

1940-41



**JAMES
MILLEN**

MANUFACTURING COMPANY, INC.

Radio Engineers and Manufacturers

150 EXCHANGE STREET • MALDEN, MASS.

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

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, regularly receive samples for display and engineering data on new Millen Products as soon as released. At the factory we too try to 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. 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. Our distributors will gladly explain the system behind this code to those interested.

OUR EXPORT SALES OFFICE is located in Chicago at 241 E. Illinois Street 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 Chicago enables us not only to give quick replies to our foreign correspondents but also to offer the facilities of our Chicago office and the services of its staff to our many friends and customers from other countries who normally visit Chicago for the annual Radio Parts Trade Show each June.

GOVERNMENT AND COMMERCIAL APPARATUS. In addition to our standard line of component parts 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 United Aircraft Corporation, The Federal Telegraph Company, and many others. We are very much interested in receiving inquiries from commercial equipment manufacturers for this department.

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.

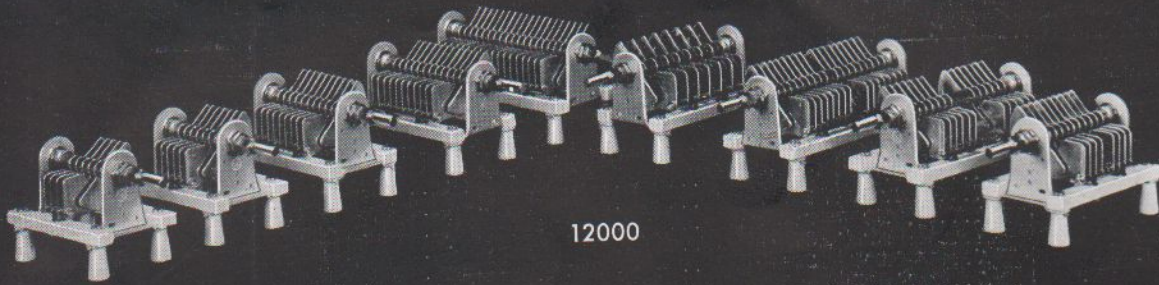
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Code	Page	Price	Code	Page	Price	Code	Page	Price	Code	Page	Price
10000	5....	\$ 3.00	24935	7....	\$2.10	37202	10....	\$.21	60504	13....	\$ 3.00
10001	5....	1.85	25130	7....	1.25	37211	10....	.15	62161	13....	3.00
10003	5....	.36	26025	7....	.80	37222	10....	.30	62162	13....	3.00
10004	5....	.09	26050	7....	.90	37501	10....	.45	62454	13....	3.00
10005	5....	.07	26075	7....	1.00	38001	10....	.30	62456	13....	3.00
10006	5....	.50	26100	7....	1.10	38500	9....	.60	63163	13....	2.50
10007	5....	.45	26140	7....	1.25	39001	7....	.36	63456	13....	2.50
10008	5....	.90	26920	7....	.90	39002	7....	.36	63503	13....	2.50
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10045	5....	.35	27025	7....	.30	39005	7....	.36	65456	13....	1.35
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12075	4....	5.50	31011	9....	.05	43020	6....	.90	79040	13....	.75
12076	4....	4.50	31012	9....	.15	43021	6....	.90	79080	13....	.75
12510	4....	3.00	31013	9....	.21	43022	6....	.90	79160	13....	.75
12515	4....	3.75	31014	9....	.27	43040	6....	.90	80001	8....	.25
12536	4....	2.00	31015	9....	.45	43041	6....	.90	80002	8....	.50
12551	4....	2.25	31017	9....	.30	43042	6....	.90	80003	8....	.25
12576	4....	2.50	31018	9....	.21	43080	6....	.90	80004	8....	.25
12935	4....	3.60	32100	10....	.30	43081	6....	.90	80005	8....	.25
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13035	4....	3.80	32102	10....	.20	43160	6....	.90	80007	8....	.30
13050	4....	4.35	32103	10....	.45	43161	6....	.90	80008	8....	.35
13070	4....	4.90	32150	10....	.05	43162	6....	.90	80100	12....	.45
14050	4....	6.00	32201	11....	.50	44000	6....	.75	80101	12....	.60
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14200	4....	6.50	32204	11....	3.90	44010	6....	1.50	80104	12....	.75
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20075	7....	1.00	33888	10....	.18	45500	9....	.45	80301	12....	.45
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20920	7....	.85	34010	8....	.60	47002	9....	.15	80307	12....	.70
20935	7....	.90	34100	8....	.36	47003	9....	.35	80308	12....	.90
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22950	7....	1.00	35103	11....	.21	58000	9....	.30	90506	16....	82.50
22075	7....	1.10	35151	11....	.18	60503	13....	3.00	90507	16....	80.00
22100	7....	1.15	35202	11....	.10	60504	13....	3.00	90600	16....	6.50
22140	7....	1.35	35206	11....	.18	60454	13....	2.75	90605	16....	1.65
23100	7....	2.04	36001	10....	.21	60455	13....	2.75	90606	16....	1.65
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23950	7....	1.92	37001	10....	.35	60501	13....	2.75	90608	16....	1.65
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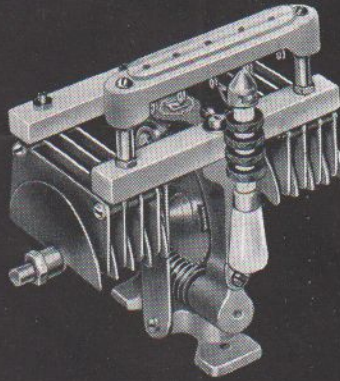




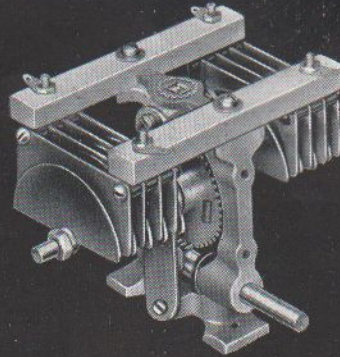
12000



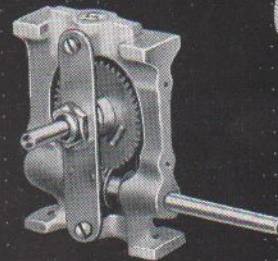
2 3/8"



11035



10000



10001

Transmitting Condensers

Series 11000 and 12000 — 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 condenser 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 rotorshaft. The series 14000 transmitting condensers are essentially the same in general design as the 13000 except the rotor plate diameter is 3 1/2" instead of 2". Will shortly also be available with a new type 1 to 1 ratio, right angle drive. For single-ended applications connect sections in parallel to obtain advantage of center feed and elimination of shorted frame loops.

