

1946-47

COMPONENT PARTS CATALOG

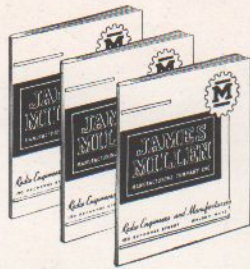


JAMES MILLEN

MANUFACTURING COMPANY, INC.

Radio Engineers and Manufacturers

150 EXCHANGE STREET • MALDEN, MASS.



MILLEN RADIO PRODUCTS are divided, for cataloging purposes, into three groups, covered by three separate catalogs:

- I Component Parts
- II Communication Receivers and Transmitters
- III Laboratory and Measurement Equipment

MILLEN RADIO COMPONENTS 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."

THIS CATALOG describes and lists those of our standard parts normally carried in stock and intended primarily for the Amateur and Experimenter. Almost every week new parts are added to the line and described in our advertisements in QST, Electronics, etc., and in our regular Engineering News Letters directed to our

FRANCHISED DISTRIBUTORS. These distributors, in addition to carrying at all times a relatively complete stock of our products as listed in catalogs I and II, regularly receive samples for display and engineering data on new Millem Communication Products as soon as released. They normally do not, however, stock items from our Instrument Division (catalog III) but will welcome the opportunity to wire or telephone orders for such equipment to the factory for you. At the factory we maintain a large stock of all regular catalog items so as to fill promptly the orders sent in by our distributors.

THE PRICES IN THIS CATALOG are strictly net for the eastern part of Continental U. S. A. (Prices on some items are slightly higher west of the Rockies and approximately 60% higher, because of customs duties, etc., in Canada.) All discounts have already been deducted for your convenience. The code numbers used are all that it is necessary to give in placing an order. They fully describe each item and also are selected so as to count as only "one word" when sent by telegraph. Most combinations of letters and numerals generally used for this purpose normally count as three words.

THE CODE NUMBERS give the user, the distributor, and all others concerned, the essential technical data on the item. For instance — just look at the following examples: They tell the story better than words!

24	9	35	26	0	50	26	9	20	33	0	04
Receiving Condenser	Double Spaced	Capacity	Receiving Condenser	Single Spaced	Capacity	Receiving Condenser	Double Spaced	Capacity	Tube Socket	Type	Contacts

CODE NUMBER GROUPING:

04000	Special Transmitting Condensers	33000	Sockets	40000	Coil and Coil Forms
10000	Drives, Locks and Knobs	34000	Chokes	50000	Insulators & Specialties
11000	Transmitting Condensers	35000	Antenna Devices	60000	I.F. Transformers
15000	Neutralizing Condensers	36000	Plate Caps	70000	Filters
16000	Receiving Condensers	37000	Terminals	80000	Chassis & Shields
30000	Standoffs	38000	Beads, Washers, etc.	90000	Complete Equipments
32000	Bushings and Feed-thrus	39000	Couplings		

INDEX. Inasmuch as the listing of products in this catalog, with minor exceptions, is in numerical sequence of code numbers, the above Code Number Grouping chart serves as an index.

OUR DOMESTIC DISTRICT SALES OFFICES are maintained in all principal cities where full information about our products and policies may be promptly obtained by telephone or mail. A full list of these offices is tabulated on the back cover of this catalog.

OUR EXPORT SALES OFFICE is located in New York City at 9 Rockefeller Plaza under the direction of Mr. C. Lohman Janik whose many years of experience in handling export sales and the shipment of radio and electrical apparatus enables us to handle export shipments quickly and efficiently with a minimum of expense and delay to our customers in all parts of the world. The central location of our export office in New York City enables us not only to give quick replies to our foreign correspondents but also to offer the facilities of our office and the services of its staff to our many friends and customers from other countries who normally visit this country through the great port of New York.

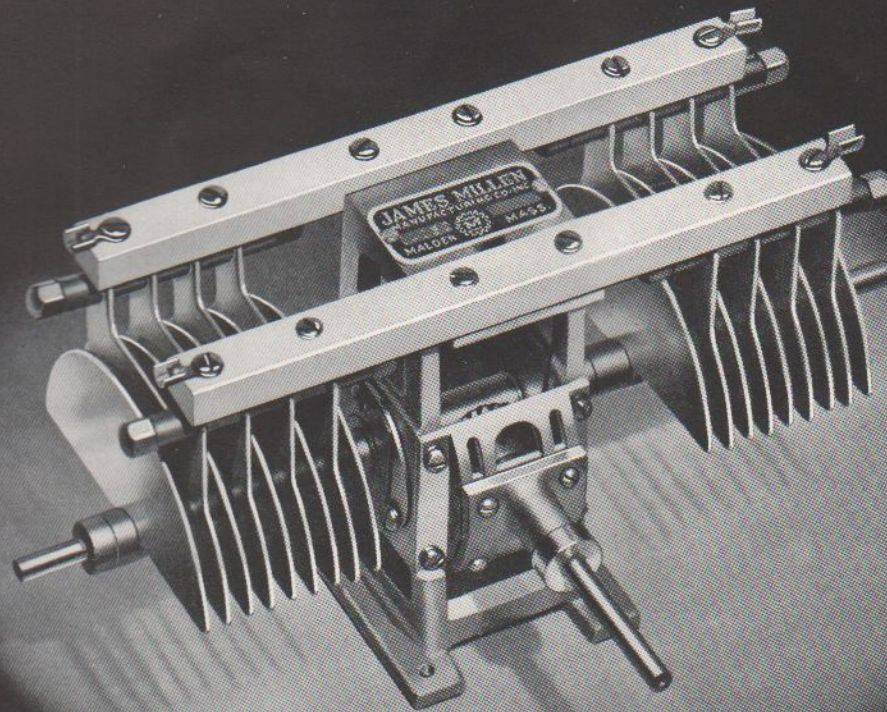
GOVERNMENT AND COMMERCIAL APPARATUS. In addition to our standard line of catalog items distributed through our foreign and domestic dealers, we operate a special design and contract manufacturing department where we specialize in the development and manufacture of component parts and complete Transmitters, Receivers, Amplifiers, Control Units, etc., for the different government departments and such commercial communication equipment manufacturers as the General Electric Company, the Western Electric Company, the Radio Corporation of America, the Federal Telegraph Company, and many others. We are very much interested in receiving inquiries from commercial equipment manufacturers for this department.

OUR PRODUCTS ARE GUARANTEED in accordance with the terms of the standard uniform guarantee of the Radio Manufacturers Association, in which organization we hold membership.

PATENTS. Our products are manufactured under many patents and patent applications of our own as well as licenses from the principal patent pools. See special labels attached to products. Trademarks Reg. U. S. Pat. Office.

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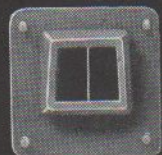
Modern Transmitting Condensers

Another Millen exclusive "Designed for Application" product is the No. 04000 series of variable air transmitting capacitors. Permits more efficient use of newer tubes — more compact and symmetrical circuit arrangements and consequent better neutralizations. Center fed rotors for better high frequency current distribution. Constant impedance, heavy current, multiple finger rotor contactor of new design. Extruded steatite insulation. Terminals in convenient places. Sturdy cast aluminum frame with right angle 1/1 drive. Adjustable drive shaft angle for either vertical or sloping panels.

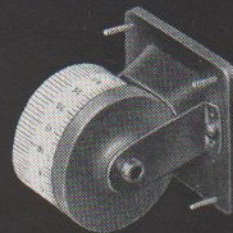
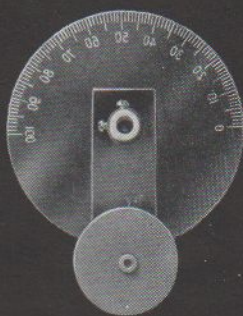
Heavy gauge rounded and polished aluminum rotor and stator plates. Rotor plate radius, $1\frac{3}{4}$ ". Available in peak voltage ratings of 3000, 6000 and 9000. Ideal for heavy duty industrial electronic heating applications as well as amateur and commercial transmitters. Mounting dimensions: Dial shaft center to base 2 inches; over-all height $4\frac{7}{8}$ inches; over-all distance behind panel $3\frac{3}{4}$ inches; plate thickness .050; area of mounting base $2\frac{1}{2}$ x 3 inches. Diameter of drive shaft is $\frac{1}{4}$ inch. Angle of adjustment of drive shaft from 3° below horizontal to 20° above.

Code	Cap./Sec.		Air Gap	Peak Volts	Plates/Sec.		Plate Finish	Length (between outside plates)	Net Price
	Max.	Min.			Rotor	Stator			
04050	48	9.3	.171	6000	5	4	Polished	7"	
04060	59	13.0	.265	9000	8	7	Polished	$11\frac{7}{8}$ "	
04100	86	12.8	.171	6000	8	7	Polished	$8\frac{7}{8}$ "	
04200	204	10.7	.077	3000	8	8	Polished	$6\frac{3}{4}$ "	





10011



10001



10004



10003



10065



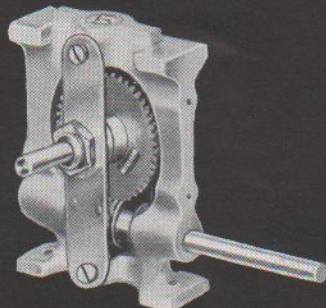
10050



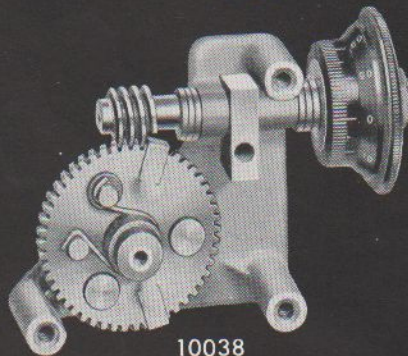
10053



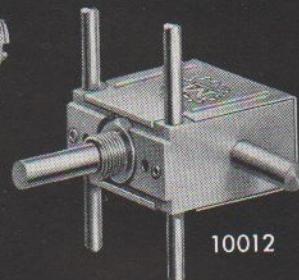
10002



10000



10038



10012



10018



10006

Dials • Drives • Scales and Knobs

The right angle worm drive assembly as used on 11000 series condensers is also available for separate sale. Cast aluminum frame may be panel or base mounted. Standard ratio, 16/1. Also 48/1 on special order. Spring loaded split gears eliminate backlash. Condensers, etc. attached to quarter inch shaft by means of flexible couplings (not furnished).

The 10038 dial and spring loaded split gear unit has ratio of 50/1. Same unit used on the Army BC191 aircraft transmitters.

The 10012 right angle drive unit is extremely compact, the case size being only 1½" x 1½" x ¾". Uses bevel gears. Mounts on adjustable "standoff rods," single hole panel bushing or tapped holes in frame. Ideal for operating switches, potentiometers, etc., that must be located, for short leads, in remote parts of chassis.

The small drum dial is designed to match in appearance the popular two and three-eighths inch square case meters. May be mounted in round panel hole in same manner as meter. Drum diameter approximately 2". May also be used as indicator for remote condensers, etc. by means of flexible shaft or string drives. Front plate molded of black bakelite. Illuminator comprises bayonet type socket and mounting clip complete with

6 volt bulb. May be used with either drum or disc dial.

The flat disc type dial with meter type escutcheon is for use with condensers such as 12000, 13000 or 14000 series where rotorshaft is perpendicular to front panel. Dial disc 3¾" in diameter. Vernier ratio approximately 10 to 1. Drive shaft extends behind panel for addition of lead flywheel when the dial is used in receivers where inertia tuning is desired.

Heavy gauge nickel silver dials are of conventional style but with improved type knobs for use with series 14000, 13000 and 12000 condensers and associated equipment. Knobs are molded with large diameter solid bakelite hub, encasing accurately reamed brass bushing, which definitely insulates metal scales from instrument shaft. This feature is extremely important, from a safety angle. When used on receivers the shape of this new style knob will be found more desirable than others heretofore available. They make for comfortable, easy and accurate tuning.

10065 vernier drive is for use with 10008 dial; 10050 lock is also for use with dials such as 10007 and 10008. Vertical movement of clamping finger is designed to prevent detuning. Captive head. Nickel finish standard, but Navy black copper oxide finish on special order.

In connection with mobile equipment and also sta-





10035



10021



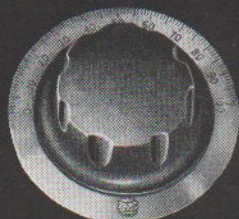
10007



10009



10008



10070



10060



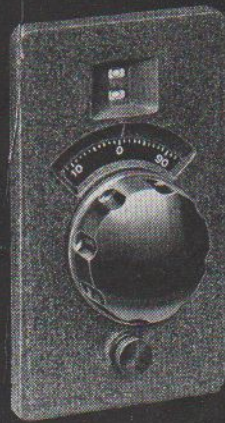
10062



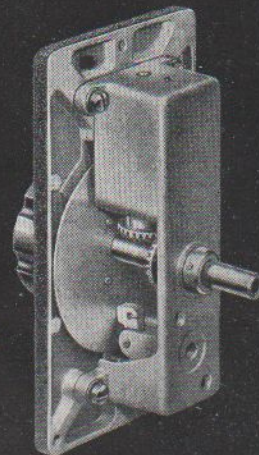
10061



10063



10030



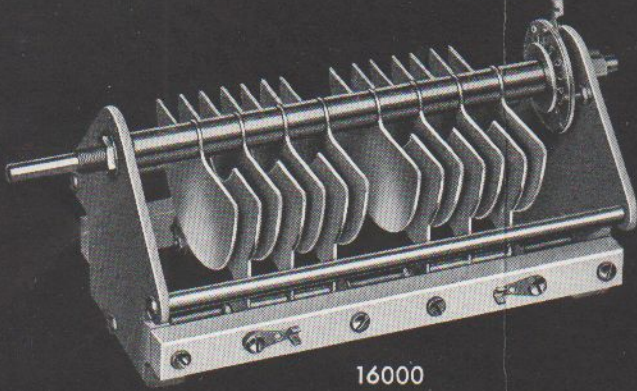
tionary equipment subject to vibration, part No. 10060 chuck type shaft lock will find many applications in connection with potentiometers, variable condensers, etc. Slots in mounting arm facilitate mounting on end plates on variable capacitors designed for standard $\frac{1}{4}$ " instrument shaft. Part 10061 is similar to part 10060 in function but was particularly designed as a combination mounting nut and lock for converting standard potentiometers and other single hole mounting type controls from "standard" to "locking" type.

Part 10030 is an extremely sturdy instrument type indicator. Control shaft has 1 to 1 ratio. Veeder type counter is direct reading in 99 revolutions and vernier scale permits readings to 1 part in 100 of a single revolution. Has built-in dial lock and $\frac{1}{4}$ " drive shaft coupling. May be used with multi-revolution transmitter controls, etc. or through gear reduction mechanism for control of fractional revolution capacitors, etc. in receivers or laboratory instruments.

