

Service Guidelines

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WARNING: PERFORM SERVICING ONLY AFTER BECOMING THOROUGHLY FAMILIAR WITH THE FOLLOWING SERVICING GUIDELINES. NONCOMPLIANCE INCREASES THE RISK OF HAZARDS AND INJURY TO THE USER. DO NOT MODIFY ANY CIRCUIT.

3.1 Safety Precautions & Warnings

The *Marquee* projection system is CSA approved and is designed for safe and reliable operation. To assure safety to users and technicians, it is imperative that the following precautions be taken during servicing and that the original projector design be maintained.

Labels and Markings ►

Observe and follow all warnings and instructions marked on the projector and within this service manual.

The exclamation point within the equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the projector.



The lightning flash with arrowhead symbol, within the equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the projector's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



High Voltage ►

High voltages capable of causing DEATH are used in this projector. Observe all precautions necessary for working on HIGH VOLTAGE equipment before servicing.

HIGH VOLTAGES MAY BE EXPOSED



QUALIFIED PERSONNEL ONLY

To prevent damage to solid state devices, do not arc the picture tube anode lead to chassis or earth ground.

- X-RAY Radiation** ► The projector is internally shielded to protect the user from exposure to x-ray radiation. Improper servicing may result in personal injury.



IF SHIELDING MUST BE REMOVED FOR SERVICING, IT MUST BE RE-INSTALLED TO ITS ORIGINAL CONDITION.

Do not operate or allow the operation of the projector with any shielding removed or damaged. Electrohome cannot be held responsible for injuries caused by improper replacement of shields or operation of the projector with damaged shields.

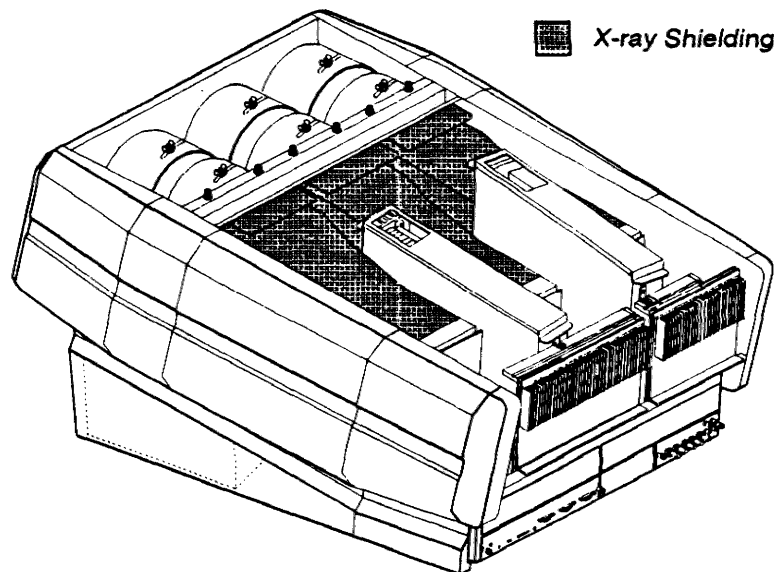


Figure 3-1. X-Ray Shielding

- Power Supplies** ► The projector's two power supplies (high voltage and low voltage) are not serviceable. Do not open or attempt servicing of the supplies should a supply failure occur. Contact Electrohome for replacement power supplies.

- Component Replacement** ► All components on schematics and parts lists which are identified with a **⚠** are critical safety. These components **MUST** be replaced by exact equivalents. Failure to do so may result in unsafe operation. Replace all components that show signs of overheating.