11000, 12000, 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	36	4.6	9	3 1/2"	.040"	.077"	3000	\$ 5.75		
11050	51	6.5	12	5 1/2"	.040	.077	3000	5.95		
11070	74	9.5	17	5 1/2"	.040	.077	3000	6.50		
13035	35	4.9	9	3 1/2"	.040	.077	3000	3.80		
13050	49.5	6.3	12	5 1/2"	.040	.077	3000	4.35		
13070	71	7.3	17	5 1/2"	.040	.077	3000	4.90		
14200	204	10.7	16	6 1/2"	.050	.171	6000	10.00		
14100	90.5	12.9	15	11 1/2"	.050	.171	6000	6.00		
14050	50		9	6 1/2"	.050	.265	9000	10.00		
14060	60		15	11 1/2"	.050					

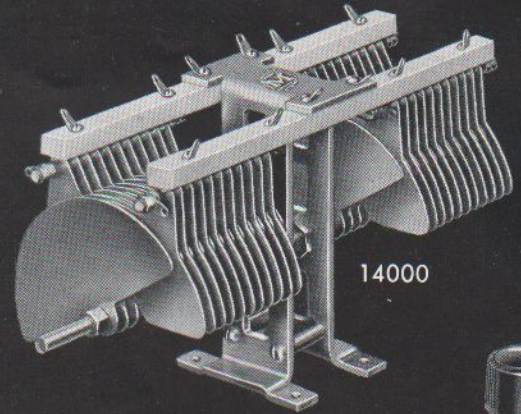
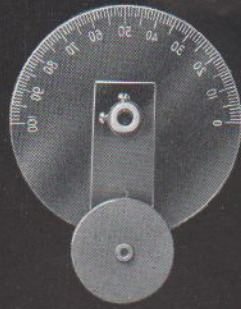
CONVENTIONAL SINGLE SECTION TYPE											
Code	Capacity per section		Number Plates			Thickness of Plates	Air Gap	Finish on Plates	Length Isolantite Bars	Position of End Frames	Net Price
	Min.	Max.	Per Section	Rotor	Stator						
12935	9	37	13	7	6	.040"	.176"	Polished	3 3/8"	[Diagram]	\$3.60
12936	9	37	13	7	6	.040	.176	Plain	3 3/8"	[Diagram]	3.25
12536	6	43	9	5	4	.040	.077	Plain	3 1/2"	[Diagram]	2.00
12551	7	55	12	6	6	.040	.077	Plain	3 1/2"	[Diagram]	2.25
12576	9	76	17	9	8	.040	.077	Plain	3 3/8"	[Diagram]	2.50
12510	12	101	23	12	11	.040	.077	Plain	3 3/8"	[Diagram]	3.00
12515	18	151	35	18	17	.040	.077	Plain	5 1/2"	[Diagram]	3.75

CONVENTIONAL DOUBLE SECTION TYPE											
Code	Capacity per section		Number Plates			Thickness of Plates	Air Gap	Finish on Plates	Length Isolantite Bars	Position of End Frames	Net Price
	Min.	Max.	Per Section	Rotor	Stator						
12035	6	43	9	5	4	.040	.077	Polished	3 3/8"	[Diagram]	\$3.60
12036	6	43	9	5	4	.040	.077	Plain	3 3/8"	[Diagram]	3.25
12050	7	55	12	6	6	.040	.077	Polished	5 1/2"	[Diagram]	4.25
12051	7	55	12	6	6	.040	.077	Plain	5 1/2"	[Diagram]	3.60
12075	9	76	17	9	8	.040	.077	Polished	5 1/2"	[Diagram]	5.50
12076	9	76	17	9	8	.040	.077	Plain	5 1/2"	[Diagram]	4.50





10011



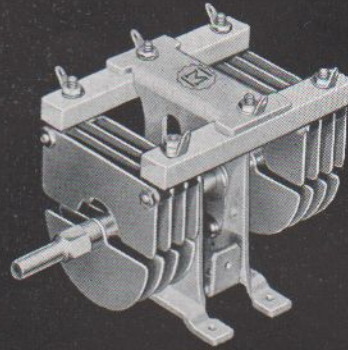
14000



10004



10003



13035



10050



10065



10005



10006



10007



10008

Dials · Drives · Scales and Knobs

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

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 es-cutcheon is for use with condensers such as 12000, 13000 or 14000 series where rotorshaft is perpendicular to front panel. Dial disc 3 3/4" in diameter. Vernier ratio approximately 10 to 1. Drive shaft extends behind panel for addition of lead fly-wheel when the dial is used in receivers where inertia tuning is desired.

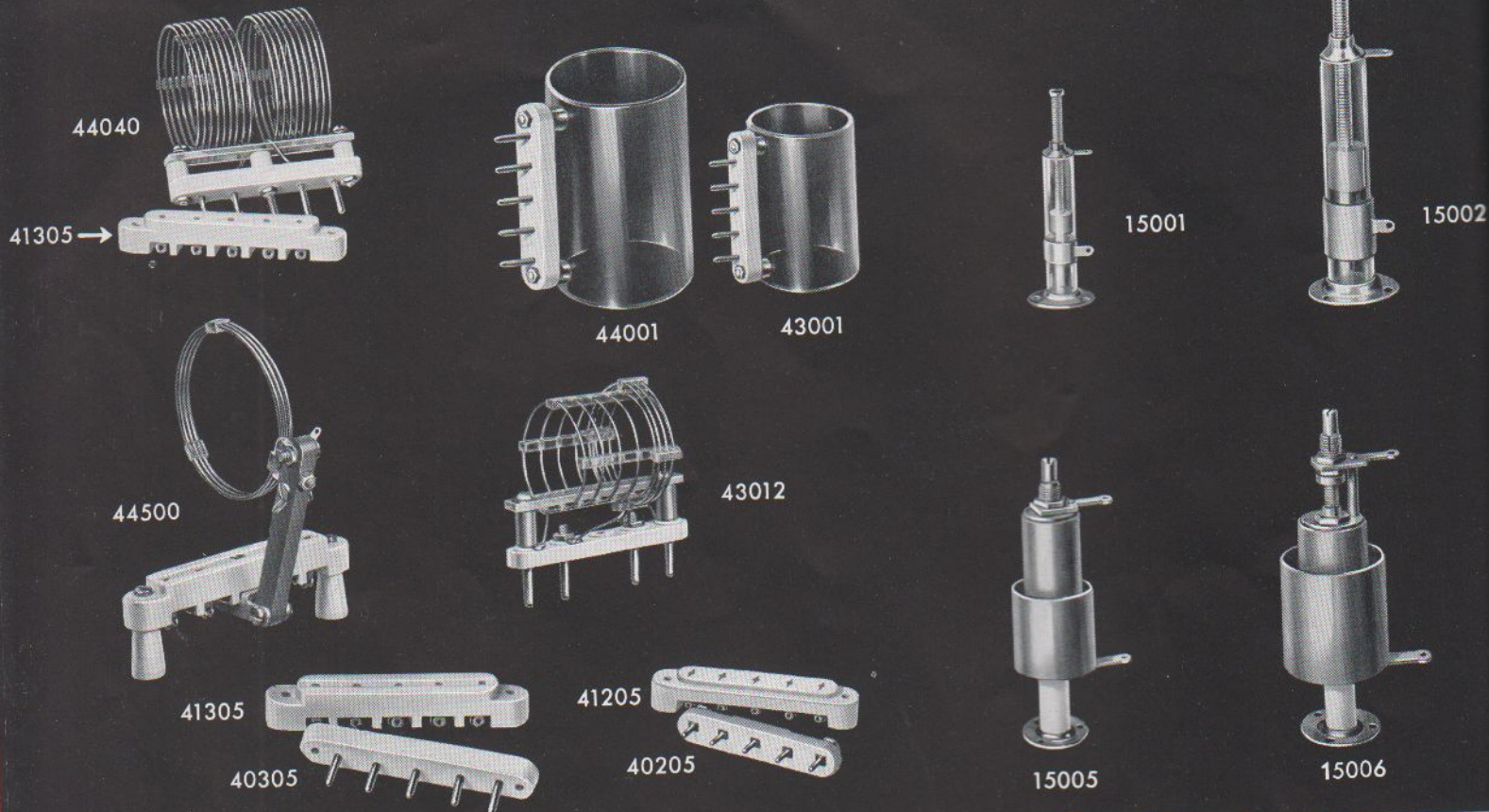
Heavy gauge nickel silver dials are of conventional style but with improved type knobs for use with series 14000, 13000 and 12000 condensers and associated equipment. Knobs are molded

