new capacitor is strong, compact and space-saving and the new hold-down bracket permits the use of either inverted or upright terminals, with wiring underneath or on top of chassis.

Write us about your capacitor problems. They will have the best efforts of Tobe engineers.

LONG LIFE ASSURED



This new separate mounting is stronger and helps prevent leaks caused by breaks in can. This outstanding Tobe design takes the minimum of space.

SPECIFICATIONS
TOBE OM-601 CAPACITORS

TYPE	OM
RATINGS	.05 to 2.0 mfd. 600 V.D.C. .05 mfd. to 1.0 mfd. 1,000 V.D.C.
STANDARD CAPACITY TOLERANCE	. . . 10%
TEST VOLTAGE	. . . Twice D.C. rating
GROUND TEST	. . . 2,500 Volts, D.C.
OPERATING TEMPERATURE	55° F to 185° F
SHUNT RESISTANCE	.05 to 0.1 mfd. 20,000 megohms. .25 to 0.5 mfd. 12,000 megohms. 1.0 to 2.0 mfd. 12,000 megohms.
POWER FACTOR	At 1,000 cycles—.002 to .005
CONTAINER SIZE	Width ⅝", length 1 5/16", ht. 2¼"
MOUNTING HOLE CENTERS	1½"

TOBE DEUTSCHMANN CORP.
TOBE
CANTON · MASSACHUSETTS

A small part in victory today

A BIG PART IN INDUSTRY TOMORROW

ORDER FROM NEWARK
FOR QUICK SERVICE ON
RADIO PARTS

DON'T let slow deliveries of radio and electronic components delay production schedules in your plant. SEND US AN ORDER for **ALL** the things you need right now . . . and we will ship **AT ONCE** every possible item we have in stock, advising probable delivery date on the balance. We supply transformers, filters, wire, resistors, rheostats, rectifiers, panels, sockets, tubes and thousands of other parts DIRECT FROM STOCK to America's war industries, schools, laboratories, etc.

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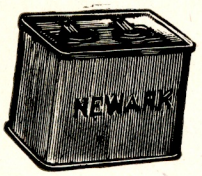
FILTER CONDENSERS



Our regular Filter Condensers, made by a famous manufacturer, and fully guaranteed at rated voltages. Thousands have been sold. Ideal for your own equipment, for laboratory and experimental purposes.

→ NO PRIORITY REQUIRED

Only L 265

Mfd.	Volts DC.	Size	Price
1	1000	5 x 3⅜ x 1½	$ .59
2	2000	4⅞ x 3⅛ x 1¾	1.50
4	3000	5 x 3⅛ x 3⅞	3.75

NEW IMPROVED TYPE

Oil Filled—Oil Impregnated

FILTER CONDENSERS

Our finest quality condensers. Complete with porcelain insulators and mounting brackets. Gray enamel finished metal case, size 1¾" x 3¾" x 4½" high. Not illustrated.

9 mfd. 2000 v. DC.

$3.25

NO PRIORITY REQUIRED

Only L 265

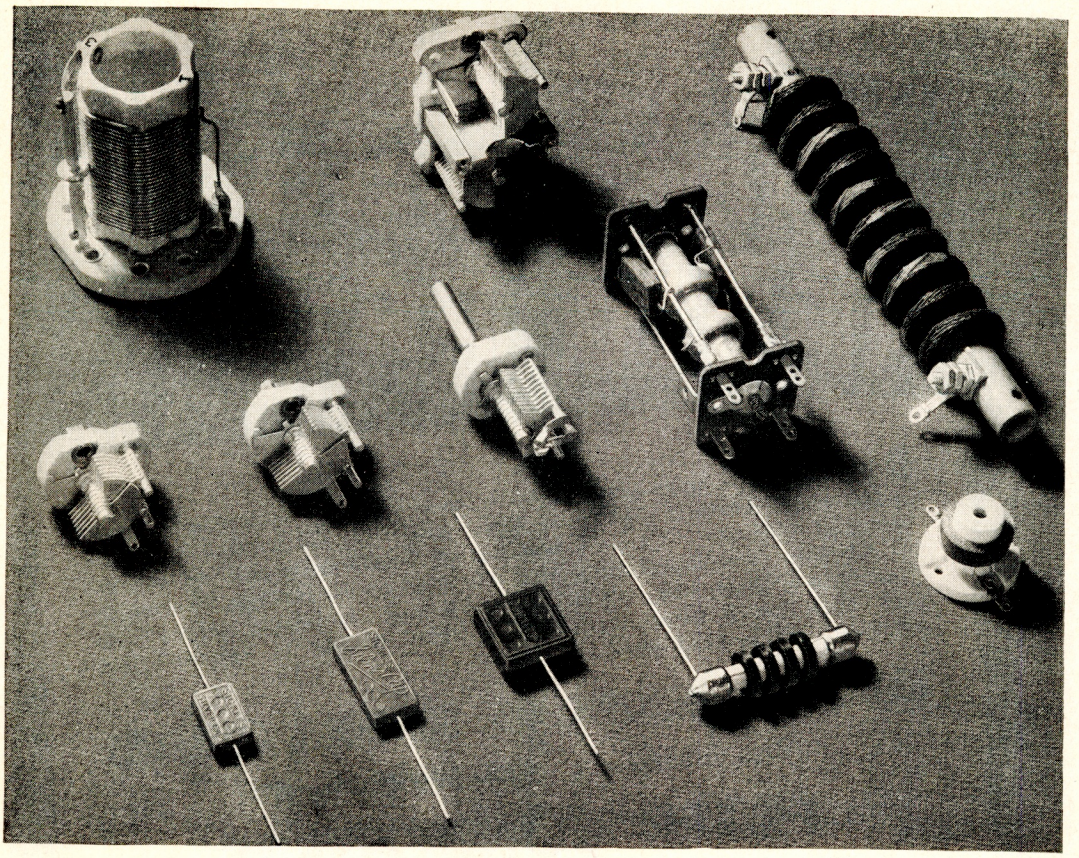
ORDER TODAY DIRECT FROM THIS ADVERTISEMENT

Sorry . . . No Catalogs for the Duration

When ordering supplies (except Filter Condensers) be sure to state priority, end use, precedence rating, and CMP allotment number.

NEWARK *Electric Company*

323 W. MADISON ST. CHICAGO, ILL.

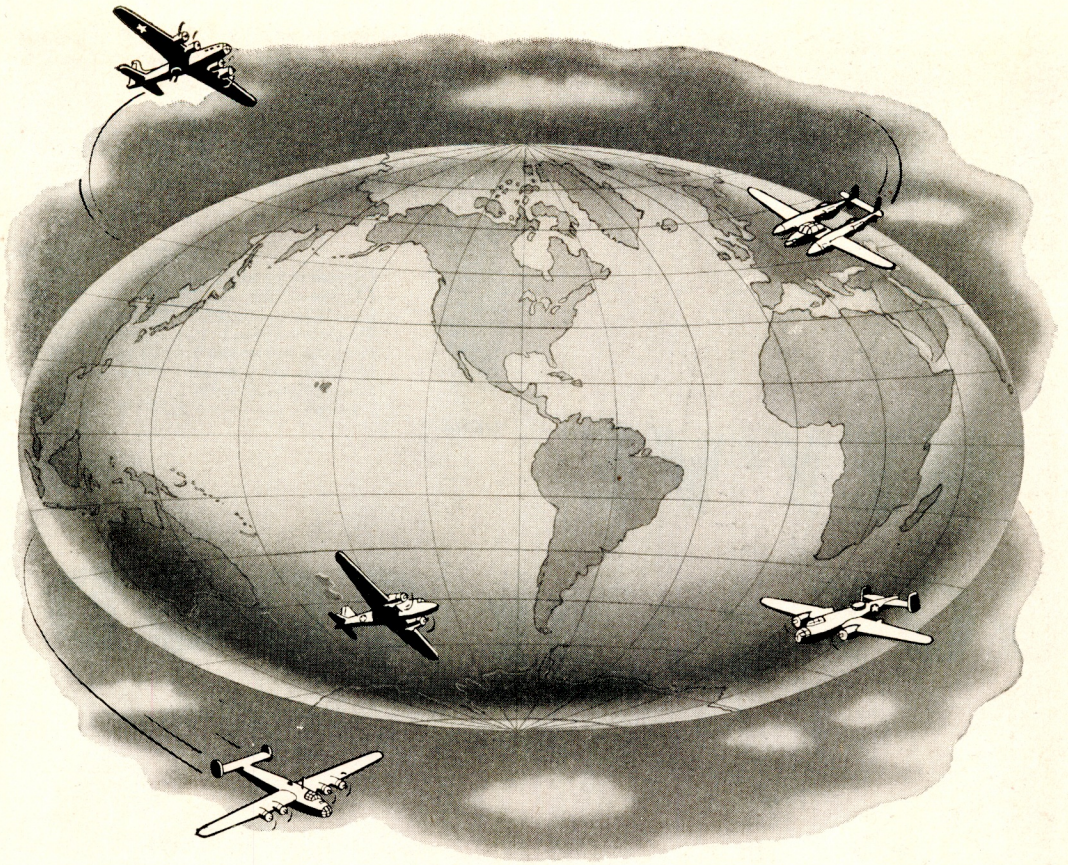


Jewelry? *In a way, yes . . .*

These are Sickles products — coils and condensers —
as precise and clean-cut as a Swiss watch, as handsome as Florentine silver,
and as scarce, for non-military purposes, as rubies . . . though our production is up
in several departments some 400% over that of pre-war days. They're jewels as performers, too . . .
as you might well judge by our recently-won Army-Navy "E."
Superior Sickles specialties of this same high quality will be available
for general use as soon as Victory is won. Meanwhile, please bear us in mind.
The F. W. Sickles Company, Chicopee, Massachusetts.

ARMY E NAVY

SICKLES *Radio and Electronic Specialties*



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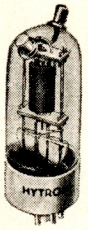
. . . *TODAY and TOMORROW*

On established passenger and cargo airlines, as well as on military missions, dependable communications are vital. Wilcox Aircraft Radio, Communication Receivers, Transmitting and Airline Radio Equipment have served leading airlines for many years . . . and while, today, Wilcox facilities are geared to military needs, the requirements of the commercial airlines likewise are being handled. Look to Wilcox for leadership in dependable communications!

WILCOX ELECTRIC COMPANY

Manufacturers of Radio Equipment

14th & Chestnut Kansas City, Mo.



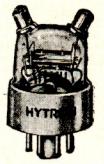
HY75

HY75 $3.95

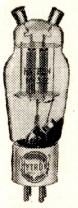
	HY 75**
Filament potential	*6.3 volts
Filament current	2.6 amps.
Plate potential (max.)	450 volts
Plate current (max.)	80 ma.
Plate dissipation (max.)	15 watts
Nominal Class C output	20 watts

HY114B $2.25 HY615 $2.25

	HY114B**	HY615**
Filament potential	*1.4v.	6.3 v.
Filament current	0.155 a.	0.175 a.
Plate potential (max.)	180 v.	300 v.
Plate current (max.)	12 ma.	20 ma.
Plate dissipation (max.)	1.8 w.	3.5 w.
Nominal Class C output	1.4 w.	3.8 w.



