

HAMMARLUND

STANDARD VARIABLE CAPACITORS

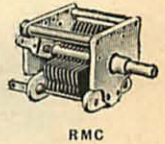
"RMC" CAPACITORS

FEATURES—The "RMC" was designed specifically for applications requiring an "MC" type tuning capacitor with very rigid construction. Its sturdy frame consists of heavy gauge aluminum end panels held together by three aluminum tie rods. It has a brass sleeve front bearing and a single ball thrust rear bearing for smooth tuning and a high degree of resetability. The rotor contact is a forked silver plated phosphor bronze spring wiping against a wide disc on the rotor. The plate shape and other constructional features are the same as on the "MC." Tapped holes in front panel and in mounting feet, as well as additional brackets for inverted mounting permit a wide variety of assembly methods.

SPECIFICATIONS—Straight line capacity. Air gap is 0.0245" nominal. Tested at 1000 V. R.M.S., 60 cycles.

CAPACITY*

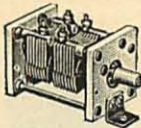
CODE	Max.	Min.	PLATES
RMC-50-S	50.	7.3	7
RMC-100-S	105.	9.5	14
RMC-140-S	143.5	11.0	19
RMC-325-S	327.	17.5	43



RMC

*Nominal Values.

"VU" CAPACITORS



VU

FEATURES—The "VU" is a uniquely designed UHF tuning capacitor using completely original concepts. With it, conventional "lumped constant" circuits, rather than tuned cavity techniques, can be efficiently used up to 500 megacycles. In addition to employing the capacitor sections in series to eliminate the rotor wiper, the design also utilizes Pyrex balls to form precision bearings and to completely isolate the rotor. Thus, noise generated by rubbing metal-to-metal contacts and variable resistance paths in the bearings have been totally eliminated. Circuit connections are made to threaded studs on each stator. This permits vacuum tube and inductor to minimize circuit inductance. The symmetrical design is ideal for tuned circuits operating up to 500 megacycles.

CONSTRUCTION—Rotors and stators are of brass with plates soldered in precisely located grooves and then silver plated to increase the "Q" of the capacitor. The insulation is silicone treated seatite. All lengthwise frame members are of brass to minimize temperature effects. Base mounting brackets are provided. **SPECIFICATIONS**—The capacity characteristic approaches a straight line frequency curve as indicated by nominal values in table. Air gap is .0168" nominal. Tested at 700 V. R.M.S., 60 cycles, between rotor and each stator.

CODE	SERIES CAPACITY*		PLATES/SECTION	DIAL % ROTATION	EFFECTIVE SERIES CAPACITY			DIAL % ROTATION	EFFECTIVE SERIES CAPACITY		
	Eff.	Min.			VU-20	VU-30	VU-45		VU-20	VU-30	VU-45
VU-20	22.5	3.35	11	0	0.	0.	7.0	11.2	15.7	22.4	
VU-30	31.5	3.5	15	10	.55	.8	8.0	14.65	20.55	29.35	
VU-45	45.0	3.8	21	20	1.55	2.2	9.0	18.6	26.05	37.2	
				30	2.75	3.85	100	22.5	31.5	45.0	
				40	4.2	5.85	Cap. Tol.: ±.15MMFD. or 1 1/4 % whichever is greater. (SPECIALLY CALIBRATED UNITS ONLY.)				
				50	6.0	8.4					
				60	8.35	11.65					

*Nominal Values.

"BFC" CAPACITORS

FEATURES—The "BFC" "butterfly" type capacitor has very low minimum capacity, low inductance and isolated rotor for use in VHF applications as a series capacitor with no rotor connection. For dual split-stator capacitor use, it has a low-loss positive rotor contact. Mechanical and electrical symmetry and stator terminal locations minimize circuit inductance. **CONSTRUCTION**—Brass rotors and stators are soldered and nickel-plated. The contact wiper is heavily silver plated phosphor bronze. Tapped studs on the silicone treated seatite front panel permit mounting the capacitor without grounding the rotor. The sleeve type bearing is nickel-plated brass. **SPECIFICATIONS**—Straight line capacity. 90° rotation from minimum to maximum capacity position. Air gap is 0.030" nominal. Tested at 1200 V. R.M.S., 60 cycles between rotor and each stator.

