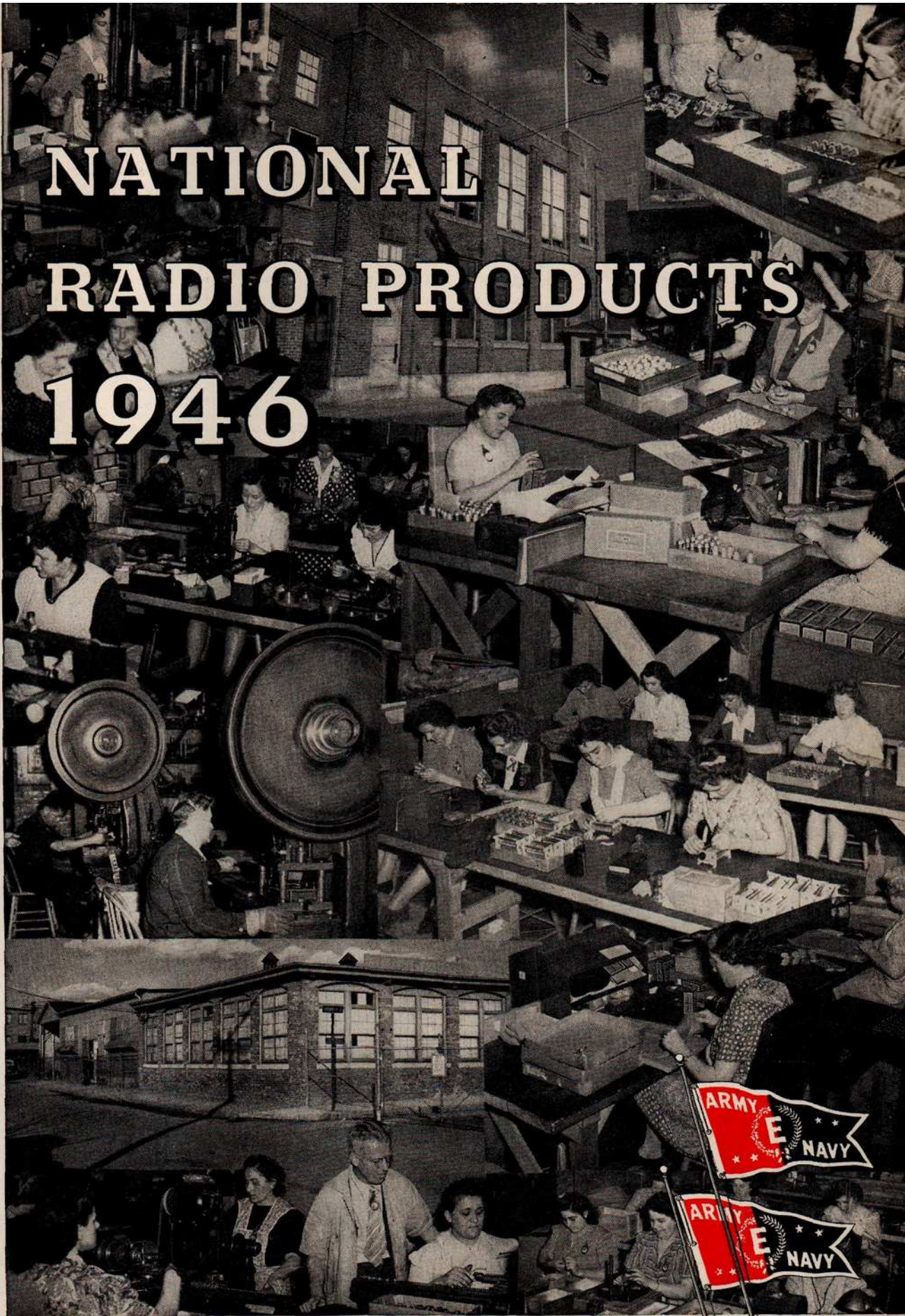


NATIONAL RADIO PRODUCTS 1946

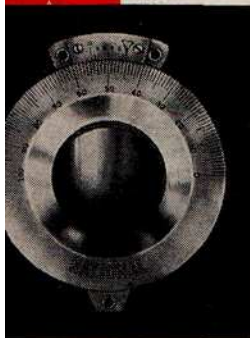


NATIONAL COMPANY, INC.
MALDEN, MASSACHUSETTS, U.S.A.

MALDEN
MELROSE
★★★★



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 1/4" shaft. **Specify scale.**

N Dial List \$

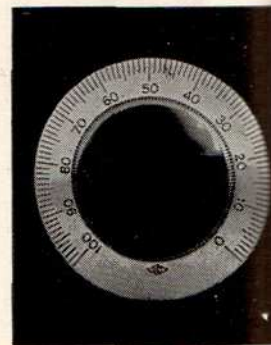


"Velvet Vernier" Dial, Type B, has a compact variable ratio 6 to 1 minimum, 20 to 1 maximum drive that is smooth and trouble free. An illuminator is available. The case is black bakelite. 1 or 5 scale. 4" diam. Fits 1/4" shaft. **Specify scale.**

B Dial List \$
Illuminator, extra List \$

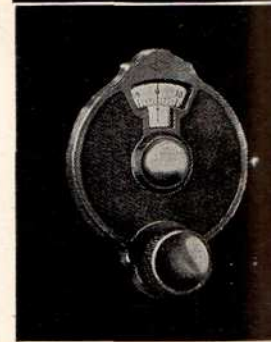
The original "Velvet Vernier" mechanism is now available in a metal skirted dial 3" in diameter. The planetary drive has a ratio of 5 to 1. It is available with 2, 3, 4, 5 or 6 scale and fits 1/4" shaft. **Specify scale.**

AM Dial List \$



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 1/4" shaft. **Specify scale.**

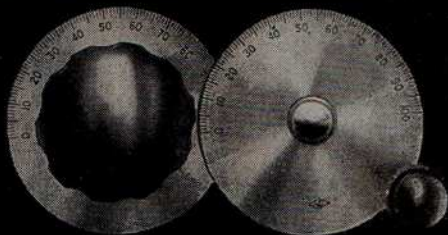
BM Dial List \$



INEXPENSIVE DIALS



TYPE R
List \$
1 5/8" Dia.
Etched Nickel
Silver



TYPE O
List \$
3 1/2" Dia.

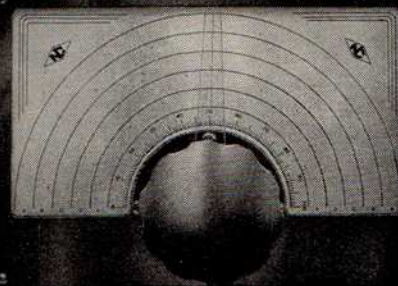
TYPE L
List \$
5" Dia.

TYPE K
List \$
3 1/2" Dia.

TYPE M
List \$
5" Dia.

R Dial scale 3 only but marked 10-0; O, K, L, M scale 2. All fit 1/4" shafts.

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 7 1/4"
- Five blank scales for direct calibration
- Employs Velvet Vernier Drive
- Easy to mount

TYPE ACN List \$



KNOBS

HRK (Fits 1/4" shaft) List \$
Black bakelite knob 2 3/8" diam.



HRP-P (Fits 1/4" shaft) List \$
Black bakelite knob 1 1/4" long and 1/2" wide. Equipped with pointer.

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

| 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 |

ACCESSORIES

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

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

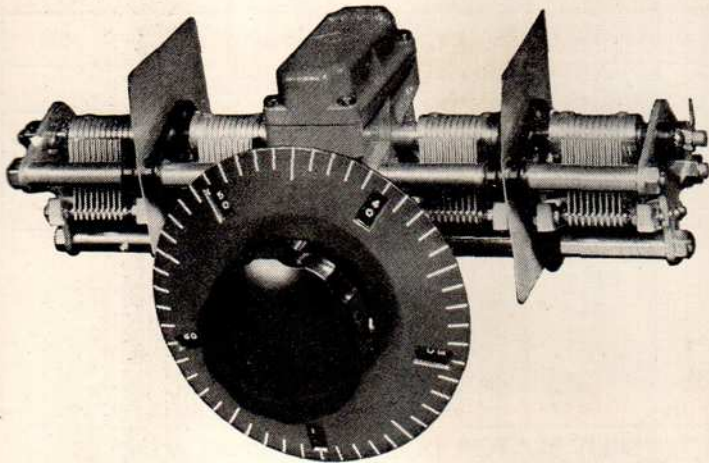
SB (Fits 1/4" shaft) List \$
A nickel plated brass bushing 1/2" diam.



RSL (Fits 1/4" shaft) List \$
Rotor Shaft Lock for TMA, TMC and similar condensers.



NATIONAL PRECISION CONDENSERS



The Micrometer dial reads direct to one part in 500. Division lines are approximately $\frac{1}{4}$ " 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.

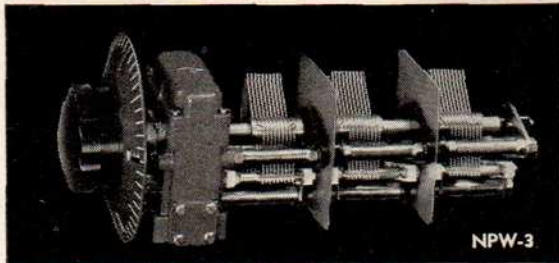
PW Condensers are available in 2, 3 or 4 sections, in either 160 or 225 mmf per section. Larger capacities cannot be supplied.