3.2 General Guidelines

STATIC SENSITIVE COMPONENTS



APPROPRIATE STATIC PRECAUTIONS MUST BE TAKEN DURING ALL SERVICING

- Lead Dress** ➤ Before servicing, observe the original lead dress. Take extra precaution to maintain the original lead dress, especially in the high voltage circuitry areas. Replace any wire that has damaged insulation.
- High Voltage** ➤ Check that the high voltage is at its correct value. Use an accurate, calibrated, high voltage meter. When troubleshooting a projector with a high voltage problem **DO NOT** operate the projector longer than is necessary to locate the cause of the problem.
- Ordering Parts** ➤ When ordering replacement parts, quote the part numbers of the items required. Also provide the projector model number, serial number, and date of manufacture which is available from the licence label located next to the line cord input at the front of the projector.
- AC Leakage Test** ➤ Perform an AC leakage test on exposed metallic parts after each servicing. This will ensure that the projector is safe to operate without danger of electric shock. Perform the test as follows:
- Temporarily disable the ground connection of the line cord using a suitable adaptor. **DO NOT** use a line isolation transformer.
 - Connect a 1500 Ω , 10 watt resistor in parallel with a 150nF AC capacitor between a known good earth ground and each exposed metallic part, one at a time. With an AC voltmeter having a minimum sensitivity of 1000 Ω /V, measure the voltage across the 1500 Ω resistor. See Figure 3-2 below. The rms voltage measured **MUST NOT EXCEED 5.25V rms** (equivalent to 3.5 mA rms current). Values exceeding this limit are potential shock hazards. Correct immediately!

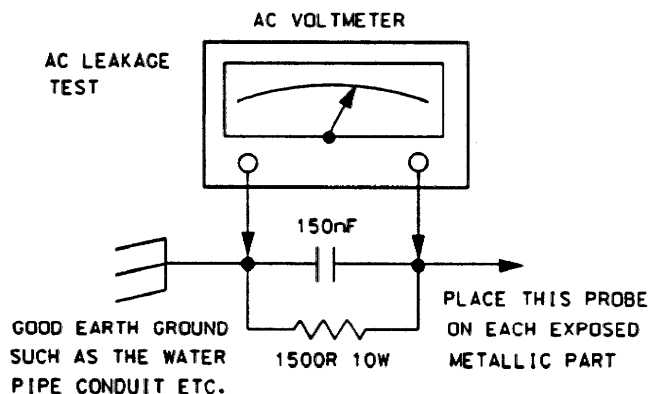


Figure 3-2. AC Leakage Test

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Component Removal ➤ If a through-hole component is defective and must be replaced, cut the leads near the body of the component as shown in Figure 3-3.

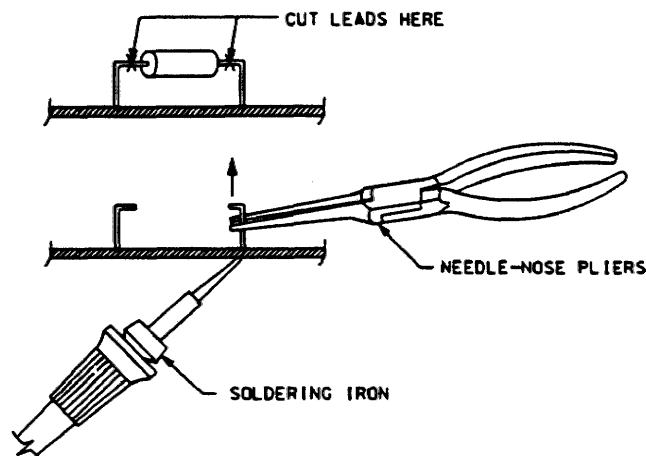


Figure 3-3. *Component Removal* 02060309

Grip the lead with needle-nose pliers. Use a soldering iron to melt the solder, securing the lead, on the back of the PCB. Pull gently to remove the lead.

If a component is to be removed for testing, grip the lead with needle-nose pliers. Use a soldering iron to melt the solder while securing the lead on the back of the PCB. Pull gently to remove the lead.

Avoid excessive heating of the component. If a transistor is to be removed, attach an alligator clip or soldering heat sink to the transistor case to provide a temporary heat sink. Clean out all holes. Use a solder sucker, solder brush or solder wick.

Check component markings and the parts list to determine the correct replacement component.

Repair Cautions ➤ **DO NOT** short transistors or ICs during circuit checks.

DO NOT short IC pins.

DO NOT short transistor emitter or collector pins while the projector is operating.

DO NOT short or remove bias resistors while the projector is operating.

DO NOT operate power transistors with heat sinks removed.

DO NOT overload transistors or ICs. Make sure the projector is disconnected from its AC power source before testing, removing, or installing transistors or ICs.

DO NOT operate the projector with parts removed (except covers).