with large diameter solid bakelite hub which definitely insulates metal scales from instrument shaft. This feature 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.

Code	Description	Net Price
10000	Worm Drive Unit	\$3.00
10001	Drum Meter Dial-0-100	1.85
10003	Navy Type Bar Knob	.36
10004	Small Tuning Knob	.09
10005	Small Control Knob	.07
10006	Large Tuning Knob	.50
10007	1 5/8" Nickel Silver Inst. Dial-0-100	.45
10008	3 1/2" Nickel Silver Inst. Dial-0-100	.90
10011	Disc Meter Dial-0-100	2.25
10036	Illuminator	.35
10045	Inertia Wheel	.35
10050	Dial Lock	.35
10062	Drum Meter Dial Bezel Only	.45
10063	Disc Meter Dial Bezel Only	.45
10065	Vernier Drive Unit	.36





Transmitting Coils · Forms · Neutralizing Condensers

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. 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. Standard tube socket pins have low contact resistance and carry high current. "100 watt" series has swinging link.

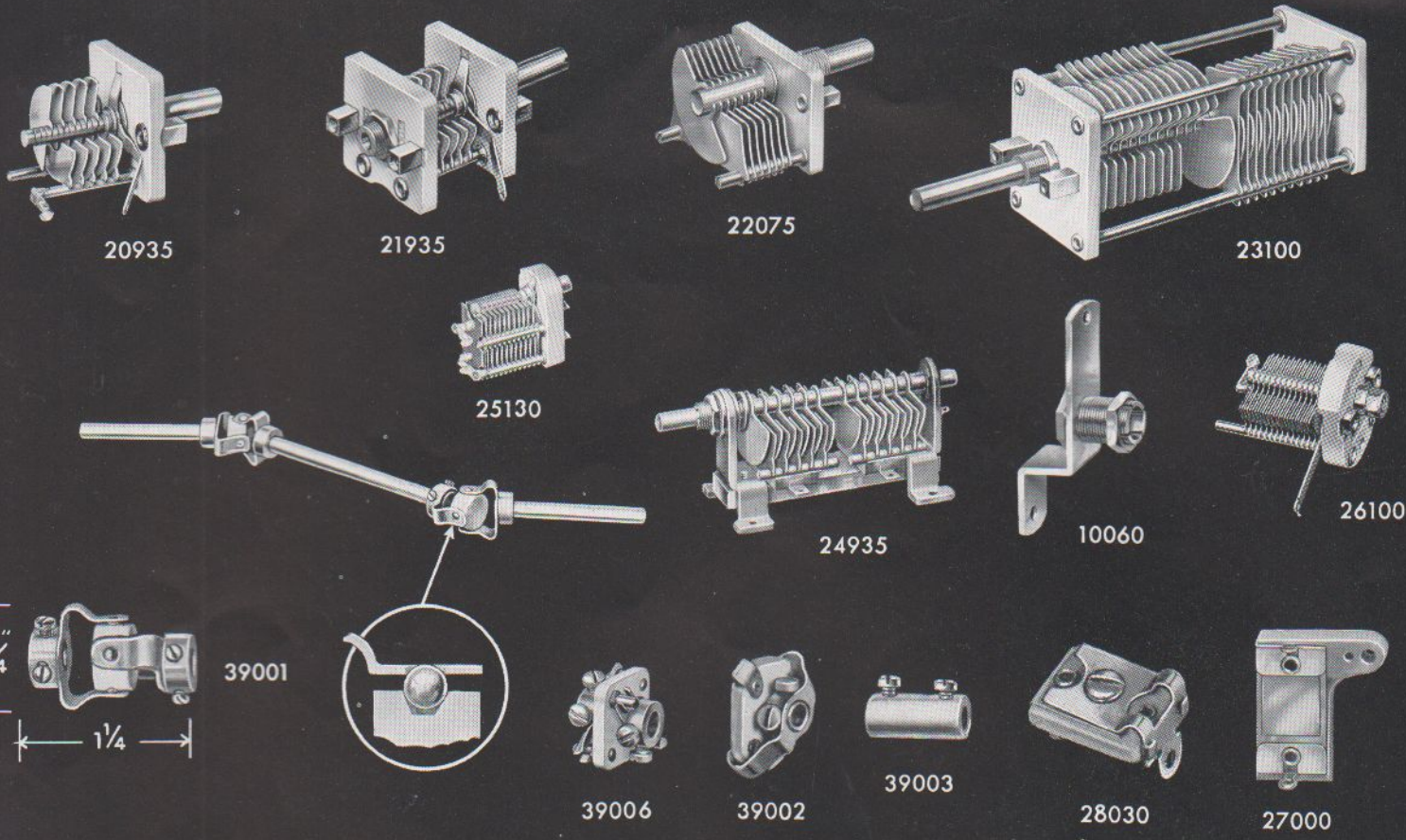
Compact new style transmitting condensers, dials, and the new types of tubes make necessary more compact and efficient neutralizing condensers. By eliminating all external supporting structures, we have arrived at the designs presented herewith. Numbers 15001, 15002 and 15003 are extremely compact and 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.