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 \$ | PW-3R | Double section right; single left | List \$ |
| PW-1L | Single section left | List \$ | | | |
| PW-2R | Double section right | List \$ | PW-3L | Double section left; single right | List \$ |
| PW-2L | Double section left | List \$ | | | |
| PW-2S | Single section each side | List \$ | PW-4 | Double section each side | List \$ |

NPW MODELS with micrometer dial

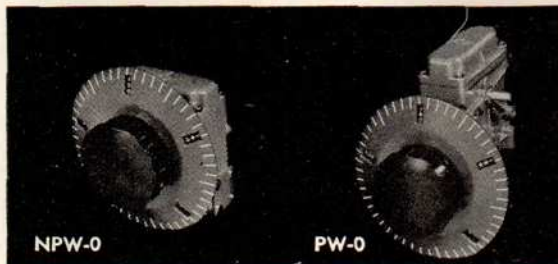


NPW-3. Three sections, each 225 mmf.
List \$

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

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

GEAR DRIVE UNITS with micrometer dial



NPW-O List \$

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

PW-O List \$

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

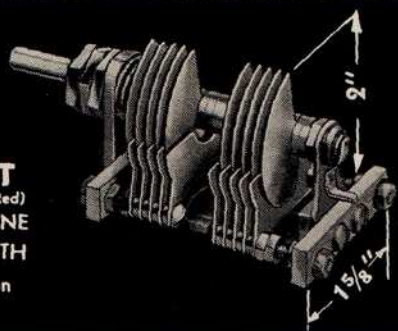


MICROMETER DIAL

PW-D List \$

Identical with the dials used on the condensers and drives above. It revolves ten times in covering the complete range and as there is no gear reduction unit furnished, the driven shaft will revolve ten times, also. The PW-D dial fits a shaft $\frac{5}{16}$ " in diameter.

NATIONAL RECEIVING CONDENSERS

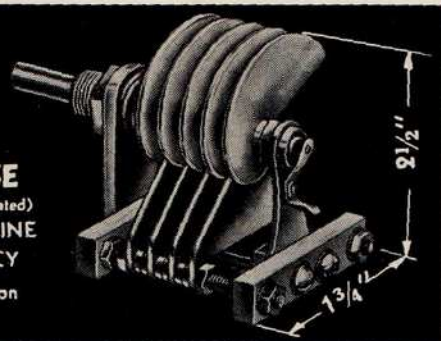


TYPE ST
(Type STD Illustrated)
STRAIGHT-LINE
WAVELENGTH
180° Rotation

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.

| 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 | \$ | |
| 25 | 3.25 | 4 | .018" | 1 3/16" | STHS- 25 | | |
| 50 | 3.5 | 7 | .018" | 1 3/16" | STHS- 50 | | |
| DOUBLE BEARING MODELS | | | | | | | |
| 35 Mmf. | 6 Mmf. | 8 | .026" | 2 1/4" | ST- 35 | \$ | |
| 50 | 7 | 11 | .026" | 2 1/4" | ST- 50 | | |
| 75 | 8 | 15 | .026" | 2 1/4" | ST- 75 | | |
| 100 | 9 | 20 | .026" | 2 1/4" | ST-100 | | |
| 140 | 10 | 27 | .026" | 2 3/4" | ST-140 | | |
| 150 | 10.5 | 29 | .026" | 2 3/4" | ST-150 | | |
| 200 | 12.0 | 27 | .018" | 2 1/4" | STH-200 | | |
| 250 | 13.5 | 32 | .018" | 2 3/4" | STH-250 | | |
| 300 | 15.0 | 39 | .018" | 2 3/4" | STH-300 | | |
| 335 | 17.0 | 43 | .018" | 2 3/4" | STH-335 | | |
| SPLIT STATOR DOUBLE BEARING MODELS | | | | | | | |
| 50-50 | 5-5 | 11-11 | .026" | 2 3/4" | STD- 50 | | \$ |
| 100-100 | 5.5-5.5 | 14-14 | .018" | 2 3/4" | STHD-100 | | |

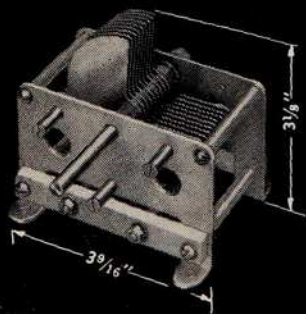


TYPE SE
(Type SEU Illustrated)
STRAIGHT-LINE
FREQUENCY
270° Rotation

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.

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

TYPE EM
STRAIGHT-LINE
CAPACITY
180° Rotation



| Capacity | Minimum Capacity | No. of Plates | Length | Catalog Symbol | List |
|----------|------------------|---------------|--------|----------------|------|
| 350 Mmf. | 12 Mmf. | 20 | 2 5/8" | EM-350 | \$ |
| 500 | 16 | 29 | 4 3/8" | EM-500 | |
| 1000 | 22 | 56 | 6 3/4" | EM-1000 | |

TYPE EM — A general purpose condenser available in large sizes and having Straight-Line capacity plates. 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.

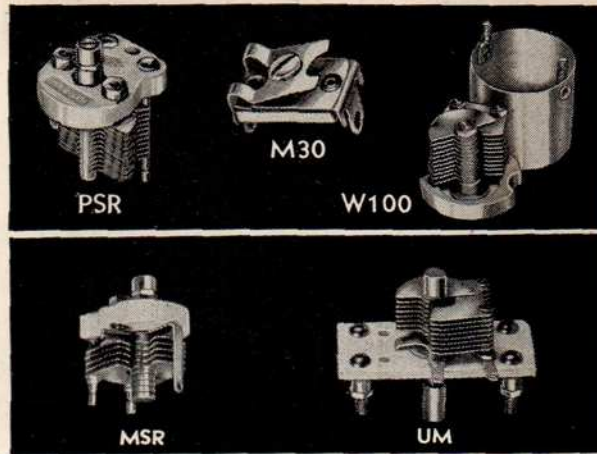
NATIONAL MINIATURE CONDENSERS

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

PSE — See table —
Type PSE condensers are similar to Type PSR, but are provided with a 1/4" diameter shaft extension at each end.

PSL — See table —
Type PSL condensers are similar to Type PSR, 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 PS series described above, but they differ in making use of plates which are like those of the UM condenser. This and other small changes result in a more robust and rigid assembly. Other details of the MSR, MSE, and MSL are the same as the PSR, PSE, and PSL respectively.



| Capacity | Catalog Symbol | | | List |
|----------|----------------|---------|---------|------|
| 25 mmf. | PSR-25 | PSE-25 | PSL-25 | \$ |
| 50 | PSR-50 | PSE-50 | PSL-50 | |
| 75 | PSR-75 | PSE-75 | PSL-75 | |
| 100 | PSR-100 | PSE-100 | PSL-100 | |
| 140 | PSR-140 | PSE-140 | PSL-140 | |

| Capacity | Catalog Symbol | | | List |
|----------|----------------|---------|---------|------|
| 25 mmf. | MSR-25 | MSE-25 | MSL-25 | \$ |
| 50 | MSR-50 | MSE-50 | MSL-50 | |
| 75 | MSR-75 | MSE-75 | MSL-75 | |
| 100 | MSR-100 | MSE-100 | MSL-100 | |

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

M-30 List \$
Type M-30 is a small adjustable mica condenser with a maximum capacity of 30 mmf. Dimensions 1 3/16" x 9/16" x 1/2". Isolantite base.

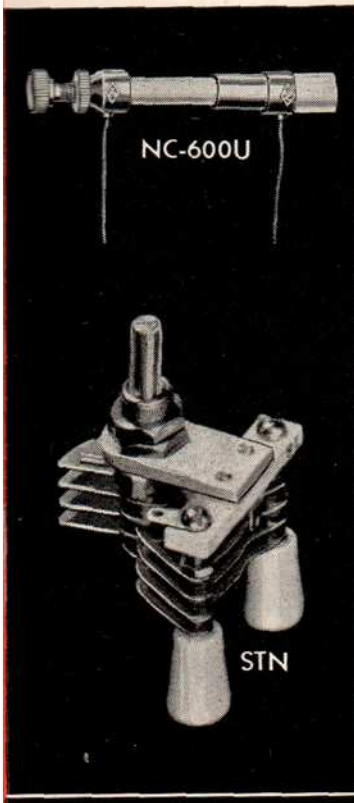
W-75, 75 mmf. List \$
W-100, 100 mmf. List \$

Small padding condensers having very low temperature coefficient. Mounted in an aluminum shield 1 1/4" 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 2 1/4", Mounting holes 5/8" x 1 23/32", Axial length 2 1/8" overall.

Plates: Straight line capacity, 180° rotation.

NATIONAL NEUTRALIZING CONDENSERS



NC-600U List \$
With standoff insulator

NC-600 List \$
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 \$
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.

NC-800 List \$
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 \$
For 75T, 808, 811, 812 & similar tubes.

NC-150 List \$
For HK354, RK36, 300T, 852, etc.

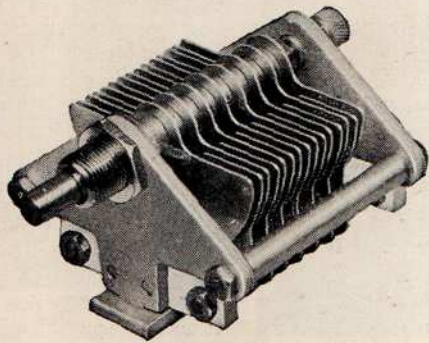
NC-500 List \$
For WE-251, 450TH, 450TL, 750TL, etc.