3.3 Extender Card Use

This subsection explains how to use the extenders cards and accessories which are provided with the optional extender kit (03-EXTEND-01P). The extender kit allows service technicians to physically extend Marquee projector system modules and boards to fully expose circuit components for testing and diagnosis. To obtain the kit, call Electrohome (see section 5.1, *Ordering Parts*).

The Marquee Extender Card Kit (03-EXTEND-01P) includes:

- 2 Marquee extender cards
- 2 rear mount side brackets
- 2 shield mount side brackets
- 1 ribbon jumper
- 1 jumper board
- 1 instruction sheet

Read all instructions prior to extender card usage. Usage of the extender kit components varies depending on the modules/boards which are to be extended. Refer to the following for instructions for each module/board.

Rear Panel Modules ➤

These instructions apply to the modules which are accessible at the rear panel of the projector. These modules include:

- Video Input Module
- Optional Modules and Boards
 - Decoder
 - Expansion Boards
- Control Module (with Deflection Processor Board)

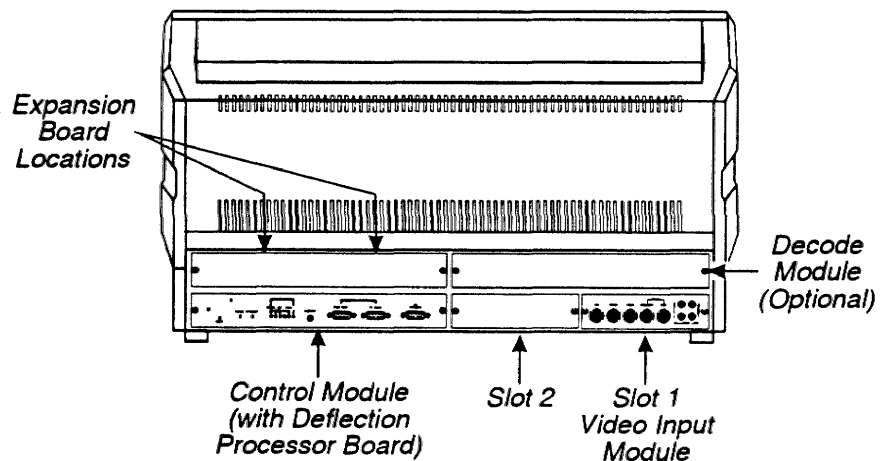
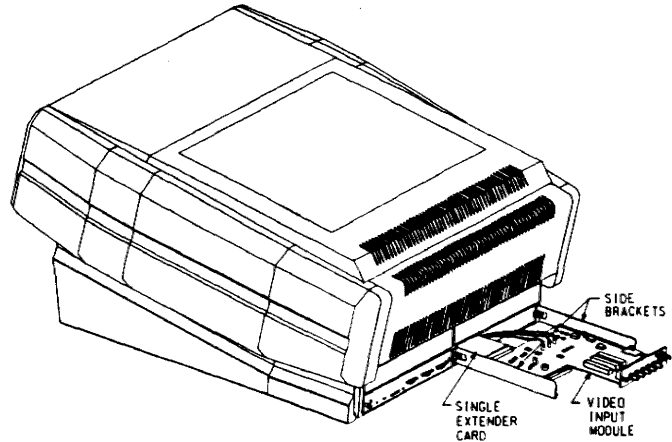


Figure 3-4. Rear Panel Module Locations

Video Input Module

- a) Unplug the projector line cord.
- b) Unscrew the thumb screws which secure the Video Input Module (slot 1) and the optional input module or plate (slot 2). Pull out the Video Input Module and set it aside.
- c) Plug in a single extender card into the slot 2 location.
- d) Install two rear panel side brackets as shown in Figure 3-5.
- e) Slide the Video Input Module through the bracket guides then into the extender card.



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Figure 3-5. Control Module Extension

- f) Check all connections then plug in the projector.

Optional Modules/Boards (Decoder, Expansion)

- a) Unplug the projector line cord.
- b) Unscrew the two thumb screws which secure the module. Pull out the module and set it aside.
- c) Plug in a single extender card in the module location. (For the Decoder Module, slide the extender card above the slot 2 location.)
- d) Install two rear panel side brackets for the module which is to be extended.
- e) Slide the module through the bracket guides then into the extender card.
- f) Check all connections then plug in the projector.