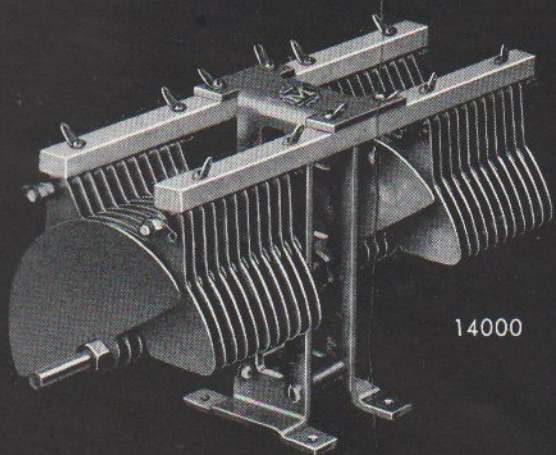
The 10035 is a combination panel and dial. Holes may readily be drilled to add two small controls, as illustrated. Escutcheon removes without disturbing dial mechanism, for easy scale calibration. Drive ratio 8/1. Escutcheon size $8\frac{1}{4}$ " x $6\frac{1}{2}$ ".

Code	Description	Net Price
10000	Worm Drive Unit, either 48/1 or 16/1	
10001	Drum Meter Dial, 0-100	
10002	Instrument Bar Knob, brass insert	
10003	Instrument Bar Knob, Navy style, brass insert	
10004	Small Tuning Knob, $\frac{1}{8}$ " dia.	
10005	Small Tuning Knob, $\frac{1}{4}$ " dia.	
10006	Large Tuning Knob, $2\frac{3}{4}$ " dia. with brass insert	
10007	Nickel Silver Inst. Dial, $1\frac{5}{8}$ " dia. 10 divisions over 180° or 280°, for CW or CCW rotation	
10008	Nickel Silver Inst. Dial, $3\frac{1}{2}$ " dia. 0-100	
10009	Nickel Silver Inst. Dial, $2\frac{3}{4}$ " dia. 0-100	
10011	Disc "Meter" Dial 0-100	
10012	Right Angle Gear Drive, 1/1 ratio	
10014	Small Tuning Knob, $\frac{7}{8}$ " dia.	
10018	Medium Tuning Knob, $1\frac{3}{4}$ " dia. with brass insert	
10021	Index Unit for use with Dials	
10030	Vernier Counter Type Instrument Dial with lock	
10035	Panel-Dial	
10036	Dial Illuminator, with bulb 6 V.	
10038	Right Angle Anti-Backlash Dial and Drive Unit	
10050	Dial Lock, Captive Head, Front of Panel Mounting	
10053	Dial Lock, Sub Panel Mounting	
10060	Shaft Lock, with mounting strap	
10061	Shaft Lock — mounting nut for potentiometers, etc.	
10062	Shaft Lock, with knurled control knob	
10063	Shaft Lock, with lever control	
10065	Vernier Drive Unit	
10070	Water-tight Shaft Gland	
10082	Drum Meter Dial Bezel Only	
10083	Disc Meter Dial Bezel Only	

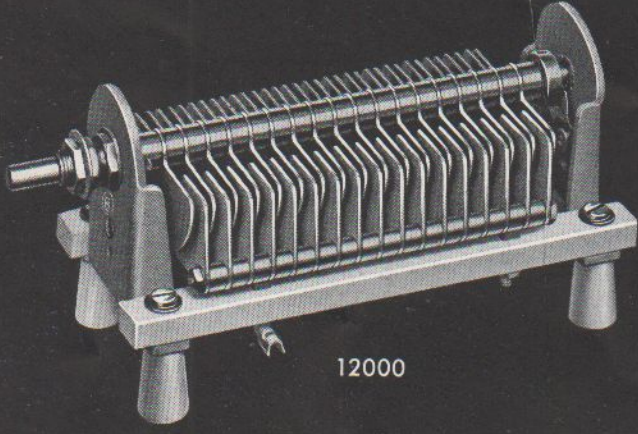




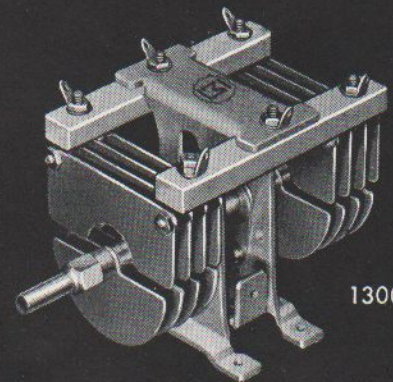
16000



14000



12000



13000

Transmitting Condensers

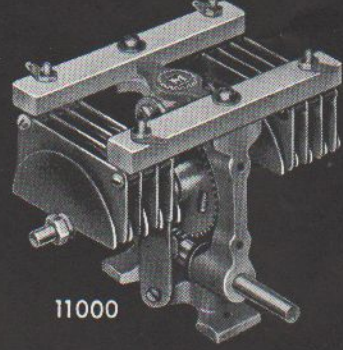
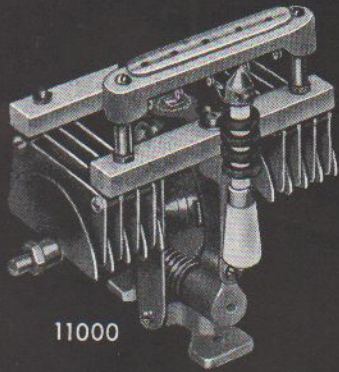
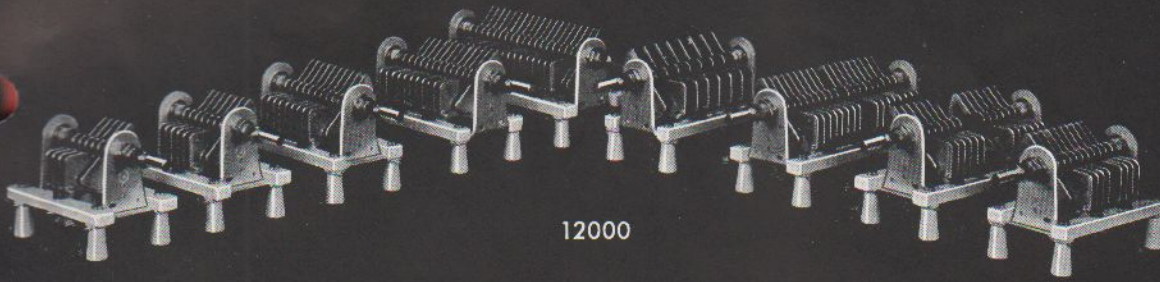
Series 11000 and 13000 — Something new — different — permitting more efficient use of newer tubes — more compact and symmetrical circuit arrangements and consequent better neutralization. Center fed rotors for better high frequency current distribution. Isolantite insulation. "Designed for Application" — terminals in convenient places; inductance socket may be mounted on stator; RF choke on frame as shown. New type meter dial at one end and meter at other provide balanced front panel appearance. End drive or right angle drive. Rounded polished heavy gauge aluminum plates. Series 12000 is conventional design using same size plates for those who want a condenser for replacement purposes in existing equipment. The series 13000 condensers have same plate sizes as series 11000 and 12000. Heavy pressed aluminum mounting frame is employed in place of casting. Direct drive from end of rotor-shaft. The series 14000 transmitting condensers are essentially the same in general design as the 13000 except the rotor plate diameter is 3½" instead of 2". For single-ended applications connect sections in parallel to obtain advantage of center feed and elimination of shorted frame loops. We also specialize in the design and develop-

ment of transmitting condensers for all types of commercial applications. The condensers illustrated on this and the following page are merely the stock items that we constantly carry on hand. Our engineering department invites correspondence relative to the development of special variable capacitors to meet your particular application whether it be in the radio transmitter, diathermy or industrial heating oscillator fields. We are also prepared to furnish combination capacitor-inductor units for ultra high frequency oscillators and wave meters, either to our own design or to customers' specifications.

Our engineering department invites your inquiry on such special designs.

11000, 13000, 14000 SERIES CONDENSERS								
.077" air gap is for 3000 volt peak rating								
MILLEN TYPE								
Code	Capacity per side		Plates per side	Dimension "L"	Plate Thickness	Air Gap	Voltage Rating	Net Price
	Max.	Min.						
11035	34	5.3	9	3½"	.040"	.077"	3000	
11050	45.2	6.2	12	5½"	.040"	.077"	3000	
11070	66	7.4	17	5½"	.040"	.077"	3000	
13035	34	5.3	9	3½"	.040"	.077"	3000	
13050	45.2	6.2	12	5½"	.040"	.077"	3000	
13070	66	7.4	17	5½"	.040"	.077"	3000	
14200	204	10.7	16	6½"	.050"	.077"	3000	
14100	85	12.8	15	11½"	.050"	.171	6000	
14050	48	9.3	9	6½"	.050"	.171	6000	
14060	59	13	15	11½"	.050"	.265	9000	





The group illustration above of an assortment of capacitors in the 12000 series shows an earlier type end plate. Current production employs an improved reinforced end bracket as illustrated on page six. On page six also is illustrated the unique constant low impedance, multiple finger, high current rotor contactor developed in the 16000 series of transmitting capacitors listed below.

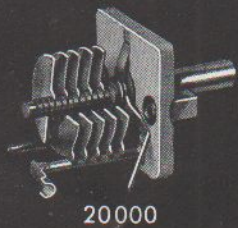
Compact new style transmitting condensers, dials, and the new types of tubes make necessary more compact and efficient neutralizing condensers. By eliminating all external supporting structures, we have arrived at the designs presented herewith. Numbers 15001, 15002 and 15003 are extremely compact and highly efficient. They use the ultra low loss QuartzQ as a dielectric. Due to the dielectric factor being approximately 3 and the puncture voltage being approximately 500 volts per mil (for thin sections) it can be appreciated how this efficient compact design is possible. Numbers 15005 and 15006 are of the telescoping cylinder type with air dielectric for use where high ambient temperatures preclude use of 15001 and 15002. The design is such that the inner cylinder largely shields the supporting Isolantite insulator so that the volume of solid dielectric in the electrostatic field is extremely small.

CONVENTIONAL SINGLE SECTION TYPE											
Code	Capacity per section		Number of Plates			Thickness of Plates	Air Gap	Finish on Plates	Length outside of frame	Voltage	Net Price
	Min.	Max.	Per Section	Rotor	Stator						
12935	9.7	28	13	7	6	.040"	.176"	Polished	4"	6000	
12936	9.7	28	13	7	6	.040	.176	Plain	4"	6000	
12536	5.8	35	9	5	4	.040	.077	Plain	3 1/2"	3000	
12551	8.1	49	12	6	6	.040	.077	Plain	3 1/2"	3000	
12576	9.5	71	17	9	8	.040	.077	Plain	4"	3000	
12510	11	96	23	12	11	.040	.077	Plain	4"	3000	
12515	16	150	35	18	17	.040	.077	Plain	5 1/4"	3000	
16550	13	52	9	5	4	.050	.171	Polished	3 3/8"	6000	
16510	17	101	17	9	8	.050	.171	Polished	6 3/8"	6000	
16520	37	203	34	18	16	.050	.171	Polished	9 3/8"	6000	
16530	45	297	49	25	24	.050	.171	Polished	12 3/8"	6000	
16559	11	65	15	8	7	.050	.265	Polished	6 3/8"	9000	
16512	40	128	30	16	14	.050	.265	Polished	11 3/8"	9000	
CONVENTIONAL DOUBLE SECTION TYPE											
Code	Min.	Max.	Per Section	Rotor	Stator	Thickness of Plates	Air Gap	Finish on Plates	Length outside of frame	Voltage	Net Price
12035	5.6	35	9	5	4	.040	.077	Polished	4"	3000	
12036	5.6	35	9	5	4	.040	.077	Plain	4"	3000	
12050	8	49	12	6	6	.040	.077	Polished	5 1/4"	3000	
12051	8	49	12	6	6	.040	.077	Plain	5 1/4"	3000	
12075	9.5	71	17	9	8	.040	.077	Polished	5 1/4"	3000	
12076	9.5	71	17	9	8	.040	.077	Plain	5 1/4"	3000	
16030	8.5	27	5	3	2	.050	.171	Polished	4 3/8"	6000	
16050	12	51	9	5	4	.050	.171	Polished	6 3/8"	6000	
16100	19	101	17	9	8	.050	.171	Polished	9 3/8"	6000	
16200	15	195	16	8	8	.050	.077	Polished	6 3/8"	3000	
16029	11	29	7	4	3	.050	.265	Polished	6 3/8"	9000	
16059	20	64	15	8	7	.050	.265	Polished	11 3/8"	9000	

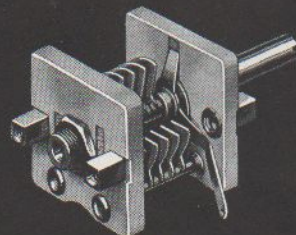
Code	Capacity Range	Peak Voltage	Net Price
15001	0.7 — 4.3	5000*	
15002	0.5 — 13.5	5000*	
15003	1.5 — 8.5	5000*	
15005	3.4 — 14.6	4000	
15006	2.8 — 9.1	6000	

* Max. recommended DC Plate Volts 1000

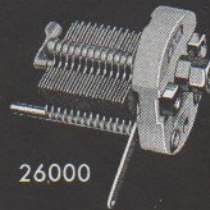




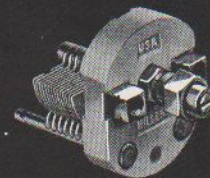
20000



21000



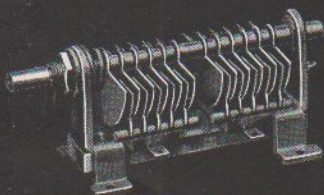
26000



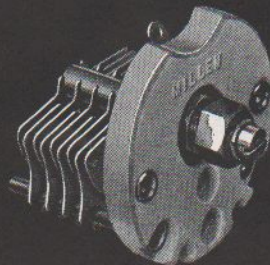
26000 LN



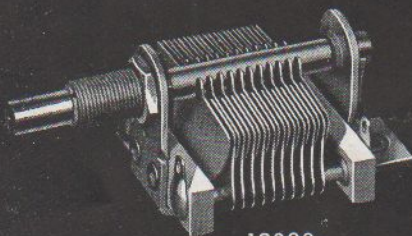
27030



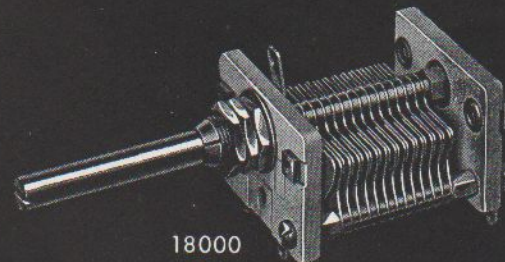
24000



17000



19000



18000

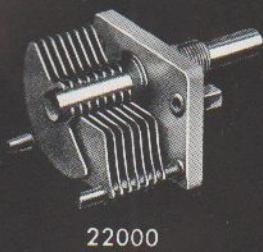
Receiving Condensers

We illustrate and list herewith the more popular stock sizes of our wide variety of small variable air capacitors. The 17000, 18000, and 26000 series can be had on special order with lock nut construction by adding the symbol LN after the code number. With the exception of the 24000 series all others employ highest grade wax impregnated steatite end plates. The 24000 series employ QuartzQ insulation and are designed primarily for ultra high frequency applications. With the exception of the 18000 series all others employ brass plates with solder type construction heavily plated. The 18000 series employs aluminum plates with washer type construction. No. 27030 is a compression type mica dielectric padder condenser of conventional design which is inexpensive and handy for many uses where the extreme stability of the air padders is not required. All condensers illustrated on this page have standard plain bearings. We can furnish precision ball bearing construction for special laboratory, military and commercial applications, upon special order.