HY615



HY31Z

HY30Z $2.75 HY31Z $3.50

	HY30Z#	HY31Z#
Filament potential	*6.3 v.	*6.3 v.
Filament current	2.25 a.	2.5 a.
Plate potential (max.)	850 v.	500 v.
Plate current (max.)	90 ma.	150 ma.
Plate dissipation (max.)	30 w.	30 w.
Nominal Class C output	58 w.	56 w.
Nominal Class B audio output	110 w.	51 w.

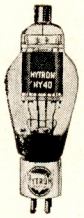
THEY'VE GOT TO BE GOOD

Soldiers, sailors, marines, coast guardsmen, and airmen unite in a vast amphibious operation—the whole linked and coordinated by former radio amateurs and potential "hams" operating intricate radio and electronic equipment.

In that action, every Hytron tube is on its mettle. Failures are out! Each tube must meet the full shock of mechanized war, and still maintain the vital electronic nerve system which spells teamwork and victory.

Quality-conscious Hytron engineers have met the challenge. Close observance, throughout manufacture, of the tight tolerances of rigid Hytron electrical and mechanical specifications insures production of only the best.

The peacetime stamp of amateur approval has carried over into war. Ask the fighting men who use these dependable Hytron war tubes. For war equipment, WERS units, and that post-war deluxe station you are planning, Hytron tubes should be your choice too. They're good, because they've got to be good.

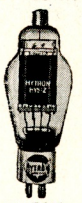


HY40

HY40 $3.75 HY40Z $3.75

	HY40#	HY40Z#
Filament potential	7.5 v.	7.5 v.
Filament current	2.25 a.	2.5 a.
Amp. factor	25	80
Plate dissipation (max.)	40 w.	40 w.
Plate	1000 max. v. & 125 max. ma.	
Nominal Class C output		94 w.
Nominal Class B output (2 tubes)		185 w.

HY51A HY51B HY51Z $4.75



HY51Z

	HY51A,Z#	HY51B#
Filament potential	7.5 v.	10 v.
Filament current	3.5 a.	2.25 a.
Amp. factor	25–85	25
Plate dissipation (max.)	65 w.	65 w.
Plate	1000 max. v. & 175 max. ma.	
Nominal Class C output		131 w.
Nominal Class B output (2 tubes)		285 w.

HY24 $1.50 801A/801 $2.50

HY67

	HY24#	801A#
Filament potential	*2.0 v.	7.5 v.
Filament current	0.13 a.	1.25 a.
Plate potential (max.)	180 v.	600 v.
Plate current (max.)	20 ma.	70 ma.
Plate dissipation (max.)	2.0 w.	20 w.
Nominal Class C output	2.7 w.	25 w.

HY63 $2.50 HY67 $7.75

	HY63††	HY67††
Filament potential	*1.25 or 2.5 v.	*6.3 or 12.6 v.
Filament current	0.22 or 0.11 a.	4 or 2 a.
Plate potential (max.)	200 v.	1250 v.
Plate current (max.)	20 ma.	175 ma.
Plate dissipation (max.)	3 w.	65 w.
Nominal Class C output	3 w.	152 w.

HY65 $3.00 HY69 $3.95

	HY65††	HY69††
Filament potential	*6.0 v.	*6.0 v.
Filament current	0.85 a.	1.6 a.
Plate potential (max.)	450 v.	600 v.
Plate current (max.)	75 ma.	100 ma.
Plate dissipation (max.)	15 w.	27 w.
Nominal Class C output	20 w.	35 w.

HY60 $2.75 HY61/807 $2.25

	HY60††	HY61/807††
Filament potential	6.3 v.	6.3 v.
Filament current	0.5 a.	0.9 a.
Plate potential (max.)	425 v.	600 v.
Plate current (max.)	60 ma.	100 ma.
Plate dissipation (max.)	15 w.	25 w.
Nominal Class C output	16 w.	40 w.

HY65

HY69

HY866 Jr. $1.05
866A/866 $1.50

	HY866 Jr.##	866A/866##
Filament potential	2.5 v.	2.5 v.
Filament current	2.5 a.	5.0 a.
Peak inverse potential	5000 v.	10000 v.
Peak plate current	500 ma.	1000 ma.
Max. D.C. output pot.	1575 v.	3165 v.
Max. D.C. Cur. (2 tubes)	250 ma.	500 ma.

OTHER POPULAR HYTRON TUBES†

Type	Description	Price
2C25	15-watt medium-mu triode	$3.00
2C45	7.5-watt triode (modulator)	2.50
1OY	15-watt general-purpose triode*	1.50
837	12-watt r.f. pentode	2.80
841	15-watt high-mu triode*	2.25
864	Non-microphonic voltage-amp. triode	1.00
954	Sharp cut-off acorn pentode	4.50
955	Acorn triode	2.75
1616	Half-wave high-vacuum rectifier*	5.75
1625	25-watt r.f. tetrode (12-v. heater)	2.25
1626	5-watt triode oscillator	1.60
E1148	3.5-watt u-h-f triode	2.25
VR105-30	Gaseous voltage regulator (OC3)	1.00
VR150-30	Gaseous voltage regulator (OD3)	1.00

† This is not a complete list.
* Instant-heating filament.
# Triode
** U. H. F. Triode
†† Beam Tetrode
Rectifier

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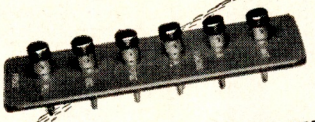

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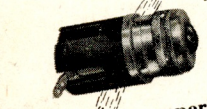

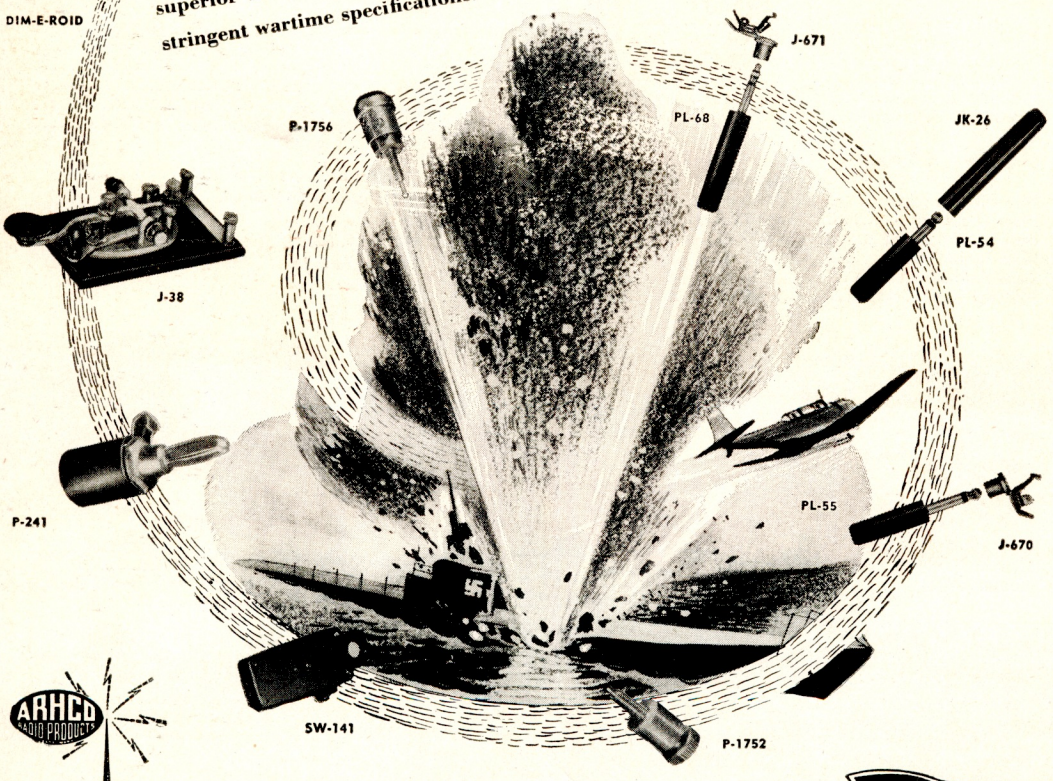

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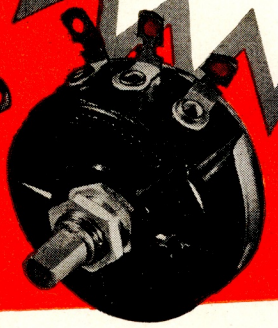
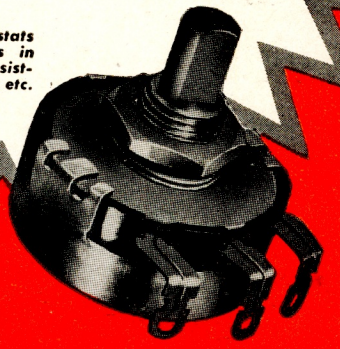
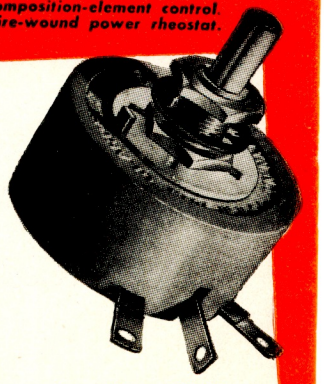




Above: Composition-element control. Below: Wire-wound power rheostat.