Code	Description	Net Price
43161	Midget coils for each	\$.90
43081	band. Mounted on No. 40205	.90
43041	plug, No. 1 at end of code means	.90
43021	center link, No. 2, end link.	.90
43011		.90
43001	QuartzQ blank form and plug	.90
40205	Midget Plug	.24
41205	Midget Socket	.30
44160	"100 watt" coils	2.10
44080	for each band. Mounted on	1.90
44040	No. 40305 plug.	1.50
44020		1.50
44010		1.50
44005		1.50
44000	QuartzQ form 1 3/4" dia. x 3 3/4"	.75
44500	Swinging link and socket	1.75
44001	QuartzQ blank form and plug	1.20
40305	Intermediate size plug	.45
41305	Intermediate size socket	.45

Code	Capacity Range	Peak Voltage	Net Price
15001	0.7 — 4.3	6000*	\$.75
15002	0.5 — 13.5	6000*	.95
15003	1.5 — 8.5	6000*	.75
15005	3.4 — 14.6	4000	1.80
15006	2.8 — 9.1	6000	2.75

* Max. recommended DC Plate Volts 1200





Receiving Condensers Flexible Couplings

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. 39002 is compact conventional style flexible coupling over-all diameter only 1 1/2". Hubs for 1/4" shafts. Isolantite insulation. No. 39003 is solid brass coupling for 1/4" shafts frequently used with type No. 10000 worm drive. 39005 is non-insulated Universal joint for high torque applications, such as turning band switches, etc. 39006 is another entirely new type of coupling for shafts with end motion, eccentric rotation, etc. Hubs can twist, move in and out, slide sideways, etc.

No. 24935 is an ultra high frequency dual double spaced condenser, suitable for small transmitters, as well as receivers, that possesses several outstanding features including aluminum mounting feet and QuartzQ dielectric. All metal parts are of aluminum or heavily cadmium plated brass. Series 20000 are compact Steatite Ultra midget condensers, ideal for small receivers, etc.

Series 21000 is same size as 20000 but with double bearings and rear shaft extension. Series 22000 and series 23000 have larger plate sizes and longer air gaps. Much used in commercial transmitter designs.

A complete line of padding condensers for all amateur receiver construction requirements, including the new "silver on mica," highly stable fixed units with Isolantite bases. Wax impregnated. The Steatite base air dielectric variable units are available in the completely variable type as well as the part-fixed, part-variable units which are frequently more practical where large values of capacity are required, due to the vernier adjustment action. Soldered plate construction, brass plates cadmium plated, extremely compact. Concentric shaft locks can be furnished for 10 cents net additional on 26000 series, 26000 series can also for 15 cents net extra be furnished with 1/4" extended shaft for use with knob. The No. 28030 compressed mica padder is of conventional design, inexpensive and handy for many uses where the extreme stability of the air padders is not required.

Code	Description	Net Price
10060	Shaft Lock for 1/4" Shafts	\$.36
39001	Truly Flexible Isolantite	.36
39002	Conventional	.36
39003	Solid Brass N.P.	.15
39005	Universal Joint, Non-Insulated	.36
39006	Slide Action	.36
24935	35 mmfd per section, Double spaced	2.10
24100	100 mmfd per section, Single spaced	2.10
20015	Steatite Ultra Midget 15 mmfd SS	.60
20035	Steatite Ultra Midget 35 mmfd SS	.75
20050	Steatite Ultra Midget 50 mmfd SS	.85
20100	Steatite Ultra Midget 100 mmfd SS	1.15
20140	Steatite Ultra Midget 140 mmfd SS	1.30
20920	Steatite Ultra Midget 20 mmfd DS	.85
20935	Steatite Ultra Midget 35 mmfd DS	.90
21050	Steatite Ultra Midget 50 mmfd SS	1.10
21100	Steatite Ultra Midget 100 mmfd SS	1.30
21140	Steatite Ultra Midget 140 mmfd SS	1.50
21935	Steatite Ultra Midget 35 mmfd DS	1.20
22915	Steatite Midget 15 mmfd DS	.85
22935	Steatite Midget 35 mmfd DS	.90
22950	Steatite Midget 50 mmfd DS	1.00
22075	Steatite Midget 75 mmfd SS	1.10
22100	Steatite Midget 100 mmfd SS	1.15
22140	Steatite Midget 140 mmfd SS	1.35
23925	Steatite Dual Midget 25 mmfd per section DS	1.68
23950	Steatite Dual Midget 50 mmfd per section DS	1.92
23075	Steatite Dual Midget 75 mmfd per section SS	1.89
23100	Steatite Dual Midget 100 mmfd per section SS	2.04
25130	93-130 Air Padder	1.25
26140	6.5-140 Air Padder	1.25
26100	5-97 Air Padder	1.10
26075	4.3-76 Air Padder	1.00
26050	4-50 Air Padder	.90
26025	3.2-25 Air Padder	.80
26920	4.5-20 Air Padder	.90
26935	5.5-36 Air Padder	.95
28030	30 mmfd Mica Padder	.15
27010	10 mmf Silver on Mica	.30
27025	25 mmf Silver on Mica	.30
27050	50 mmf Silver on Mica	.30
27100	100 mmf Silver on Mica	.30
27150	150 mmf Silver on Mica	.35





70225



80001



34140



34225



34100



34102



80002



80001



34140



34150



34800



34010



40104



80003



80004



80005



80006



80007



80008

Tuned Exciter Tanks · RF Chokes · Shields

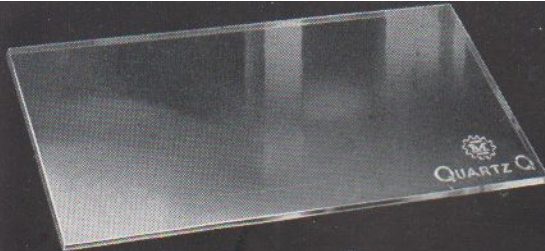
Something radically new in compact fixed-tuned exciter tank design. Die cast aluminum base with removable cover admits ready access to coil for changing turns after being mounted on chassis and wired into circuit. Eliminates all of the difficulties in this respect in connection with early designs. Condenser, dual, double space 25mmfd. Electrostatic shield between condensers. Isolantite base. Standard socket mounting hole in die cast base. Type 40104 or 40105, Isolantite tube base may be mounted in casting so that it will become "plug-in". Coil form is standard type 45000 of mica base low loss molded Phenolic. The Isolantite wafer pin bases are ideal for ultra high frequency coils, plug-in fixed condensers, tapped resistors and other such uses. The cast aluminum condenser case may also be used for plug-in shielded coils in receivers, for shielding tube sockets, etc. The series of shield cans illustrated are those used for our IF transformers, etc. Heavy extruded aluminum. No. 80008 is designed for shielding the small transmitting pentodes.

Code	Description	Net Price
70225	Complete (Unwound) (No base plug)	\$3.25
80001	Extruded Aluminum cover	.25
80002	Cast Aluminum base only	.50
40104	4 Prong Isolantite base plug	.25
40105	5 Prong Isolantite base plug	.25

The No. 34100 RF choke is made to the same electrical specifications as our famous original design. Mechanical improvement includes brass tapped insert molded in die cast end to permit mounting on steatite standoff furnished with each choke. No. 34150 is new 500 MA iron core transmitting design with spun glass insulated wire, which provides impedance peaks on all amateur bands. Ideal for high power at 14 megacycles. Other transmitting chokes are "tried and proven" standard designs. No. 34010 is 10 millihenry shielded type for receiver use. No. 34800 is shielded double inductance for interruption frequency oscillator of super-regenerative receivers.