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

NC-800
NC-75
NC-150
NC-500

| Air Gap (inches) | NC-800 (mmf.) | NC-150 (mmf.) | NC-500 (mmf.) |
|------------------|---------------|---------------|---------------|
| 0 | 0 | 0 | 0 |
| 2 | ~1 | ~2 | ~4 |
| 4 | ~2 | ~4 | ~8 |
| 6 | ~3 | ~6 | ~12 |
| 8 | ~4 | ~8 | ~16 |
| 10 | ~5 | ~10 | ~20 |
| 12 | ~6 | ~12 | ~24 |
| 14 | ~7 | ~14 | ~28 |
| 16 | ~8 | ~16 | ~32 |

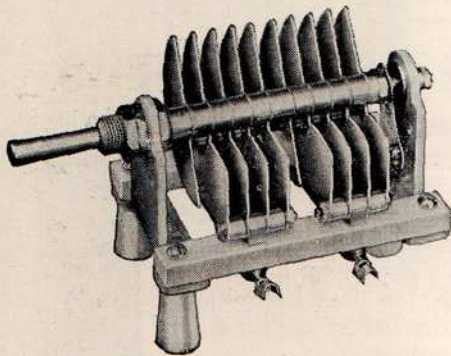
NATIONAL TRANSMITTING CONDENSERS



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 | |
| 150 | 11 | 3" | .026" | 1000v. | 14 | TMS-150 | |
| 250 | 13.5 | 3" | .026" | 1000v. | 22 | TMS-250 | |
| 300 | 15 | 3" | .026" | 1000v. | 27 | TMS-300 | |
| 35 | 8 | 3" | .065" | 2000v. | 7 | TMSA-35 | |
| 50 | 11 | 3" | .065" | 2000v. | 11 | TMSA-50 | |
| DOUBLE STATOR MODELS | | | | | | | |
| 50-50 Mmf. | 6-6 | 3" | .026" | 1000v. | 5-5 | TMS-50D | |
| 100-100 | 7-7 | 3" | .026" | 1000v. | 9-9 | TMS-100D | |
| 50-50 | 10.5-10.5 | 3" | .065" | 2000v. | 11-11 | TMSA-50D | |



TYPE TMH

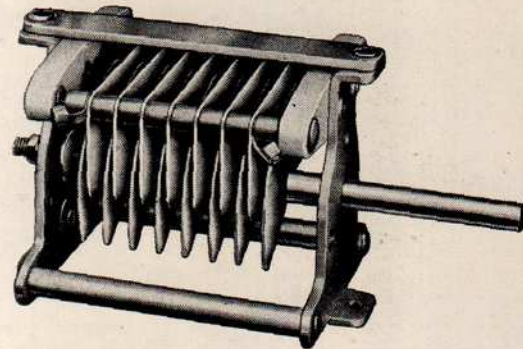
features very compact construction, excellent power factor, and aluminum plates .040" thick with polished edges. It mounts on the panel or on removable stand-off insulators. Isolantite insulators have long leakage path. Stand-offs included in listed price.

| Capacity | Minimum Capacity | Length | Air Gap | Peak Voltage | No. of Plates | Catalog Symbol | List |
|-----------------------------|------------------|---------------------------------|---------|--------------|---------------|----------------|------|
| SINGLE STATOR MODELS | | | | | | | |
| 50 Mmf. | 9 | 3 ³ / ₄ " | .085" | 3500v. | 15 | TMH-50 | |
| 75 | 11 | 3 ³ / ₄ " | .085" | 3500v. | 19 | TMH-75 | |
| 100 | 12.5 | 5 ¹ / ₈ " | .085" | 3500v. | 25 | TMH-100 | |
| 150 | 18 | 6 ¹ / ₂ " | .085" | 3500v. | 37 | TMH-150 | |
| 35 | 11 | 5 ¹ / ₈ " | .180" | 6500v. | 17 | TMH-35A | |
| DOUBLE STATOR MODELS | | | | | | | |
| 35-35 Mmf. | 6-6 | 3 ³ / ₄ " | .085" | 3500v. | 9-9 | TMH-35D | |
| 50-50 | 8-8 | 5 ¹ / ₈ " | .085" | 3500v. | 13-13 | TMH-50D | |
| 75-75 | 11-11 | 6 ¹ / ₂ " | .085" | 3500v. | 19-19 | TMH-75D | |

NATIONAL TRANSMITTING CONDENSERS

TYPE TMK

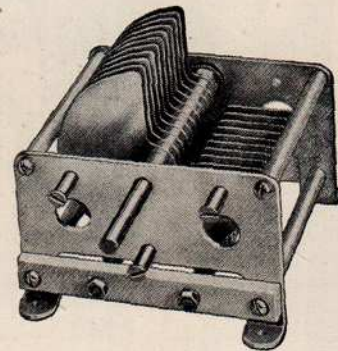
is a new condenser for exciters and low power transmitters. Special provision has been made for mounting AR-16 coils in a swivel plug-in mount on either the top or rear of the condenser, (see page 10). For panel or stand-off mounting. Isolantite insulation.



| Capacity | Minimum Capacity | Length | Air Gap | Peak Voltage | No. of Plates | Catalog Symbol | List Price |
|--|------------------|--------------------|---------|--------------|---------------|----------------|------------|
| SINGLE STATOR MODELS | | | | | | | |
| 35 Mmf. | 7.5 | 2 $\frac{7}{32}$ " | .047" | 1500v. | 7 | TMK-35 | |
| 50 | 8 | 2 $\frac{3}{8}$ " | .047" | 1500v. | 9 | TMK-50 | |
| 75 | 9 | 2 $\frac{1}{16}$ " | .047" | 1500v. | 13 | TMK-75 | |
| 100 | 10 | 3" | .047" | 1500v. | 17 | TMK-100 | |
| 150 | 10.5 | 3 $\frac{5}{8}$ " | .047" | 1500v. | 25 | TMK-150 | |
| 200 | 11 | 4 $\frac{1}{4}$ " | .047" | 1500v. | 33 | TMK-200 | |
| 250 | 11.5 | 4 $\frac{7}{8}$ " | .047" | 1500v. | 41 | TMK-250 | |
| DOUBLE STATOR MODELS | | | | | | | |
| 35-35 Mmf. | 7.5-7.5 | 3" | .047" | 1500v. | 7-7 | TMK-35D | |
| 50-50 | 8-8 | 3 $\frac{5}{8}$ " | .047" | 1500v. | 9-9 | TMK-50D | |
| 100-100 | 10-10 | 4 $\frac{1}{4}$ " | .047" | 1500v. | 17-17 | TMK-100D | |
| Swivel Mounting Hardware for AR 16 Coils | | | | | | SMH | |

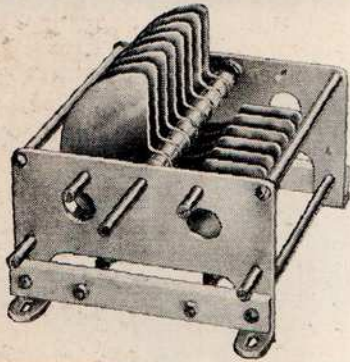
TYPE TMC

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 | |
| 100 | 13 | 3 $\frac{1}{8}$ " | .077" | 3000v. | 13 | TMC-100 | |
| 150 | 17 | 4 $\frac{5}{8}$ " | .077" | 3000v. | 21 | TMC-150 | |
| 250 | 23 | 6" | .077" | 3000v. | 32 | TMC-250 | |
| 300 | 25 | 6 $\frac{3}{4}$ " | .077" | 3000v. | 39 | TMC-300 | |
| DOUBLE STATOR MODELS | | | | | | | |
| 50-50 Mmf. | 9-9 | 4 $\frac{5}{8}$ " | .077" | 3000v. | 7-7 | TMC-50D | |
| 100-100 | 11-11 | 6 $\frac{3}{4}$ " | .077" | 3000v. | 13-13 | TMC-100D | |
| 200-200 | 18.5-18.5 | 9 $\frac{1}{4}$ " | .077" | 3000v. | 25-25 | TMC-200D | |

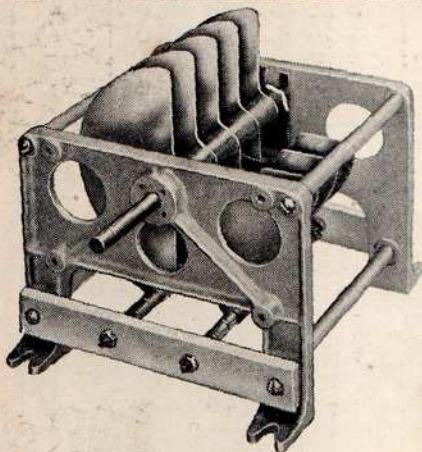
NATIONAL TRANSMITTING CONDENSERS



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 $\frac{3}{8}$ " | .077" | 3000v. | 23 | TMA-300 | |
| 50 | 15 | 4 $\frac{3}{8}$ " | .171" | 6000v. | 7 | TMA-50A | |
| 100 | 19.5 | 6 $\frac{7}{8}$ " | .171" | 6000v. | 15 | TMA-100A | |
| 150 | 22.5 | 6 $\frac{7}{8}$ " | .171" | 6000v. | 21 | TMA-150A | |
| 230 | 33 | 9 $\frac{3}{8}$ " | .171" | 6000v. | 33 | TMA-230A | |
| 100 | 30 | 9 $\frac{1}{4}$ " | .265" | 9000v. | 23 | TMA-100B | |
| 150 | 40.5 | 12 $\frac{1}{2}$ " | .265" | 9000v. | 33 | TMA-150B | |
| 50 | 21 | 7 $\frac{1}{8}$ " | .359" | 12000v. | 13 | TMA-50C | |
| 100 | 37.5 | 12 $\frac{1}{8}$ " | .359" | 12000v. | 25 | TMA-100C | |
| DOUBLE STATOR MODELS | | | | | | | |
| 200-200 Mmf. | 15-15 | 6 $\frac{7}{8}$ " | .077" | 3000v. | 16-16 | TMA-200D | |
| 50-50 | 12.5-12.5 | 6 $\frac{7}{8}$ " | .171" | 6000v. | 8-8 | TMA-50DA | |
| 100-100 | 17-17 | 9 $\frac{3}{8}$ " | .171" | 6000v. | 14-14 | TMA-100DA | |
| 60-60 | 19.5-19.5 | 12 $\frac{1}{2}$ " | .265" | 9000v. | 15-15 | TMA-60DB | |
| 40-40 | 18-18 | 12 $\frac{1}{8}$ " | .359" | 12000v. | 11-11 | TMA-40DC | |