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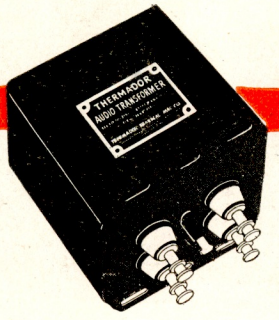

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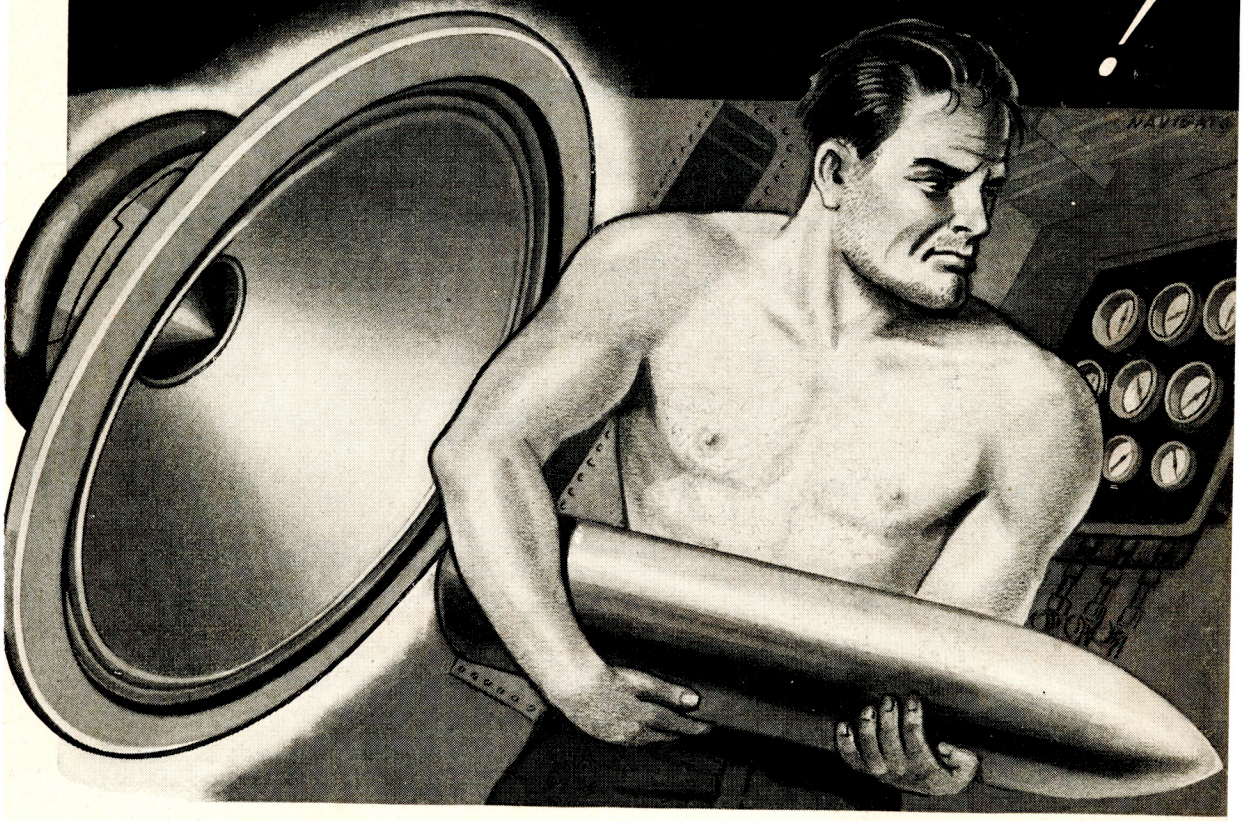

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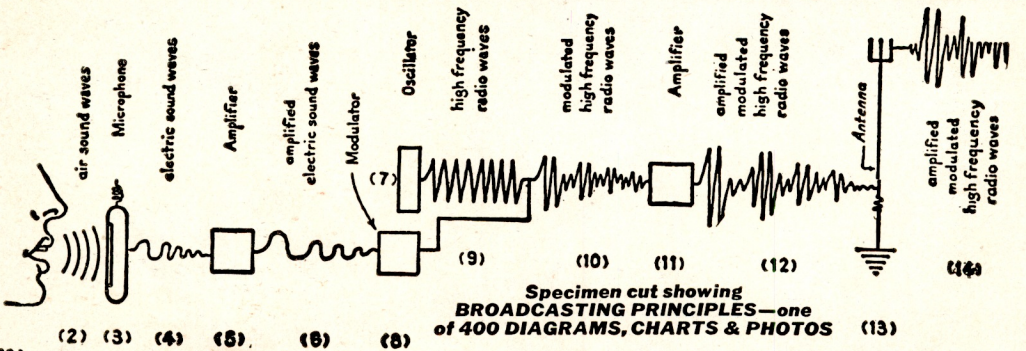

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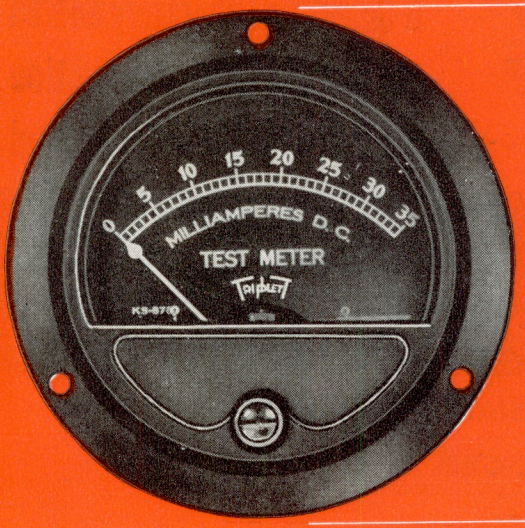

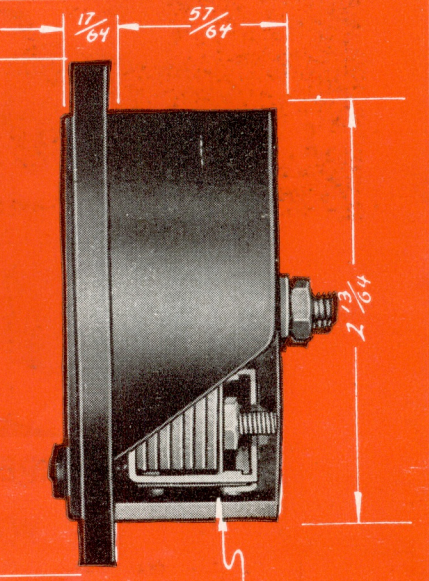

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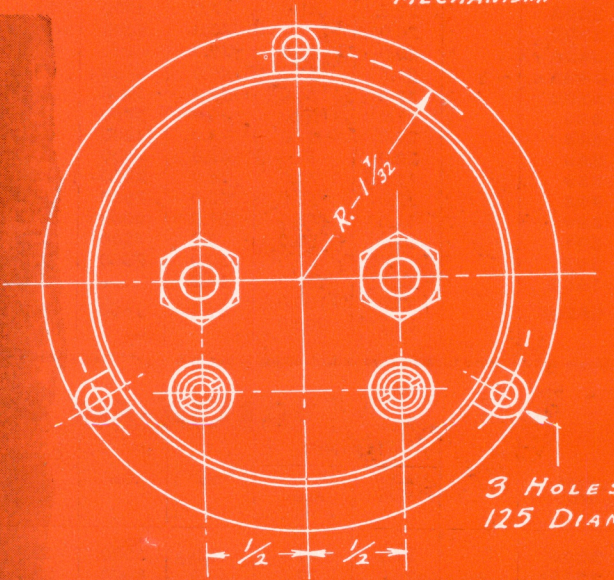

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TYPE NO.		FILAMENT Volts	FILAMENT Amps.	Mu	Gm	Capacitance Grid to Plate	*PLATE Max. Volts	*PLATE Max. Amps.	*PLATE Max. Dissipation Watts	*Nominal Output Watts	Max. Freq. MC. At Max. Plate Input	Max. Freq. MC. At 50% Max. Plate Input
207		22.0	52.0	20.0	6500	27.0	15000	2.00	10000	C20000	1.6	20
220C		21.5	41.0	35.0	5000	22.0	15000	1.00	10000	BR2500	3.0	30
228A		21.5	41.0	17.0	6500	23.4	6000	.75	3000	BR1000	1.5	20
232C		20.0	72.0	40.0	8000	22.0	20000	2.00	20000	BR8500	1.5	20
342A		20.0	67.0	40.0	6820	27.0	18000	1.40	25000	BR8500	4.0	16
343A		21.5	57.5	40.0	6750	23.5	15000	.70	10000	BR3500	4.0	8
520B		22.0	34.0	17.0	5000	27.0	10000	1.20	5000	C5000	2	.....
846		11.0	51.0	40.0	2800	9.0	7500	1.00	1600	C2500	50	150
848		22.0	52.0	8.0	4200	27.0	12000	....	7500	A2000	1.6	20
858		22.0	52.0	42.0	4500	18.0	20000	2.00	20000	C20000	1.6	40
859		11.0‡	71.0	36.0	8000	15.0	20000	3.50	20000	C35000	1.5	40
863		22.0	52.0	50.0	7000	27.0	15000	2.00	7500	B22000	1.6	20
889		11.0	195.0	21.0	8000	17.5	7500	2.00	5000	C10000	50	150
891		11.0‡	60.0	8.0	4200	27.0	15000	2.00	5000	B22000	1.6	20
892		11.0‡	60.0	50.0	7000	32.0	10000	1.00	6600	CP6000	1.6	20
1652		14.5	52.0	14.0	....	27.0	7500	1.25	5000	C6000	1.5	10
HF50K		27.0** / 13.5**	100.0 / 200.0	36.0	1600	20.0	20000	5.00	30000	øC25000	10	50

‡ Single or two-phase filament (two units); voltage is per unit. ** Single or two-phase filament excitation. ø At upper frequency limit of 50 megacycles.

FORCED-AIR COOLED TYPES

TYPE NO.		FILAMENT Volts	FILAMENT Amps.	Mu	Gm	Capacitance Grid to Plate	*PLATE Max. Volts	*PLATE Max. Amps.	*PLATE Max. Dissipation Watts	*Nominal Output Watts	Max. Freq. MC. At Max. Plate Input	Max. Freq. MC. At 50% Max. Plate Input
220R†		21.5	41.0	35.0	5000	22.0	12500	1.00	6000	BR2500	4.0	30
232R†		20.0	72.0	40.0	8000	22.0	12500	2.00	7500	CP10000	3.0	20
343R†		21.5	57.5	40.0	6750	23.5	7500	1.50	5000	CP5000	4.0	30
889R‡		11.0	125.0	21.0	8000	19.0	6000	1.00	3000	CP4000	25	100
891R†		11.0‡	60.0	8.0	4200	28.0	10000	2.00	4500	B10000	1.6	20
892R†		11.0‡	60.0	50.0	7000	32.0	8500	1.00	4000	CP5000	1.6	20
HF3000°		21.5	40.5	16.0	6500	10.0	10000	1.35	3000	C7500	20	50
ZB3200°		21.5	40.5	85.0	5000	10.0	10000	1.50	2000	B8000	20	50

* $75.00 credit will be allowed against purchase of new tube if radiator and crate are returned in good condition.
‡ Single or two-phase filament (two units); voltage is per unit.
° All glass radiation and air-cooled transmitting tubes.
† $100.00 credit will be allowed against purchase of new tubes if radiator and crate are returned in good condition.

