MARQUEE 8000

USER'S MANUAL

ELECTROHOME
Projection Systems

The Image of A Winner

WARNING

To reduce the risk of fire or electrical shock, do not expose the projector to rain or moisture. Observe and follow all warnings and instructions marked on the projector.

> 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.

Before operating the projector for the first time, read section 4.1 Warnings and Guidelines.

NOTICE

The projector generates and may radiate radio frequency energy. If not installed and used in accordance with this manual, it may cause interference with radio communications.

The projector is tested to and complies with the limits for a Class A computing device pursuant to subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against radio interference in a commercial environment. When the projector is operated in a residential area it may cause radio interference. In such a case the user will be required, at his/her own expense, to take measures required to correct the interference.

The projector is tested to and complies with the limits for a Class A digital apparatus pursuant to the Canadian Department of Communications radio interference regulations. The regulations are designed to provide reasonable protection against such interference from devices operated in a commercial environment.

Cet appareil à affichage numerique a été contrôlé. Il est conforme aux limites des reglements de la Classe A d'appareils a affichage numérique établis par le Ministére des Communications du Canada en ce qui concerne les interférences radio. Ces réglements ont été mis en place pour assurer une protection raisonnable contre les interferences produits par des appareils utilisés dans un environnement commercial.

CAUTION

Only use attachments or accessories recommended by Electrohome. Use of others may result in the risk of fire, shock or personal injury.

Typographical Conventions

Please note the following typographical conventions used throughout this manual.

- Warnings that relate to user safety are highlighted in **bold** print.
- First and second level subsection titles are located in the left margin of each page. Third level titles are located within the body text and are in ***bold italic*** print.
- The pointing hand symbol ☞ emphasizes important information within a subsection or paragraph.
- Key symbols (POWER , SOURCE , 5 , etc.), when located in the left margin, indicate initial keystrokes required for the function being described in the adjoining text.
- Special notes and comments appear in *italics*.
- Important terms within a paragraph appear in *italics*.

Table of Contents

Note: Due to constant research, the information in this manual is subject to change without notice.

Section 1

Introduction

1.1 The Projector

The Electrohome *Marquee 8000* is an ultra high resolution graphics projector compatible with virtually all input sources. Its superior performance and high quality projected image place it well above other projection systems in its class. Features of the *Marquee 8000* include:

□ automatic lock to inputs between 15 kHz and 130 kHz
□ a projected display size from 6 to 25 feet (diagonal)
□ a full function built-in keypad and a full function IR remote keypad
□ customizable control
□ an intuitive menu driven interface with on-line help
□ external computer control capability
□ advanced features such as *ASR* and *ASI* which reduce the need for manual display adjustments

Functional ▶
Description

The projector accepts data/graphics and video input signals from a variety of sources for projection onto flat, curved, or rear projection screens. System inputs are processed to provide separate red, green, and blue image components for projection through the projector's three front lenses. The three primary color components converge on the projection screen to provide a high quality display output.

Sophisticated processor-based logic and control circuitry provide many of the automatic features which are designed into the *Marquee 8000*. This circuitry interfaces with the built-in and IR hand-held remote keypads, both of which provide full projector control. Control functions include:

□ turning the projector on or off
□ switching input sources from interface modules and external signal switchers
□ adjusting all display settings such as contrast, brightness, and size
□ correcting for undesirable display effects and input noise
□ displaying projector operating status screens and help information
□ controlling the projector's operating settings
□ controlling audio output

Should projector servicing be required, the keypads are also used by service personnel to make service adjustments and alignments. In some cases, the projector may be service aligned without physically accessing the projector's internal circuitry.

Because projector settings are usually different for different sources, the projector stores display settings for each source individually. These settings are retained until changed by the user, even if power is removed from the projector.

Construction ▶ The projector body is comprised of a sturdy metal chassis, metal top covers, and durable plastic side covers. The front top cover can be temporarily removed to access the built-in keypad and align the lenses. The rear top cover and rear panel are removable for servicing and projector upgrading.

Expandability ▶ The *Marquee 8000* can be expanded or upgraded to include additional features, accessories, and input options; these include: a variety of quick plug-in interface modules to suit the input devices you are using, a signal switcher, a video decoder, and ceiling and floor mount accessories. For more information or if you need assistance for upgrading your projector, contact your dealer or Electrohome.

1.2 Purchaser's Record and Servicing

Whether the projector is under warranty or the warranty has expired, Electrohome's extensive factory and dealer service network is always available. Electrohome service technicians are fully trained to quickly diagnose and correct projector malfunctions. Complete service manuals and updates are available to service technicians for all new projector models manufactured by Electrohome.

If you have a problem with your projector or require assistance, contact the authorized Electrohome dealer from which the projector was purchased. Fill out the information below for your records.

Purchaser's Record

Dealer:
Dealer Phone Number:
Projector Serial Number:
Purchase Date:

Note: Projector serial# can be displayed by pressing ⊞ at presentation level.

Electrohome Service Locations (North America)

Electrohome Limited
809 Wellington Street North
Kitchener, Ontario
Canada N2G 4J6
Telephone (519) 744-7111
U.S. customers call toll-free
1-800-265-2171
Fax: (519) 749-3136

Electrohome USA (1989), Inc.
10282 Sixth Street
Rancho Cucamonga
California 91730-5835
Telephone: (909) 466-3816
Fax: (909) 466-3824

700 Ensminger Road, Suite 112
Tonawanda, N.Y. 14150
Telephone: (716) 874-3630
Fax: (716) 874-4309

Electrohome Europe Ltd.
46 London Road
Reading
Berkshire
RG1 5AP
England
Telephone 44 734 756540
Fax 44 734 756541

Installation & Setup

This section explains how to install and set up the projector. If you are familiar with the projector and want to quickly set it up for temporary use, follow the Quick Setup instructions in section 2.1. For a complete setup, skip section 2.1 and follow the instructions and guides covered in the remaining subsections.

2.1 Quick Setup

Follow these 7 steps for quick set up of the projector:

Step 1 ▶ Position the Projector

To perform a quick setup, the projector must be positioned so that the projector-to-screen distance is the same as that used during the most recent optical alignment; otherwise a detailed setup is required . The projector-to-screen distance is the distance between the center lens on the projector, and the center of the projection screen. If the projector is new, the projector-to-screen distance should be approximately 80" (2 meters). *Note: If a detailed (optical) setup is required, refer to section 2.8, Optical Alignment.*

Step 2 ▶ Connect the Power Cord

Plug the AC line cord into the line input unit on the lower front panel of the projector. Plug the three prong end of the line cord in a grounded AC outlet. *Notes: 1) Input voltage must be between 90 VAC and 264 VAC. 2) Ensure the line cord is the proper type for the AC receptacle.*

Step 3 ▶ Connect a Source

Connect a source to the projector's RGB input. Ensure the source is on and properly connected.

Step 4 ▶ Access the Keypad

You may use the built-in or remote keypad. If using the built-in keypad, temporarily remove the projector's snap-in front top cover to access it. See page 3-3.

Step 5 ▶ Turn the Projector On

Press POWER on the keypad to turn the projector on. Hold down the power key for about one second. *Note: If using the IR remote keypad, point the keypad toward the screen or the front of the projector.*

Step 6 ▶ Select the Input

Press SOURCE 0 1 to select the source connected to the RGB interface.

Step 7 ▶ Adjust the Display

Press HELP 1 to select the Quick Setup guide. The quick setup guide provides instructions for display adjustment.

2.2 Installation Considerations

Careful consideration should be given as to how and where the projection system is installed. Although the performance of the projector is extremely good, the final display quality could be compromised if the projector is not installed properly. This subsection discusses the considerations you should make before proceeding with a final installation. These considerations include the installation type (floor, ceiling, rear), screen size and type, room lighting and ventilation.

Installation Type ▶

Choose the installation type which suits your needs: front or rear screen, floor mount or ceiling mount.

Front Screen, Floor Mount Installation

ADVANTAGES	CONSIDERATIONS
• Easy to set-up. • Can be moved or changed quickly. • Easy to access projector.	• Shares floor space with audience. • May be accidentally moved, necessitating re-alignment.

Front Screen, Ceiling Mount Installation

ADVANTAGES	CONSIDERATIONS
• Does not take up audience space. • The projector is less noticeable. • The projector cannot be accidentally moved.	• Installation is more permanent. • It is more difficult to physically access the projector.

Rear Screen, Floor Mount Installation

ADVANTAGES	CONSIDERATIONS
• Projector is completely hidden from the audience. • Easy to access projector. • Usually good ambient light rejection.	• Requires separate room.

Rear Screen, Ceiling Mount Installation

ADVANTAGES	CONSIDERATIONS
• Projector is completely hidden from the audience. • Usually good ambient light rejection.	• Requires separate room. • Installation cost is usually higher.

### Rear Screen, Floor Mount With Mirror

ADVANTAGES	CONSIDERATIONS
• Projector is completely hidden. • Usually good ambient light rejection. • Less space is required behind the screen than other rear screen installations.	• Requires separate room. • Installation cost is usually higher.

Screen Type ▶ Screen type is a very important factor when designing a projection system. Inexperienced users or installers should always consult their dealer when deciding on screen type. The following guidelines may be helpful to understand the differences between screen types.

Front Screen Installations

There are two basic screen types: flat and curved. The choice between a flat screen versus a curved screen is dependant on audience viewing angle and screen gain. There is always a trade-off between viewing angle and gain. Viewing angles for both screen types are illustrated in Figures 2-1 and 2-2.

Flat screens offer a gain of about 1 with a viewing angle just less than 180°. Incident light reflects equally in all directions so the audience can see the display from various angles. Because of the lower gain, flat screens are more effective when ambient lighting is reduced.
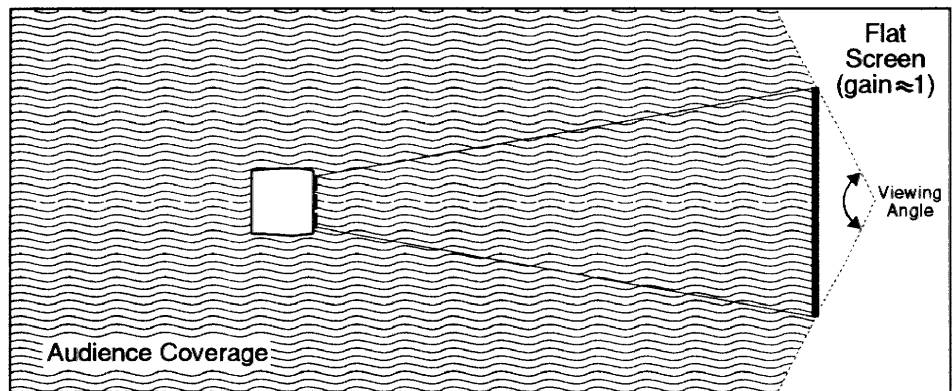
Figure 2-1. *Audience Coverage with Flat Screen*
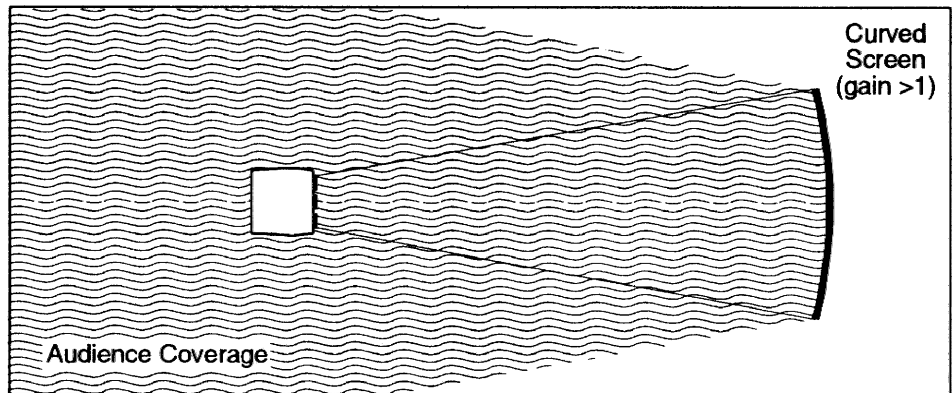
Figure 2-2. *Audience Coverage with Curved Screen*

Curved screens have gains larger than 1 and viewing angles much less than 180°. Most curved screens have different horizontal and vertical viewing angles. Incident light does not reflect equally in all directions. The reflected light concentrates in a conical volume or "viewing cone". Audiences within the viewing cone see a brighter image than that from an equal area on a flat screen. Audiences outside the viewing cone see a dimmer image.

To summarize, curved screens are better suited for brightly lit rooms where the audience is situated within the viewing cone. Flat screens are best suited when a wide viewing angle is required and ambient room lighting (near the screen) is low.

Note: Screen Gain is defined in Appendix A, Glossary.

Rear Screen Installations

There are two basic types of rear screens: diffused and optical. A diffused screen has a surface which spreads the light striking it. Purely diffused screens have a gain of less than 1. The main advantage of the diffused screen is its wide viewing angle, similar to that of a flat screen for front screen projection.

Optical screens take light from the projector and redirect it to increase the light intensity at the front of the screen. This reduces it in other areas. A viewing cone, similar to that of a curved front screen installation, is created.

To summarize, optical screens are better suited for brightly lit rooms where the audience is situated within the viewing cone. Diffused screens are best suited when a wide viewing angle is required but there is low ambient room lighting.

Screen Size and ▶
Distance

Screen size and projector-to-screen distance are interrelated. As screen size increases, the distance between the projector and the screen also increases. During projection room design, make sure that the room can accommodate the required position of the projector for the screen size you need.

Screen Size

Screen size may be from 6 to 25 feet diagonal (1.8 to 7.6 meters). Choose a screen size which is appropriate for your application. If the projector will be used to display text information it is important that the image size allows the audience to clearly resolve all text. The eye usually sees a letter clearly if eye-to-text distance is less than 150 times the height of the letter. Small text, located too far from the eye, may not be legible at a distance even though it is projected sharply and clearly on the screen.

To fill a screen with an image, the aspect ratio of the screen must be equal to the aspect ratio of the image. The aspect ratio of an image is the ratio of its width to its height. Standard video from a VCR has a 4:3 or 1.33:1 aspect ratio. For example, to display a VCR output with a 4:3 aspect ratio onto a 10 foot (3m) high screen, the width of the screen must be at least 13.3 feet (4m).

Note: Screen size is often specified as diagonal size. Screens specified by diagonal size have aspect ratios of 4:3. Screens with other aspect ratios are not typically specified by diagonal size.

Projector-to-Screen Distance

Projector-to-screen (throw) distance is the distance between the projector's green lens and the center of the screen; it is determined by screen size. Once your screen size is known, you can calculate projector-to-screen distance using the following calculation. Table 2-1 provides some typical projector-to-screen distances for common screen sizes.

Calculate projector-to-screen distance as follows:

$$D = 1.22 \text{ x Screen Width} + 10" \text{ (25 cm)}$$

or

$$D = 0.98 \text{ x Diagonal Screen Size} + 10" \text{ (25 cm)}$$

Table 2-1. *Projector to Screen Distance Chart*

SCREEN SIZE inches (cm)			PROJECTOR TO SCREEN DISTANCE (D) inches (cm)
diagonal	height*	width*	
72 (183)	43.2 (110)	57.6 (146)	80.3 (204)
96 (244)	57.6 (146)	76.8 (195)	103.7 (264)
120 (305)	72.0 (183)	96.0 (244)	127.1 (323)
240 (610)	144.0 (366)	192.0 (488)	244.2 (621)
300 (762)	180.0 (457)	240.0 (610)	302.8 (769)

* Based on a 4:3 aspect ratio.

Notes: 1) Calculated values and the values in the table are for reference only. Before designing a permanent installation it is good practice to simulate the setup to determine the necessary projector-to-screen distance. 2) Display size is affected by input signal frequency. Once the projector position is set, use the Size function to fine tune display size.

Lighting ▶ Proper lighting is another important factor when designing a projection room. Visiting a movie theatre can give you an idea of what makes a good projection environment. All walls, floors and furnishings are dull colored and non-reflectively finished. Every effort should be made to create the best environment for your system.

When designing a projection room, try to avoid white, reflective ceilings and non-directional lighting such as fluorescent lights. The white ceiling spreads the light which makes the room appear brighter. You want to keep the lighting and reflections to a minimum. If it is not possible to keep fluorescent lights off, consider using parabolic reflectors ("egg crates") to direct light down to the floor and away from the ceiling. Spot lighting (incandescent) is a better way to obtain illumination. Installing light dimmers or rheostats allows you to control your lighting environment.

Outside windows are undesirable in any projection environment. A small crack between curtains on a sunny day can severely wash-out a projected image. Make sure that curtains are opaque and tightly fitted. Some curtains are designed to provide up to 100 percent blockage of outside light. Pay close attention to the curtain material facing inside the room. It should contain a non-reflective finish.

Even with all lighting removed it is still possible that reflections within the room can degrade the image. Light from the projection screen should be absorbed by the ceilings, walls and floors so that it will not be reflected back to the screen. Again, reflective surfaces should be kept to a minimum.

To minimize the effects caused by unwanted light from door and aisle ways, carefully choose the position of your projector and screen. Figure 2-3 shows an installation where poor screen placement has allowed too much unwanted light to enter the screen. In Figure 2-4, the screen and the projector are positioned so that unwanted light is minimized.
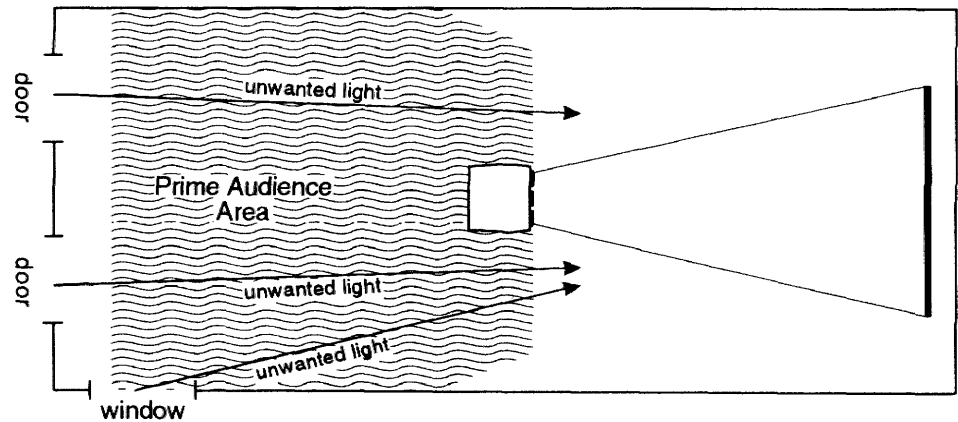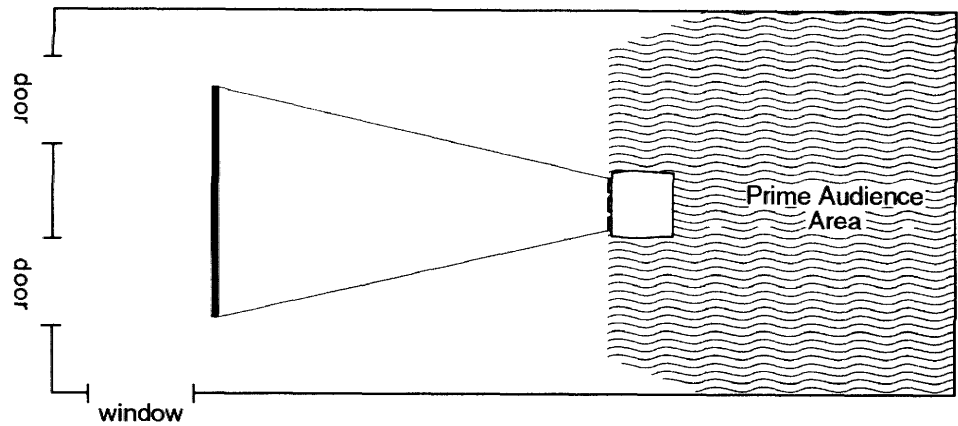
Figure 2-3. *Poor Screen Placement*
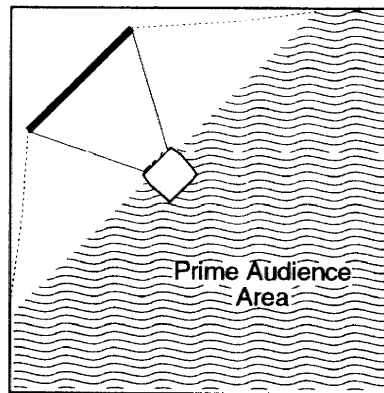
Figure 2-4. *Good Screen Placement*

Other ▶
Considerations

Here are some other considerations and tips which can help you improve the design of your projection system.

❑ Ventilation is an important factor when preparing a projection room. The ambient temperature should be kept constant and below 35 °C (95 °F). Keep the projector away from heating and/or air conditioning vents. Changes in temperature can cause drifts in the projector circuitry which may affect performance.

❑ Keep the projector away from devices which radiate electromagnetic energy such as motors and transformers. Common sources of these are slide projectors, speakers, power amplifiers, elevators, etc. Keep 35 mm slide projectors at least 2 feet away from the projector. Even if both are not used at the same time, the magnetic fields created by the slide projector can cause permanent magnetization of the projector.

❑ For rear screen applications, less space is required if a mirror is used to fold the optical path.

❑ Choose the right screen size for your application:

• As screen size increases, magnification increases which reduces brightness. This reduces the contrast ratio which affects legibility. Sharp defined edges become soft and fuzzy. Consider whether screen size is more important.
• Installing a large screen in a small room is similar to watching television close up; too large a screen can overpower a room. A good rule of thumb is to be no closer than 1.5 times the width of the screen.
• Larger screens require greater attention to lighting conditions.

❑ When laying out your projection room, consider positioning the projector and screen in a manner which will achieve maximum audience coverage and space efficiency. For example, placing the screen along the larger wall in a rectangular room will reduce audience coverage. Figure 2-5 shows two examples of how audience coverage is maximized.

SQUARE ROOMS
Corner placement of screen
yields best audience coverage.

RECTANGULAR ROOMS
Screen placement along short
wall yields best audience coverage.
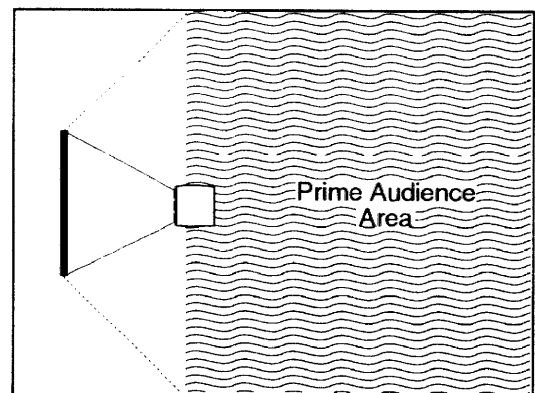
**Figure 2-5.** *Screen Locations for Maximum Audience Coverage*

2.3 Hardware Setup

This section explains how to:

1) Install the IR keypad battery.
2) Set up the projector for reverse scan installation.

IR Keypad Battery ▶ Installation

The IR Remote Keypad requires a standard 9V alkaline battery (supplied) to operate. With normal operation, the battery should last about one year before requiring replacement. To install the battery, locate the battery compartment on the back side of the keypad and slide the compartment door as shown. Gently pull out the battery connector then connect the battery. Place the battery in the enclosure and slide the door back into place.

Slide door on backside of keypad to install 9V alkaline battery.

Battery Compartment
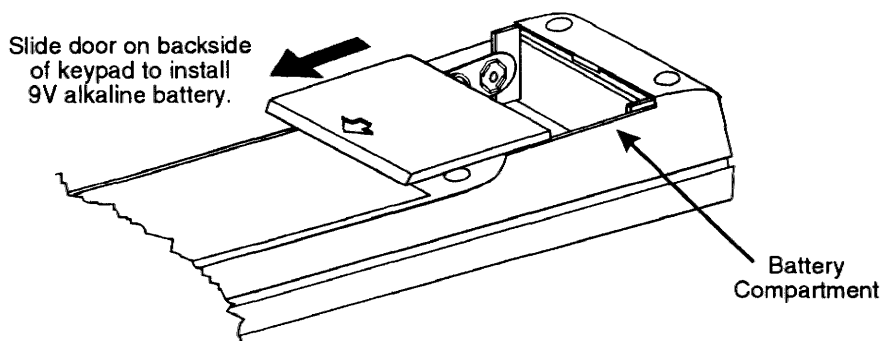
Figure 2-6. *Battery Installation*

Reverse Scan ▶ Installation

Reverse Scan Installation is required when the projector operation configuration changes, for example — from floor mount to ceiling mount. The following reverse scan procedure allows you to change the horizontal and/or vertical scan direction to match the operating configuration of your new installation. If the scan directions are not set correctly, the displayed image will be upside down or reversed. Table 2-2 (next page) shows five common operating configurations and the scan directions for each.

The projector is shipped from the factory ready for a front screen, floor mount installation. If the projector's scan settings do not match the settings you need, proceed as follows:

HIGH VOLTAGES MAY BE EXPOSED

⚠ WARNING ⚡

THIS PROCEDURE SHOULD BE PERFORMED BY QUALIFIED PERSONNEL ONLY
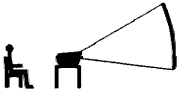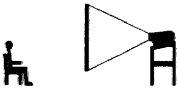
Tools and Equipment Required:

□ Phillips head screw driver

Step 1 - Remove Power

Unplug the projector from the wall outlet or power source.

Table 2-2. *Operating Configurations*

OPERATING CONFIGURATION		HORIZONTAL SCAN	VERTICAL SCAN
	Front Screen, Floor Mount	NORMAL	NORMAL
	Front Screen, Ceiling Mount	REVERSED	REVERSED
	Rear Screen, Floor Mount	REVERSED	NORMAL
	Rear Screen, Ceiling Mount	NORMAL	REVERSED
	Rear Screen, Floor Mount, With Mirror	NORMAL	NORMAL

(Default configuration is front screen, floor mount.)

Step 2 - Remove Front Top Cover

The projector has two top covers: a snap-in front top cover and a rear top cover. These covers are shown in Figure 2-7.

Position your hands above the red and blue lenses then grasp the front top cover. Gently lift the cover until it is released from its securing latch. Next, slide the cover away from the projector as shown in Figure 2-8.

Rear Top Cover
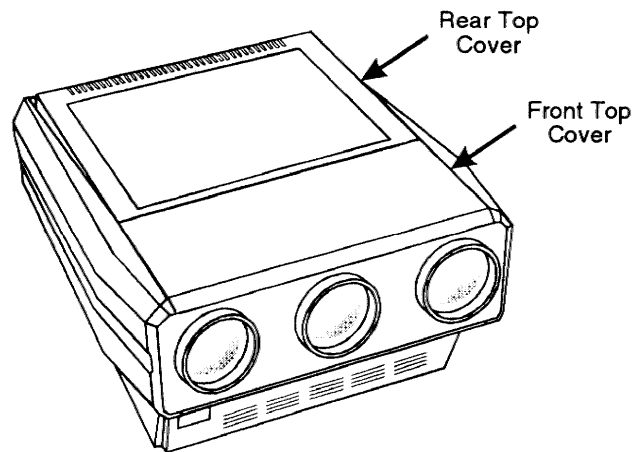
Front Top Cover

Figure 2-7. Projector Top Covers

a) Lift front cover until latch is released.

b) Slide cover forward.
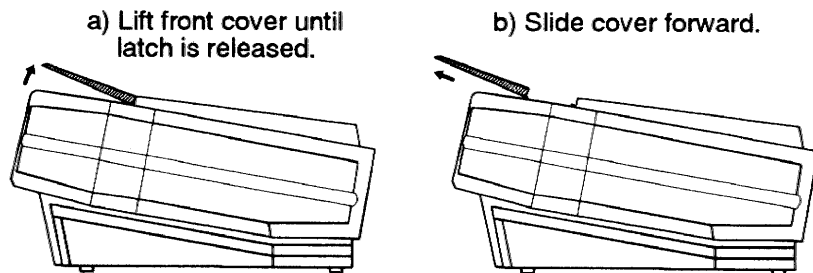
Figure 2-8. *Front Top Cover Removal*

2-9

Step 3 - Remove Rear Top Cover

With a Phillips head screw driver, loosen the two fixing screws located at the front section of the cover. *Note: Do not remove the screws, only loosen them.* Next, slide the cover back about 1" then lift. See Figure 2-9 below.

a) Loosen 2 fixing screws.

b) Slide rear cover back.
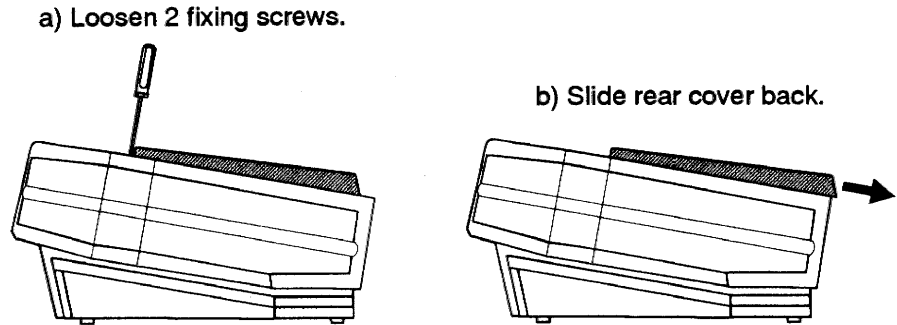
Figure 2-9. *Rear Top Cover Removal*

Step 4 - Reverse Scan

From Table 2-2, determine the scan configuration required.

