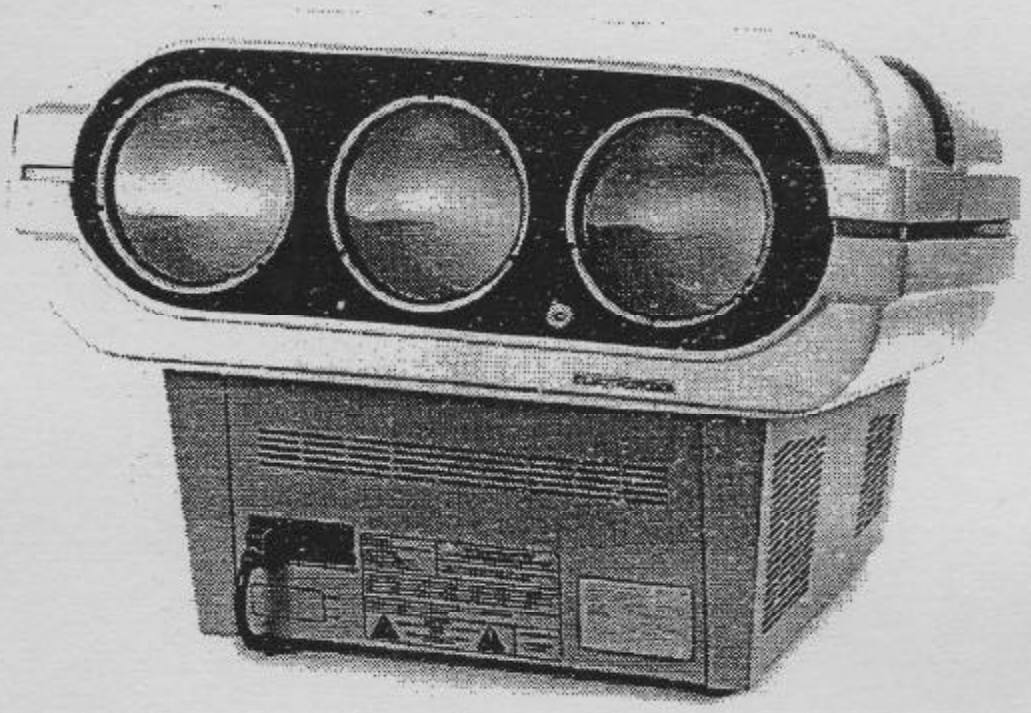
ELECTROHOME

38–B09955–75(AC)/38–B09980–75(AC)

ECP 3100/4100 SERIES PROJECTION SYSTEMS



USER'S MANUAL

DUE TO CONSTANT RESEARCH, THE INFORMATION IN THIS MANUAL IS SUBJECT TO CHANGE WITHOUT NOTICE.

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Printed in Canada/54–7582–04P (07/90)

WARNING

THE ECP PROJECTOR GENERATES AND MAY RADIATE RADIO FREQUENCY ENERGY. IF NOT INSTALLED AND USED IN ACCORDANCE WITH THIS OWNER'S MANUAL, IT MAY CAUSE INTERFERENCE WITH RADIO COMMUNICATIONS.

THE ECP PROJECTOR IS TESTED TO AND COMPLIES WITH THE LIMITS FOR 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 ECP PROJECTOR IS OPERATED IN A RESIDENTIAL AREA IT MAY CAUSE RADIO INTERFERENCE. IN SUCH A CASE THE USER WILL BE REQUIRED, AT HIS OWN EXPENSE, TO TAKE MEASURES REQUIRED TO CORRECT THE INTERFERENCE.

NOTICE

THIS DIGITAL APPARATUS 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.

AVIS

CET APPAREIL À AFFICHAGE NUMERIQUE A ÉTÉ CONTRÔLÉ. IL EST CONFORME AUX LIMITES DES REGLEMENTS DE LA CLASSE À D'APPAREILS A AFFICHAGE NUMÉRIQUE ÉTABLIS PAR LE MINISTÈRE DES COMMUNICATIONS DU CANADA EN CE QUI CONCERNE LES INTERFERENCES RADIO. CES RÈGLEMENTS ONT ÉTÉ MIS EN PLACE POUR ASSURER UNE PROTECTION RAISONNABLE CONTRE LES INTERFERENCES PRODUITS PAR DES APPAREILS UTILISES DANS UN ENVIRONNEMENT COMMERCIAL.

WARNING

TO PREVENT FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE. DO NOT USE THE POLARIZED POWER CORD WITH EXTENSION CORDS, RECEPTACLES OR OTHER OUTLETS WHICH DO NOT HAVE A GROUND CONNECTION.

WARNING: TO MAINTAIN FCC AND DOC REQUIREMENTS, USE THE 38-800615-71 CABLE FOR 15 KHZ TO 35 KHZ SIGNALS.

WARNING: TO MAINTAIN FCC AND DOC REQUIREMENTS, USE THE 38-800632-71 CABLE FOR 15 KHZ TO 80 KHZ SIGNALS.

WARNING: DO NOT LIFT THE PROJECTOR BY THE TOP COVER.

WARNING: MAKE SURE THE LINE VOLTAGE IS PROPERLY SELECTED BEFORE CONNECTING THE POWER CORD.

CAUTION: DO NOT BLOCK AIR FLOW AROUND THE PROJECTOR. IF THE PROJECTOR IS MOUNTED ON OTHER THAN AN ELECTROHOME CART, MAKE SURE THAT THERE IS AT LEAST ½ INCH (1.25 CM) CLEARANCE BENEATH THE BOTTOM OF THE PROJECTOR AND THE MOUNTING SURFACE.

CAUTION: KEEP OUT OF DIRECT SUNLIGHT. PROLONGED EXPOSURE TO SUNLIGHT MAY CAUSE PERMANENT DAMAGE.

CAUTION: ACRYLIC LENS. NEVER TOUCH THE LENS WITH FINGERS. CLEAN ONLY WHEN ABSOLUTELY NECESSARY. MOISTEN A SOFT FACIAL TISSUE WITH NON-ABRASIVE WINDOW CLEANER AND RUB VERY GENTLY IN A CIRCULAR MOTION.

CAUTION: IF SHIPPED IN COLD WEATHER, UNPACK THE PROJECTOR AND ALLOW IT TO SIT AT ROOM TEMPERATURE FOR ONE HOUR BEFORE OPERATING. FAILURE TO DO SO MAY RESULT IN CRT BREAKAGE.

CAUTION: RETAIN AND USE THE ORIGINAL PACKING FOR SHIPPING THE PROJECTOR TO ANOTHER LOCATION. THE ORIGINAL PACKING IS CUSTOM DESIGNED.

CAUTION: THE FEET ON THE PROJECTOR MUST BE FULLY RETRACTED PRIOR TO PACKING THE PROJECTOR.

HOW THIS MANUAL IS ORGANISED

This manual provides general and operating information for the Electrohome ECP 3100/4100 series projectors. The manual is structured in a modular format to make use and updating easy.

Individual sections of this manual may be updated or replaced as available features for your projector change. Appropriate sections will be provided with all new or upgraded components. Initial section titles include:

SPECIAL:	Safety	Important Safety Instructions
SECTIONS:	Section 1	Introduction
	Section 2	Projector Installation
	Section 3	Operation
	Section 4	Control & Software
	Section 5	Care and Maintenance
	Section 6	List of Available Items
APPENDICES:	Appendix A	Projector to Screen Distance Calculations
	Appendix B	Reverse Scan Installation
	Appendix C	Projection Screens
	Appendix D	Installation Guide
	Appendix E	Projector Mounting Accessories
	Appendix F	Communications Process Module
	Appendix G	Interface Modules
	Appendix H	Infrared Remote Video/Data Switcher
REFERENCE:		Glossary
		Specifications
		Warranty

IMPORTANT SAFETY INSTRUCTIONS

1. Read all of these instructions.

2. Unplug the projector from the power outlet before cleaning. **DO NOT** use liquid or aerosol cleaners. Use a dampened cloth for cleaning.

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

4. **DO NOT** use this projector near water -for example, near a swimming pool or the like.

5. **DO NOT** place this projector on an unstable cart, stand or table. The projector may fall causing serious injury to a person and serious damage to the projector. Ceiling mounting should follow the manufacturer's recommendations and should use a mounting kit approved by Electrohome.

6. 

   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.

7. Slots and openings in the cabinet 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 a built-in installation unless proper ventilation is provided.

8. Only operate the projector from the type of power source indicated on the line voltage indicator. See Section 2. Consult your dealer or local power company if you are unsure of your power source.

9. This projector is equipped with a three wire grounding type 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.**

10. **DO NOT** allow anything to rest on the power cord. **DO NOT** locate the projector where the cord will be abused by persons walking on it or objects rolling over it.

11. Observe and follow all warnings and instructions marked on the projector.

12. **DO NOT** overload power outlets and extension cords as this can result in fire or shock.

13. **DO NOT** push objects of any kind into the projector through the ventilation openings. They may touch dangerous voltage points or short out parts that could result 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.

14. The projector is solid state and contains no user serviceable parts. **DO NOT** attempt to service the projector yourself. Opening or removing the covers may expose you to dangerous voltages or other hazards. Refer all servicing to qualified service personnel.

15. Unplug the projector from the power outlet and refer service to qualified service personnel if any of the following conditions exist:
    a) the power cord has been damaged
    b) liquid has been spilled into the projector
    c) the projector has been exposed to moisture
    d) the projector does not operate normally even after adjusting user operating controls
    e) the projector has been dropped or the cabinet damaged
    f) projector performance has deteriorated.

16. When replacement parts are required, be sure that the service technician uses parts specified by Electrohome. Other substitutions may result in fire, electric shock or risk of personal injury.

17. Have the service technician perform routine safety checks after each servicing of the projector to make sure the projector is safe to operate.

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SECTION 1

INTRODUCTION

The ECP Projector is a three lens, high resolution, high brightness, video/data projector. The ECP Projector automatically synchronizes to a variety of video input sources in the frequency range of 15 kHz to 55 kHz horizontal (ECP 3100) or 15 kHz to 80 kHz horizontal (ECP 4100) and 45 Hz to 120 Hz vertical.

1.1 OPTICS

The ECP Projector can be focused on flat, curved or rear screens. Allowable projector-to-screen distances range from 72 inches to 30 feet (1.83 to 9.14m). The resultant image size varies from (48 to 240 inches (1.22 to 6.10m) wide and from 36 to 180 inches (0.91 to 4.57m) high.

1.2 ELECTRONICS

The electronics are of modular construction. All major projector functions, except optical focus, are microprocessor controlled.

All projector settings are entered via the built-in, a wired remote or an infrared remote keypad. Settings are stored in battery backed-up, non-volatile memory. All-digital convergence divides the image into 256 horizontal and 128 vertical segments for precise control. During convergence, the image is preset for 25 user accessible zones.

ACON, an optional automatic convergence feature, improves ease of use by automatically converging the image in 45 zones.

Protection circuits continuously monitor projector operation and prevent the drive levels from exceeding maximum safe values.

1.3 SOFTWARE

The ECP Projector is equipped with software which permits the control of a wide range of projector functions. See the Software Section for details.

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SECTION 2

PROJECTOR INSTALLATION

2.1 UNPACKING & PACKING THE PROJECTOR

See FIGURE 2-1.

CAUTION

TO PREVENT INJURIES DO NOT LIFT THE PROJECTOR BY THE FRONT TOP COVER.

NOTES: 1. Save the carton and packaging for future shipping.

2. The feet on the projector must be fully retracted prior to packing the projector.

2.2 LINE VOLTAGE SELECTION

WARNING

SEVERE DAMAGE MAY OCCUR TO THE ECP PROJECTOR IF LINE VOLTAGE IS NOT SELECTED CORRECTLY. DAMAGE CAUSED BY INCORRECT LINE VOLTAGE SELECTION IS NOT COVERED UNDER WARRANTY. THE CORRECT LINE VOLTAGE SELECTION FOR NORTH AMERICA IS 120V.

Check the line voltage selected. The indicator pin shows 120V or 240V selected line voltages only.

NOTE: The 120V setting covers a 90 to 132 VAC range. The 240V setting covers a 180 to 264 VAC range.

Change the selected line voltage as follows:

Remove the cover using a small blade screwdriver or similar tool. A Phillips screw secures the fuse block to the back of the cover. Remove the screw. Flip the fuse block over and replace it on the cover. Make sure one fuse is visible for 120V and two fuses are visible for 240V mains.

Pull out the voltage selector card using needle-nose pliers. Rotate the pin such that it points away from the desired line voltage.

Replace the voltage selector card and the cover. Check that the pin shows the correct line voltage. See FIGURE 2-2.

2.3 REVERSE SCAN

WARNING

The REVERSE SCAN procedure must be performed by a qualified service technician.

Your ECP Projector can be used, as shipped, upright on a cart or table for front screen projection. Ceiling mounted and rear screen applications are termed reverse scan. Refer to the ECP Projection System Service Manual and APPENDIX B.

2.4 PROJECTOR AND SCREEN SETUP

Locate the projector out of the audience's direct view and aim it towards the center of the screen. Tilt the screen to aim the reflected image towards the eye of the audience.

NOTE: Before installing your projector at a fixed location you should simulate the actual operating conditions, e.g., video signal sources and physical layout. Electrohome cannot be held responsible for incorrect location of the projector.

The distance (D) between the green lens of the ECP Projector and the center of the screen, determines the size of the image. See APPENDIX A to determine the exact relation between desired image size and projector-to-screen distance. See APPENDIX D, INSTALLATION GUIDE and FIGUREs 2-3 and 2-4.

Determine the height (H) and the width (W) of the desired image. Select an image size that allows the audience to clearly resolve all text. The eye sees a letter clearly if eye-to-text distance is less than approximately 250 times the height of the letter. Small text, located too far from the eye, may not be legible even though it appears sharp and clear 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 video tape has a 4:3 or 1.33:1 aspect ratio.

For example: To display the image from a computer CGA card that has an aspect ratio of 4:3 or 1.33:1 on a 45 inch (1.14m) high screen, the width of the screen must be at least 60 inches (1.52m). If screen

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width is less than 60 inches (1.52m), a 45 inch (1.14m) high image would not fit entirely.

An image with a different aspect ratio than a screen cannot fill the screen in both the horizontal and vertical directions simultaneously.

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 specified by diagonal size.

NOTE: Screen size must be equal to or greater than the size of the desired image.

Calculate the projector-to-screen distance following the steps outlined in APPENDIX A.

NOTE: The minimum projector–to–screen distance is 72 inches (1.83m), the maximum projector–to–screen distance is 30 feet (9.14m). Distances calculated per APPENDIX A which are less than the minimum or greater than the maximum, cannot be used. Down or up size the image accordingly.

