

APPROVALS			REVISIONS			
	INITIALS	DATE	REV	DESCRIPTION	DATE	APPR
Drawn	JFG	23NOV98	B	Redrawn	04MAR00	JFG
Engineering						
Manufacturing						
Marketing						

1. Introduction

1.1. Scope

This procedure covers the modification of microwave generators, those currently using the model GL131 magnetron, for use with the new GA8002 magnetron. Most of these generators were originally manufactured by Gerling Laboratories (also AGL, Inc.), but some units manufactured by Gerling-Moore, Inc., Genesys Systems or Litton Industries and upgraded to use the GL131 may also apply.

Two separate procedures are outlined in this document.

- 1.1.1. The **Standard Retrofit** procedure (Section 2) covers generators having the **most current** version socket for use with the GL131C magnetron. This procedure involves changing only the upper pole piece, thrust ring and thrust ring insulator.
- 1.1.2. The **Enhanced Retrofit** procedure (Section 3) covers generators having the earlier version socket for use with the original version GL131 magnetron or other similar magnetrons supplied by companies other than Gerling Labs. This procedure involves changing the waveguide launch assembly in addition to the components listed above.

NOTE: This document does NOT cover the modification of generators currently using the Litton Industries model L-3858 magnetron. Please contact GAE directly for information on upgrading these generators for use with the new GA8002 magnetron.

1.2. Background

Hitachi manufactures two magnetrons, models 2M130 and 2M131, which are very similar to each other with respect to the anode assembly (the component under vacuum, often referred to as the "bottle" which consists of the anode, filament and antenna). Several years ago Hitachi considered utilizing the same anode assembly in both magnetrons as a means to reduce manufacturing costs. The 2M130 is far more widely used than the 2M131 and thus had the preferred anode assembly. The tooling used to manufacture the 2M131 anode assembly eventually wore out, and in 1997 the anticipated change in the 2M131 design to use the 2M130 anode assembly was implemented.

The Gerling Labs model GL131C magnetron was originally designed as a custom modification of the 2M131 using only its anode assembly. But now that the 2M131 has been changed as described above, its anode assembly can no longer be used to produce a magnetron which is 100% compatible with the GL131C in all respects to form, fit and function. The differences between the old and new style 2M131 anode assemblies are mostly with respect to mechanical

- 2.1.9. Carefully bend the magnetron filament leads straight up.
- 2.1.10. Remove the three #8 kepnuts that hold the **UPPER POLE PIECE** to the **UPPER ELECTROMAGNET RETAINER**.
- 2.1.11. Remove the **UPPER POLE PIECE** assembly which includes the old **THRUST RING, THRUST RING INSULATOR** and two Ceramic Standoffs. Discard this assembly.
- 2.1.12. Remove the GL131C Magnetron. Save the thrust ring washer which is resting on top of the magnetron and discard the magnetron.

2.2. Reassembly

- 2.2.1. Refer to Drawing 910121 for location of **ITEMS** referenced in the following discussion.
- 2.2.2. Insert the new **GA8002 MAGNETRON** into the housing and ensure it is properly seated into the **LOWER POLE PIECE**.
- 2.2.3. Ensure that the thrust ring washer is resting on top of the magnetron anode assembly and around filament lead mast. Note that only one thrust ring washer is required and that one may have been supplied with the replacement GA8002 magnetron.
- 2.2.4. Install the new **UPPER POLE PIECE** onto the **UPPER ELECTROMAGNET RETAINER** with the flange towards the bottom. Tighten the #8 nuts previously removed until they are just snug. Do not over tighten.
- 2.2.5. Install and hand tighten the new **THRUST RING** while gently rocking the magnetron by its cooling lines until the magnetron is firmly seated and snug in place. The stem of the magnetron must be centered and vertical. Finish tightening the three #8 nuts securing the **UPPER POLE PIECE**.
- 2.2.6. Carefully insert the new **THRUST RING INSULATOR** around the magnetron filament leads and into the **THRUST RING**.
- 2.2.7. Carefully bend the magnetron filament leads so that they are positioned towards the HV feedthru leads. Secure the filament leads to the leads from the HV feedthru (attached to the filament housing wall) using the #8-32 screws and Kepnuts supplied with the retrofit kit. Position these connections such that they are separated from each other and approximately mid-way between the bottom and top of the filament housing.
- 2.2.8. Reinstall the housing **SIDE COVER** and fasten it to the **FILAMENT HOUSING** with two the screws previously removed.
- 2.2.9. Install the **TOP COVER** and **FAN** assembly and secure it to the filament housing with the four sheet metal screws previously removed.
- 2.2.10. Reattach the fan cord to the **FAN**.

- 2.2.11. Reattach the cooling hoses to the cooling lines of the magnetron. DO NOT OVER TIGHTEN THE BANDS.
- 2.2.12. Replace outer access cover(s).
- 2.2.13. Perform the Set Up Procedures for installation of a new magnetron as described in the Installation, Operation and Maintenance Manual which was originally provided with the generator.