To reverse horizontal scan, remove the snap-in cover from the Horizontal Deflection Module. Pull out the module to expose plugs P2, P4, and P5. Plug locations are shown in Figure 2-10. Reverse the orientation of each plug so that the "REVERSED" labels are facing down. Plug in the module then snap the cover back in place.

HORIZONTAL MODULE
Reverse plugs P2, P4, and P5 on the Horizontal Deflection Module for reversed horizontal scan.

VERTICAL MODULE
Reverse plugs P5, P6, and P7 on the Vertical Deflection Module for reversed vertical scan.

Figure 2-10. *Reverse Scan Connectors*

Note: Earlier version modules are different than the above. For reverse horizontal scan, plugs P1, P3, and P5 are reversed with the "REVERSED" labels facing the back of the projector. Also, the plugs are orientated RBG, not RGB as shown. Refer to the scan label on the blue CRT shield.

To reverse vertical scan, unplug each plug located at the top of the Vertical Deflection Module. Reverse the plug orientation so that the "REVERSED" labels are facing up.

Step 5 - Verify Connector Positions

Double check to verify correct placement and orientation of all connectors.

Step 6 - Install Top Covers

Install the two top covers.

Step 7 - Apply Power and Verify Scan Reversal

Plug the projector line cord back into the wall outlet or power source. Press POWER for at least one second to turn the projector on. Display an image on the screen. Are the red, green, and blue colors orientated correctly? Press ✱ to display the main status display screen. Does the status screen indicate the correct horizontal and vertical scan configuration? If an error is detected, "Er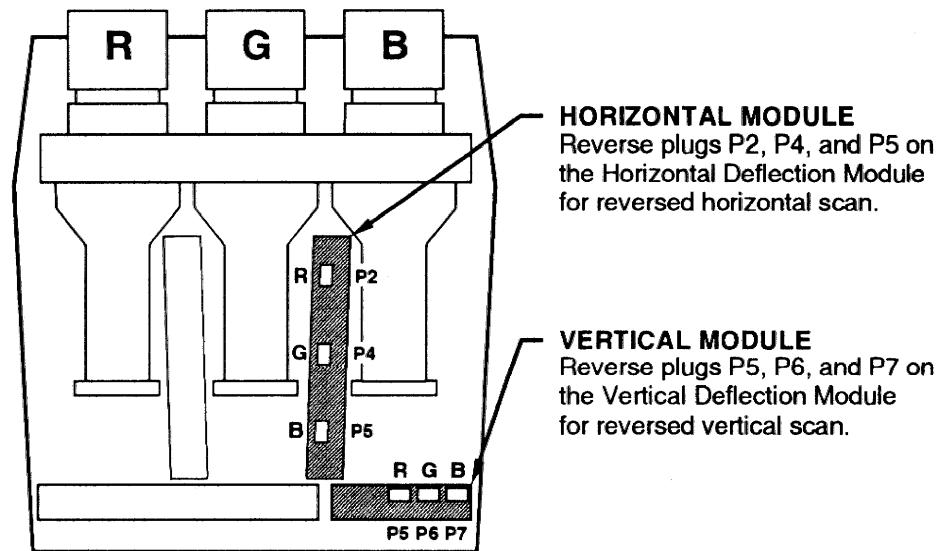ror ###" is displayed. "###" contains three digits to indicate the orientation of the red, green, and blue plugs. A "0" indicates normal orientation. A "1" indicates reversed orientation.

2.4   Mounting

The projector should be mounted after the system design has been established and reverse scan setup (if required) is complete.

Front Screen ▶ *Installations*

Floor Mount

Mount the projector on a secured table or cart. Position the projector at the chosen room location with the projector pointing towards the center of the projection screen. The angle of projection, combined with the tilt angle of the screen should direct the reflected image towards the center of the audience. The difference between the projection angle and the screen tilt angle (within a common reference) should be less than 15°. Refer to Figure 2-11.

Projector Tilt - Screen Tilt = θ
$\theta \leq 15$
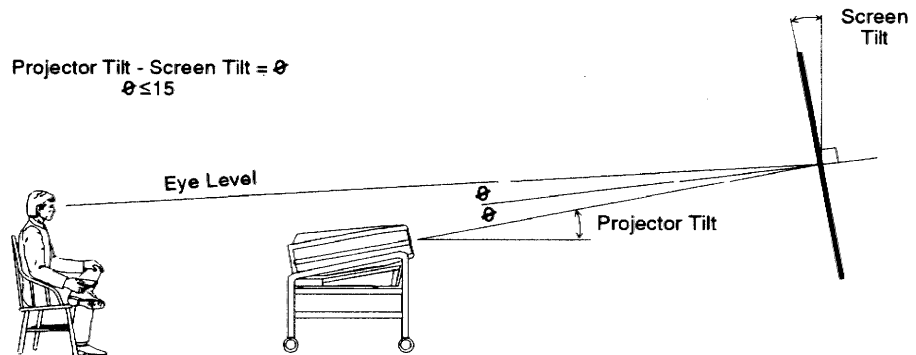
Figure 2-11. *Floor Mount Installation*

You can adjust projection angle and level by adjusting the height of the projector legs. See Figure 2-12.
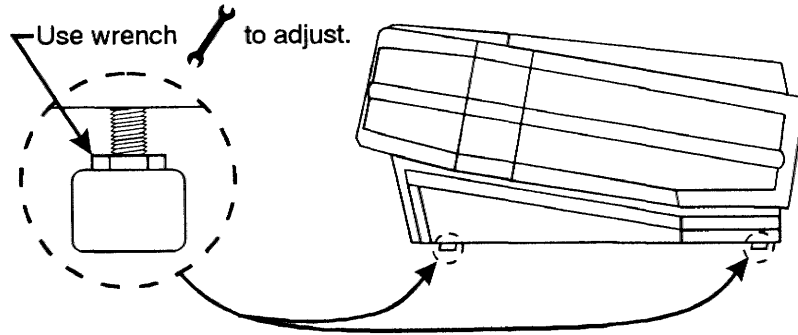
Figure 2-12. *Leg Adjustment*

The tool kit provided with the projector contains a small wrench for leg adjustment. With the wrench, adjust each leg so that the projector is level. Next adjust the front two legs to obtain the correct projection angle. It is best to do a rough adjustment when the projector is turned off, then a fine adjustment when the system is completely installed and an image is displayed.

Ceiling Mount

Mounting the projector to the ceiling requires the use of a projector ceiling mount fixture. The fixture is shipped from the factory in kit form (with assembly instructions) for assembly and installation by the dealer/installer. For more information, contact your dealer or Electrohome.

Position the projector so that it is pointing toward the center of the projection screen. The angle of projection combined with the tilt angle of the screen should direct the reflected image towards the center of the audience. The difference between the projection angle and the screen tilt angle (within a common reference) should be less than 15°. Refer to Figure 2-13.
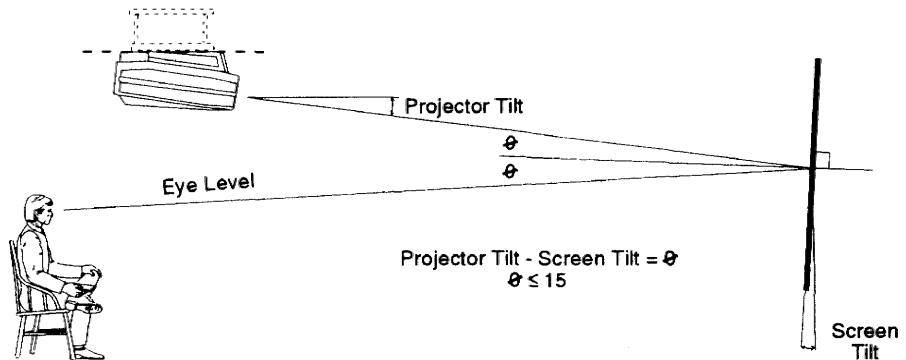
Figure 2-13. *Ceiling Mount Installation*

Instructions for adjusting projection angle are provided with the fixture kit. For more information, contact your dealer or Electrohome.

Rear Screen ▶ When installing a rear screen system, the vertical positioning of the projector
Installations is dependant on the type of rear screen being used. There are two basic types of rear screens: optical and diffused.

Optical Rear Screen Systems

If the system includes an optical rear screen, mount the projector along the center axis of the screen as shown in Figure 2-14.

Projection Angle = 0°

90°
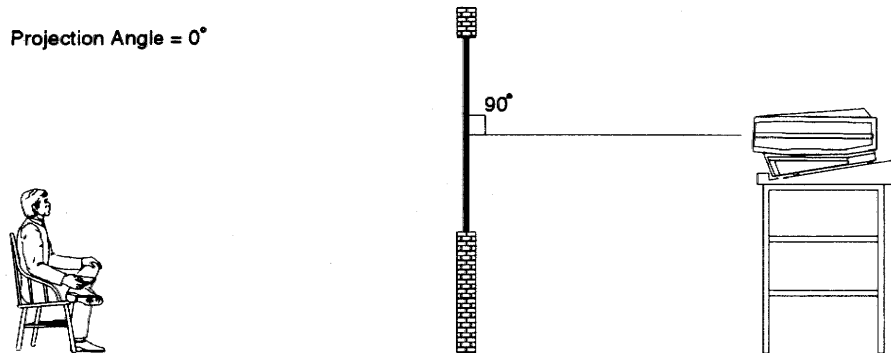
Figure 2-14. *Optical Rear Screen Installation*

Diffused Rear Screen Systems

If the system includes a diffused rear screen, floor mount or ceiling mount the projector so that the image is directed to the center of the audience. Projection tilt should be less than 15°. See figure 2-15.

Projector Tilt

θ

θ

Eye Level

$\theta \leq 15°$
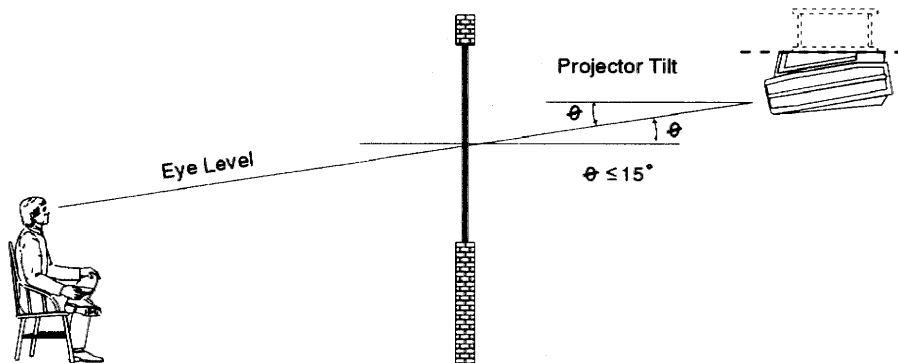
Figure 2-15. *Diffused Rear Screen Installation*

In situations where the space behind the projector is limited, a mirror may be used to fold the optical path as illustrated in Figure 2-16. If a diffused screen is used, the projection angle θ should be less than 15°. If an optical screen is used, the optical path between the mirror and the screen should be perpendicular to the screen. Much attention must be given to the positioning of the projector and the mirror. This can be quite difficult for installers unfamiliar with this type of installation. It is recommended that your dealer or an experienced installer perform the installation.

Note: When using a mirror as shown in Figure 2-16, the calculated projector-to-screen distance (D) is the summation of D1 and D2.

Projector to Screen Distance (D) = (D1 +D2)   Mirror Tilt = θ + 1/2 Projection Tilt

Minimum Mirror Size = $\dfrac{D1}{D}$ x Screen Size

$\theta \leq 15°$

Surface Mirror

D2

θ α

Eye Level

α D1

Projector Tilt

$\alpha = \dfrac{\text{Projector Tilt}}{2} - \theta$
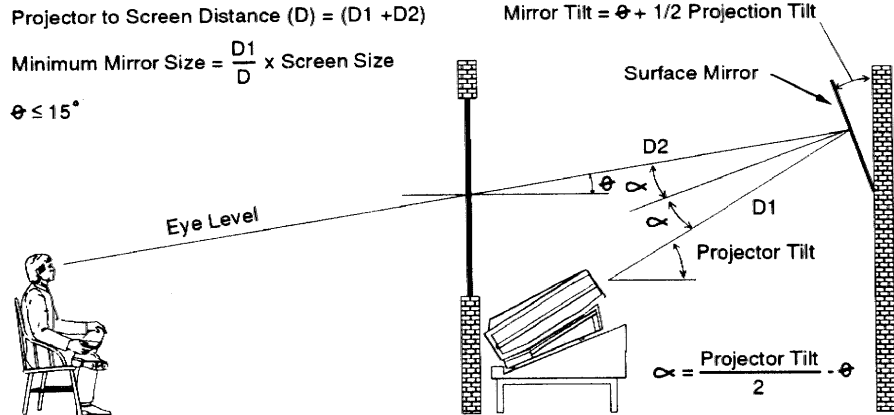
Figure 2-16. *Folded Optics*

2.5 Power Connection

To apply power to the projector, plug the AC line cord into the line input socket located at the front panel of the projector. Plug the three prong end of the line cord in a grounded AC outlet. Input voltage to the projector must be between 90 and 264 VAC, 50 or 60 Hz. The power source must supply 650 watts of power to the projector.

90 - 264 VAC
50 - 60 Hz
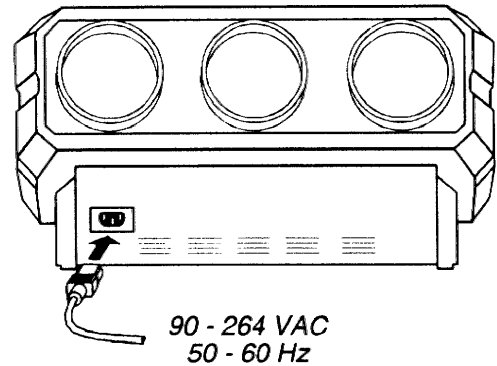
Figure 2-17. *Power Connection*

2.6 Source Connections

The projector includes a built-in RGB input interface for connection with an external RGB source and audio equipment. The interface is located in the slot 1 position at the rear of the projector as shown in Figure 2-18. This interface is not removable.

"Slots" 3 to 6 when optional decoder is installed.

Slot 2   Slot 1
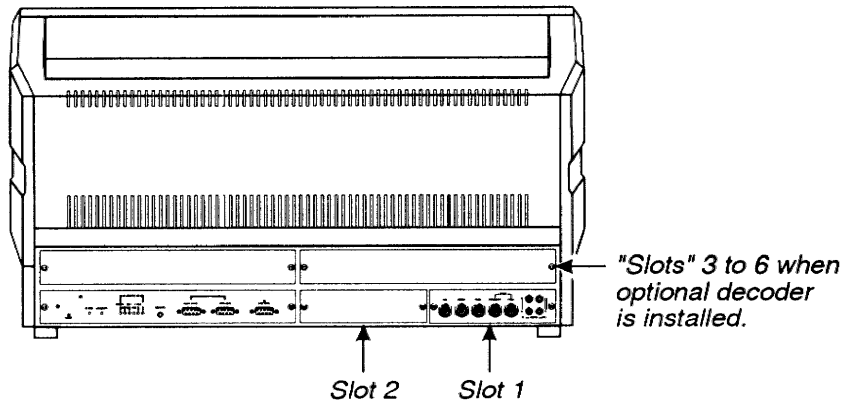
Figure 2-18. *Projector Input Slots*

Other optional interface modules are available to increase the total number of inputs and accommodate other signal types. These include an RGB Input Module, an RGB Loop Thru Module, a Composite/S-Video Module, a HDTV Input Module, and a PC Analog Input Module. Any one of these can be installed in slot 2. A video decoder module may also be installed to add four additional inputs to the system ("slots" 3 to 6). To further increase the number of inputs, a signal switcher may be connected to the RGB interface in slot 1 to add 8 more sources to the system (9 switcher inputs replace one RGB input). Other switchers may be connected to the first switcher for more inputs. Descriptions and installation details of optional modules and products are available from your dealer and Electrohome.

The built-in RGB interface in slot 1 allows connection of a single RGB source having one of the following sync types: *sync-on-green*, *composite sync*, or *separate sync*. To connect a source, connect the red, green, and blue outputs to the RED, GREEN, and BLUE inputs on the interface. If the source uses sync-on-green, no additional cables are required. If the source provides a composite sync output, connect it to the HOR/COMP input. If the source provides separate horizontal and vertical sync outputs, connect the horizontal sync signal to the HOR/COMP input and connect the vertical sync input to the VERT input. Interconnection cables must be terminated with BNC connectors. See Figure 2-19.

Figure 2-19. *Built-in RGB Interface Connections*

To control audio levels in an audio/visual system, pre-amplified (line level) audio inputs are connected to the left and right channel audio inputs on the interface. Audio outputs are then connected to external audio amplification equipment for sound output. All audio connection cables require standard RCA type phono plugs.

2.7 Serial Port Connections
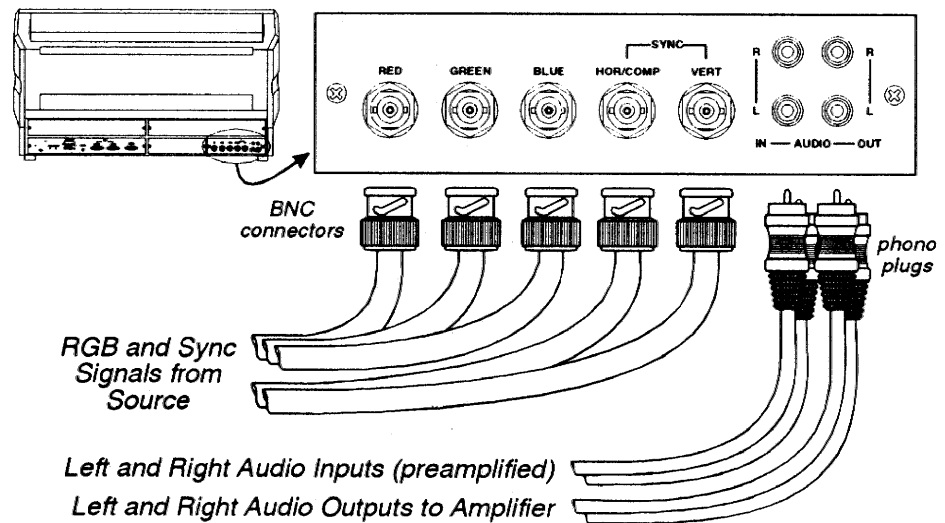
Serial port connections are required when:

□ using an Electrohome signal switcher with the projector or

□ the projector is to be controlled by a personal computer with an RS-232 interface.

The projector's serial ports are located on the back panel as shown in Figure 2-20.
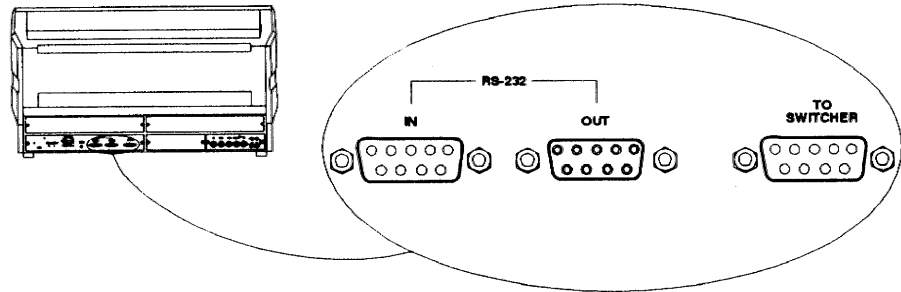
Figure 2-20. *Serial Port Connections*

If using the projector with a switcher, connect an RS-232 serial communication cable between the switcher and the projector serial port labelled "TO SWITCHER". If the projector is to be controlled by a computer which has an RS-232 serial port, connect an RS-232 serial cable between the computer and the projector serial port labelled "IN". After the connection is made, set the serial port baud rate as described in the Projector Setup entry in section 3.7, *Utilities*.

Notes: 1) All serial connections require a 9 pin D connector at the projector end. Refer to Appendix D for cable wiring requirements. 2) For computer control, PC software is required. 3) The RS-232 serial port labelled "OUT" is provided for projector networking applications.

2.8 Optical Alignment

Optical alignment is required when the projector-to-screen distance changes or the projector cannot be focused using the focus controls. The projector is optically aligned at the factory for use with a 8 foot diagonal screen and a projector-to-screen distance of 102 inches (2.6 metres). If the projector-to-screen distance has changed since the last setup, proceed as follows:

Notes: 1) The projector must be warmed up for at least 45 minutes prior to performing optical alignment. 2) Optical alignment is both a mechanical and electrical adjustment. Electrical adjustments are stored in the current setup memory. After alignment is complete, setup memories which were previously set up (if any) must be set up again. Memory setup is explained in section 2.9.

It is recommended that optical alignment be performed using the projector's Detailed Setup Guide. The Detailed Setup Guide displays step-by-step instructions during the alignment. The instructions in this section require use of the setup guide.

To access and use the setup guide, turn on the projector ([POWER]) then press [HELP] at presentation level. The Help menu is displayed. Next press [2] to select Detailed Setup Guide. The first page of the guide will be displayed on the projection screen. When using the guide, press [HELP] to display the next page, press [RECALL] to display the previous page. When complete, press [EXIT] to return to the Help menu.

```
Help
  1. Quick Setup Guide
  2. Detailed Setup Guide
  3. Source Selection Guide
  4. Keypad Guide
  5. -
  6. Using Help

  For all menus:
  <number> or △ ▽ then <ENTER>
  to select function
  <HELP> for information
  <RECALL> to go back one level
  <EXIT> to return to picture
```
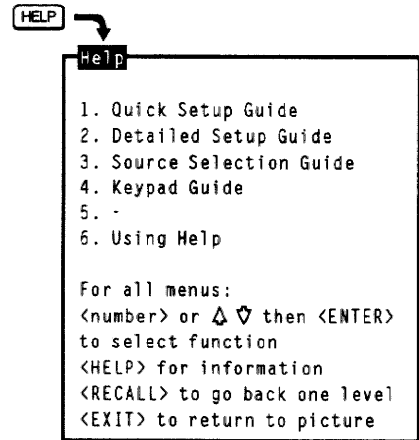
Step 1 ▶   If you have not already done so, calculate the projector-to-screen distance and set the projector position as explained in section 2.4, *Mounting*. Turn power off before moving the projector.

Step 2 ▶   Locate the front top cover of the projector. See Figure 2-21. Next, position your hands above the red and blue lenses then grasp the cover. Gently lift it until it is released from its securing latch. Slide the cover away from the projector as shown in Figure 2-22 below.

Front Top Cover
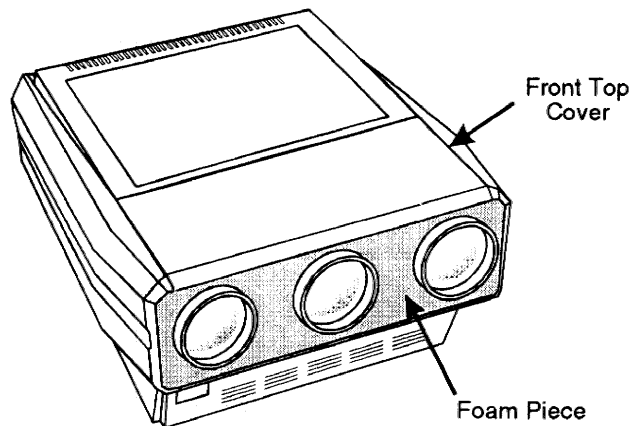
Foam Piece

Figure 2-21. *Front Top Cover*

a) Lift front cover until latch is released.

b) Slide cover forward.
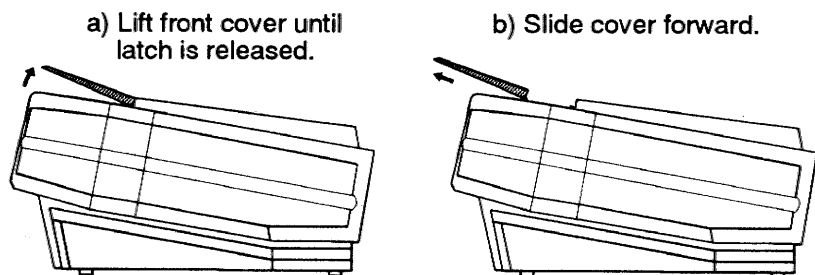
Figure 2-22. *Front Top Cover Removal*

Also remove the black decorative foam piece at the front of the lenses (removal is optional). Remove the large allen head driver from the tool kit provided with the projector. The driver is used for lens alignment.

Examine the lenses and the lens hardware. See Figure 2-23. Each lens consists of two sections: a rear section and a front section. The rear section sets the optical focus at the center of the image. This section is secured to the lens body by a wing nut at the top rear of the lens assembly. The front section sets the focus at the corners; it is secured to the rear section by a wing nut at the top front of the lens assembly. The lenses are secured to the projector frame by a top plate as shown. During optical alignment, the securing bolts must be loosened and tightened as instructed. Each securing bolt is labelled (A-D) to assist you.
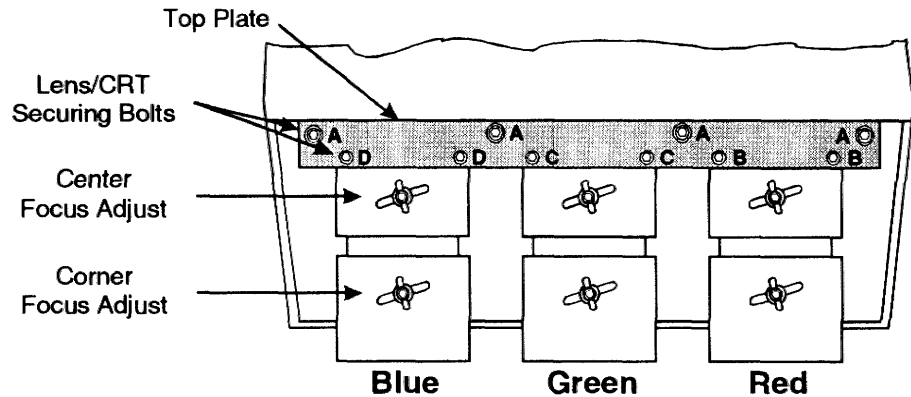
Figure 2-23. *Lens Assemblies - Top View*

Each CRT is attached to its lens by 3 socket head allen screws located at each lens mounting plate. For each lens, the upper right screw (when facing the lens) adjusts the focus between the top and bottom of the picture, and the lower left screw adjusts the focus between the left and right sides of the picture. See Figure 2-24.
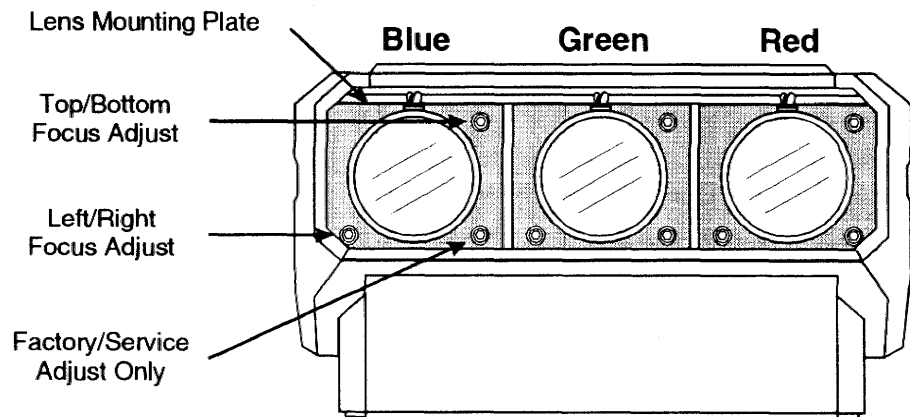
Figure 2-24. *Lens Assemblies - Front View*

Step 3 ➤ Loosen the rear wing nut on the green lens. Rotate the lens using the wing nut until the picture is focused in the center. Tighten the rear wing nut.
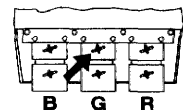
Step 4 ▶ Loosen the front wing nut on the green lens. Rotate the front lens barrel until the picture is focused in the corners. Tighten the front wing nut.
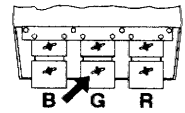
Step 5 ▶ Steps 6 to 8 require that you look directly into the lenses for adjustment. Before you continue, press ▼ to reduce contrast to a low level (less than 10%).