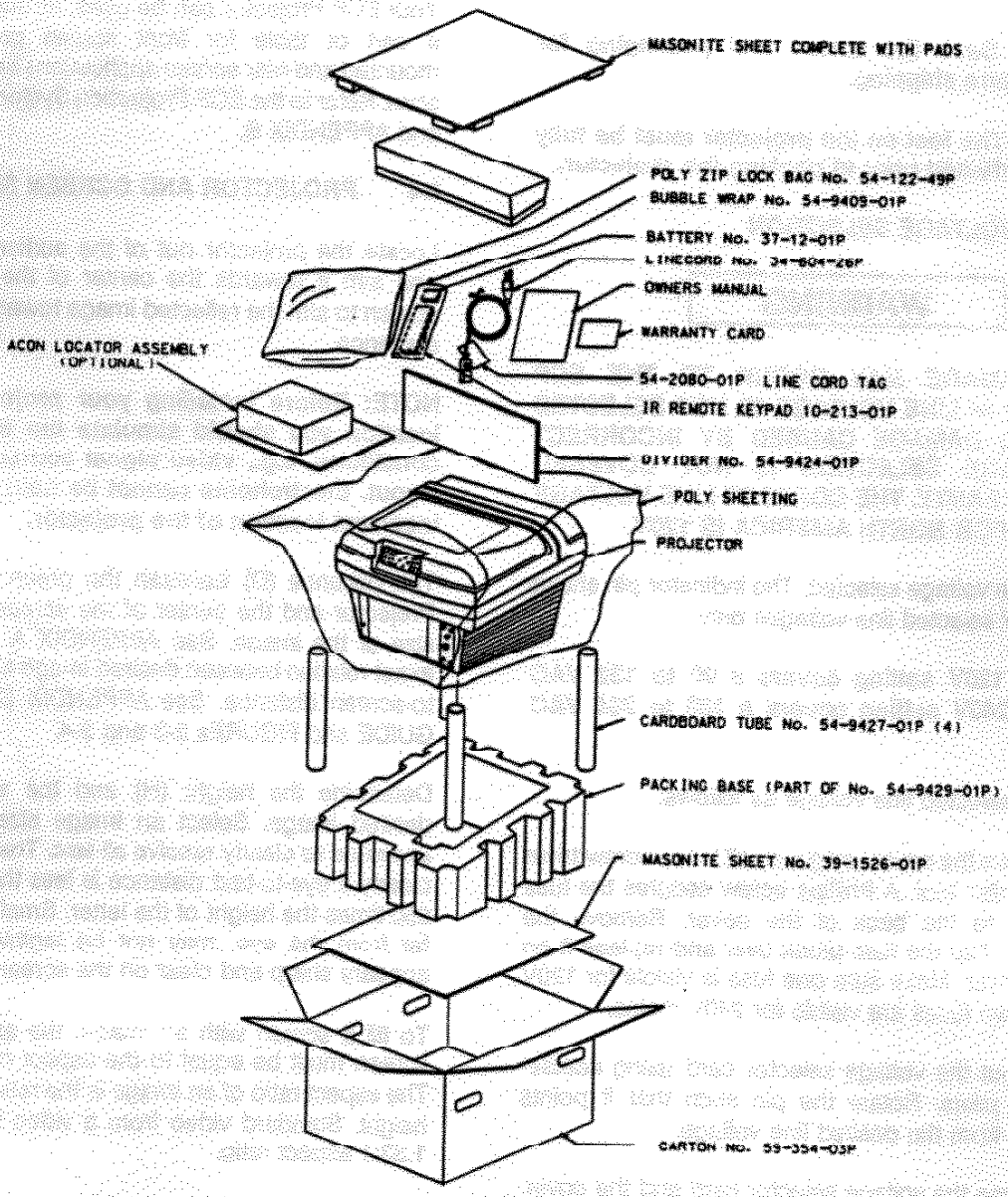

FIGURE 2–1. ***Projector Unpacking & Packing***

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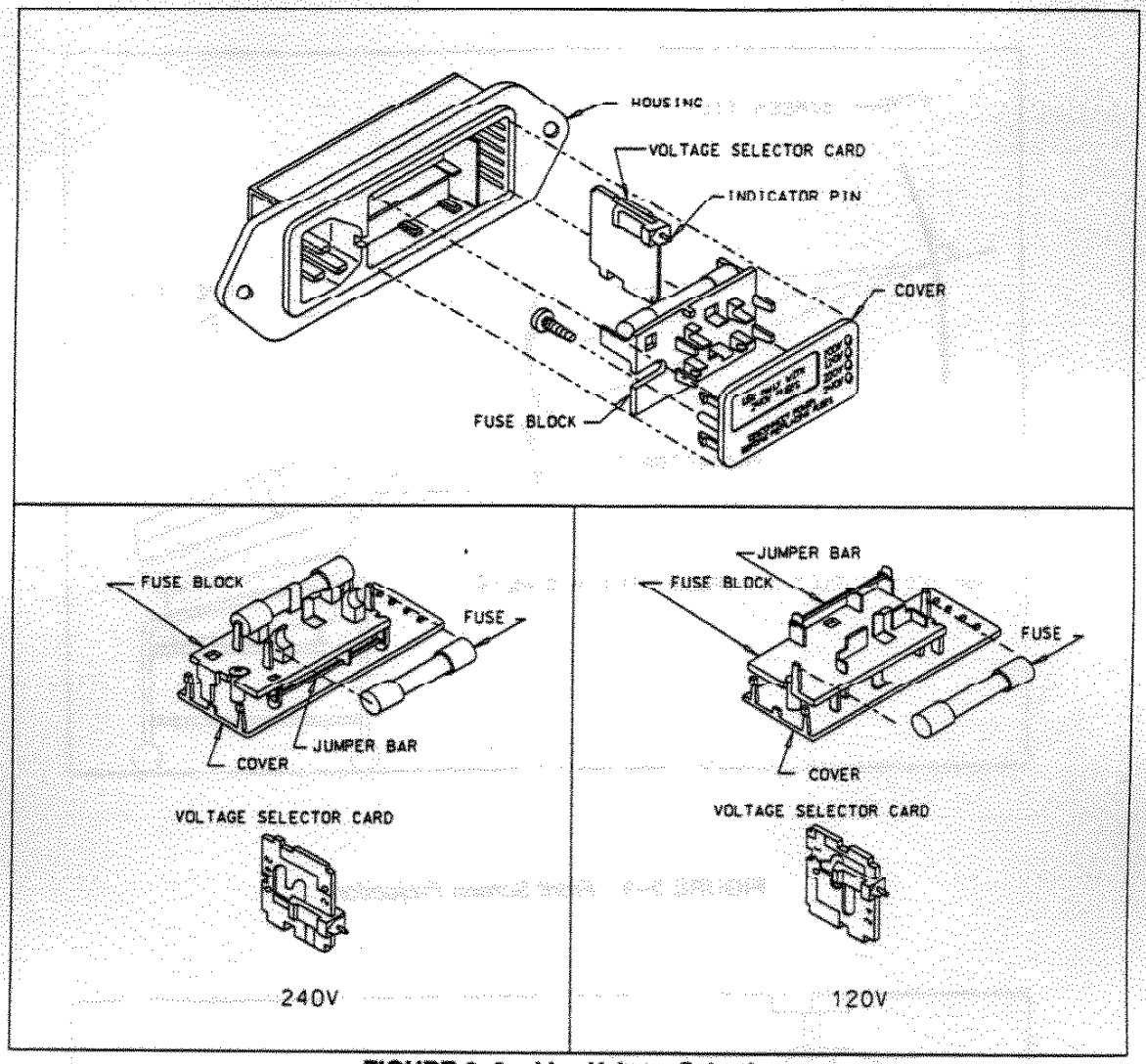


FIGURE 2-2. ***Line Voltage Selection***

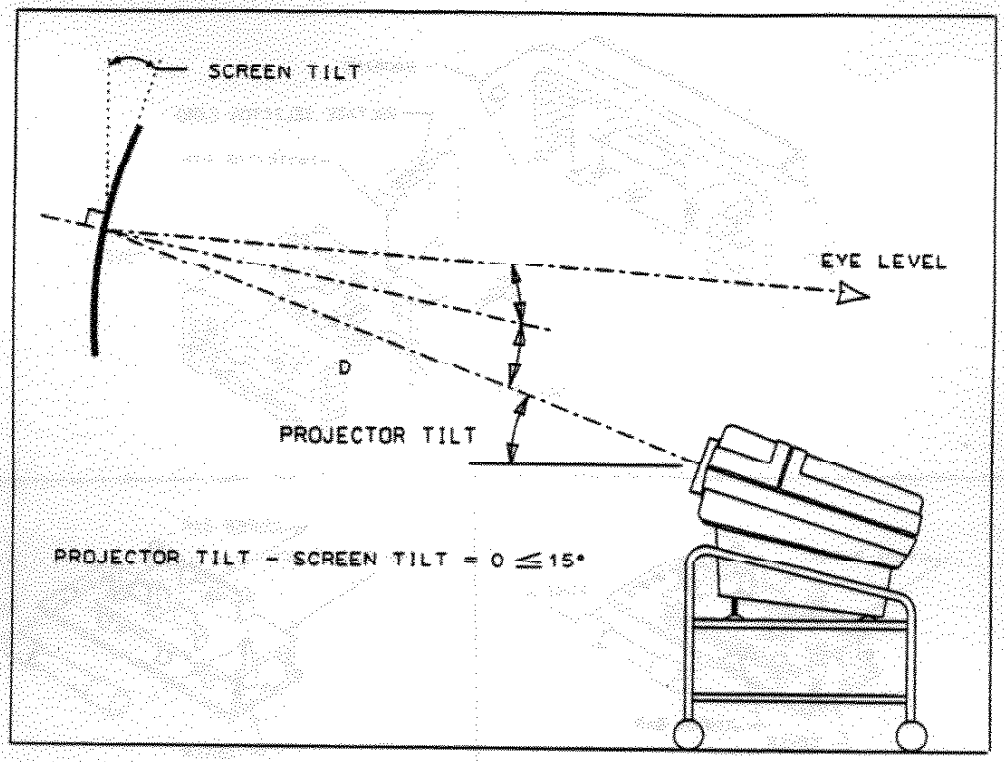
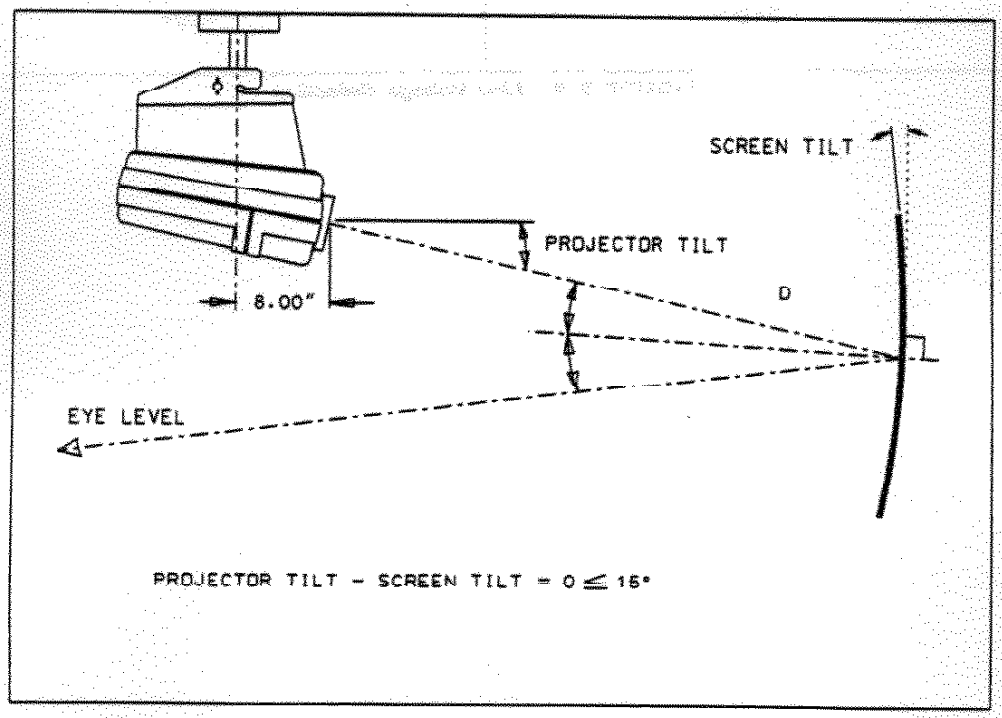


FIGURE 2–3. ***Front Screen Projection***



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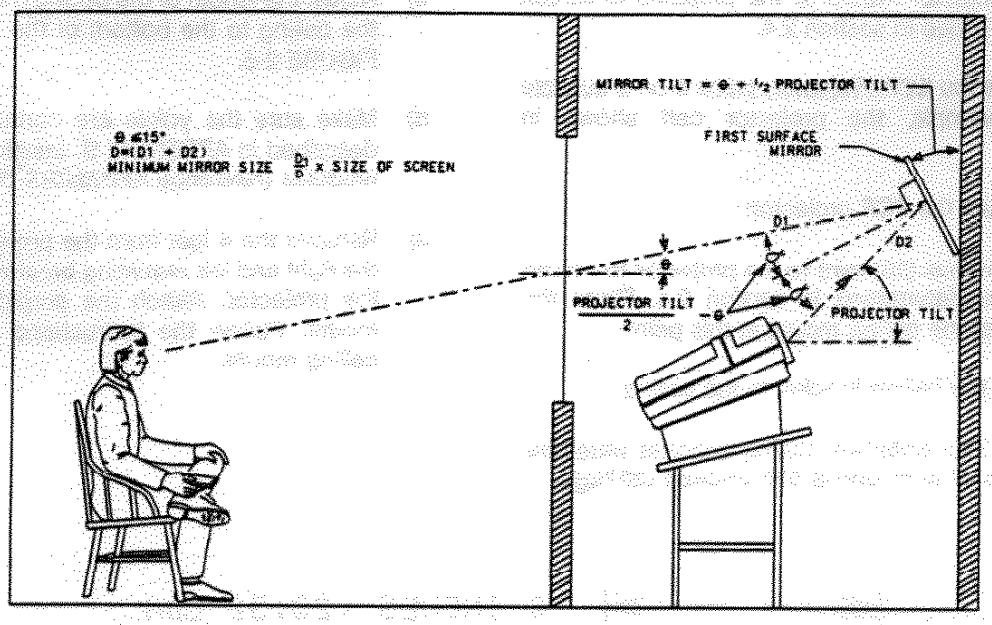
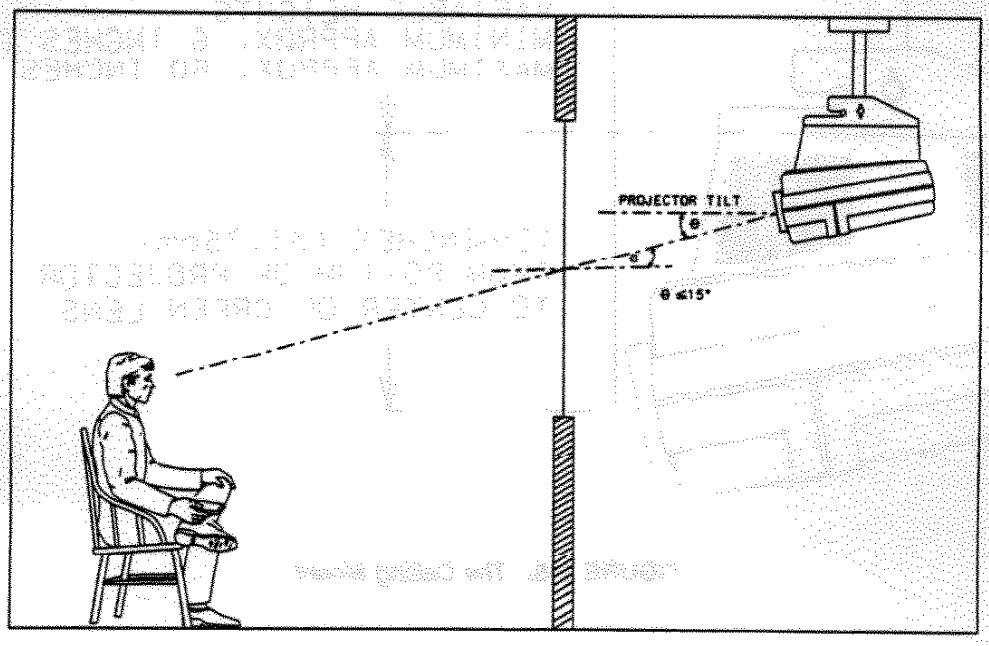


FIGURE 2-4. ***Rear Screen Projection***



Secure the projector mount at the projector-to-screen distance determined in section 2.4.

To floor mount the ECP Projector, place it on a suitable stand, for example, the projector cart shown in APPENDIX E.

To ceiling mount the ECP projector:

a) Add 8 inches (203mm) to the projector-to-screen distance determined in section 2.4. Place the center of the ceiling mount at this point.

b) Secure the ceiling bracket to the ceiling.

NOTE: The secured ceiling bracket must be capable of supporting 500 pounds (227kg).

c) Adjust the length of the ceiling mount to reach from the ceiling to the bottom of the projector. Refer to FIGURE 2-5.

d) Make sure the yokes are connected correctly as described in APPENDIX B. Install the required input modules (reference APPENDIX G).

e) Remove the 4 feet from the projector base. Secure the right and left mounting brackets to the bottom of the projector. Attach the projector to the ceiling mount. Follow the instructions supplied with the ceiling mount.