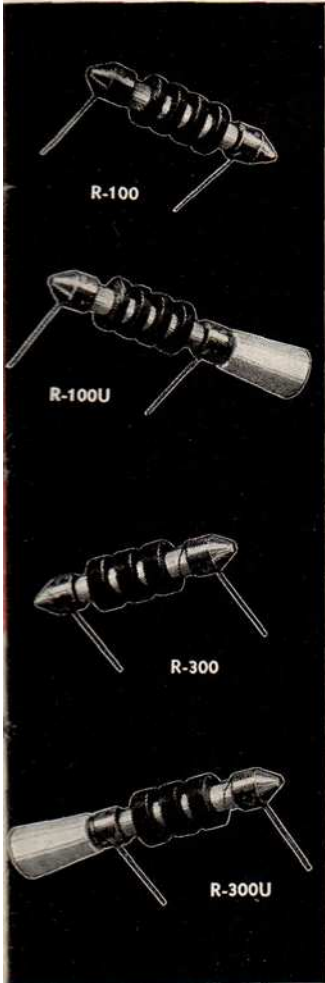


TYPE TML

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 $\frac{1}{16}$ " | .719" | 20,000v. | 17 | TML-75E | |
| 150 | 60 | 18 $\frac{1}{16}$ " | .469" | 15,000v. | 27 | TML-150D | |
| 100 | 45 | 13 $\frac{5}{8}$ " | .469" | 15,000v. | 19 | TML-100D | |
| 50 | 22 | 8 $\frac{5}{8}$ " | .469" | 15,000v. | 9 | TML-50D | |
| 245 | 54 | 18 $\frac{1}{16}$ " | .344" | 10,000v. | 35 | TML-245B+ | |
| 150 | 45 | 13 $\frac{5}{8}$ " | .344" | 10,000v. | 21 | TML-150B+ | |
| 100 | 32 | 10 $\frac{5}{8}$ " | .344" | 10,000v. | 15 | TML-100B+ | |
| 75 | 23.5 | 8 $\frac{5}{8}$ " | .344" | 10,000v. | 11 | TML-75B+ | |
| 500 | 55 | 18 $\frac{1}{16}$ " | .219" | 7,500v. | 49 | TML-500A+ | |
| 350 | 45 | 13 $\frac{5}{8}$ " | .219" | 7,500v. | 33 | TML-350A+ | |
| 250 | 35 | 10 $\frac{5}{8}$ " | .219" | 7,500v. | 25 | TML-250A+ | |
| DOUBLE STATOR MODELS | | | | | | | |
| 30-30 Mmf. | 12-12 | 18 $\frac{1}{16}$ " | .719" | 20,000v. | 7-7 | TML-30DE | |
| 60-60 | 26-26 | 18 $\frac{1}{16}$ " | .469" | 15,000v. | 11-11 | TML-60DD | |
| 100-100 | 27-27 | 18 $\frac{1}{16}$ " | .344" | 10,000v. | 15-15 | TML-100DB+ | |
| 60-60 | 20-20 | 13 $\frac{5}{8}$ " | .344" | 10,000v. | 9-9 | TML-60DB+ | |
| 200-200 | 30-30 | 18 $\frac{1}{16}$ " | .219" | 7,500v. | 21-21 | TML-200DA+ | |
| 100-100 | 17-17 | 10 $\frac{5}{8}$ " | .219" | 7,500v. | 11-11 | TML-100DA+ | |

NATIONAL RF CHOKES



R-100 List \$
Without standoff insulator

R-100U List \$
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 $2\frac{1}{2}$ m.h.; distributed capacity 1 mmf.; DC resistance 50 ohms; current rating 125 ma.

R-300 List \$
Without insulator

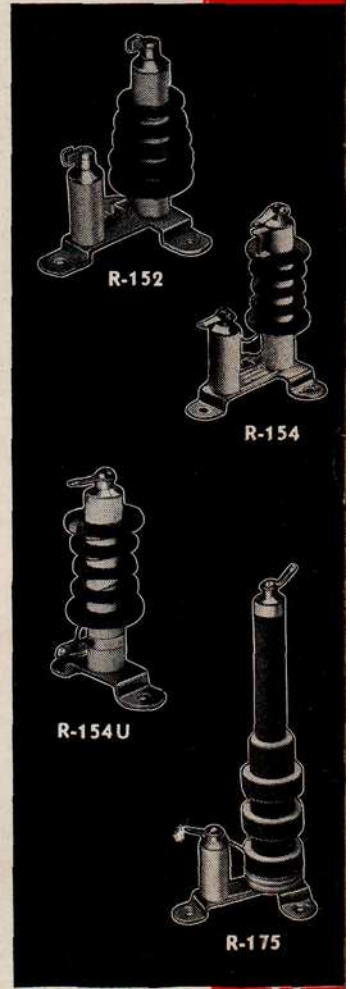
R-300U List \$
With insulator

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 stand-off insulator screwed on one end. Inductance 1 m.h.; distributed capacity 1 mf.; DC resistance 10 ohms; current rating 300 ma.

R.F. chokes are available in a variety of inductance values, ranging from 6 microhenries to 10 millihenries, in addition to those shown above. Various mounting arrangements are also available. Full information will be furnished on request.

R-152 List \$
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.

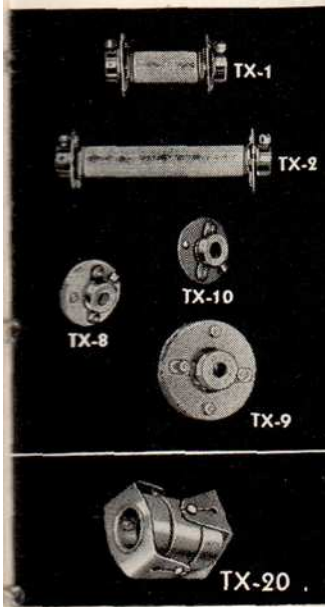
R-154 List \$
R-154U List \$
For the 20, 40 and 80 meter bands. Inductance 1 m.h., DC resistance 6 ohms, DC current 600 ma. Coils honeycomb wound on Isolantite core. The R-154U does not have the third mounting foot and the small insulator, but is otherwise the same as R-154. See illustration.



R-175 List \$
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 $225 \mu\text{h}$, distributed capacity 0.6 mmf., DC resistance 6 ohms, DC current 800 ma., voltage breakdown to base 12,500 volts.

National has manufactured a great many sizes and styles of chokes not shown above, during the war. A complete line of chokes will be available in the near future but full technical data had not been prepared at the time this edition of the A.R.R.L. Handbook went to press. Complete information will be found in later catalogs or can be obtained by writing us direct.

NATIONAL SHAFT COUPLINGS



TX-1, Leakage path 1" List \$
TX-2, Leakage path $2\frac{1}{2}$ " List \$

Flexible couplings with glazed Isolantite insulation which fit $\frac{1}{4}$ " shafts.

TX-8 List \$
A non-flexible rigid coupling with Isolantite insulation. 1" diam. Fits $\frac{1}{4}$ " shaft.

TX-9 List \$
This small insulated flexible coupling provides high electrical efficiency when used to isolate circuits. Insulation is Steatite. $1\frac{5}{8}$ " diam. Fits $\frac{1}{4}$ " shaft.

TX-20 List \$
A small insulated flexible coupling of the Hooke's joint type

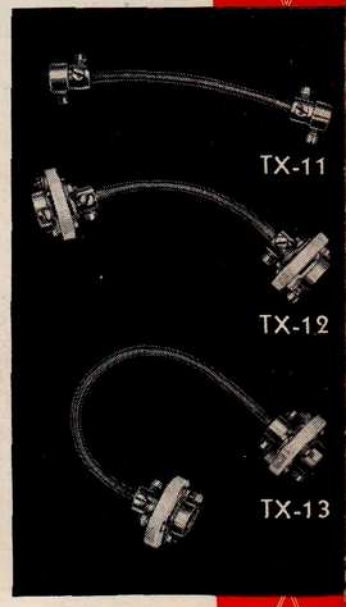
which will accommodate angular misalignment up to five degrees as well as $\frac{1}{64}$ " transverse misalignment between the shafts.