Control Module

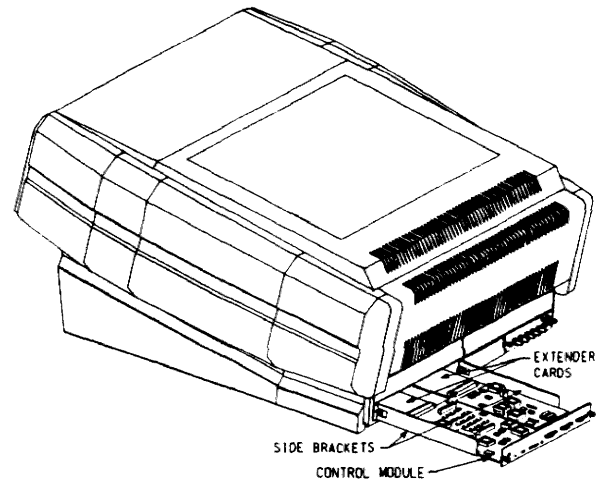
- a) Unplug the projector line cord.
- b) Unscrew the two thumb screws which secure the Control Module. Pull out the Control Module and set it aside.

Note: Do not place the module on a conductive surface.

- c) Plug in two extender cards as shown in Figure 3-6.
- d) Install two rear panel side brackets as shown.
- e) Slide the Control Module through the bracket guides then into both extender cards.
- f) To expose the Control Board components located under the Deflection Processor Board (DPB), remove the four screws which secure the DPB to the Control Board. Lift the DPB from the Control Board then plug it into the supplied jumper board. Plug the jumper board into the DPB connector (J5) on the Control Board. See Figure 3-7.

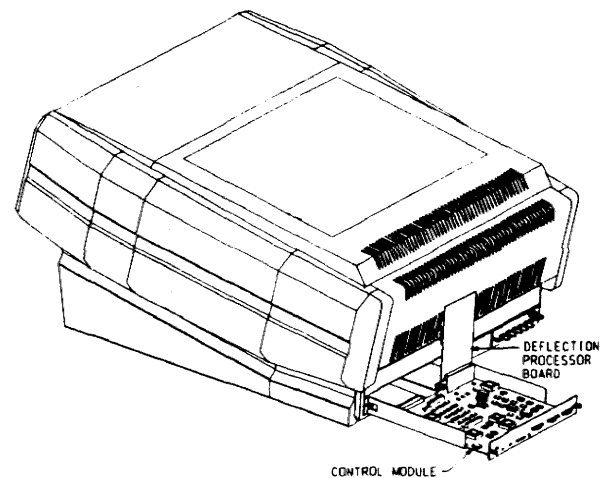
IMPORTANT! The DPB can be damaged if it is improperly plugged in.

- g) Check all connections then plug in the projector.



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Figure 3-6. Control Module Extension



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Figure 3-7. DPB Extension

Internal Modules ►

These instructions apply to the modules which are accessible by removing the projector's rear and top covers. These modules include:

- Focus Module
- Horizontal Deflection Module
- Convergence Amplifier Module
- Vertical Deflection Module