Code	Description	Net Price
34100	Universal 2.5 MH	\$.36
34101	Universal 2.5 MH, less Standoff	.30
34102	Commercial type 2.5 MH	.36
34140	Universal air core Transmitting	1.00
34150	Amateur Band Iron Core	1.75
34010	Shielded 10 MH receiving	.60
34210	General Purpose RFC 10 MH	.30
34225	General Purpose RFC 25 MH	.35
34240	General Purpose RFC 40 MH	.40
34285	General Purpose RFC 85 MH	.50
34800	Interruption Frequency Oscillator Coil	.90
80003	Square $1\frac{1}{8} \times 4$.25
80004	Oblong $1\frac{1}{8} \times 1\frac{7}{8} \times 4\frac{1}{2}$.25
80005	Square $2 \times 4\frac{3}{8}$.25
80006	Round $2\frac{1}{8} \times 4$.25
80007	Round $2\frac{1}{8} \times 2\frac{3}{8}$.30
80008	Round $2\frac{1}{8} \times 2\frac{3}{8}$.35





55000



31011 31012 31013 31014 31015



45004



45500



30002

30001

30003

30004



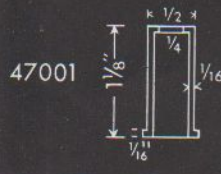
47004



47002



47003



47001



38500



31017



31001-2-3-4



58000

QuartzQ . Standoffs . Coil Forms

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. QuartzQ sheets may be cut into strips for condenser insulation, etc. Standoffs have fitted metal tops. May also be used for ultra low loss coil forms. QuartzQ beads are for construction of short concentric link lines; ideal for use between RF stages in transmitters. The 1 1/2" diameter QuartzQ coil form, at last, presents a practical solution to the problem of an ultra low loss coil form with plug-in base. The Isolantite base wafer effectively heat-insulates the prongs from the QuartzQ so as to prevent damage when soldering leads to pins.

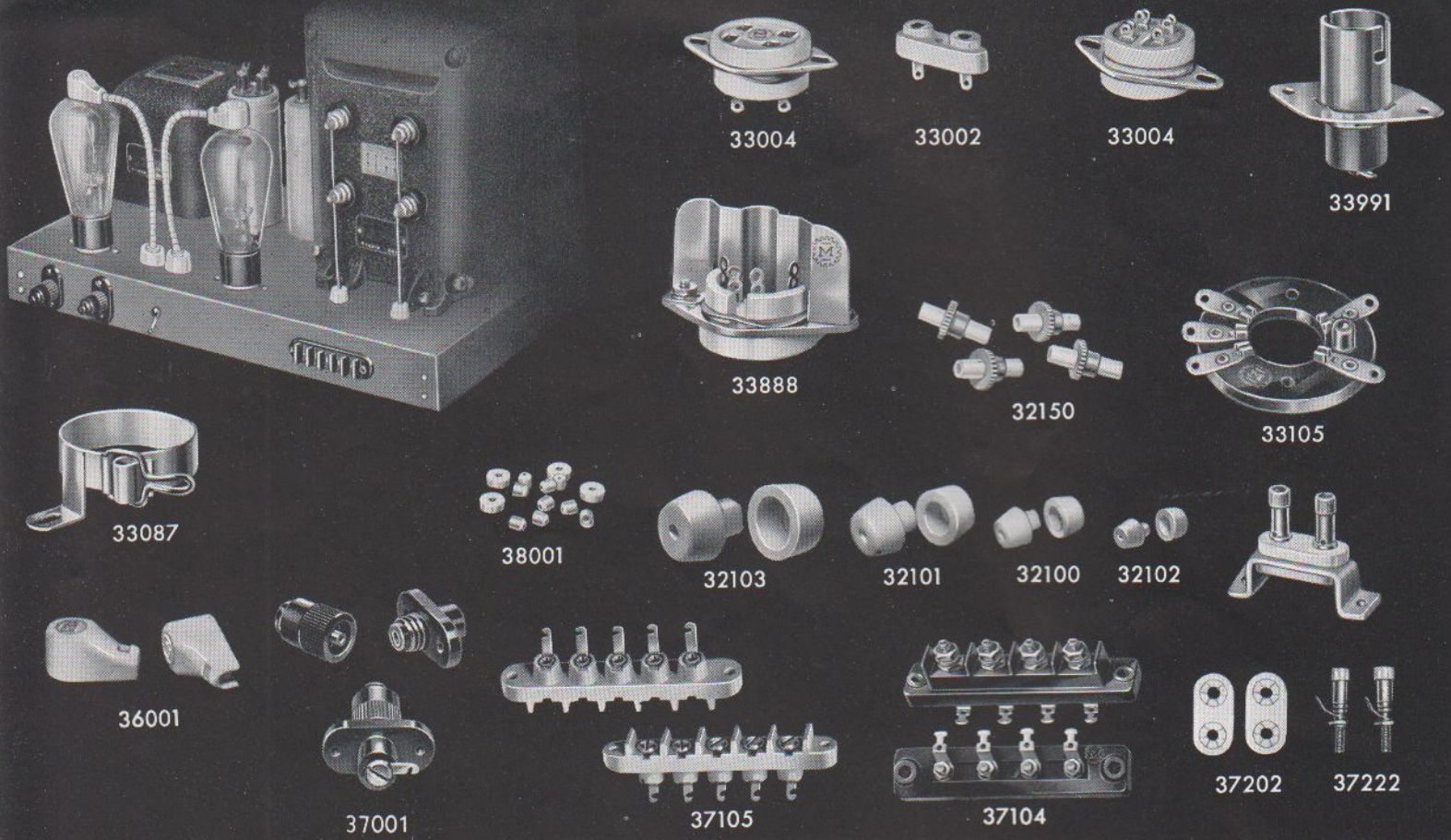
The series 45000 coil forms are of the popular mica base molded Phenolic type. They are slightly longer than formerly available units of this type, so as to make easier the winding of low frequency coils. Also available with five-prong base for

increased number of circuit applications.