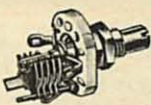
High Speed Ball-Bearing Models Also Are Available.

CODE	CAPACITY SECTION*		SERIES CAPACITY*		PLATES	
	Max.	Min.	Max.	Min.	Rotor	Each Stator
BFC-12	14.5	3.4	7.6	2.2	4	3
BFC-25	27.3	4.8	14.1	2.9	7	6
BFC-38	40.1	6.2	20.6	3.6	10	9
BFC-50	52.4	7.6	27.1	4.3	13	12

* Nominal Values.



"MAC" CAPACITORS



MAC

FEATURES—The "MAC" provides the low minimum capacity essential for use as a trimmer in the VHF range. It was engineered to achieve the smallest dimensions practical to meet the requirements of a miniaturized component.

CONSTRUCTION—Its silicone treated seatite base is only 3/4" x 5/8". Rotor and stator are soldered assemblies and are of brass, nickel-plated. Rotor and stator terminals are positioned to permit short leads. The threaded bearing is provided with flat sides to permit single hole mounting.

SPECIFICATIONS—Straight line capacity. Screwdriver adjustment. Air gap is 0.017" nominal. Tested at 880 V. R.M.S., 60 cycles.

CODE	CAPACITY*			DIFFERENTIAL TYPE	CAPACITY/SECT.*		
	Max.	Min.	PLATES		Max.	Min.	PLATES
MAC-5	5.4	1.3	5	MAC-5-5	5.4	1.3	7
MAC-10	9.6	1.5	9	MAC-10-10	9.6	1.5	13
MAC-15	15.8	1.9	15	MAC-15-15	15.8	1.9	22
MAC-20	21.5	2.2	31	MAC-20-20	21.5	2.2	31
MAC-30	30.0	2.5	27				

* Nominal Values.

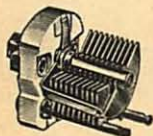
HAMMARLUND

STANDARD VARIABLE CAPACITORS

"APC" CAPACITORS

FEATURES—The "APC" trimmer capacitor originated by Hammarlund over twenty years ago is still widely recognized as the standard capacitor of its type. Its use is indicated in all classes of equipment where a compact, high quality air dielectric trimmer is required. It was designed to resist effects of temperature, moisture and vibration. Silicone treated steatite insulation is used to insure high leakage resistance.

CONSTRUCTION—Brass rotor and stator plates are soldered to brass supports. Nickel-plated phosphor bronze wiper assures positive rotor contact. All metal parts are nickel-plated. Terminals are hot-tin dipped. Tapped brass mounting studs fastened to silicone treated steatite base permit mounting capacitor without grounding the rotor.



APC

SPECIFICATIONS—Straight line capacity characteristic. Available either with hexagonal collar on slotted shaft to permit rotor adjustments to be made with wrench or screwdriver or with 1/2" extended shaft for knob control or shaft coupling. "APC-C" Lock Type now also available through distributors. Air Gap is 0.015" nominal. Tested at 600 V. R.M.S., 60 cycles.

CODE	CAPACITY*		PLATES
	Max.	Min.	
APC-15	17.	2.8	5
APC-25	25.	3.0	7
APC-50	50.	3.9	14
APC-75	75.	4.6	20
APC-100	100.	5.5	27
APC-140	140.	6.7	37

*Nominal Values.

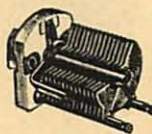
"MAPC" CAPACITORS

FEATURES—The "MAPC" capacitor is representative of Hammarlund's efforts to meet the demand for smaller dependable components. It is a scaled-down version of the popular "APC" with everything reduced except the quality and performance characteristics. For example, an "MAPC" is about half the size and weight of an "APC." Lower minimum capacities and low inductance make the "MAPC" suitable for VHF use. **CONSTRUCTION**—The standard "APC" construction is used in this capacitor. Rotors and stators are fabricated by soldering brass plates to supporting members and nickel-plating the assemblies. Nickel-plated phosphor bronze wiper assures positive rotor contact. Tapped brass mounting studs fastened to silicone treated steatite base permit mounting capacitor without grounding rotor.