Step 6 ▶ Look directly into the red lens and use ▲, ▼, ◀, and ▶ to center the displayed crosshatch on the face of the picture tube.

Step 7 ▶ Look directly into the green lens and use ▲, ▼, ◀, and ▶ to center the displayed crosshatch on the face of the picture tube.

Step 8 ▶ Look directly into the blue lens and use ▲, ▼, ◀, and ▶ to center the displayed crosshatch on the face of the picture tube.

Step 9 ▶ Press ▲ to increase contrast to a normal viewing level.

Step 10 ▶ Pivot the projector and move it side to side as required to center the crosshatch side-to-side on the screen. The pivot point should be at the rear wing nut of the green lens to avoid changing the projector-to-screen distance.
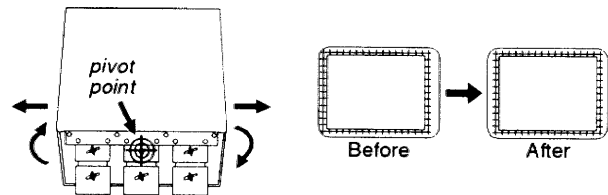
Step 11 ▶ Tilt the projector so that the center horizontal line is level and centered with the screen . Adjust the feet of the projector or ceiling mount as required.
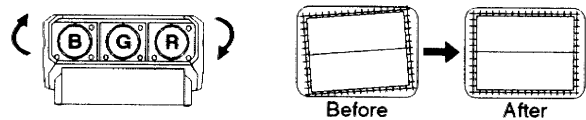
Step 12 ▶ A red image is displayed. Loosen the rear wing nut on the red lens. Rotate the lens using the wing nut until the picture is focused in the center. Tighten the rear wing nut.
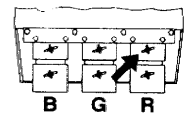
Step 13 ▶ Loosen the front wing nut on the red lens. Rotate the front lens barrel until the picture is focused in the corners. Tighten the front wing nut.
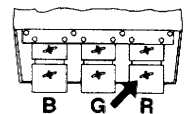
Step 14 ▶ A blue image is displayed. Loosen the rear wing nut on the blue lens. Rotate the lens using the wing nut until the picture is focused in the center. Tighten the rear wing nut.
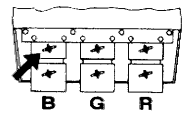
Step 15 ▶ Loosen the front wing nut on the blue lens. Rotate the front lens barrel until the picture is focused in the corners. Tighten the front wing nut.
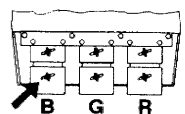
Step 16 ▶ Press ⊡ or ⊡ to adjust for best electrical focus at the center of the picture.

Step 17 ▶ Loosen the four bolts labelled "A"
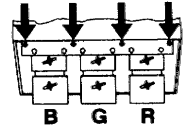
Step 18 ▶ Loosen the two bolts labelled "B".
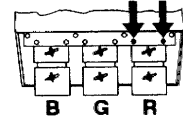
Step 19 ▶ A red and green crosshatch is displayed. Move the red lens so that the left and right edges of the red crosshatch match the green.

Before   After
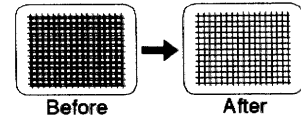
Step 20 ▶ Tighten the two bolts labelled "B".
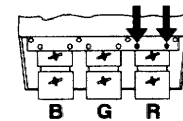
Step 21 ▶ Loosen the two bolts labelled "D".
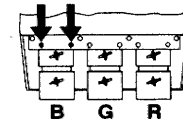
Step 22 ▶ A blue and green crosshatch is displayed. Move the blue lens so that the left and right edges of the blue crosshatch match the green.

Before   After
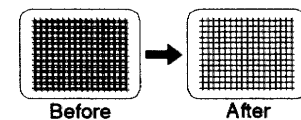
Step 23 ▶ Tighten the two bolts labelled "D".
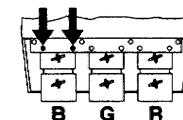
Step 24 ▶ A green image is displayed. Loosen the rear wing nut on the green lens and slightly defocus the center of the picture.
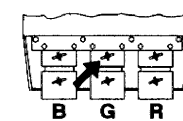
Step 25 ▶ Adjust the large allen head bolt located at the upper right corner of the green lens mounting plate. Turn the bolt head until the top and bottom areas of the picture are equally defocused. You may need to adjust the lens' rear wing nut to keep the center defocused.
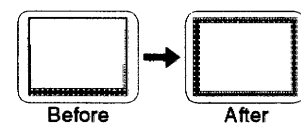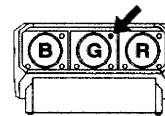
Before   After

Step 26 ▶ Rotate the green lens using the rear wing nut until the picture is focused in the center. Tighten the rear wing nut.
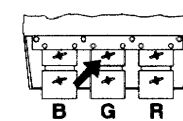
Step 27 ▶ A red image is displayed. Loosen the rear wing nut on the red lens and slightly defocus the center of the picture.
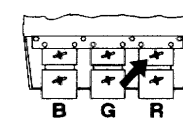
Step 28 ▶ Adjust the large allen head bolt located at the upper right corner of the red lens mounting plate. Turn the bolt head until the top and bottom areas of the picture are equally defocused. You may need to adjust the lens' rear wing nut to keep the center defocused.

Before   After
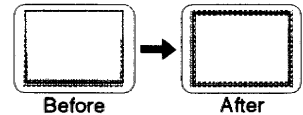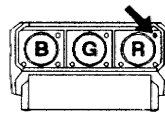
Step 29 ▶ Adjust the large allen head bolt located at the lower left corner of the red lens mounting plate. Turn the bolt head until the left and right sides of the picture are equally defocused. You may need to adjust the lens' rear wing nut to keep the center defocused.

Before   After
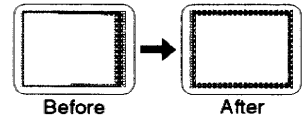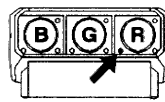
Step 30 ▶ Rotate the red lens using the rear wing nut until the picture is focused in the center. Tighten the rear wing nut. Readjust corner focus if necessary (see step 13).

Step 31 ▶ A blue image is displayed. Loosen the rear wing nut on the blue lens and slightly defocus the center of the picture.

B   G   R
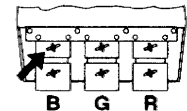
Step 32 ▶ Adjust the large allen head bolt located at the upper right corner of the blue lens mounting plate. Turn the bolt head until the top and bottom areas of the picture are equally defocused. You may need to adjust the lens' rear wing nut to keep the center defocused.

Before   After
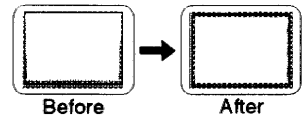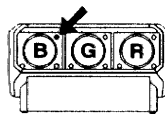
Step 33 ▶ Adjust the large allen head bolt located at the lower left corner of the blue lens mounting plate. Turn the bolt head until the left and right sides of the picture are equally defocused.

Before   After
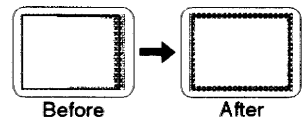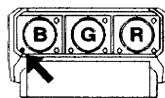
Step 34 ▶ Rotate the blue lens using the rear wing nut until the picture is focused in the center. Tighten the rear wing nut. Readjust corner focus if necessary (see step 15).

Step 35 ▶ Tighten the bolts labelled "A".
Mechanical alignment is now complete.

B   G   R
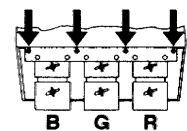
Step 36 ▶ Press ◀ or ▶ to adjust skew so that the vertical line through the center of the image is not tilted (perpendicular to the horizontal line).

Before   After
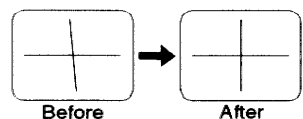
Step 37 ▶ Press ◀ or ▶ to adjust keystone so that the width at the top of the picture is equal to the width at the bottom.

Before   After

2-21
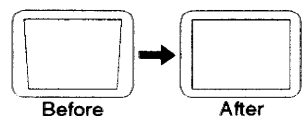
Step 38 ▶ Press ◀ or ▶ to adjust side pincushion so that the left and right sides of the picture are straight and not curved.
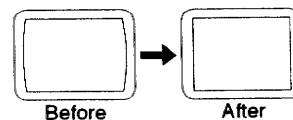
Step 39 ▶ Press ▲ or ▼ to adjust bow so that the horizontal line at the middle of the picture is straight.
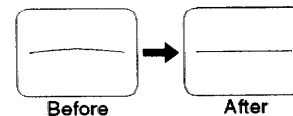
Step 40 ▶ Press ▲ or ▼ to adjust top pincushion so that the horizontal line at the top of the picture is straight and not curved.
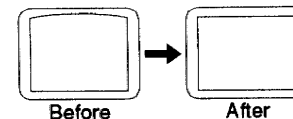
Step 41 ▶ Press ▲ or ▼ to adjust bottom pincushion so that the horizontal line at the bottom of the picture is straight and not curved.
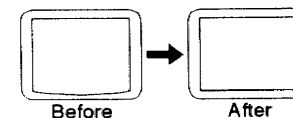
Step 42 ▶ Press ▲ or ▼ to adjust C linearity so that the horizontal line through the center of the crosshatch (7th from the top) is equally distant from the lines at the very top and bottom.
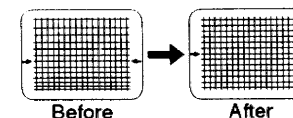
Step 43 ▶ Press ▲ or ▼ to adjust S linearity so that the vertical size of each crosshatch square is equal from top to bottom.
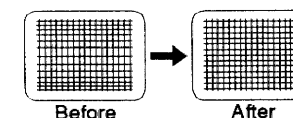
The source connected to the currently selected input should now be visible. If there is no picture, check to see if the source is active.

Step 44 ▶ Press ▲, ▼, ◀ or ▶ to adjust phase so that the picture is centered on the screen.
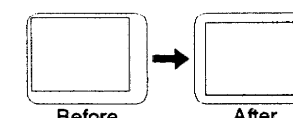
Step 45 ▶ Press ▲, ▼, ◀ or ▶ to adjust the size of the picture. Ensure that objects in your picture have the correct shape. For example, if there is a circle in your picture, size should be adjusted so that the circle is round, not oval.
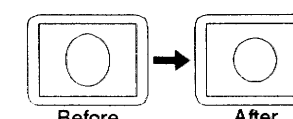
Step 46 ▶ The last step is convergence. To begin a convergence, press [EXIT] [CONV] [1]. Convergence is described in section 3.6, Convergence Registration.
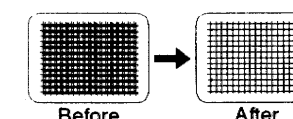
Note: Remember that all electrical adjustments (steps 36 to 46) should be repeated for other setups in the system. You can re-perform the detailed setup - skipping steps 1 to 35, or select each adjustment function individually with an image or test pattern displayed. See section 2.9, Memory Setup.

2.9 Memory Setup

This section explains how to set up projector memories to improve the performance of the projector's ASI and ASR features. If you are not familiar with setup memories, read section 3, *Operation*, prior to memory setup; in particular, read section 3.4, *Setup Memories*, and the "ASI with Save" and "Turn ASR On/Off" entries in section 3.7, *Utility Features*. If the projector's setup memories are properly set up, the projector will be easier to use and operate.

Note: Memory setup should be performed when the projector is in its final operating position. If the physical position of the projector changes, memory setup must be repeated.

Here is a brief summary of the setup memory, ASR, and ASI discussions in Section 3.

About Setup Memories ...

The projector has 80 setup memories for storing display settings of different sources. Multiple setup memories are required since display settings usually vary amongst sources. There are two types of setup memories: Input and Recall. Both memory types store the same parameters. The only difference is that Input memories store display settings for a particular physical input (e.g., switcher 0, slot 1) while Recall memories can be used with any input.

At any one time, one setup memory is the *current setup memory*. The display settings in the current setup memory are used for the current display. When a source is selected by entering its input number, the Input memory for the selected input becomes the current setup memory*. If a Recall memory is selected, it becomes the current setup memory*. Display adjustments are automatically saved in the setup memory which is current at the time of adjustment (unless the setup memory is locked).

To display the Recall memories stored in the projector, press [UTIL] [3]. Press [UTIL] [4] to display the Input memories. (Unused setup memories are not displayed).

* Note: If the ASR feature (explained below) is turned on during setup memory selection, the selected memory may not be the current setup memory.

About ASI and ASR ...

ASI (Automatic Source Interpolation) is a feature which automatically adjusts display settings based on the settings of other setup memories stored in the projector. When a setup memory is first created, ASI automatically generates its initial display settings. These settings will be created by copying another setup memory or by interpolating multiple setup memories.

ASI is activated when:

- A new setup memory is created.
- An ASR is performed and its logic has activated an ASI.
- An "ASI with Save" is specified by the user (see section 3.7).

ASR (Automatic Source Recall) is a feature which, when turned on for a given input, provides automatic Recall memory selection or ASI adjustment. ASR processing can activate when 1) a change in scan frequencies is detected at the input, 2) an input is selected, 3) a Recall memory is selected, or 4) a channel is selected. This feature is primarily intended for use when many different sources must share the same input (via a third party switcher, for example) or when a signal source can output several different scan frequencies (e.g., a SVGA card). When a source switch is made, the projector may automatically select a Recall memory with matching scan frequencies or create the display settings based on the settings in other setup memories.

(Refer to Appendix C for ASI/ASR logic diagrams.)

Input Memory Setup ▶ Follow these steps to prepare an Input memory for a source.

Note: To assure proper setup of an existing Input memory, ASR must be off (default) for the memory.

Step 1

Connect the source to the input to be set up, then select the input using the Source command. For example, if the source is connected to slot 1 of the projector, press ⌈SOURCE⌋ ⌈0⌋ ⌈1⌋. If the Input memory did not previously exist, it will be created automatically.

Step 2

The source should be displayed on the projection screen. If much adjustment is required, press ⌈UTIL⌋ ⌈1⌋ ⌈2⌋ to perform an "ASI with Save". The display appearance may improve based on the settings stored in other setup memories. (If the Input memory is new, "ASI with Save" will have already been performed when the input was selected.)

Step 3

Make display adjustments as required. Adjustment changes will automatically be saved in the Input memory.

**Recall Memory ▶
Setup**

Follow these steps to prepare a Recall memory.

Step 1

Select the input connected to the source. For example, if the source is connected to switcher 1, slot 5, press ⌈SOURCE⌋ ⌈1⌋ ⌈5⌋. The source should be displayed on the projection screen.

Note: To assure proper setup of a Recall memory, ASR must be off (default) for the current input.

Step 2

Select a Recall memory as the current setup memory. For example, to make Recall memory 03 the current setup memory, press ⌈RECALL⌋ ⌈0⌋ ⌈3⌋. If the Recall memory did not previously exist, it will be created automatically.

Step 3

If much adjustment is required, press ⌨UTIL 1 2 to perform an "ASI with Save". (If the Recall memory is new, "ASI with Save" will have already been performed when the memory was selected.)

Step 4

Make display adjustments as required. Adjustment changes will automatically be saved in the Recall memory.

ASI Improvement ▶ If the projector will be used with many sources, or new sources will be frequently added to the system, it is recommended that five or six setup memories be created expressly for the purpose of improving ASI accuracy. ASI accuracy improves as more setup memories are created and stored, and the variations amongst horizontal and vertical scan frequencies increases. For example, if you always use the same input and you never use Recall memories (thus only one setup memory has ever been created), ASI will not be effective. However, if many Input and Recall memories have been used and adjusted for a variety of sources, the projector has more "knowledge" in its database for performing an ASI. As this "knowledge" increases, ASI accuracy improves.

An easy way to add setup memories at various scan frequencies is to use the projector's internal frequency generator. The internal frequency generator can display a test pattern using the scan frequencies you select. When display adjustments are made, the display settings are stored in the current setup memory. Prepare a Recall memory using the generator as follows:

Step 1

Select a Recall memory to be the current setup memory. For example, to make Recall memory 90 the current setup memory, press ⌨RECALL 9 0. (Recall memory numbers may be any number from 01 to 99). If the selected Recall memory did not previously exist, it will be created automatically.

Step 2

Press ⌨UTIL 1 6 to access the Internal Frequency Selection menu. Items one to six contain preset scan frequencies covering the scan range of the projector. The remaining items are available for future use. It is recommended that Recall memories be created for the six preset frequency selections. To make a selection, enter an item number or use ▲ and ▼ to move the cursor bar to the item you want, then press ⌨ENTER.

⌨UTIL 1 6 ➘

Internal Frequency Selection		
	Horiz	Vert
1.	15.73	59.94
2.	31.47	59.94
3.	47.71	71.90
4.	62.50	66.67
5.	89.30	70.00
6.	126.84	60.00
7.	-	-
8.	-	-
9.	-	-

Tip: It is recommended that Recall memories for the two extreme frequencies be set up first (items 1 and 6). When other Recall memories are created, their initial display settings will be based on the settings already stored in memory.

Step 3

At this point, a test pattern is displayed. Make display adjustments as required. All display settings will be stored in the Recall memory. To create another Recall memory, repeat the above steps. To return to the external source, press ⌷EXIT⌷ while only the test pattern is displayed.

(You may notice that as new Recall memories are created, fewer display adjustments are required. This is because ASI is using other setup memories to create the initial settings of the new memories.)

ASR Setup ▶ This subsection provides two examples of how the ASR feature may by used and set up.

ASR Example #1

Refer to the system illustrated in Figure 2-25. A computer is connected to slot 1 of the projector as shown. The graphics adapter in the computer can operate at different frequency modes to accommodate various software applications. The ASR feature may be used so that when the frequency mode of the computer changes, the projector setup also changes to match that of the new mode.

Source with multiple scan rates / operating modes.

Input 01

MODE	TYPE	FREQ. (H)	RECALL#
1	Text	31.5 kHz	01
2	Graphics	35.6 kHz	02
3	Graphics	64.0 kHz	03
4	Graphics	126.8 kHz	04
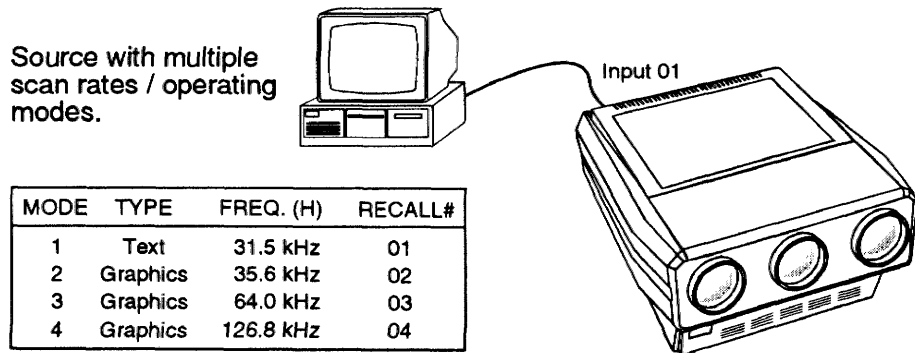
Figure 2-25. ASR System Example #1

To prepare setup memories for the above system, follow these steps:

Step 1

Select the input using the Source command. Press ⌷SOURCE⌷ ⌷0⌷ ⌷1⌷ to select projector slot 1.

Step 2

Press ⌷✱⌷ twice to display the Current Input Parameters status page. Check to see if ASR is off for the current input. If it is on, press ⌷UTIL⌷ ⌷1⌷ ⌷4⌷ to turn ASR off for the input. (It is usually easier to prepare setup memories when ASR is turned off.)

Step 3

At the computer, switch to an application which uses one of the graphics adapter operating modes. Select an unused Recall memory as the current setup memory. For example, to make Recall memory 01 the current setup memory, press ⌷RECALL⌷ ⌷0⌷ ⌷1⌷. Make display adjustments as required. The display settings for the current graphics mode will be stored in the Recall memory. Repeat this step for the remaining graphics adapter operating modes, storing adjustments for them in Recall memories 02, 03 and 04. It is recommended that the two extreme frequencies be set up first.

Step 4

Press ⌷SOURCE⌷ ⌷0⌷ ⌷1⌷ to make Input memory 01 the current setup memory then press ⌷UTIL⌷ ⌷1⌷ ⌷5⌷ to display the "clear setup" confirmation box. Move the cursor to "Do It" then press ⌷ENTER⌷ to clear the display settings and frequency settings of the input. By doing this, Input memory 01 will not be used during an ASR search.

Step 5

Press ⌷UTIL⌷ ⌷1⌷ ⌷3⌷ to lock Input memory 01 to prevent display or frequency changes to the Input memory.

Step 6

Press ⌷UTIL⌷ ⌷1⌷ ⌷4⌷ to turn ASR on for the input. Now, each time the computer's graphics adapter switches operating modes, the projector will automatically adjust its display settings to suit the new mode.

ASR Example #2

Refer to the system illustrated in Figure 2-26 on the following page. Six different sources are connected to a third party (non-Electrohome) signal switcher. Unlike the *Marquee Signal Switcher*, this third party switcher is not controlled by the keypad. Under normal circumstances, the projector is not aware of source switches made by the switcher. However, if ASR is turned on for the input, and a Recall memory has been set up for each source device, the projector will detect the external source switch and automatically select the appropriate Recall memory. Even if Recall memories have not been set up but ASR is on, ASR will try to adjust the display settings based on the settings of other Input or Recall memories. To prepare setup memories for this system, follow these steps:

Step 1

Connect the output of the signal switcher to a projector input or a Marquee signal switcher input. Select the input using the Source command. For this example, press ⌷SOURCE⌷ ⌷0⌷ ⌷1⌷ to select projector slot 1.

Step 2

Press ⌷±⌷ twice to display the Current Input Parameters status page. Check to see if ASR is off for the current input. If it is on, press ⌷EXIT⌷ then press ⌷UTIL⌷ ⌷1⌷ ⌷4⌷ to turn ASR off for the input.

Step 3

At the switcher, switch in one of the source devices. Select an unused Recall memory as the current setup memory. For example, to make Recall memory 01 the current setup memory, press [RECALL] [0] [1]. Make display adjustments as required. The display settings for the selected device will be stored in the Recall memory. Repeat this step for the remaining devices.

Step 4

Press [UTIL] [1] [5] to display the "clear setup" confirmation box. Move the cursor to "Do It" then press [ENTER] to clear the display settings and frequency settings of the input. By doing this, Input memory 01 will not be used during an ASR search.

Step 5

Press [UTIL] [1] [3] to lock Input memory 01 to prevent display or frequency changes to the Input memory.

Step 6

Press [UTIL] [1] [4] to turn ASR on for the input. The projector will automatically adjust its display settings to match the source selected by the switcher.
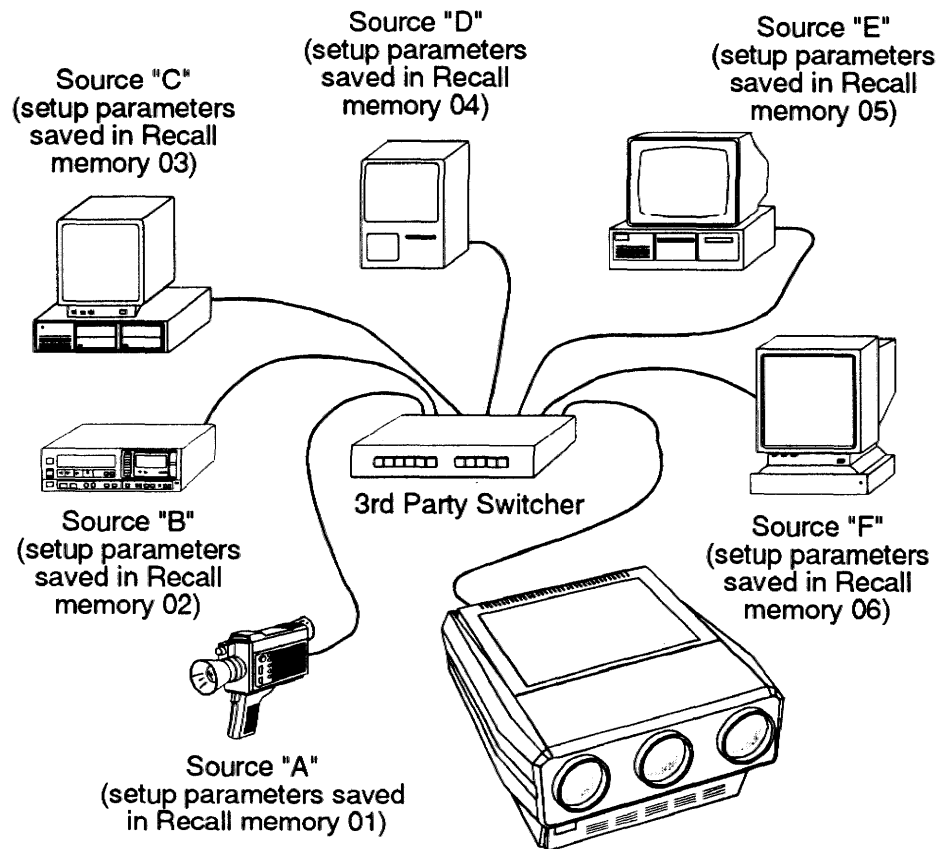
Figure 2-26. ASR System Example #2

Section 3

Operation

3.1 Overview

This section explains how to operate the projector once it has been installed and is ready for use. If you have not yet set up the projector, refer to Section 2, *Installation and Setup*.

Before using the projector for the first time, it is recommended that you read through this section of the manual. Although the projector is easy to use, there are many advanced features which allow you to enhance performance and operation. By understanding these features, and how to use them, you will soon be able to take full advantage of the projector's extensive capabilities.

Organization of this section is as follows:
- 3.1 Overview
- 3.2 Projector Basics
- 3.3 Source Selection
- 3.4 Setup Memories
- 3.5 Display Adjustments
- 3.6 Convergence Registration
- 3.7 Utility Features
- 3.8 Multi-projector Functions

3.2 Projector Basics

Notice that the projector has no knobs or moving parts to make adjustments or change control settings. This is because all user adjustments are digitally controlled via the projector's built-in or remote keypad. Adjustment settings are retained in the projector's internal memory, even when the projector is unplugged.

Keypads ▶ Four different keypads may be used with the projector: the Built-in Keypad, the IR Remote Keypad, the Wired Remote Keypad, and the Presenter's Keypad. The Built-in and IR Remote keypads are supplied with the projector. The Wired Remote and Presenter's keypads are optional. Use the keypad which is most appropriate for your application.

Built-in Keypad

The Built-in Keypad is the projector's primary keypad; it is a *full function* keypad which enables control of all projector functions (adjustments and control settings). This keypad is connected to the projector by a 3 foot extension cable and is located below the front top cover. It is intended for initial setup and service of the projector. The keypad can be accessed as follows:

Locate the front top cover of the projector. See Figure 3-1. Next, position your hands above the red and blue lenses and grasp the cover. Gently lift it until it is released from its securing latch. Slide the cover away from the projector as shown in Figure 3-2 below.
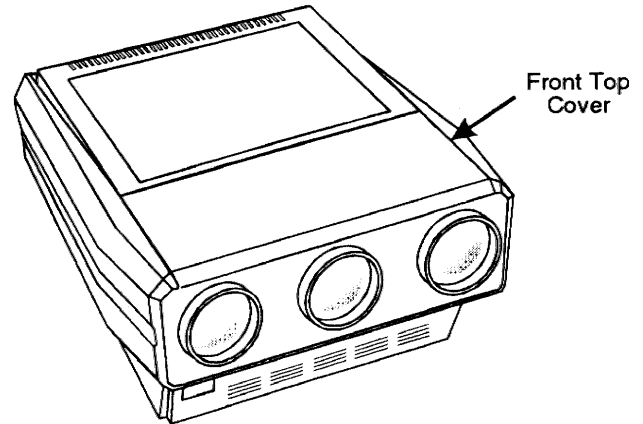
Figure 3-1. *Front Top Cover*

Front Top Cover

a) Lift front cover until latch is released.

b) Slide cover forward.

keypad location
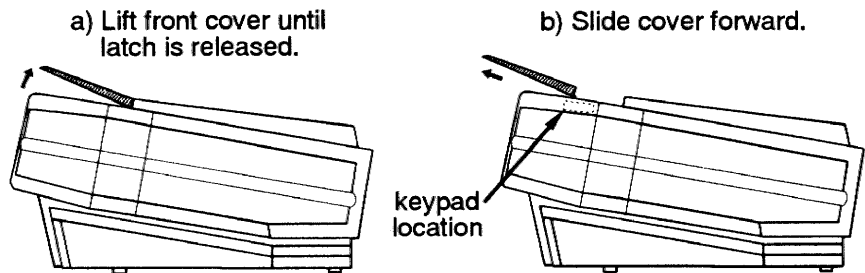
Figure 3-2. *Front Top Cover Removal / Keypad Access*

The built-in keypad can slide out of it securing bracket but it is recommended that it remain in place for use. When finished using the keypad, position the front top cover back in place.