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

Code	Part	Size	Material	Net Price
55001	Sheet	3 x 8 1/2 x .1	QuartzQ	\$.35
30001	Standoff	1/2 x 1 1/8	QuartzQ	.15
30002	Standoff	1/2 x 2 1/8	QuartzQ	.21
30003	Standoff	3/4 x 2 1/8	QuartzQ	.55
30004	Standoff	3/4 x 4 1/8	QuartzQ	.65
31001	Standoff	1/2 x 1	Isolantite	.12
31002	Standoff	1/2 x 2 1/2	Isolantite	.18
31003	Standoff	3/4 x 2	Isolantite	.30
31004	Standoff	3/4 x 3 1/2	Isolantite	.42
31011	Cone	3/4 x 1 1/2	Steatite	.05
31012	Cone	1 x 1	Steatite	.15
31013	Cone	1 1/2 x 1	Steatite	.21
31014	Cone	2 x 1	Steatite	.27
31015	Cone	3 x 1 1/2	Steatite	.45
31017	Cone with base and jack	1 1/4" high	Steatite	.30
31018	Cone with base and screw top	1 1/4" high	Steatite	.21
38500	100 Beads	5/16" dia.	QuartzQ	.60
45000	Coil Form	1" dia. no p.	Low loss mica base Phenolic	.21
45004	Coil Form	1" dia. 4 p.	Low loss mica base Phenolic	.30
45005	Coil Form	1" dia. 5 p.	Low loss mica base Phenolic	.30
45500	Coil Form	5/8" dia.	Steatite	.45
47001	Coil Form	1 1/2" dia.	QuartzQ	.10
47002	Coil Form	1 1/2" dia.	QuartzQ	.15
47003	Coil Form	3/4" dia.	QuartzQ	.35
47004	Coil Form	3/4" dia.	QuartzQ	.45
46100	Coil Form	1 1/2" dia. no p.	QuartzQ	.45
58000	Coil Dope	2 oz.	QuartzQ	.30





Safety Terminals · Connectors · Sockets

TERMINALS. Every day the importance of safety in the design of amateur 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. 37105 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. Extra terminals provide for relay connection for remote "push to talk" switching. 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.

SOCKETS. This new series of sockets uses a much higher steatite body than any former design so as to provide increased insulation between contacts and between contacts and chassis. Barriers separate all of the contacts. Thus the four prong units, for instance, may be safely used for 866 rectifiers on high voltage units. This design permits use of sockets with plug-in coils without having the coils excessively close to the chassis as in the case of "thin" sockets. Contacts designed so solder will not readily flow into them. May be mounted on metal chassis without steel stirrup if preferred. Crystal holder socket offers many desirable features: good contact, easy to mount (only round holes required), round bushings surrounding contacts extend through chassis or panel when socket is mounted behind chassis or panel. Acorn socket uses QuartzQ insulation.

Code	Description	Net Price
32100	Steatite Bushing for $\frac{3}{8}$ " hole	\$.30
32101	Steatite Bushing for $\frac{1}{2}$ " hole	.35
32102	Steatite Bushing for $\frac{3}{4}$ " hole	.20
32103	Steatite Bushing for $\frac{1}{4}$ " hole	.45
32150	Insulantite Thru-bushing, for $\frac{1}{2}$ " hole	.05
36001	Ceramic Plate Cap, $\frac{3}{8}$ " for 866 etc.	.21
36002	Ceramic Plate Cap, $\frac{3}{8}$ " for 807 etc.	.21
37001	Black Bakelite Safety Terminal	.35
37501	Low Loss Mica Bakelite Safety Terminal	.45
37104	Four Terminal, Black Bakelite	.55
37105	Five Terminal, Steatite	.45
38001	Insulantite $\frac{3}{16}$ " O.D. Beads (Pk of 50)	.30

Code	Description	Net Price
33002	Crystal Socket	\$.25
33004	4 Prong Socket	.24
33005	5 Prong Socket	.24
33006	6 Prong Socket	.24
33007	7 Prong, Large, Socket	.34
33008	8 Prong, Octal, Socket	.24
33888	Aluminum Shield for 33008	.18
33991	Socket for 991 etc.	.45
33087	Base Clamp for 807 etc.	.30
33105	Acorn Socket, QuartzQ	.90
37202	Steatite Plates, Pr.	.21
37222	Terminal Posts, Pr.	.30
37211	Bracket	.15





35103

35151



32300



50110



35206

35202



32201



90721



32205



32204



32203



32202

Antenna Devices · Safety Relays · Hetrofil*

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"! Novel feature of the lead-in bowl hardware is the screw-driver slot at ends of rods to permit holding while tightening nuts. Isolantite bushing 32300, while perhaps a little high priced for many amateur applications, has the very desirable feature of being made from solid pieces of Isolantite and will stand up under very severe conditions. Much used on certain types of government, commercial, and diathermy work.

An extremely unique device is the No. 50006 vacuum enclosed delay relay. Available with either 6 or 110 volt heater winding. Takes approximately 30 seconds for bimetallic snap disc to operate. Due to snap action of the contact and vacuum, the relay can easily handle 1 kilowatt. Time action adjustable over limited range by heater voltage variation. Ideal for aircraft installations. Standard 4 prong base.

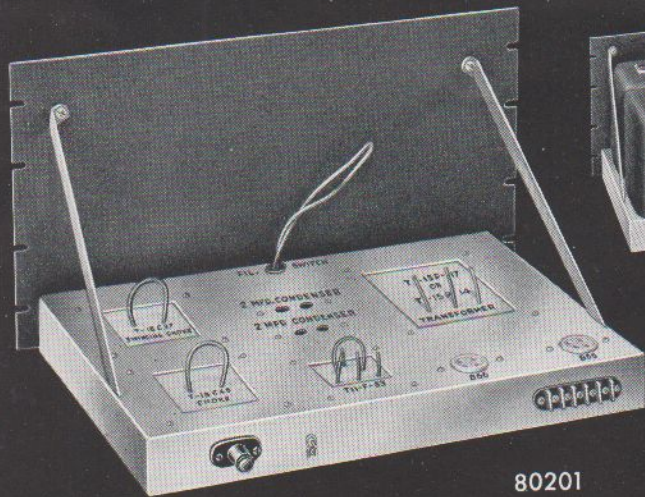
The HETROFIL is a device which provides means directly in the audio output of a communications receiver to reject or suppress an interfering signal or audio beat note. Thus, if two CW stations are being received simultaneously the HETROFIL may be adjusted so as to reject either of the signals and accept 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.

*Reg. U. S. Pat. Office.

Code	Description	Net Price
35103	Steatite Antenna Insulators	\$.21
35151	Steatite Antenna Insulators	.18
35206	Steatite Feeder Spreader 6"	.18
35202	Steatite Feeder Spreader 2"	.10
32300	Isolantite Bushing	1.50
32201	Steatite Bushings and Hardware 1 1/4" hole	.50
32202	Steatite Bushings and Hardware 1 3/4" hole	1.75
32203	Steatite Bushings and Hardware 2 5/8" hole	3.00
32204	Steatite Bushings and Hardware 3 5/8" hole	3.90
32205	Steatite Bushings and Hardware 3 3/4" hole	9.30
50006	Delay Relay 6V. Cold Open	10.00
51006	Delay Relay 6V. Cold Closed	10.00
50110	Delay Relay 110V. Cold Open	10.00
51110	Delay Relay 110V. Cold Closed	10.00
90721	Hetrofil	3.50





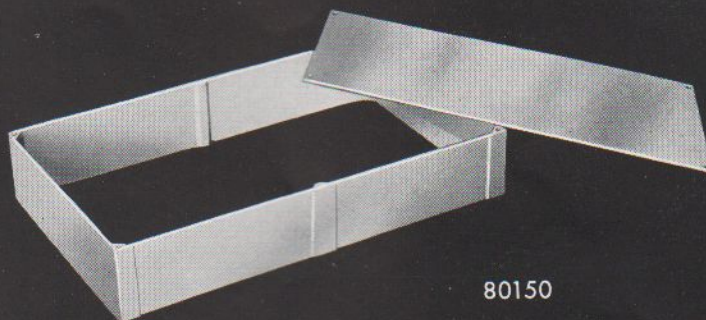
80201



80100 etc.