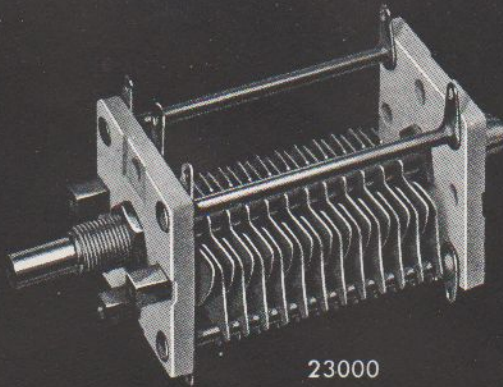
Code	Description	Net Price
17025	Large Air Padder, 25 mmfd SS	
17035	Large Air Padder, 35 mmfd SS	
17050	Large Air Padder, 50 mmfd SS	
17100	Large Air Padder, 100 mmfd SS	
17140	Large Air Padder, 140 mmfd SS	
17935	Large Air Padder, 35 mmfd DS	

Code	Description	Net Price
18000	This series made to customer's specifications as to capacity, spacing and shaft length.	
19025	Open Frame Midget, 25 mmfd SS	
19035	Open Frame Midget, 35 mmfd SS	
19050	Open Frame Midget, 50 mmfd SS	
19075	Open Frame Midget, 75 mmfd SS	
19100	Open Frame Midget, 100 mmfd SS	
19140	Open Frame Midget, 140 mmfd SS	
19200	Open Frame Midget, 200 mmfd SS	
19325	Open Frame Midget, 325 mmfd SS	
19935	Open Frame Midget, 35 mmfd DS	
19950	Open Frame Midget, 50 mmfd DS	
20015	Steatite Ultra Midget, 15 mmfd SS	
20025	Steatite Ultra-Midget, 25 mmfd SS	
20035	Steatite Ultra Midget, 35 mmfd SS	
20050	Steatite Ultra Midget, 50 mmfd SS	
20075	Steatite Ultra-Midget, 75 mmfd SS	
20100	Steatite Ultra Midget, 100 mmfd SS	
20140	Steatite Ultra Midget, 140 mmfd SS	
20920	Steatite Ultra Midget, 20 mmfd DS	
20935	Steatite Ultra Midget, 35 mmfd DS	
21050	Steatite Ultra Midget, 50 mmfd SS	
21100	Steatite Ultra Midget, 100 mmfd SS	
21140	Steatite Ultra Midget, 140 mmfd SS	
21935	Steatite Ultra Midget, 35 mmfd DS	
24100	100 mmfd per section, single spaced	
24935	35 mmfd per section, double spaced	
26025	3.2-25 mmfd Air Padder	
26050	4-50 mmfd Air Padder	
26075	4.3-76 mmfd Air Padder	
26100	5-97 mmfd Air Padder	
26920	4.5-20 mmfd Air Padder, double spaced	
26935	5-35 mmfd Air Padder, double spaced	
27030	Mica Padder	

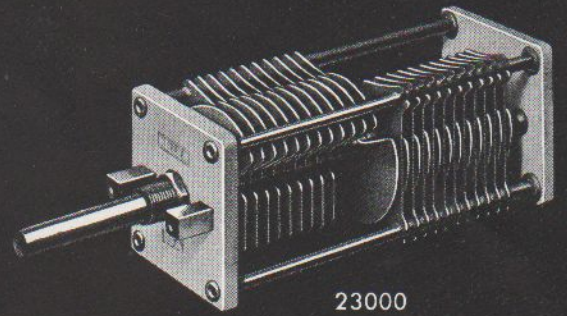




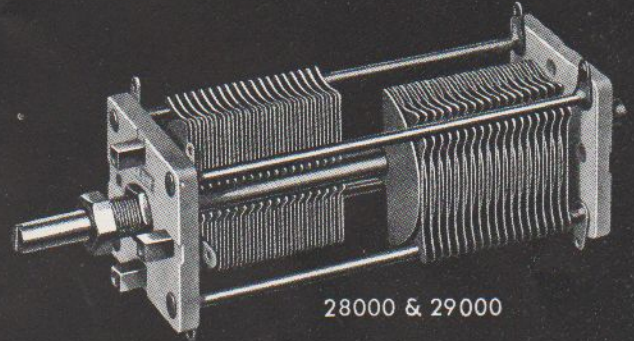
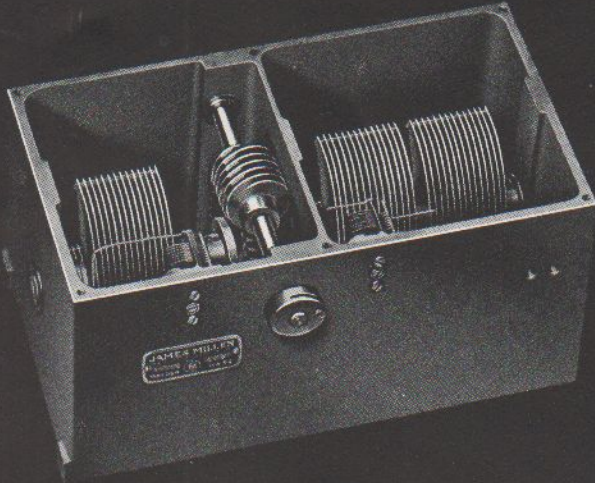
22000



23000



23000

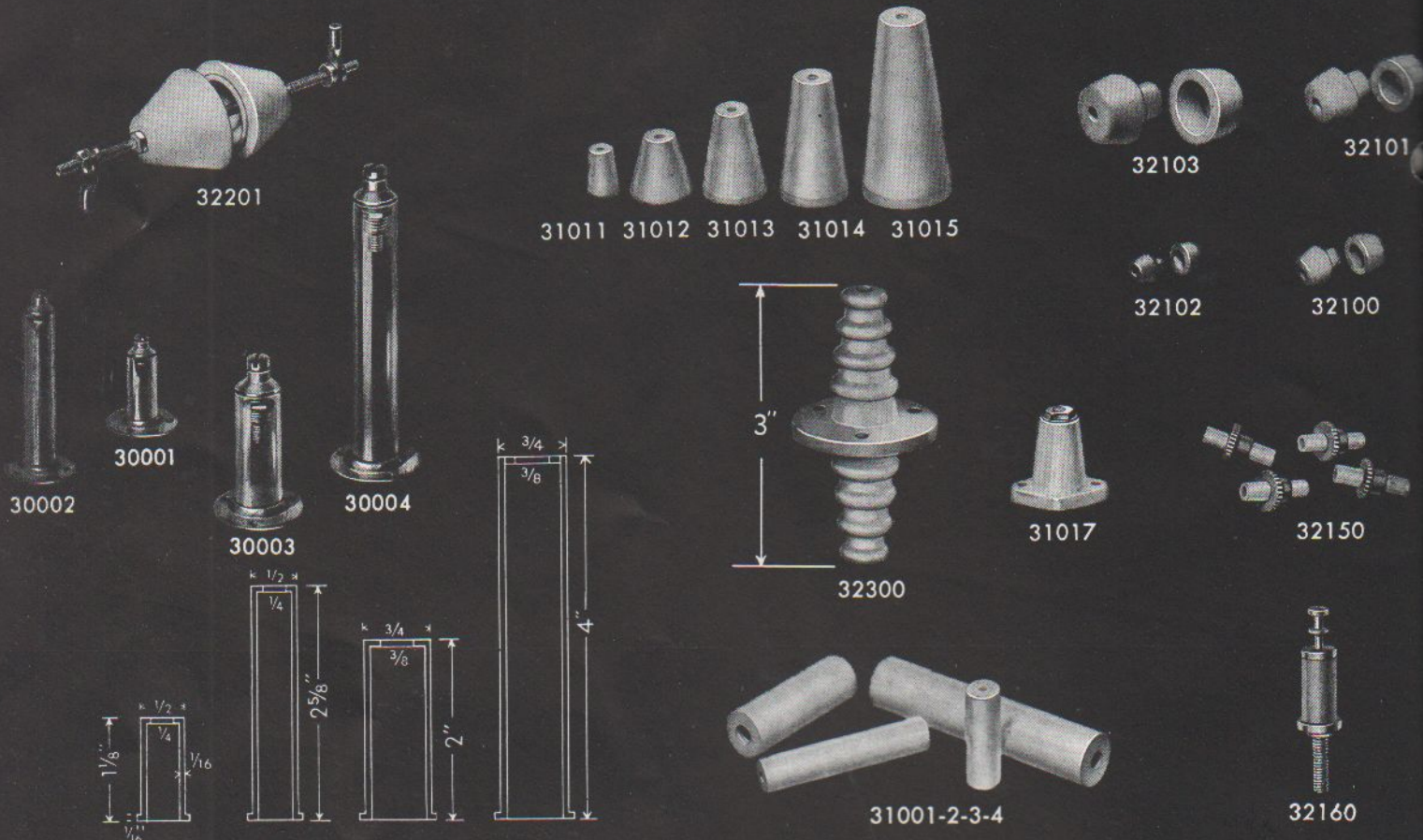


28000 & 29000

A wide variety of small capacitors can be assembled in the 22000, 23000, 28000 and 29000 series of condensers as indicated in the illustrations above. There are three different radii of rotor plates as well as the combinations possible by having either single or double end bearings, single or double spacing and single or dual stators. We list herewith the more popular stock sizes but are prepared to furnish any practical combination possible from standard parts. The condenser illustrated in the lower lefthand corner of the plate above is merely to indicate some of the special development and custom manufacturing work done in our condenser division on special customer orders. We also have many standard designs for which we are completely tooled but for lack of space are unable to illustrate and describe herewith. This is particularly true of the multiple gang precision units developed for our own and other high and ultra high frequency communication receivers.

Code	Description	Net Price
22035	Steatite Midget, 35 mmfd SS	
22050	Steatite Midget, 50 mmfd SS	
22075	Steatite Midget, 75 mmfd SS	
22100	Steatite Midget, 100 mmfd SS	
22140	Steatite Midget, 140 mmfd SS	
22915	Steatite Midget, 15 mmfd DS	
22935	Steatite Midget, 35 mmfd DS	
22950	Steatite Midget, 50 mmfd DS	
23075	Steatite Dual Midget, 75 mmfd per section SS	
23100	Steatite Dual Midget, 100 mmfd per section SS	
23140	Steatite Dual Midget, 140 mmfd per section, SS	
23925	Steatite Dual Midget, 25 mmfd per section DS	
23950	Steatite Dual Midget, 50 mmfd per section DS	
28000	Special High Capacity Type. To Customer specifications	
29000	Special Straight Frequency Line Type. To Customer specifications	





Standoffs · Bushings

QuartzQ is a highly polymerized styrene which possesses remarkably low radio frequency losses (practically zero!) and high resistance to voltage breakdown. Its excellence as a high frequency dielectric is about the same as that of fused quartz. The use of this material in place of the more commonly employed dielectrics in condensers, coil forms, etc. will result in a substantial reduction in losses and consequent increase in "Q" — hence, the name QuartzQ. QuartzQ may be readily cut and drilled. Electrical Characteristics: power factor .02%; dielectric constant 2.6; loss factor, .00053; dielectric strength 500v/mil.

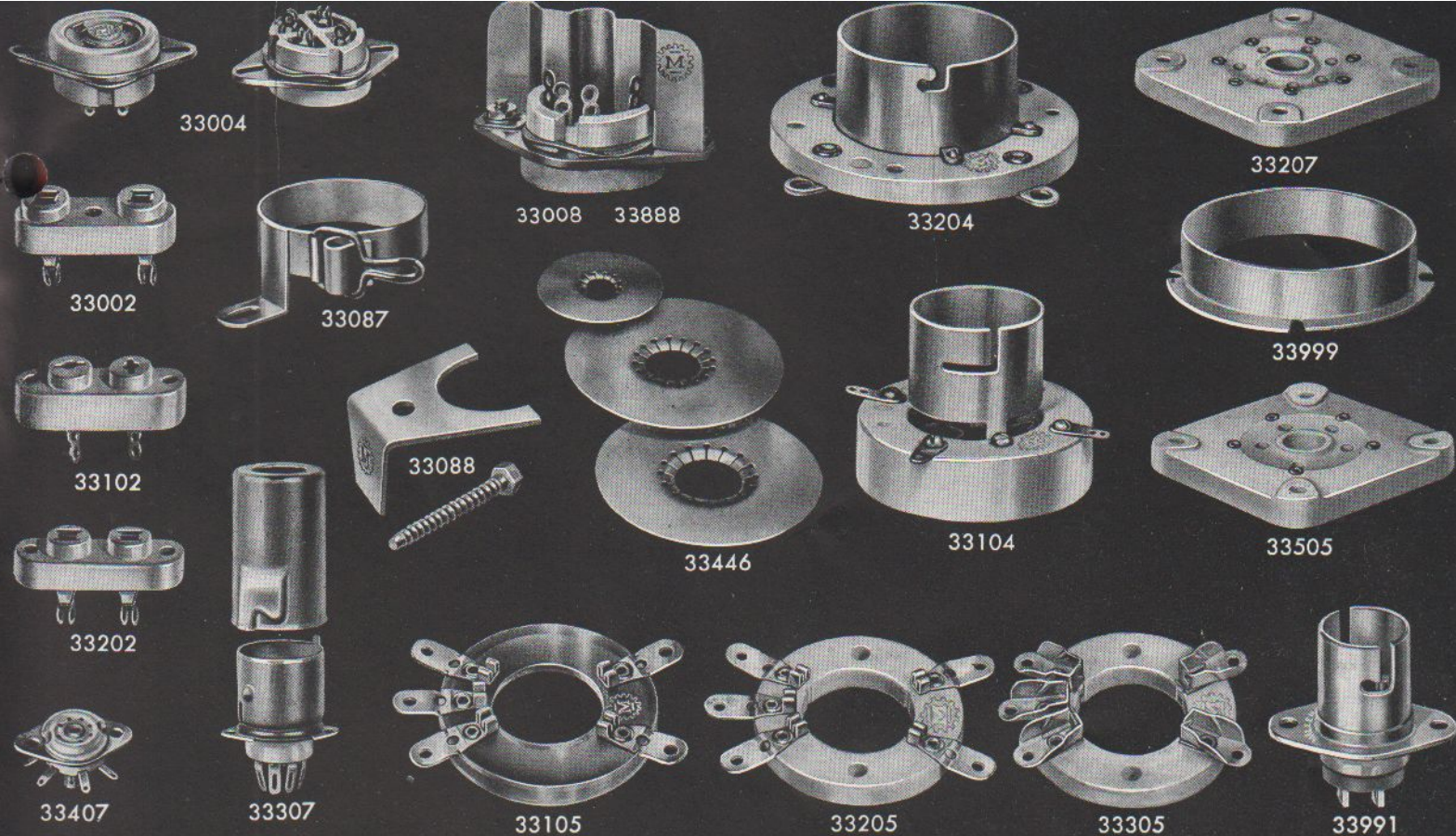
Standoffs have fitted metal tops. May also be used for ultra low loss coil forms.