RADIATION COOLED TYPES

TYPE NO.	FILAMENT Volts	FILAMENT Amps.	Mu	Gm	Capacitance Grid to Plate	*PLATE Max. Volts	*PLATE Max. Ma.	*PLATE Max. Dissipation Watts	*Nominal Output Watts	Max. Freq. MC. At. Max. Plate Input	Max. Freq. MC. At. 50% Max. Plate Input
AB-150	10.0	3.25	5.3	3400	9.5	1500	.....	100	AB150	.....	.....
HF- 60	10.0	2.50	20.0	5000	5.2	1600	150	60	C100	30	100
HF- 75	10.0	3.25	12.5	4000	2.0	2000	120	75	C150	75	200
HF-100	10.0	2.50	23.0	4200	4.5	1500	150	75	C150	30	150
HF-120	10.0	3.25	12.0	4500	10.5	1250	175	100	C150	20	80
HF-125	10.0	3.25	25.0	4500	11.5	1500	175	100	C200	30	90
HF-130	10.0	3.25	12.5	4300	9.0	1250	210	125	C170	20	90
HF-140	10.0	3.25	12.0	4500	12.5	1250	175	100	C150	15	60
HF-150	10.0	3.25	12.5	4300	7.2	1500	210	125	C200	30	100
HF-175	10.0	4.00	18.0	5000	6.3	2000	250	125	C300	25	100
HF-200	10.5	4.00	18.0	5000	5.8	2500	200	150	C350	20	100
HF-250	10.5	4.00	18.0	5000	5.8	3000	200	150	C375	20	100
HF-300	11.0	4.00	23.0	5600	6.5	3000	275	200	C600	20	100
ZB-120	10.0	2.50	30.0	5000	5.2	1500	160	75	B300	30	90
111H	10.0	2.50	23.0	4200	4.6	1500	160	75	C175	25	50
203A	10.0	3.25	25.0	4500	13.5	1250	175	100	C150	15	80
203H	10.0	3.25	25.0	4500	11.5	1500	175	100	C200	30	90
204A	11.0	3.85	23.0	4000	15.0	2500	275	250	C500	3	30
211	10.0	3.25	12.0	4500	12.5	1250	175	100	C150	15	80
211C	10.0	3.25	12.5	4300	9.0	1250	210	125	C175	20	90
211H	10.0	3.25	12.5	4300	7.2	1500	210	125	C200	30	100
212E	14.0	6.00	16.0	8000	19.0	2000	350	275	BR75	1.5	3.0
241B	14.0	6.00	16.0	8500	18.8	2000	350	275	C400	7.5	20
242A	10.0	3.25	12.5	3600	13.0	1250	150	85	A20	6	25
242B	10.0	3.25	12.5	3600	13.0	1250	150	100	A20	6	25
242C	10.0	3.25	12.5	3600	13.0	1250	150	100	A20	6	25
251A	10.0	16.00	10.5	3800	8.0	3000	600	1000	C1200	30	60
261A	10.0	3.25	12.0	4000	9.0	1250	210	125	C175	30	50
270A	10.0	9.75	16.0	5700	21.0	3000	375	350	C700	7.5	20
276A	10.0	3.25	12.0	4000	9.0	1250	210	125	C175	30	50
279A	10.0	21.00	10.0	5000	18.0	3000	800	1200	BR500	20	40
304B	7.5	3.25	11.0	2000	2.5	1250	100	50	C85	100	350
308B	14.0	6.00	8.0	7500	17.4	2250	325	250	A50	1.5	3
800	7.5	3.25	15.0	2000	2.5	1250	80	35	C65	60	190
801	7.5	1.25	8.0	1600	6.0	600	70	42	C25	60	120
805	10.0	3.25	50.0	4800	6.0	1500	210	125	B400	30	80
810	10.0	4.50	35.0	5000	4.8	2000	250	125	C375	30	100
830	10.0	2.50	8.0	2000	9.9	750	130	40	C60	6	50
830B	10.0	2.50	25.0	3080	11.0	1000	150	60	B175	15	65
833	10.0	10.00	35.0	8000	6.3	3000	500	300	C1000	30	100
834	7.5	3.25	11.0	2000	2.5	1250	100	50	C75	100	350
838	10.0	3.25	50.0	4800	8.0	1250	175	100	B275	30	120
841	7.5	1.25	30.0	750	7.0	425	60	15	B25	6	50
842	7.5	1.50	3.0	1250	7.0	425	.....	12	A3	.....	.....
845	10.0	3.25	5.3	3400	11.5	1250	.....	75	A25	.....	.....
849	11.0	5.00	19.0	6000	33.0	3000	350	300	B1225	3	30
849A	11.0	7.70	19.0	7600	11.5	4000	500	500	B1900	3	30
849H	11.0	7.70	19.0	7600	11.5	3500	500	500	C1180	20	40
851	11.0	15.50	20.5	15000	47.0	2500	1000	750	C1700	3	15
852	10.0	3.25	12.0	1200	2.6	3000	150	100	C165	30	120

* Ratings given are typical of the class of service in which the tube is most commonly used.

The letter preceding each rating identifies the particular class of service as follows:

A —power output per tube as Class A power amplifier and modulator

AB—power output per pair of tubes as Class AB power amplifier and modulator

B —power output per tube as Class B power amplifier and modulator

BR—power output per pair of tubes as Class B Radio Frequency power amplifier

C —power output per tube as Class C power amplifier or oscillator

CP—power output per tube as Class C plate modulated power amplifier

AMPEREX RECTIFYING TUBES

MERCURY VAPOR RECTIFIERS

TYPE NO.	FILAMENT Volts	FILAMENT Amps.	Peak Inverse Volts	Approx. ◆Ave. Plate Amps.	Peak Plate Amps.
249B	2.5	7.50	7500	0.50	1.5
258B	2.5	7.50	7500	0.50	1.5
266B	5.0	42.00	22000	7.00	20.0
267B	5.0	6.75	10000	1.25	5.0
315A	5.0	10.00	15000	1.50	6.0
575A	5.0	10.00	15000	1.50	6.0
857B	5.0	40.00	22000	10.00	40.0
866	2.5	5.00	7500	0.25	1.0
866A	2.5	5.00	10000	0.25	1.0
869B	5.0	20.00	20000	2.50	10.0
872A	5.0	6.75	10000	1.25	5.0

◆ Actual value will depend on wave-form resulting from load and filter circuit.

WATER-COOLED VACUUM RECTIFIERS

TYPE NO.	FILAMENT Volts	FILAMENT Amps.	Peak Inverse Volts	Ave. Emission Amps.	Peak Plate Amps.
222A	21.5	41.00	25000	7.0	5.5
237A	20.0	61.00	50000	10.0	8.0

RADIATION COOLED HIGH VACUUM RECTIFIERS

TYPE NO.	FILAMENT Volts	FILAMENT Amps.	Peak Inverse Volts	Ave. Emission Amps.	Peak Rate Amps.
8020	5	6	40000	0.100	0.750
221A	5	10	25000	0.300	1.5

AMPEREX

ELECTRONIC PRODUCTS

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EXTRA

TYPEWRITER KEYBOARD PERFORATOR AND TRANSMITTER OF THE WHEATSTONE TYPE

SEVERAL different types of these instruments will be available. » One type is a complete perforator and transmitter in one unit designed to be used on heavy circuits now manually operated. This will provide high speed, accurate transmission with less fatigue for both the sending and receiving operator. It will also greatly reduce the possibilities of errors. The transmitting, of course, may be done by a typist with no knowledge of the code. » There will be available also the regular commercial type of separate perforator and transmitter.

FOLDER WITH FULL DESCRIPTION WILL BE FURNISHED UPON REQUEST

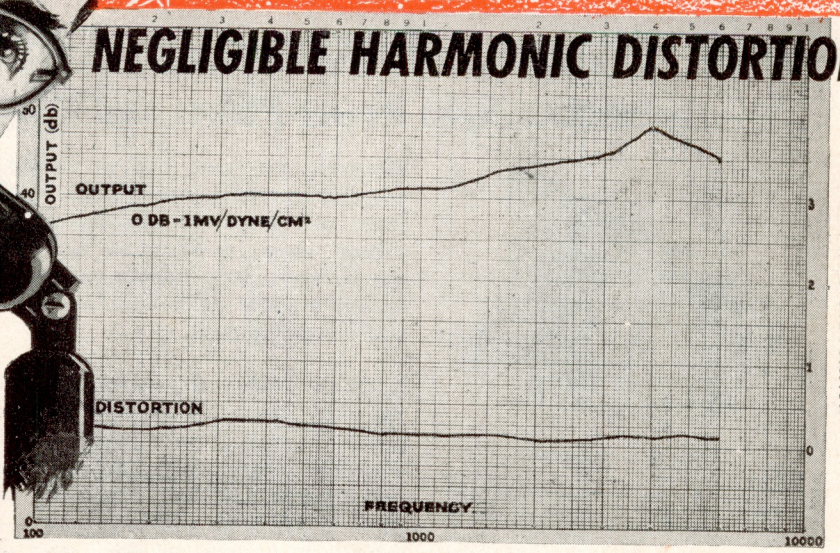
Also complete line of Code Instruction instruments. MASTER TELEPLEX remains the only Code instructor that will record your own sending so that you can see exactly how you make your signals and then repeat them back to you.

WRITE FOR BOOKLET QB

TELEPLEX CO.

107 Hudson Street «» Jersey City, N. J.

NEGLIGIBLE HARMONIC DISTORTION

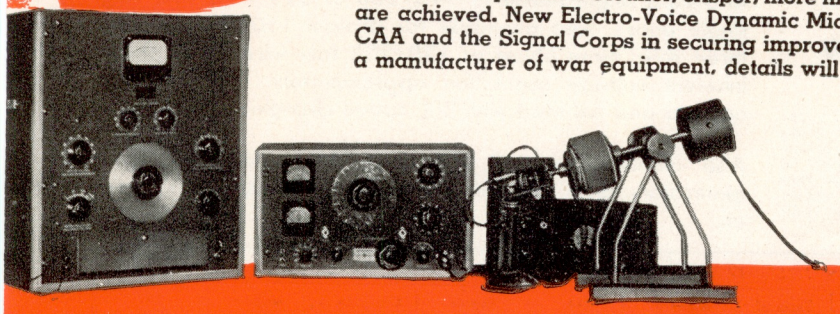


A Statement of Fact —Not a Boast

Every microphone manufactured by Electro-Voice has been designed and developed by our engineers—many in collaboration with the U. S. Army Signal Corps.

Harmonic distortion is the addition of spurious frequencies to the fundamental in definite harmonic relationship. Though the frequency curve may be excellent, harmonic distortion turns up as raspy reproductions, with an unnatural twang in microphones, amplifiers and speakers. Five percent is considered a satisfactory upper limit for good reproduction, and as much as fifteen percent is allowable for speech communication.

Now come new Electro-Voice Dynamic Microphones with radical innovations in diaphragm fabrication, reducing harmonic distortion to a lower degree than hitherto possible. Cleaner, crisper, more highly intelligible reproductions are achieved. New Electro-Voice Dynamic Microphones are aiding both the CAA and the Signal Corps in securing improved communications. If you are a manufacturer of war equipment, details will be sent upon request.



The Harmonic Wave Analyzer measures the presence of spurious frequencies introduced by microphone distortion. To the ear, such frequencies give the feeling of ragged and false speech quality that may be unintelligible under the stress and strain of battle.

Electro-Voice engineers have found a way to eliminate harmonic distortion in microphone design, as proved by the Wave Analyzer; and the completely natural reproduction from the new Electro-Voice microphones.

