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MADRIGAL  **IMAGING**

Instruction Manual

MP8 CRT Installation

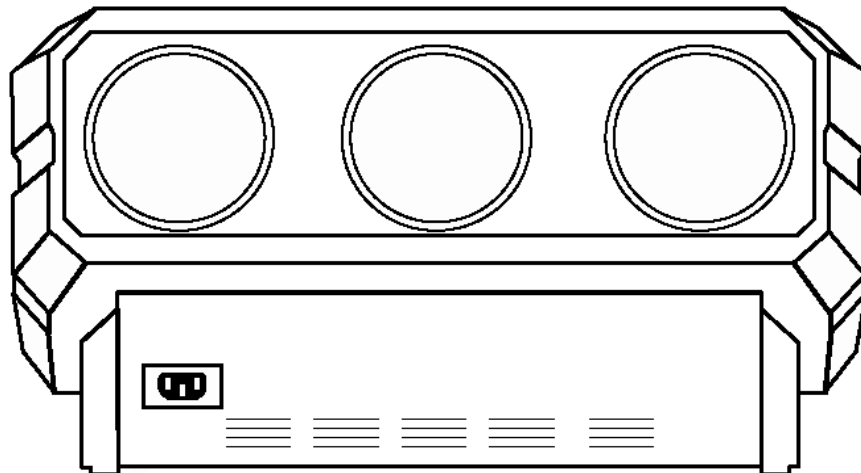


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Overview

This procedure will allow a qualified Madrigal Imaging dealer to install a CRT into a MP8. Please read and understand all instructions outlined in this procedure before attempting the installation.

Should you have questions about this procedure please contact the Madrigal Technical Services Department.

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Precautions

This CRT assembly replaces similar Panasonic 8" CRTs.

- Check the original CRTs are 8" Panasonic.
- Do not use to replace 9" CRTs (MP-9).

Check that the projector is **TURNED OFF AND UNPLUGGED** before performing this procedure.

Projection CRTs contain a vacuum and pose a threat of flying glass if dropped. The use of **PROTECTIVE EYEWEAR** is highly recommended when handling a CRT.

During the removal and installation of the CRT, it is important to insure that **NO MAGNETIC MATERIALS** are brought close to the focus coil or permanent field distortion will occur.

To reduce the chance of a **HIGH VOLTAGE DISCHARGE**, discharge the anode lead (red high voltage lead) of the CRT to Chassis ground upon removal.

Components

The service CRT provided comes complete with factory-aligned components.

- Deflection Yoke
- Convergence Yoke
- Electromagnetic Focus Coil
- Stigmator / Flair Rings

All components are clamped to the CRT and glued into place except for the deflection yoke. The deflection yoke is left free for tilt adjustment.

Install the service CRT with the above components; do not attempt to remove or re-use these components, as the physical alignment is critical to the performance of the projector.

CAUTIONS Before Beginning

CAUTION! Hazardous voltages available inside unit. Before proceeding, remove AC cable from AC outlet.

CAUTION! Static sensitive parts and subassemblies inside unit. Observe proper grounding procedures before continuing.

WARNING! Be careful when handling metal as it scratches easily. Place a soft towel under unit while doing repair.

Tools Required

- Ball Nose Screwdriver (Supplied With Projector)
- Needle Nose Pliers
- Philips head screwdriver

Procedure

TO BE PERFORMED BY QUALIFIED SERVICE PERSONNEL ONLY!

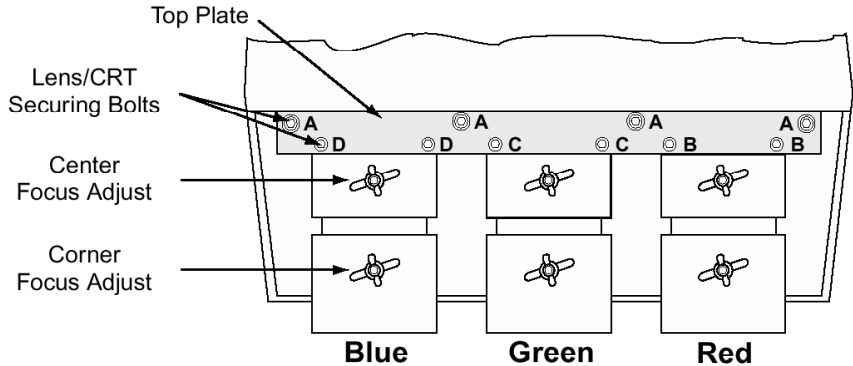
Unpacking New CRT Assembly

1. Carefully unpack the CRT Service Assembly and inspect for shipping damage.
2. Compare the defective component with the replacement part to ensure the correct part was ordered. Carefully check the following.
 - Check the label of the CRT to make sure the color of the phosphor is correct.
 - If your projector has an electronic Stigmator control, check that the focus coil has two sets of connectors (one for the Focus Module and the other for the Stigmator Amplifier Module).