80305



80150

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 conven-

tional 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 10½ 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	\$13.50
80205	Complete Prewired Foundation Unit	Panel 19 x 12½ Chassis 17 x 14 Power Ratings: 2000 or 2500V at 300	15.00
80100	Steel Chassis	5½ x 9½ x 1½	.45
80101	Steel Chassis	7 x 9 x 2	.60
80102	Steel Chassis	7 x 13 x 2	.75
80103	Steel Chassis	7 x 15 x 3	.90
80104	Steel Chassis	4 x 17 x 3	.75
80105	Steel Chassis	7 x 17 x 3	.90
80106	Steel Chassis	10 x 12 x 3	1.00
80107	Steel Chassis	10 x 14 x 3	1.00
80108	Steel Chassis	10 x 17 x 2	1.00
80109	Steel Chassis	10 x 17 x 3	.90
80150	Aluminum Chassis	17 x 10 x 3	8.50
80301	Steel Panel	19 x 1¾ x 1½	.45
80303	Steel Panel	19 x 3½ x 1½	.50
80305	Steel Panel	19 x 5¼ x 1½	.65
80307	Steel Panel	19 x 7 x 1½	.70
80308	Steel Panel	19 x 8¾ x 1½	.90
80310	Steel Panel	19 x 10½ x 1½	1.05
80501	Steel Brackets	¾ x ½ x 12	.25





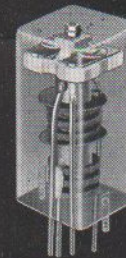
63456



60456



67456



64456



62456



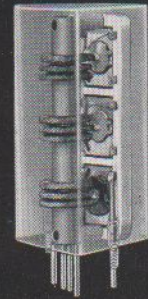
77083



79040



77866



66150

IF Transformers • Wave Traps • Hash Filters

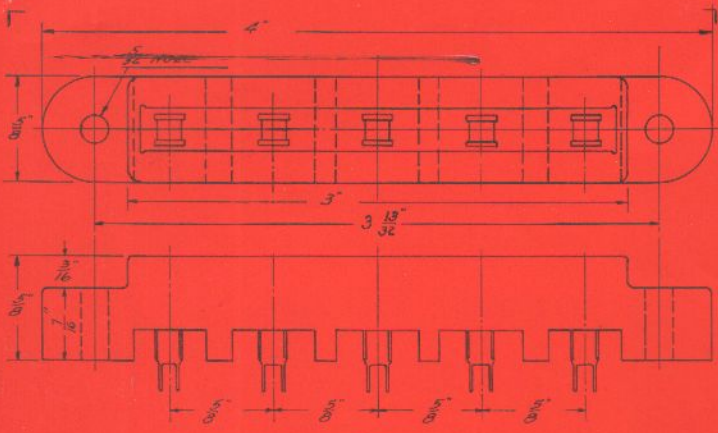
The "hash" filters are designed to eliminate the interference caused by mercury vapor types of rectifier tubes. The type 77083 is for use with type 82 or type 83 tubes. The type 77866 is for use with 866s. Wound on Isolantite cores. They should be connected in each plate leads as close to the tube as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

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

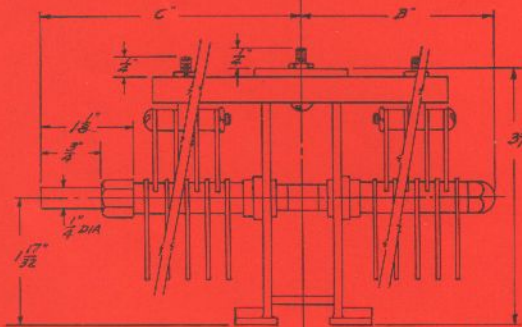
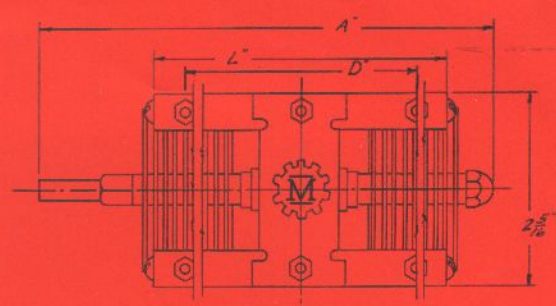
Our line of IF transformers is extremely complete and covers air core air tuned, iron core air tuned, permeability tuned, as well as inexpensive mica tuned iron core units. Both mica tuned and air condenser tuned IF and discriminator units are available for FM receivers. No. 66150 is a compact triple tuned unit which has an unusually straight sided response curve so as to reduce inter-channel interference to a minimum. This type transformer is used in some of the newer receivers now under development. 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.

Code	Description	Net Price
79020	14mc Band Wave Trap	\$.75
79040	7mc Band Wave Trap	.75
79080	3.5mc Band Wave Trap	.75
79160	1.7mc Band Wave Trap	.75
77083	"83" Hash Filter 250MA	1.00
77866	"866" Hash Filter 500MA	1.25 pr.
77872	"872" Hash Filter	1.40 pr.
<i>Air Trimmed</i>		
60456	456 Interstage (2) Air Core	2.75
60455	456 Interstage (1) Air Core	2.75
60454	456 Diode Air Core	2.75
63456	456 BFO Air Core	2.50
60501	5000 Interstage (2) Air Core	2.75
60502	5000 Diode Air Core	2.75
60503	5000 FM Interstage Air Core	3.00
60504	5000 FM Disc Air Core	3.00
63503	5000 BFO Air Core	2.50
62456	456 Interstage Iron Core	3.00
62454	456 Diode Iron Core	3.00
62161	1600 Interstage Iron Core	3.00
62162	1600 Diode Iron Core	3.00
63163	1600 BFO Air Core	2.50
<i>Mica Trimmed</i>		
67456	456 Interstage Iron Core	1.25
67454	456 Diode Iron Core	1.25
67503	5000 FM Interstage Air Core	1.50
67504	5000 FM Disc Air Core	1.50
<i>Permeability Tuned</i>		
64456	456 Interstage (2)	1.35
64454	456 Diode (2)	1.35
65456	456 BFO	1.35
<i>Triple Tuned</i>		
66456	456 Interstage	1.75
66454	456 Diode	1.75