Electro-Voice MICROPHONES

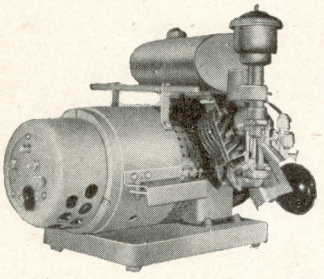
ELECTRO-VOICE MANUFACTURING CO., INC. · 1239 SOUTH BEND AVENUE · SOUTH BEND, INDIANA

Export Division: 13 East 40th Street, New York 16, N. Y. — U. S. A. *Cables: ARLAB*

KATOLIGHT

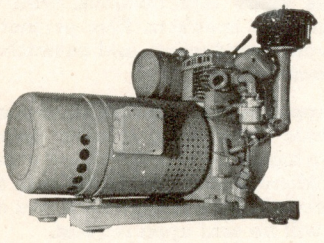
110-VOLTS A.C. ANYTIME, ANYWHERE!

with Katolight Power Plants and Generators



23A, 500 WATTS, AC

500-watt, self-excited generator, 110-volts, 60-cycle AC 1800 r.p.m. Bolted directly to engine crankcase. 22 amperes at 6-volts DC may be drawn from the DC terminals when plant is not carrying full AC load. Brushes easily accessible for adjustment and inspection. Filtered and shielded for radio operation. Powered with a Johnson 1 h.p. single cylinder aircooled engine. 21" long x 16½" wide x 17½" high, weight 135 lbs.; shipping wt. 170 lbs.



28A, 1500 WATTS, AC

1500-watt, self-excited generator, 110-volts, 60-cycle AC 1800 r.p.m. Bolted directly to engine crankcase. Brushes easily accessible for replacement and adjustment. Filtered and shielded for radio operation. Good voltage regulation. Plant complete ready to go by adding gasoline and oil. Powered with a Briggs & Stratton Model ZP, single cylinder, aircooled engine.

Generate the same kind of current obtained from power lines for operating transmitters, receivers, sound apparatus, radio and electronic equipment, lights, etc. For continuous service where no source of A.C. is available—for summer homes, farms, filling stations, resorts or for standby emergency service in case of power line failure for hospitals, radio stations and so forth.

Katolight Plants and generators supply electricity right out in the field where power line hook-up is not available. They permit equipping our fighting forces with the most modern electrical appliances. Fighting forces need guns, planes, tanks, trucks, kitchens, emergency hospitals, lights, and so forth. To keep this equipment going, complete repair equipment such as drills, grinders, saws, air compressors, grease guns, and electrical testing devices are needed. Katolight generators supply this electricity. They also supply current for beacons, land field controls and other uses too numerous to mention.

350 through 25,000 watts capacities available

Can be furnished for all standard voltages, 110, 220, or 440 volts single phase or 115/230 or 220/440, four ring, single phase. Also available for straight 110, 220 or 440, three wire, three phase or 120/208 four wire, three phase. Inherent voltage regulation approximately 10% between no load and full load with 3% speed change.

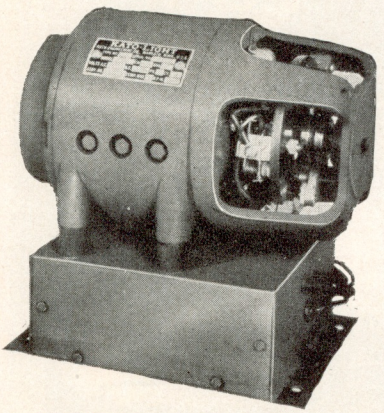
Also manufacturers of A.C. and D.C. generators, motor generators, high frequency generators, frequency changers, etc.

Watts Capacity	Model No.	Code Word	Type of Cooling	Make of Engine	No. Cyl.	Engine H.P.	Cranking Volts	Ship. Wt.	List Price
110-VOLTS, 60-CYCLE, 1800 R.P.M.									
350	19HAJ4	ABODE	air	Johnson	1	⅝	6	125	$102.00
500	23HAJ4	ABTOL	air	Johnson	1	1	6	170	158.00
600	14HAB4	ALERT	air	*B & S	1	1.4	12	220	210.00
1000	26HAB4	ABBOT	air	*B & S	1	2.4	12	295	298.00
1500	28HAB4	ABEAR	air	*B & S	1	4.5	18	340	365.00
2000	30HAB4	ABIDE	air	*B & S	1	5	18	360	450.00
4000	44HAW4	ACTIN	air	LeRoi	4	13	24	800	750.00
5000	45HAL4	ALBION	water	LeRoi	4	16	32	880	850.00
7500	47HAL4	ALBON	water	LeRoi	4	19	6	1290	1350.00
10,000	49HAL4	ALBUN	water	LeRoi	4	26	6	1680	1460.00
15,000	51HAL4	ACTIV	water	LeRoi	4	38	6	1680	1630.00
1200 R.P.M.									
5000	45HAL6	ALBERT	water	LeRoi	4	19	6	1290	1100.00
7500	47HAL6	ALBOX	water	LeRoi	4	26	6	1680	1460.00
10,000	49HAL6	ALBUS	water	LeRoi	4	38	6	1680	1630.00
15,000	51HAL6	ALBAT	water	LeRoi	4	38	6	1680	1760.00

*Briggs & Stratton

KATOLIGHT

KATOLIGHT ROTARY KONVERTERS



MODEL 5KA23, 5KA33, 5KA43
225 volt-amperes continuous load capacity at 3600 R.P.M. 40°C Temperature Rise

Illustrations show machines with covers removed

Specifications on machines with special voltages furnished on request

Changes 32, 110 or 220-volts D.C. to standard 110-volt, 60-cycle A.C. Permits using standard 60-cycle A.C. appliances where the source of current is direct current.

Everything has been done in the design of these machines to minimize radio interference, reduce ripple and to provide best possible wave form. D.C. ripple is low because of extra number of commutator bars. Pole pieces shaped from scientific procedure eliminating trouble making harmonics. Very high efficiency due to low loss 26 Gauge electrical sheets.

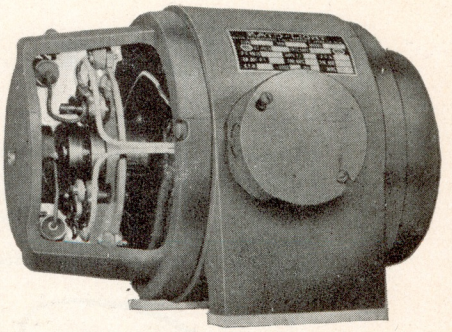
Furnished with and without filter. Filter not needed for operation of appliances such as electric signs, amplifiers, etc. Special filters furnished upon specification. Smaller sizes available with governor. Recommended where D.C. input voltage is not steady.

Power factor of load should be specified when ordering converter. If unknown, describe load—whether transformers, electric motors or resistive.

KATO ROTARY KONVERTERS, 3600 R.P.M., BALL BEARING

D.C. Input	*Capacity Volt-Amperes	Output A.C.	Model No.	Code Word	Frame Patt. No.	R.P.M.	Dimensions Without Filter			Net Wt.	Ship. Wt.
							Length	Height	Width		
32	110	110	3KA43	KIT	641	3600	8 1/2''	7 1/16''	6 7/8''	29	39
32	150	110	4KA43	KIG	5–1	3600	10 3/4''	7 1/16''	6 7/8''	52	62
32	225	110	5KA43	KIY	5–1	3600	10 3/4''	7 1/16''	6 7/8''	52	62
32	350	110	19KA43	KIN	7–1	3600	11 3/4''	7 13/16''	7 13/16''	65	75
32	500	110	23KA43	KIB	642	3600	12 7/8''	7 13/16''	7 13/16''	72	85
32	750	110	14KA43	KID	627	3600	12 7/8''	10 7/8''	11 1/2''	105	125
32	1000	110	26KA43	KIP	627	3600	12 7/8''	10 7/8''	11 1/2''	111	131
110	110	110	3KA33	KAT	641	3600	8 1/2''	7 1/16''	6 7/8''	29	39
110	150	110	4KA33	KAG	5–1	3600	10 3/4''	7 1/16''	6 7/8''	52	62
110	225	110	5KA33	KAY	5–1	3600	10 3/4''	7 1/16''	6 7/8''	52	62
110	350	110	19KA33	KAN	7–1	3600	11 3/4''	7 13/16''	7 13/16''	65	75
110	500	110	23KA33	KAB	642	3600	12 7/8''	7 13/16''	7 13/16''	72	85
110	750	110	14KA33	KAD	627	3600	12 7/8''	10 7/8''	11 1/2''	105	125
110	1000	110	26KA33	KAP	627	3600	12 7/8''	10 7/8''	11 1/2''	111	131
220	110	110	3KA23	KET	641	3600	8 1/2''	7 1/16''	6 7/8''	29	39
220	150	110	4KA23	KEG	5–1	3600	10 3/4''	7 1/16''	6 7/8''	52	62
220	225	110	5KA23	KEY	5–1	3600	10 3/4''	7 1/16''	6 7/8''	52	62
220	350	110	19KA23	KEN	7–1	3600	11 3/4''	7 13/16''	7 13/16''	65	75
220	500	110	23KA23	KEB	642	3600	12 7/8''	7 13/16''	7 13/16''	72	85
220	750	110	14KA23	KED	627	3600	12 7/8''	10 7/8''	11 1/2''	105	125
220	1000	110	26KA23	KEP	627	3600	12 7/8''	10 7/8''	11 1/2''	111	131
1800 R.P.M. BALL BEARING											
32	350	110	19KA44	KINK	232–1	1800	12 7/8''	9''	9''	87	106
32	500	110	23KA44	KICE	263–1	1800	12 3/4''	10 1/2''	10 1/4''	135	171
32	750	110	14KA44	KITE	263–1	1800	12 3/4''	10 1/2''	10 1/4''	135	171

*Watts when operating non inductive load



MODEL 19KA23, 19KA33, 19KA43
350 volt-amperes continuous load capacity at 1800 R.P.M. 40°C Temperature Rise

KATO ENGINEERING COMPANY, Inc., MANKATO, MINNESOTA

3 Plants . . . 2 Flags . . . ONE PURPOSE

To beat the band of Axis bandits, three Solar factories are now operating "round the clock". The men and women of Eastern Plants 1 and 2 were told "Well Done" by the Army and Navy; they proudly wear the Army-Navy "E".

The Midwestern Plant has just started production; the men and women of this modern air-conditioned factory are ready to help you speed the day of Victory.

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Solar Manufacturing Corporation, General Offices: Bayonne, New Jersey.

Solar SOLAR —CAPACITORS—

CAPACITORS and RADIO NOISE-SUPPRESSION FILTERS

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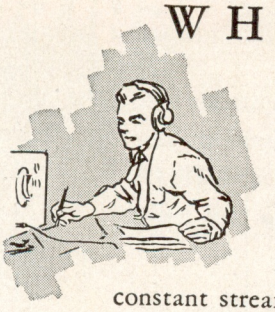
WHEREIN WE SERVE



New and unusual calls for wartime supply have enlarged the scope of Allied service. As a result, Allied has been termed a centralized arsenal of supply for *everything in radio and electronics*. Twenty years of specialized experience has made this possible. From the large Allied stock flows a constant stream of radio and electronic parts and equipment . . . earmarked for the war training centers, the battle fronts, the war plants, the laboratories and the government agencies of the United Nations.