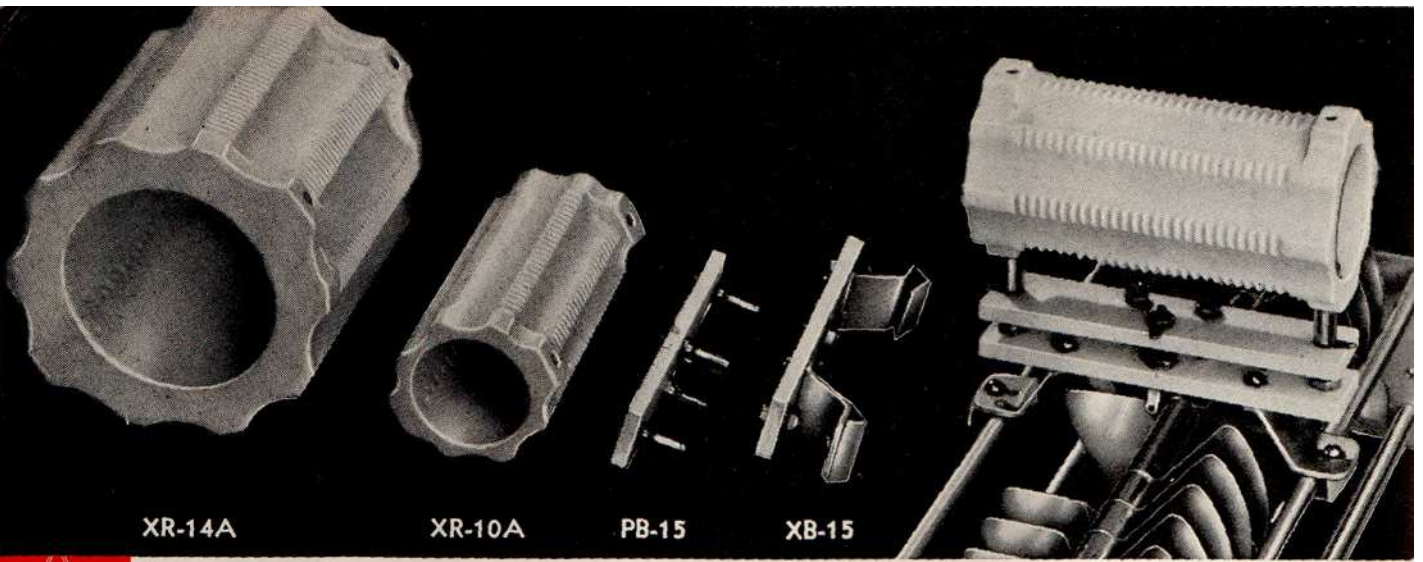
TX-10 List \$
A very compact insulated coupling free from backlash. Insulation is canvas Bakelite. $1\frac{1}{16}$ " diam. Fits $\frac{1}{4}$ " shaft.

TX-11 List \$
The flexible shaft of this coupling connects shafts at angles up to 90 degrees, and eliminates misalignment problems. Fits $\frac{1}{4}$ " shafts. Length $4\frac{1}{4}$ ".

TX-12, Length $4\frac{5}{8}$ " List \$
TX-13, Length $7\frac{1}{8}$ " List \$

These couplings use flexible shafting like the TX-11 above, but are also provided with Isolantite insulators at each end.





XR-14A

XR-10A

PB-15

XB-15

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 3 3/4" (30 turns total) and is intended for the 80 meter band. The smaller form, Type XR-10A, has a winding length of 3 3/4" and a winding diameter of 2 1/2" (26 turns total). It is intended for the 20 and 40 meter bands.

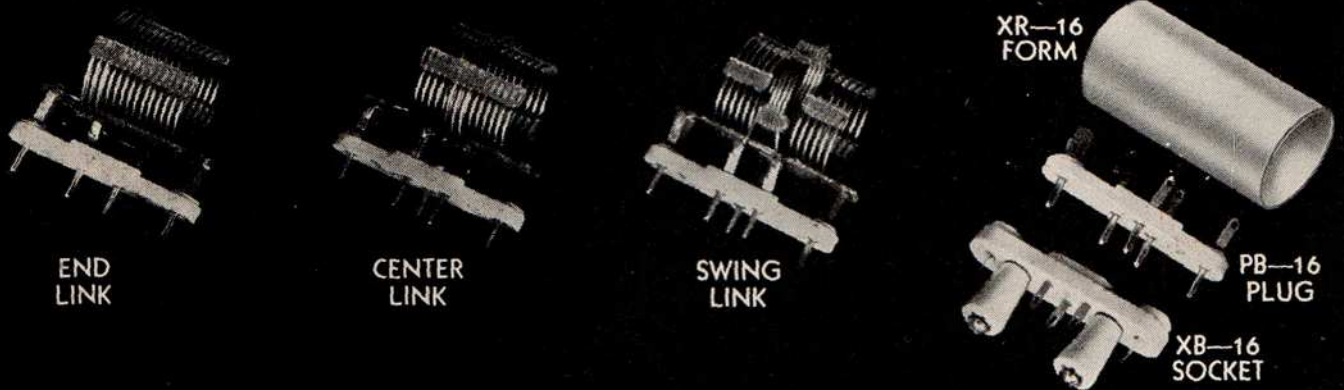
Either coil form fits the PB-15 plug. For higher frequencies, the plug may be used with a self-supporting coil of copper tubing. The XB-15 Socket may be mounted on breadboards or chassis, as well as on the TMA Condenser.

SINGLE UNITS

| | |
|------------------------|---------|
| XR-10A, Coil Form only | List \$ |
| XR-14A, Coil Form only | List \$ |
| PB-15, Plug only | List \$ |
| XB-15, Socket only | List \$ |

ASSEMBLIES

| | |
|---|---------|
| UR-10A, Assembly (including small Coil Form, Plug and Socket) | List \$ |
| UR-14A, Assembly (including large Coil Form, Plug and Socket) | List \$ |



END LINK

CENTER LINK

SWING LINK

XR-16 FORM

PB-16 PLUG

XB-16 SOCKET

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

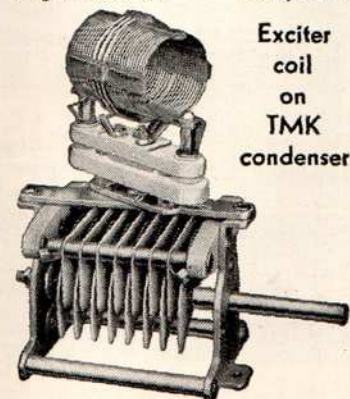
These air-spaced coils are suitable for use in stages where the plate input does not exceed 50 watts and are available in the sizes tabulated below. Capacities listed will resonate the coils at the low frequency end of the band and include all stray circuit capacities. All have separate link coupling 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 1 1/4" and a winding length of 1 3/4".

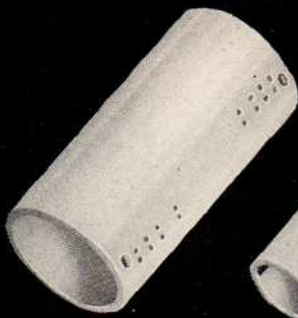
| | |
|--|---------------|
| XR-16, Coil Form only | List \$ |
| PB-16, Plug-in Base only | List \$ |
| XB-16, Plug-in Socket only | List \$ |
| AR-16, Coils — Any type (see table). Include PB-16 Plug as illustrated | Each, List \$ |

| 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 | | |

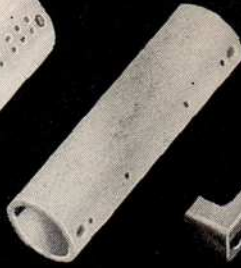
When final allocation of the amateur bands has been made the exciter coils will be redesigned to provide coverage.



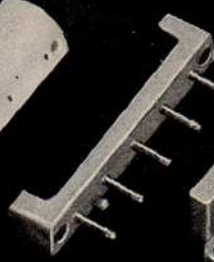
Exciter coil on TMA condenser



XR-13



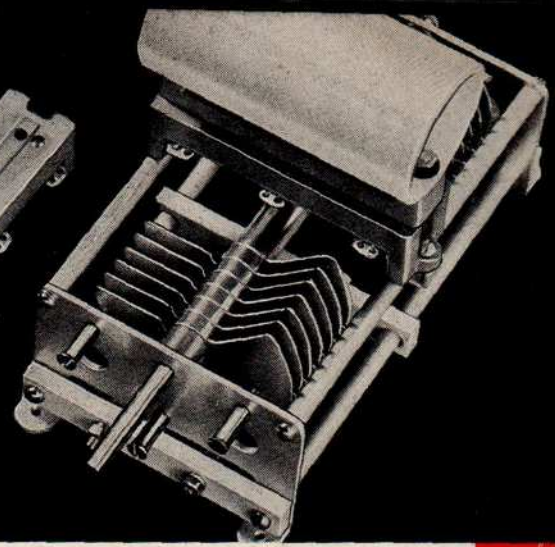
XR-13A



PB-5



XB-5



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 1 3/4" in diameter and has a winding length of 2 3/4". The smaller form, Type XR-13A, is 1" in diameter and provides a winding length of 2 3/4". Both forms have holes for mounting and for leads.

SINGLE UNITS

XR-13, Coil Form only List \$
XR-13A, Coil Form only List \$
PB-5, Plug only List \$
XB-5, Socket only List \$

ASSEMBLIES

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

FIXED-TUNED EXCITER TANK



PLUG-IN BASE AND SHIELD

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 \$
FXTB-5, with 5 prong base List \$
FXTB-6, with 6 prong base List \$

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 be 2" x 2 3/8" x 4 1/8".