IR Remote Keypad

The IR Remote Keypad is similar to the Built-In Keypad except that it allows the user to control the projector remotely. The keypad includes a battery powered infrared (IR) transmitter for wireless control.

Presenter's Keypad (optional)

The Presenter's Keypad is similar to the IR Remote Keypad except that it is not a full function keypad; it contains only frequently used keys. Presenters may find that the Presenter's Keypad is easier to use than a full function keypad. For more information about the Presenter's Keypad, call your dealer or Electrohome.

Wired Remote Keypad (optional)

The Wired Remote Keypad is similar to the IR Remote Keypad except that it connects externally to the projector by a 25 ft extension cable. The Wired Remote Keypad is recommended when:

- the location of the keypad with respect to the projector or screen is inadequate for IR Remote Keypad operation,
- the projector is in a lighting environment which is unsuitable for IR remote keypad operation, or
- there are multiple projectors in the same room and you want each projector to be controlled by its own remote keypad.

For more information, call your dealer or Electrohome).

Status Page
☐ to display status pages

Utilities Menu
To access the following utilites:
☐ Source Setup   ☐ Preferences
☐ Channel List   ☐ Remote Options
☐ Memories Display ☐ Service

Projector
☐ to command a single projector in a multi-projector system

Display Controls
To adjust:
☐ Color   ☐ Contrast
☐ Tint   ☐ Brightness
☐ Detail   ☐ Volume

Enter
☐ to select a highlighted menu item
☐ to select a dialog box option

Arrow Keys
☐ for adjustments
☐ for menu item selection
☐ for movement between edit fields

Numeric Keys
☐ for menu item selection
☐ for number entry

Mute
☐ to turn audio on or off

Standby
☐ to turn both picture and audio on or off

Picture Menu
To adjust:
☐ Phase   ☐ Focus
☐ Size   ☐ Sync
☐ White Balance ☐ Blanking

Geometry Menu
To adjust:
☐ Size   ☐ Bow
☐ Keystone   ☐ Linearity
☐ Pincushion ☐ Skew

Convergence Menu
☐ to adjust red, green and blue convergence registration

Exit
☐ to exit from a menu or function

Source
☐ for input selection
☐ for channel up/down selection
☐ for source message display

Recall
☐ to select a Recall Memory
☐ to go back one screen during menu/help display
☐ to view hidden slidebars when message display is turned off.

Help
☐ for context sensitive help
☐ for setup guides

Test Pattern
☐ to select a test pattern for display

Power
☐ to turn the projector on or off

Figure 3-3. *Full Function Keypad*

Keypad Usage ▶ The keypad is used the same way you would use a remote keypad supplied with a TV or VCR. There are only a few general key press rules to keep in mind:

☞ ***Key Press Rules***

1) All key presses are in sequence; no functions require simultaneous key presses.
2) POWER and STBY are the only keys which require an extended hold-down for function activation (about one second). For all other keys, a momentary press will activate the key's function.
3) ▲, ▼, ◀, and ▶ are the only keys which repeat when held down. For all other keys, the key must first be released then pressed again for repeated activation.
4) If keys are pressed at a time when the projector is busy (such as during power-up), the key presses may not take effect.

Figure 3-3 shows the projector functions which are accessible from a *full function* keypad. As you may notice from the figure, some keys provide direct access to specific functions (such as POWER to turn the projector on or off), and some keys provide indirect function access via menus. Functions which are less frequently accessed are provided through on-screen menus.

When the projector is turned on, it begins operation at *Presentation Level*. Presentation level is the normal level of operation at which a source image is (or may be) displayed. The projector temporarily leaves presentation level when menus are displayed, control settings are changed, or online help is accessed. The screen display changes to reflect the operation or function being performed. One or more of the following may be displayed:

• Slidebar - to make adjustments to display settings.
• Menu - to select projector functions.
• Selection Box - to display and change control settings.
• Confirmation Box - to confirm or cancel an indicated action.
• Message Box - to display messages.
• Help Page - to display help and provide assistance.
• Test Pattern - to assist during setup.

(Note: The display of slidebars and messages can be suppressed if desired. For more information, refer to section 3.7, Utility Features).

Each of the above are explained in the following entries. As you read through the explanations, note the following:

☞ In most cases ...

EXIT brings you back to presentation level,
RECALL brings you back to the previous page or menu,
ENTER is pressed to make a selection, and
HELP provides context-sensitive help.

Slidebars

When an adjustment is made, a slidebar is superimposed on the projection screen. The slidebar displays the adjustment setting on a percentage scale. To make an adjustment, use the arrow keys indicated by the slidebar. If no keys are pressed within 5 seconds, or [EXIT], [RECALL], or [ENTER] is pressed, the slidebar disappears from the display.

For example, if [CONT] is pressed, the Contrast Slidebar is superimposed on the image. The slidebar shows that contrast is set to 50%. Press ▲ or ▼ on the keypad to change the contrast level.

```
 ◊   Contrast
 50  ███████──────┐
 ▽   0    50   100
```
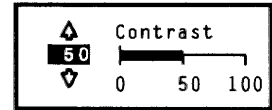
Menus

When a menu key is pressed, a menu with a list of selection items is superimposed on the projection screen. Each menu consists of a title, selection items, and a cursor bar. Selection items may include adjustment functions, control settings or other menus.

Title ►

```
┌─Geometry────────┐
│ 1. Size         │  ◄ Cursor
│ 2. Keystone     │     Bar
│ 3. Side Pin     │
│ 4. Top Pin      │
│ 5. Bottom Pin   │
│ 6. Bow          │
│ 7. C Linearity  │
│ 8. S Linearity  │
│ 9. L/R Skew     │
└─────────────────┘
```
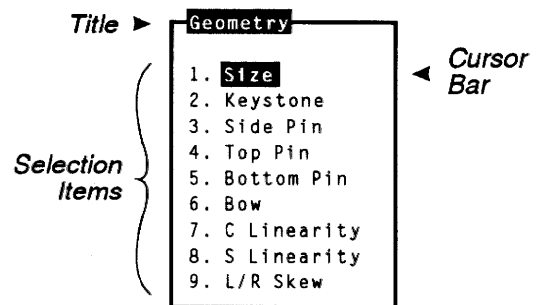
Selection Items

To make a selection from the menu, either:
• press the number key corresponding to the item number, or
• press ▲ or ▼ to move the cursor bar to the desired item, then press [ENTER].

Selection Boxes

Selection boxes allow you to select and/or edit projector control settings. When a selection box is displayed, one of its data fields is highlighted with an edit cursor. The ◄, ►, ▲, and ▼ arrow keys move the cursor amongst fields for editing. Instructions at the bottom of the screen indicate how to edit the field.

Edit
Cursor

```
┌─Preferences──────────────────┐
│                              │
│ Auto Power-up:    On  ✓Off   │
│                              │      Option
│ Screen                       │      Selection
│      Messages:   ✓On   Off   │      Indicator
│                              │
│ Source Switch                │
│ Blanking Time:   0.0 sec  ✓Auto │
│                              │
│ Single Digit          Time   │
│ Channel Entry:   Imm  Out ✓Off │
│                              │
│ <ENTER> to select            │
└──────────────────────────────┘
```

Instructions ►
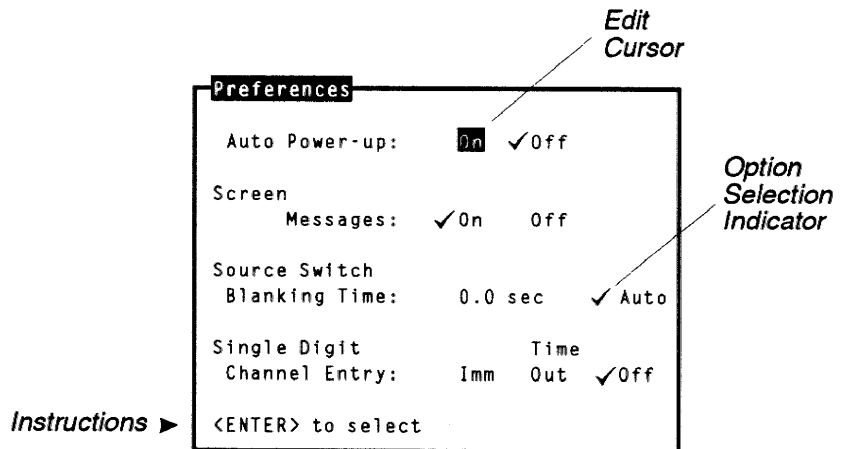
There are three data field types used in selection boxes: numeric, text, and option. Numeric fields store numbers such as scan frequency information; text fields store alphanumeric characters such as titles and messages; option fields indicate a "selected" or "on/off" status. Fields are edited as follows:

Numeric Field Editing

To replace the existing number in a numeric field, simply enter the new number using the number keys on the keypad. To clear the number in the field, press ⊞.

Text Field Editing

When the edit cursor is moved to a text field, only the first character in the field is highlighted. The highlighted character (alpha or numeric) may be changed by pressing the ▲ or ▼ keys. ▲ changes the highlighted character to the next character. ▼ changes the highlighted character to a prior character. You may hold down the arrow key to quickly change the highlighted character to the one you want.

```
        .      ▲
        :      │
        C      │
        B      │
        A      ▲
      space    │▼
        9      ▼
        8
        7
        :      │
        .      ▼
```
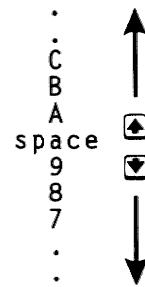
To move the cursor to the previous or next character in the field, press ◄ or ► respectively. When the cursor is at the first character, ◄ moves the cursor to the previous field. When the cursor is at the last character within the field, ► moves the cursor to the next field. To erase the characters in the field which follow the highlighted character, press ⊞.

Note: Digits may also be entered using the number keys on the keypad.

Option Field Selections

Options within selection boxes are displayed and selected using selection indicators (✓). For example, in the first line of the selection box shown on the previous page, ✓ indicates that the auto-power-up feature is currently On. To make an option selection, move the cursor next to the option setting you want then press ENTER.

To exit from a selection box and return to presentation level, press EXIT. To go back to a previous menu, press RECALL.

Confirmation Boxes

Confirmation boxes are displayed when the projector requires confirmation of an indicated action. For example, after a convergence registration is performed (explained later),

Exit Convergence		
Save	No Save	Continue Adjust

a confirmation box is displayed to confirm that the new convergence settings are to be saved in memory. ENTER or EXIT cause the highlighted response to be performed. The arrow keys allow you to highlight an alternative response.

Message Boxes

Message boxes display brief messages on the screen to indicate a status, condition, or error. Messages are overlayed on the displayed source image and most remain on the screen for about five seconds. To remove a message box prior to the five second display period, press [EXIT].

Help Pages

Help pages provide assistance when you need it. There are various forms of help available, all accessible by pressing [HELP]. For information about using help, refer to the *Using Help* entry in this section.

To exit from a help screen, press [EXIT]. To go back to a previous help screen, press [RECALL].

Test Patterns

The projector has an internal generator which can display several different types of test patterns to assist you during projector setup. Press [#] to display the first test pattern — a crosshatch. Each subsequent press of [#] changes the test pattern as shown below. If a test pattern is the only graphic displayed (i.e., no overlayed text), pressing [EXIT] returns the display to the external image.
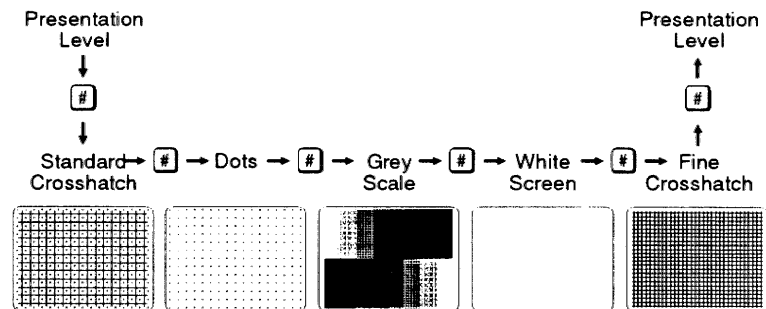
Note: Test patterns are normally generated at the scan frequencies of the current input signal.

Using Help ▶ The projector includes an extensive online help system. The help system provides operation guidance and assistance. There are two types of online help: Context Sensitive Help and Guided Help.

Context Sensitive Help

Context Sensitive Help is used to display help pages pertaining to a specific keypad or menu function, or a particular operation in progress (such as convergence).

☞ To view one or more help pages pertaining to a direct access keypad function, press the function key then [HELP]. For example, to view a help page which describes the brightness function, press [BRITE] [HELP]. To exit the help display, press [EXIT].

☞ To view one or more help pages pertaining to a menu selection item, move the cursor bar to the item then press (HELP).

If multiple pages are available, press (HELP) to advance to the next page. Press (RECALL) to go back to the previous page. When finished, press (EXIT).

Guided Help

Guided Help provides several online tutorials which explain how to operate the projector and assist you during setup.

☞ To access the tutorials, press (HELP) at presentation level. The Help menu is displayed. When using tutorials, press (HELP) to display the next tutorial page, press (RECALL) to display the previous page, press (EXIT) to return to the picture.

(HELP) ➘

```
┌Help────────────────────────────┐
│                                 │
│  1. Quick Setup Guide           │
│  2. Detailed Setup Guide        │
│  3. Source Selection Guide      │
│  4. Keypad Guide                │
│  5. -                           │
│  6. Using Help                  │
│                                 │
│  For all menus:                 │
│  <number> or △ ▽ then <ENTER>   │
│  to select function             │
│  <HELP> for information         │
│  <RECALL> to go back one level  │
│  <EXIT> to return to picture    │
└─────────────────────────────────┘
```

1. Quick Setup Guide

The Quick Setup Guide provides a step-by-step procedure for quick-setup of the projector. Setup may be performed while proceeding through the tutorial.

Notes: 1) During the tutorial, (RECALL) displays the previous page and (EXIT) returns you to presentation level (this includes when slidebars are displayed). 2) If the display cannot be focused, ensure that the projector-to-screen distance is correct (see section 2.2). If the screen distance is correct but the display cannot be focused, follow the Detailed Setup Guide.

2. Detailed Setup Guide

The Detailed Setup Guide provides step-by-step instructions for optical alignment of the projector. Optical alignment is necessary when the screen size changes, the projector-to-screen distance changes, or the display image does not focus using the focus control. For more details, refer to section 2.8, *Optical Alignment*.

3. Source Selection Guide

The Source Selection Guide explains various source selection methods.

4. Keypad Guide

The Keypad Guide explains how to use the keypad.

6. Using Help

Using Help provides instructions on how to use the help system.

Power-on ➤ To turn on the projector, press ⌞POWER⌟ on the keypad. Hold ⌞POWER⌟ down for about one second. If using the IR remote keypad, point the keypad at the projection screen or the front of the projector. During power-on, the projector proceeds through a series of internal diagnostic tests which last approximately 9 seconds. Once complete, an input image should be displayed on the projection screen. If no image is displayed, press ⌞SOURCE⌟ to display the source message. The source message displays the currently selected input. Check that the correct source is indicated on the display.

If there is no display when ⊞ is pressed, check the LEDs (Light Emitting Diodes) on the projector back panel. Only the green *Power* LED should be lit. If any of the red diagnostics LEDs are lit, call your dealer for assistance.
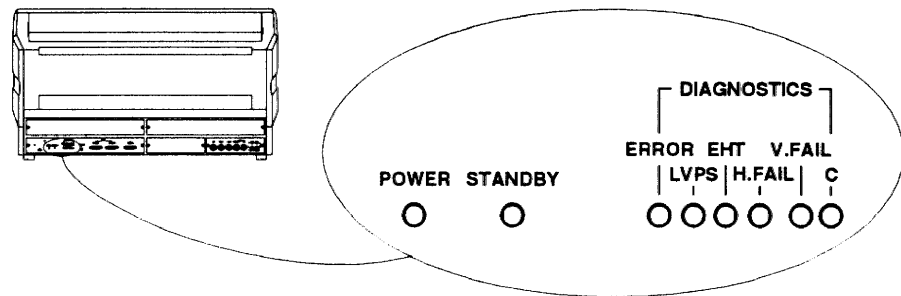
Figure 3-4. *Rear Panel LEDs*

Notes: 1) Allow the projector to warm up for 45 minutes before use. Critical adjustments should be performed after the warm-up period. 2) Turning the projector off via the remote or built-in keypad places the projector in a "wait to operate" mode. To remove power from the projector, unplug the power cord.

Standby Mode ➤ Standby Mode allows you to blank the display and mute the audio output while keeping the projector in a warmed-up and ready state.

☞ To enter standby mode, hold down ⌞STBY⌟ for about one second while at presentation level. The display blanks and audio is muted. Both the green *Power* LED and the yellow *Standby* LED are lit. To leave standby mode, hold down ⌞STBY⌟ or ⌞EXIT⌟ for one second. The display and audio are then restored and the *Standby* LED is turned off.

Tip: During presentations, the standby feature is useful when you want to direct audience attention away from the projection screen.

Note: To prolong CRT life, it is recommended that the standby feature be used when the display is not required.

Audio ➤ **Mute**
Functions
The Mute function is used to silence audio output.

☞ To silence the audio output, press ⌞MUTE⌟. Press ⌞MUTE⌟ again to restore audio.

Volume

The Volume function is used to adjust the audio level.

☞ To adjust Volume, press 🔲 then ⊞ or ⊟ until the desired audio level is attained.

System Status ▶
Pages

The projector's current operating settings may be displayed by pressing ⊞ while at presentation level. Each time ⊞ is pressed, one of three main status pages is displayed. To return to presentation level, press ⌷EXIT⌷.

Page 1 displays general projector information and operating settings which include identity, software version, keypad type, scan configuration, auto power-up setting, message display setting, switchers (numbers) connected, installed options, and mute setting. Operating settings are explained in the following entries in this section.

Page 2 displays current input parameters. These parameters (defined later in this section), relate specifically to the currently selected input.

Page 3 lists the display settings currently in use. Note: If the current setup memory is locked or an ASI has occurred, the display settings shown may not be identical to those stored in the setup memory.

Presentation Level
↓
⊞
Page 1 ↓

```
      E   Electrohome Projection Systems

      Marquee X000          Serial No:  123456789
   Projector No:  000         Software:  VX.X

     IR Sensor:  On
   Remote Jack:  On
   IR Protocol:  A
                             Horiz Scan:  Normal
  Auto Power-up:  Off        Vert Scan:  Normal
      Messages:  On
                             Switchers:  1
         Mute:  Off          Options:  Decoder
```

↓
⊞
Page 2 ↓

```
            Current Input Parameters

              Channel:  12  Computer A
             Switcher:  1
                 Slot:  4
               Recall:  01
                  ASR:  On
     Interface Module:  Standard RGB

           Horiz Freq:  75.00 kHz
            Vert Freq:  72.67 Hz
          Signal Type:  RGB
            Sync Type:  Separate H & V
       Video Standard:  -
```

↓
⊞
Page 3 ↓

```
            Current Display Settings

              Channel:  12 Computer A
                Input:  14
               Recall:  01

  Contrast:  30      H Size:  50      H Phase:  50
     Brite:  50      V Size:  50      V Phase:  50
    Volume:  0     Keystone:  50    White Bal:  2
     Color:  50     Side Pin:  50      (6500 °K)
      Tint:  50      Top Pin:  50       Focus:  50
    Detail:  25      Bot Pin:  50     T Blank:  0
   Retrace:  Long        Bow:  50     B Blank:  0
      Sync:  Slow       C Lin:  50     L Blank:  0
Auto Clamp:  On         S Lin:  50     R Blank:  0
                      L/R Skew:  50
```

↓
⊞
↓
Presentation Level

3.3 Source Selection

The projector includes one built-in interface and can be expanded to accept additional inputs. With optional accessories such as a video decoder, and the use of one or more external switchers, the number of inputs can be significantly increased. Because of this large capability, three source selection methods are available: Input Selection, Direct Channel Selection, and Channel Up/Down Selection. Sources are selected at presentation level.

Notes: 1) For systems with only one or two source connections, direct input selection may be the only method you will use. If your system includes many sources, all methods will be of interest. 2) Internal sources are also selectable for use during setup and testing. To select an internal source, refer to section 2.7, Memory Setup, and section 3.7, Utility Features.

Input ▶
Selection

This method is the most basic of the three source selection methods. A source is selected by specifying the input to which the source is connected, defined by a switcher number and slot number. For the purposes of input selection, the projector is considered to be a type of switcher. Projector and switcher slots are illustrated in Figures 3-5 and 3-6 below. Each slot can accept one external input signal for display.

**Projector
(rear view)**

"Slots" 3 to 6 when optional decoder is installed.

Slot 2   *Slot 1*

([SOURCE] [0] [2])   ([SOURCE] [0] [1])
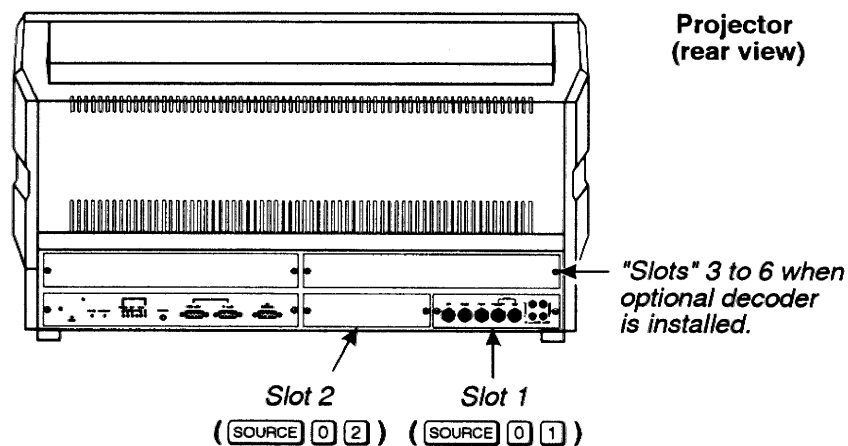
Figure 3-5. *Projector Slots*

**Marquee Signal
Switcher
(rear view)**

SWITCHER

9 8 7 6 5 4 3 2 1

Slot

Output Module ——— *CPU*
(to projector)   *Module*
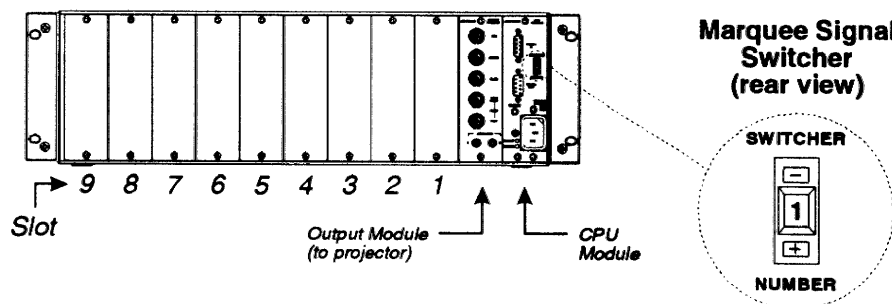
NUMBER

Figure 3-6. *Switcher Slots*

☞   To select an input:

Press [SOURCE] [m] [n].

where: m = 0 (projector) or 1-9 (switcher 1, 2, ... 9)
         n = 1-9 (slot number)

The projector switches to, and displays, the source connected to the input
selected. The projector also uses the display settings previously set in
memory for that input. If the selected input is invalid, a warning message is
displayed. An example of an invalid input might be "0 1" when a switcher is
connected to slot 1 of the projector. Another example of an invalid input
would be to select a switcher which does not physically exist.

Example 1

Slot 1 on the projector has the output from a computer workstation connected
to it. To display the workstation output, press [SOURCE] [0] [1].

INPUT
*The workstation output
is connected to
slot 1 of the projector.*
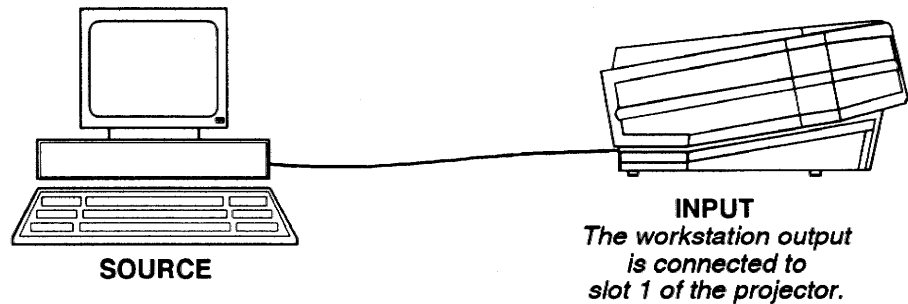
SOURCE

Example 2

A single *Marquee* Signal Switcher is connected to the projector and a
computer is connected to slot 3 of the switcher. To display the computer
output, press [SOURCE] [1] [3].

SOURCE

Switcher Number 1

*The switcher output
is connected to
slot 1 of the projector.*

INPUT
*The computer output
is connected to slot 3
of switcher number 1.*
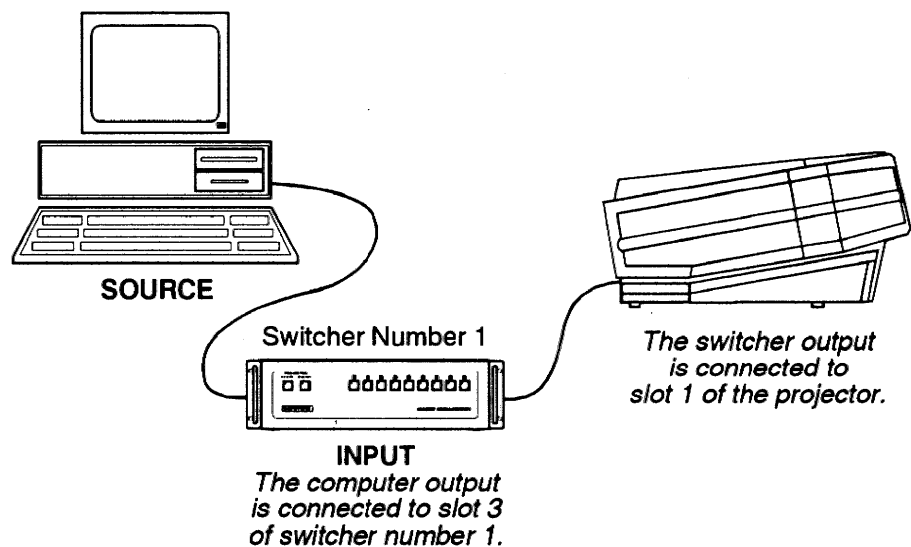
Direct Channel ➤
Selection

This method of source selection takes advantage of the Channel List feature explained in section 3.7, *Utility Features*. The Channel List allows you to assign a source to a 2-digit number, from 01 to 99.

Once you have assigned channel numbers to your sources, and the projector is at presentation level, you can select a source by pressing the 2-digit channel number associated with it.

☞ To select a channel, press ⓜ ⓝ.

where: *m* = the 1st digit of the channel number
        n = the 2nd digit of the channel number

The projector switches to, and displays, the source assigned to the channel number. If an invalid switcher or slot number is assigned to the channel, a warning message is displayed.

Example

Channel 08 in the Channel List was programmed to select a source connected to slot 5 on switcher 3. To select this source, simply press ⓪ ⑧.

Note: If the Single Digit Channel Entry option in the Preferences selection box ([UTIL] ⑤) is set to either "Imm" or "Time Out", the preceding zero shown in the example above does not have to be entered. For more information, refer to the Preferences entry in Section 3.7.

Channel Up/Down ➤
Selection

This method of source selection also takes advantage of the Channel List feature. It lets you quickly switch between channels programmed in the Channel List by using the up and down arrow keys on the keypad.

☞ To make a selection:

Press [SOURCE] followed by ⬆ or ⬇.

Each time an arrow key is pressed, a channel number (and name) is displayed on the screen. When the channel number you want is displayed, simply wait to allow the projector to switch to the source defined by the channel.