★ Perhaps the soldier who transmits urgent battlefront messages was trained on equipment supplied by Allied Radio. Perhaps a vital production line was kept going, a new development project completed sooner, a communications service maintained, or a needed repair part quickly obtained—because of some service Allied was able to render.

★ Close contact with all leading manufacturers has been a factor in coordinating and simplifying procurement of every type of item for radio communications, as well as industrial electronic applications. Precious time has been saved . . . deliveries have been expedited. A technical staff frequently assists on design and application problems.

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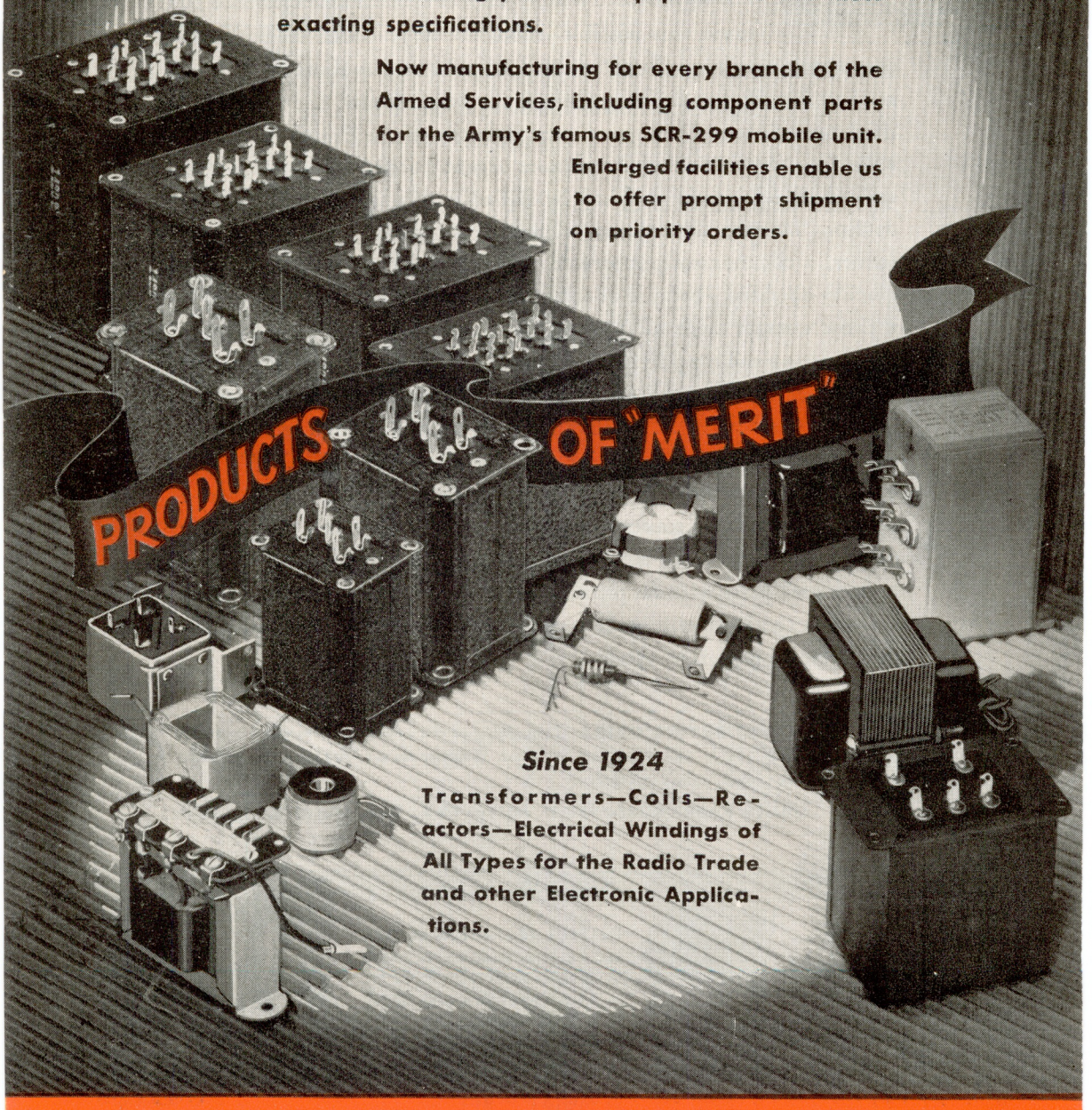
Now manufacturing for every branch of the Armed Services, including component parts for the Army's famous SCR-299 mobile unit.

Enlarged facilities enable us to offer prompt shipment on priority orders.



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The "BUG" Trade Mark identifies the Genuine Vibroplex

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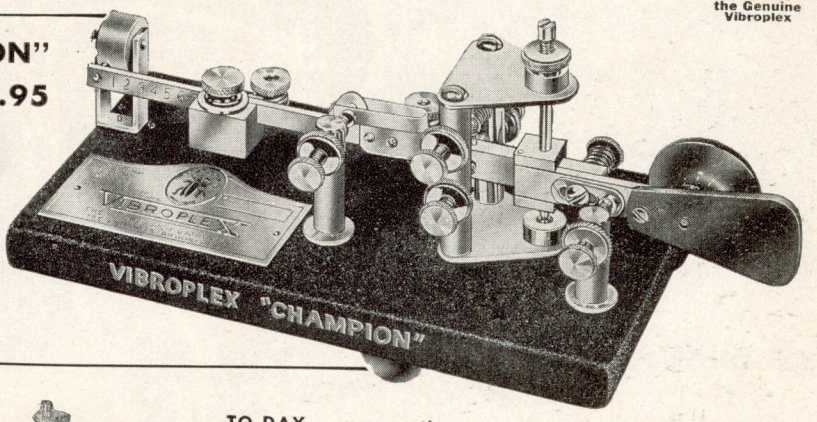
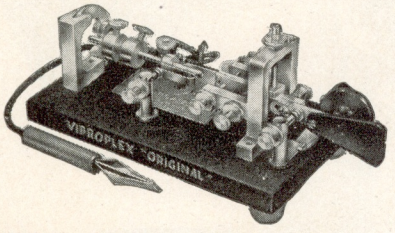
ONLY $9.95

Answers every need for a low-priced semi-automatic radio key that's smart, efficient and dependable. Easy to use. Full size black crackle base. Bright plated parts. 3/16th contacts. Without circuit closer, cord and wedge. *For radio use only.*





TO-DAY . . . more than ever before telegraphing demands the utmost in sending skill and endurance to withstand long operating periods. Day after day the world over . . . the VIBROPLEX SEMI-AUTOMATIC KEY is demonstrating its ability to develop sending skill to a remarkable degree, and at the same time cut sending effort in half. No wonder experienced operators—over 100,000 of them—use only VIBROPLEX.

FAMOUS "ORIGINAL" MODEL

This popular key has proved its ability to do a high-class sending job anywhere, anytime. Internationally famous for its smooth, rhythmic action, distance reach, superior signal and easy manipulation. Every necessary detail perfected for expert sending performance. Standard black crackle base. Bright machined parts. Precision construction including **DIE CUT** contact and main spring. 3/16th contacts. Complete with circuit closer, cord and wedge..... **$15.95**

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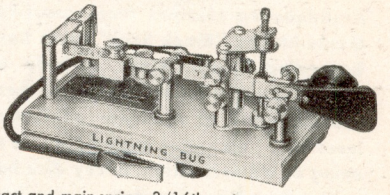

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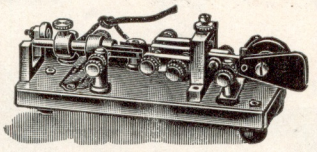

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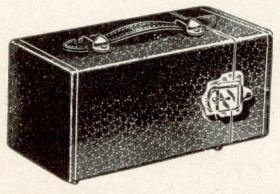

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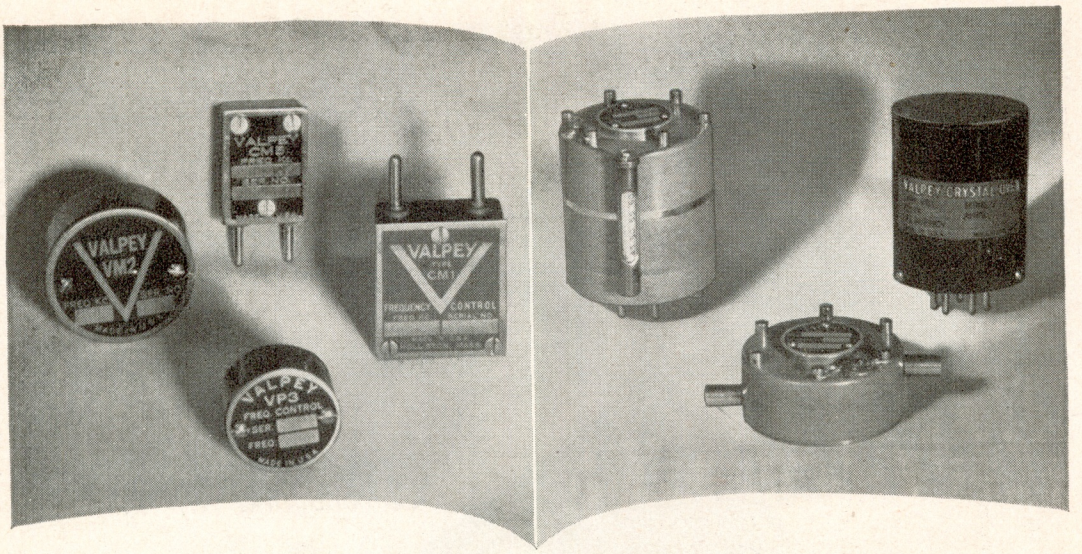

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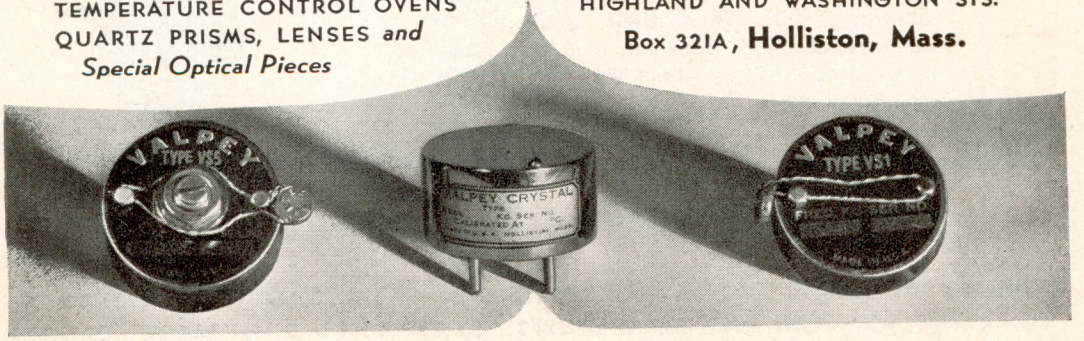