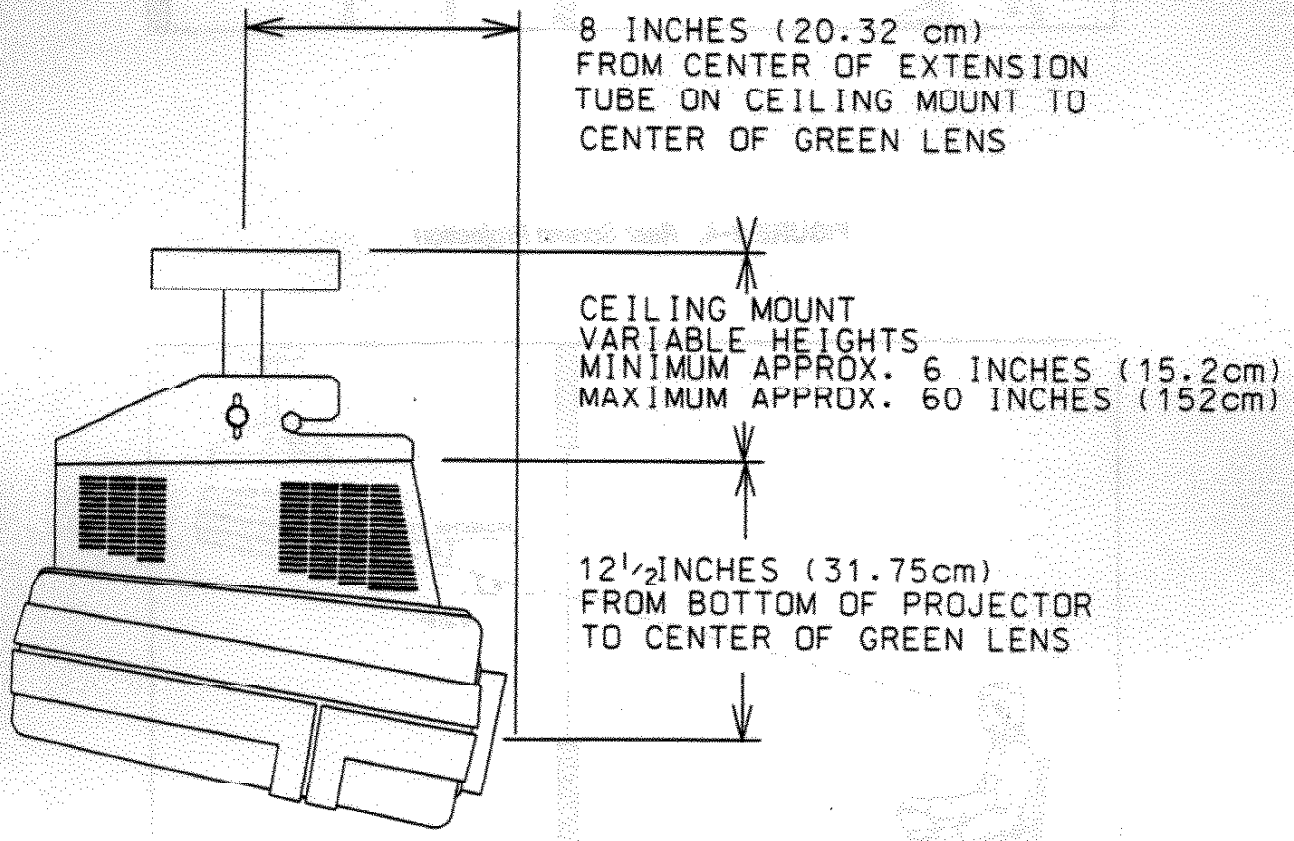


FIGURE 2-5. ***The Ceiling Mount***

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SECTION 3

OPERATION

3.1 PROJECTOR ALIGNMENT

The ECP Projector is factory preset to focus on a flat wall, 87.5 inches (2.22m) from the cart-mounted projector. At this setting, the displayed image from a video source with an aspect ratio of 4:3, is 60 inches (1.52m) wide and 45 inches (1.14m) high. Optical alignment of the ECP Projector is necessary when the position of the projector changes. The system must be properly installed before attempting an optical alignment. The distance from the center of the green lens' front to the center of the screen must be between 72 inches (1.83m) and 30 feet (9.14m). The tilt between the projector and the screen must be within ± 15°.

Adjust the optical focus manually at the projector. The tools required for alignment are located under the front lens cover. See FIGURE 3-2. Adjust all other functions, including the electrical focus, with a keypad. Do not use the Executive remote keypad.

Remove the front top cover to access the lenses and the tools. The front top cover is snap fit, remove by pulling up on it. See FIGURE 3-1.

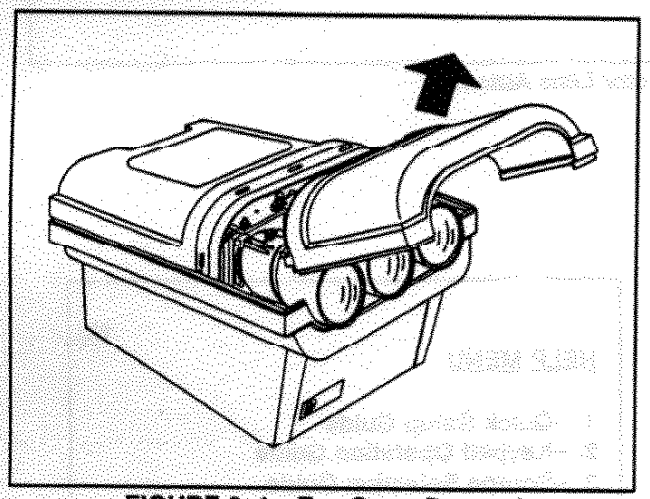

FIGURE 3-1. *Top Cover Removal*

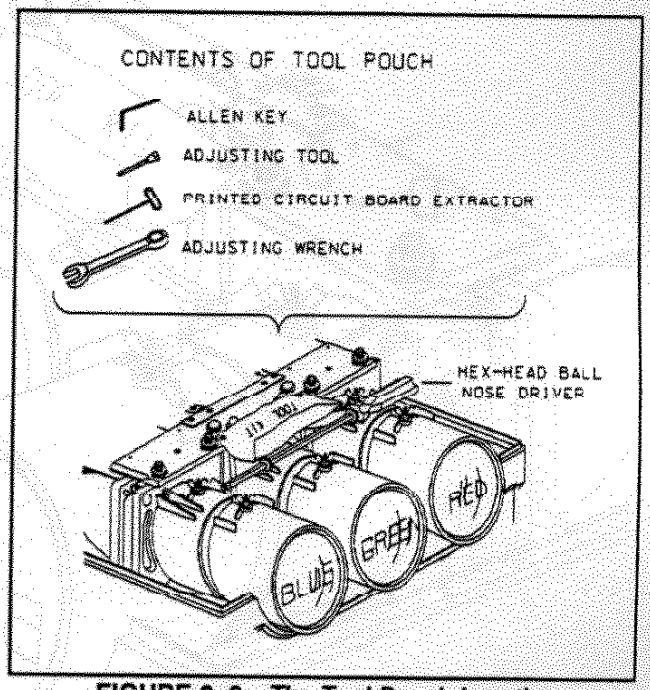

FIGURE 3-2. *The Tool Pouch Location*

Each lens consists of two sections. The rear section sets the optical focus at the center of the image. The front section sets the focus at the corners. The rear section is secured to the lens body. The front section is secured to the rear section by wing nuts located on top of the lens assembly.

Each CRT is attached to its lens by 3 socket head allen screws, located at the base of the lens assembly. The top plate and two hex-head bolts, marked "A" and "C," secure the three lens assemblies to the projector chassis. Each lens assembly is held in place on the top plate by a pin, and secured to the top plate by two socket head allen screws. The socket head allen screws for the red assembly are marked "B," those for the blue assembly are marked "D." The socket head allen screws for the green assembly are not marked.

Locate the above-mentioned parts before continuing. See FIGURE 3-3.

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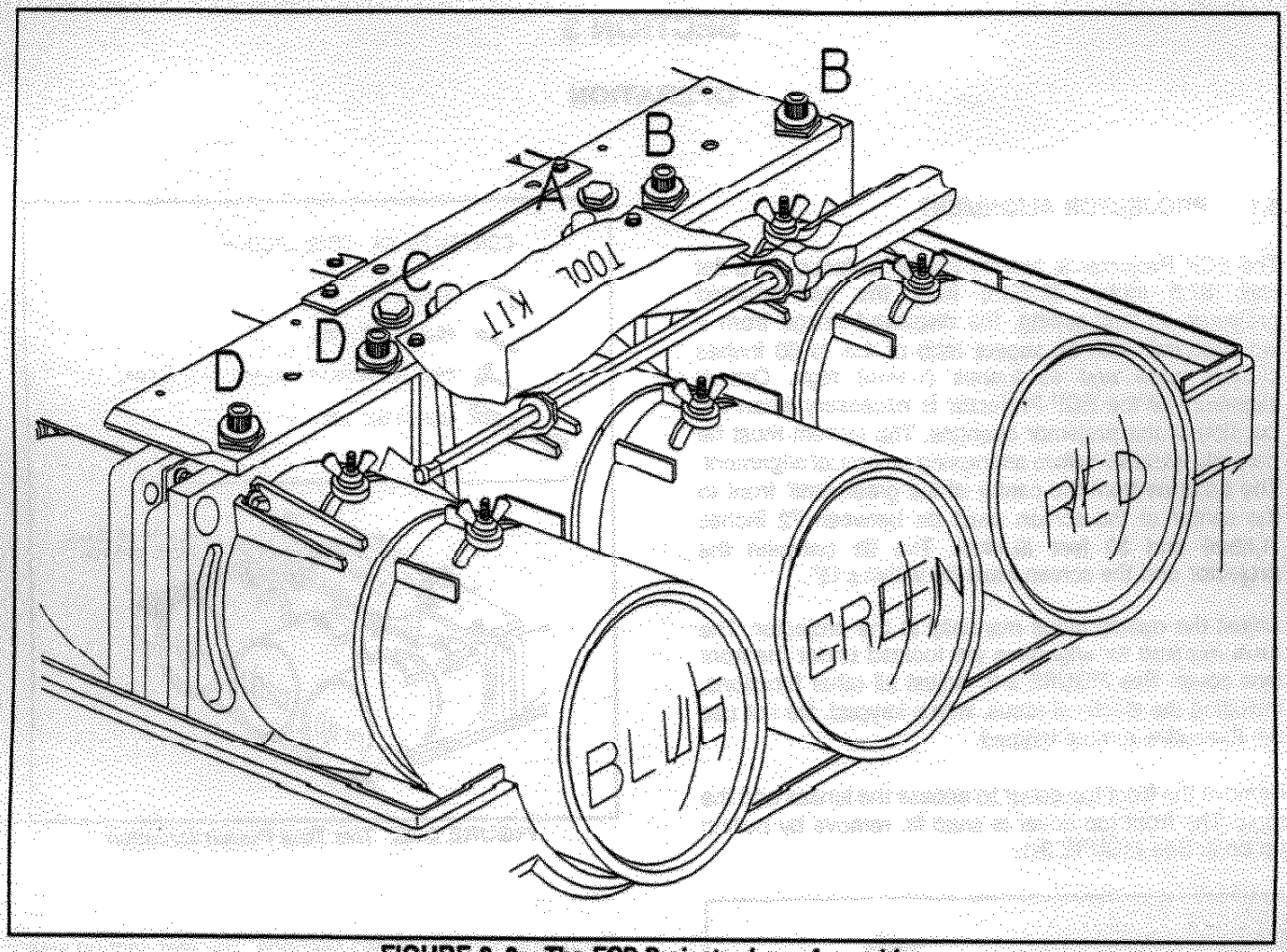

FIGURE 3-3. ***The ECP Projector Lens Assembly***

When the projector is inverted or ceiling mounted, the vertical yokes must be reversed. Refer to APPENDIX B.

Power-up the projector; press the key marked **POWER**. Select a source. Press **SOURCE, m, n**, where m is the slot number and n is the input number on that slot, to which an input is connected.

1. Press the **HELP** key. A menu, similar to the one shown to the right, will be displayed on the screen, in green.

H0

HELP MENU

1. –Quick Setup Guide
2. –Keypad Operation Guide
3. –Source Selection Guide
4. –Utilities Setup Options

Push 1,2,3,or 4 to select

Push EXIT to return

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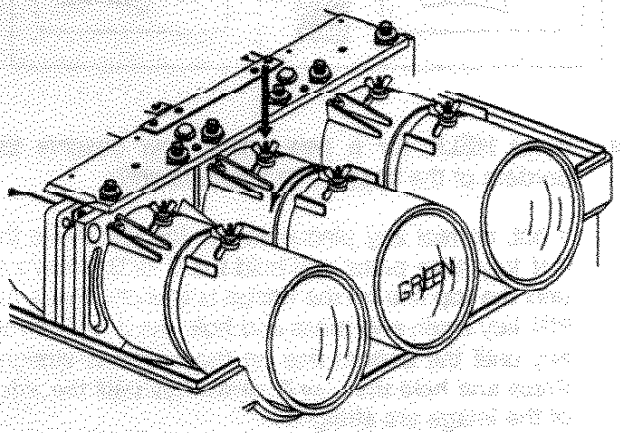
2. If this menu is out of focus and not legible, proceed as follows:

   Loosen the rear wing nut on the green lens. Rotate the lens, using its wing nut, until the image is focused at the center and becomes legible.



3. Select option 1 "Quick setup guide." a new menu, similar to the following, will be displayed.

HELP MENU H 910
1. –Quick setup guide for factory setting on flat 6 foot (1.83 meter) diagonal screen size
2. –Complete setup guide for optimizing on a new screen size or a curved high gain screen
Push 1 or 2 to select Push EXIT to return

4. Select option 2 "Complete setup guide...," from the above menu.

   Initially, instructions will be displayed in green. Follow these instructions step-by-step for proper optical and geometry alignment. These instructions are summarized in section 3.2.

   NOTE: The above instructions apply to cart/table mounted projection systems only.

   Use the instructions for ceiling mount systems as follows: Where the instructions refer to the TOP and LEFT edge of the image, during optical alignment, insert BOTTOM and RIGHT edge. Similarly, the BOTTOM and RIGHT sides become TOP and LEFT.

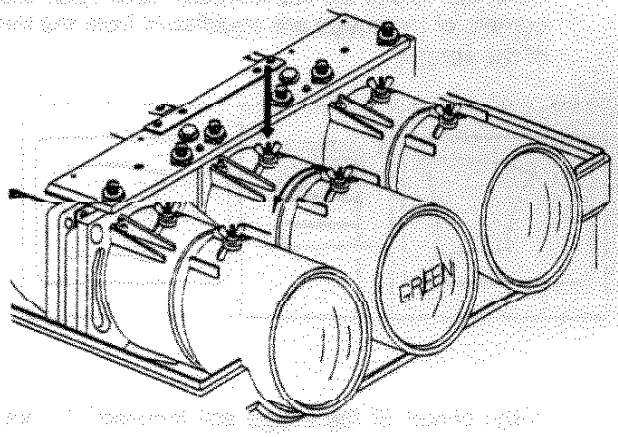
   For rear screen systems, view the image on the back of the rear screen, from the projection room.

3.2 FOCUS AND GEOMETRY ALIGNMENT

This section explains the instructions contained in the "Complete setup guide." These instructions outline the steps necessary to align the cart or table mounted ECP Projector to display a new image size on a selected front screen.

1. Check and align the projector-to-screen distance. Refer to section APPENDIX A for the correct distance.

2. Focus the center of the image. Loosen the wing nut on the rear section of the green lens and rotate the lens, using the wing nut, until the center of the image is focused. Tighten the wing nut.



3. Adjust the electrical focus. Press the **FOCUS** key, then press and hold the **U** or **D** arrow key to optimize the focus at the center of the image.

4. Focus the corners of the image. Loosen the front wing nut on the green lens. Rotate the front lens to optimize the focus at the corners of the image. Tighten the front wing nut.

See the following figure.

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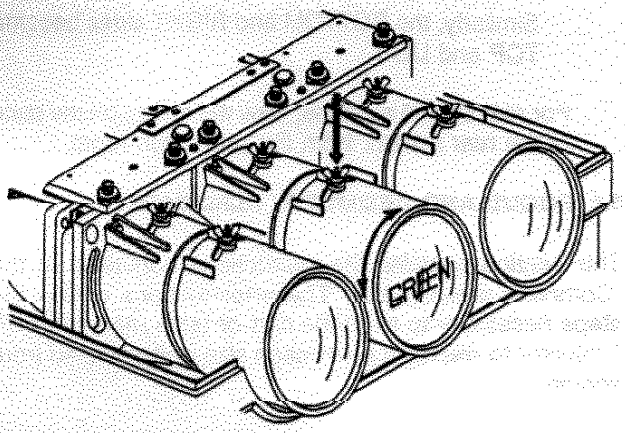
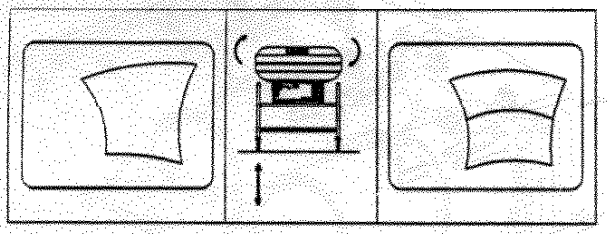


5. Lift the projector on one side and adjust the legs on that side until both bottom corners of the image are equidistant from the bottom of the screen.

6. Arc the projector, side-to-side (and move it to keep the image on the screen), until both top corners of the image are equidistant from the top of the screen.

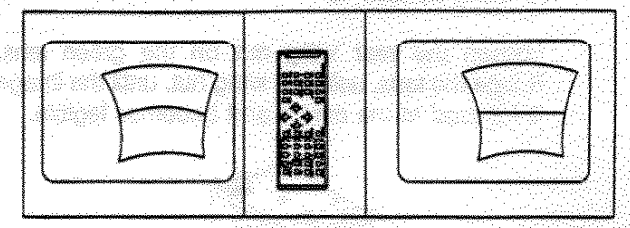


7. Is the center of the image still focused? If not, focus by repeating steps 1 and 2.

8. Press **HELP** for a new image (as instructed) and observe the line across the center of the image. Is it straight?

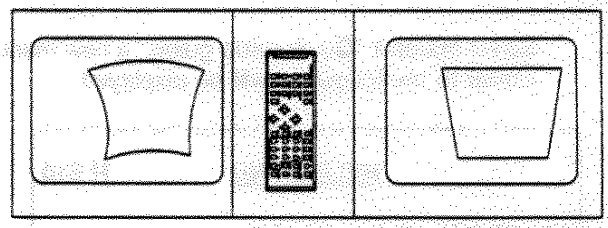
   If not, correct any bow on the line as follows: Press the **BOW** key, then press and hold the **U** arrow key to move the center of the line up. Press and hold the **D** arrow key to move the center of the line down. Continue until the line is straight.

   See the following figure.