SPECIFICATIONS—Straight line capacity. Available either with screwdriver or socket wrench adjustment or with 7/16" extended shaft for knob control or shaft coupling. "MAPC-C" Lock Type now also available through distributors. Air Gap is 0.0135" nominal. Tested at 600 V. R.M.S., 60 cycles.

CODE	CAPACITY*		PLATES
	Max.	Min.	
MAPC-15	15.	2.3	6
MAPC-25	25.	2.6	10
MAPC-35	35.	2.9	14
MAPC-50	50.	3.2	19
MAPC-75	75.	3.9	29
MAPC-100	100.	4.5	38
MAPC-140	140.	5.5	52

*Nominal Values.

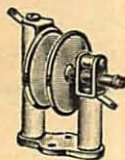


MAPC

"NZ-10" CAPACITORS

FEATURES—The "NZ-10" is a compact transmitter neutralizing capacitor designed for easy and accurate adjustment. The rotor is attached to a fine-thread lead screw which may be adjusted with smooth and precise action by a screwdriver and locked securely by a readily accessible clamping screw. A stop prevents shorting of plates at maximum capacity. Long leakage paths to ground from both rotor and stator are provided. Glazed steatite insulators and smoothly rounded aluminum plates minimize flashover.

SPECIFICATIONS—Capacity is adjustable from 2.3 to 10 mmf. Peak voltage rating is 3000 V. at maximum capacity (minimum gap) position.



NZ-10

"FC" and "FNC" COUPLINGS

FEATURES—The "FC-46-S" is an insulated flexible coupling designed to provide for mechanical coupling of shafts even though angularly misaligned. The smallest dimensions have been incorporated consistent with the rugged construction necessary for general service. A high degree of electrical isolation is achieved through the use of silicone treated steatite insulation. Flashover voltage is approximately 5000 V. R.M.S. Brass hubs and spring

temper phosphor bronze flexible arms are nickel plated. An exclusive and important feature of this coupling is its characteristic of uniform side-thrust through 360° of rotation. This eliminates tendency to vibrate at high speeds, minimizes bearing wear and assures accurate tracking.

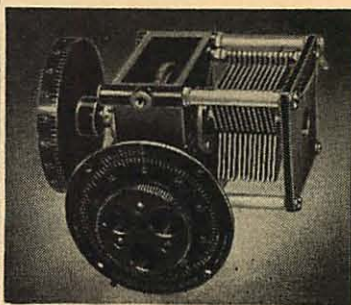
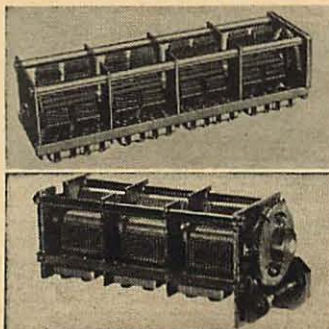
The "FNC-46-S" is a non-insulated coupling for use where electrical continuity between shafts is required. The flexible arms are held securely to a nickel plated brass ring instead of an insulator.



STANDARD STOCK TYPES	
CODE FC-46-S	Insulated flexible coupling
CODE FNC-46-S	Non-insulated flexible coupling

SPECIAL VARIABLE CAPACITORS FOR ALL NEEDS HAMMARLUND CUSTOM ENGINEERED CAPACITORS

Hammarlund has for many years been considered the foremost designer and producer of variable capacitors for special military, scientific and precision applications. Should you have a special capacitor requirement, your engineers will find the services of our capacitor design group to be of inestimable value. Illustrated are two communications receiver multiple-section tuning capacitors and a single-section frequency meter capacitor. All of these capacitors feature exceptionally precise calibration accuracy, the highest possible degree of resetability, essentially zero temperature coefficient, close tolerances on starting and running torque, high "Q" under adverse operating conditions and complete freedom from noise. To produce these and similar capacitor designs involve the techniques of metallurgy, gearing, finishing, bearing design, ceramics, vibration and shock—to mention but a few. These techniques are possessed to a high degree here at Hammarlund.

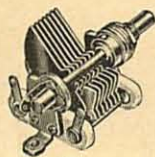


Should you have need for facilities such as ours, we will welcome your inquiry.

