JOHANSON MANUFACTURING CORPORATION
GENERAL APPLICATION NOTES

1.0 PURPOSE:

The purpose of this document is to provide general information on handling Johanson electronic components. Additional information by individual product is available: Contact your Johanson Sales Engineer at (973) 334-2676 or at www.johansonmfg.com.

2.0 REFERENCES:

2.1 JMC E284 Thin-Trim Solder Pad Specification.

2.2 JMC R321-1 Giga-Trim Solder Pad Specification.

2.3 JMC R360 Cera-Trim Handling and Storage Specification.

3.0 GENERAL:

Johanson RF/Microwave Capacitors and Microwave Tuning Devices are precision components and require specific handling during installation and adjustments. If these simple procedures are followed, your Johanson component can be expected to provide you with trouble free service.

4.0 STORAGE

4.1 In general, all electronic components are susceptible to degradation due to improper environmental conditions over long periods of time. For best results, keep Johanson components in their original packaging as long as possible.

4.2 CERA-TRIM®: See R360 for special storage requirements.

5.0 MOUNTING

5.1 CHASSIS MOUNTING STYLES:

Bushing Mounted Capacitors, Tuning Elements and DYNA-TRIMS® should be installed using a torque limiting nut driver. Recommended mounting torques are as follows:

BUSHING THREAD	TORQUE (OZ.IN)
.120-80	10
5/32(.156)-64	20
#10(.190)-64	30
15/64(.234)-64	50
1/4(.250)-64	90
5/16(.312)-64	120
3/8(.375)-64	120
15/32(.469)-32	240

5.2 TUNING ROTORS:

Johanson Tuning Rotors are high precision devices with accurately formed threads. For best results we recommend the use of Johanson Taps.

THREAD SIZE	TAP P/N	RECOMMENDED TAP DRILL
#0(.060)-80 UNF-2	7053	3/64(.0469)
#2(.086)-56 UNC-2	7054	#51(.067)
3/32(.094)-80 UNS-2	7064	#45(.082)
.120-80 UNS-2	7060	#36(.1065)
5/32(.156)-64 UNS-2	7059	9/64(.1406)
#10(.190)-64 UNS-2	7061	#17(.173)
.200-80 UNS-2	7057	3/16(.1875)
15/64(.234)-64 UNS-2	7062	7/32(.2187)
1/4(.250)-64 UNS-2	7063	15/64(.2344)
3/8(.375)-64 UNS-2	7056	23/64(.3594)

5.3 THRU-HOLE CAPACITORS:

Air and GIGA-TRIM® capacitors with leads for PC board mounting may be lightly clinched after assembly to board, to help retain them. We do not recommend clinching the leads on THIN-TRIM® or SEAL-TRIM® capacitors.

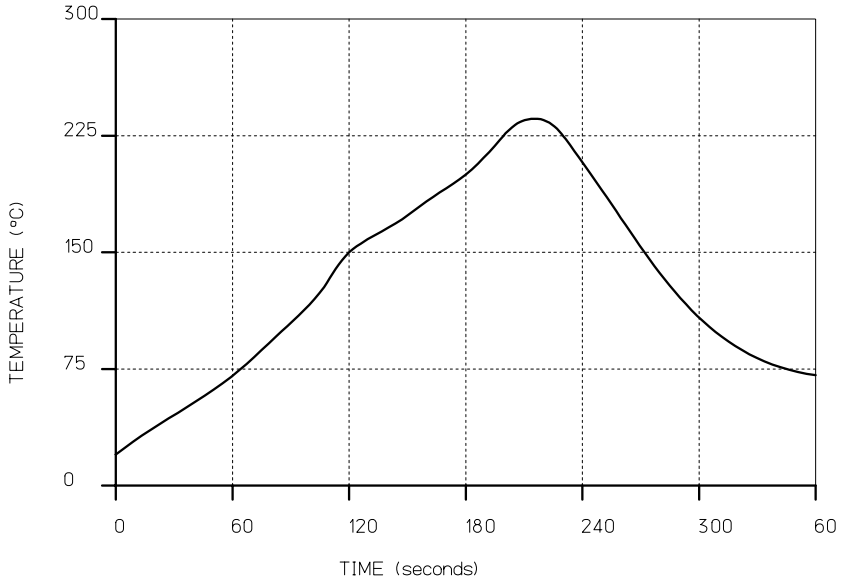
5.4 SURFACE MOUNT CAPACITORS:

Adhesive is not recommended to hold the vertical mount styles of Air or GIGA-TRIM® capacitors in place on the board before soldering.