9. Press **HELP** for a new image and observe the borders of the image. Are they straight?

   If not, correct any pincushion as follows: Press the **PIN** key, then press and hold the **U** or **D** arrow key until the top line on the image is straight. Press the **PIN** key again and press and hold the **U** or **D** arrow key until the bottom line on the image is straight. Press and hold the **L** or **R** arrow key until the sides of the image are straight.



10. Observe the borders on the left and right edges of the image. Are they parallel to the edges of the screen?

    If not, correct any keystone as follows: Press the **KEY** key, then press and hold the **U** or **D** arrow key until the two sides of the image are parallel to the sides of the screen.

    See the following figure.

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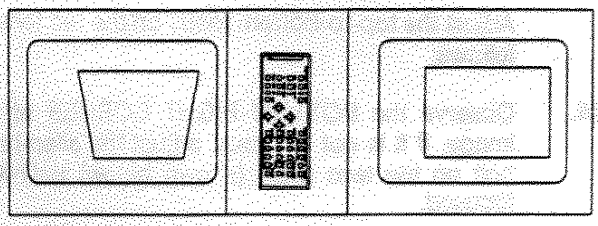
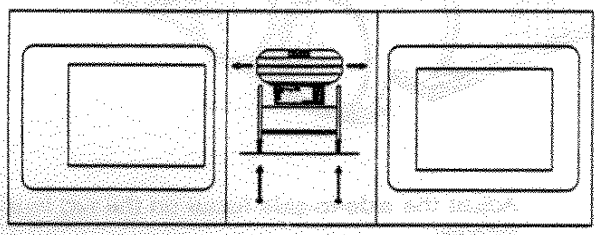


11. Move the projector side-to-side to center the image on the screen horizontally.

12. Adjust the two front legs on the projector to center the image on the screen vertically. Align the keystone if necessary.



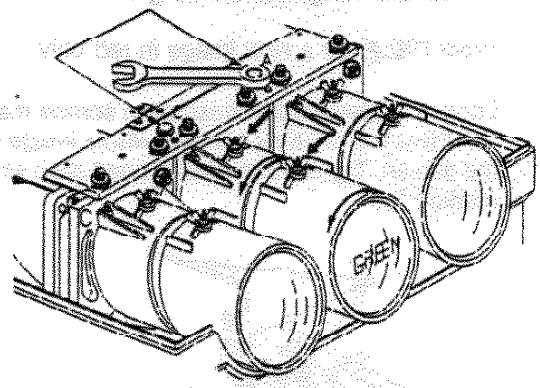
The image now should be rectangular, its borders parallel to the borders of the screen and it should be centered on the screen. If not, repeat steps 2 through 12. (The image may not necessarily be focused everywhere.)

Adjust the top-to-bottom focus on the green as follows:

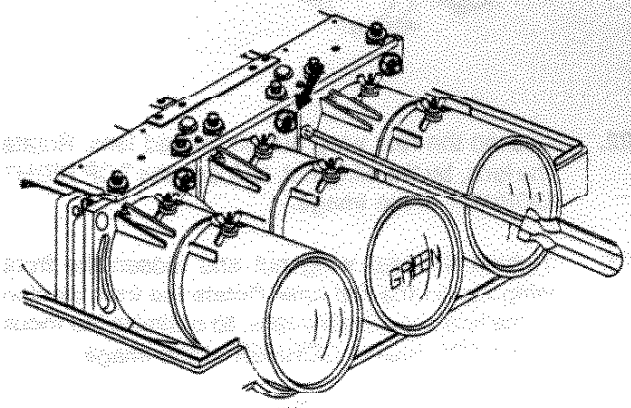
13. Loosen the two hex head bolts marked "A" and "C," using the combination wrench supplied.

14. Loosen the rear wing nut on the green lens. Rotate the rear section of the lens to focus the TOP of the image.

15. Tighten the rear wing nut and loosen the front wing nut. Rotate the front section of the lens to optimize the focus at the TOP of the image.



16. Observe the BOTTOM CENTER of the image. If it is out of focus, adjust the allen-head bolt on the base of the lens (shown below) using the ball-nose driver, until focused.



17. Repeat steps 14, 15 and 16.

The image (green only) should now be in focus everywhere, centered on the screen and have the correct geometry.

Check the green focus as follows:

18. Loosen the rear wing nut on the green lens and slightly de-focus, then focus, the green image. Observe the center and the edges. The center and the edges should de-focus together. If not, repeat steps 14, 15 and 16.

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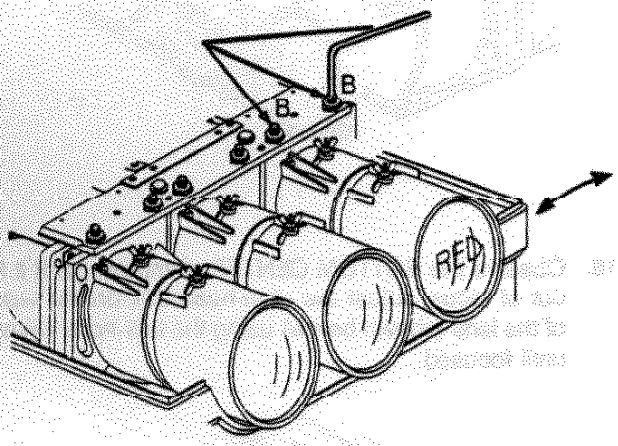
19. Check the center and corner focus. Adjust, if necessary, by rotating the rear and front sections of the lens.

20. Tighten the wing nuts on the green lens.

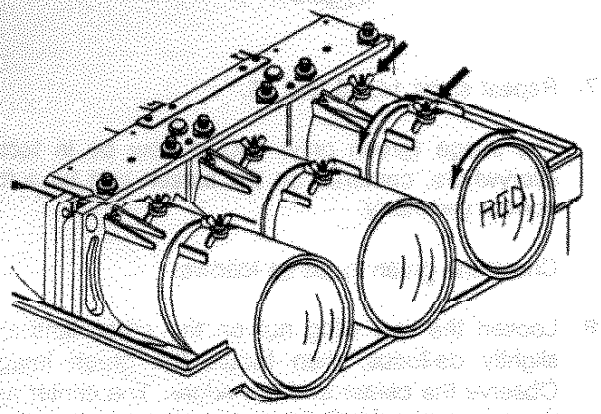
Press **HELP** for a new image in red only.

21. Loosen the two socket head allen screws marked "B." Pivot the red lens until the whole image is on the screen. Tighten the socket head allen screws marked "B."



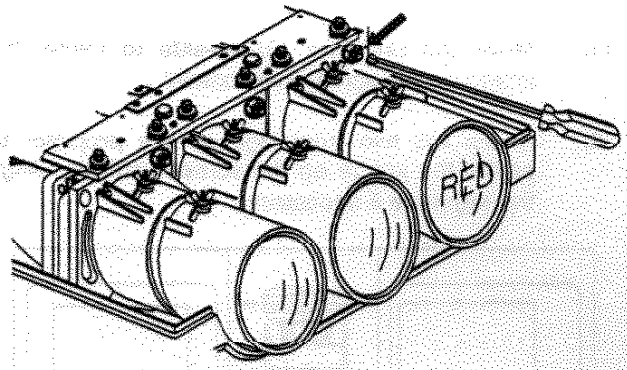
22. Loosen the rear wing nut on the red lens. Rotate the lens, by the wing nut, to focus the TOP RIGHT CORNER of the image.

23. Tighten the rear wing nut and loosen the front wing nut on the red lens. Rotate the front section of the lens, holding the lens, to optimize the focus at the TOP RIGHT CORNER of the image.



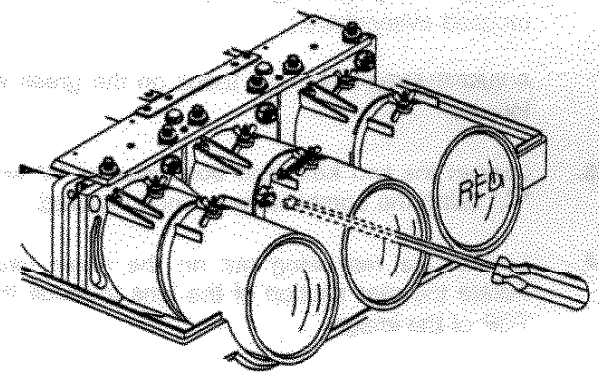
Adjust the top-to-bottom focus on the red lens as follows:

24. Observe the BOTTOM RIGHT CORNER of the image. If it is out of focus, adjust the allen-head bolt on the lens base (shown below) until it is focused.



Adjust the side-to-side focus on the red lens as follows:

25. Observe the LEFT EDGE of the image. If it is out of focus, adjust the allen-head bolt on the lens base (shown below) until the LEFT EDGE is focused.



Adjust the red lens side-to-side tilt as follows:

26. Press **HELP** for a new screen. A red/green cross will be displayed on the center. Loosen the two socket head allen screws marked "B."

27. Pivot the red lens until the red cross aligns with the green cross.

28. Tighten the socket head allen screws marked "B."

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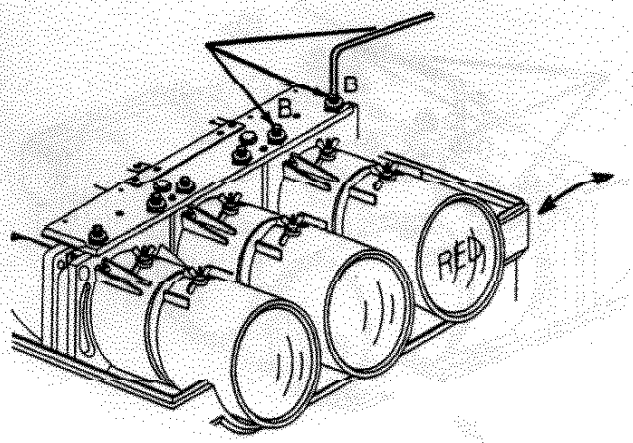


29. Repeat steps 22, 23, 24, and 25.

The red image should now be focused. The red and green crosses at the center of the image should be converged and one yellow cross should be visible.

Check the red focus as follows:

30. Loosen the red rear wing nut and slightly de-focus, then focus, the image. The edges and the center should de-focus and focus together. If not, repeat steps 22, 23, 24, and 25.

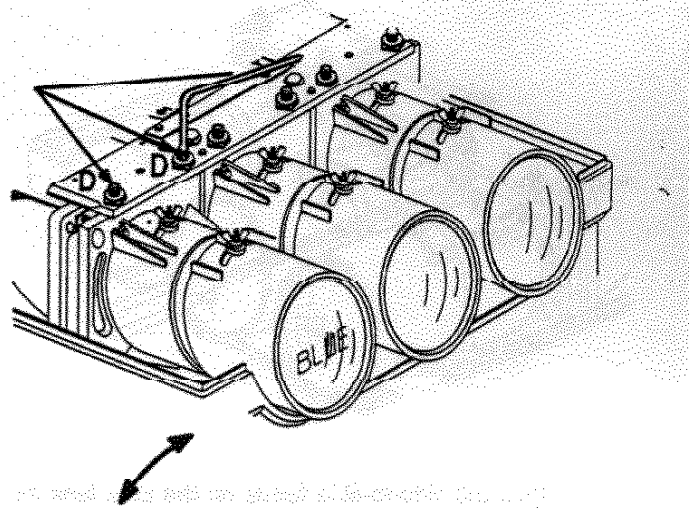
31. Check the center and corner focus. Align, if necessary, by rotating the rear and front sections of the lens.

32. Tighten the two wing nuts on the red lens.

Press **HELP** for a new image in blue only.

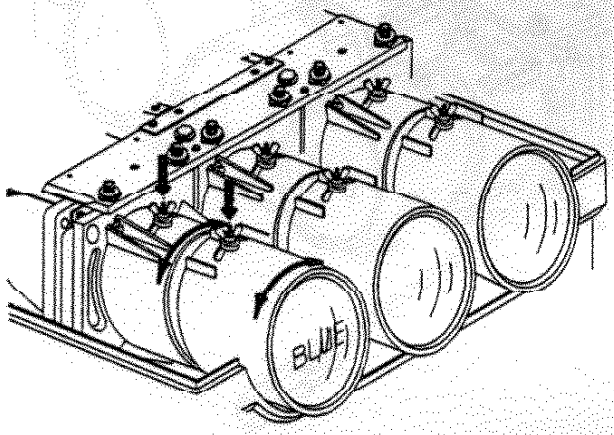
33. Loosen the two socket head allen screws marked "D." Pivot the blue lens until the whole image is on the screen. Tighten the socket head allen screws marked "D."

See the following figure.



34. Loosen the rear wing nut on the blue lens. Rotate the lens, by the wing nut, to focus the TOP RIGHT CORNER of the image.

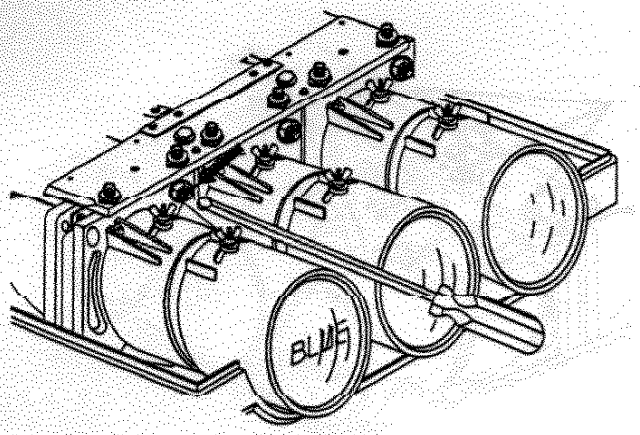
35. Tighten the rear wing nut and loosen the front wing nut on the blue lens. Rotate the front section of the lens, holding the lens, to optimize the focus at the TOP RIGHT CORNER of the image.



Adjust the top-to-bottom focus on the blue lens as follows:

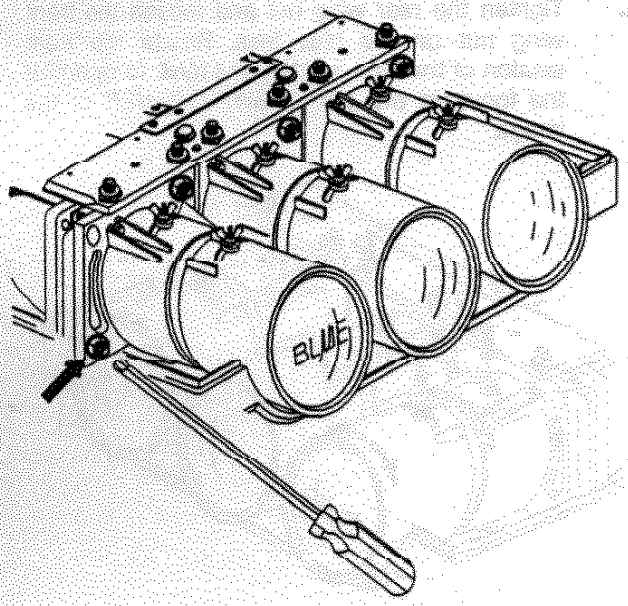
36. Observe the image at the BOTTOM RIGHT CORNER. If it is out of focus, adjust the allen-head bolt on the lens base until the image is focused.

See following figure.



Adjust the side-to-side focus on the blue lens as follows:

37. Observe the LEFT EDGE of the image. If it is out of focus, adjust the allen-head bolt on the lens base (shown below) until the LEFT EDGE is focused.

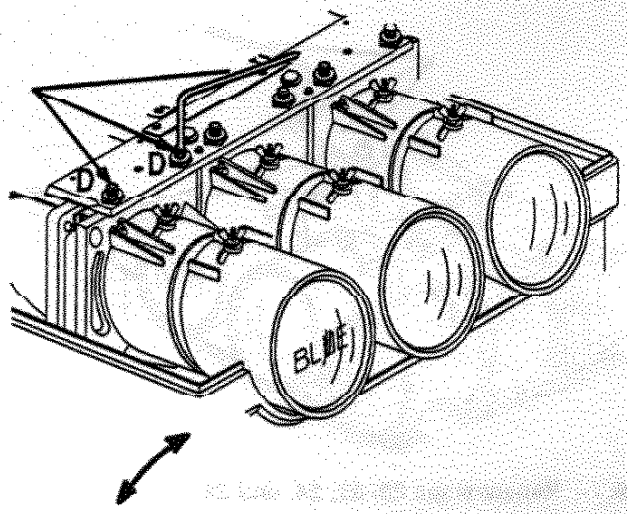


Adjust the side tilt of the blue lens as follows:

38. Press HELP for a new screen. A blue and a green cross will be displayed on the center oofthe screen. Loosen the two socket head allen screws marked "D."

39. Pivot the blue lens until the blue cross aligns with the green cross.

See following figure.



40. Tighten the socket head allen screws marked "D."

41. Repeat steps 34, 35, 36 and 37.

The blue image should now be focused. The blue and green crosses at the center of the image should be converged and one cyan cross should be visible.

Check the blue focus as follows:

42. Loosen the blue rear wing nut and slightly de-focus and focus the image. The edges and the center should de-focus and focus together. If not, repeat steps 34, 35, 36 and 37.