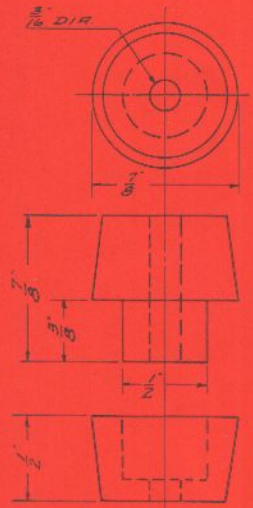
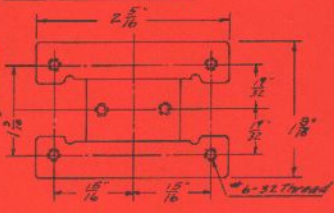




41305



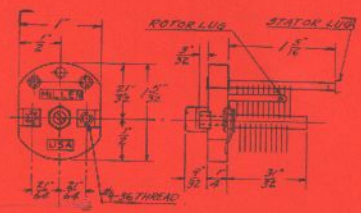
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13050	6	2 1/2	3 1/8	3 1/2	2 1/2
13070	7 1/8	3 1/2	4 1/8	5 1/2	2 1/2



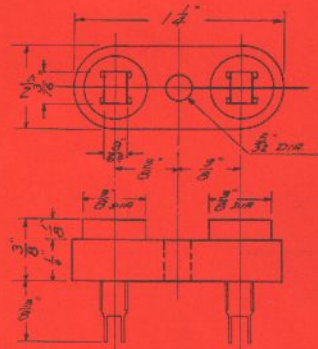
32101



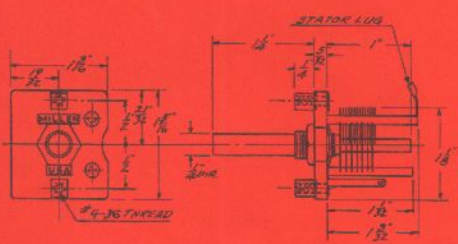
32100



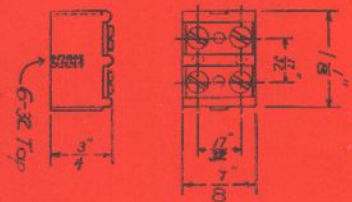
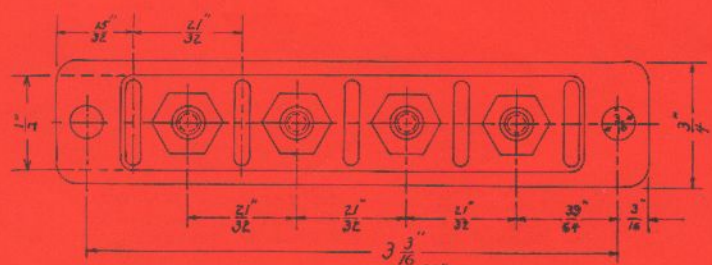
26025 26050 26075 26100



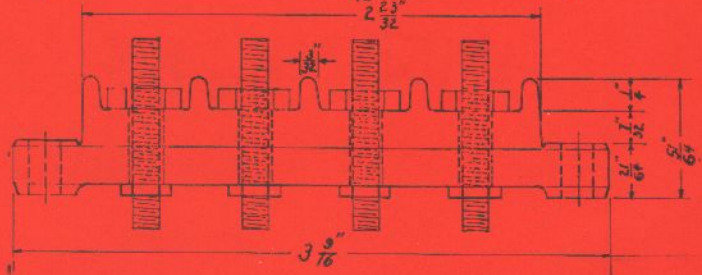
33002

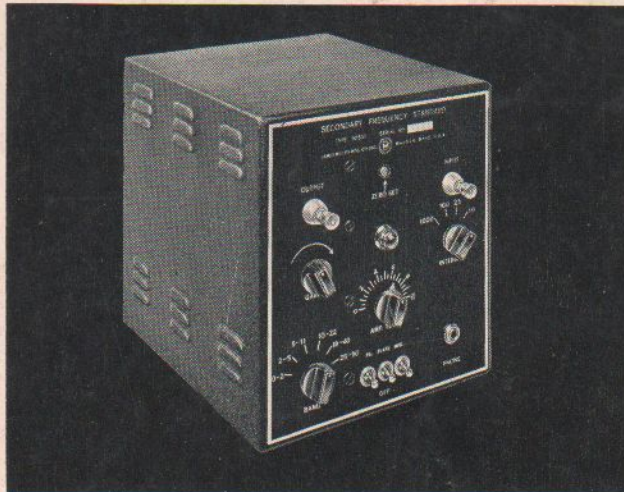


20015 20035 20050 20100



37102





A Precision Crystal Secondary Frequency Standard

A precision frequency standard capable of being adjusted to WWV or some other primary standard and putting out uniformly accurate calibrating signals with 10, 100, 1000 KC intervals. Uses the new GENERAL ELECTRIC 1000 KC crystal having a frequency temperature coefficient of less than one cycle /Mc /C°. The crystal is sealed in Helium in a standard metal tube envelope.

The self-contained AC power supply has VR150-30 voltage regulator tube.

In addition to oscillator, multi-

brators, and amplifier, a built-in detector with phone jack and gain control on panel is incorporated.

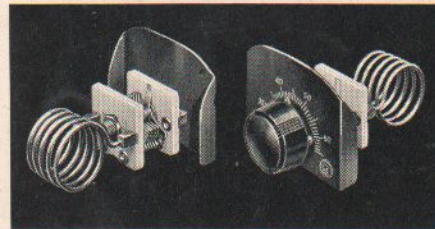
The August 1940 issue of the magazine *QST* contains a detailed technical description by the designer, Mr. George M. Brown.

Tubes required: VR150-30; 6K8; 2-6SC7; 6V6; 6L7; 5W4. Cabinet size: 9" x 9½" x 10½"
Weight of the 110 volt 60 cycle model, less packing, is 16 lbs.

90501	Frequency Std., less tubes and crystal 110V60 net pr.	\$55.00
90502	Frequency Std., less tubes and crystal 110V25 net pr.	62.50
90503	Frequency Std., less tubes and crystal 220V50-60 net pr.	60.00
90505	Same as 90501 complete with G.E. tubes and G.E. crystal net pr.	75.00
90506	Same as 90502 complete with G.E. tubes and G.E. crystal net pr.	82.50
90507	Same as 90503 complete with G.E. tubes and G.E. crystal net price	80.00
	Kit of G.E. tubes	5.00
	General Electric 1000 KC crystal	15.00

Midget 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. Sold in sets of 4 in handy protective case or individually.



90605	Range 2.8 to 9.7 mc.	\$1.65
90606	Range 9.0 to 28 mc.	1.65
90607	Range 26 to 65 mc.	1.65
90608	Range 50 to 140	1.65
90600	Complete set of four, in case	6.50

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