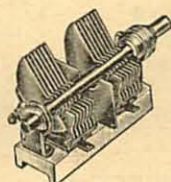
HAMMARLUND

STANDARD VARIABLE CAPACITORS

"MC" and "MCD" CAPACITORS



MC



MCD

FEATURES—The "MC" is a versatile single section tuning capacitor designed to give the equipment engineer a choice of mountings, connections and capacity characteristics. The threaded brass front bearing and tapped aluminum end brackets permit panel or base mounting. A rotor stop permits 180° clockwise rotation for increasing capacity. "MC-S" capacitors have a straight line capacity characteristic. "MC-M" units have offset plates resulting in a "Midline" characteristic which more equally spaces frequencies. "MC-X" units are wide-spaced for high voltages. For optimum performance all Hammarlund "MC" capacitors have silver plated spring tempered wiping contact, silicone-treated seatite insulation, soldered nickel-plated brass rotors and stators, rotor shaft supported on bearings at both front and rear of capacitor. The "MCD" is a split-stator panel-mounted capacitor with all the "MC" features. Stators have terminals on both sides. Stators on single-spaced capacitors are separated by a shield. Wide-spaced units have no shield. **SPECIFICATIONS**—Straight line or "Midline" capacity characteristic. Single-spaced types have 0.0245" nominal air gap and are tested at 1000 V. R.M.S., 60 cycles. Wide-spaced ("X") types have 0.0715" nominal air gap and are tested at 1750 V. R.M.S., 60 cycles.

CODE		CAPACITY*		PLATES/SECTION	CODE		CAPACITY/SECT.*		PLATES/SECTION
Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.	
MC-20-S	20.	5.5	3	MC-20-SX	20.	6.8	7		
MC-35-S	35.	6.0	5	MC-35-MX	32.	7.8	11		
MC-50-M	50.	6.3	7	MC-35-SX	32.	8.5	11		
MC-50-S	50.	6.5	7	MC-50-MX	53.	10.5	19		
MC-75-M	80.	7.3	11	MC-50-SX	53.	11.5	19		
MC-75-S	80.	8.0	11	MC-100-SX	100.	16.5	35		
MC-100-M	100.	7.7	14	MCD-50-M	50.	5.5	7		
MC-100-S	100.	8.3	14	MCD-100-M	100.	6.3	14		
MC-140-M	140.	9.0	19	MCD-100-S	100.	7.0	14		
MC-140-S	140.	10.0	19	MCD-140-M	140.	7.8	19		
MC-200-M	200.	10.3	27	MCD-35-MX	31.	6.0	11		
MC-250-M	250.	12.0	34	MCD-35-SX	31.	6.8	11		
MC-325-M	320.	13.5	43						

M-Midline plates, S-Straightline plates, X-Wide-Spaced. *Nominal Values.

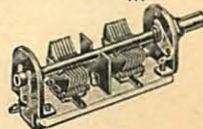
"HF" and "HFD" CAPACITORS

SINGLE SECTION CAPACITOR—The "HF" is a single section tuning capacitor employing "APC" rotor and stator design. Extra long sleeve bearing and positive contact nickel-plated phosphor bronze wiper make this unit ideally suited to high frequency applications. Silicone treated seatite insulation. Single hole or base mounting. Special spacing, capacity values, finishes and other modifications are available to manufacturers on special order.

DOUBLE SECTION CAPACITOR—The "HFD" dual capacitors, like the "HF" singles, incorporate advanced features providing for maximum efficiency at high frequency. Soldered brass plates are nickel-plated. Aluminum front and rear end panels are mounted on a heavy silicone treated seatite base. Wide front and rear bearings with individual silver plated spring tempered wipers for each section assure long life and maximum contact efficiency. Single hole panel mount or base mounting. Electrostatic shield between sections. Terminals are provided on both sides of each stator to permit mounting tube and inductor on opposite sides. **SPECIFICATIONS**—Straight line capacity. Single spaced types (HF and HFD) have 0.015" air gap and are tested at 600 V. R.M.S., 60 cycles. Wide spaced types (HF-X and HFD-X) have 0.045" air gap and are tested at 1400 V. R.M.S., 60 cycles.