PB-10-5, (5 Prong Base & Shield) List \$
PB-10-6, (6 Prong Base & Shield) List \$
PB-10A-5, (5 Prong Base only) List \$
PB-10A-6, (6 Prong Base only) List \$



SPP-9



SPP-3



12



24



8

SAFETY GRID AND PLATE CAPS

National Safety Grid and Plate Caps have a ceramic body which offers protection against accidental contact with high voltage caps on tubes.

SPP-9 Ceramic insulation. Fits 9/16" diameter. List \$
SPP-3 Ceramic insulation. Fits 3/8" diameter. List \$

GRID AND PLATE GRIPS

National Grid and Plate Grips provide a secure and positive contact with the tube cap and yet are released easily by a slight pressure on the ear.

Type 12, for 9/16" Caps List \$
Type 24, for 3/8" Caps List \$
Type 8, for 1/4" Caps List \$



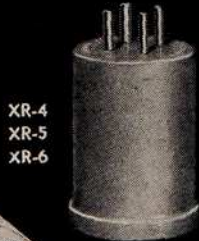
NATIONAL PARTS



XR-1
XR-2



XR-3



XR-4
XR-5
XR-6



XC-6C

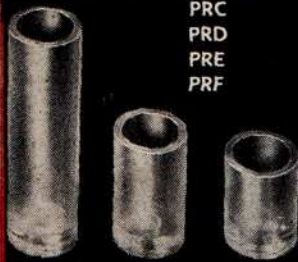


S-101



OSR

POLYSTYRENE COIL FORMS



PRC
PRD
PRE
PRF

COIL FORMS

- XR-1, Four prong, List \$
- XR-2, without prongs, List \$

Molded of R-39, permitting them to be grooved and drilled. Coil form diameter 1", length 1 1/2".

- XR-3, List \$

Molded of R-39. Diameter 9/16", length 3/4". Without prongs.

- XR-4, Four prong, List \$
- XR-5, Five prong, List \$
- XR-6, Six prong, List \$

Molded of R-39, permitting them to be grooved and drilled. Coil form diameter 1 1/2", length 2 1/4". A special socket is required for the six-prong form.

- XC6C, Special six-prong socket for XR-6 Coil Form, List \$

IMPEDANCE COUPLER

- S-101, List \$

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 \$

A shielded oscillator coil which tunes to 100 KC with .00041 Mfd. Two separate inductances, closely coupled. Excellent for interruption-frequency oscillator in super-regenerative receivers.

H. F. COIL FORMS

| Symbol | Outside Diameter | Length | List |
|--------|------------------|--------|------|
| PRC-1 | 3/8" | 3/8" | \$ |
| PRC-2 | 3/8" | 1/2" | |
| PRC-3 | 3/8" | 3/4" | |
| PRD-1 | 1/2" | 1/2" | \$ |
| PRD-2 | 1/2" | 1" | |
| PRE-1 | 9/16" | 3/4" | \$ |
| PRE-2 | 9/16" | 1" | |
| PRE-3 | 9/16" | 2" | |
| PRF-1 | 3/4" | 3/4" | \$ |
| PRF-2 | 3/4" | 1 1/4" | |

COIL SHIELDS

- RZ, coil shield, List \$
- 1 3/8" square x 4" high.

- RS, coil shield, List \$
- 1 1/16" x 1 7/8" x 3 1/2" high.

- RO, coil shield, List \$
- 2" x 2 3/8" x 4 1/8" high.

- B-30, coil shield, List \$
- 3" dia. x 3 3/4" high without mounting base.

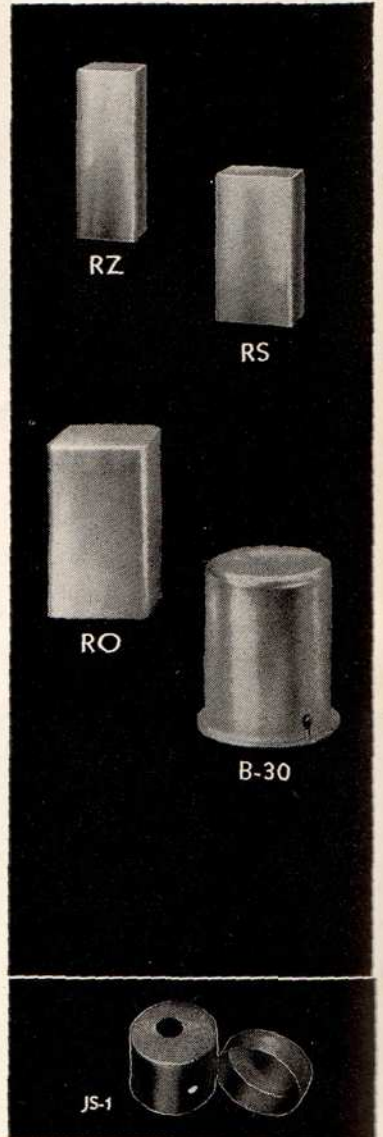
National coil shields are formed from a single piece of pure aluminum. They are mechanically strong and have ample thickness to mount small parts on the walls.

The RZ, RS and RO coil shields are supplied with two threaded studs extending downward from the open end for attaching to the chassis. The B-30 coil shield is supplied with an aluminum base which not only provides a convenient mounting, but also completes the coil enclosure.

JACK SHIELD

- JS-1, Jack shield, List \$

For shielding small standard jacks mounted behind a panel, or on the ends of extension cords.



| | Width | Height | Depth | List Price |
|----------------|---------|--------|---------|------------|
| Type C-SW3 | 9 3/4" | 7" | 9" | |
| Type C-NC100 | 17 1/4" | 8 3/4" | 11 1/4" | |
| Type C-HRO | 16 3/4" | 8 3/4" | 10" | |
| Type C-One-Ten | 11" | 7" | 7 1/4" | |
| Type C-SRR | 7 1/2" | 7" | 7 1/2" | |

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.



NATIONAL CABINETS



CHART FRAME



COIL DOPE



TOUCH-UP PAINT

CHART FRAME

The National Chart Frame is blanked from one piece of metal, and includes a celluloid sheet to cover the chart. Size $2\frac{1}{4}''$ x $3\frac{1}{4}''$, with sides $\frac{1}{4}''$ wide.

Type CFA List \$

COIL DOPE

CD-1, $\frac{1}{4}$ pint can List \$
Liquid Polystyrene Cement — is ideal for windings as it will not spoil the properties of the best coil form.

TOUCH-UP PAINT

A high quality air-drying paint that may be applied with a brush. It is especially suited to touching up places on radio equipment where the paint may have become marred through abrasion.

CP-1, gray List \$
CP-2, black List \$

SPEAKER CABINETS

NDC-8 for 8" speaker List \$
NDC-10 for 10" speaker List \$
NDC-2 for 10" speaker List \$

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 \$
IFCO, Oscillator, air core List \$

Air dielectric condensers isolated from each other by an aluminum shield. Litz wound coils on a moisture proofed ceramic base. Shield can $4\frac{1}{8}''$ x $2\frac{3}{8}''$ x $2''$. Available for either 175 KC or 450-550 KC. Specify frequency.

IFD, Diode Transformer, air core List \$

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

IFE, Transformer List \$
Same as IFC but iron core, 450-550 KC only.

IFG, IF Transformer List \$
IFH, Discriminator List \$

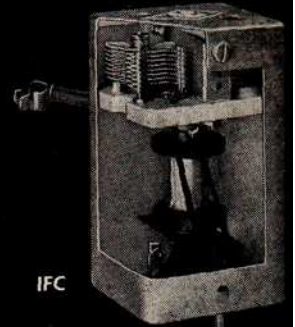
High frequency IF transformers, similar in construction to the IFC above. They are intended for FM receivers and others requiring a high IF frequency. Frequency is 3 MC. When definite assignment of the bands has been made these transformers will be available in a frequency which gives the minimum images in the FM and television bands.

IFJ, with variable coupling List \$
IFK, with fixed coupling List \$

15 MC IF transformers suitable for ultra high frequency superheterodynes. They are made in two models, with and without variable coupling.

National TRF units are designed as a single channel high fidelity TRF receiver for reception in the broadcast band. Each RF transformer is similar in construction to the IFC transformer above and is tuned both primary and secondary. 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 1 volt. Three models cover ranges of 540-875, 740-1230, and 1100-1700 KC.

DLT, RF Transformer, set of four required. List, each \$



IFC



IFD



IFK



DLT SET OF FOUR REQUIRED



NDC-8
NDC-10

NDC-2

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 \$
1" screen, using RCA-913 and 6X5 rectifier. Table model, $4\frac{1}{8}''$ x $6\frac{1}{8}''$ x $8''$.

CRR, less tubes List \$
2" screen, using RCA-902 and 6X5 rectifier. Relay rack mounting.



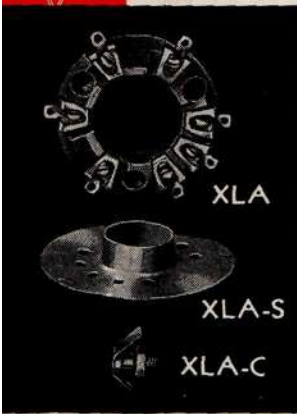
CRM



CRR

NATIONAL OSCILLOSCOPES

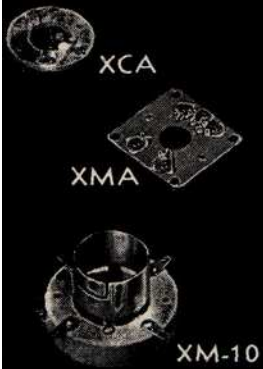
NATIONAL LOW-LOSS SOCKETS AND INSULATORS



XLA List \$
A low-loss socket for the 6F4 and 950 series acorn tubes for frequencies as high as 600 MC. Conventional by-pass condensers may be compactly mounted between the contact terminals and the chassis. Low contact resistance, short and direct leads and low and constant inductance are features of the design.