Ceramic standoffs are of the best grade steatite with clean accurately threaded holes. Should not be confused with porcelain units.

In addition to the complete line of conventional type steatite bushings illustrated herewith, (hardware furnished though not shown) we also have developed the 32150 thru-bushing which provides a low loss, compact, low price, high voltage thru-bushing for running leads through chassis partitions, shield cans, etc. Die-cast soft metal shoulder on extruded Isolantite tube. Fits $\frac{1}{4}$ " hole in chassis and is locked in place by either drop of solder or crimping. Hole size in Isolantite tube takes up to No. 14 B & S wire.

Code	Part	Size	Material	Net Price
30001	Standoff	$\frac{1}{2}$ x $1\frac{3}{8}$	QuartzQ	
30002	Standoff	$\frac{1}{2}$ x $2\frac{7}{8}$	QuartzQ	
30003	Standoff	$\frac{3}{4}$ x $2\frac{7}{8}$	QuartzQ	
30004	Standoff	$\frac{3}{4}$ x $4\frac{7}{8}$	QuartzQ	
31001	Standoff	$\frac{1}{2}$ x 1	Isolantite	
31002	Standoff	$\frac{1}{2}$ x $2\frac{1}{2}$	Isolantite	
31003	Standoff	$\frac{3}{4}$ x 2	Isolantite	
31004	Standoff	$\frac{3}{4}$ x $3\frac{1}{2}$	Isolantite	
31006	Standoff	$\frac{9}{32}$ x $\frac{7}{8}$	Isolantite	
31007	Standoff	$\frac{3}{8}$ x 1	Isolantite	
31011	Cone	$\frac{3}{4}$ x $\frac{1}{2}$	Steatite	
31012	Cone	1 x 1	Steatite	
31013	Cone	$1\frac{1}{2}$ x 1	Steatite	
31014	Cone	2 x 1	Steatite	
31015	Cone	3 x $1\frac{1}{2}$	Steatite	
31017	Cone with base and jack	$1\frac{1}{4}$ " high	Steatite	
31018	Cone with base and screw top	$1\frac{1}{4}$ " high	Steatite	
31160	Insulated Ty-Point, turret lug			
32100	Steatite Bushing for $\frac{3}{8}$ " hole			
32101	Steatite Bushing for $\frac{1}{2}$ " hole			
32102	Steatite Bushing for $\frac{1}{4}$ " hole			
32103	Steatite Bushing for $\frac{3}{4}$ " hole			
32150	Isolantite Thru-bushing for $\frac{1}{4}$ " hole			
32201	Steatite Bushings and Hardware $1\frac{1}{4}$ " hole			
32300	Isolantite Bushing			





Sockets

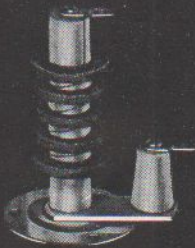
We make a complete line of sockets for all types of tubes. Our sockets are not just another line of sockets but possess "Designed for Application" features. For instance, in the type 33004, 5 and 6 sockets, the steatite base extends much higher above and below the metal mounting plate than is generally customary so as to provide a long flash over path to ground. Likewise, insulating barriers are provided between all contacts, thus tubes can be operated at much higher voltage when using these sockets. The No. 33888 shield when used with our type 33008 octal socket very materially increases the isolation between the input and output circuit of single ended metal tubes and thus makes possible the use of these tubes at very much higher gain with high stability. Our type 33202 crystal holder socket has been especially designed for use with the Signal Corps type CR1 crystal holder now so much in general use. In our acorn tube line of sockets the 33305 uses a new style of edge grip, snap lock contact that prevents frequency jump, insures permanent low resistance contact and holds the tube firmly in place under conditions of high vibration.

In addition to the type 33087 series of tube base clamps for use with conventional tubes furnished in all sizes in which conventional tube bases are made, we also have a series of hold-down "dogs" or clamps for use with metal tubes. They are available in two sizes. The standard No. 33085 for most

metal tubes and the 33086 for larger metal tubes such as the 6L6, etc.

Code	Description	Net Price
33002	Crystal Socket, $\frac{3}{4}$ " spacing, .125 pins	
33102	Crystal Socket, $\frac{487}{1000}$ " spacing, .095 pins	
33202	Crystal Socket, $\frac{1}{2}$ " spacing, .125 pins	
33004	Tube Socket, 4 prong	
33005	Tube Socket, 5 prong	
33006	Tube Socket, 6 prong	
33007	Tube Socket, 7 prong	
33008	Octal Tube Socket	
33888	Shield for 33008	
33087	Tube Base Clamp, standard size for $1\frac{3}{8}$ " diameter base tubes, other sizes to order	
33088	Metal Tube Clamp, small size	
33089	Metal Tube Clamp, large size for 6L6	
33105	Acorn Socket, Polystyrene Base	
33205	Same as 33105, Iso Base	
33305	Acorn Socket, new style contacts, Iso Base	
33104	'10 Type Tube Socket	
33204	'50 Type Tube Socket	
33207	Iso Wafer Type Socket for 829, etc.	
33999	Aluminum Shield for 33207	
33307	Socket, Midget 9000 series with shield	
33407	Socket, Midget 9000 series less shield	
33405	Giant 5 pin for Eimac, etc.	
33991	Dual Contact Bayonet for 991, black bakelite ins.	
33992	Dual Contact Bayonet for 991, mica filled ins.	





34154



34140



34400



34200



34600



34300



34103



34108



34100



34105



34101



34106



34800



34010



34102



34104



34107



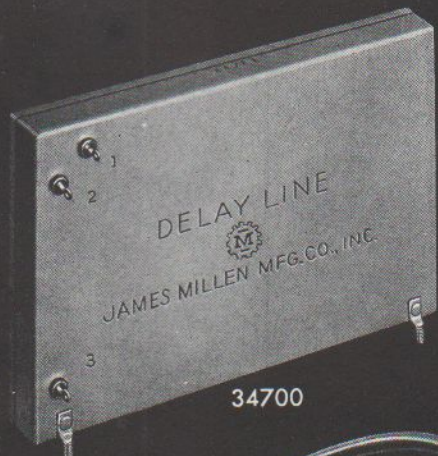
34109

RF Chokes

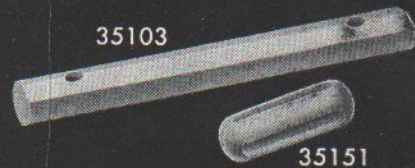
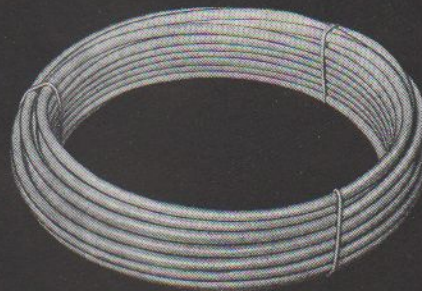
We specialize in the design and manufacture of RF chokes to meet all requirements. Our original design for model 34103 has been widely copied and has become relatively standard throughout the industry. The series of 34100 thru 34109 are variations of this original design to meet all types of applications. The 34200 series are single coil high inductance units wound on a low loss Steatite form. May be used in pairs for IF transformer, etc., applications. 34300 series are extremely compact low inductance units wound on molded bakelite form with self-supporting lead wires. 34400 series, compact low inductance multiple coil unit for single hole mounting. 34154 are for low power transmitting tube use.

Code	Inductance	Max. Amp.	Net Price
34100	2.5 mH	250 mA	
34101	2.5 mH	250 mA	
34102	2.5 mH	250 mA	
34103	2.5 mH	250 mA	
34104	2.5 mH	250 mA	
34105	1 mH	300 mA	
34106	1 mH	300 mA	
34107	1 mH	300 mA	
34108	1 mH	300 mA	
34109	1 mH	300 mA	
34010	Shielded 10 mH Receiving RF Choke		
34140	Universal air core transmitting choke		
34152	4 mH Amateur Transmitting Choke		
34154	Amateur band air core 1 mH 600 mA		
34156	2½ mH (500 mA) Transmitting Choke		
34210	General purpose RFC 10 mH		
34225	General purpose RFC 25 mH		
34240	General purpose RFC 40 mH		
34280	General purpose RFC 80 mH		
34285	General purpose RFC 85 mH		
34300	Custom wound to specifications		
34400	Custom wound to specifications		
34600	Pulse line to specifications		
34800	Interruption Frequency Oscillator Coil		



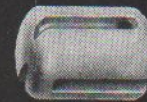


34700

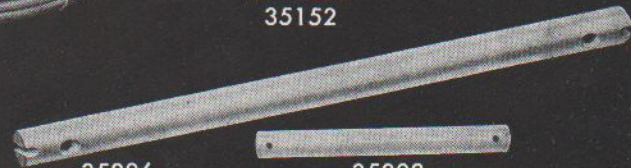


35103

35151

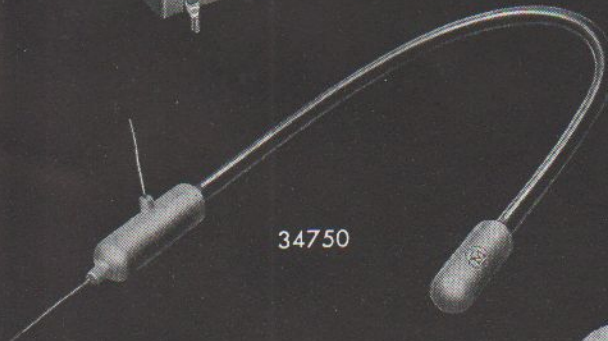


35152



35206

35202



34750



35305



35304



35303



35302

Delay Lines . Antenna Devices

In pulse formation work and pulse delay measurement, one of the essential components is a circuit, with an inherent delay characteristic. In earlier work, such time delay units were designed around lumped capacitors and inductances. For some applications, this is still the preferred method, both from a functional as well as an economic point of view. In pulse generating devices, for time measurements, however, a lumped type delay line will not always produce the optimum pulse shape, and markedly superior results are obtained from a line of the continuous delay or distributed constants type. Such a line was an exclusive war-time development of the research laboratory of the General Electric Company. During the war, we were the manufacturers of this continuous delay line for the General Electric Company, who, in turn, furnished it to all radar and gun director manufacturers. We are now merchandisers as well as manufacturers of this new type line.

Distributed constants or continuous delay line is furnished in three forms:

1. Bulk line
2. Flexible completed units
3. Cased completed units

The bulk line has an impedance of approximately 1100 ohms and a delay constant of approximately .6 u sec/ft. It can also be furnished on special order with 400 ohm impedance. It is approximately 5/16" diameter and is furnished in random lengths of from 50 to 100 feet each. It is priced "by the foot". In handling, care must be used not to coil bulk line around a diameter of less than 6".

The flexible complete lines are furnished in values of from 0.1 u sec. to 3.5 u sec. The terminals are No. 18 tinned leads, extended through the molded end caps. This form of line is particularly useful in applications where space is at a premium, as the line can be worked into a harness cable or tucked around the edges of the chassis, in otherwise waste space.

The cased lines are mounted in hermetically sealed steel containers with sperti "metal to glass" terminals. Case size, terminal arrangement, mount-

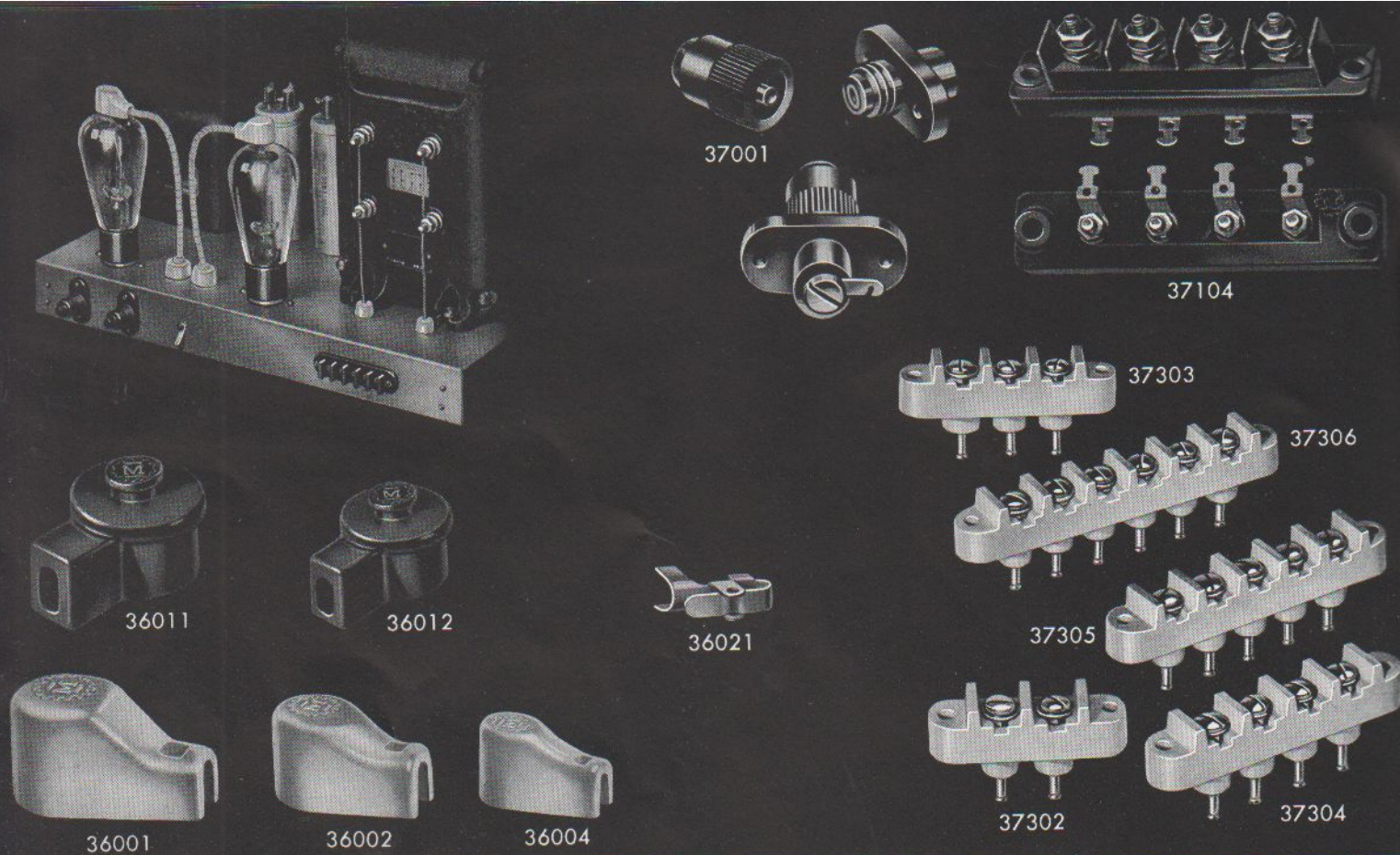
ing feet, etc., furnished to customer's requirements. Lines of this type can be furnished in values up to 8 u sec. or more and with multiple sections, in a single case.

Due to the special nature of delay line applications, we list no standard units, but solicit correspondence regarding your exact requirements. This also applies to lumped line units. Illustrated herewith are typical samples of all styles.