Notes: 1) If a channel specifies a switcher which does not exist, the channel is cosidered invalid. 2) The Channel List utility allows you to flag the channels to be used by the Channel Up/Down selection feature. For more information, refer to the Channel List entry in section 3.7, Utility Features.

The Source ➤
Message

When [SOURCE] or [RECALL] is pressed at presentation level, and/or a source switch is made, a source message is briefly overlayed on the projection screen. The source message displays current source information.

```
Channel       01
IBM PC
Input         01
Recall  ⊙⟶  13
ASI     S02-R06
```

/ *Channel Number*
/ *Source Name*
—— *Input Number*
\ *Recall Memory No.*
\ *ASI Message*

3-13

Notes: 1) If messages are turned off via Preferences (⬚ ⑤), the source message is not displayed. 2) During input selection or Recall memory selection (explained later), the message box displays numeric keypad entries as they occur. In both cases, two digits must be entered. If only one digit is entered, the message box will remain displayed until a second digit is entered or the selection is cancelled by pressing ⬚. 3) When an internal source is in use, an internal source message is displayed.

Channel Number

If a channel has been selected, the channel number is displayed; otherwise this line is blank.

Source Name

If a channel was selected and a source name was defined for it in the Channel List, the name is displayed here; otherwise this line is blank.

Input Number

The switcher and slot number of the active input is displayed. If the switcher number is 0, the input is on the projector (versus on a switcher). The slot number may indicate a projector slot or a switcher slot.

If the Input memory for the input is in use and locked, a key icon (O━┳) is displayed. Setup memories which are locked are not affected by adjustments to display settings. For an explanation of Input memories and locked memories, refer to section 3.4, *Setup Memories*.

Recall Memory Number

When a Recall memory is in use, the Recall memory number is displayed; otherwise this line is blank.

If the Recall memory is locked, a key icon (O━┳) is displayed. Setup memories which are locked are not affected by display adjustment changes. For an explanation of Recall memories and locked memories, refer to section 3.4, *Setup Memories*.

ASI Message

If the ASR feature is set to ON for the Input memory, and an ASI has occurred, an ASI message is displayed; otherwise this line is blank. The message indicates which memories were used for interpolation to produce the current display settings. When this line is visible, adjustments to display settings will NOT be stored in the current setup memory. For more information about the ASR feature and ASI, refer to the Source Setup entry in section 3.7, *Utility Features*.

3.4 Setup Memories

The projector has 80 setup memories which store display settings. Multiple setup memories are needed because display settings are usually different for different sources. For example, the display settings (brightness, contrast, convergence, etc.) when using a VCR may be very different than the settings for a high resolution computer output. When display adjustments are made, the new settings are automatically saved in one of the projector's setup memories.

There are two types of setup memories: Input and Recall. Both memory types store the same parameters. The only difference is that Input memories store display settings for a particular physical input (e.g., switcher 0, slot 1) while Recall memories can be used with any input.

At any one time, one setup memory is the *current setup memory*. The display settings in the current setup memory are used for the current display. When a source is selected by entering its input number, the Input memory for the selected input becomes the current setup memory (unless ASR is on and is triggered). If a Recall memory is selected, it becomes the current setup memory. Display adjustments are automatically saved in the setup memory which is current at the time of adjustment (unless the setup memory is locked — explained later).

Setup Memory Parameters

Memory Identification
- Input or Recall
- Switcher No. & Slot No., or Recall No.

Memory Status
- Locked or Unlocked
- ASR last used

Signal Frequencies
- Horizontal Fequency
- Vertical Frequency

Picture Parameters
- Phase
- Focus
- Size
- Sync
- White Balance
- Blanking

Primary Display Param.
- Color
- Contrast
- Tint
- Brightness
- Detail
- Volume

Geometry Parameters
- Size
- Bow
- Keystone
- Linearity
- Pincushion
- Skew

Convergence Parameters
- Convergence settings at all 45 zones.

Control Settings
- ASR On/Off (Input memories)
- Video Format (decoder only)
- Signal Route
- Volume (audio)
- Clamping and Retrace

Input Memories ▶ As mentioned above, Input memories store display settings for each physical input (i.e., switcher 0, slot 1). When an input is selected, the Input memory for that input becomes the current setup memory and its display settings are used (unless ASR is on and is triggered). If the input is being selected for the first time, a new Input memory is created.

Recall Memories ▶ Recall memories provide an alternative to using the display settings stored in the Input memory of the selected source. For example, you may want to temporarily disconnect a computer connected to the projector's RGB input and in its place, connect another computer with different signal characteristics. Since the connection is only temporary you don't want to change the display settings stored in the Input memory. Instead, you can select a Recall memory which has the settings you want for the new input. If there are many devices which will be sharing the same input, many Recall memories can be created to store the display settings for each. On the other hand, if there are many sources on different inputs with exactly the same signal characteristics, it may be possible for them to share the same Recall memory.

Recall memories are identified by a two digit number. Any number from 01 to 99 can be assigned, although only 80 memory spaces exist.

☞ To select or create a Recall memory:

Press ⌧RECALL⌧ ⌧m⌧ ⌧n⌧.

where: *m* = the 1st digit of the Recall memory number
　　　　n = the 2nd digit of the Recall memory number

For example, to select Recall memory 01, press ⌧RECALL⌧ ⌧0⌧ ⌧1⌧. Recall memory 01 will then be the current setup memory and its settings will be used for the currently selected source. If this is the first time that the Recall memory number is used, a new Recall memory is created. Any display adjustments you make will be stored in the Recall memory.

Memory ▶
Allocation

Each time a setup memory is selected the projector checks its memory bank to see if the selected memory exists. If it does exist, it uses the memory and its display settings. If it does not exist, a small portion of memory is allocated for the new setup. Space is available for up to 80 setup memories. When the last space is used up, a warning message is displayed. If this happens, call for servicing to delete memories which you no longer use to make room for new memories.

Locking Setup ▶
Memories
○━ⴕ

Setup memories may be locked or unlocked. Locking a setup memory prevents adjustments to display settings from being saved in that memory. For example, if Recall memory 08 is locked and selected, then brightness is adjusted, the new brightness setting is only temporary. If the setup memory is then reselected, the original brightness setting will be restored.

Note: When a locked setup memory is selected, a key icon (○━ⴕ) is displayed in the Source Message.

☞ To lock or unlock the current setup memory, select option 3 from the Source Setup menu (⌧UTIL⌧ ⌧1⌧ ⌧3⌧). Option 3 indicates the current setting

3.5 Display Adjustments

This section describes the projector's display adjustment functions. To access all display functions, a full function keypad such as the built-in or standard IR remote keypad is required. If you are using the optional Presenter's keypad, only the primary display functions are available. There are four types of display adjustment functions: Primary, Picture, Geometry, and Convergence.

NORMAL ADJUSTMENT SEQUENCE

UNADJUSTED IMAGE

↓

Primary Adjustments

↓

Picture Adjustments

↓

Geometry Adjustments

↓

Convergence Registration

↓

FULLY ADJUSTED IMAGE

□ Primary Display functions include Brightness, Contrast, Detail, Color and Tint. These functions are accessed directly from the keypad.

□ Picture functions are used to adjust display settings that affect the projected image. These functions include Phase, Size, White Balance, Focus, Sync, and Blanking. Picture functions are accessed via the Picture menu which is selected by pressing [PIC] on the keypad.

□ Geometry functions are used to correct for geometric distortions of the display such as Size, Keystone, Pincushion, Bow, Linearity, and Skew. Geometry functions are accessed via the Geometry menu which is selected by pressing [GEOM] on the keypad.

□ Convergence is used to align the red, green, and blue color components of the image. It is described in section 3.6, *Convergence Registration.*

Most adjustment functions, when selected, display a slidebar overlayed on the source image. The slidebar displays the current setting and indicates which arrow keys to use for making the adjustment. Adjustment settings are stored in the current setup memory (Input or Recall). There are two exceptions:
1) If the current setup memory is locked, new adjustment settings are shown but not stored; they are discarded when another setup memory is selected.
2) If ASR is on for the current input and an ASI is performed, the settings are only temporary and are not saved in the current setup memory.

For new images, where much adjustment is required, it is recommended that adjustments be made using the sequence illustrated above. When making picture or geometry adjustments, follow the sequence displayed in the adjustment menu.

Tip: When making many picture or geometry adjustments, press [ENTER] after each adjustment to return the cursor back to its previous menu item position.

Primary Display ▶ Adjustments

Brightness

The Brightness function is used to adjust the overall light output.

To adjust brightness, press [BRITE] then [▲] or [▼]. If video or data is displayed with a black background, adjust until the background just disappears (black becomes a very dark grey).

Note: If room lighting changes, it may be necessary to re-adjust brightness.

Contrast

The Contrast function is used to adjust the contrast between the light and dark areas of the display image.

To adjust contrast, press ⌷CONT⌷ then ⊞ or ⊟. If contrast is set too high, the image loses detail and clarity. If set too low, it may be difficult to distinguish between foreground and background information.

Notes: 1) For best results, adjust brightness before contrast. 2) If projection room lighting changes, it may be necessary to re-adjust contrast and brightness.

Detail

The Detail function is used to adjust the picture sharpness of video signals when using a video decoder installed in the projector.

To adjust detail, press ⌷DETAIL⌷ then ⊞ or ⊟ until the sharpest display is attained. Detail level should be roughly proportional to input signal quality. Higher levels of detail improve good quality signals. Lower levels of detail reduce noise in poor quality signals.

Color

1) The Color function is used to adjust color saturation levels when using a video decoder installed in the projector.

   To adjust color, press ⌷COLOR⌷ then ⊞ or ⊟ until the desired color saturation level is displayed. If Color is set to a 0% level, the result will be a black and white picture. If Color is set too high, the color levels in the picture will be over-powering.

2) The Color function also allows you to turn on or off the red, green and/or blue color components of the picture.

   To select the color components you want displayed, press ⌷COLOR⌷ followed by a number (*n*). Refer to the chart below.

⌷n⌷	COLORS TURNED ON	⌷n⌷	COLORS TURNED ON
1	red	5	green-blue
2	green	6	red-blue
3	blue	7	none
4	red-green	8	all

Tint

The Tint function is used to adjust color hue to obtain true color reproduction of NTSC signals when using a video decoder installed in the projector.

To adjust tint, press ⌷TINT⌷ then ⊞ or ⊟ until an optimum display is attained. It is best to adjust tint while displaying an image with natural flesh tones.

Note: Tint is not adjustable for PAL or SECAM sources.

Picture Functions ▶

Picture functions are accessed through the Picture menu. To display this menu, press `PIC`.
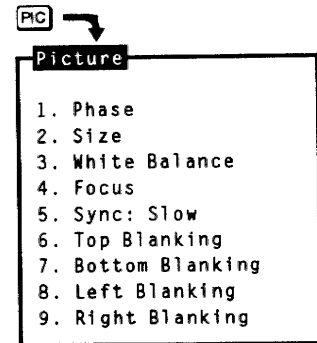
`PIC` `1` ***Phase***

The Phase function is used to move the picture up, down, left, or right within the picture display area.

To adjust phase, select Phase from the Picture menu. Two slidebars are displayed: a Horizontal Phase slidebar and a Vertical Phase slidebar. Use ▲, ▼, ◄, and ► to move the picture in the direction of the arrows so that the entire picture is visible and centered. If the picture cannot be made entirely visible, a blanking adjustment may be required; refer to the Blanking Function entries in this section.

`PIC` `2` ***Size***

The Size function is used to adjust the horizontal and vertical size of the display image. (This adjustment is also available through the Geometry menu.)

To adjust size, select Size from the Picture menu. Two slidebars are displayed: a Horizontal Size slidebar and a Vertical Size slidebar. Use ▲, ▼ to adjust vertical size and ◄, ► to adjust horizontal size until the objects within your picture have the proper shape. For example, if there is a circle in your picture, size should be adjusted so that the circle is round, not oval.

Note: The Size function should not be used to compensate for aspect ratio mismatches between source images and the projection screen. Not all sources use the same aspect ratio therefore it may not always be possible to fill the entire screen. ("Aspect Ratio" is defined in Appendix A).

`PIC` `3` ***White Balance***

The White Balance function is used to select or adjust the color temperature (or shade) of white used by the projector. For most applications, the White Balance set by the factory is satisfactory.

To select or adjust the white balance, select White Balance from the Picture menu. From the White Balance menu, select items 1, 2, or 3 to use one of the factory default color temperatures. The current selection is shown at the bottom of the menu. Select option 4 to use the service adjusted user setting. Select option 5 to display the White Balance slidebar and adjust white balance manually for a custom adjustment.

`PIC` ➔

```
┌─Picture────────────┐
│                    │
│  1. Phase          │
│  2. Size           │
│  3. White Balance  │
│  4. Focus          │
│  5. Sync: Slow     │
│  6. Top Blanking   │
│  7. Bottom Blanking│
│  8. Left Blanking  │
│  9. Right Blanking │
│                    │
└────────────────────┘
```

Note: Item 5 is a toggle function.

`PIC` `3` ➔

```
┌─White Balance──────┐
│                    │
│  1. 3200 K (reddish)│
│  2. 6500 K (white) │
│  3. 9300 K (bluish)│
│  4. User Setting   │
│  5. Customize White│
│                    │
│  Currently Using: 2│
└────────────────────┘
```

⌨️PIC ⌨️4   ***Focus***

The Focus function is used to adjust the electrical focus of the combined red, green, and blue color components.

To adjust focus, select Focus from the Picture menu then use 🔼 and 🔽 until the center of the display appears the sharpest. If the displayed image cannot be adequately focused, a service adjustment to electrical focus or optical lens adjustment may be required. Refer to the section 2.8, *Optical Alignment*.

⌨️PIC ⌨️5   ***Sync (Fast/Slow)***

The Sync function is used to minimize horizontal jittering, "flag waving" or tearing at the top of the display image.   This effect sometimes occurs when the source is a VCR or video signal. The function changes the synchronization mode of the projector from fast to slow, or slow to fast.

To switch between synchronization modes, select item 5 from the Picture menu. Item 5 indicates the current sync mode.

⌨️PIC ⌨️6   ***Top Blanking***
⌨️PIC ⌨️7   ***Bottom Blanking***
⌨️PIC ⌨️8   ***Left Blanking***
⌨️PIC ⌨️9   ***Right Blanking***

These functions are used to hide or black out unwanted information (or noise) at the top, bottom, left, or right of the display image. Blanking adjustments may be required when the source is a VCR or video signal.

When Top Blanking or Bottom Blanking is selected, 🔼 and 🔽 are used to adjust the amount of blanking at the top or bottom of the display (respectively). When Left Blanking or Right Blanking is selected, ◀ and ▶ are used to adjust the amount of blanking at the left or right side of the display (respectively). A 0% level on the slidebar indicates no blanking.

Geometry Functions ▶

Geometry functions are accessed through the Geometry menu. To display this menu, press ⌨️GEOM.
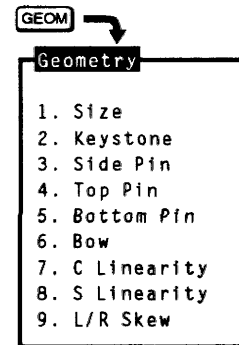
Note: It is usually easier to adjust display geometry while a test pattern (🔳) is displayed.

⌨️GEOM ⌨️1   ***Size***

The Size function is used to adjust the horizontal and vertical size of the display image. (This adjustment is also available through the Picture menu).
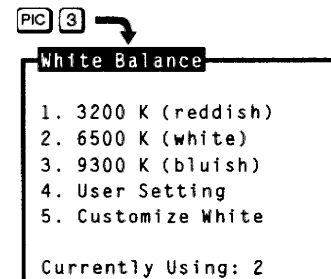
┌─────────────────┐
│ Geometry   │
├─────────────────┤
│ 1. Size   │
│ 2. Keystone   │
│ 3. Side Pin   │
│ 4. Top Pin   │
│ 5. Bottom Pin   │
│ 6. Bow   │
│ 7. C Linearity │
│ 8. S Linearity │
│ 9. L/R Skew   │
└─────────────────┘

To adjust size, select Size from the Geometry menu. Two slidebars are displayed: a Horizontal Size slidebar and a Vertical Size slidebar. Use 🔼, 🔽 to adjust vertical size, and ◀, ▶ to adjust horizontal size until the objects within your picture have the proper shape. For example, if there is a circle in your picture, size should be adjusted so that the circle is round, not oval.

Note: The Size function should not be used to compensate for aspect ratio mismatches between source images and the projection screen. Not all sources use the same aspect ratio therefore it may not always be possible to fill the entire screen. ("Aspect Ratio" is defined in Appendix A).

`GEOM` `2` ### Keystone

The Keystone function corrects for keystone geometry distortion. Adjust keystone if the width at the top of the display is not the same as the width at the bottom. For example, the displays below require keystone adjustment.

To adjust keystone, select Keystone from the Geometry menu then use ◄ and ► until the top and bottom widths of the display are equal.
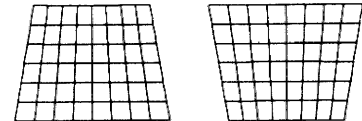
`GEOM` `3` ### Side Pincushion

The Side Pincushion function corrects for curvature occurring at the sides of the display image. For example, the two displays shown below require side pincushion adjustment.

To adjust side pincushion, select Side Pincushion from the Geometry menu then use ◄ and ► until the sides of the image are straight.
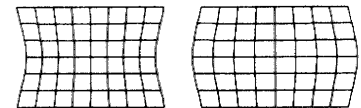
`GEOM` `4` ### Top Pincushion

The Top Pincushion function corrects for curvature occurring at the top of the display image. For example, the two displays shown below require top pincushion adjustment.

To adjust top pincushion, select Top Pincushion from the Geometry menu then use ▲ and ▼ until the top of the image is straight.
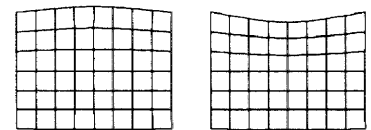
`GEOM` `5` ### Bottom Pincushion

The Bottom Pincushion function corrects for curvature occurring at the bottom of the display image. For example, the two displays shown below require bottom pincushion adjustment.

To adjust bottom pincushion, select Bottom Pincushion from the Geometry menu then use ▲ and ▼ until the bottom of the image is straight.
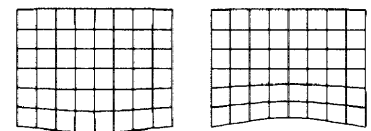
GEOM 6   **Bow**

The Bow function corrects for curvature in the vertical direction in the middle of the picture. For example, the two displays shown below require bow adjustment.

To adjust bow, select Bow from the Geometry menu then use ⬆ and ⬇ until the center of the picture is straight.
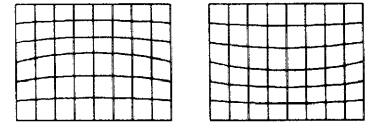
GEOM 7   **C Linearity**

The C Linearity function corrects for gradual vertical non-linearity between the top and bottom of the display image. For example, as shown in the display below, the top of the image increases in vertical size while the bottom decreases in vertical size.

To adjust C linearity, it is best to display a screen full of characters or use one of the internal test patterns available by pressing #. Select C Linearity from the Geometry menu then use ⬆ and ⬇ until the characters at the top, middle, and bottom of the screen have the same vertical size.
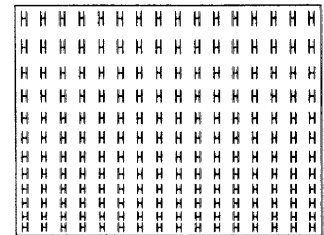
GEOM 8   **S Linearity**

The S Linearity function corrects for vertical non-linearities which extend from the center of the display to the top and bottom. For example, in the display shown below, the top and bottom characters are much smaller in size than the center characters.

To adjust S Linearity, it is best to display a screen full of characters or use one of the internal test patterns available by pressing #. Select S Linearity from the Geometry menu then use ⬆ and ⬇ until the characters at the top, middle, and bottom of the screen have the same vertical size.
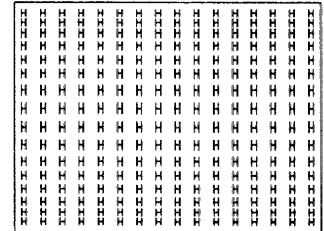
GEOM 9   **L/R Skew**

The Skew function corrects for left/right tilting of the display image. For example, the two displays shown below require skew adjustment.

To adjust skew, select Skew from the Geometry menu then use ⬅ and ➡ until the center vertical line (as shown) is straight up and down.
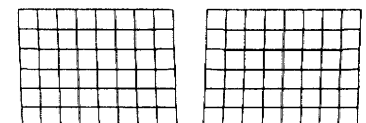
3.6 Convergence Registration

Convergence Registration is the process of aligning the red, green, and blue color components on the projection screen. The projector's convergence system provides accurate color registration in 45 discrete convergence zones configured in a 9 by 5 array on the projection screen. Since the projector must converge colors differently for each source (due to varying scan frequencies), convergence settings are saved for each input. Convergence settings can also be saved in Recall memories.

There are three basic convergence methods available: Guided, Interpolated, and Random Access. Any one of these can be selected for performing a registration adjustment. All are easy to use and context-sensitive help is available if needed.

☞ To perform a convergence:

Begin by selecting the input source to be converged. Convergence settings will be saved in the current setup memory.

Next, press CONV to display the Convergence menu. Select one of the convergence options from the menu.

```
CONV ⬎
┌─Convergence─────────────┐
│                         │
│  1. Guided              │
│  2. Interpolated        │
│  3. Random Access       │
│  4. -                   │
│  5. Service             │
│                         │
│  During Convergence,    │
│  press <#> to cycle     │
│  to external image      │
└─────────────────────────┘
```

Guided Convergence provides a complete guided convergence of the red and blue images onto the green image in all 45 convergence zones. Use this option if the image requires minor convergence alignment and you wish to be guided through the 45 convergence zones.

Interpolated Convergence provides a complete convergence similar to Guided but is recommended when the image requires major convergence alignment (and should be used the first time a source is converged).

Random Access Convergence allows you to converge a particular area of the display. Any zone may be quickly selected and converged. This option also allows convergence of the blue on the red image (if preferred to the normal blue on green).

The Service selection is used to access the convergence service utilities. These utilities are provided for qualified service personnel only. (Password access is required).

The following options are available while performing any of the manual convergence routines:

Convergence on Image

When a convergence method is first selected, an internally generated crosshatch test pattern is displayed. Alternatively, you may override the use of the test pattern and have the external image displayed. Press ⊡ to cycle to the external image.
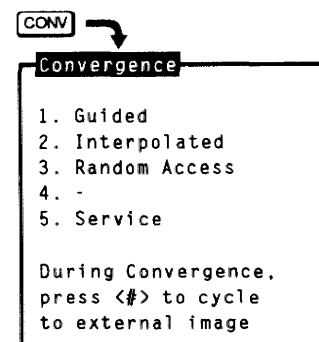
Convergence Reset

During convergence, the following reset options are available:

□ Press ⓪ to reset red and blue convergence — static and dynamic.
□ Press ① to reset red and blue convergence — static only.
□ Press ② to reset red and blue convergence — dynamic only.

"Static" refers to the complete image. "Dynamic" refers to a zonal area.

Note: Allow the projector to warm up for at least forty five minutes prior to convergence registration.

Guided ▶
Convergence

Press ① from the Convergence menu to select Guided Convergence. An internally generated crosshatch is displayed for the alignment. Initially, a red and green crosshatch is displayed and a rectangular box surrounds the center convergence zone. Use ▲, ▼, ◄, and ► to move the red onto the green in the zone. Press ⎚ENTER⎚ to similarly move the blue onto the green. These first two adjustments adjust the position of the red and blue images with respect to the green over the entire screen (static adjustments). The adjustments to follow (dynamic), modify color positioning within individual zones.
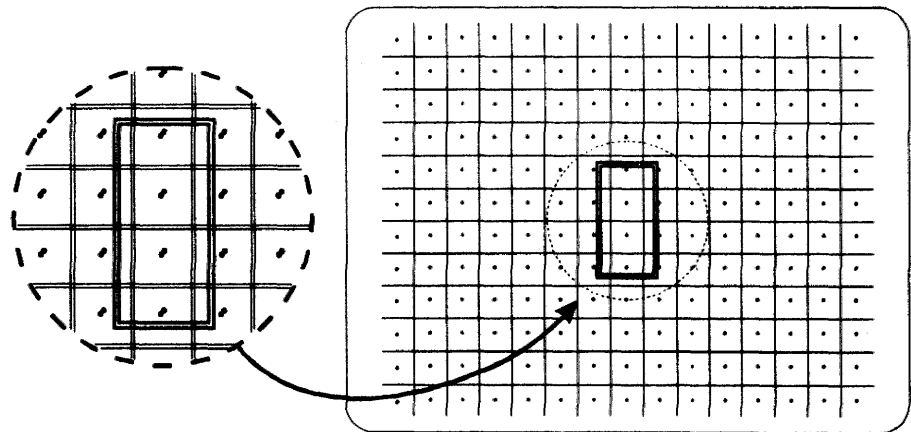
Press ⎚ENTER⎚ to move the rectangular box to the next convergence zone.
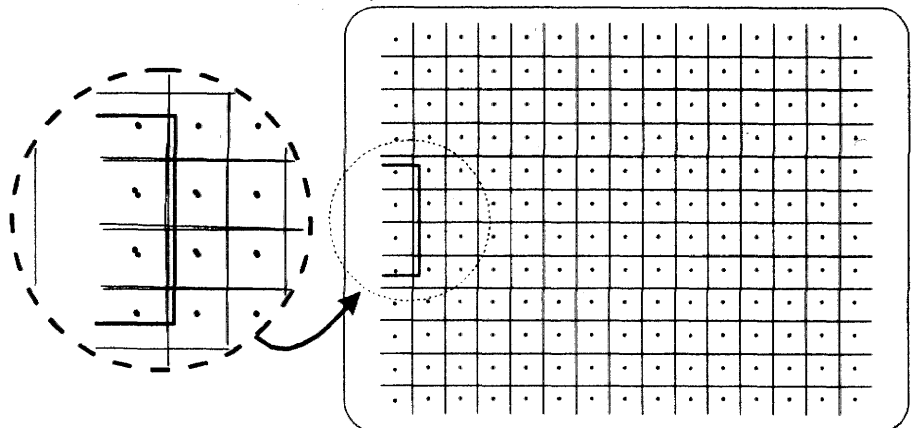
Again, use the arrow keys to adjust the red on the green. Next, press ⟨ENTER⟩ to adjust the blue on the green. Within each zone, a central control point defines the position of each color within the zone. You will notice that the center position within the box is most sensitive to the adjustment. This is where the control point is located. Continue using ⟨ENTER⟩ to move to the next zone/color for adjustment. If you wish to go back to a previous zone, press ⟨✱⟩. Once all 45 zones have been converged an Exit confirmation box is displayed, as shown below. If you wish to exit prior to converging all 45 zones, ⟨EXIT⟩ will immediately display the Exit confirmation box.

Note: ⟨CONV⟩ *may be used instead of* ⟨ENTER⟩ *to change zones/colors, if preferred.*

When the Exit confirmation box is first displayed, the cursor bar is positioned on "Save". Press ⟨ENTER⟩ or ⟨EXIT⟩ to save the new convergence settings. To re-perform the convergence, move the cursor bar to "Continue Adjust" then press ⟨ENTER⟩ . To discard your changes, move the cursor bar to "No Save" then press ⟨ENTER⟩ or ⟨EXIT⟩ .

```
      Exit Convergence
┌──────┬──────────┬──────────┐
│ Save │ No       │ Continue │
│      │ Save     │ Adjust   │
└──────┴──────────┴──────────┘
```

Interpolated ▶
Convergence

Press ⟨2⟩ from the Convergence Menu to select Interpolated Convergence. Interpolated Convergence is performed in the same way as that described for Guided convergence. The primary difference between Guided Convergence and Interpolated Convergence is noticed during adjustment. In Interpolated convergence, adjustments are not limited to single zones, but will affect larger regions of the raster. Response is greatest within the displayed box and decreases linearity towards zones which have already been converged in the sequence. Interpolated convergence is recommended when converging a source for the first time. This method can be much faster than guided convergence. However, it is not recommended if only minor convergence alignment is required.

Random Access ▶
Convergence

Press ⟨3⟩ from the Convergence menu to select Random Access Convergence. A red and green crosshatch is displayed with a rectangular box at the center zone. Above the box, "CONV" indicates that the zone is ready for convergence. Use the arrow keys to move the red onto the green within the box. This affects the position of the red with respect to the green over the entire screen (static convergence).
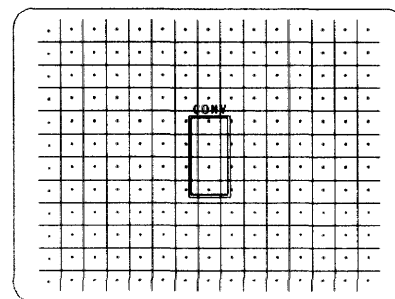
To change the convergence color, press ⟨COLOR⟩. Each press of the Color key changes the color as shown.