XLA-S List \$
An internal shield fitting the XLA socket and suitable for tubes such as the 956.

XLA-C List \$
This miniature by-pass condenser may be mounted inside the socket, directly below the contact.



XCA List \$
XMA List \$
A low-loss socket for acorn triodes.

XM-10 List \$
For pentode acorn tubes, this socket has built-in by-pass condensers. The base is a copper plate.



XM-50 List \$
A heavy duty metal shell socket for tubes having the UX base.



JX-50 List \$
Without Standoff Insulators
JX-50S List \$
With Standoff Insulators
A low-loss wafer socket for the 813 and other tubes having the Giant 7-pin base.

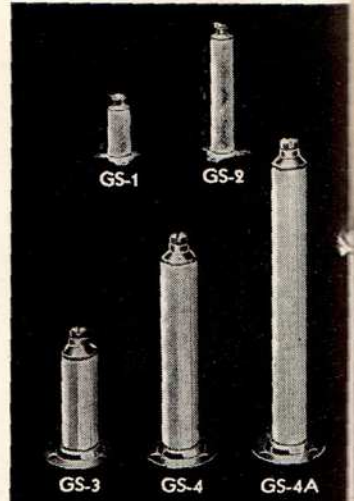


HX-100 List \$
HX-100S List \$
A low-loss wafer socket suitable for the EIMAC-4-125-A, 4-250-A and other tubes using the Giant 5-pin base.

- GS-1**, 1/2" x 13/8" List \$
- GS-2**, 1/2" x 27/8" List \$
- GS-3**, 3/4" x 27/8" List \$
- GS-4**, 3/4" x 47/8" List \$
- GS-4A**, 3/4" x 67/8" List \$

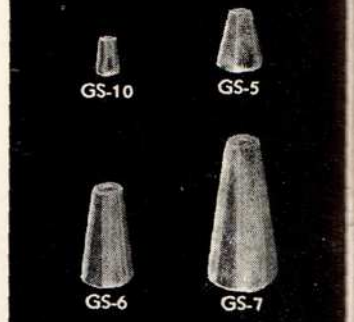
Cylindrical low-loss steatite standoff insulators with nickel plated caps and bases.

GSJ, (not illustrated) List \$
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 \$
- GS-6**, 2" List, each \$
- GS-7**, 3" List, each \$
- GS-10**, 3/4", package of 10 List \$

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 \$
- GS-9**, with jack List \$

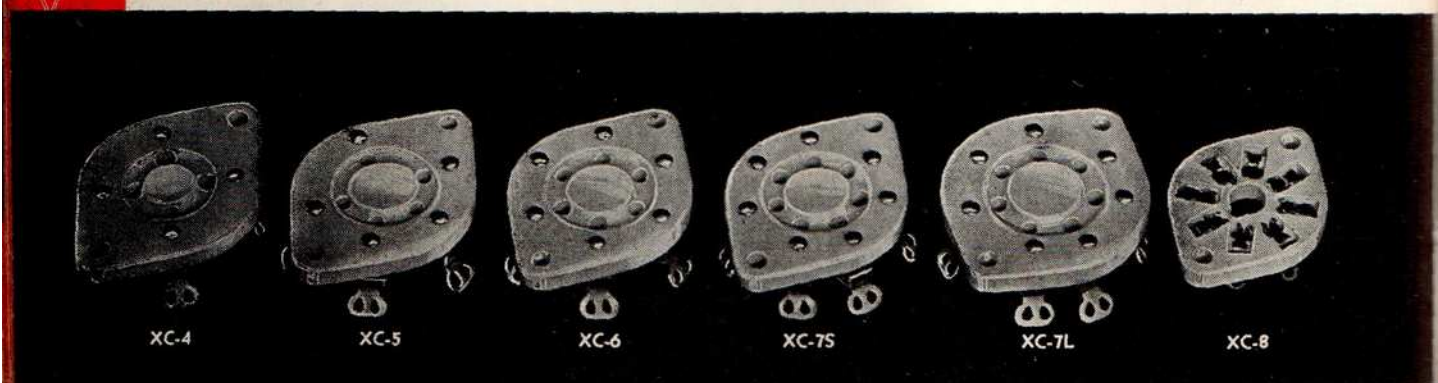
These low-loss steatite standoff insulators are also useful as lead-through bushings.



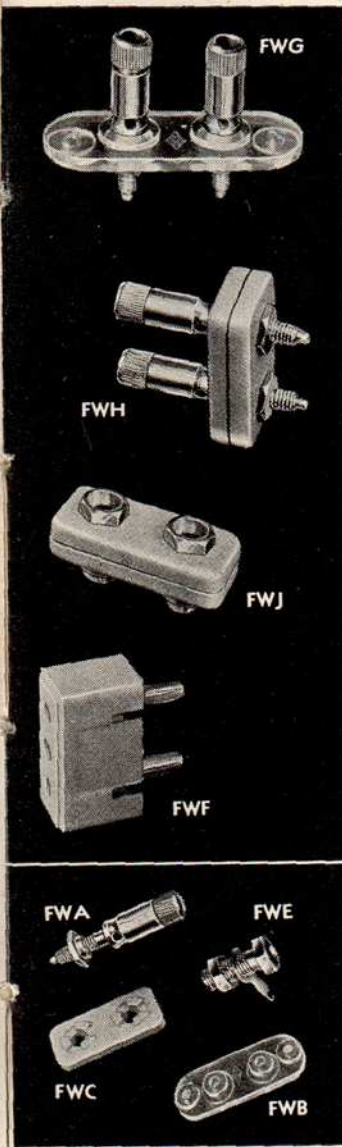
XC Series Sockets

- XC-4** List \$
- XC-5** List \$
- XC-6** List \$
- XC-7S** List \$
- XC-7L** List \$
- XC-8** List \$

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



NATIONAL LOW-LOSS SOCKETS AND INSULATORS



FWG List \$
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 \$
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 \$
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 \$
This molded R-39 plug has two banana plugs on $\frac{3}{4}$ " centers and fits FWH or FWJ above. Leads may be brought out through the top or side.

FWA, Post List, each \$
Brass Nickel Plated

FWE, Jack List, each \$
Brass Nickel Plated

FWC, Insulator List, per pair \$
R-39 Insulation

FWB, Insulator List, each \$
Polystyrene insulation

AA-3 List \$
A low-loss steatite spreader for 6 inch line spacing. (600 ohms impedance with No. 12 wire.)

AA-5 List \$
A low-loss steatite aircraft-type strain insulator.

AA-6 List \$
A general purpose strain insulator of low-loss steatite.

XS-6 List, each \$
A low-loss isolantite bushing for $\frac{1}{2}$ " holes.

XP-6
Same as above but Victron. List, box of ten \$

TPB List, per dozen \$
A threaded polystyrene bushing with removable .093 conductor moulded in, $\frac{1}{4}$ " diam., 32 thread.

XS-7, ($\frac{3}{8}$ " Hole) List \$

XS-8, ($\frac{1}{2}$ " Hole) List \$

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

XS-1, (1" Hole) List \$

XS-2, (1 $\frac{1}{2}$ " Hole) List \$

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

XS-3, ($2\frac{3}{4}$ " Hole) List \$

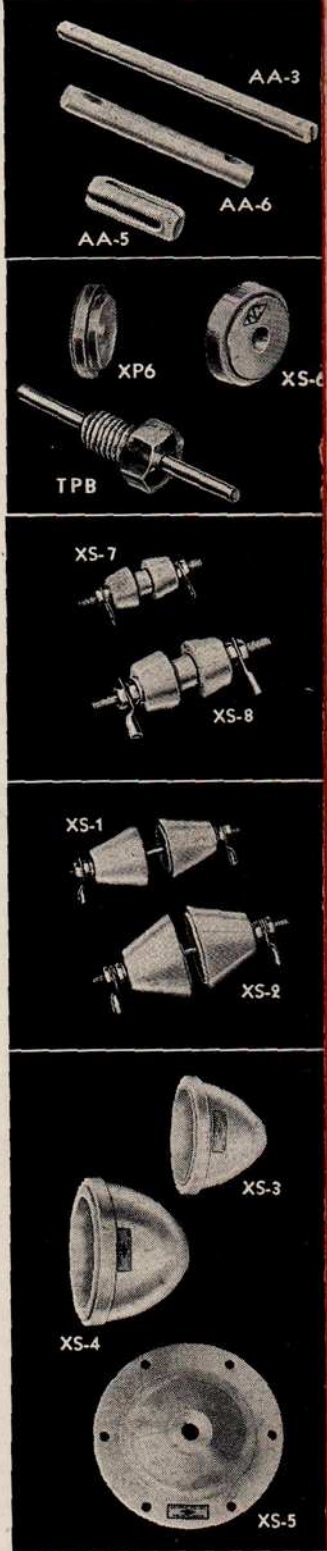
XS-4, ($3\frac{3}{4}$ " Hole) List \$

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

XS-5, Without Fittings List, each \$

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

These big low-loss bowls have an extremely long leakage path and a $5\frac{1}{4}$ " flange for bolting in place. Insulation steatite.



CIR Series Sockets
Any Type List \$
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.