The small No. 35202 steatite spreader has many possibilities for use inside the radio shack as well as out. When used with a pair of No. 16 tinned wires the spreaders are easily, neatly, and ruggedly locked in place by means of a drop of solder on the wire at each side of the hole. This arrangement makes an efficient, neat 500 ohm line for use between the receiver, the transmitter and the antenna change over relay. Diameter is only 1/4". Design feature of the lead-in bowl hardware is the screw-driver slot at ends of rods to permit holding while tightening nuts.

Code	Description	Net Price
35103	Steatite Antenna Insulators	
35151	Steatite Antenna Insulators	
35152	Steatite Antenna Insulators	
35202	Steatite Feeder Spreader 2"	
35206	Steatite Feeder Spreader 6"	
35302	Steatite Bushings and Hardware 1 7/8" hole	
35303	Steatite Bushings and Hardware 2 3/8" hole	
35304	Steatite Bushings and Hardware 3 3/4" hole	
35305	Steatite Bushings and Hardware 3 3/4" hole	





Safety Terminals and Plate Caps

TERMINALS. Every day the importance of safety in the design of Radar and radio equipment is being more fully realized. High voltage power supply units have been particularly bad offenders in the past. Newly designed high voltage terminals, rectifier plate caps, bushings, and terminal panels presented herewith now make possible improved safety designs of complete units. Power unit in upper left corner of page illustrates how these parts may be used. Barrier between contacts on No. 37305 AC terminal panel not only prevents arc over but also accidental contact with metal terminals. Easy to mount. Only series of small round holes required in chassis. Turret lug and terminal all one piece.

No. 37001 high voltage terminal mounts with round holes. Insulated bushing extends thru chassis, all metal parts completely enclosed in bakelite case; tapered plug and socket "high area, heavy pressure" contact. Available in black or red bakelite on 37001 and in low loss mica-filled brown bakelite on 37501.

The plate caps 36001, 36002 and 36004 are steatite with spring connectors that will retain their tension under continuous high heat conditions encountered in operation.

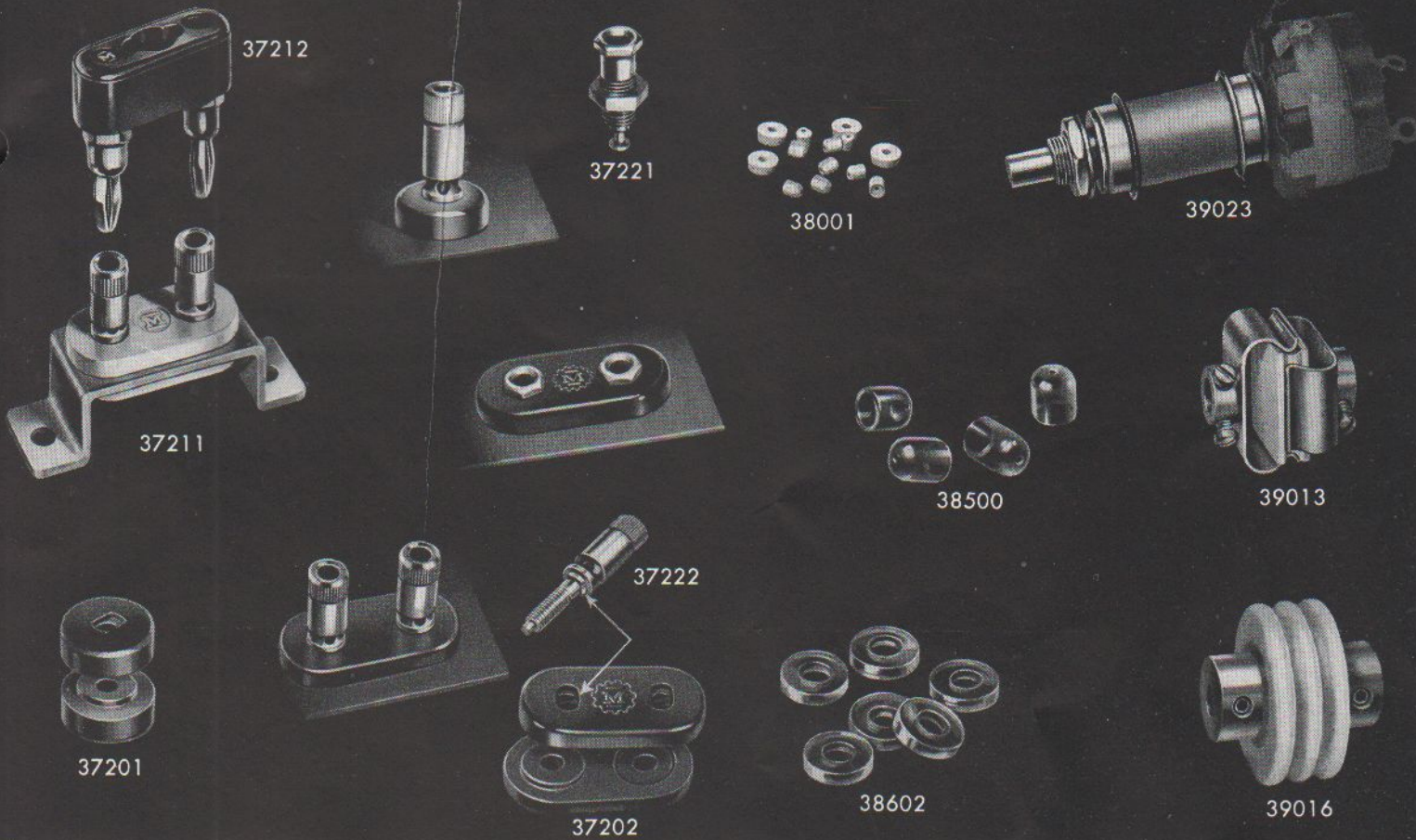
36011 and 36012 designed especially for mobile, industrial

and other applications where tighter than normal grip with multiple finger 360° low resistance contact is required. Contact self-locking when cap is pressed into position. Insulated snap button at top releases contact grip for easy removal without damage to tube.

36021 is all metal grip and plate connector, with spring release for use with 829s and similar tubes.

Code	Description	Net Price
36001	Ceramic Plate Cap $\frac{1}{16}$ " , for 866, etc.	
36002	Ceramic Plate Cap $\frac{3}{8}$ " , for 807, etc.	
36004	Ceramic Plate Cap, $\frac{1}{4}$ "	
36011	Snap Action Plate Cap, $\frac{1}{16}$ "	
36012	Snap Action Plate Cap, $\frac{3}{8}$ "	
36021	All Metal 829 Grid Connector	
37001	Black or Red Bakelite Safety Terminal	
37501	Low Loss Mica Bakelite Safety Terminal	
37104	Four Terminal, Black Bakelite	
37302	Two Terminal, Steatite	
37303	Three Terminal, Steatite	
37304	Four Terminal, Steatite	
37305	Five Terminal, Steatite	
37306	Six Terminal, Steatite	





Binding Posts • Beads • Couplings

The 37222 binding posts and 37202 plates incorporate such unusual special features as: (1) the square shoulder on the mounting stud of the post which seats in the slot in the plate so as to prevent annoying loosening of the posts when operating the clamping head; (2) captive head; (3) long stud; (4) the telescoping boss and socket so as to permit the plates to grip tightly the thinnest chassis as well as the thickest panels without necessity of grinding or filing; (5) the availability of the plates in Steatite, mica filled natural bakelite, as well as standard black phenolic. Disc mounts for single posts, such as antenna, etc.

The 37212 is an unusually compact plug for use with the 37222 posts or 37221 jacks. Available in black, red or brown mica filled bakelite.

The QuartzQ beads and washers are for construction of short concentric link lines; ideal for use between RF stages in transmitters.

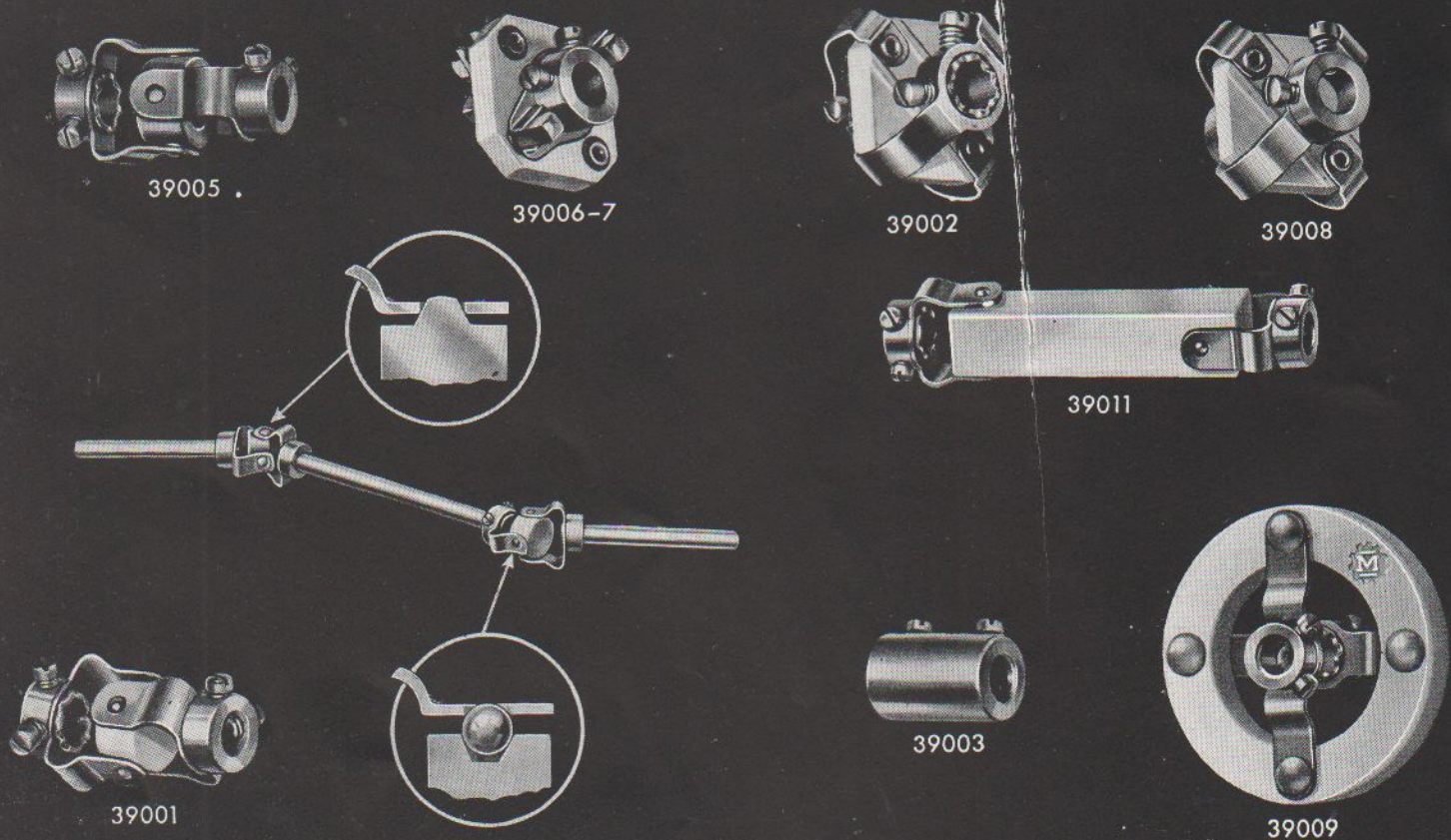
The combination mounting device and insulated shaft extension for potentiometers was designed especially for use in oscilloscopes and other such devices where the potentiometer itself is operated at substantial voltage above ground and thus requires electrical isolation of its shaft from the panel control.

The 39013 slide coupling is of unique design to provide for the ganging of two shafts operating on slightly different centers. The 39016 solid insulated coupling employs a radically new method of construction wherein the metal connecting hubs are of sintered bronze, which is fused as an integral part

to the ceramic insulating body. The hubs in this particular coupling are very accurately reamed for true alignment. Available for use with either $\frac{1}{4}$ " or $\frac{3}{8}$ " shafts or for connecting a $\frac{3}{8}$ " shaft to a $\frac{1}{4}$ " shaft. Specify size when ordering.

Code	Description	Net Price
37201	Black or Brown Bakelite Discs, pr.	
37202	Steatite, Black or Brown Bakelite Plates, pr.	
37212	Plug, Black, Red or Brown	
37211	Bracket, Nickel Plated Brass	
37221	Jack, Nickel Plated, pr.	
37222	Binding Posts, Nickel Plated, pr.	
38001	Isolantite $\frac{3}{16}$ " O.D. Beads (pkg. of 50)	
38501	QuartzQ $\frac{3}{16}$ " O.D. Beads (pkg. of 100)	
38601	QuartzQ Washers, $\frac{1}{2}$ " O.D. x $\frac{1}{8}$ " I.D. x 0.1" th.	
38602	QuartzQ Washers, $\frac{1}{2}$ " O.D. x $\frac{1}{4}$ " I.D. x 0.1" th.	
39013	Slide Coupling, $\frac{1}{4}$ " hubs	
39016	Solid Insulated Coupling, $\frac{1}{4}$ " hubs	
39017	Same as 39016 but $\frac{3}{8}$ " hubs	
39018	Same as 39016 but $\frac{1}{4}$ " x $\frac{3}{8}$ " hubs	
39023	Insulated Shaft Extension-Mounting	





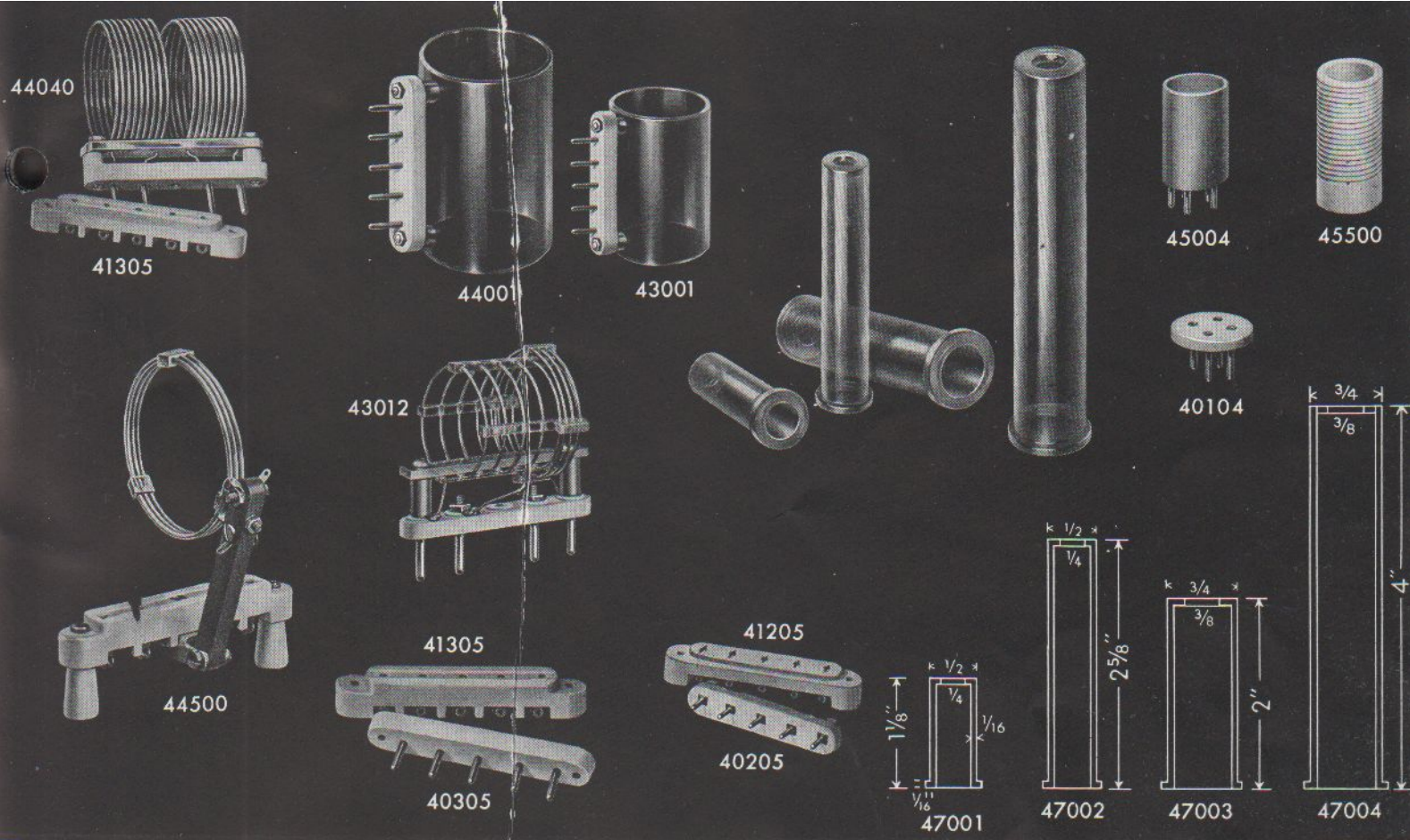
Flexible Couplings (cont.)