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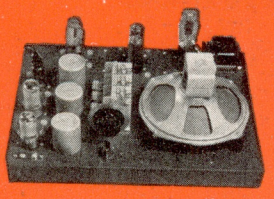

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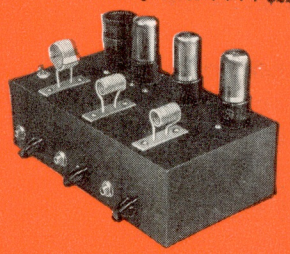

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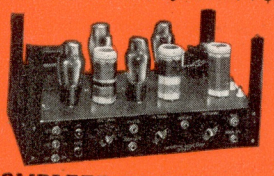

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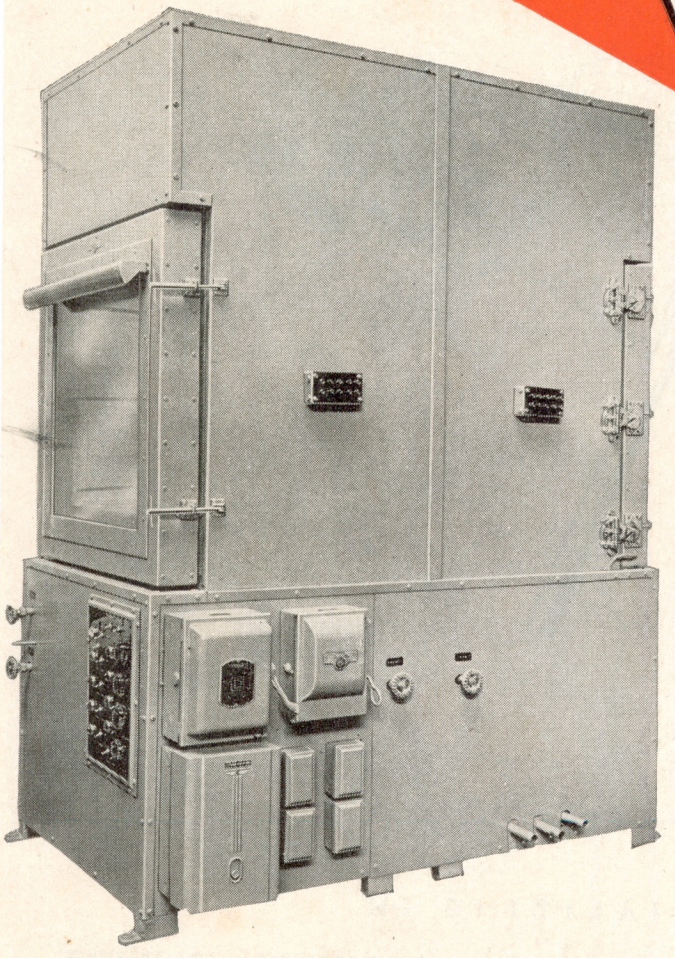

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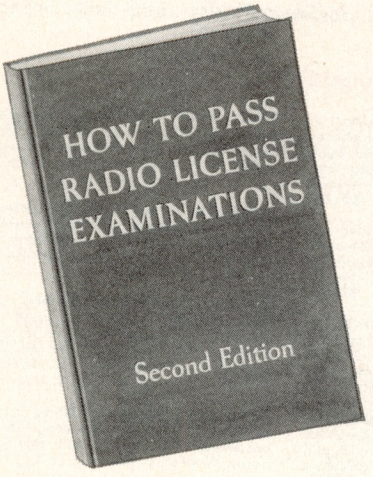

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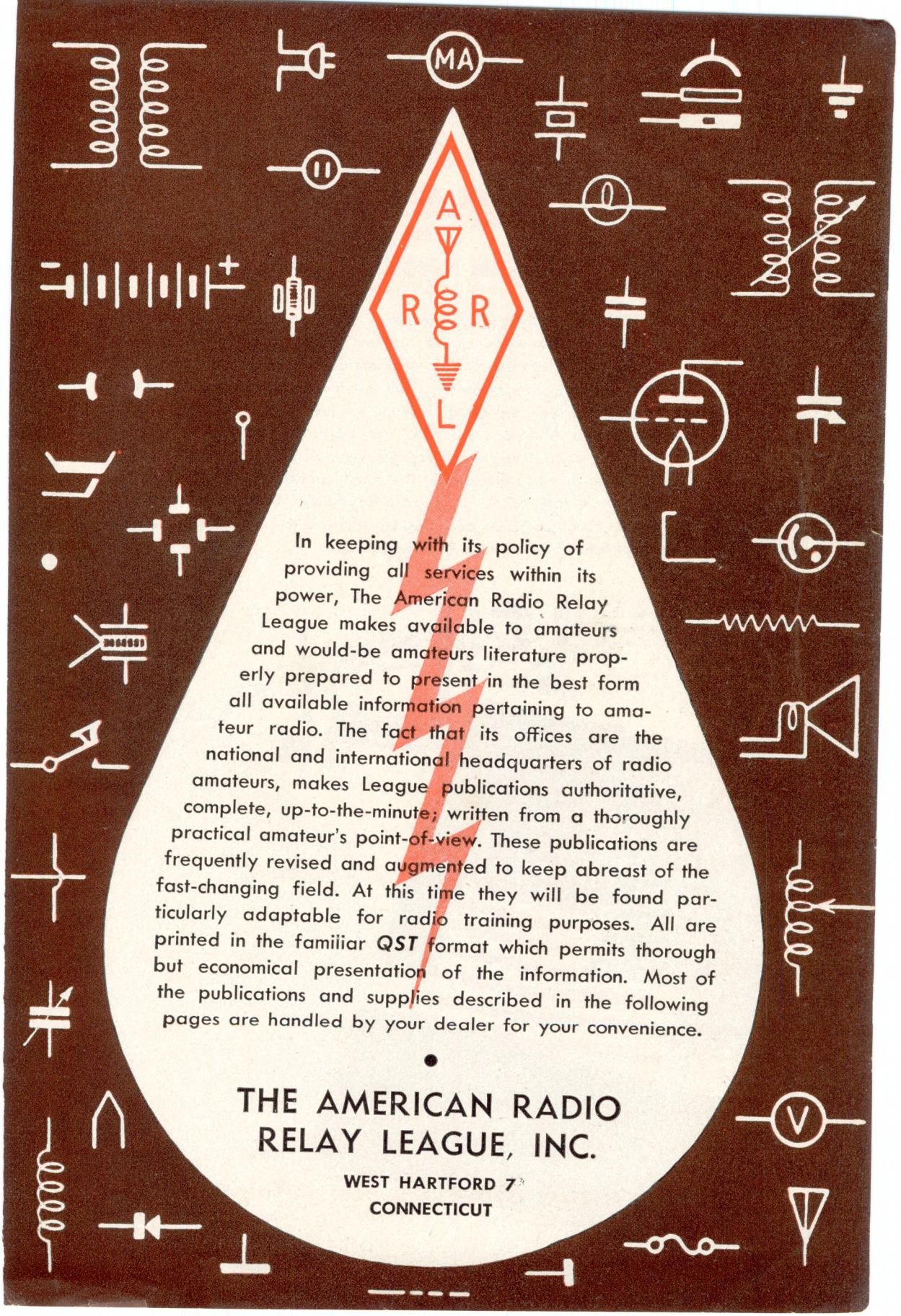

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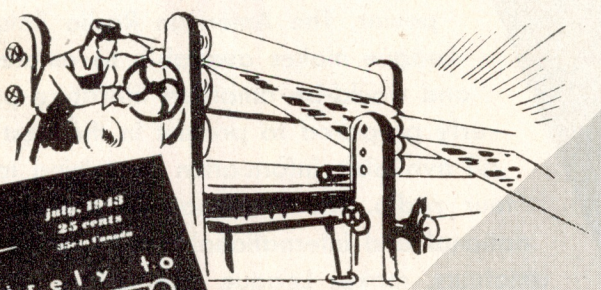

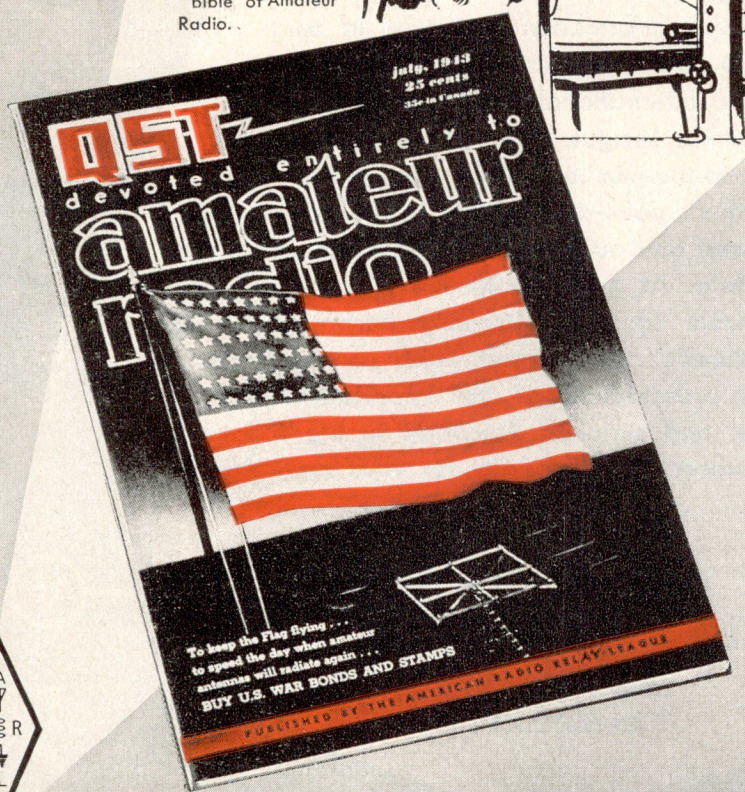

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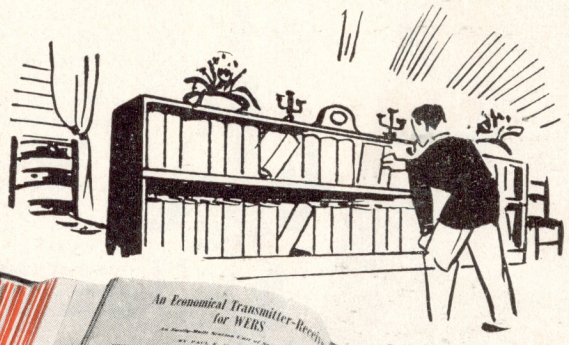