43. Check the center and corner focus. Align, if necessary, by rotating the rear and front sections of the lens.

44. Tighten the two wing nuts on the blue lens.

45. Tighten the two hex-head bolts marked "A" and "C."

46. Press HELP for a new screen. A crosshatch will be displayed in white. The colors may not be converged. Use this crosshatch to check the focus alignment for all three colors. Press the COLOR key repeatedly to cycle through the colors. If focus alignment is required for any color, repeat the appropriate steps.

47. Replace all tools into the tool pouch. Set the front top cover in place. Make sure that the 5 tabs on the rear edge of the front top cover align with their mating slots in the top rear cover. The front top cover should snap in place.

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48. When finished, press **EXIT** to return to the image. Proceed to section 3.3, "CONVERGENCE ALIGNMENT."

3.3 CONVERGENCE ALIGNMENT

For optimum performance the red, green and blue images must be accurately converged for the video input in use. There are two convergence subroutines available; **Guided** and **Advanced Random Access**. If the projector includes the ACON automatic convergence option, a full automatic convergence is also available.

NOTE: Allow the projector 45 minutes to warm-up, before converging.

Prior to converging the projector, use the **SOURCE** function to select the input source (see section 3.5). Next, press the **CONVERGE** key to enter the convergence menu.

CONVERGENCE

1. Guided Convergence
2. Advanced Random Access
3. Test Pattern
4. Acon: Auto-Convergence

Press a number to select

Press HELP for instructions
Press EXIT to return

Select one of the following items:

1. Guided Convergence. Selection of this option provides a complete user-guided convergence of the red and blue on the green image in 25 convergence zones.

2. Advanced Random Access. Select this option to converge a particular area of the display. One or more of 45 user-specified convergence zones may be selected and converged. This option also allows convergence of the blue on the red image.

3. Test Pattern. Select this option to display a test pattern. Press **EXIT** to remove the test pattern and return to normal mode. Press **CONVERGE** if convergence is necessary.

4. ACON: Auto-Convergence. If ACON is installed, select this item to fully auto-converge the projector. Refer to the ACON User's manual.

Guided Convergence

When guided convergence is selected, a help menu explaining the convergence procedure is displayed. Read the menu then press the **CONVERGE** key. A red and green crosshatch is displayed with a box positioned in the center of the screen. Use the arrow keys to converge the red on the green in the box. Press the **CONVERGE** key again to adjust the blue to the green.

Note: The center convergence adjusts the complete crosshatch position. Concentrate on the crosshatch positioning within the center box.

Once the center convergence is complete, press the **CONVERGE** key again. A red and green crosshatch will be displayed with a box positioned at the left side of the display. Use the arrow keys to converge the red on the green in the box. Press **CONVERGE** to advance the box to another zone. Continue using the arrow keys to converge, and the **CONVERGE** key to advance the box. When the red on green convergence is complete in all zones, the crosshatch will change colors to green and blue and the process repeated. When all convergence zones are converged, the exit menu will be displayed.

Press the **EXIT** key to store the new convergence pattern. Press the **0** key to exit without saving.

Advanced Random Access Convergence

When random access convergence is selected, a red and green crosshatch will be displayed with the box at the center position. Use the arrow keys to converge the red on the green in the box. Press the **CONVERGE** key again to adjust the blue on the green.

Note: The center convergence adjusts the complete crosshatch position. Concentrate on the crosshatch positioning within the center box.

Once the center converge is complete, press the **CONVERGE** key again. Use the arrow keys to re-locate the box to any of the 45 convergence zones. Press the **CONVERGE** key to converge the red on the green. To converge the blue on the green or blue on the red, use the **COLOR** key as shown below.

	reference color	convergence color
press COLOR	green	blue
press COLOR again	red	blue
press COLOR again	a white crosshatch for reference	
press COLOR again	repeat starting at green-red	

From this point on, use the **MOVE** and arrow keys to move to other convergence zones. When complete,

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press the **EXIT** key. An exit menu will be displayed.

Press the **EXIT** key to store the new convergence pattern. Press the **0** key if the new convergence is less satisfactory than the previous convergence.

3.4 OTHER ALIGNMENT FUNCTIONS

The following alignment functions are also stored for each input of each source. Select an input before making alignments. Select another input and repeat the alignments for the new input.

a) PICTURE CENTERING

Check the position of the image on the screen. If the picture is not centered on the screen, move it using the **MOVE** key.

Press **MOVE** until the "H.MOVE" bar graph appears on the bottom left corner of the screen. Press and hold the **L** or **R** arrow key to move the picture side to side. Press **MOVE** again, then press and hold the **U** or **D** arrow key to move the picture up and down.

Press **MOVE** again, then press and hold any one of the four arrow keys to move the picture horizontally or vertically. Press **MOVE** again, to return to the NO MOVE state.

b) MANUAL/AUTOMATIC LOCK

During manual lock, the projector requires the operator to manually adjust the horizontal and vertical hold frequencies to match the incoming video signal. The lights located on the back of the projector marked "H.HOLD" and "V.HOLD" are ON. In automatic mode, the projector locks to the frequency of the input and displays a stable image without any user adjustment. The "H.HOLD" and "V.HOLD" status lights are OFF.

Automatic lock is most commonly used and is recommended. Verify the current lock mode by checking the "H.HOLD" and "V.HOLD" lights or by pressing the **H.HOLD** or **V.HOLD** key. Pressing the **H.HOLD** or **V.HOLD** key displays the lock mode (auto or manual) as well as the current horizontal and vertical hold frequencies. A second press of the **H.HOLD** or **V.HOLD** key will toggle the current lock mode.

When switching to manual lock (per above), the picture may roll or appear unstable. Use the up/down arrow keys until the display becomes stable.

c) VERTICAL BLANKING

Video from video tapes often has timing information placed at the top of the picture. Distracting head switching occurs at the bottom of the picture. These signals are not part of the picture, nor are they seen on television. Use the **V BLANK** function to blank off this unwanted information. Press the **V BLANK** key, then press and hold the **D** arrow key until the top of the picture is clean. Press **V BLANK** again, then press and hold the **U** arrow key until the bottom of the picture is clean.

To remove blanking, press **V BLANK**, then press and hold the **U** arrow key until all the information on the top is visible. Press **V BLANK** again then press and hold the **D** arrow key until all information on the bottom of the picture is visible.
NOTE: Do not blank the picture when displaying computer generated images.

d) SLOW/FAST SYNC

Press the **FAST/SLOW SYNC** key to correct any bend or distortion at the top of the picture. These abnormalities are caused by poor sync on video tape players.

e) ADJUST PICTURE SIZE

Press the **SIZE** key, then press and hold the **U** or **D** arrow key to adjust the picture height.

Press the **SIZE** key again, then press and hold the **L** or **R** arrow key to adjust the width of the picture.

3.5 INPUT SELECTION

The projector can hold two input modules at any one time. An input module installed in SLOT 0 becomes SOURCE 0. An input module installed in SLOT 1 becomes SOURCE 1.

To display an input, use the **SOURCE** function followed by two digits. The first digit identifies the slot number. The second digit identifies the input number on that input module.

> For example: Slot 0 contains a RGB SYNC 10 PIN input module. A computer source is connected to INPUT 2. To display this source, enter **SOURCE, 0, 2**.

The key sequence **SOURCE, 0** or **SOURCE, 1** without the second digit, will always access input 1 for that source by default, if the second digit is not entered within 1.5 seconds.

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Source Up/Down Programming

The Source Up/Down programming feature allows a list of up to 48 available input sources and conditions to be saved in memory for later quick selection. Available input sources may be sequentially viewed from the program list by pressing the **SOURCE** key followed by the **U** or **D** arrow keys. When "Simplified Source Switching" mode is ON, any of the 48 programmed sources may be displayed with no more than 2 keystrokes of the keypad.

To program the list, press the **HELP** key, then select option 4, UTILITIES. From the utilities menu, select option 1, "Source U & D Programming". A help screen is displayed explaining the Source Up/Down Programming function. Press **HELP** to enter programming mode. The following chart will be displayed with a cursor at the first field of selection (channel) #1.

Source Up/Down Programming U12

CH	SW	SI	R#		CH	SW	SI	R#
1	*	01	*		25	2	51	*
2	*	02	*		26	2	52	*
3	*	11	*		27	2	61	*
4	*	12	*		28	2	62	*
5	1	11	*		29	3	11	*
6	1	12	*		30	3	12	*
7	1	21	*	Press	31	3	21	*
8	1	22	*	EXIT	32	3	22	*
9	1	31	*	when	33	3	31	*
10	1	32	*	done	34	3	32	*
11	1	41	*		35	3	41	*
12	1	42	*		36	3	42	*
13	1	51	*		37	3	51	*
14	1	52	*		38	3	52	*
15	1	61	*		39	3	61	*
16	1	62	*		40	3	62	*
17	2	11	*		41	4	11	*
18	2	12	*		42	4	12	*
19	2	21	*		43	4	21	*
20	2	22	*		44	4	22	*
21	2	31	*		45	4	31	*
22	2	32	*		46	4	32	*
23	2	41	*		47	4	41	*

The chart lists all 48 data sets. Each data set includes:

CH CHANNEL NUMBER (from 1 to 48).

SW SWITCHER NUMBER (from 1 to 4). An asterisk (*) indicates no switcher.

SI SLOT and INPUT NUMBER. The slot number may be 0 or 1 if **SW** is an asterisk (*). If **SW** is between 1 and 4, the slot number may be from 1 to 6. The input number may be 1 or 2.

R# RECALL NUMBER (0 to 9). Any of the recall memories may be specified.

An asterisk (*) in any field position indicates an unspecified or null value. To program a channel, use the arrow keys to move the cursor to first field of the desired channel. Enter the switcher number ("*" if a switcher is not being selected). The cursor moves to the next field. Enter the slot number of the projector (or switcher if specified), then the input number (1 or 2). If a recall memory is to be specified, enter the recall memory number. If no recall memory is to be used, leave a "*" in the R# field by pressing the asterisk key or moving the cursor to another field.

If an invalid input is entered, either the input will not be accepted or an associated field will automatically change to accomodate the entry. The changed field (usually to a "Z" or "*") will require entry of a valid number. For example, if entering "1" for the switcher number while the slot number is set to "0", the slot number will change to a "Z" or "*". If a "Z" appears, it will change to a "*" once the cursor is repositioned. It is then required to change the "*" to a switcher slot number (between 1 and 6).

Once programming is complete, press the **EXIT** key. The exit menu will be displayed. Press the **EXIT** key to save or the **0** key to cancel the new settings.

Simplified Source Switching

Simplified Source Switching is an operating mode which allows fast and easy selection of any one of the 48 user-programmed input sources set by the Source Up/Down programming utility. To turn the mode ON or OFF, press the **HELP** key, then select option 4, UTILITIES. Option #8 indicates whether simplified source switching mode is ON or OFF. Toggle the setting by pressing "8".

With simplified source switching mode ON, press the channel number associated with the desired input. Channels 1 to 9 must begin with a 0. The selected channel and source information is briefly displayed with the new source. If the field information in the up/down programming list is not valid, the projector settings remain the same.

3.6 CONTRAST AND BRIGHTNESS CONTROL

Set contrast and brightness as follows:

a) Press the **CONT** key, then press and hold the **D** arrow key until the contrast is at the left edge of the bar graph and the image disappears.
b) Press the **BRITE** key, then press and hold the **U** arrow key until the raster becomes visible.
c) Press and hold the **D** arrow key until the raster just becomes invisible, then release the D arrow key.
d) Press the **CONT** key, then press and hold the **U** arrow key until the image is visible and the desired level of brightness is reached.

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3.7 VIDEO TAPE OR DISK PLAYERS

To use the projector with video tape or disk players, install a MULTI STANDARD DECODER. Connect the video source to one of the BNC connectors marked "1 VIDEO." Terminate the other BNC connector using the terminator supplied with the module. Connect a second video source, if required, to the video input marked "2." Connect both audio channels from each source to AUDIO IN, 1 and 2 inputs.

NOTE: Use one audio channel only for monophonic audio output. Connect AUDIO OUT outputs to an amplifier.

Select an input using the **SOURCE, n, 1** or **SOURCE, n, 2** key sequence. Press the **FAST/SLOW SYNC** key to correct any distortion present at the top of the picture. Adjust the picture using the **COLOR, TINT,** and **DETAIL** keys and the **U** or **D** arrow key. Adjust the volume using the **VOL** key with the **U** or **D** arrow key. Press **MUTE** to turn off the sound. Press **MUTE** again to restore the sound.

3.8 STORAGE AND RECALL OF PROJECTOR SETTINGS

All projector settings are stored in battery backed-up, non-volatile memory. The projector updates all memories automatically.

During a power-down or power failure, the projector stores the source number and all settings before it powers-down.

During a power-up, the projector turns on displaying the source in use just before the last power-down.

3.9 RECALL MEMORIES

There are ten, user programmable, memory locations which may be allocated to any input on any source. They are called RECALL MEMORIES. Frequently used projector settings can be stored in recall memory and recalled, as required, for quick set-up.

To store a complete set of projector parameters in recall memory, press the **HELP** key. Select option 4. UTILITIES, then select option 3. SOURCE RECALL MEMORY, on the new menu. Follow the displayed instructions.

To recall a memory, press **SOURCE, RECALL, n**, where n is the recall memory number (between 0 and 9). Recalling a recall memory does not overwrite the settings stored in the source memory. Switching to a new source, or powering-down the projector, automatically saves the settings in both the source and recall memories.

For example: A video tape and a personal computer are frequently used but often disconnected and replaced with other video sources.

To preserve the projector settings, store them in a recall memory. To store the video tape setting in recall memory 8, make sure the video tape is displayed. Press the **HELP** key. Select option 4. UTILITIES, then select option 3. RECALL MEMORIES. Enter the **SOURCE, RECALL, 8** sequence.

If the video tape is used again and connected to source 1,1, display it by pressing the **SOURCE, 1, 1** sequence; then enter the **SOURCE, RECALL, 8** sequence.

Settings in recall memory can be revised by repeating the **HELP**, option 4. UTILITIES and option 3. RECALL MEMORIES sequence.

3.10 MULTIPLE PROJECTOR USE

There are two multi-projector configurations possible with remote keypad control:

i) Several projectors, controlled by one remote keypad (dependent operation).
ii) Several projectors, each controlled separately by one distinct keypad (independent operation).

a) Dependent Operation

A number of projectors may be controlled by one keypad as follows:

Identify each projector. Use its built-in keypad. Press the **HELP** key. select option 4. UTILITIES, then select option 5. MULTIPROJECTOR SYSTEMS, on the new menu. Enter **PROJ n** where n is the projector number.

NOTES: 1. Up to 1000 projectors may be used when option 5 is selected.

2. Use of and IR AMPLIFIER/DISTRIBUTION BOX (38-800316-61) ensures that each projector within the multiprojector system receives clean, correct infrared signals. The IR amplifier/distribution box can accept up to twelve projectors. It may be ganged, as required to accommodate up to 1000 projectors. See Figure 10.1. Projectors should be connected to the IR amplifier/distribution box via MULTIPROJECTOR CABLE (38-800626-71).

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To access an individual projector in a multi-projector environment, enter **PROJ n** using the remote keypad.

To check the number of the projector, press the * key. The three digit number positioned in the second last row is the programmed projector number.

To access all projectors at the same time, enter the **PROJ EXIT** sequence.

For example: Ten projectors are aligned to show a very large composite image. The contrast on projector 4 is too high and the keystone on projector 7 needs adjustment.

To correct these problems using one remote keypad, proceed as follows:

Enter **PROJ**, **4**, **CONT**, then press and hold the **D** arrow key until the contrast on projector 4 is at the correct level. Enter **PROJ**, **7**, **KEY**, then press and hold the **D** arrow key until the keystone distortion on projector 7 is correct.

To increase the contrast on all projectors at the same time, enter **PROJ**, **EXIT**, then press the **CONT** key and press and hold the **U** arrow key until the contrast on all the projectors reaches the desired level.

b) Independent Operation

To operate two projectors independent of each other, in the same room, use a Protocol 2 IR keypad and a standard keypad (Protocol 1). See section 4.

To operate several projectors independent of each other, use wired remote keypads or the built-in keypads.