HF

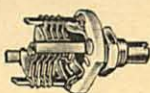


HFD

CODE		CAPACITY*		PLATES/SECTION	CODE		CAPACITY*		PLATES/SECTION
Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.	
HF-15	17.5	2.8	5	HF-30-X	30.	5.2	20		
HF-35	36.	3.2	10	HFD-25	25.0	2.9	7		
HF-50	52.	3.7	14	HFD-50	52.	3.6	14		
HF-100	102.	5.3	27	HFD-100	102.	5.0	27		
HF-140	142.	6.3	37	HFD-140	142.	6.0	37		
HF-15-X	15.	3.6	10	HFD-15-X	16.	3.8	11		
D-Split stator.				HFD-30-X	28.5	5.0	19		

D-Split stator, X-Wide-Spaced, *Nominal Values.

MACBF CAPACITORS



MACBF

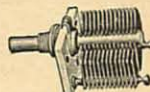
FEATURES—The "MACBF" is a miniaturized butterfly capacitor providing extremely low capacity for the VHF range. It is of the straight-line capacity type. **CONSTRUCTION**—Rotor and stator of brass, solder assembled, and nickel-plated. Base is of silicone-treated seatite. Terminals are hot-tinned dipped. Threaded bushing with flattened sides for panel or chassis mounting. **SPECIFICATIONS**—Straight line capacity. Screwdriver adjustment. Air gap is 0.017" nominal. Tested at 880 V. R.M.S., 60 cycles.

CODE	Part No.	CAPACITY (per section)		No. of PLATES	
		Max. ±10%	Min. ±15%	Rotor	Stator
MACBF-3	34604-G1	3.1	1.3	3	4
MACBF-5	34604-G2	5.0	1.6	5	8
MACBF-8	34604-G3	7.9	2.0	8	14
MACBF-11	34604-G4	10.8	2.4	11	20

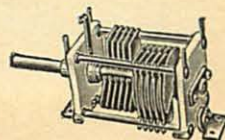
"HFA" and "HFD" CAPACITORS

SINGLE SECTION CAPACITOR—The "HFA" is a single section tuning capacitor similar to the "HF" except that larger plates permit wider air-gaps for the same capacitance values. Resultant higher break-down ratings extend the use of the capacitor into the high frequency low-power transmitter field. A threaded sleeve bearing permits single hole mounting and the bracket supplied may be used for base mounting. A lug-type terminal mounted with the bearing provides an efficient rotor connection.

DOUBLE SECTION CAPACITOR—The "HFD" is a dual, balanced rotor transmitting capacitor employing front and rear panels plus a ball-thrust rear bearing, but other incorporating constructional features identical to the smaller "HFA". An insulated shaft extension safeguards operating personnel from the high voltages which may be applied to the rotor. The small size, rugged construction, balanced rotor and range of capacitance values and breakdown voltages make this capacitor ideally suited to many applications.



HFA



HFD

CODE		CAPACITY**		SPAC-ING	PLATES/SECTION	CODE		CAPACITY**		SPAC-ING	PLATES/SECTION
Max.	Min.	Max.	Min.			Max.	Min.	Max.	Min.		
HFA-100-A	102.	4.5	0.020	19	HFA-100-B†	100.	7.5	0.030	27		
HFA-140-A	145.	6.0	0.020	27	HFA-15-E	16.	4.0	0.070	9		
HFA-200-A	200.0	8.0	0.020	38	HFD-50-C	50.	9.0	0.050	11		
HFA-10-B	9.	2.3	0.030	3	HFD-100-C	105.	14.0	0.050	23		
HFA-15-B	16.	2.8	0.030	5	HFD-35-E*	37.	9.5	0.070	11		
HFA-25-B	25.	3.0	0.030	7	HFD-65-E*	63.	12.5	0.070	19		
HFA-50-B	50.	4.3	0.030	14							

60 cycle voltages: "HFA"- "A" 800 V. R.M.S. "B" 1200 V. R.M.S. "E" 1750 V. R.M.S. "HFD"- "C" 1500 V. R.M.S. "E*" 3000 V. R.M.S.; plates have rounded edges. †Has front and rear supporting panels. **Nominal Values.

SPECIFICATIONS—Straight line capacity. Air gaps and test voltages are as indicated in table. However, "HFD" breakdown voltages are doubled and capacitance values approximately halved when stator sections are connected in series.