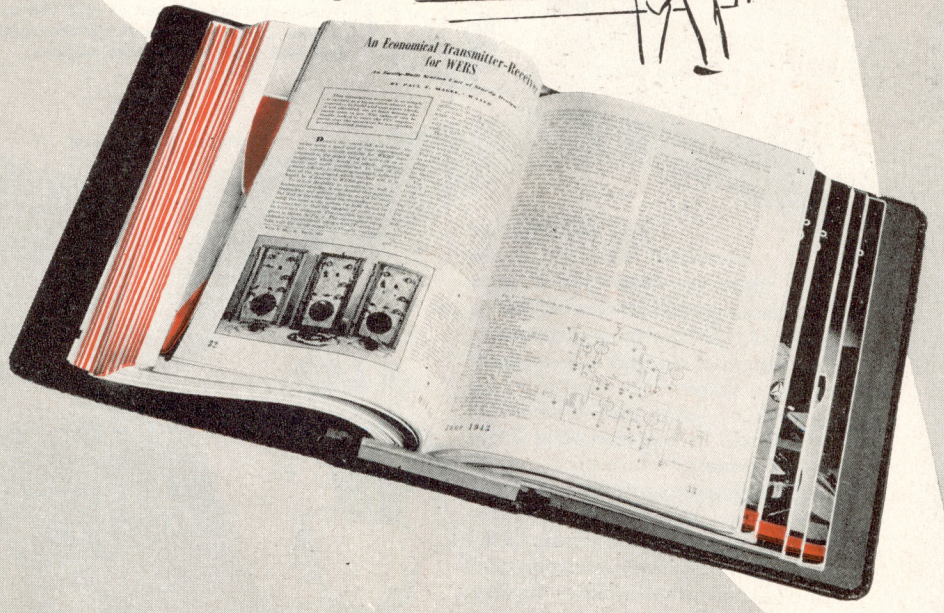

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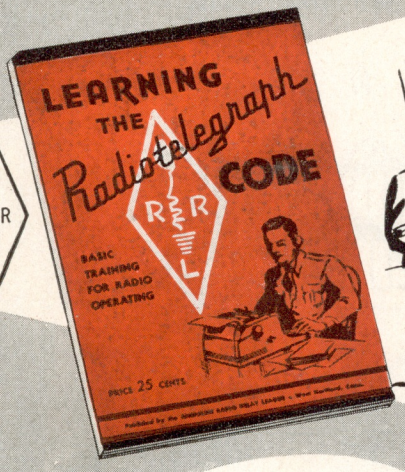

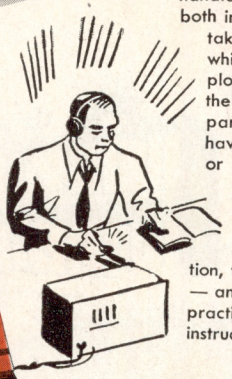

Designed to train students to handle code skillfully and with precision, both in sending and in receiving, this booklet takes first rank among the League's publications which meet today's special training needs. Employing a novel system of code-learning based on the accepted method of *sound* conception, it is particularly excellent for the student who does not have the continuous help of an experienced operator or access to a code machine. It is similarly helpful home-study material for members of code classes. Adequate practice material is included for classwork as well as for home-study. There are also helpful data on high-speed operation, typewriter copy, general operating information — and an entire chapter on tone sources for code practice, including the description of a complete code instruction table with practice oscillator.

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To obtain an amateur operator's license you must pass a government examination. The License Manual tells how to do that—tells what you must do and how to do it. It makes a simple and comparatively easy task of what otherwise might seem difficult. In addition to a large amount of general information, it contains questions and answers such as are asked in the government examinations. If you know the answers to the questions in this book, you can pass the examination without trouble.

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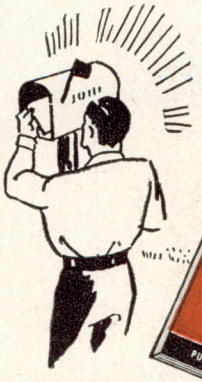

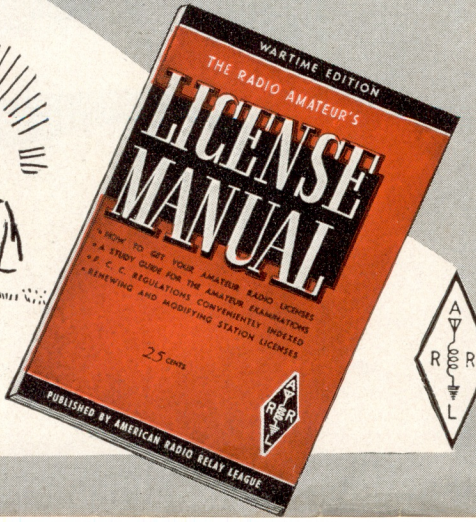

Amateurs are noted for their ingenuity in overcoming by clever means the minor and major obstacles they meet in their pursuit of their chosen hobby. An amateur must be resourceful and a good tinkerer. He must be able to make a small amount of money do a great deal for him. He must frequently be able to utilize the contents of the junk box rather than buy new equipment. Hints and Kinks is a compilation of hundreds of good ideas which amateurs have found helpful. It will return its cost many times in money savings—and it will save hours of time.

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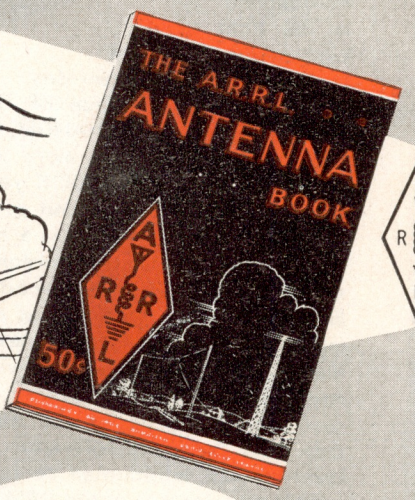
A comprehensive manual of antenna design and construction, by the headquarters staff of the American Radio Relay League. Eighteen chapters, profusely illustrated. Both the theory and the practice of all types of antennas used by the amateur, from simple doublets to multi-element rotaries, including long wires, rhomboids, vees, phased systems, u.h.f. systems, etc. Feed systems and their adjustment. Construction of masts, lines and rotating mechanisms. The most comprehensive and reliable information ever published on the subject.



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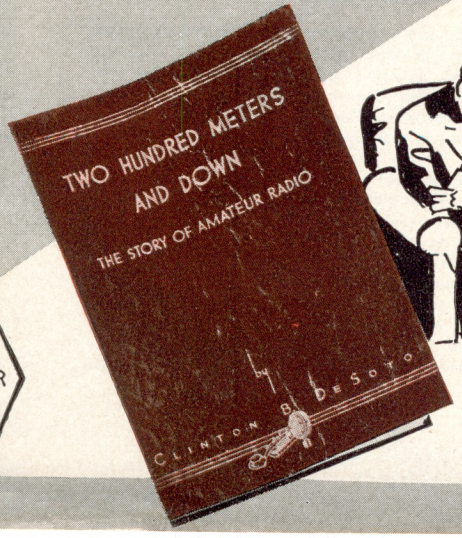

The Story of Amateur Radio, by Clinton B. DeSoto—a detailed, accurate presentation in full book length of all the elements that have served to develop the most unique institution of its kind in the history of the world. A book of history but not a history-book, TWO HUNDRED METERS AND DOWN: The Story of Amateur Radio tells in spirited, dramatic fashion the entire chain of significant events in the development of the art.

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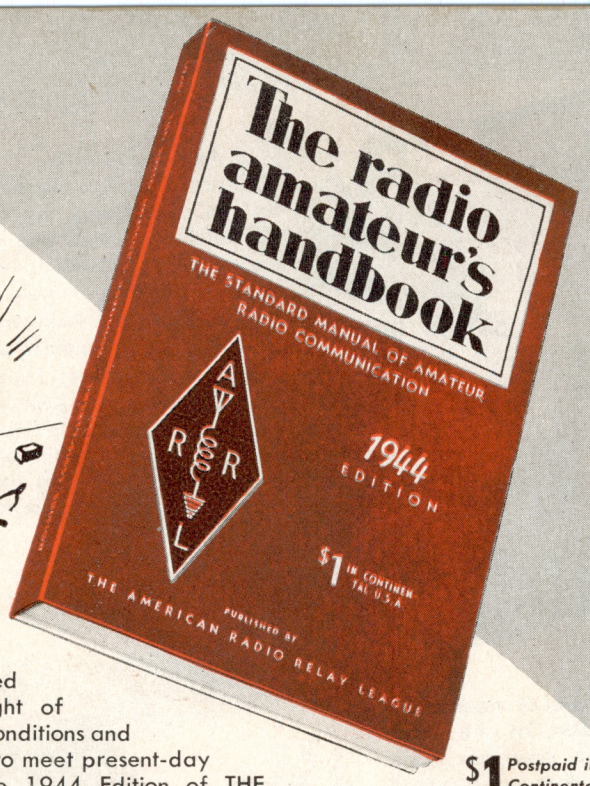

Re-designed in the light of wartime conditions and re-styled to meet present-day needs, the 1944 Edition of THE RADIO AMATEUR'S HANDBOOK contains more pages and more information per page than any HANDBOOK yet published. Greatly expanded, the revised and re-written section on theory and fundamentals is basically the same highly successful treatment that made the HANDBOOK the world's outstanding radio training text. In addition to the established features, the new edition includes an enlarged chapter on the War Emergency Radio Service and an entirely new chapter on carrier-current communication, plus other useful new material—all added without sacrificing any of the essential information in previous editions. Every subject encountered in practical radio communication is covered, arranged for maximum convenience to the reader, sectionalized by topics with abundant cross-referencing and fully indexed. More than ever the ideal reference work, the 1944 edition also contains the practical constructional information on tested and proved gear which has always been the outstanding feature of the HANDBOOK.

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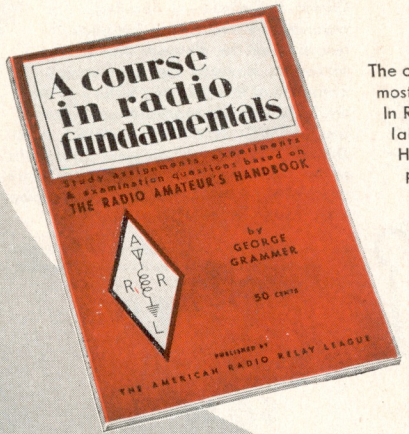

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The objective in preparing this course was to accent those principles most frequently applied in actual radio communication. "A Course In Radio Fundamentals" is a study guide, examination book and laboratory manual. Its text is based on the "Radio Amateur's Handbook." Either the special edition for war training purposes or the Standard Edition may be used. References contained in the "Course" are identical in both editions. As a text, this book greatly smooths the way for the student of the technicalities of radio. It contains interesting study assignments, experiments and examination questions for either class or individual instruction. It describes in detail 40 experiments with simple apparatus giving a complete practical knowledge of radio theory and design.