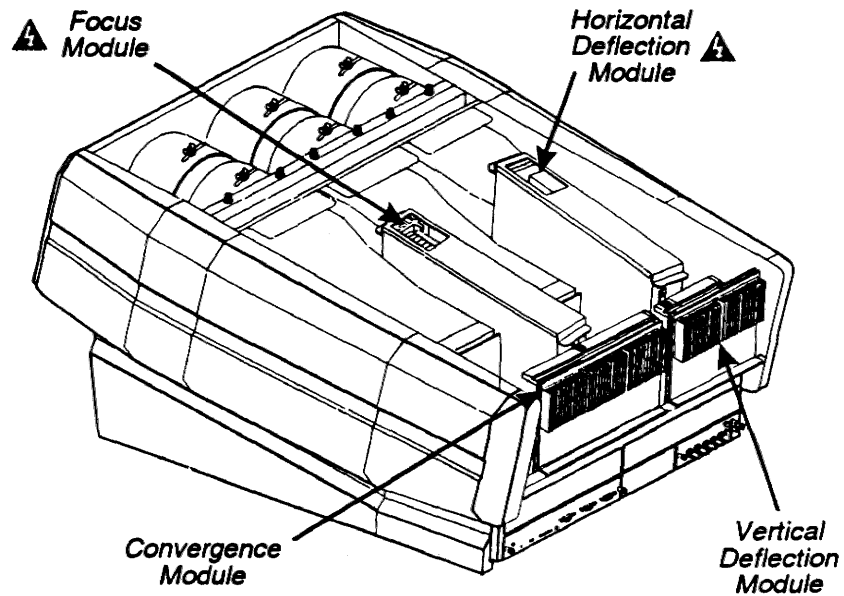
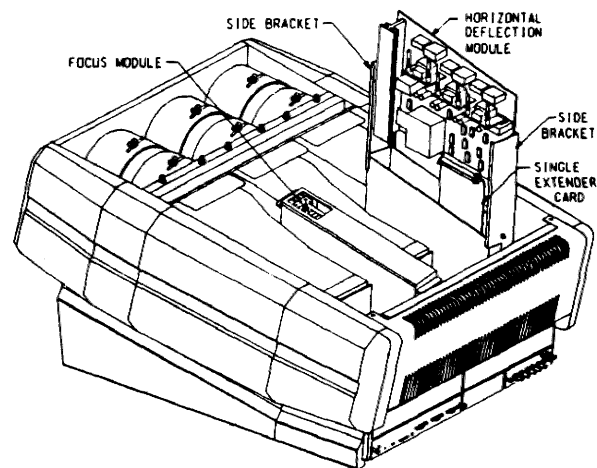


Figure 3-8. Internal Module Locations



Focus and Horizontal Deflection Modules

- a) Unplug the projector.
- b) Remove the snap-in front top cover and rear top cover as described in Section 5, *Parts & Disassembly*.
- c) Pull off the shield lid of the module to be extended.
- d) Pull out the module and set it aside.
- e) Install the two shield mount side brackets as shown in Figure 3-9.



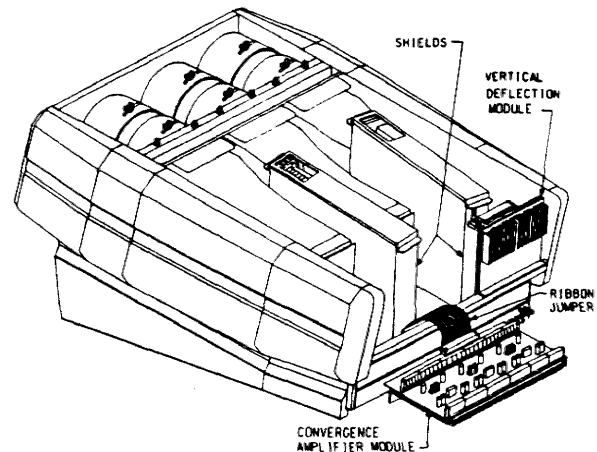
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Figure 3-9. Horizontal Deflection Extension

- f) Plug in a single extender card in the module location.
- g) Plug the module into the extender card.
- h) Check all connections then plug in the projector.

Convergence Board and Vertical Deflection Board

- a) Unplug the projector.
- b) Remove the snap-in front top cover and rear top cover as described in Section 5, *Parts & Disassembly*.
- c) With a Phillips head screwdriver, remove the five screws which secure the rear ventilation cover. Set the cover aside.



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- d) Remove the two screws which hold the "L" bracket that secures the module to the adjoining shield.
- e) Remove the two or three screws which secure the module assembly to the projector frame.
- f) Pull out the module assembly and set it aside.
- g) Plug the supplied ribbon jumper onto the header on the Mother Board. Plug the board assembly into the ribbon jumper as shown in Figure 3-10. Keep the board horizontal by fastening it to the projector frame via removed frame screws. Holes are provided on the frame specifically for this.
- h) Check all connections then plug in the projector.

3.4 Cleaning

Clean the projector as required after each servicing. Before cleaning, always unplug the projector from the power outlet.

Lens Cleaning ►

To avoid the risk of scratching the lenses, only clean the lenses if absolutely required. A small amount of dust on the lenses will have very little effect on picture quality. If the lenses must be cleaned, use a DRY soft cotton cloth. Rub gently in a circular motion.

Case Cleaning ►

Clean the case with a soft dampened cloth. Use a mild commercial cleaner. Do not use liquid or aerosol cleaners.