3. Enhanced Retrofit Procedure

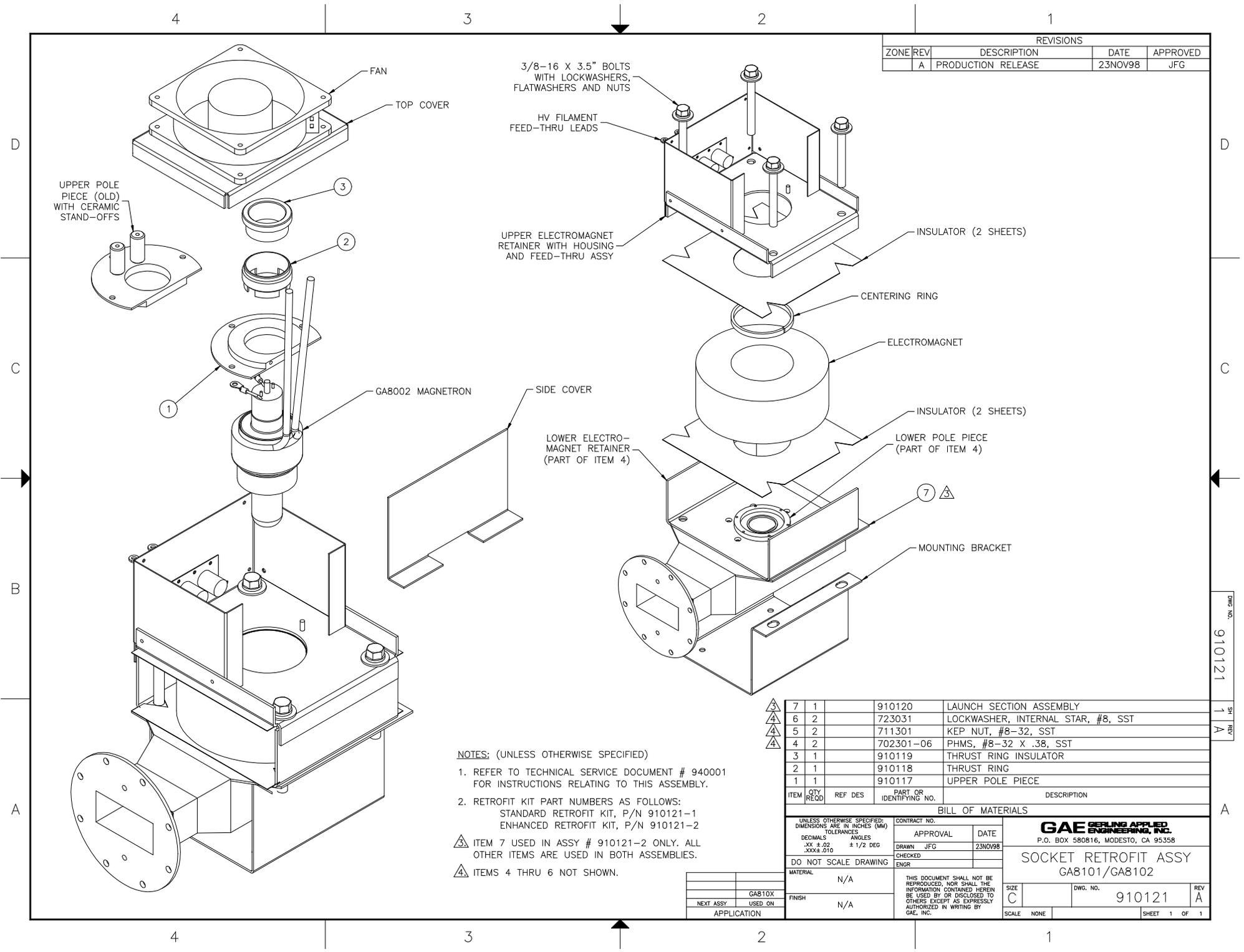
3.1. Disassembly

- 3.1.1. Refer to Drawing 910121 for location of **ITEMS** referenced in the following discussion.
- 3.1.2. DISCONNECT THE POWER SOURCE FROM THE ELECTRIC POWER CONNECTION AND COOLING WATER CONNECTION.
- 3.1.3. Follow steps 2.1.3 through 2.1.12 as outlined in the Standard Retrofit Procedure above for removal of the old GL131C magnetron.
- 3.1.4. Remove the brown phenolic insulator block from around the connection between the filament transformer HV leads and **HV FEEDTHRU LEADS**.
- 3.1.5. Disconnect the filament transformer leads from the feedthru leads.
- 3.1.6. Disconnect the electromagnet leads from the two-position terminal block located on the side of the housing near the HV feedthru leads.
- 3.1.7. Remove the four sets of **3/8-16 BOLTS** (with nuts and washers) and left off the **UPPER ELECTROMAGNET RETAINER** with the filament housing intact.
- 3.1.8. Remove the **ELECTROMAGNET** along with the **INSULATORS** above and below the electromagnet. Also remove the plastic **CENTERING RING**.
- 3.1.9. Remove the front vent plate and the waveguide retaining plate (just below the vent) from the front of the power source enclosure.
- 3.1.10. Disconnect any waveguide components which might be attached to the output waveguide flange of the power source.
- 3.1.11. Remove the **LAUNCH SECTION ASSEMBLY** from the power source and discard the entire assembly.