NATIONAL NC-2-40C

NATIONAL NC-2-40CS

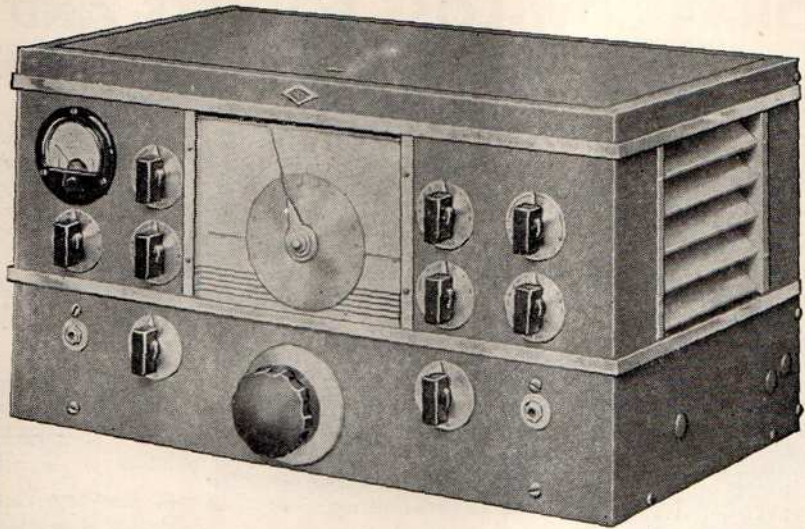
The NC-2-40C is a twelve-tube superheterodyne covering a continuous frequency range of 490 to 30,000 KC. The NC-2-40CS is identical but covers from 200 to 400 KC and from 1000 to 30,000 KC.

The circuit employed on all bands consists of one stage of radio frequency amplification, a separate first detector and stabilized high frequency oscillator, two intermediate frequency stages, an infinite impedance second detector, a self-balancing phase inverter and audio amplifier, and an 8-watt push-pull audio output stage.

Auxiliary circuits include a crystal filter with exceptionally wide selectivity range for use on both CW and phone, a series valve noise limiter, AVC, beat oscillator, tone control, and signal strength meter. The power supply is built in.

These receivers have a number of new features of recent design. A new high frequency oscillator design of extreme stability eliminates detuning effects of RF gain control and motorboating or fluttering which occurs in some receivers when tuning in strong signals. A line voltage shift from 100 to 120 volts produces less than 1000 cycles at ten meters.

Sensitivity is particularly high, an input signal of 1 microvolt providing 1 watt of audio output, and full sensitivity is maintained up to the highest frequencies. Signal-to-image ratio is better than 30 db at ten meters. The AVC is flat within 2 db for signals from 10 to 100,000 microvolts. Moulded polystyrene



coil forms are used in both RF and IF circuits and padding and tuning condensers are of the air-dielectric type.

There are six calibrated coil ranges, controlled by a knob on the front panel which moves the desired coils into position below the tuning condenser and plugs them into the circuit. No coil switch is used. The tuning control has a ratio of 60 to 1 approximately, and is designed to have enough fly-wheel effect to facilitate spinning the knob for quick changes in frequency.

All models of the NC-2-40 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.

NC-2-40C, Table model, receiver only

List \$

NC-2-40CS, Table model, receiver only

List \$

NC2-TS, Table model 10" PM speaker to match receiver

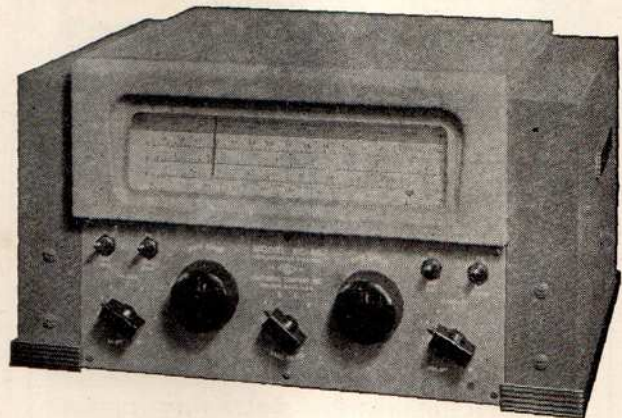
List \$

NATIONAL NC-46

The NC-46 receiver is a ten tube superheterodyne combining capable performance with low price. Features include a series valve noise limiter with automatic threshold control, CW oscillator, separate RF and AF gain controls, and amplified and delayed AVC. Power supplies are self contained and operate on 105 to 130 volts AC or DC. An audio output of 3 watts is provided by push-pull 25L6's.

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-46 is not entirely free from images. However, where price is an important considera-



tion, the NC-46 will be found a very satisfactory receiver.

NC-46 — Receiver only, complete with tubes, coils covering from 550 KC to 30 MC for 105-130 volts AC or DC operation — gray finish.

List \$

NC-46TS — Loud Speaker in table mounting cabinet to match above receiver.

List \$

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

List \$



TABLE MODEL

HRO-5TA table model, receiver only, complete with four sets of coils having bandspread on amateur bands as well as general coverage (1.7-4.0, 3.5-7.3, 7.0-14.4, 14.0-30.0 MC). **List \$**

HRO-5RA rack model, other details same as for HRO-5TA above. **List \$**

COILS

HRO Type E, Range 900-2050 kc **List \$**

HRO Type F, Range 480-960 kc **List \$**

HRO Type G, Range 180-430 kc **List \$**

HRO Type H, Range 100-200 kc **List \$**

HRO Type J, Range 50-100 kc **List \$**

HRO Type A, Range 14.0-30.0 mc **List \$**

HRO Type B, Range 7.0-14.4 mc **List \$**

HRO Type C, Range 3.5-7.3 mc **List \$**

HRO Type D, Range 1.7-4.0 mc **List \$**

MCS Table model cabinet, 8" PM dynamic speaker and matching transformer. **List \$**

697 Table power unit, 115 volt, 60 cycle input, 6.3 volt heater and 230 volt, 75 ma. output, with tube. **List \$**

See General Catalogue for relay rack mounting, coil containers and accessories

NATIONAL HRO

The HRO Receiver is a high-gain super-heterodyne 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, a beat oscillator, a headphone jack and a B+ stand-by switch. Power supply is a separate unit. The standard models, HRO-5TA and HRO-5RA, are supplied with four sets of coils covering all frequencies from 1.7 to 30 MC and have bandspread on the 10, 20, 40 and 80 meter amateur bands.

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

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



NATIONAL SCR-4

List \$

The SCR-4 is an extremely compact crystal controlled receiver for single channel reception. It is mounted on a 5 1/4" panel and uses 13 tubes. Two stages of tuned RF amplification are followed by a separately excited converter with crystal controlled oscillator, three stages of IF amplification, a detector and two audio stages. The power supply is self-contained. Auxiliary circuits include amplified and delayed AVC, CW oscillator, noise limiter, CONS and signal strength meter. Signal-to-noise ratio averages 6 db for 1 microvolt. The AVC is

NATIONAL } SCR-4 SCR-4A

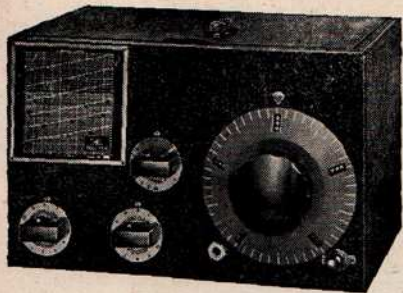
flat within 6 db for inputs from 1 microvolt to 1 volt. Being crystal controlled, frequency stability is excellent. The IF channel has a wide-band characteristic to allow for slight transmitter drift.

As the SCR-4 receiver is intended for communication work, the audio channel has been made flat only from 100-3000 cycles, with increasing attenuation of higher frequencies, thus providing good intelligibility with maximum reduction of unwanted signals and noise.

NATIONAL SCR-4A

List \$

The SCR-4A receiver is similar to the SCR-4 but has no beat oscillator and no signal strength meter. Both receivers are available for use at fixed frequencies between 100 KC and 40 MC.



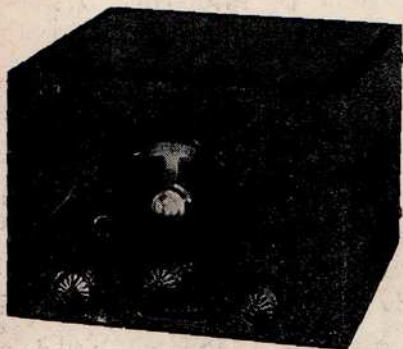
1-10 Receiver and 6 sets of coils, without tubes, speaker or power supply. List \$

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

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 \$

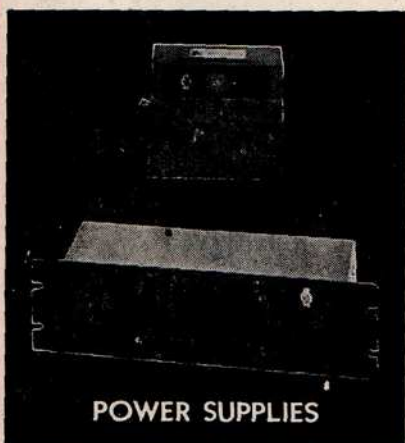
5886-AB, Power Supply, 115 V., 60 cycle, with 80 Rectifier. List \$

General Coverage Coils

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

Band Spread Coils

| | | |
|-----|-------------|----------|
| 30A | — 10 meter | \$ |
| 31A | — 20 meter | ..... |
| 33A | — 40 meter | ..... |
| 34A | — 80 meter | ..... |
| 35A | — 160 meter | ..... |



POWER SUPPLIES

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 \$

NATIONAL



COMPANY

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