6.0 SOLDERING:

Soldering may be performed by reflow, wave or hand soldering (Hand soldering--at a maximum temperature of 260°C (500°F) for 3 seconds maximum) as is appropriate for the mounting style and assembly of the capacitor. The use of 60-40 solder (SN60-63) is recommended for all Johanson products; but other lead free alloys have been tested and found acceptable. (See test profile below.) Do not solder directly to the bushing or stator solder joint area of an Air Capacitor. Protect all unsealed capacitors from flux intrusion. The use of screw-on Seal Cap assemblies or plastic process Seal Caps is recommended. Do not allow molten solder or hot soldering irons to contact the SEAL-TRIM® Capacitor housing. Do not remove the Teflon washer from the base of these units.

TYPICAL LEAD FREE PROFILE



6.1 Wave Soldering:

For all PC leaded style AIR, GIGA-TRIM®, THIN-TRIM® and SEAL-TRIM® Capacitors, recommended preheat time is 1-3 minutes. The maximum tested soldering temperature is 260°C(500°F) for 5 TO 10 seconds maximum.

6.2 Reflow Soldering:

For all surface mount style Air, GIGA-TRIM®, THIN-TRIM® and SEAL-TRIM® Capacitors recommended preheat time is 1-3 minutes. The maximum tested soldering temperature for THIN-

TRIM® and SEAL-TRIM® Capacitors, Air and GIGA-TRIM®, is 260°C(500°F) for 5 to 10 seconds maximum.

6.3 For all Surface Mount Single Turn capacitors, do not run conductor patterns underneath the unit beyond the solder pad.

7.0 CLEANING:

Johanson components are compatible with a wide variety of cleaning processes including those that utilize aqueous or semi-aqueous cleaning solutions, alcohol solutions, deionized water and numerous other cleaners**. However, due to the large variety of such processes, actual compatibility must be determined by the customer through cleaning process evaluation in conjunction with Johanson products purchased. (Contaminated solutions may cause low insulation resistance and/or rough, uneven tuning torque. To avoid this, change the solutions often and use a filtered solution cleaning system.)

7.1 ***9300 Series CERAMIC TRIMMERS*** are not cleanable. All others can be cleaned as indicated below.

7.2 Capacitors without seal caps should be protected from intrusion of cleaning solutions on the internal bushing thread. It is recommended these units be installed after circuit boards have been cleaned. Units with seal caps may be immersed in liquid, vapor, and ultrasonic cleaning systems.

7.3 THIN-TRIM® capacitors should be cleaned in contamination free solution. If rough torque occurs after cleaning, re-clean in fresh solution.

7.4 SEAL-TRIM® capacitors can withstand total immersion cleaning in contamination free solution. Excellent results have been obtained using water soluble flux and aqueous cleaning.

**Johanson components are compatible with chlorinated and fluorinated solvents although their use is not recommended due to environmental concerns and resultant EPA mandated usage regulation and reduction.

8.0 ADJUSTING:

The plastic process seal caps available for air capacitors and GIGA-TRIM® Capacitors are designed so that, after assembly is complete they may be penetrated by the Johanson Tuning Tool and left in place or may be removed and discarded before adjustment. Penetration renders the seal no longer effective.

8.1 The Tuning Torque Range is specified for each type of capacitor. The maximum specified value should not be exceeded or damage to the capacitor may result.

8.2 Always use the recommended tuning tool. Johanson Tuning Tools are designed specifically for tuning Johanson products; use of other tools, particularly metal screwdrivers, may damage the internal bushing thread causing rotor binding. The following tools are available for tuning JMC Capacitors and Tuning Elements:

JMC TUNING TOOL	WHERE USED
8764 OR 8777 (.130 DIA.END)-	ALL AIR TRIMMERS INCLUDING MINI-TRIMS®, DYNA-TRIMS® AND MIVORWAVE TUNING DEVICES EXCEPT .120-80 O.D. THREADED BUSHING UNITS. ALL 9300 SERIES CERAMIC TRIMMERS.
8766 OR 8777(.078 DIA END)-	ALL .120-80 O.D. THREADED BUSHING AIR TRIMMERS AND MICROWAVE TUNING DEVICES. ALL GIGA-TRIM® EXCEPT 27260 SERIES.
8762-	27260 SERIES GIGA-TRIM®,6922 AND 6960 MICROWAVE TUNING ELEMENTS.
2190-	9910 SERIES THIN-TRIM® AND 9690 SERIES SEAL-TRIM®
4192-	9440, 9401, 9402 SERIES THIN-TRIM®, 9620 AND 9630 SERIES SEAL-TRIM®
4193-	9410 SERIES THIN-TRIM® AND 9610 SERIES SEAL-TRIM®