SEQUENCE Press:	REFERENCE COLOR	CONVERGENCE COLOR
1. **COLOR**	green	blue
2. **COLOR** again	red	blue
3. **COLOR** again	a white crosshatch for reference	
4. **COLOR** again	repeat starting at green-red	

To move to another control point, press
[ENTER]. The caption above the box changes
to "MOVE". Use the arrow keys to move
to another zone for convergence. Press
[ENTER] to converge the zone. When all
zones requiring adjustment are converged,
press [EXIT] to display the Exit confirmation
box. Press [ENTER] to save the new
convergence settings. To go back to the
convergence screen, move the cursor bar
to "Continue Adjust", then press [ENTER]. To discard your changes, select
"No Save".
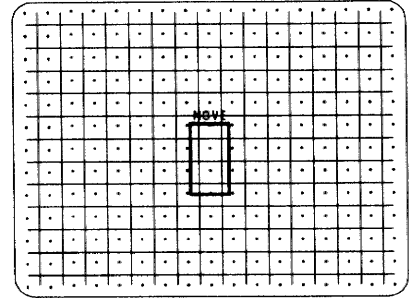
Note: [CONV] *may be used instead of* [ENTER] *to alternate between converge and
move functions, if preferred.*

3.7 Utility Features

The projector's utility features allow you to
customize operation of the projector to suit
your application and preferences. To access
these features, press [UTIL]. The Utilities
menu is displayed.

[UTIL]

```
┌Utilities──────────────────┐
│                           │
│  1. Source Setup          │
│  2. Channel List          │
│  3. Recall Memories       │
│  4. Input Memories        │
│  5. Preferences           │
│  6. Remote Control Options │
│  7. -                     │
│  8. -                     │
│  9. Service               │
│                           │
└───────────────────────────┘
```
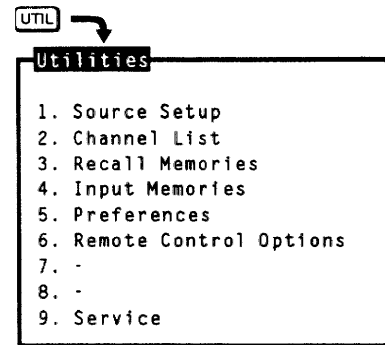
Item 1, Source Setup, provides utilities for
setup memory manipulation and selection of
internal sources.

Item 2, Channel List, allows you to program
the Channel List.

Item 3, Recall Memories, displays a listing of the Recall memories stored in
the projector.

Item 4, Input Memories, displays a listing of the Input memories stored in the
projector.

Item 5, Preferences, lets you set various operational settings which affect the
behaviour of the projector, according to your preferences.

Item 6, Remote Control Options, allows you to modify the projector's
communication settings for communication with external control devices such
as remote keypads.

Item 9, Service, provides service utilities for use by authorized service
personnel. (Password access is required.)

Source Setup ▶   Source Setup utilities are accessed by pressing ☐ from the Utilities menu. Nine source related utilities are available.

⟦UTIL⟧ ☐ —↘

```
┌─Source Setup────────────────┐
│                             │
│  1. Copy Setup              │
│  2. ASI with Save           │
│  3. Current Setup: Unlocked │
│  4. ASR: Off                │
│  5. Clear Current Setup     │
│  6. Select Internal Frequency│
│  7. Auto Clamp: On          │
│  8. Retrace: Long           │
│  9. Decoder Options         │
│                             │
│  Current Setup Memory:      │
│     Input: 12               │
│     Recall: 01              │
└─────────────────────────────┘
```

Note: Items 3, 4, 7 and 8 are toggle functions.

⟦UTIL⟧ ☐ ☐   ***Copy Setup***

The Copy Setup utility is used to copy stored display settings from one setup memory to another. When a copy is made, the originating memory remains unchanged and the destination memory is overwritten with the display settings of the originating memory.

☞   To copy a setup memory, press ☐ from the Source Setup menu. A selection box is displayed. Enter the setup memory you want to copy from and the setup memory you want to copy to. Input memories are entered by pressing ⟦SOURCE⟧ followed by a switcher and slot number. Recall memories are entered by pressing ⟦RECALL⟧ followed by a two digit Recall memory number (01 to 99). Once complete, press ⟦ENTER⟧ to proceed with the copy. A "Copy Complete" message is briefly displayed to indicate a successful copy. When you are finished copying setup memories, press ⟦EXIT⟧ to return to presentation level.

⟦UTIL⟧ ☐ ☐ —↘

```
┌─Copy Setup──────────┐
│                     │
│  From:   S 1 2      │
│                     │
│  To:     R 5 6      │
│                     │
│  Press <ENTER> to copy│
└─────────────────────┘
```

⟦UTIL⟧ ☐ ②   ***ASI with Save***

ASI (Automatic Source Interpolation) is a feature which automatically adjusts display settings based on the settings of other setup memories stored in the projector. The "ASI with Save" utility performs an immediate ASI on the current source and saves the resulting display settings in the current setup memory. The new settings are created by either copying the settings from another setup memory which has matching scan frequencies or by interpolating between "the two closest" setup memories. This feature is very useful when adding a new source to the system and/or when much adjustment is required. By using the "ASI with Save" feature, the projector can do most of the required adjustments for you.

☞   To perform an "ASI with Save", press ② from the Source Setup menu. A confirmation box is displayed. Press ◀ to move the cursor bar to "Do It" then press ⟦ENTER⟧. New display settings will immediately be calculated and saved in the current setup memory. The only exception is when the current setup memory is locked. If locked, display settings will not be modified. If "Cancel" is selected from the confirmation box, the operation is stopped. For more information about the ASI logic process, refer to Appendix C, *ASR/ASI Logic Diagrams*.

```
┌──────────────┐
│WARNING!  ASI │
│with Save will│
│overwrite the │
│current setup.│
├──────────────┤
│Do It│Cancel│ │
└──────────────┘
```

3-27
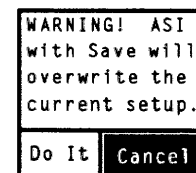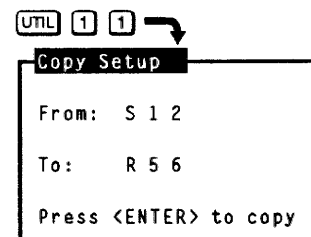
Notes about the ASI feature ...

ASI works better when there are many setup memories in the system. For example, if you always use the same input and you never use Recall memories (thus only one setup memory has ever been created), ASI will not be effective. However, if many Input and Recall memories have been used and adjusted for a variety of sources, the projector has more "knowledge" in its database for performing an ASI. As this "knowledge" increases, ASI accuracy improves.

UTIL 1 3   **Current Setup (Locked/Unlocked)**

This utility allows you to lock or unlock the current setup memory. Locking a setup memory prevents changes to display settings from being saved in that memory. For example, if a locked Recall memory is selected and then brightness is adjusted, the new brightness setting is only temporary. If the Recall memory is reselected, the original brightness setting will be restored.

Note: When a locked setup memory is selected, a key icon (⊶) is displayed in the Source Message.

To lock or unlock the current setup memory, press 3 from the Source Setup menu. Item 3 in the menu indicates the current setting.

UTIL 1 4   **ASR (On/Off)**

The ASR (Automatic Source Recall) feature provides automatic Recall memory selection or ASI (Automatic Source Interpolation) for inputs which have ASR set to On.

To turn ASR on or off for the current input, press 4 from the Source Setup menu. Item 4 in the menu indicates the current setting.

When ASR is On, the projector monitors the current input for horizontal and vertical scan frequency changes. When a frequency change occurs, the current Input memory and all Recall memories are scanned in search of a memory with matching scan frequencies. If one exists, this memory becomes the current setup memory. If a matching memory is not found, an ASI is performed. ASI automatically adjusts display settings based on the settings of other setup memories stored in the projector. The new settings created by ASI are either a copy of the settings from another setup memory which has matching scan frequencies or an interpolation between "the two closest" setup memories.

ASR is also performed when:
- You switch to an input which has ASR set to On.
- You select a Recall memory and ASR is set to On for the current input.
- A channel is selected which specifies an input which has ASR set to On.
- The source frequencies are different than the frequencies in the setup being selected.

When ASR selects a setup memory, a source message is briefly displayed to indicate which memory was selected. If the new memory settings (Input and Recall) match that of one of the channels in the Channel List, the matching channel is used and displayed in the source message. Display adjustments, if made, are stored in the new memory (unless it is locked).

```
Input        01
Recall       13
```

Selected Memory
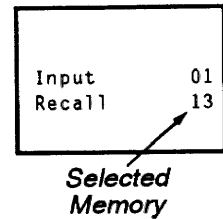
If, on the other hand, an ASI is performed, a source message is briefly displayed which includes an ASI message to indicate the action taken. If an Input memory with matching scan frequencies was found by ASI, its settings are used and its identity is displayed. If an interpolation was performed, the two setup memories selected for the interpolation are displayed and the resulting settings are used. If adjustments are made to

```
Input        01
ASI      S05-S06
```

Memories Selected for Interpolation

settings created by the ASI feature, the new settings will NOT be saved in the current setup memory; a message is displayed to indicate this. To perform an ASI and have the adjustments saved in the current setup memory, press ⌷UTIL⌷ ⌷1⌷ ⌷2⌷ to select the *ASI with Save* utility.
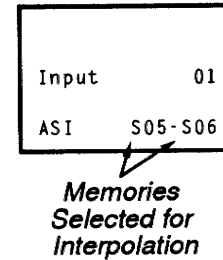
Note: To avoid selection/use of the current Input memory settings when it is desired that Recall memories be ASR selected when a source change occurs, clear the current Input memory (⌷UTIL⌷ ⌷1⌷ ⌷5⌷) to reset its scan frequency settings to null values, then immediately lock the memory (⌷UTIL⌷ ⌷1⌷ ⌷3⌷) so that its settings cannot be modified.

For more information about the ASR logic process, refer to Appendix C, *ASR/ASI Logic Diagrams*.

When to use the ASR feature...

The ASR feature is intended for use when many different sources must share the same input (via a third party switcher, for example) or when a signal source can output several different scan frequencies (e.g., a SVGA card).

Example

A system has six different sources as shown in Figure 3-7 on the following page. Source "A" is a video camera. Source "B" is a VCR. Sources "C" through "F" are various computers. All sources are connected to a 3rd party (non-Electrohome) signal switcher. The switcher is connected to projector slot 1. For each source, a Recall memory is created to store its display settings. No two sources have the same frequencies.

⌷UTIL⌷ ⌷1⌷ ⌷4⌷ is pressed to turn on the ASR feature for the projector's slot 1 input. When ASR is on and a source is selected by the switcher, the projector automatically adjusts its display settings for the new source by switching to the Recall memory set up for that source.

Source "D"
(setup parameters
saved in Recall
memory 04)

Source "C"
(setup parameters
saved in Recall
memory 03)

Source "E"
(setup parameters
saved in Recall
memory 05)

3rd Party Switcher

Source "B"
(setup parameters
saved in Recall
memory 02)

Source "F"
(setup parameters
saved in Recall
memory 06)

Source "A"
(setup parameters saved
in Recall memory 01)
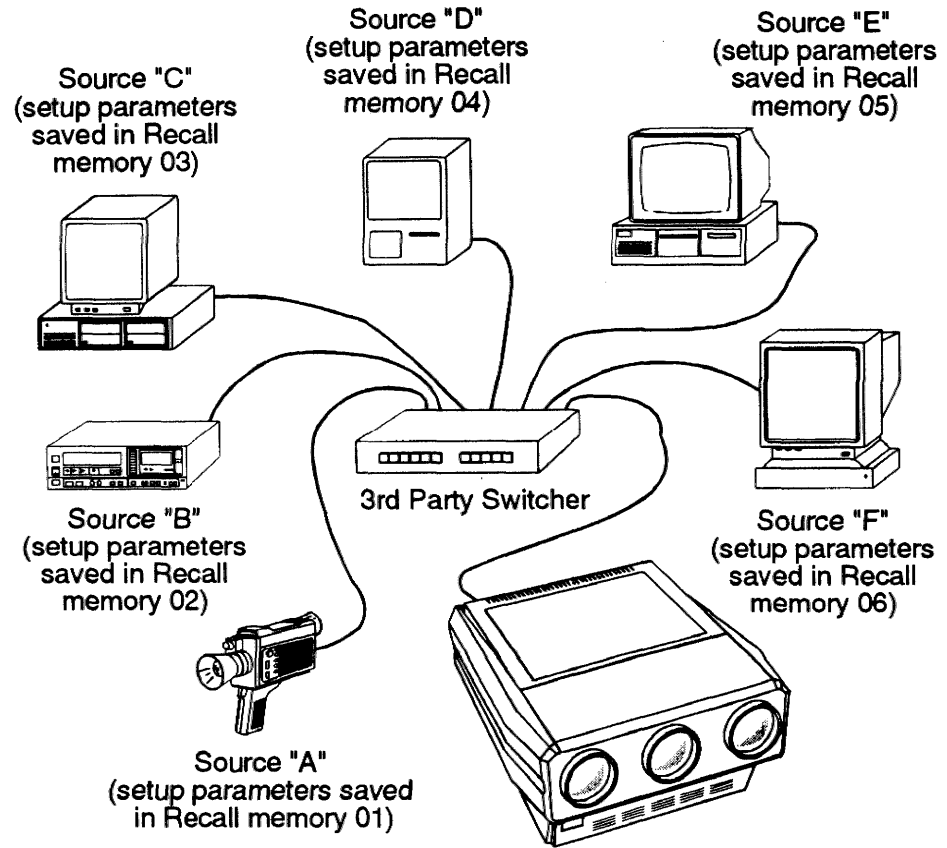
Figure 3-7. *An Installation using the ASR Feature*

`UTIL` `1` `5` ***Clear Current Setup***

This utility is used to clear the current setup memory to the factory default display settings.

☞ To clear the current setup memory, press `5` from the Source Setup menu. A confirmation box is displayed. Move the cursor to "Do It" then press `ENTER` to clear the memory. If you press `ENTER` with the edit cursor on "Cancel", the clear operation is not performed. When the clear operation is complete, the Source Setup menu is returned.

```
Clear this
 setup to
defaults?

Do It  Cancel
```
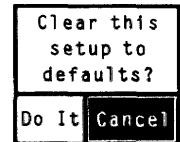
Note: Clearing a setup memory does not "delete" it from the system. If the projector's 80 memory spaces are used up, and you need to delete unused memories to make room for new memories, call your dealer for assistance.

`UTIL` `1` `6` ***Select Internal Frequency***

This utility allows you to use the projector's internal signal generator. The internal signal generator is provided to assist users and technicians during projector setup. By using the internal generator, a setup memory can be adjusted for a particular set of horizontal and vertical scan frequencies without requiring an external source. Six preset horizontal and vertical frequencies are provided.

If one of the preset frequency sets closely match a source you will be using, you can set up an Input or Recall memory for the source before it is available for connection to the projector. When the source becomes available few adjustments will be required. Another reason to use the internal generator is to improve the accuracy of the ASI feature. By setting up various memories at different scan frequencies, ASI has more information to choose from when making interpolations between setups.

☞ To select an internal frequency, press ⑥, "Select Internal Frequency" from the Source Setup menu. The resulting menu allows you to choose the scan frequencies of the internal generator. Items 1 to 6 contain the preset scan frequencies. These frequencies cover the scan range of the projector. Items 7, 8, and 9 are for future use.

[UTIL] [1] [6] ⟍

Internal Frequency Selection		
	Horiz	Vert
1.	15.73	59.94
2.	31.47	59.94
3.	47.71	71.90
4.	62.50	66.67
5.	89.30	70.00
6.	126.84	60.00
7.	-	-
8.	-	-
9.	-	-

To make a selection, enter an item number or use ▲ and ▼ to move the cursor bar to the item you want then press ENTER. When a selection is made, a crosshatch test pattern is displayed. All subsequent adjustments are saved in the current setup memory. To select one of the projector's other test patterns, press #. Each press of # produces a different test pattern. To return to the current external source, press EXIT while only the test pattern is displayed.

[UTIL] [1] [7] **Auto Clamp (On/Off)**

It is sometimes necessary to turn the projector's automatic clamping circuits off when the input signal contains more than one sync type (e.g., both sync on green and composite sync). When more than one sync type exists, one or more of the red, green, and blue color components may be abnormally bright. In such a case, Auto Clamp should be set to Off. For standard input signals which contain only one sync type, Auto Clamp mode should set to On.

☞ To toggle the Auto Clamp mode, press ⑦ from the Source Setup menu. The new Auto Clamp setting will be stored in the current setup memory.

[UTIL] [1] [8] **Retrace (Short/Long)**

Retrace time affects the width and display of the picture. A short retrace time is desired if information is missing or "cut off" on both the left and right sides of the picture. A long retrace time may be required if the picture is significantly smaller than the screen.

☞ To change retrace time for the current setup, press ⑧ from the Source Setup menu. The menu indicates the current retrace setting.

Notes: 1) Check phase, left blanking, and right blanking from the Picture menu before changing retrace time. 2) Long retrace is not available for all frequencies.

⌨ ① ⑨ ***Decoder Options***

This utility allows you to control the operational modes of a video decoder installed in the projector.

☞ To modify decoder operation, press ⑨ from the Source Setup menu. The Decoder Options selection box is displayed. In the selection box, two selection columns are displayed: Standard and Signal Route. The Standard column specifies the decoding method for the current input. The Signal Route column specifies how the current input signal will be routed within the projector.

```
⌨ ① ⑨ ➙
┌─Decoder Options───────────────┐
│                               │
│  Standard     │ Signal Route  │
│  ────────       ────────────  │
│                               │
│ ✓Auto Detect  │✓Auto          │
│  NTSC 3.58    │ RGB           │
│  NTSC 4.43    │ Composite     │
│  PAL          │ S-Video       │
│  SECAM        │               │
│                               │
│  <ENTER> to select            │
└───────────────────────────────┘
```
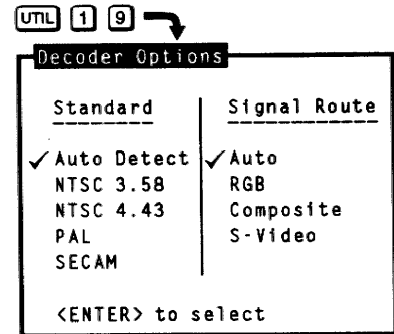
Move the cursor next to the option you want then press ⏎. A check mark (✓) is displayed to indicate your selection.

Standard Selection

The decoder has five operating modes: Auto Detect, NTSC 3.58, NTSC 4.43, PAL, and SECAM. Auto Detect is the default mode. When Auto Detect is on, the decoder automatically determines the video standard of the input signal and processes it accordingly. Alternatively, you can override this automatic standard detection and force the decoder to operate in one specific mode. Although this is usually unnecessary, you may need to do this for poor quality input signals.

Signal Route Selection

The signal routing column allows you to use interface modules in non-standard ways in association with the decoder. Four options are available: Auto, RGB, Composite, and S-Video. Auto is the default option. If set to Auto, the projector determines whether the input signal requires routing through the decoder according to the type of interface used. For example, if the source is an RGB input connected to the RGB interface, the signal will bypass the decoder since video decoding is not required. However, if the input is a composite signal connected to a Composite/S-Video interface, the projector will route the signal through the decoder for processing. If RGB is selected in the Signal Route column, the projector assumes the signal at the current input is always RGB and the decoder is bypassed. If Composite is the selected option, the projector assumes the input signal is composite video and processes it through the decoder. Likewise, if S-Video is selected, the projector expects the input signal in the form of separate Y and C signals.

One reason for overriding automatic mode is to allow connection of a composite or S-Video signal to a standard RGB interface and still have the projector process the input correctly through an installed decoder; otherwise, a Composite/S-Video interface would be required. Figure 3-8 illustrates the connection of a composite or S-Video signal to an RGB input (the projector's built-in RGB input is shown as an example).
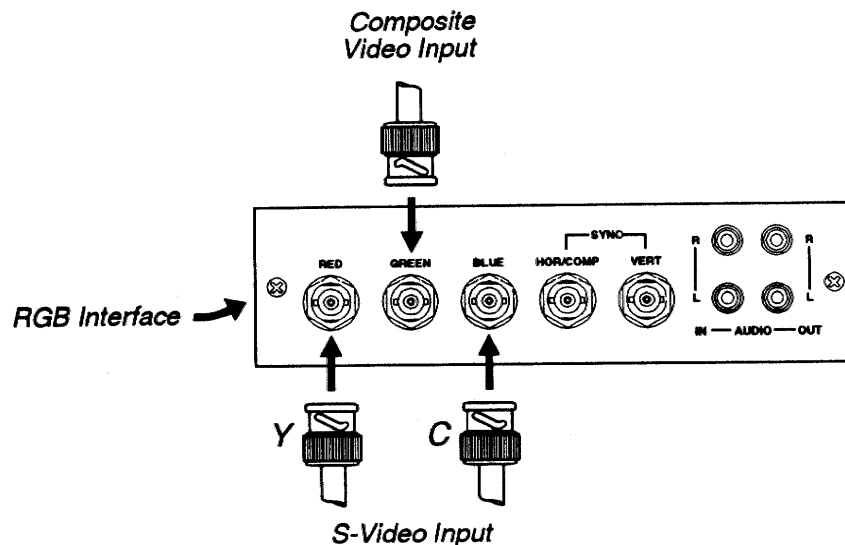
Figure 3-8. *Connection of Composite Video or S-Video to RGB Input*
(Decoder Option Required)

Channel List ▶ The Channel List utility allows you to display and program the projector's Channel List. The Channel List is a user-programmable list of sources and projector setups. Sources added to the list can be quickly switched to and displayed by entering their assigned two-digit channel number. Channels may also be selected using the keypad's up and down arrow keys. Channel selection is described in section 3.3, *Source Selection*.

To display and/or program the Channel List, press ② from the Utilities menu. The initial display shows the first ten channels in the list. Up to 99 channels can be displayed. For each channel, a name, switcher number, slot number, Recall memory number, and up/down list may be programmed.

☞ Program a channel as follows:

When the Channel List is first displayed, the cursor is positioned in the channel number column. While in the channel number column, press ⊕ and ⊕ to highlight the channel you want. Alternatively, you can highlight the channel you want by entering the channel number on the keypad. Entering the channel number also allows you to select/display/edit channels beyond the first ten.

Next, press ▶ to move the cursor to the name field. While in the name column, ▲ and ▼ change the character at the cursor position and ◀ and ▶ move the position of the cursor. Once a source name has been entered, move the cursor to the INPUT field by pressing ENTER or by using ▶. Edit the INPUT, RECALL, and UD fields. See below for field definitions. To exit the channel list, press RECALL or EXIT.

```
  ·
  ·     ↑
  C     |
  B     |
  A
space ▲
  9   ▼
  8
  7     |
  ·     |
  ·     ↓
```
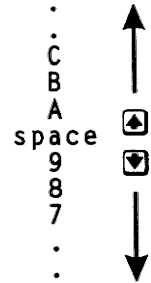
Note: When the cursor is positioned on a edit field, the field may be cleared by pressing ✱.

The Name Field

The Name field stores the names of the sources in the list. Source names may be up to 11 characters in length. It is recommended that source names be entered to make it easier to keep track of the sources. Source names are briefly displayed when channels are selected.

Notes: 1) Digits may be entered using the number keys on the keypad or selected using the ▲ *and* ▼ *keys. 2) If* ✱ *is pressed during name editing, all characters in the field to the right of the cursor will be cleared.*

The Input Field

The Input field contains the switcher and slot number of the input to be switched to when the channel is selected. If the input is a direct projector input, the input number is a 0 followed by the projector slot number. If the input is from a switcher, the input number is a number from 1 to 9 (switcher number) followed by the switcher slot number.

The Recall Memory Field

The Recall Memory field contains the number of the Recall memory to be used when the channel is selected. If the field does not contain a number (a blank or dash is shown), no Recall memory will be used.

The Up/Down Field (U/D)

The Up/Down field specifies the channels which are accessible when using up/down channel selection (explained in section 3.3). If the field does not contain a check mark, the channel is ignored. To enter a check mark, press a number key (0-9). To clear a check mark, press ✱.

Note: Channels should contain valid inputs. For example, do not specify switcher 1 if switcher 1 does not exist in the system.

Recall Memories ▶
(Listing)

The Recall Memories utility provides a list of the Recall memories stored in the projector. (Recall memories are explained in section 3.4). The list includes the scan frequencies of each Recall memory. A check mark (✓) is displayed in the ASR column next to the memories which ASR may use. If two or more Recall memories have identical scan frequencies, only the memory last adjusted will have a check mark. (ASR is explained in section 3.7, *Utility Features*.)

```
[UTIL] [3]
┌─Recall Memories───────────────────────────────────────┐
│ Re      Horiz    Vert   ASR │ Re      Horiz    Vert   ASR │
│ 01      31.50   60.00    ✓  │ 16     105.50   66.00    ✓  │
│ 02      50.80   66.00    ✓  │ 17      93.00   83.00    ✓  │
│ 03     110.00   71.90    ✓  │ 18      43.20   50.00    ✓  │
│ 04      45.56   75.00    ✓  │ 19      24.00   60.00    ✓  │
│ 05      50.00   60.00    ✓  │                             │
│ 06      67.50   70.00    ✓  │                             │
│ 07      55.00   60.00    ✓  │                             │
│ 08      54.00   66.00    ✓  │                             │
│ 09      69.10   71.90    ✓  │                             │
│ 10      31.50   60.00       │                             │
│ 11     110.00   60.00    ✓  │                             │
│ 12      94.00   70.00    ✓  │                             │
│ 13      96.50   66.00    ✓  │                             │
│ 14      54.00   71.90    ✓  │                             │
│ 15      28.75   75.00    ✓  │                             │
│ ✓ - can be used by ASR.                                 │
└─────────────────────────────────────────────────────────┘
```

To list the Recall Memories, press ③ from the Utilities menu. If more than 30 Recall memories exist, press [ENTER] to display the remaining memories.

Input Memories (Listing) ▶ The Input Memories utility provides a list of the Input memories stored in the projector. (Input memories are explained in section 3.4). The list includes the scan frequencies of each Input memory. The ASR column indicates if the ASR feature is on or off for each memory. A check mark (✓) is displayed in the ASR column next to the memories which may be chosen for use by ASI during an ASR. If two or more Input memories have identical scan frequencies, only the memory last adjusted will have a check mark. (ASR is explained in section 3.7, *Utility Features*.)

```
[UTIL] [4]
┌─Input Memories──────────────────────────────────────┐
│ SW SL  ASR    Horiz   Vert │ SW SL  ASR    Horiz  Vert │
│  0  2  On     35.50  60.00 │                            │
│  1  1  Off ✓ 110.00  70.00 │                            │
│  1  3  On  ✓  60.00  66.00 │                            │
│  1  2  On  ✓  35.50  60.00 │                            │
│  1  4  On  ✓  38.50  80.00 │                            │
│                                                        │
│                                                        │
│                                                        │
│                                                        │
│                                                        │
│                                                        │
│ ✓ - can be used by ASR/ASI.                            │
└────────────────────────────────────────────────────────┘
```

To list the projector's Input Memories, press ④ from the Utilities menu. If more than 30 Input memories exist, press [ENTER] to display the remaining memories.

Preferences ▶ The Preferences utility provides a selection box which allows you to set various preferences which affect the behaviour of the projector.

To display the Preferences selection box, press ⑤ from the Utilities menu. To make a selection, use the arrow keys to move the cursor to the option to be selected then press ⏎. A check mark (✓) is displayed to indicate your selection.

(Default preferences are shown.)

```
UTIL  S  ⟍

┌─Preferences──────────────────────────┐
│                                       │
│   Auto Power-up:      On  ✓Off        │
│                                       │
│  Screen                               │
│        Messages:   ✓On    Off         │
│                                       │
│  Source Switch                        │
│   Blanking Time:     0.0 sec   ✓ Auto │
│                                       │
│  Single Digit            Time         │
│   Channel Entry:    Imm   Out  ✓Off   │
│                                       │
│  <ENTER> to select                    │
└───────────────────────────────────────┘
```
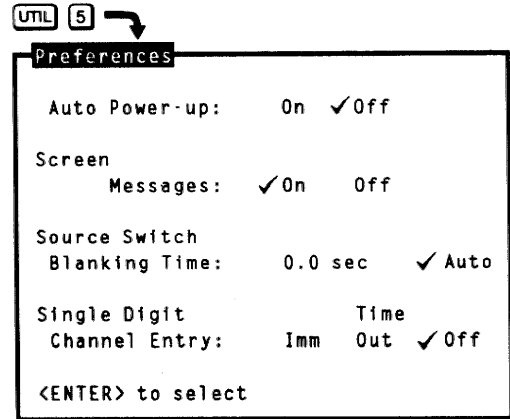
Auto Power-up

If Auto Power-up is set to On, the projector automatically powers itself up when line power is removed then re-applied. For example, if power is temporarily interrupted due to a lightening storm, the projector will automatically power itself back up when power returns. If Auto Power-up were set to OFF, the projector would require a manual power-on.