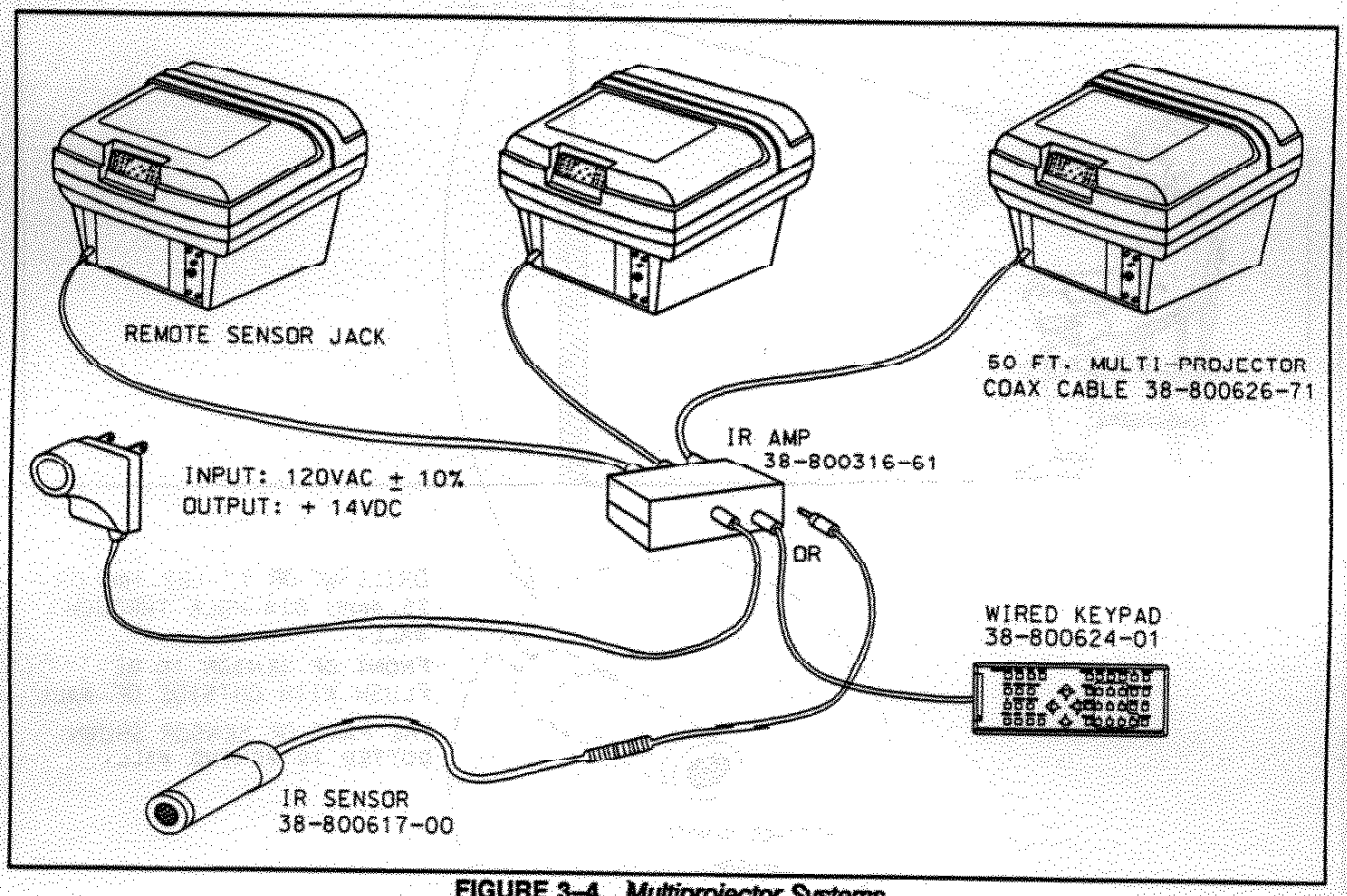

FIGURE 3–4. ***Multiprojector Systems***

3.11 USE OF THE IR REMOTE KEYPAD FOR REAR SCREEN APPLICATIONS

Most rear screens are transparent to infrared light used by the remote keypad. In most cases, aiming the remote keypad towards the rear screen is sufficient to operate the projector. If the response of the projector to the remote keypad is poor, install a remote IR sensor (optional) in the wall that separates the rear projection booth from the viewing room.The face of the IR sensor must protrude into the viewing room. Plug the remote IR sensor into the jack on the projector marked "REMOTE SENSOR." Aim the remote keypad at the remote IR sensor to operate the projector. **NOTE: If an IR Switcher is in use, the remote IR sensor must still be plugged into the projector.**

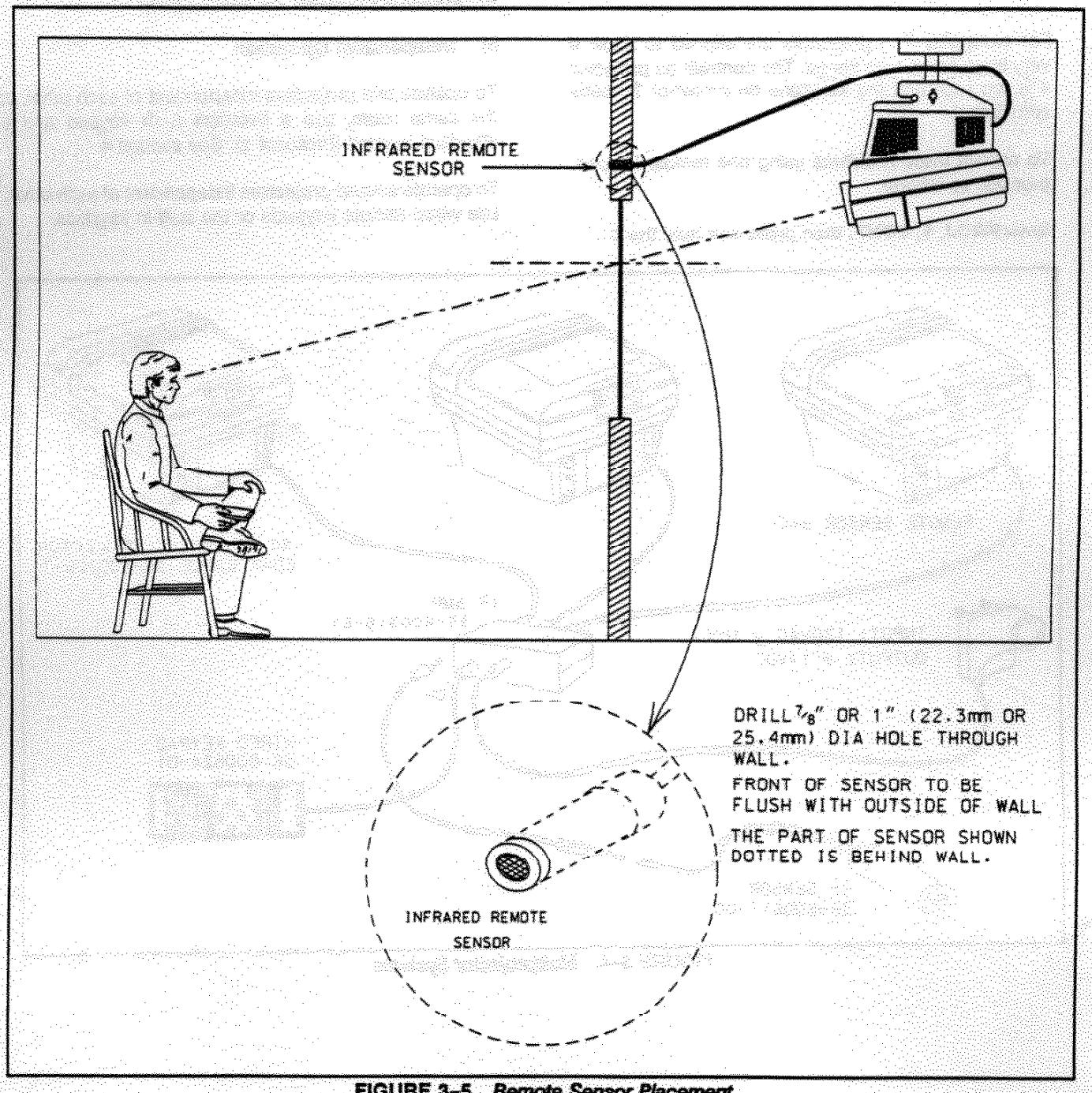

FIGURE 3-5. ***Remote Sensor Placement***

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SECTION 4

CONTROL & SOFTWARE

This ECP Projector operates under the control of software version V2.1.

Most projector functions (except the optical focus) are controlled by keypad. There are two keypads supplied with each projector, the infrared IR Remote Keypad and the built-in keypad. The keypads are functionally the same; all are configured as Protocol 1 keypads. The remote keypads use a 9V battery as their power source. To install the battery, slide the battery compartment cover off, install the battery and replace the battery compartment cover.

To operate the ECP Projector with an IR Remote Keypad, maintain a clear line of view between the keypad and the screen or projector. Aim the keypad at the screen or projector and key the required functions.

NOTE: Software version V2.1 is NOT backwards compatible with previous software versions. If the projector is to be used with an earlier version Infrared Remote Switcher, the switcher software must be upgraded.

4.1 OPERATION

The user adjusts the projector via a keypad. A keypad command may be a single keystroke or two or three keystrokes in a specific sequence. Most keypad commands are two keystroke. **For all keystrokes, pressed keys must be held down for 1 second minimum.**

There are three sets of colored keys on the keypad:

Set-up keys: These keys are used during set-up. They are dark grey in color.

Control keys: These keys are used frequently. They include the color-coded **SOURCE**, **MUTE** and **POWER** keys and a number of light grey keys.

Arrow keys: The arrow keys provide smooth control when used in conjunction with both the set-up and control keys. They are light grey in color.

Pressing a function key, superimposes a bar graph on the bottom right hand corner of the image. The bar graph names the function and shows the current function setting on a scale of 0 to 10. If keys are not pressed within a 5 second period, the bar graph will disappear from the image.

For example: Press the **SIZE** key. The following bar graph will be superimposed on the image.

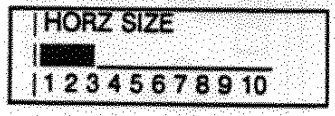

FIGURE 4–1. ***The Function Bar Graph***

The graph shows horizontal size is 30% greater than minimum. Press the **L** or **R** arrow key to change the picture width.

NOTE: Pressing the **U** or **D** arrow key will cause the projector to switch to the vertical size function. Pressing the **U** or **D** arrow key while in the vertical size function will increase or decrease vertical size. Pressing the **L** or **R** arrow key will cause the projector to switch to the horizontal size function. Pressing the **SIZE** key will also change the function. The bar graph follows the picture change. If keys are not pressed within 5 seconds, the bar graph will disappear.

To enable or disable the bar graph function, enter the **RECALL**, **HELP** key sequence. A menu will be displayed. Press the **1** and **EXIT** keys to enable the bar graph function. Pressing a function key will cause the bar graph to be displayed on the bottom right corner of the image. The bar graph automatically disappears 5 seconds after a function key is pressed.

Press the **RECALL**, **HELP**, **2** and **EXIT** keys to disable the bar graph. The bar graph will not be displayed during function adjustment. This feature is useful for discretely tweaking functions, during presentations, to optimize picture quality.

To check a particular projector function setting, press **RECALL**, then press the function key. The bar graph will be displayed for 5 seconds.

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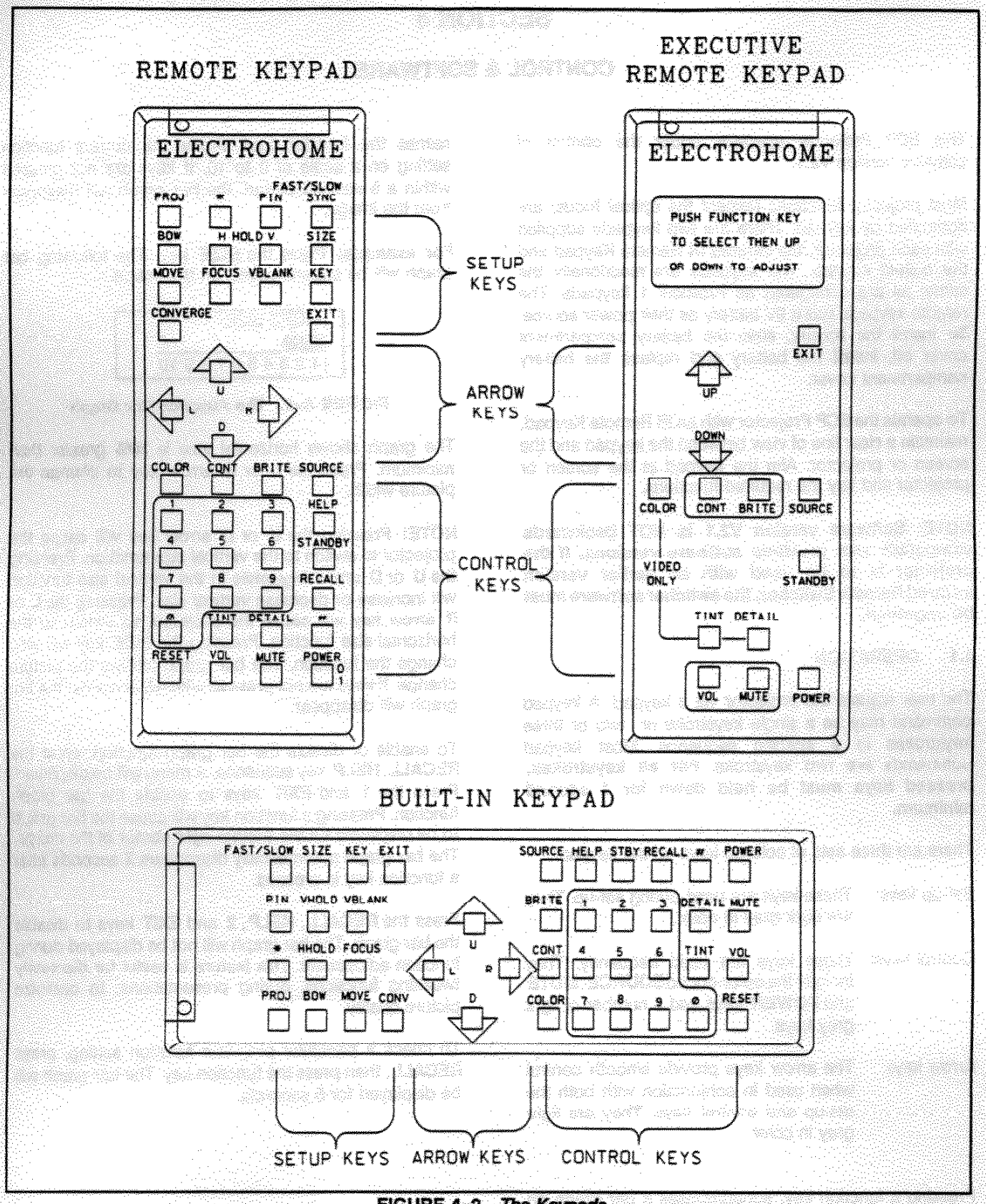

FIGURE 4–2. ***The Keypads***

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4.2 KEYPAD COMMANDS

The commands and their uses, listed here, are for software version V2.1, refer to Addendum for updates.

1. Single Keystroke Commands – one keystroke

KEYSTROKE	ACTION
*	Superimpose the projector identification on the image. Press again to remove the identification from the image.
COLOR	Switch colors in the convergence routine.
CONVERGE	Enter the convergence routine.
EXIT	End current command, exit menu or save data settings.
FAST/SLOW SYNC	Correct flag-waving or distortion at the top of a video image when using a VCR.
HELP	Display a help menu.
MUTE	Turn the audio off when using a Multi Standard Decoder. Press again to turn the audio on.
#	Display an internal crosshatch test pattern. Press again to return to the image.
POWER	Turn power on. Press again to turn power off.
RESET	Reset convergence to zero setting during the convergence routine.
SOURCE	Display status of current source, i.e., switcher, slot and input numbers.
STANDBY	Turn off the image (and the audio). Press again to return the image (and the audio).

2. Double Keystroke Commands – two keystrokes

Immediate action commands. Press the key shown, then press a numeric key. The **n** is a numeric key between 0 and 9.

PROJ n	Call projector n to respond to the next command.
SOURCE n	Display the input connected to input 1 of slot n.
VBLANK n	Turn on selected colors.

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

TABLE 4–1. *Key/Color Chart*

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Continuously variable commands. Press the key shown, then press and hold one of the arrow keys, **U**, **D**, **L** or **R**. Release the arrow key when ready. The **a** represents an arrow key.

BOW a	Press **BOW**, then use the **U** or **D** arrow key to correct a bow.
BRITE a	Press **BRITE**, then use the **U** or **D** arrow key to set the brightness of the background or black areas.
CONT a	Press **CONT**, then use the **U** or **D** arrow key to adjust contrast of the foreground, or brightest areas, to desired levels.
CONVERGE a	In the convergence routine, press **CONVERGE**, then press an arrow key to match the lines of the two colors.
FOCUS a	Press **FOCUS**, then use the **U** or **D** arrow key to adjust electronic focus.
H HOLD a	Press **H HOLD**, then use the **U** or **D** arrow key to lock the projector to input. Press **H HOLD** again to return to automatic lock mode.
KEY a	Press **KEY**, then use the **U** or **D** arrow key to correct keystone.
MOVE a	Press to enable horizontal centering. Press again to enable vertical centering. Press again for simultaneous horizontal and vertical centering. Use the arrow keys to move the image in the desired direction. Press again to disable centering.
MOVE a	In the convergence routine, press **MOVE**, then use an arrow key to move box to desired area.
PIN a	Press **PIN**, then an arrow key, to correct the top half and sides of the image. Press **PIN** again, then an arrow key, to correct the bottom half and sides of the image.
SIZE a	Press **SIZE**, then use an arrow key to adjust picture size.
V BLANK a	Press to enable blanking at the top of the image. Press again to enable blanking on the bottom of the image. Use the **U** or **D** arrow key to blank the required area.
V HOLD a	Press **V HOLD**, then use the **U** or **D** arrow key to synchronize the projector to input. Press **V HOLD** again to return to automatic lock mode.