The 39001 is something new in flexible couplings. No backlash, yet angle drives with as much as 45°, may be obtained. Isolantite insulation. Ideally suited for driving type 10001 drum dial indicator under many conditions. Applied torque must be limited to an amount that will not displace ball pivot bearings. No. 39005 is a non-insulated Universal joint for large angle drives requiring relatively high torque. No. 39006 is another new and unique type of flexible coupling developed for use where shafts have end motion, slightly eccentric motion or end wobble. Also this type coupling permits small angle drives. Spring pinch forks eliminate backlash and are especially suitable for applications requiring disengagement without use of tools, of driving and driven equipment such as small loop antennas, etc. Available with either ceramic or linen base bakelite insulation. No. 39002 is the compact conventional type coupling. 39008 is the same style coupling with the hubs on the outside instead of the inside of the spring arms. 39009 is the

large diameter Isolantite ring type coupling for higher voltage application. No. 39011 is a high voltage version of 39001. All of these couplings are standard for 1/4" shaft and have slotted head hardened cup point set screws. On special order they can be furnished for other shaft diameters and with Allen head or Bristo set screws.

Code	Description	Net Price
39001	Truly Flexible Isolantite Coupling	
39002	Conventional Coupling	
39003	Solid Brass N.P. Coupling	
39004	Same as 39005 but with hubs "in"	
39005	Universal Joint, Non-insulated Coupling	
39006	Slide Action Coupling, Steatite Insulation	
39007	Slide Action Coupling, Bakelite Insulation	
39008	Same as 39002 except outside Hubs	
39009	High Voltage Ring Type Coupling	
39011	High Voltage "truly flexible" Coupling	





Coils and Coil Forms

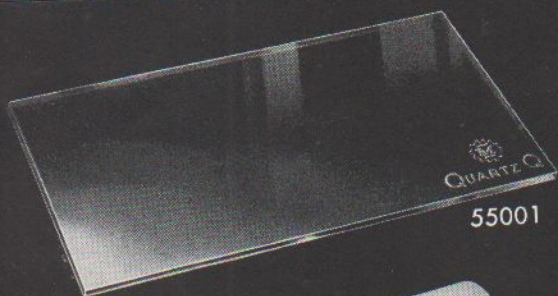
The series 45000 coil forms are of the popular mica base molded phenolic type. They are slightly longer than formerly available units of this type, so as to make easier the winding of low frequency coils. Also available with four or five-prong base for increased number of circuit applications. Unique "Designed for Application" feature is "lead funnel" molded in base to guide insertion of leads to base pins.

The midget series of airwound inductors are ideal for receiver and preselector use as well as oscillators, exciters, doublers and low power finals. Bar type Steatite plug and socket makes possible compact symmetrical circuit layout. Same coils as used in Millen 90800 50 watt transmitter-exciter. Sockets mount conveniently directly on transmitting condensers. QuartzQ coil forms are easy to drill. Wire may be imbedded into form by use of QuartzQ coil dope (No. 58001 on page 18). Standard tube socket pins have low contact resistance and carry high current. "150 watt" series also has swinging link. Husky 150 watt series are 2½" diameter.

No. 40104-5 Isolantite wafers fit standard four and five-prong sockets. Ideal for 2¼ and 5 meter transmitter and receiver self-supporting air wound inductors. Also made to fit die-cast aluminum shield, No. 80002 on page 21.

Code	Description	Net Price
43081 43041 43021 43011	Midget coils for each band. Mounted on No. 40205 plug. No. 1 at end of code means center link. No. 2, end link.	
43001 40205 41205	QuartzQ blank form and plug Midget Plug Midget Socket	
44080 44040 44020 44010 44005	"150 watt" coils for each band. Mounted on No. 40305 plug.	
44000 44500 44001 40305 41305 40104 40105 45000 45004 45005 45500 46160	QuartzQ form 1⅞" dia. x 3¾" Swinging link and socket QuartzQ blank form and plug Intermediate size plug Intermediate size socket 4 prong Isolantite base plug 5 prong Isolantite base plug	
47001 47002 47003 47004	Coil Form 1" dia. no p. Coil Form 1" dia. 4 p. Coil Form 1" dia. 5 p. Coil Form 5/8" dia. Coil Form 15/16" dia. no p. Coil Form 1½" dia. Coil Form 1⅞" dia. Coil Form 2" dia. Coil Form 2½" dia. Coil Form 3" dia.	Low loss mica base Phenolic Low loss mica base Phenolic Low loss mica base Phenolic Steatite QuartzQ QuartzQ QuartzQ QuartzQ QuartzQ

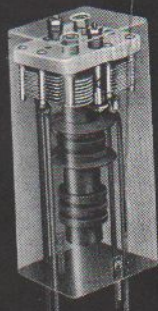




55001



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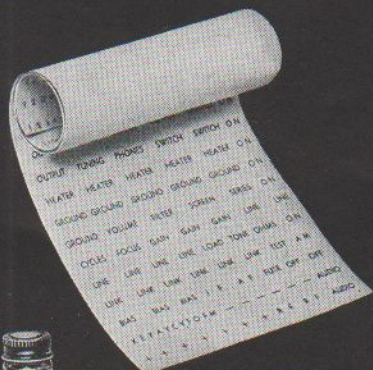
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67456



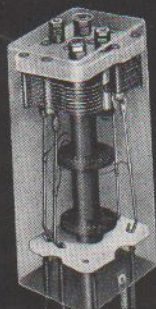
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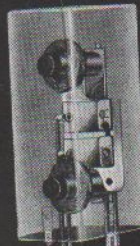
59001



69041



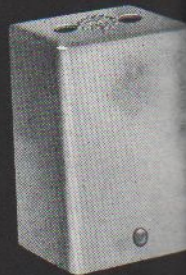
62456



64456



68161



IF Transformers • Specialties

Our line of IF transformers is extremely complete and covers air core air tuned, iron core air tuned, permeability tuned, as well as inexpensive mica tuned iron core units. Both mica tuned and air condenser tuned IF and discriminator units are available for FM receivers. Air dielectric condenser tuned beat frequency oscillator units are available for all standard IF frequencies. Each BFO unit contains the grid condenser and the grid leak inside the shield. The large size heavy wall extruded aluminum shield cans, high Q condensers and coils result in the over all Q of all transformers being extremely high for their particular type. The new deluxe type are same construction as used in our own receivers, with heavy molded end terminal boards, steatite coil forms, rigidly located "down leads", etc.

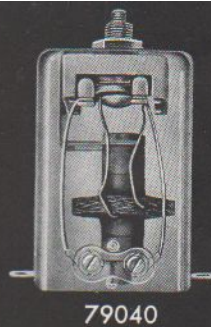
The QuartzQ sheets and coil dope are now too well known to require further comment. The 59001 decalcomania kit however is a new "war time development" that permits the amateur and home constructor to work the panel of his transmitter, etc. in accordance with the latest practice. These transfers should not be confused with pre-war types.

The No. 59001 panel marking transfers have 1/8" block letters. Special solution furnished. Must not be used with water. Equally satisfactory on smooth or wrinkle finished panels or chassis. Ample supply of every conceivable word or marking required for amateur or commercial equipment.

Code	Description	Net Price
55001	QuartzQ 3 x 8 x .1	
58001	QuartzQ Coil Dope, 2 oz.	
59001	Panel Marking Decalcomania Kit	
	<i>Air Trimmed</i>	
60456	456 Interstage (2)	Air Core
60455	456 Interstage (1)	Air Core
60454	456 Diode	Air Core
63456	456 BFO	Air Core
60501	5000 Interstage (2)	Air Core
60502	5000 Diode	Air Core
60503	5000 FM Interstage	Air Core
60504	5000 FM Disc	Air Core
63503	5000 BFO	Air Core
62456	456 Interstage	Iron Core
62454	456 Diode	Iron Core
62161	1600 Interstage	Iron Core
62162	1600 Diode	Iron Core
63163	1600 BFO	Air Core
	<i>Mica Trimmed</i>	
67456	456 Interstage	Iron Core
67454	456 Diode	Iron Core
67503	5000 FM Interstage	Air Core
67504	5000 FM Disc	Air Core
	<i>Permeability Tuned</i>	
64456	456 Interstage (2)	
64454	456 Diode (2)	
65456	456 BFO	
	<i>De Luxe Permeability Tuned</i>	
64161	1600 Interstage	
65163	1600 BFO	
68161	1600 Interstage	
68162	1600 Diode	
68163	1600 BFO	
68456	456 Interstage	
68454	456 Diode	
68457	456 BFO	
69041	Ultra-high Form	



XSTAL FILTER



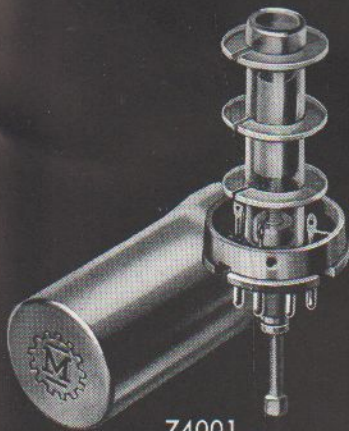
79040



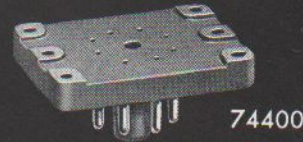
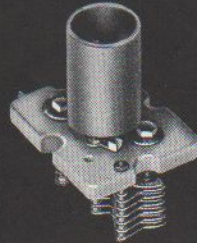
77083



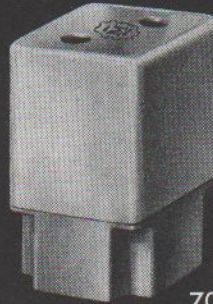
77866



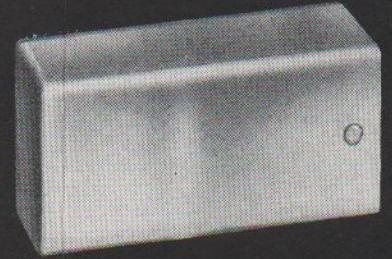
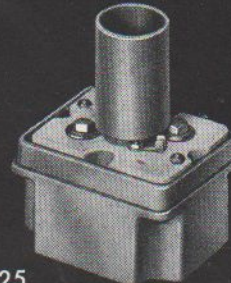
74001



74400



70225



70721

Filters • Tunable Coil Forms • Hetrofil*

The "hash" filters are designed to eliminate the interference caused by mercury vapor types of rectifier tubes. The type 77083 is for use with type 82 or type 83 tubes. The type 77866 is for use with 866s. Wound on Isolantite cores. They should be connected in each plate lead as close to the tube as possible.

Wave traps afford practical and inexpensive means of combating BCL interference complaints. Available for all amateur bands.

Another new Millen "Designed for Application" product is the No. 74001 permeability tuned, shielded plug-in coil form. Standard octal base of low loss mica-filled Bakelite, polystyrene 1/2" diameter coil form, heavy aluminum shield, iron tuning slug of high frequency type, suitable for use up to 35 mc. Adjusting screw protrudes through center hole of standard octal socket. Special extension terminals facilitate connection to base pins.

The HETROFIL* is a device which provides means directly in the audio output of a communications receiver to reject or suppress an interfering signal or audio beat note. Thus, if two CW stations are being received simultaneously the HETROFIL* may be adjusted so as to reject either of the signals and accept the other. It may be used externally as a separate unit or built into a complete receiver. When used with a receiver

without the modern type crystal filter it has all of the advantages of the phasing control of the crystal circuit and at the same time is much easier and quicker to operate. The HETROFIL* may be used with any type of receiver and provides a means of selective control for TRF receivers comparable to the crystal filter used in superheterodynes and at a much lower cost. A technical paper fully describing this device appeared in the September, 1939, issue of *QST*. Manufactured under license from the inventor, Dr. R. W. Woodward.

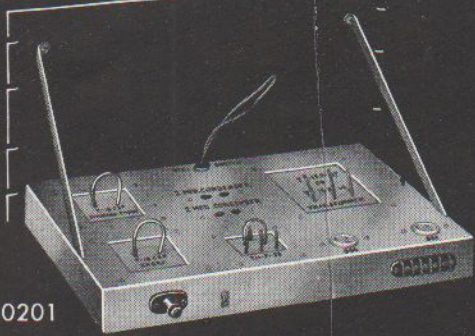
The crystal Filter Unit is the same 456 kc unit as used in our own receivers. Complete with crystal.

* Reg. U. S. Pat. Office.

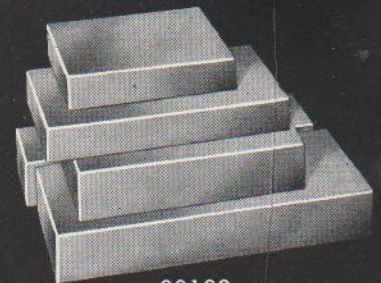
Code	Description	Net Price
70225	Dual Condenser Tuned Form	
74400	Octal Base and Shield	
70721	Hetrofil*	
74001	Permeability Tuned Shielded Form	
74002	Untuned Shielded Form	
75001	Crystal Filter Unit, 456 KC	
79020	14mc Band Wave Trap	
79040	7mc Band Wave Trap	
79080	3.5mc Band Wave Trap	
79160	1.7mc Band Wave Trap	
77083	"83" Hash Filter 250MA	
77866	"866" Hash Filter 500MA, PR.	
77872	"872" Hash Filter, PR.	