Note: Upon automatic power-up, the most recent display adjustments may be lost if they were not yet saved in the current setup memory.

Screen Messages

The Screen Messages preference allows you to choose whether screen messages will be displayed. Screen messages include slidebars, error and warning messages, the SOURCE, RECALL, PROJ and MUTE messages, and the PIC and GEOM menus. For most applications, it is recommended that Screen Messages be left on. However, if during a presentation you want to make subtle display adjustments without drawing attention to your actions, Screen Messages should be set to Off.

Note: It is still possible to display a screen message, such as a slidebar, while Screen Messages is set to Off. To do this, press RECALL just after selecting the function.

Source Switch Blanking Time

When a source is selected, the projector blanks the screen for a short period of time. The amount of blanking time required can vary depending on the source being switched. To have the projector automatically set the blanking time, select Auto (default). To set the blanking time yourself, position the cursor on the time field next to "Blanking Time:". Enter two digits. The first digit is "seconds" and the second digit is "tenths of a second". Blanking time can be from 0.0 to 9.5 seconds in 0.5 second increments (only "0" and "5" are accepted for the second digit). Once blanking time is entered, press ⏎ to place a ✓ next to the time value.

Single Digit Channel Entry

There are three different ways the projector can respond to channel numbers entered during direct channel selection. If Single Digit Channel Entry is set to Off, two digits must always be entered to select a channel, even for channels 1 to 9. Thus if only one digit is entered, the projector waits for the second digit. If the second digit is not entered within 5 seconds, the channel is considered invalid.

Alternatively, you can set the projector to allow single digit channel entry. One of two modes can be selected:

"Imm" - The projector responds immediately to the first digit entered. This means that only channels 1 to 9 can be selected.

"Time Out" - The projector accepts either one or two digits. If a single digit is entered and a second digit is not entered within five seconds, the projector selects the single digit channel number. If a second digit is entered before the 5 second time-out, both digits are accepted.

Remote Control ▶
Options

Remote Control Options allow you to modify the projector's communication settings for operation with remote keypads and control devices.

To select the Remote Control Options menu, press ⑥ from the Utilities menu. Two selection items are displayed: Keypad Options and Projector Setup.

```
[UTIL] [6] ⤷
┌─Remote Control Options─┐
│                        │
│ 1. Keypad Options      │
│ 2. Projector Setup     │
└────────────────────────┘
```
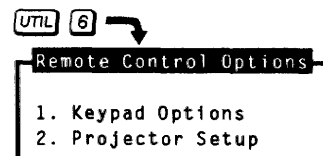
Keypad Options

Press ① from the Remote Control Options menu to display the Keypad Options selection box. This allows you to select which types of keypads and the IR protocol the projector will respond to.

IR Sensor

When this option is set to Off, the IR sensor built in to the projector is disabled.

Remote Jack

When this option is set to Off, the Remote Jack on the rear panel of the projector is disabled. When enabled, the Remote Jack can accept input from a wired keypad or a remote IR sensor.

Note: The built-in keypad is always active.

```
[UTIL] [6] [1] ⤷
┌─Keypad Options──────────┐
│                         │
│   IR Sensor:  ✓ On   Off│
│ Remote Jack:  ✓ On   Off│
│                         │
│    Protocol:  ✓ A    B  │
│                         │
│ <ENTER> to select       │
│ WARNING:                │
│ If both IR sensor and remote│
│ jack are disabled, only the │
│ built-in keypad can be used │
│ to re-enable.               │
└─────────────────────────┘
```
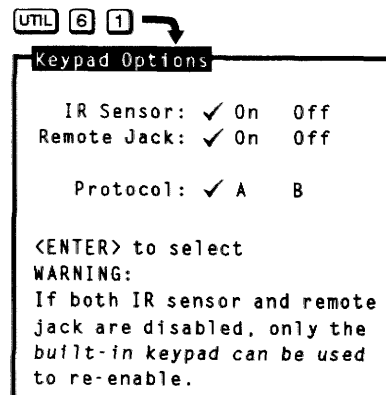
Protocol

To allow two projectors in the same room to be independently controlled by separate IR remote keypads, the projector accepts two different IR keypad transmission protocols: A and B. The default protocol is "A" which matches the protocol A remote keypad supplied with the projector. If an optional protocol B remote keypad is to be used with the projector, the protocol selection in the Keypad Options selection box must be set to "B". See Figure 3-9.

Warning: If you accidentally modify the IR protocol setting, you may have to use the built-in or a wired remote keypad to correct the setting.

Protocol A   Protocol B
IR Keypad   IR Keypad

This projector has   This projector has
protocol "A" set in the   protocol "B" set in the
Keypad Options selection box.   Keypad Options selection box.
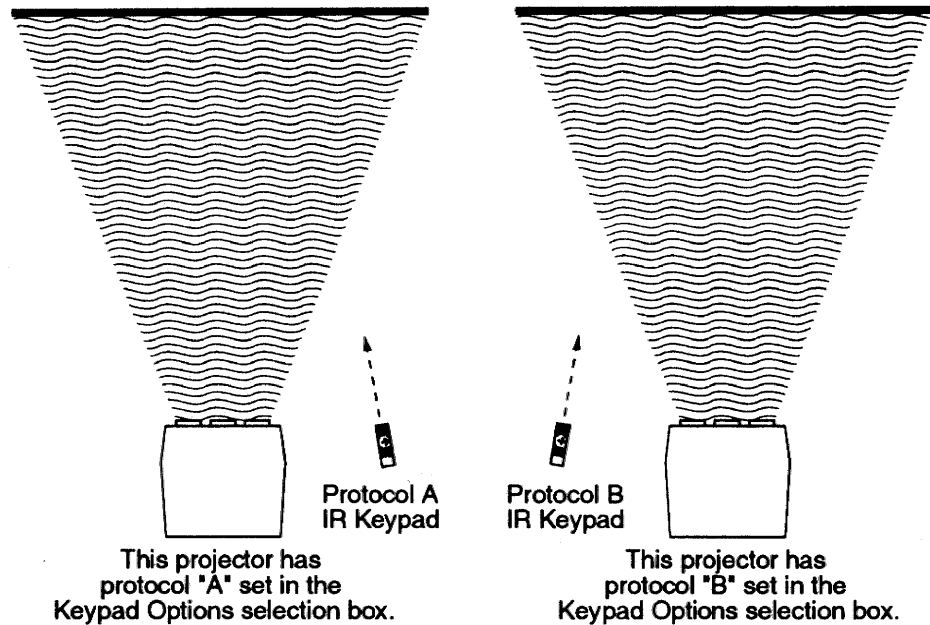
Figure 3-9. *Independent IR Keypad Control*

Projector Setup

Press ② from the Remote Control Options menu to set the projector identification number and the RS-232 serial port baud rate.
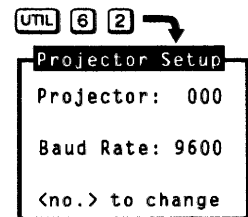
Projector Identification Number

The projector's identification number allows IR remote control of a single projector in a multi-projector installation. To set the projector identification number, enter a three digit number from 000 to 999. If there is only one projector in the installation, 000 is the recommended projector number.

For more information about multi-projector control, refer to section 3.8, *Multi-projector Functions*.

Serial Port Baud Rate

The RS-232 serial port, located at the back of the projector, provides a means to control the projector using a computer or another projector. The serial port baud rate setting must match the operating baud rate of the controlling device. Baud rate may be set to 300, 600, 1200, 2400, 4800, or 9600. To set the baud rate, move the cursor to the baud rate field in the selection box then use ENTER to scroll through the various rates.

Notes: 1) If unsure of your computer's baud rate setting, refer to the system documentation provided with the computer. 2) For information about cable connections between devices, refer to Appendix D.

3.8 Multi-projector Functions

In a multi-projector installation, it is usually desired to have a single IR keypad control all the projectors in the system. This section explains the special control functions available for such installations.

The Projector ▶ Function

The Projector function allows you to select which projector in a group will respond to IR keypad commands. To use this function, each projector in the installation must first be assigned a unique projector number. Projector numbers are assigned through the Projector Setup selection box which is accessed by pressing UTIL ⑥ ② on the built-in keypad or a wired remote keypad. Once each projector has its own unique projector number, projectors in the installation can be individually controlled using the same IR keypad.

☞ To select a projector to solely respond to commands from the IR keypad, press PROJ followed by the projector's identity number. The specified projector will be the only projector which will respond to the keypad. To enable ALL projectors to listen to the IR keypad, press PROJ ✱.

Note: One, two, or three digits may be entered for the projector number. Response is immediate if all three digits are entered (i.e., 001). Otherwise, leading zeros are assumed after a five second time-out. ENTER can also be used when less than the full three digits are entered. For example, PROJ ② ENTER immediately selects projector 002 for control.

Maintenance

4.1 Warnings and Guidelines

The *Marquee* projection system is CSA approved and is designed for safe and reliable operation. However, safe operation cannot simply be assured by design; the installers, maintainers, and users must maintain a safe operating environment for the system. This section covers warnings and guidelines which promote the safe usage of the projector. Please read through and understand these warnings and guidelines.

Labels and Markings ▶ Observe and follow all warnings and instructions marked on the projector.

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.

Projector Location ▶ Operate the projector in an environment which meets the operating range specifications in Section 5. Do not operate the projector close to water — for example, near a swimming pool.

Do not place the projector on an unstable cart, stand or table. If the projector is to be ceiling mounted, only use an Electrohome approved ceiling mount fixture.

The projector and cart combination should be used with care. Quick stops, excessive force, and uneven surfaces may cause the projector and cart combination to overturn.

Power Cord and Attachments ▶ Only use attachments or accessories recommended by Electrohome. Use of others may result in the risk of fire, shock or personal injury.

Do not allow anything to rest on the power cord. Locate the projector where the cord cannot be abused by persons walking on it or objects rolling over it.

Operate the projector at the voltage indicated on the line voltage indicator. Do not overload power outlets and extension cords as this can result in fire or shock hazards.

The projector is equipped with a three wire plug having a third (grounding) pin. **This is a safety feature.** If you are unable to insert the plug into the outlet, contact an electrician to have the outlet replaced. Do not defeat the safety purpose of the grounding-type plug.

Ventilation Slots ▶ Slots and openings in the projector provide ventilation. To ensure reliable operation of the projector and to prevent overheating, these openings must never be blocked or covered. The projector should never be placed near or over a radiator or heat register. The projector should not be placed in an enclosure unless proper ventilation is provided.

Do not push objects of any kind into the projector through the ventilation openings. They may touch dangerous voltages or short-out parts resulting in a fire or shock hazard. Do not spill liquids of any kind into the projector. Should an accidental spill occur, immediately unplug the projector and have it serviced by a qualified service technician.

Servicing ▶ If any of the following conditions exist, unplug the projector from the power outlet and refer service to qualified service personnel.

- □ The power cord has been damaged.
- □ Liquid has been spilled into the projector.
- □ The projector has been exposed to excessive moisture.
- □ The projector does not operate normally.
- □ The projector has been dropped or the case has been damaged.
- □ Projector performance has deteriorated.

Do not attempt to service the projector yourself. All servicing must be performed by a qualified Electrohome service technician. If replacement parts are required, it is important that only Electrohome approved parts are used. Other parts may result in fire, electric shock or risk of personal injury.

WARNING: The projector is internally shielded to protect the user from exposure to soft x-ray radiation. Improper servicing or shield removal may result in personal injury.

4.2 Cleaning

Clean the projector when required. 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.

4.3 Trouble-shooting

If the projector is not operating properly, note the symptoms of the problem and use the following guide to assist you. If you cannot resolve the problem yourself, contact your dealer for assistance.

Projector Response ▶
Problems

Refer to the following if the projector is not responding to keypad commands.

Symptom: The projector will not turn on when [POWER] is pressed. All back panel lights are off. See Figure 4-1 below.

Cause/Remedy: 1) The power cord may be disconnected. Check the power cord connection at the wall outlet and the projector.

```
                                    ┌ DIAGNOSTICS ┐
                                    |             |
                                    ERROR EHT  V.FAIL
                                    | LVPS | H.FAIL |  C
              POWER  STANDBY        |      |        |  |
               O       O            O O O O  O O
```
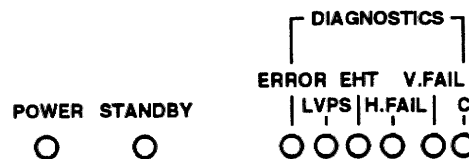
Figure 4-1. *Rear Panel LEDs*

Symptom: The projector will not turn on when [POWER] is pressed. Only the amber *Standby* LED on the back panel is lit.

Cause/Remedy: 1) [POWER] may not have been held down long enough to initiate projector power-up. Hold down [POWER] for at least one second to initiate power-up.
2) If using an IR keypad, ensure it is pointed at the screen or the front of the projector.
3) If using an IR keypad, the battery may need replacement. If required, remove the battery from the battery compartment on the back side of the keypad, and install a new battery as described in the section 2.3.
4) The keypad may be damaged. If the back panel *C* LED does not flash when [POWER] is pressed, the projector is not responding to the keypad. Try using a different keypad.

Symptom: The projector will not turn on when [POWER] is pressed. One or more of the following red LEDs are lit: *ERROR, LVPS, EHT, H.FAIL, V.FAIL.*

Cause/Remedy: 1) An internal failure has occurred. Projector servicing may be required. Contact your dealer or Electrohome for assistance.

Symptom: The projector's green *Power On* LED is lit and all other LEDs are off yet no picture is displayed.

Cause/Remedy: 1) Contrast or brightness may be set too low. Press ✱ to activate the status screen. If there is no display, press ✱ then increase contrast ([CONT]) and brightness ([BRITE]) until the crosshatch is displayed. Adjust contrast and brightness to their proper settings.

2) The room lighting may be too bright. Lower the intensity of the room lighting. Reduce light reflections as much as possible.
3) The projector may be too far from the screen. Move the projector closer to the screen. The maximum projector-to-screen distance is 25 feet.
4) Were the lens covers accidentally left on? Remove the lens covers.

Symptom: While in use, the projector suddenly become non-responsive to keypad commands, even when using the built-in keypad.

Cause/Remedy: 1) Although rare, it is possible that an internal software error occurred which has put the software in a non-ending loop. This might occur if a power spike interfered with the projector's internal processor system.

To fix this problem, leave the projector plugged in and using a small screw driver or ball point pen, press the recessed RESET button on the back panel. This operation will reset the projector's processor without affecting memories or display settings.

Symptom: The projector does not respond to the STBY or MUTE keys.

Cause/Remedy: 1) You may not be holding down the key long enough to initiate the action. Like POWER, STBY and MUTE must be pressed down for at least one second.

Symptom: The projector does not respond to the IR Remote keypad.

Cause/Remedy: 1) The projector's IR keypad listening status may be turned off. Press PROJ ✳ to turn on the listening status of all projectors, or press PROJ followed by the projector's identity number to turn on the listening status of the projector you want to respond.
2) The protocol type (A or B) of the keypad may not match the projector's IR protocol setting. Using the built-in keypad, press ✳ to display the first projector status screen. The projector's IR protocol setting is shown. If it does not match the keypad protocol, change the protocol setting. (See section 3.7, *Utility Features*).
3) The IR keypad may be too far away from the projector or screen. Use the IR keypad closer to the projector or screen. Also ensure the keypad is pointed directly at the screen or the front of the projector.
4) The viewing path between the IR keypad and the projector (or screen or switcher) may be restricted. Ensure there is a clear line-of-sight between the keypad and the projector (or screen or switcher).

5) The IR sensor may be disabled per the Keypad Options menu (⬚UTIL ⬚6 ⬚1).

6) The battery in the IR keypad may be weak. Replace the battery in the keypad. See section 2.3 for battery installation instructions.

7) There may be unusual lighting conditions in the room which effect IR keypad operation. Determine if such conditions exist and correct.

Display Problems ▶

Symptom: The display is jittery or unstable.

Cause/Remedy: 1) The horizontal or vertical scan frequency of the input signal may be out of range. Check the specifications in Section 5 for projector scan frequency ranges.

2) Synchronization signals from the source may be inadequate. Correct the source problem.

3) The input signal type may not match the signal type required by the input module. Install the correct input module/interface to match the signal type of the source.

Symptom: The upper portion of the display is waving, tearing, or jittering.

Cause/Remedy: 1) This sometimes occurs when the source is a VCR or video signal. Change the sync mode by selecting the fast/slow sync option from the Picture Adjust menu (⬚PIC ⬚5).

Symptom: The upper or lower portions of the display are cut off.

Cause/Remedy: 1) A top or bottom blanking adjustment may be required. Select the appropriate blanking adjustment option from the Picture Adjust Menu (⬚PIC) then adjust the amount of blanking. *Note: A 0% slidebar level indicates no blanking.*

2) A phase adjustment may be required. Select Phase from the Picture Adjust menu (⬚PIC) then adjust phase so that the entire picture is visible and centered.

Symptom: One side of the display is cut off.

Cause/Remedy: 1) A left or right blanking adjustment may be required. Select the appropriate blanking adjustment option from the Picture Adjust menu (⬚PIC) then adjust the amount of blanking. A 0% slidebar level indicates no blanking.

2) A phase adjustment may be required. Select Phase from the Picture Adjust menu (⬚PIC) then adjust phase so that the entire picture is visible and centered.

3) The retrace time of the projector may be longer than the horizontal blanking time of the signal. Press ⬚UTIL ⬚1 ⬚8 to change projector retrace time to Short.

Symptom: Transitions between colors are fuzzy.

Cause/Remedy: 1) Convergence may require adjustment. Perform a convergence on the selected source.

2) The projector may not be optically aligned for the installation. Has the projector-to-screen distance changed significantly since the last optical alignment? If so, have the projector re-aligned. Refer to section 2.8, *Optical Alignment*.

Symptom: The display is very faint.

Cause/Remedy: 1) Contrast or brightness settings may be set too low. Adjust contrast and/or brightness.

2) The projection room may be too bright. Lower the intensity of projection room lighting. Reduce light reflections as much as possible.

3) The projection room walls and ceilings may be too reflective. Reflective ceilings, walls, and floors should be kept to a minimum. The best projection rooms are dark with matte finishing.

4) The projector may be too far from the screen. Move the projector closer to the screen.

5) The location of the audience with respect to the screen may not be adequate. Make sure the audience is within the viewing angle set by the projector and screen position, and the screen type.

6) The phase setting may require adjustment. Select Phase from the Picture Adjust menu ([PIC]) then determine if adjusting the phase improves the display.

7) The source may be double terminated. Ensure the source is terminated (75Ω) only once.

Symptom: The display appears to be folded.

Cause/Remedy: 1) The phase setting may require adjustment. Select Phase from the Picture Adjust menu ([PIC]) then determine if adjusting the phase improves the display.

Symptom: The display is reversed or upside down.

Cause/Remedy: 1) The projector scan configuration is not set correctly for the installation type. Refer to section 2.3, *Hardware Setup*, to set the projector's scan configuration.

Symptom: The display is not sharp or "clean".

Cause/Remedy: 1) Display adjustment may be required. Adjust the brightness, contrast, focus, and detail settings.

2) Is a BNC T connector being used? Use a distribution amplifier to boost signal levels.

3) Is the input signal properly terminated?

4) The screen size may be too large. As screen size increases, magnification increases which reduces brightness. This then reduces the contrast ratio which affects legibility. Sharp defined edges become soft and fuzzy.

5) The source input signal may be of low quality.

Symptom: Display quality seems to drift (from good to bad, bad to good, etc.).

Cause/Remedy: 1) The operating temperature of the projector may not be constant. Is the projector close to heating and/or air conditioning vents? The ambient temperature after warm-up should be kept constant below 35 °C (95 °F). Make sure none of the projector ventilation slots are obstructed.

2) The source input signal may be of low quality.

3) The horizontal or vertical frequency of the input may have changed at the source end. For the selected source, set ASR to on. The projector will then try to use display parameter settings which are best matched for the source.

Symptom: Colors on the display are not accurate (when using a video decoder).

Cause/Remedy: 1) Color and tint settings may require adjustment.

Symptom: The display is not rectangular in shape.

Cause/Remedy: 1) The geometry settings may not be set correctly. Adjust the display geometry settings. (Press GEOM for the Geometry menu).

Symptom: The display is "noisy".

Cause/Remedy: 1) The input may not be terminated. Make sure the input is terminated (75 Ω). If it is the last connection in a loop-through chain, it should be terminated at the projector (only).

2) The signal cables carrying the input signal may be of poor quality. Use only good quality signal cables. Electrohome cables are recommended.

3) The distance between the input source device and the projector may to too great. If the distance between the input source device and the projector is greater than 25 feet, signal amplification/conditioning may be required.

4) There may be interference from other equipment. Keep the projector away from devices which radiate electromagnetic energy such as motors and transformers. Common sources of these are slide projectors, speakers, power amplifiers, elevators, etc. Keep 35 mm slide projectors at least 2 feet away from the projector.

5) The input signal may be of poor quality.

6) If the source is a VCR or off-air broadcast, detail may be set too high.

Symptom: Modified display settings are not being saved in the active setup memory.

Cause/Remedy: 1) Is the active setup memory locked? Press ⌜SOURCE⌝ to display the Source Message. If a ⌐π is displayed, unlock the setup. (Press ⌜UTIL⌝ ⌜1⌝ ⌜3⌝.)

2) ASR is set to On for the current input memory and an ASI was automatically performed due to mismatched scan frequencies.

Symptom: The display is OK when displaying the crosshatch test pattern (⌸) or status screen (⌗) but when trying to display a source, nothing is visible.

Cause/Remedy: 1) You may not be selecting the source correctly. Refer to section 3.3, *Source Selection*, for source selection instructions.

2) The source may not be connected properly. Verify that the input source is active and check the cables between the source and the projector.

Specifications

5.1 Specifications

Marquee 8000.

Note: Due to constant research, specifications are subject to change without notice.

Optics ▶
- High definition F1.1 hybrid lens
- 10 line pairs per mm
- 8" electromagnetic focus CRTs
- Scheimpflug adjustment for top, bottom, and side to side focus

Resolution ▶
- 2500 x 2000 addressability
- 1350 x 1100 ANSI pixels

Brightness ▶
- Usable brightness per industry standard 175 ANSI lumens

Display ▶
- Electronic geometry circuits separately correct top, bottom and sides for flat, curved or rear screens from 6 to 25 feet diagonal
- Keystone circuitry to correct pictures for angles up to $\pm 15°$ vertically from screen axis
- Color temperature adjustment for precise setup
- S and C vertical linearity
- Top, bottom and side blanking

Video Circuits ▶

Input
- Input Level: 0.5 to 1.0 volts p-p, 75Ω $\pm$ 1% terminated
- Automatically switches to separate sync, composite sync, or sync on green
- Separate sync is automatically accepted in either polarity

Frequency Response ▶
- 100 MHz bandwidth (-3 dB)
- Accommodates 4 nanosecond pixels and digital clock rates over 250 MHz

DC Restoration ▶
- Keyed clamp, better than 1%

Geometry Distortion ▶
- Horizontal: 1.0% maximum
- Vertical: 1.0% maximum

Deflection Circuits ▶   □ Smartlock™ circuitry for quick lock in and ultra steady images

Vertical Deflection

□ Frequency Range: 45 Hz to 150 Hz autolock
□ Size automatically regulated over frequency range and adjustable from 15% underscan to 10% overscan
□ Retrace Time: less than 300 microseconds

Horizontal Deflection

□ Frequency Range: 15 kHz to 130 kHz autolock
□ Size automatically regulated over frequency range and adjustable from 15% underscan to 10% overscan (less above 90 kHz)
□ Retrace Time: 2.1 to 6.0 microseconds

High Voltage ▶   □ 34 KV regulated to better than ± 1%

Power Requirements ▶   □ 90 VAC to 264 VAC auto switched
□ Line Frequency: 50 to 60 Hz nominal
□ Power: 650 watts maximum
□ Power factor corrected

Inputs ▶   □ Built-in RGB input. Optional interface modules install in interface slot.
□ Built-in RS-232 for computer control, with loopthru for connection of multiple projectors.

Optional Source Expansion ▶   □ The Electrohome Signal Switcher allows use of 9 additional input modules. Up to nine switchers can be connected.
□ Maximum Number of Inputs: 78

Control Features ▶   □ Menu driven interface with on-screen help
□ Built-in set up tutorials
□ Auto power up after power interruption
□ Built-in test patterns
□ Internal frequency generator

Servicing ▶   □ Modular design provides ease of servicing
□ Most service adjustments are made using the keypad

Environment ▶

Maximum Operating Range

□ Temperature: 0 to 35°C
□ Humidity: 0 to 90% non-condensing
□ Altitude: 0 to 3000m (0-10,000 ft.)

Storage

□ Temperature: -30°C to 65°C

Heat Dissipation

□ 2450 BTU/Hr (approximate)

Mounting ▶   □ The Marquee 8000 can be ceiling mounted on its optional ceiling mount or placed on a castered cart for portable applications.

Weight ▶   □ 139 lbs / 63 kg
              □ 199 lbs / 90.3 kg (shipping weight)

Accessories ▶   □ IR remote control keypad
Included   □ Built-in, full function keypad
              □ Tool Kit
              □ User's manual

Regulatory ▶   □ Meets FCC Class A, DHHS and HWC requirements
Approvals   □ IEC 950 / CSA C22.2

Warranty ▶   □ One year parts and labour (see back inside cover)

Physical ▶
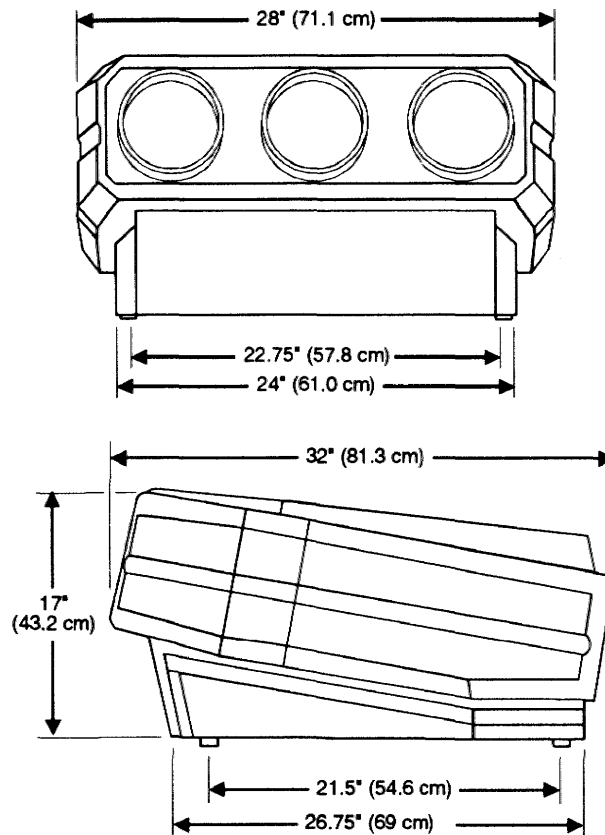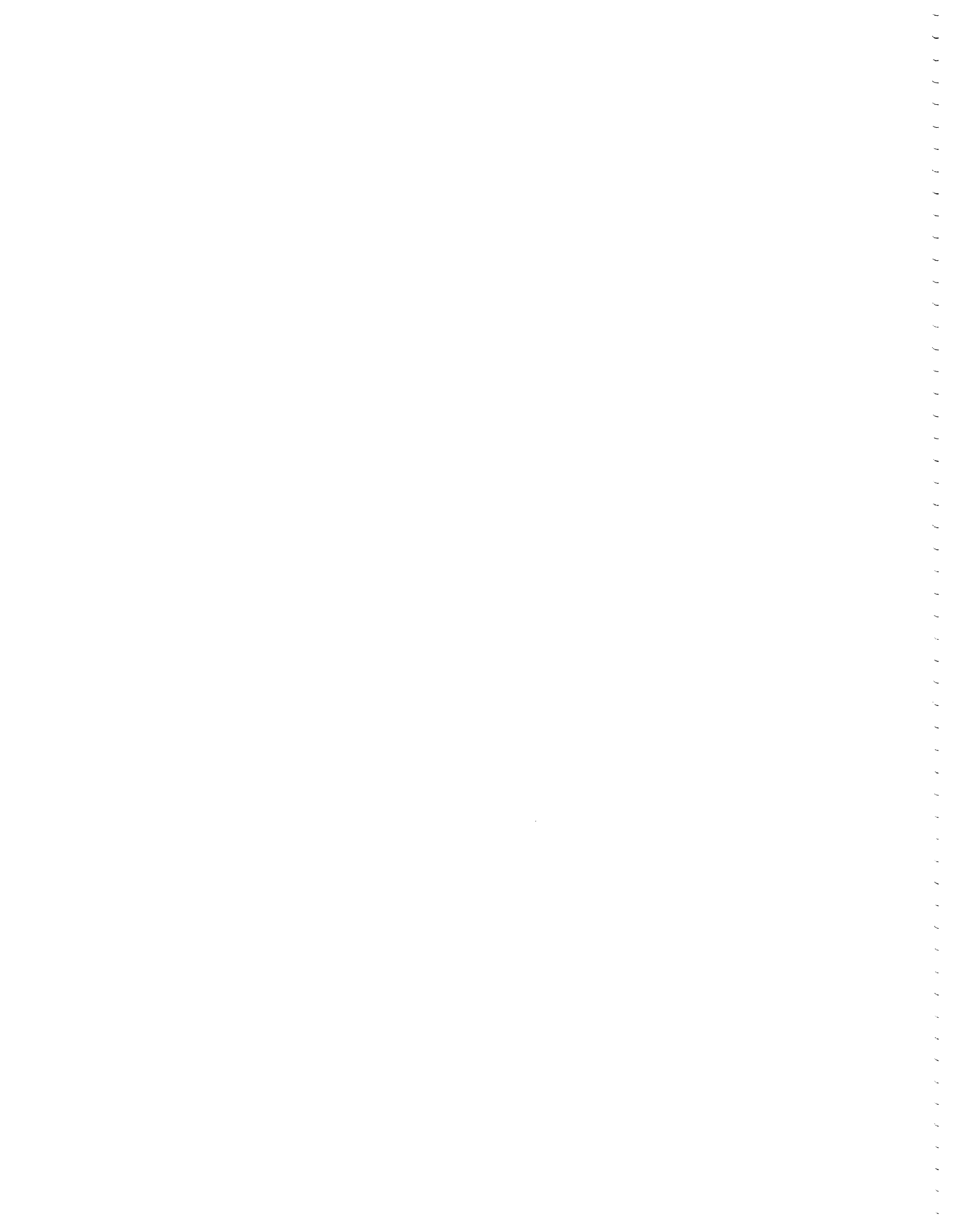
Glossary

This appendix defines many of the terms used in this manual as they apply to the *Marquee* projection system.