The following four commands apply only when using the Multi Standard Decoder module.

COLOR a	Press **COLOR**, then use the **U** or **D** arrow key to adjust the color saturation.
DETAIL a	Press **DETAIL**, then use the **U** or **D** arrow key to adjust the sharpness.
TINT a	Press **TINT**, then use the **U** or **D** arrow key to adjust the hue for NTSC standard video (hue adjustment is not required for PAL or SECAM video).
VOL a	Press **VOL**, then use the **U** or **D** arrow key to adjust the volume.

3. **Triple Keystroke Commands – three keystrokes** n and m are two numeric keys between 0 and 9.

SOURCE n m	Display the source, connected to INPUT m, on the input module in SLOT n (also applies to sources connected to the IR Switcher when using the Multiswitcher Interface Module).
SOURCE * n	Select a switcher when using the Multiswitcher Interface Module. See the Multiswitcher Interface Module User Manual for more details.
SOURCE RECALL n	Use recall memory n to display the current image.

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4.3 SYSTEM CONFIGURATION

Press *, to check your projector's system configuration at power up. System configuration will disappear from the screen automatically after approximately ten seconds. See FIGURE 4-3.

NOTE: The system configuration screen reflects POWER UP conditions only. Changes made after POWER UP, for example, unplugging a switcher, will not be reflected on subsequent system configuration screens.

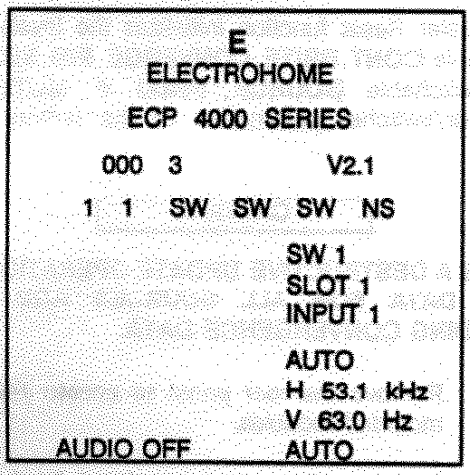


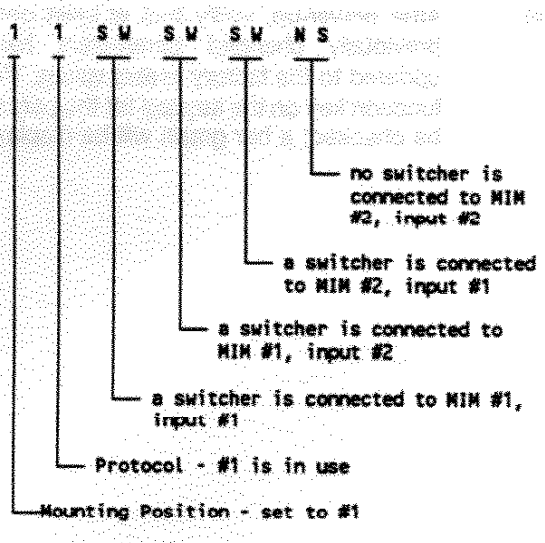
FIGURE 4–3. *The System Configuration Screen*

The System Configuration Screen, shown in FIGURE 4-3, displays the following information:

line 3 Indicates the projector series.

line 4 Indicates the projector number (000), current selected switcher (3), and software version (V2.1)

line 5



The example in Figure 4-3 shows the configuration screen which would be seen with an installation of two MIMs connected to the projector. The status line may appear differently with other installation types.

EXAMPLES

1 1 NS	- no switchers connected
1 1 SW NS	- A MIM in projector slot 1 with a switcher on input 1.
1 1 NS NS NS SW	- MIMs in projector slots 0 and 1 with a switcher on MIM 2, input 2.

line 6 Indicates switcher #1 is the currently selected switcher (SW 1). If no switcher is present, this line is blank.

line 7 Indicates the currently selected slot is #1 (SLOT 1). This applies to the switcher slot if a switcher is selected.

line 8 Indicates the currently selected input is #1 (INPUT 1). This applies to the switcher input if a switcher is selected.

line 9 Indicates horizontal Auto Lock is ON (AUTO). If horizontal Auto Lock is OFF, this line is blank.

line 10 Indicates the horizontal frequency of the current source is 53.1 kHz (H 53.1 kHz)

line 11 Indicates the vertical frequency of the current source is 63.0 Hz (V 63.0 Hz).

line 12 AUDIO OFF indicates the mute function is ON. AUTO indicates vertical Auto Lock is ON (AUTO). If Auto Lock is OFF, this line is blank.

4.4 SOURCE STATUS

Press **SOURCE** to check the current switcher, slot, and input numbers selected. See FIGURE 4-4.

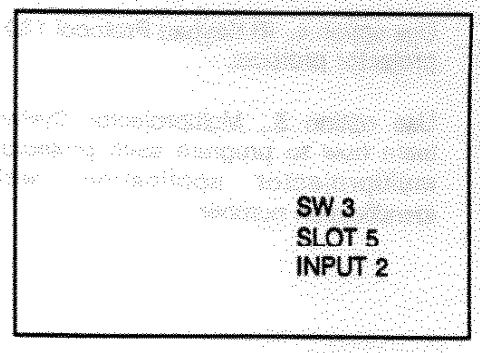


FIGURE 4–4. *The Source Status Screen*

4.5 HELP MENUS

The help menus, stored in the memory, provide on-screen information and access to a number of functions. There are 4 categories of help menus: set-up guide, keypad operation guide, source selection guide and utilities.

To access any one of these four categories press the HELP key. The projector displays a menu in green and lists the four categories. Access any one of the categories by following the instructions on the menu.

a) The set-up guide provides the user with step-by-step set-up procedures, displaying instructions and comments. To access the set-up guide, press the HELP key, then press the 1 key and follow the instructions displayed.

b) The keypad operation guide explains the use of each key on the keypad. To access, press the HELP key, then press the 2 key and follow the displayed instructions.

c) The source selection guide explains how to select a source. To access, press the HELP key, then press 3 and follow the displayed instructions.

d) The utilities contain 8 options. To access, press the HELP key, then press the 4 key to display the options.

Use option 1., Source U & D Programming, to program a sequence/list of sources.

Use option 2., Mounting Positions, if arrow action is opposite to the direction indicated by the arrow key.

Use option 3., Source Recall Memory, to store settings in, or recall settings from, recall memory.

Use option 4., IR Keypad Protocol 1&2, to set projector protocol.

Use option 5., Multiprojector Systems, to learn how to program each projector, in a multiprojector application, with an identification number.

Use option 6., Multiswitcher Systems, to set up IR Switchers when using a Multiswitcher Interface Module.

Use option 7., Screen Display Disable, to remove the on-screen display.

Use option 8., Programmed Source Switching, to enable or dispable Simplified Source Switching. Refer to Section 3.

4.6 MASTER OR HARD RESET

The Master Reset function initializes the levels of the adjustable (CONT, BRITE, CONVERGE, PIN, SIZE, etc.) and switchable (SOURCE, PROJ. #, MUTE, etc.) projector/switcher parameters to the factory preset values.

CAUTION

THIS IS A DESTRUCTIVE UPDATE OPERATION, ALL USER DATA FOR ALL SOURCES ARE LOST, INCLUDING CONVERGENCE DATA.

a) Remove the rear panel to access the track-mounted modules.

b) Power-up the projector and wait for the ready state.

c) Press the RECALL key on the keypad.

d) Within 5 seconds, press the red reset pushbutton on the Remote Control module (3rd card from the left when viewed from the back of projector). The projector should turn OFF.

e) After power-up, verify that at least one of the previously changed parameters has been updated to the factory preset values. Press the function key on the keypad for the parameter to be checked; a bar graph will be displayed.

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The factory preset values, in alphabetical order are:

FUNCTION	VALUE/STATE
BOW	5
BRITE	5
COLOR	5
CONT	2
DETAIL	5
FAST/SLOW SYNC	FA
H HOLD	5
FOCUS	5
KEY	5
MOVE	NO MOVE 0 HMOVE HORIZ 5 VMOVE VERT 5 HVMOVE VERT 5
MUTE	OFF
PIN	5
PROJ	000 ON
SIZE	5
SOURCE	SLOT 1 INPUT 1
STBY	OFF
TINT	6
V BLANK	TOP 10 BOTTOM 10
V HOLD	5
VOL	5
Bar Charts	ON

TABLE 4–2. ***Factory Preset Values***

4.7 OPTIONAL KEYPADS

1. The Executive Keypad (38–800630–01)

This is a simplified keypad containing essential control functions for presentation use only. See Figure 4-2. The Executive Keypad cannot be used with the Multiswitcher Interface Module.

2. The Wired Remote Keypad (38–800624–01)

This keypad is equipped with a 25 foot (7.6m) cable. Use it as an alternative to the infrared remote keypad. The cable plugs into the remote jack marked "REMOTE SENSOR," on the back of the projector.

NOTES: 1. Wired remote keypads are configured as Protocol 1 keypads.

2. If an IR Switcher is in use, the wired remote keypad must still be plugged into the projector.

3. The PROTOCOL 2 Infrared Remote Keypad (38–800625–01)

A PROTOCOL 2 Keypad and a standard IR keypad, are required to operate two projectors in the same room, independent of each other, by IR remote keypad. Program each projector to respond to one protocol only.

To program a projector for protocol 1 or 2, press the **HELP** key, select option 4 UTILITIES, select option 4 IR 1 & 2 from the new menu and follow the instructions. A projector programmed for protocol 2 will only respond to a PROTOCOL 2 remote keypad.

Press the * key on the built-in keypad to check the protocol of a projector. The number positioned at the left of the screen in the last row is the protocol number.

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SECTION 5

CARE AND MAINTENANCE

The following periodic and preventive maintenance measures are suggested. This care will help extend the life of the projector.

5.1 PERIODIC MAINTENANCE

- Clean the lenses only when necessary. Use a soft lens cleaner or facial tissue moistened with a non-abrasive window cleaner. Rub very gently in a circular motion.
- Clean the case with a soft cloth. Use a mild commercial cleaner.

5.2 PREVENTIVE MAINTENANCE

- Keep all liquids away from the projector. Accidental spillage can cause severe damage.
- Double check all input connections before powering up the projector.
- Protect the projector from hostile environments, e.g., dust. Airborne contaminants entering the projector via its cooling fans, can have damaging effects on the electronic circuitry and optics.
- Avoid using excessive brightness settings or leaving stationary images on the CRTs for a prolonged period of time. Failure to observe this precaution can result in images being "burnt" on to the face of the CRT.
- Use the original carton and packing material when shipping the projector.

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SECTION 6

LIST OF AVAILABLE ITEMS

NAME		ELECTROHOME PART NUMBER
ECP 3100/3101		38-BO9955-75(AC)
ECP 4100/4101		38-BO9980-75(AC)
ECP 3100/4100 USER'S MANUAL		54-7582-04P
ECP 3100/3101 SERVICE MANUAL		54-7904-02P
ECP 4100/4101 SERVICE MANUAL		54-7904-03P
ACON KIT		38-800800-AC
ACON USER'S MANUAL		54-7931-01P
PROJECTOR CART		38-800618-66
CEILING MOUNT YOKE		38-800619-66
CURVED SCREEN		38-800002-61
SCREEN LEGS		38-800403-66
KEYPADS	IR REMOTE	03-000213-01P
	EXECUTIVE REMOTE	38-800630-01
	WIRED REMOTE	38-800624-01
	PROTOCOL 2	38-800625-01
INFRARED REMOTE SENSOR		38-800617-00
IR REMOTE VIDEO/DATA SWITCHER		38-800410-61
100 MHz OUTPUT MODULE		38-800911-01
INPUT MODULES	RGB SYNC 2 INPUT	38-800913-01
	RGB 3,4,5 WIRE LOOP	38-800914-01
	ENHANCED PC INTERFACE	38-800915-01
	RGB SYNC 10 PIN	38-800916-01
	MULTISWITCHER INTERFACE	38-800926-01
	TTL INTERFACE	38-800918-01
	2 INPUT MONO	38-800919-01
	MULTI STANDARD DECODER	38-800920-01
	PS/2 INTERFACE	38-800922-01
INPUT MODULE CASE/POWER SUPPLY		38-800921-61
POWER SUPPLY ONLY		03-230335-01P
COMMUNICATIONS PROCESSOR MODULE		38-800924-61
25 FOOT (7.6m) INPUT CABLE (10 pin male to male BNC splitter)		38-800615-71
25 FOOT (7.6m) HIGH RESOLUTION INPUT CABLE (10 pin male to male BNC splitter)		38-800632-71

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SECTION 6

LIST OF AVAILABLE ITEMS

NAME	ELECTROHOME PART NUMBER
10 PIN CONNECTOR (to use 38-800632-71 as an extension)	38-800633-71
10 PIN/BNC (6) SPLITTER	38-800627-01
IR AMPLIFIER/DISTRIBUTION BOX	38-800316-61
MULTIPROJECTOR CABLE (50 FEET (15.2m) STD.)	38-800626-71

NOTES

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APPENDIX A

PROJECTION DISTANCE CHART AND CALCULATIONS

Use the following chart as a rough guide to determine the projector-to-screen distance for mounting the projector. Since picture width can vary with respect to the horizontal frequency of the signal source, an accurate projector-to-screen distance may be calculated using the calculations on the following page. Also use the calculations to calculate an average projector-to-screen distance when multiple sources are used.

IMAGE SIZE – PROJECTOR DISTANCE CHART

Image Size [inches(cm)]			Projector Distance [inches(cm)]
diagonal*	height and/or width		
60 (152)	36.0 (91.4)	48.0 (121.9)	72.3 (183.6)
66 (168)	39.6 (100.6)	52.8 (134.1)	78.8 (200.2)
72 (183)	43.2 (109.7)	57.6 (146.3)	85.3 (216.7)
78 (198)	46.8 (118.9)	62.4 (158.5)	91.8 (233.2)
84 (213)	50.4 (137.2)	67.2 (170.7)	98.3 (249.7)
90 (229)	54.0 (137.2)	72.0 (182.9)	104.8 (266.2)
96 (244)	57.6 (146.3)	76.8 (195.1)	111.3 (282.7)
102 (259)	61.2 (155.4)	81.6 (207.3)	117.8 (299.2)
108 (274)	64.8 (164.6)	86.4 (219.5)	124.3 (315.7)
114 (290)	68.4 (173.7)	91.2 (231.6)	130.8 (332.2)
120 (305)	72.0 (182.9)	96.0 (243.8)	137.3 (348.7)
126 (320)	75.6 (192.0)	100.8 (256.0)	143.8 (365.3)
132 (355)	79.2 (201.2)	105.6 (268.2)	150.2 (381.5)
138 (351)	82.8 (210.3)	110.4 (280.4)	158.7 (398.0)
144 (366)	86.4 (219.5)	115.2 (292.6)	163.2 (414.5)
150 (381)	90.0 (228.6)	120.0 (304.8)	169.7 (431.0)
156 (396)	93.6 (237.7)	124.8 (317.0)	176.2 (447.5)
162 (411)	97.2 (246.9)	129.6 (329.2)	182.7 (464.1)
168 (427)	100.8 (256.0)	134.4 (341.4)	189.2 (480.6)
174 (442)	104.4 (265.2)	139.2 (353.6)	195.7 (497.1)
180 (457)	108.0 (274.3)	144.0 (365.8)	202.2 (513.6)
192 (488)	115.2 (292.6)	153.6 (390.1)	215.2 (546.6)
204 (518)	122.4 (310.9)	163.2 (414.5)	228.2 (579.6)
216 (549)	129.6 (329.2)	172.8 (438.9)	241.2 (612.6)
228 (579)	136.8 (347.5)	182.4 (463.3)	254.2 (645.7)
240 (610)	144.0 (365.8)	192.0 (487.7)	267.1 (678.4)
252 (640)	151.2 (384.0)	201.6 (512.1)	280.1 (711.5)
264 (671)	158.4 (402.3)	211.2 (536.4)	293.1 (744.5)
276 (701)	165.6 (420.6)	220.8 (560.8)	306.1 (777.5)
288 (732)	172.8 (438.9)	230.4 (585.2)	319.1 (810.5)
300 (762)	180.0 (457.2)	240.0 (609.6)	332.1 (843.5)

NOTE: * applies to 4:3 aspect ratio only.

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APPENDIX A

PROJECTOR WIDTH/DISTANCE CALCULATIONS

The following calculations allow the projector-to-screen distance to be calculated based on the projector, video source and required screen width. Part a) calculates correction factors for use in further calculations, based on projector type and source frequency. Part b) provides a "calculated" screen width used for part c). Part c) is the final projector-to-screen width calculation.

a) Correction Factors

The width of the picture will vary with respect to the horizontal frequency of the signal source. The ECP 3100 and ECP 4100 series projectors each require different amounts of compensation.