80201



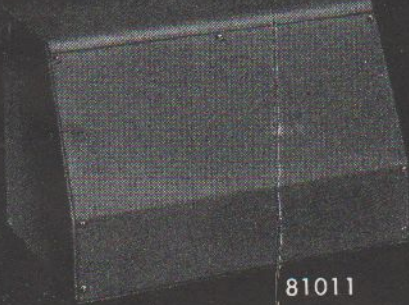
80100



80560



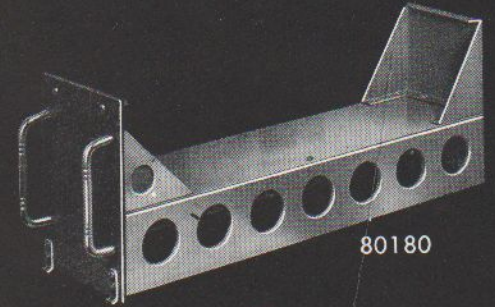
81011



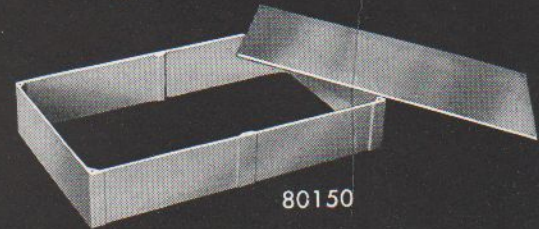
81001



80180



80150



80300



Prewired Foundation Units · Chassis · Panels

PREWIRED HIGH VOLTAGE TRANSMITTER POWER PACK CHASSIS. Again, something entirely new! Not only is the headache work of cutting square holes, etc. in what is generally a rather necessary but uninteresting part of the transmitter construction eliminated, but also the wiring. After all, power supply circuits are pretty well standardized and leave little room for experimentation in themselves. Each size chassis can be used for more than one rating of pack by use of proper size power transformer. Designed with a view to "safety"; heavy steel baffle welded in base isolates input line circuits from high voltage leads. Furnished with insulated safety output terminal, AC input terminal block, tube socket, safety rectifier cap, etc. AC terminals on block for remote or relay control of high voltage. Complete except for tubes, transformer, chokes, filter condensers and bleeder. All mounting holes for Thordarson units. Other makes may be used by drilling additional holes.

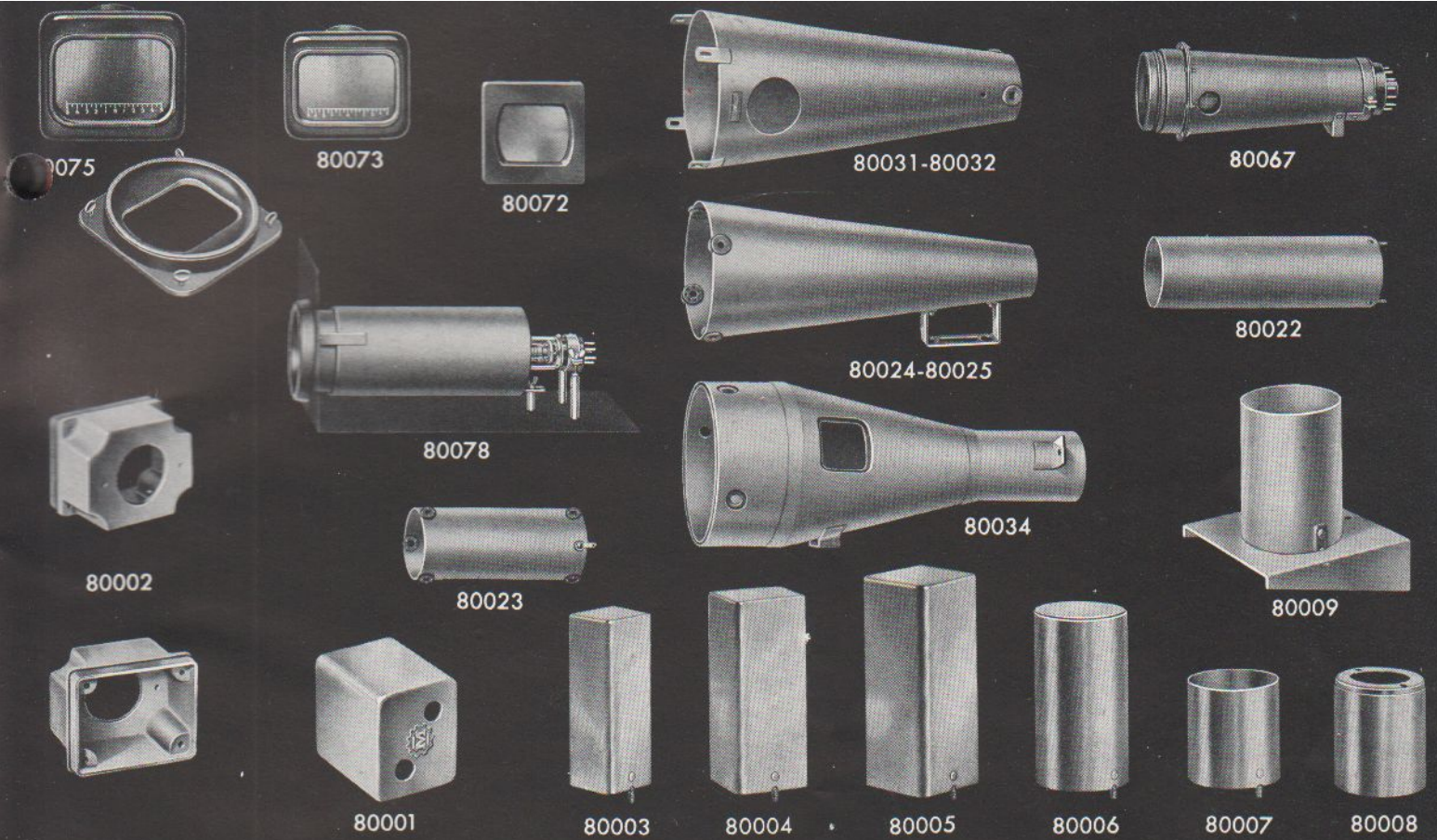
RUGGED CAST ALUMINUM CHASSIS. A little expensive, from some points of view, but can be used over and over again in different jobs by merely replacing sheet aluminum top. Easy to use as all drilling, etc. is done on flat top plate before mounting on cast frame. Ideal for ECOs, receivers, etc. where stability is important. Only available, at present, in one stock size, but others will be added to the line if demand warrants.

PANELS. Fine grain black wrinkle finished $\frac{1}{8}$ " thick steel panels. Standard relay rack punchings and sizes. Nothing new or novel. Just the conventional at the standard price! Uniform finish makes group of panels always match.

PLAIN STEEL CHASSIS. Light gauge, easy to drill. Baked black wrinkle finish.

Code	Part	Size	Net Price
80201	Complete Prewired Foundation Unit	Panel 19 x 10 $\frac{1}{2}$ Chassis 17 x 12 Power Ratings: 600 or 750V at 300MA 750 or 1000V at 300MA 1000 or 1250V at 300MA 1250 or 1500V at 300MA	
80205	Complete Prewired Foundation Unit	Panel 19 x 12 $\frac{1}{2}$ Chassis 17 x 14 Power Ratings: 2000 or 2500V at 300MA	
80100	Steel Chassis	5 $\frac{1}{2}$ x 9 $\frac{1}{2}$ x 1 $\frac{1}{2}$	
80101	Steel Chassis	7 x 9 x 2	
80102	Steel Chassis	7 x 13 x 2	
80103	Steel Chassis	7 x 15 x 3	
80104	Steel Chassis	4 x 17 x 3	
80105	Steel Chassis	7 x 17 x 3	
80106	Steel Chassis	10 x 12 x 3	
80107	Steel Chassis	10 x 14 x 3	
80108	Steel Chassis	10 x 17 x 2	
80109	Steel Chassis	10 x 17 x 3	
80150	Aluminum Chassis	17 x 10 x 3	
80301	Steel Panel	19 x 1 $\frac{3}{4}$ x $\frac{1}{8}$	
80303	Steel Panel	19 x 3 $\frac{1}{2}$ x $\frac{1}{8}$	
80305	Steel Panel	19 x 5 $\frac{1}{4}$ x $\frac{1}{8}$	
80307	Steel Panel	19 x 7 x $\frac{1}{8}$	
80308	Steel Panel	19 x 8 $\frac{3}{4}$ x $\frac{1}{8}$	
80310	Steel Panel	19 x 10 $\frac{1}{2}$ x $\frac{1}{8}$	
80501	Steel Brackets	$\frac{1}{2}$ x $\frac{1}{2}$ x 12	
80560	Instrument Handle, leather, with gunmetal finished hardware		
81001	Speaker Cabinet, for 6" diam. speaker		
81011	Cabinet, 14" long, 9" deep, 9" high		
80180	ATR Chassis $\frac{1}{2}$		
80181	ATR Chassis $\frac{3}{4}$		
80182	ATR Chassis full		





Aluminum and Magnetic Metal Shields

We specialize in the design and manufacture of high permeability shields for use with cathode ray tubes for the minimization of the effect of undesired stray magnetic fields. Standard stock sizes are available in different materials for all standard types of cathode ray tubes for use under normal conditions. We are also prepared to custom build this type of shield to special requirements, on short notice. For most applications the single layer nicoloi shield is completely adequate. In cases where still more effective shielding is required we can furnish either dual nicoloi or single mu-metal types. Illustrated above are a few of the most generally used models.

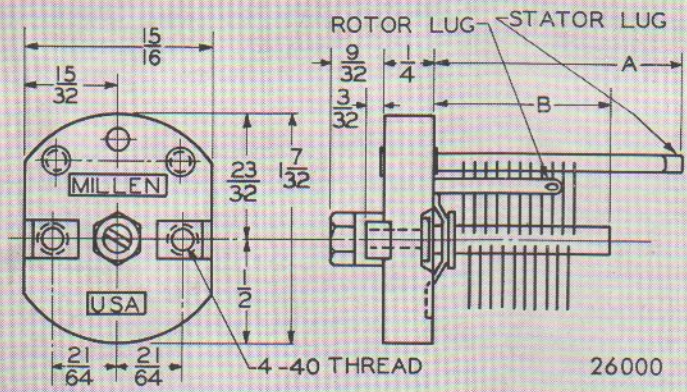
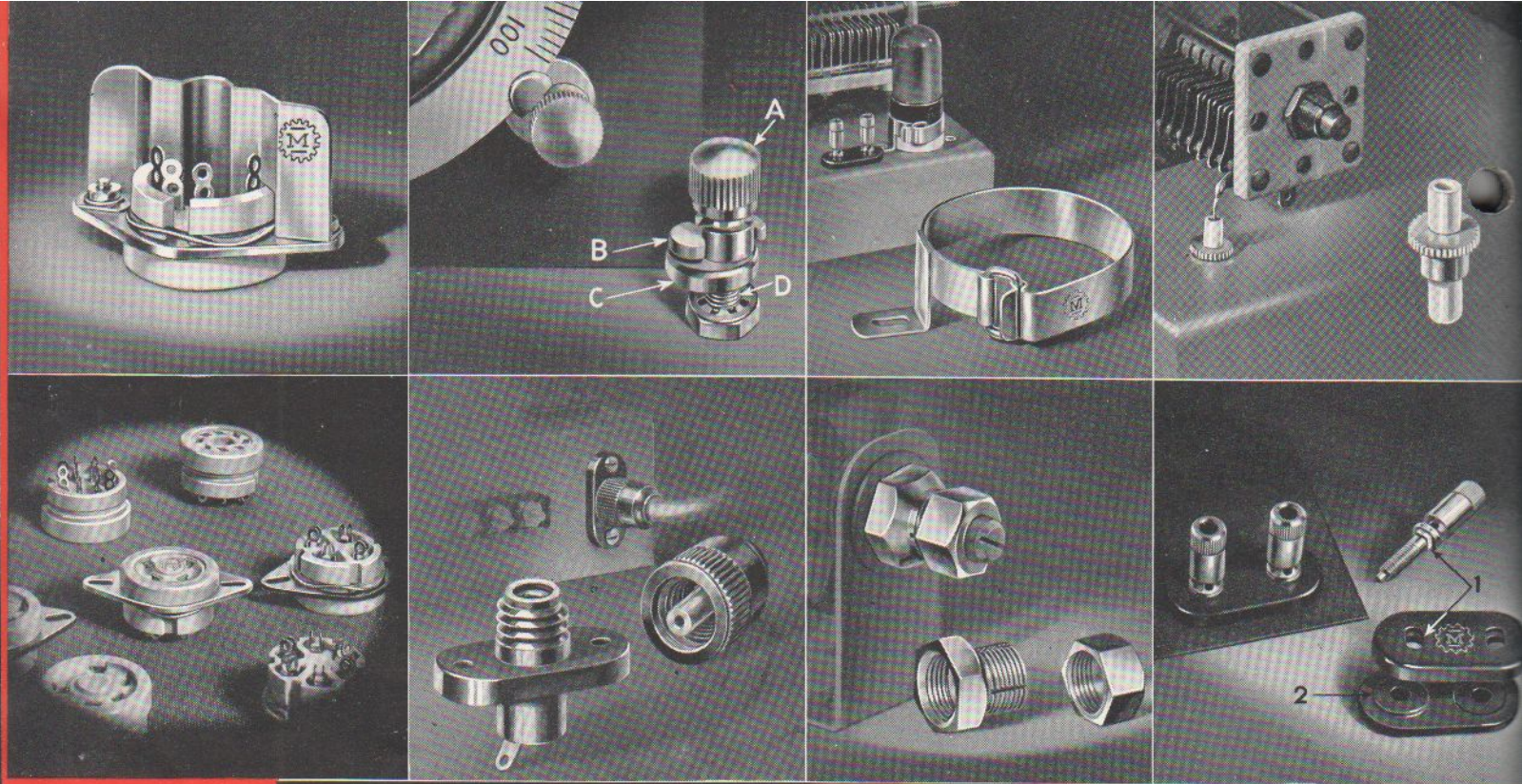
Particular attention should be called to the No. 80067 complete deluxe unit for the 3BP1 tube which comprises light shield, panel bezel, scale, green light filter, neoprene mounting cushion, mu-metal shield and tube base clamp. A less expensive unit generally used in amateur experimental work is the No. 80078 kit for 3" tubes. The Panel Bezel such as the No. 80075 comprises the cast aluminum bezel, neoprene cushion, scale and green light filter.

Of particular interest to the amateur transmitter constructor is the 80009 mounting shelf, shield and tube socket for use with 807s. This is the same unit as used in the Millen 90800 transmitter.

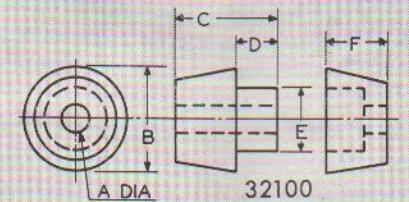
The aluminum shield cans are available in a variety of sizes and shapes, as illustrated and listed. The 80001-2 combination of die-cast aluminum base and extruded cover is illustrated in use on page 19 in the No. 70225 "fixed-tuned" exciter tank units. May be employed for many other purposes. Isolantite base pin units (40104 and 40105) from page 17 fit die-cast base for converting to a "plug-in" unit which will fit standard 4 and 5 prong sockets.