ASI (Automatic ▶ A process whereby a display setup for a given source is approximated from
Source Interpolation) other setups already in memory. For more information about ASI, refer to
the ASR entry in section 3.7, *Utility Features*.

ASR (Automatic ▶ A process whereby a display setup for a given source is chosen from memory
Source Recall) according to it's signal parameters (horizontal and vertical frequencies). For
more information about ASR, refer to the ASR entry in section 3.7, *Utility
Features*.

Active Line Time ▶ The time, inside one horizontal scan line, during which video is generated.

Ambient Light ▶ The ability of a screen to reflect ambient light in a direction away from the
Rejection "line of best viewing". Curved screens usually have good ambient light
rejection. Flat screens usually have less ambient light rejection.

Analog Video ▶ The video output of most computers and video tape machines. Analog video
can generate a large number of colors.

Aspect Ratio ▶ The ratio of the width of an image to its height.

Autolock ▶ The ability of the projector to automatically synchronize to the horizontal and
vertical scan frequencies of an input signal.

Bandwidth ▶ The frequency range of the projector's video amplifier.

Blanking Time ▶ The time inside one scan line during which video is not generated. The
blanking time of the input signal must be equal to or greater than the retrace
time of the projector.

Bow ▶ The convex or concave curve of the horizontal scan lines in the center of the
image.

Brightness ▶ Brightness in projection usually describes the amount of light emitted from a
surface such as a screen. Brightness is measured in lumens, foot-lamberts,
foot-candles, or lux.

Candela or Candle ► The intensity of light is measured in candelas.

Channel ► A 2-digit number with user-assigned source input information. This information includes a physical input (switcher, slot), a setup memory (input or recall), and a name or description. Assignments are made through the Channel List.

Channel List ► A list of up to 99 channels (explained above) which may be created, edited, or deleted by the user. The Channel List feature provides an alternative, and sometimes easier, way to select sources and their setups.

Color Shift ► The change in the tint of a white field across an image.

Color Temperature ► This term refers to the coloration (reddish, white, bluish, etc.) of a white image. (It does not refer to the brightness of a white image.) The Kelvin (K) temperature scale is used to measure color temperature.

Composite Video ► This term refers to the output of video tape players and some computers. Synchronization, luminance, and color signals are combined on one output cable.

Contrast (ratio) ► The ratio of brightness of the brightest possible area to the darkest possible area of an image.

Convergence ► The alignment of the projected red, green and blue images on the projection screen.

Current Setup Memory ► The setup memory which is currently being used to display a given source's image.

Curved Screen ► A projection screen which is curved to improve screen gain. Curved screens usually have screen gains which are greater than 1 but viewing angles much less than 180°.

Decoder ► A device that converts NTSC, PAL, SECAM or NTSC 4.43 video to RGB video.

Diffused Screen ► A type of rear-projection screen which spreads the light striking it. Screen gain is less than 1 but audience viewing angles are increased.

Display Setting ► The level of a display adjustment. Some display adjustments are: Contrast, Brightness, Blanking, Bow, Size, Keystone, Pincushion, Focus and Convergence.

Flicker ► A rapid variation in brightness created when the frame rate is too slow. (See also Interlace.)

Frame Rate ► The frequency at which complete images are generated. For non-interlaced signals, the frame rate is identical to the vertical frequency. For interlaced signals, the frame rate is one half of vertical frequency.

Foot-candle ➤ The intensity of visible light per square foot.

1 foot-candle = 1 lumen/square foot = 10.76 lux

Foot-lambert ➤ The luminance (brightness) which results from one foot-candle of illumination falling on a perfectly diffuse surface.

Gain or Screen Gain ➤ The ability of a screen to direct incident light to an audience. A flat matte white wall has a gain of approximately 1. Screens with gain less than 1 attenuate incident light; screens with gain more than 1 direct more incident light to the audience but have a narrow viewing angle. For example: An image reflecting off a 10 gain screen appears 10 times brighter than it would if reflected off a matte white wall. Curved screens usually have larger gain than flat screens.

Geometry ➤ The reproduction of a straight and rectangular image.

Help Page ➤ A display of help information on the projection screen.

Horizontal Frequency ➤ Also called horizontal scan rate or line rate, this is the frequency at which scan lines are generated. Horizontal frequencies vary amongst sources.

Hot Spot ➤ A circular area of a screen where the image appears brighter than elsewhere on the screen. The hot spot always appears located along the line of sight and "moves" with the line of sight. High gain screens and rear screens designed for slide or movie projection usually have a hot spot.

Input ➤ A physical connection route for a source signal defined by two numbers; a *switcher number* and a *slot number*. If the switcher number is 0, the input is a projector input.

Input Memory ➤ A setup memory which is associated with a particular projector or switcher input.

Interface ➤ A device that accepts an input signal for display by the projector.

Interlace ➤ A method used by video tape players and some computers to double the vertical resolution without increasing the horizontal line rate. If the resulting frame rate is too low, the image may flicker depending on the image content.

Keypad ➤ A device which allows the user to control projector settings and operation. There are four different keypads which may be used with the projector: the Built-in Keypad, the IR Remote Keypad, the Wired Remote Keypad, and the Presenter's Keypad. For more information about these keypads, refer to the keypads entry in section 3.2, *Projector Basics*.

Keystone ➤ A distortion of the image which occurs when the top and bottom borders of the image are not equal in length. Side borders slant in or out, producing a keystone shaped image.

Linearity ▶ The reproduction of the horizontal and vertical size of characters and/or shapes over the entire screen.

Line of Best Viewing ▶ When light from a projector is incident on a screen, the light reflects from the screen such that the angle of reflection equals the angle of incidence. The Line of Best Viewing is along the line of reflection.

Loopthrough (Loopthru) ▶ The method of feeding a series of high impedance inputs from a single video source with a coaxial transmission line in such a manner that the line is terminated with its characteristic impedance at the last input on the line.

Lumen ▶ The amount of visible light emitted by a light source is measured in lumens.

Lux ▶ The amount of visible light per square meter incident on a surface.

1 lux = 1 lumen/square meter = 0.093 foot-candles

Menu ▶ A list of options which are displayed on the screen for selection by the user.

NTSC Video ▶ A video output format of some video tape and disk players. There are two types of NTSC video: NTSC 3.58 and NTSC 4.43. NTSC 3.58 is used primarily in North America and Japan. NTSC 4.43 is less commonly used.

Optical Screen ▶ A type of rear-projection screen which re-directs light through the screen to increase image brightness in front of the screen. Screen gain is usually greater than 1 but audience viewing angles are reduced.

PAL Video ▶ A video output format of some video tape and disk players (used primarily in Europe).

Pincushion ▶ A distortion of the image which occurs when the borders are concave or convex.

Pixel (Picture Element) ▶ The smallest discernable element of a computer generated image.

Presentation Level ▶ The projector is at presentation level when an image is (or may be) displayed and no control, dialog, error, or help messages are displayed. For example, if a help page is displayed, the projector is not at presentation level.

Projector-to-Screen Distance ▶ Also called "Throw Distance", the distance between the front of the projector's green lens and the screen.

Protocol ▶ The type of code format utilized by IR keypad(s). The standard code is Protocol A. By using two different protocols, two projectors may be used side by side while being controlled independently by their remote IR keypads.

Rear Screen ▶ A translucent panel for screen projection. Incident light travels through the incident surface of a rear screen and forms an image on the other surface.

Recall Memory ▶ A setup memory which is not associated with any particular input.

Resolution of the CRT ▶ The maximum number of lines that can be distinguished on the face of a CRT.

Resolution of the Lens ▶ The maximum number of alternate white and black horizontal lines that can be distinguished on a screen when a photographic target is placed between the lens and a light source, and illuminated by that light source.

Resolution of the Projector ▶ The smaller of CRT and Lens resolutions.

Retrace Time ▶ The minimum time required for the projector to move the position of the scanning spot from the right edge to the left edge of a CRT.

Rise Time ▶ The time required by the video amplifier of the projector to increase its output from 10% to 90% of the maximum value.

RGB Video ▶ The video output of most computers. It can be analog or digital. Analog RGB video has 3, 4, or 5 wires; one for red, one for green, one for blue, and none, one or two for sync. For three wire RGB, the green wire usually provides sync. (See also TTL Video).

Scan Frequency ▶ The horizontal or vertical frequency at which images are generated.

Scan Line ▶ One scan line is one horizontal line on the display.

SECAM ▶ A video output format of some video tape and disk players (used primarily in France).

Setup Memory ▶ A projector memory which stores user-adjustable display settings. There are two types of setup memories: *Input* and *Recall*. Both memory types store the same parameters. The only difference is that Input memories store display settings for a particular physical input (i.e., switcher 0, slot 1) and Recall memories can be used with any input.

Slidebar ▶ A slidebar is a graphical display of an adjustment setting. The setting is displayed on a percentage scale.

Source ▶ A device, such as a computer or VCR, which may be connected to the projector for display.

Spot Size ▶ The diameter of the smallest dot that can be generated on the face of a CRT.

Sync ▶ This term refers to the part of the video signal that is used to stabilize the picture. Sync can take three forms:
1) "Composite sync" when the horizontal and vertical components are together on one cable.
2) "SYNC on green" when the sync is part of the green video.
3) "Separate sync" or "H.SYNC and V.SYNC" when the horizontal and vertical components of the sync are on two separate cables.

Sync Width ▶ The duration of each sync pulse generated by a computer. The sync width is part of the blanking time.

TTL Video ▶ A type of RGB video. It can generate a specific limited number of colors (8, 16 or 64).

Terminated ▶ A wire connecting a single video source to a display device, such as a projector, must be terminated by a resistance (usually 75Ω for video).

Throw Distance ▶ Also called "Projector-to-Screen Distance", the distance between the front of the projector's green lens and the screen.

Variable Scan ▶ The ability of a projector to synchronize to inputs with frequencies within a specified range.

Vertical Frequency ▶ The frequency at which images are generated. Vertical frequencies vary amongst sources. This term is also called vertical scan rate.

Video ▶ The signal that is used by display devices (such as projectors) to generate a picture. This term also refers to the output of video tape/disk players and computers.

Video Decoder ▶ A device that converts NTSC, PAL, SECAM or NTSC 4.43 video to RGB video.

Viewing Angle ▶ Screens do not reflect equally in all directions. Most light is reflected in a conical volume which is centered around the "line of best viewing". Maximum brightness is seen when you are positioned within the viewing cone. The horizontal and vertical viewing angles are the horizontal and vertical angles of the cone.

White Balance ▶ White Balance refers to the color temperature of white used by the projector.

White Field ▶ A white field is the area of an image that is white only. For example, a full white field is an image that is white everywhere. A 10% white field is a white area (usually rectangular) that occupies 10% of the image; the remaining 90% is black.

Menu Tree

Status Pages

Display Settings

Current Input Parameters

Electrohome Projection Systems

Marquee 1000	Serial No: 1234567
Projector No: 008	Software: V1.1
IR Sensor: On	
Remote Jack: On	
IR Protocol: A	
	Horiz Scan: Normal
Auto Power-up: Off	Vert Scan: Normal
Messages: On	
	Switchers: 1
Mute: Off	Options: Decoder

Test Patterns

Utilities

1. Source Setup
2. Channel List
3. Recall Memories
4. Input Memories
5. Preferences
6. Remote Control Options
7. -
8. -
9. Service

UTIL — *see next page*

Picture

1. Phase
2. Size
3. White Balance
4. Focus
5. Sync: Slow
6. Top Blanking
7. *Bottom Blanking*
8. Left Blanking
9. Right Blanking

PIC

White Balance

1. 3200 K (reddish)
2. 6500 K (white)
3. 9300 K (bluish)
4. User Setting
5. Customize White

Currently Using: 2

3

Geometry

1. Size
2. Keystone
3. Side Pin
4. Top Pin
5. Bottom Pin
6. Bow
7. C Linearity
8. S Linearity
9. L/R Skew

GEOM

Convergence

1. Guided
2. Interpolated
3. Random Access
4. -
5. Service

During Convergence,
press <#> to cycle
to external image

CONV

Help

1. Quick Setup Guide
2. Detailed Setup Guide
3. Source Selection Guide
4. Keypad Guide
5. -
6. Using Help

For all menus:
<number> or △ ▽ then <ENTER>
to select function
<HELP> for information
<RECALL> to go back one level
<EXIT> to return to picture

HELP

ELECTROHOME

PROJ   *   UTIL   PIC
COLOR TINT DETAIL GEOM
CONT BRITE VOL CONV
ENTER   EXIT

U
L   R
D

SOURCE
RECALL
HELP

1 2 3
4 5 6
7 8 9
0 MUTE STBY POWER

Source Setup

1. Copy Setup
2. ASI with Save
3. Current Setup: Unlocked
4. ASR: On
5. Clear Current Setup
6. Select Internal Frequency
7. Auto Clamp: On
8. Retrace: Long
9. Decoder Options

Current Setup Memory:
    Input: 01
    Recall: 05

Copy Setup

From: S 1 2

To: R 5 6

Press <ENTER> to copy

Internal Frequency Selection

	Horiz	Vert
1.	15.73 -	59.94
2.	31.47	59.94
3.	47.71	71.90
4.	62.50	66.67
5.	89.30	70.00
6.	126.84	60.00
7.	-	-
8.	-	-
9.	-	-

Channel List

CH	NAME	INPUT	RECALL	U/D
01	COMPUTER A	02		✓
02	COMPUTER B	14	04	✓
03	VCR	12		
04				
05				
06				
07	VGA	23		✓
08	VGA MODE 2	23	01	✓
09				
10				

<2 digit no.> or △ ▽ to highlight channel
▷ to edit channel

Decoder Options

Standard	Signal Route
--------	------ -----
✓Auto Detect	✓Auto
NTSC 3.58	RGB
NTSC 4.43	Composite
PAL	S-Video
SECAM	

<ENTER> to select

UTIL

Utilities

1. Source Setup
2. Channel List
3. Recall Memories
4. Input Memories
5. Preferences
6. Remote Control Options
7. -
8. -
9. Service

Recall Memories

Re	Horiz	Vert	ASR	Re	Horiz	Vert	ASR
01	31.50	60.00		16	105.50	66.00	✓
02	50.80	66.00	✓	17	93.00	83.00	✓
03	110.00	71.90	✓	18	43.20	50.00	✓
04	45.56	75.00	✓	19	24.00	60.00	✓
05	50.00	60.00	✓				
06	67.50	70.00	✓				
07	55.00	60.00	✓				
08	54.00	66.00	✓				
09	69.10	71.90	✓				
10	31.50	60.00	✓				
	110.00	60.00	✓				

Input Memories

SW	SL	ASR		Horiz	Vert	SW	SL	ASR	Horiz	Vert
0	2	On		35.50	60.00					
1	1	Off	✓	110.00	70.00					
1	3	On		60.00	66.00					
1	2	On	✓	35.50	60.00					
1	4	On	✓	38.50	80.00					

Keypad Options

IR Sensor: ✓ On   Off
Remote Jack: ✓ On   Off

    Protocol: ✓ A   B

<ENTER> to select
WARNING:
If both IR sensor and remote
jack are disabled, only the
built-in keypad can be used
to re-enable.

Preferences

Auto Power-up: On ✓Off

Screen
        Messages: ✓On   Off

Source Switch
  Blanking Time: 0.0 sec   ✓Auto

Single Digit   Time
  Channel Entry: Imm Out ✓Off

<ENTER> to select

Projector Setup

Projector: 000

Baud Rate: 9600

<no.> to change

Remote Control Options

1. Keypad Options
2. Projector Setup

ASR/ASI Logic Diagrams

A change in scan frequency is detected. The change is greater than 100 Hz horizontal or greater than 1 Hz vertical.

A source, Recall memory, or channel was manually selected. The H & V scan frequencies of the source do not match that of the selected setup memory.

no — Is ASR set to On for the currently selected input? — yes

yes — Is ASR set to On for the selected input? — no

Do nothing.

Switch to the selected source and/or setup memory.

match — Check the Input memory of the currently selected input for matching H & V scan frequencies. — no match

Change the current setup memory to the matched Input memory.

match — Search for a Recall memory with matching H & V scan frequencies. — no match

Change the current setup memory to the matched Recall memory.

ASI Logic Begins

Adjustments made at this point are stored in the current setup memory.

match — Search for an Input memory with matching H & V scan frequencies. — no match

Use the display settings of the matched Input memory but do not update the current setup memory.

← ASI → Functions

Create new display settings by interpolating the two closest setup memories (in freq.). Do not update the setup memory.

Adjustments made at this point are displayed but NOT stored in the current setup memory.

ASR Logic Diagram

C-1

UTIL 1 2
is pressed to perform
an "ASI with Save".

Display an
"ASI with Save"
confirmation box.

Was "Do It"
selected from the
confirmation box?

yes   no

Check the
Input memory of the
currently selected input for
matching H&V scan
frequencies.

match   no match

Do nothing.
Return to presentation
level.

Search for a
Recall memory
with matching H&V scan
frequencies.

match   no match

Copy the display
settings in the "matched"
memory to the current
setup memory.

Search for an
Input memory
with matching H&V scan
frequencies.

match   no match

Select two setup
memories for interpolation
and store the resulting
display settings in the
current setup memory.

"ASI with Save" Logic Diagram

Appendix D

Communication Cables

When connecting the projector to a Marquee Signal Switcher, another Marquee projector, or a computer, a standard RS-232 serial communication cable is required. Cable details are provided below.

Cable Type: RS-232, 9 Pin Male to 9 Pin Female

Shielded Multi-conductor Cable

9 Pin D Connector (Male - for projector end)   9 Pin D Connector (Female)

Cable Wiring:

2
3
5
Shield

2
3
5
Shield

Application:
- ☐ For connection between the projector and a switcher.
- ☐ For connection between projectors (future).
- ☐ For connection to a computer with a 9 pin "AT" type RS-232 port.

Cable Type: RS-232, 9 Pin Male to 25 Pin Female

Shielded Multi-conductor Cable

9 Pin D Connector (Male - for projector end)   25 Pin D Connector (Female)

Cable Wiring:

2
3
5
Shield

2
3
7
Shield
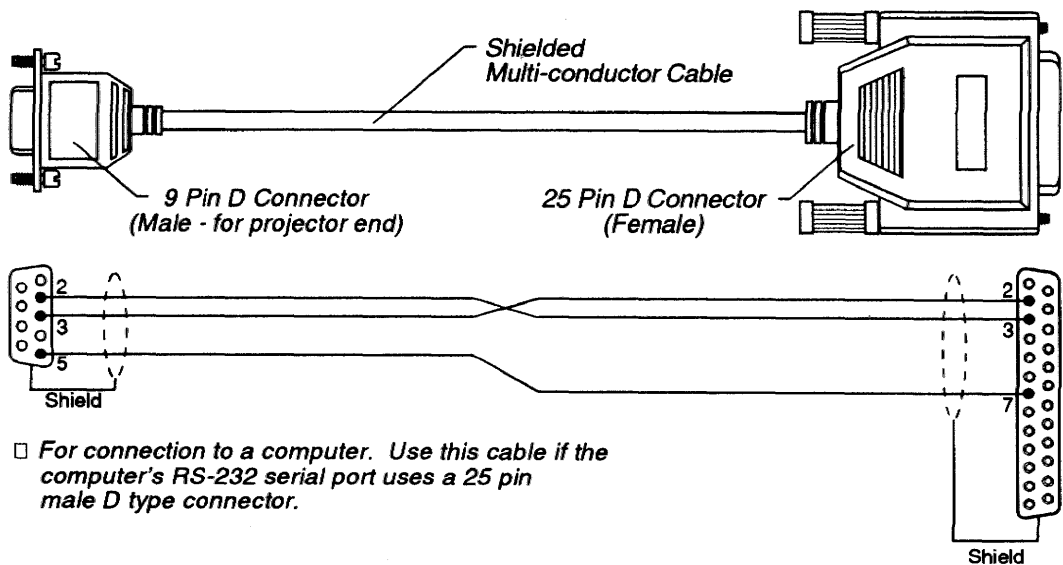
Application:
- ☐ For connection to a computer. Use this cable if the computer's RS-232 serial port uses a 25 pin male D type connector.

Keypad Reference

Status Page
□ to display
status pages

Projector
□ to command a single
projector in a multi-
projector system

Display Controls
To adjust:
□ Color □ Contrast
□ Tint □ Brightness
□ Detail □ Volume

Enter
□ to select a highlighted
menu item
□ to select a dialog
box option

Arrow Keys
□ for adjustments
□ for menu item selection
□ for movement between
edit fields

Numeric Keys
□ for menu item selection
□ for number entry

Mute
□ to turn audio on or off

Standby
□ to turn both picture and
audio on or off

Utilities Menu
To access the following utilites:
□ Source Setup □ Preferences
□ Channel List □ Remote Options
□ Memories Display □ Service

Picture Menu
To adjust:
□ Phase □ Focus
□ Size □ Sync
□ White Balance □ Blanking

Geometry Menu
To adjust:
□ Size □ Bow
□ Keystone □ Linearity
□ Pincushion □ Skew

Convergence Menu
□ to adjust red, green
and blue convergence
registration

Exit
□ to exit from a
menu or function

Source
□ for input selection
□ for channel up/down
selection
□ for source message
display

Recall
□ to select a Recall Memory
□ to go back one screen
during menu/help display
□ to view hidden slidebars
when message display is
turned off.

Help
□ for context sensitive help
□ for setup guides

Test Pattern
□ to select a test
pattern for display

Power
□ to turn the projector
on or off

ELECTROHOME

PROJ * UTIL PIC
COLOR TINT DETAIL GEOM
CONT BRITE VOL CONV
ENTER EXIT

U
L R
D

SOURCE

1 2 3 RECALL
4 5 6 HELP
7 8 9 #
0 MUTE STBY POWER

Index

PROJECTION SYSTEMS LIMITED WARRANTY POLICY

WARRANTY

Electrohome Projection Products are warranted to be free of defects in material and workmanship in normal use for the period listed below from the original date of purchase:

PRODUCT	PART	PICTURE TUBE	LABOUR
Color Projection Monitor	1 Year	1 Year	1 Year
Interface Devices	1 Year replacement warranty		1 Year
Wire Harness	90 Day replacement warranty		
Accessories (stands, Screens, etc.)	90 Day replacement warranty		

This warranty does not apply to units which have been subject to abuse, accident, improper installation or on which the serial number has been removed or damaged.

1. LIMITATIONS

1. The labour warranty is valid only if the malfunctioning unit is returned prepaid to an authorized service depot or selling dealer. It does not cover "on location" service.
2. The warranty does not cover:
   a) Problems caused by associated equipment such as antenna distribution systems, video tape recorders, cameras, etc.
   b) Damage caused by accident , misuse, improper power source, fire, flood, lightning, other acts of God, repair or alteration by other than Electrohome Limited authorized service organization.
   c) Transit damage.
   d) Phosphor degradation of the picture tube: example, visible burns or patterns on phosphor screen during normal use.
3. Proof of purchase is necessary for verification of warranty.
4. Unit must be properly packaged (in original packaging if possible) when returned under warranty.
5. Electrohome Interface devices are designed to be used with Electrohome projection systems. Use of other interface devices with Electrohome projection systems could void the warranty. Interfaces used with other than Electrohome projection systems are void of all warranty.
6. Wire harness assemblies sold by Electrohome contain installation instructions. These instructions are current at the time of printing and updated as necessary. Although Electrohome strives to maintain our technical information as current as possible, we cannot be responsible for changes made by the terminal manufacturer to their specs and equipment as it applies to the installation of the wiring harness or its operation. Wire harness should be installed by qualified technical personnel.

2. DEALER'S OBLIGATION

1. The dealer is expected to evaluate the merchandise to insure that it is in working order, and is responsible for making any minor setup adjustments at no cost to Electrohome or the customer.
2. The dealer must advise the customer that the warranty registration card is to filled out and mailed to Electrohome within 7 days of the date of purchase using the return envelope provided.
3. If assistance or guidance is required on technical problems, it is the dealer's responsibility to contact Electrohome Limited, or the nearest authorized service depot.
4. Where warranty service is required, it is the dealer's responsibility to insure that the unit is packed and shipped prepaid to an authorized Electrohome Limited service depot.
5. If a dealer elects to make warranty repairs through anyone other than an authorized Electrohome Service depot, the warranty becomes void, unless otherwise specified.
6. A current list of all authorized serviced organizations can be obtained from Electrohome Limited. In the United States, call 1-800-265-2171. In Canada, call (519) 744-7111.

7. When returning a unit for repair to an authorized service depot, documentation should be included with the following information.

In Warranty
A. Customer's name and address.
B. Date of Purchase.
C. Specific complaint/failure (Notations such as "defective" or "repair under warranty" are not acceptable).

Out of Warranty
A. Include terms A, B, C, of "In Warranty".
B. A purchase Order to cover the cost of repairs.

Damaged Merchandise
See transit damage/loss below.

3. TRANSIT DAMAGE/LOSS

VISIBLE/HIDDEN DAMAGE
Electrohome Limited endeavours to use reliable and reputable carriers but occasionally damage or loss can occur. Resolving the problem of transit damage or loss depends on the co-operation of all parties. The following will outline the responsibilities of the various parties involved.

The consignee or buyer **must**:
- Inspect all shipments on arrival.
- If damage, suspected damage or loss is apparent upon delivery, an appropriate notation should be marked on all copies of the carrier's pro bill and the driver **must** sign all copies to acknowledge this notation.
- Ask the carrier to do a detailed inspection of the damages.
- File a claim with the carrier.
- Co-operate with the carrier to achieve damage repair where possible.
- Follow-up as necessary to secure final settlement.

The carrier should:
- Co-operate in every way with the buyer/claimant to achieve an amicable settlement.

Electrohome will:
- **Assist** our customers, through our Distribution Services Department, in freight claim matters.
- **Drop Shipments:** Electrohome does not promote the practice of drop shipments.
- Although Electrohome will provide every assistance, we cannot be responsible for the actual filing of claims on the carrier or accept liability for uncontrolled freight claims.

4. SERVICE DEALER

Dealers who maintain their own service facilities and would like to become an authorized depot may acquire application forms from Electrohome Limited.

ELECTROHOME

Projection Systems

The Image of A Winner