Removing the CRT Assembly

1. Remove all necessary covers and panels on the projector (Front and Rear Top Covers, Rear panel, Upper Left and Right Side panels, Left and Right Side Shield panels).
2. Remove the enclosure (rear cover) from the Video Neck Board (VNB) and disconnect all electrical connections to the VNB. **NOTE ALL CONNECTOR LOCATIONS AND IDENTIFY MATCHING CONNECTIONS** in preparation for re-assembly once the CRT has been replaced.
3. Disconnect all remaining electrical connections to the CRT assembly again noting connector locations, lead dressing and identifying matching connections. (If removing the Green CRT, unscrew the High Voltage Splitter box and save the screws).
4. Remove the top plate by removing the four long Hex headed bolts, six allen bolts and other supporting parts. This will free up the CRT assembly for removal. **(AT THIS POINT, ALL THREE CRTs ARE FREE)**. It is recommended that you perform this service while projector is off the ceiling and upright. See Diagram 1 for Top Plate bolt locations. These bolts are labeled A – B – C – D in the diagram.

Diagram 1 – CRT Securing Bolt Locations



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5. Carefully lift the entire defective CRT assembly (includes bulkhead, lens, plastic covers and VNB) out of the projector.
 6. Carefully remove the VNB from the Neck of the CRT and white plastic shielding.
 7. Remove the defective CRT from the bulkhead by undoing the four allen head bolts located in the corners near the face of the CRT and set it aside.

Installing the CRT Assembly

1. Attach the replacement CRT to the bulkhead, making sure that the anode lead (red high voltage lead) is facing up when reinstalled in the projector. Check that the CRT is seated tightly and flush to the bulkhead.

DO NOT OVERTIGHTEN THE FOUR ALLEN HEAD BOLTS; THIS CAN CAUSE THE CRT TO FRACTURE CREATING A POTENTIAL IMPLOSION HAZARD.

2. Attach the white plastic shielding and dress the neck component leads appropriately.

THE WHITE PLASTIC SHIELDING (WITH LEAD TAPE) AND ASSOCIATING PARTS ARE CRITICAL FOR ENSURING ADEQUATE PROTECTION FROM X-RAY RADIATION. INSTALL EXACTLY AS REMOVED.

3. Carefully attach the VNB (the pins on the neck of the CRT can easily be bent).
4. Reinstall the CRT assembly using the information recorded from step #3.
5. If replacing the Green CRT, reinstall the High Voltage Splitter box using the two screws which previously held it in place.
6. Inspect the completed projector for proper lead dressing and uninstalled plugs.
7. Reattach all covers on the Projector (Left and Right Side Shield panels, Upper Left and Right Side panels, Rear panel, Front and Rear Top Covers).

Supplemental Information

Alignment of Yoke Rotation (if needed)

NOTES: X-RAY LEVELS ARE EXTREMELY LOW, HOWEVER WHEN ALIGNING THE YOKE THE BEAM LIMIT CURRENT SHOULD BE KEPT LOW (CONTRAST < 30 ON THE BAR MENU).

DO NOT TOUCH THE WINDINGS OR TERMINALS OF THE DEFLECTION YOKE. CONTACT WITH THE WINDINGS OR TERMINALS POSE A SERIOUS SHOCK HAZARD.

To align the new CRT to the other two for minimum converge power and optimize accuracy, you must readjust the mechanical rotation of the yoke.

- Reset software for convergence values.
- Remove the top white plastic shield.
- Turn on the projector and display an internal crosshatch.
- Rotate the Deflection Yoke (closest to the front of the CRT) to match the other setup while looking at the center horizontal lines of a crosshatch.
- Place a dab of hot melt on CRT and Yoke to insure that the deflection yoke does not move.
- Reattach the top plastic shield.

NOTE: Upon completion, a full optical alignment may be required.



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