Code	Description	Net Price
80001	Extruded Aluminum cover 2" x 2 $\frac{3}{8}$ " x 3 $\frac{1}{4}$ "	
80002	Cast Aluminum base only	
80003	Square Aluminum Shield 1 $\frac{1}{16}$ " x 4"	
80004	Oblong Aluminum Shield 1 $\frac{1}{16}$ " x 1 $\frac{7}{8}$ " x 4 $\frac{1}{2}$ "	
80005	Aluminum Shield, square 2" x 4 $\frac{7}{8}$ "	
80006	Aluminum Shield, round 2 $\frac{1}{8}$ " x 4"	
80007	Aluminum Shield, round 2 $\frac{1}{8}$ " x 2 $\frac{3}{8}$ "	
80008	Aluminum Shield, round 2 $\frac{1}{8}$ " x 2 $\frac{3}{8}$ "	
80009	Shield, Shelf and Socket for 807	
80022	Nicoloi Shield for 3" tubes	
80023	Nicoloi Shield for 3" tubes	
80024	Mu-Metal Shield for 1802	
80025	Nicoloi Shield for 1802	
80031	Nicoloi Shield for 5CPI	
80032	Mu-Metal Shield for 5CPI	
80067	Mu-Metal Shield, with hood and filter for 3BP1	
80072	Bezel, cushion & filter for 2" tubes	
80073	Bezel, cushion & filter for 3" tubes	
80075	Bezel, cushion & filter for 5" tubes	
80078	Nicoloi Shield & Bezel Kit for 3" tubes	

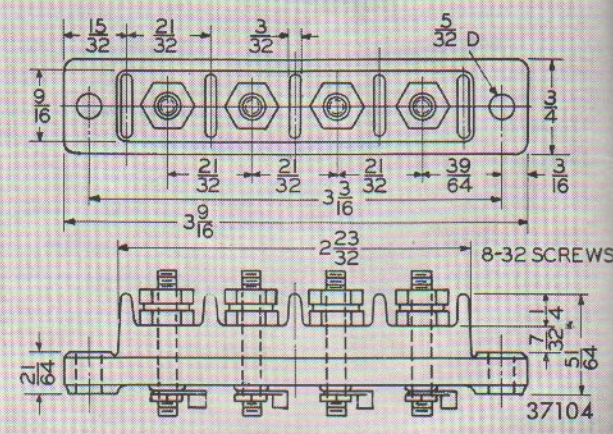
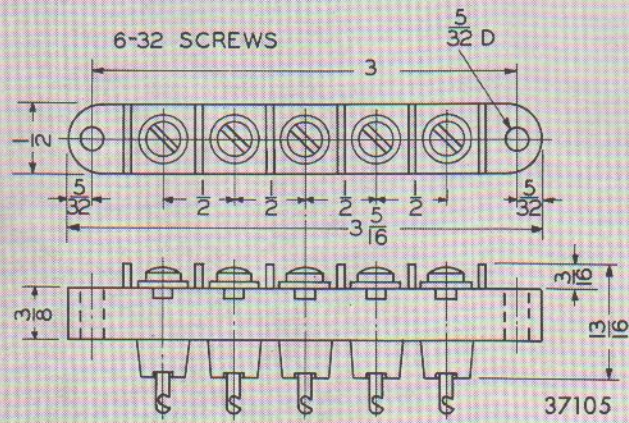


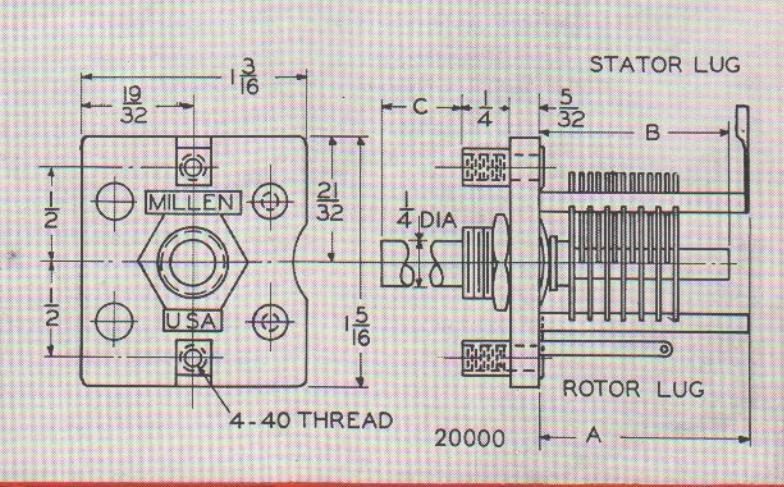
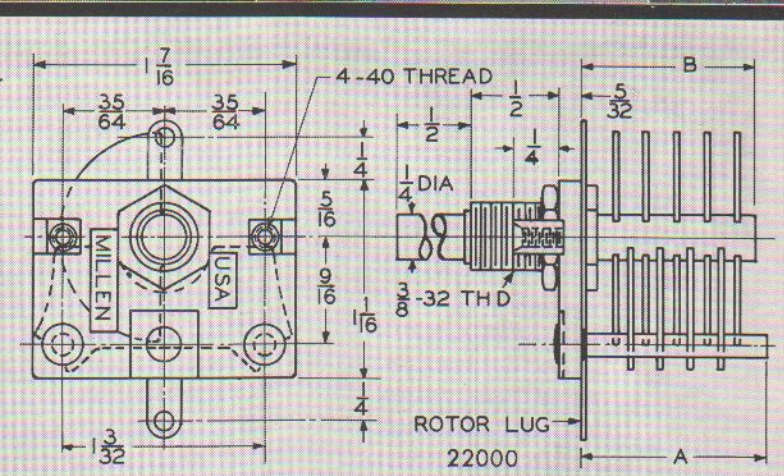
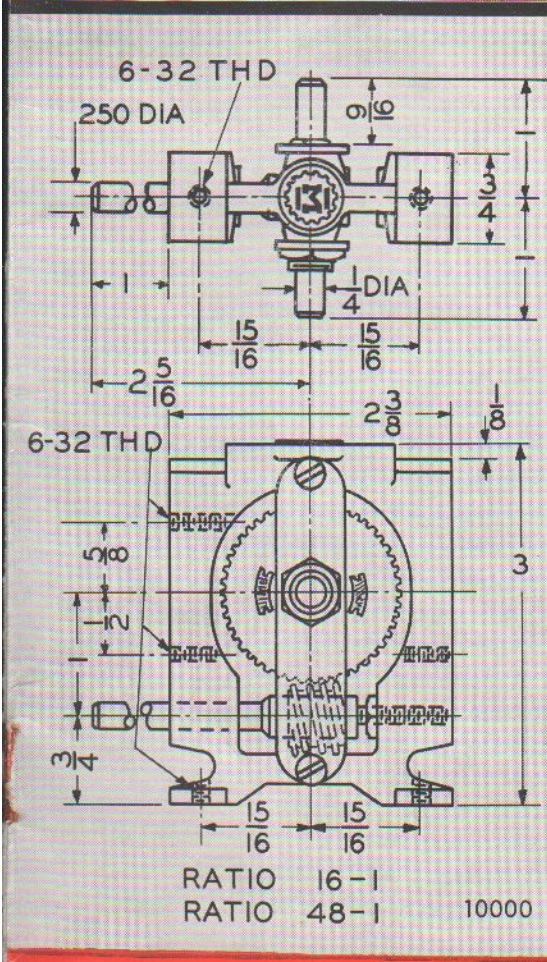
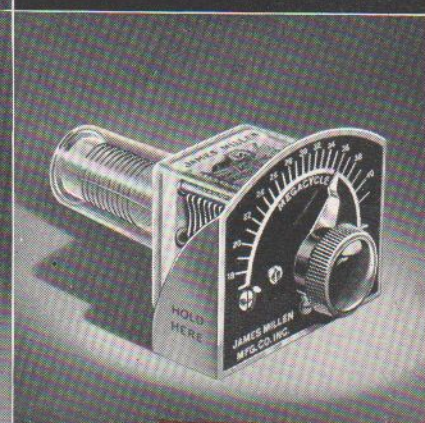
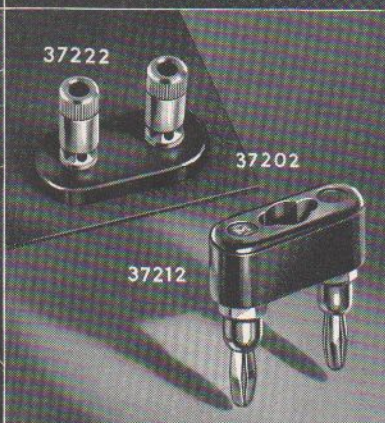
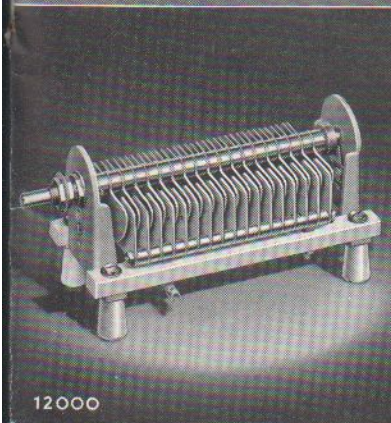
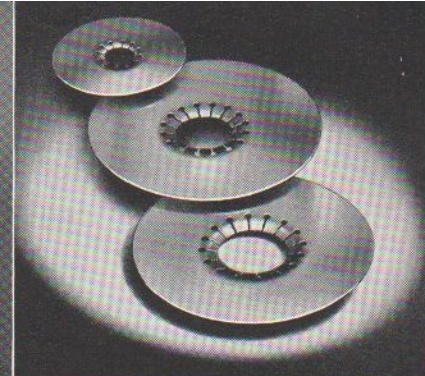
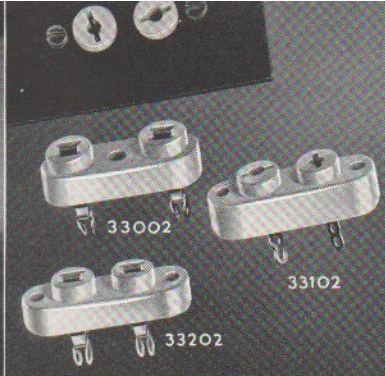
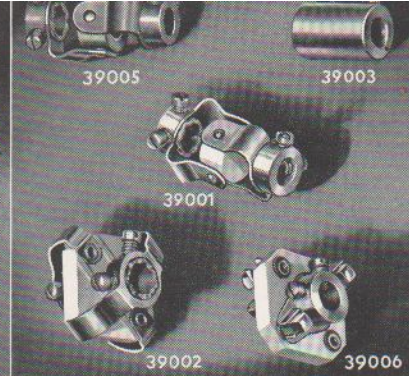


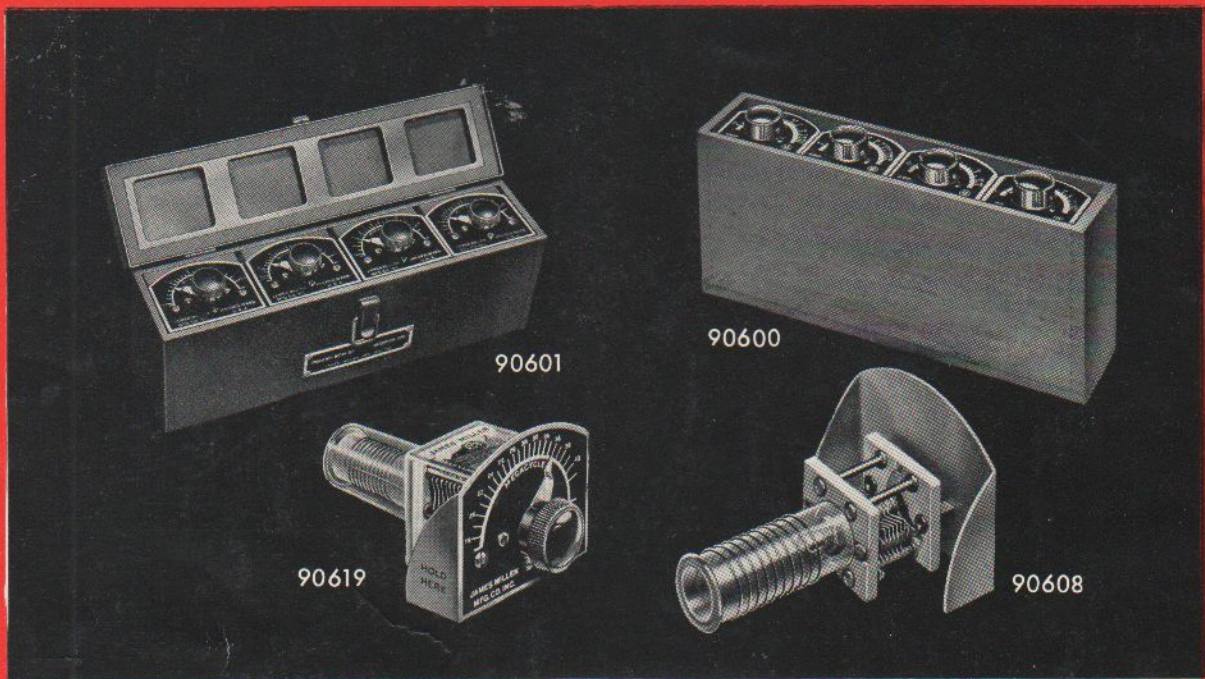
26000



DIMENSIONS	A	B	C	D	E	F
CODE 32100	$\frac{5}{32}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
CODE 32101	$\frac{3}{16}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
CODE 32102	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$
CODE 32103	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{5}{16}$	$\frac{9}{16}$	$\frac{3}{4}$	$\frac{3}{4}$







Midget Absorption Frequency Meters

Many amateurs and experimenters do not realize that one of the most useful "tools" of the commercial transmitter designer is a series of very small absorption type frequency meters. These handy instruments can be poked into small shield compartments, coil cans, corners of chassis, etc., to check harmonics; parasitics; oscillator-doubler, etc., tank tuning; and a host of other such applications. Quickly enables the design engineer to find out what is really "going on" in a circuit.

Types 90605 thru 90609 are extremely small and designed primarily for engineering laboratory use

where they will be handled with reasonable care. The most useful combination being the group of four under code No. 90600 and covering the total range of from 3.0 to 140 megacycles. When purchased in sets of four under code No. 90600 a convenient carrying and storage case is included. Series 90601 are slightly larger and very much more rugged. They are further protected by a contour fitting transparent polystyrene case to protect against damage and dirt. This latter series is designed primarily for field use and are not quite as convenient for laboratory use as the 90605 thru 90608 types. All types have dials directly calibrated in frequency.

Code	Description	Net Price
90604	Range 160 to 210 mc.	
90605	Range 3.0 to 10 mc.	
90606	Range 9.0 to 23 mc.	
90607	Range 23 to 60 mc.	
90608	Range 50 to 140 mc.	
90609	Range 130 to 170 mc.	
90610	Range 105 to 150 mc.	
90619	Range 350 to 1000 kc.	
90600	Complete set of 90605 thru 90608, in case	
90601	Complete set Field type Frequency Meters in metal carrying case 1.5 to 40 mc.	

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