3.2. Reassembly

- 3.2.1. Refer to Drawing 910121 for location of **ITEMS** referenced in the following discussion.

- 3.2.2. Set the new **LAUNCH SECTION ASSEMBLY** onto the **MOUNTING BRACKET** and through the opening in the front of the power source enclosure. Do not install the mounting bolts at this time.
- 3.2.3. Replace the waveguide retaining plate and vent plate on the front of the power source enclosure.
- 3.2.4. Set one of the electromagnet **INSULATORS** onto the launch section assembly around the **LOWER POLE PIECE**. Be sure the notches are aligned with the holes in the launch section assembly.
- 3.2.5. Set the **ELECTROMAGNET** onto the **INSULATOR** with the leads on top and towards the rear of the power source.
- 3.2.6. Install the plastic **CENTERING RING** in the space between the **ELECTROMAGNET** and **LOWER POLE PIECE**.
- 3.2.7. Set the other electromagnet Insulator on top of the **ELECTROMAGNET** and properly centered. Be sure the notches are aligned with those of the lower Insulator and the launch section assembly mounting holes.
- 3.2.8. Set the **UPPER ELECTROMAGNET RETAINER** with filament housing attached over the **ELECTROMAGNET** with the mounting holes aligned with those of the launch section assembly.
- 3.2.9. Install the four **3/8-16 BOLTS** through the launch section mounting holes from the bottom. Install the flat washers, split-ring lockwashers, and the hex nuts in that order. Tighten the hex nuts until the lockwasher is **approximately one-half compressed** (this is to allow for thermal expansion of the electromagnet).
- 3.2.10. Connect the leads of the electromagnet to the two-position terminal block (the order of connection is not important).
- 3.2.11. Connect the filament transformer HV leads to the **HV FEEDTHRU LEADS**. Also attach the flying HV lead from the rectifier assembly (on top of the plate transformer) to the near HV feedthru lead. Install the phenolic insulator block over these HV lead connections.
- 3.2.12. Follow steps 2.2.2 through 2.2.13 as outlined in the Standard Retrofit Procedure above for installation of the new **GA8002 MAGNETRON**.



REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	PRODUCTION RELEASE	23NOV98	JFG

- NOTES: (UNLESS OTHERWISE SPECIFIED)**
- REFER TO TECHNICAL SERVICE DOCUMENT # 940001 FOR INSTRUCTIONS RELATING TO THIS ASSEMBLY.
 - RETROFIT KIT PART NUMBERS AS FOLLOWS:
STANDARD RETROFIT KIT, P/N 910121-1
ENHANCED RETROFIT KIT, P/N 910121-2
- ⚠ ITEM 7 USED IN ASSY # 910121-2 ONLY. ALL OTHER ITEMS ARE USED IN BOTH ASSEMBLIES.
- ⚠ ITEMS 4 THRU 6 NOT SHOWN.

ITEM	QTY	REF	DES	PART OR IDENTIFYING NO.	DESCRIPTION
7	1			910120	LAUNCH SECTION ASSEMBLY
6	2			723031	LOCKWASHER, INTERNAL STAR, #8, SST
5	2			711301	KEP NUT, #8-32, SST
4	2			702301-06	PHMS, #8-32 X .38, SST
3	1			910119	THRUST RING INSULATOR
2	1			910118	THRUST RING
1	1			910117	UPPER POLE PIECE

BILL OF MATERIALS			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES (MM)		CONTRACT NO.	
DECIMALS	ANGLES	APPROVAL	DATE
.XX ±.02	± 1/2 DEG	DRAWN JFG	23NOV98
.XXX ±.010		CHECKED	
DO NOT SCALE DRAWING		ENGR	
MATERIAL		THIS DOCUMENT SHALL NOT BE REPRODUCED, NOR SHALL THE INFORMATION CONTAINED HEREIN BE USED BY OR DISCLOSED TO OTHERS EXCEPT AS EXPRESSLY AUTHORIZED IN WRITING BY GAE, INC.	
FINISH		GAE GERLING APPLIED ENGINEERING, INC. P.O. BOX 580816, MODESTO, CA 95358	
NEXT ASSY USED ON		SOCKET RETROFIT ASSY GA8101/GA8102	
APPLICATION		SIZE	DWG. NO.
		C	910121
		SCALE	REV
		NONE	A
		SHEET 1 OF 1	

DWG. NO. 910121 1 SH. REV. A