In the following equations, the correction factor is represented by C. H represents the horizontal scanning frequency of the signal divided by 1000. Plug the value of H into the appropriate equation below for the correction factor.

ECP 3100: Video source's horizontal frequency is from 15.0 kHz to 27.0 kHz.

$$C = \frac{(0.4724 \times H) - 7.086}{100}$$

ECP 3100: Video source's horizontal frequency is from 27.1 kHz to 55 kHz.

$$C = \frac{(0.454 \times H) - 11.04}{100}$$

ECP 4100: Video source's horizontal frequency is from 15.0 kHz to 36.2 kHz.

$$C = \frac{(0.5727 \times H) - 0.5905}{100}$$

ECP 4100: Video source's horizontal frequency is from 36.3 kHz to 80.0 kHz.

$$C = \frac{(0.2872 \times H) - 9.632}{100}$$

Example: You have an ECP 3100 projector. The horizontal scan frequency of your signal source is 23.0 kHz, H = 23.0.

$$C = \frac{(0.4724 \times 23.0) - 7.086}{100}$$

$$C = 0.0378$$

b) Calculated Screen Width

The actual screen width you require (W) and the correction factor (C) are used in the following equation to determine the calculated screen width (Wc). Wc is used to determine the projector to screen distance you need to get the screen width you require.

$$Wc = W \times (1 + C)$$

Example: If we use a correction factor of C = 0.0378, taken from the earlier example, and we require a screen width (W) of 60":

$$Wc = 60" \times (1 + 0.0378)$$

$$Wc = 62.27"$$

c) Calculated Projector–to–Screen Distance

Use Wc to calculate the distance (D) from the green lens of the projector to the center of the screen. D will be the projector to screen distance you need for your required screen width (W).

$$D = Wc \times 1.64$$

Example: Using the calculated screen width from above, Wc = 62.27".

$$D = 62.27 \times 1.64$$

$$D = 102.12"$$

Therefore a signal source with a horizontal scan frequency of 23.0 kHz going into an ECP 3100 requires a projector to screen distance of 102.12" to give a screen width of 60".

d) Electrical Controls

Because of wide variation between source signals, electrical size controls (vertical and horizontal) are factory set at 5 on the bar graph display. This ensures adequate range adjustment to compensate for typical ranges of 75% to 100% active video inside the raster, and projection angles up to 15°. Further adjustments must be made by the user to meet application requirements.

IMPORTANT: In the case of fixed installations, it is strongly recommended the user simulate actual operating conditions (signal source, layout) prior to committing to a fixed throw distance. Electrohome cannot be held responsible for erroneous projector location.

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APPENDIX B

REVERSE SCAN INSTALLATION

WARNING

THE REVERSE SCAN PROCEDURE MUST BE PERFORMED BY A QUALIFIED SERVICE TECHNICIAN.

CAUTION

TO PREVENT INJURIES DO NOT LIFT THE PROJECTOR BY THE FRONT TOP COVER.

NOTE: When reversing the scan installation type, it will also be necessary to:

1) **reconnect the yoke plugs**
2) **mount the projector**
3) **center the raster and optically focus the projector**

Tools & Equipment Required:

- Phillips screwdriver
- 1/4" hex socket driver

STEP 1 – DISCONNECT YOKE PLUGS

I) **Expose The Yoke Pluge.** Turn the projector upside down. Remove the 17 Phillips head screws which secure the lower plastic case to the chassis. Remove the case from the chassis.

II) **Locate the Yoke Plugs.** The horizontal and vertical yoke plugs are located at the top rear of the projector, slightly below the CRT necks. See Figure B-1 below.

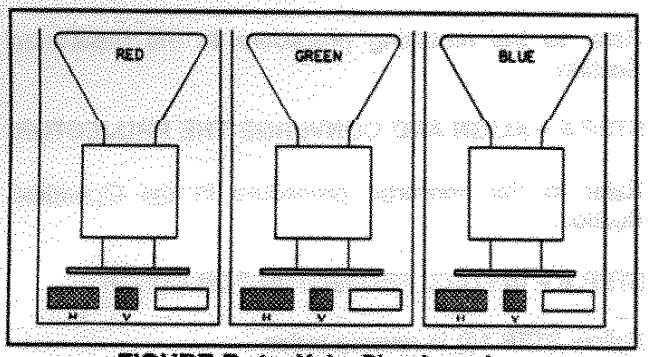

FIGURE B–1. *Yoke Plug Locations*

NOTE: When a deflection yoke plug is in the reverse position, the label "REVERSE SCAN", is visible on the plug. In the normal position, no marking is visible.

III) **Plug Removal.** Remove the horizontal (P6) and vertical (P8) deflection yoke plugs from each of the 3 deflection boards.

STEP 2 – CONNECT YOKE PLUGS ACCORDING TO INSTALLATION TYPE

There are four installation types:

1) front screen projection - floor mount (normal)
2) front screen projection - ceiling mount (inverted)
3) rear screen projection - floor mount
4) rear screen projection - ceiling mount (inverted)

The yoke plugs are connected differently for each installation type. Unless specified, the projector is shipped from the factory with the yoke plugs connected for a front screen projection - floor mount installation. To alter the yoke plug connections for other installation types, refer to Figures B-2 to B-4.

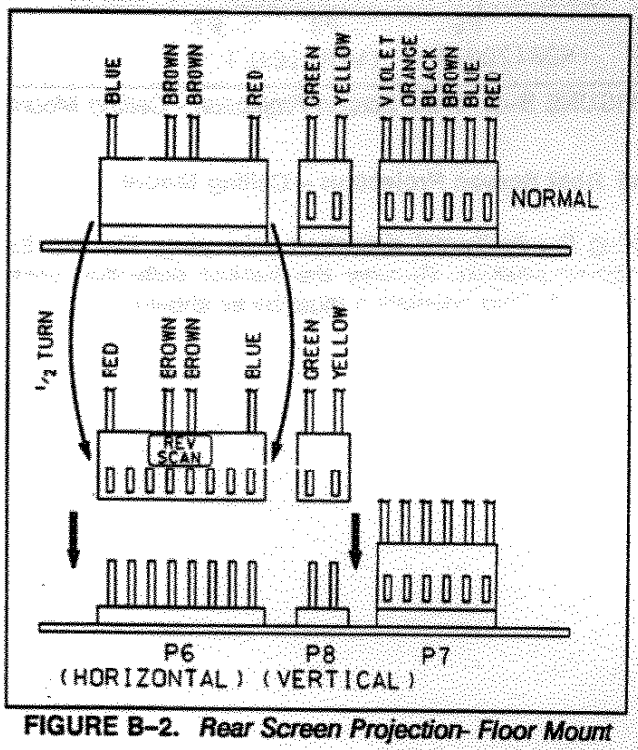

FIGURE B–2. *Rear Screen Projection- Floor Mount*

a) Rear Screen Projection – Floor Mount

Reverse the horizontal deflection plug, P6. Plug the vertical deflection yoke plug, P8, into its normal position. Plug orientation must be as shown.

APPENDIX B

b) Front Screen Projection – Ceiling Mount

Reverse the horizontal plug, P6. Reverse the vertical deflection yoke plug, P8. Plug orientation must be as shown.

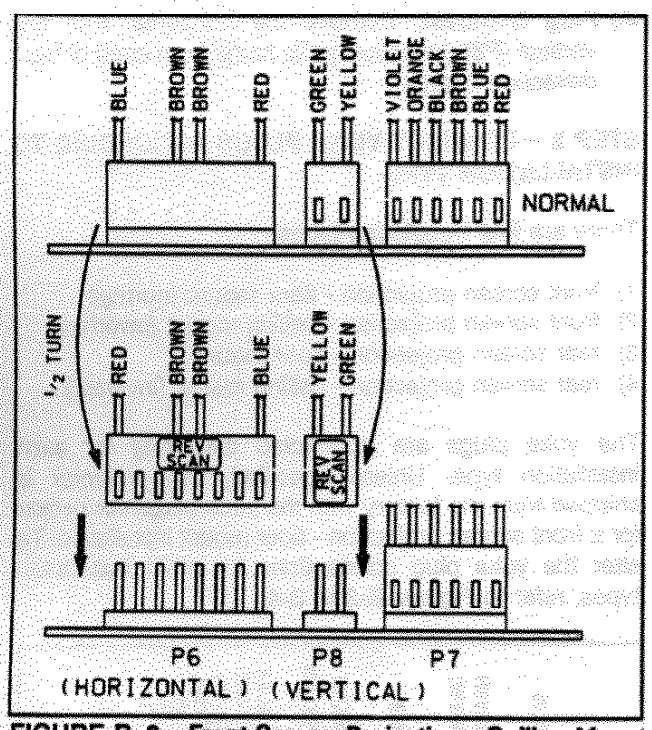

FIGURE B–3. ***Front Screen Projection - Ceiling Mount***

c) Rear Screen Projection – Ceiling Mount

Plug the horizontal deflection yoke plug, P6, into its normal position. Reverse the vertical deflection yoke plug, P8. Plug orientation must be as shown.

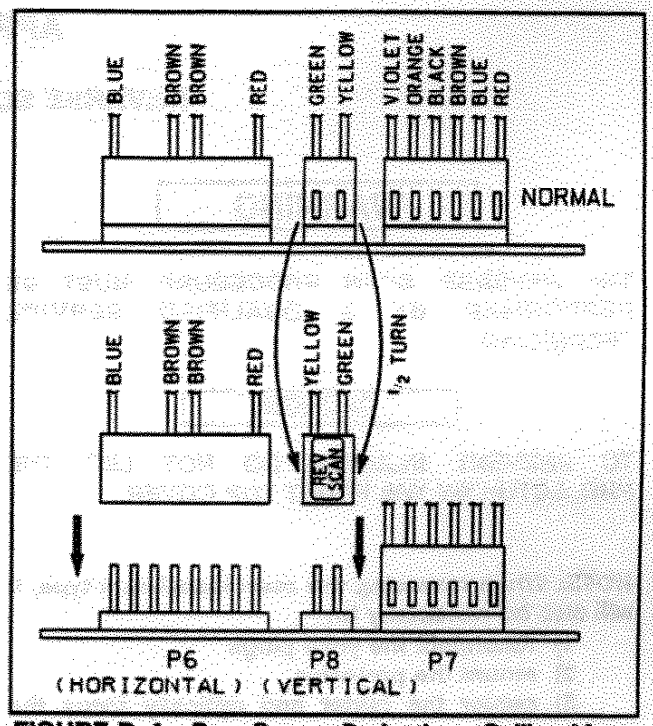

FIGURE B–4. ***Rear Screen Projection - Ceiling Mount***

STEP 3 – INSTALL BUILT–IN KEYPAD

Install the built-in keypad following STEP 1(ii) in reverse order.

NOTE: If the projector is to be ceiling mounted, install the built–in keypad such that the keypad sensor is next to the right side bracket (serviceman standing behind the projector and facing same direction as projector lenses). This will ensure the key labels are right side up once the projector is mounted.

STEP 4 – MOUNT THE PROJECTOR

Refer to the mounting procedure in the Installation Section.

STEP 5 – ALIGN AND CONVERGE THE PROJECTOR

Refer to the converge procedure in the Operation Section.

STEP 6 – INSTALL PROJECTOR TOP COVERS

Follow STEP 1(i) in reverse order.

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APPENDIX C

PROJECTION SCREENS

a) SCREEN TYPES

Flat screens have gains of about 1, their viewing angles are usually 180°. Incident light reflects equally in all directions. Flat screens require dim room lighting to be effective.

Curved screens have gains larger than 1 and viewing angles less than 180°. Most curved screens have different horizontal and vertical viewing angles. Incident light does not reflect equally in all directions from a curved screen. The reflected light concentrates in a conical volume or "viewing cone" with its apex at the screen.

The higher the gain of a curved screen, the smaller the viewing cone. Audiences within the viewing cone see a brighter, sharper image than that from an equal area flat screen. Audiences outside the viewing cone see a duller image. Curved screens are well suited for brightly lit rooms. See FIGURE C-1.

Rear screens are constructed from diffusing material. All rear screens are geometrically flat. Many have gains larger than 1 and viewing angles less than 180°.

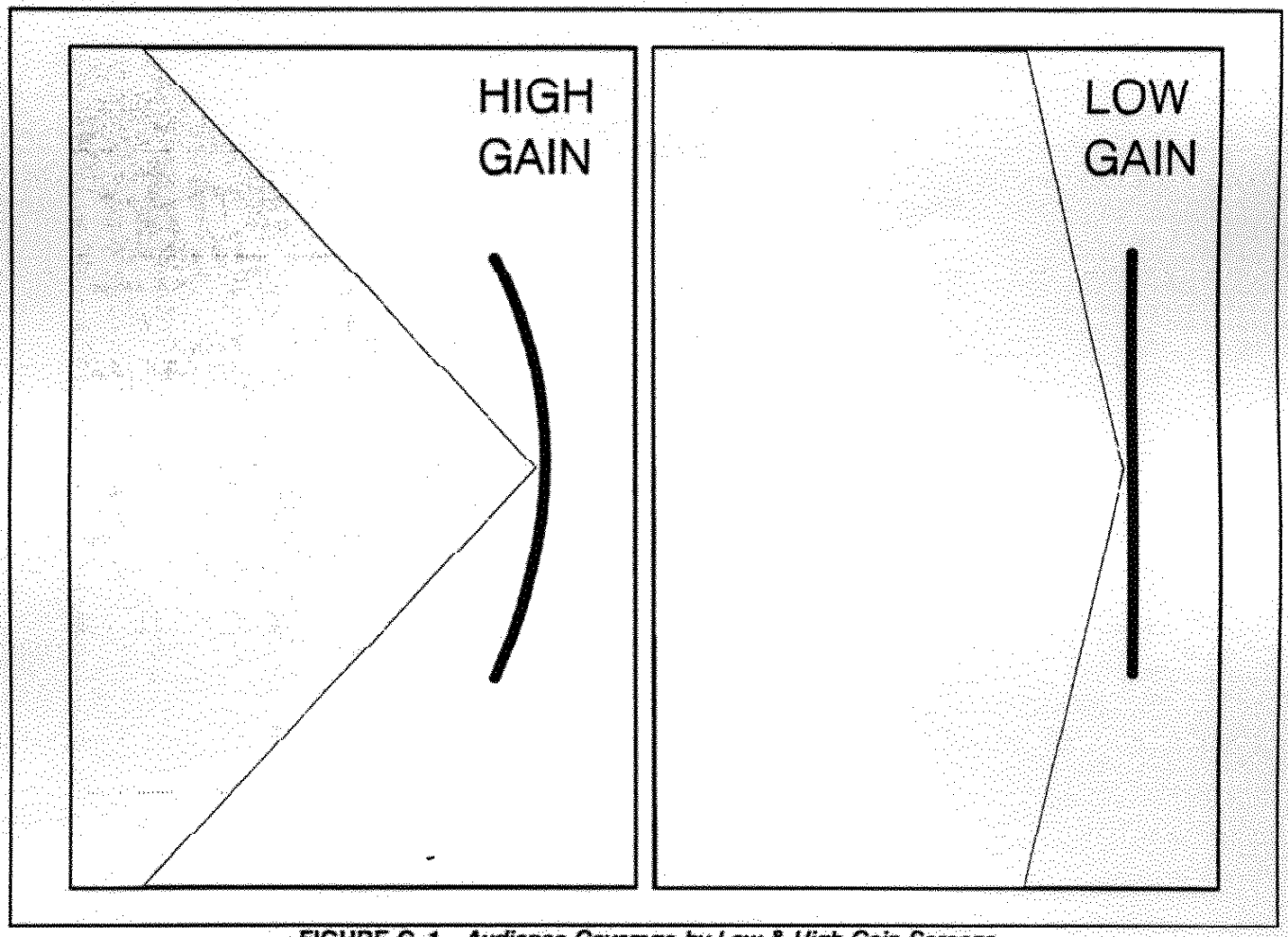

FIGURE C–1. *Audience Coverage by Low & High Gain Screens*

APPENDIX D

INSTALLATION GUIDE

To optimize installation of your ECP Projector projection system:

i) Select a projection system configuration: in front of screen on the ceiling or floor; rear of screen on the ceiling or floor, with or without a mirror.

ii) Determine the screen location. See Section 2.

iii) Select a screen type suited for the rooms lighting conditions and the location of the viewing audience.

iv) Determine image and screen size.

v) Determine projector location.

vi) Select suitable interfaces to connect video sources to the projector.

a) PROJECTION SYSTEM CONFIGURATIONS

PROJECTION SCREEN TYPE	BENEFITS	CONSIDERATIONS
Front Screen	- marginally brighter than simple diffuse rear screen systems * - sharp image * - wide selection of screens * - easy to access and move	- shares floor space with audience - may be accidentally moved, necessitating alignment
Rear Screen	- projection system is hidden from audience * - easy to access - most lensed rear screens reject more ambient light than front screens *	- projector requires separate room - cost of installation
Ceiling Mount	– **see asterisked BENEFITS of Front Screen and Rear Screen types** - does not require floor space - difficult to accidentally move	- difficult to install and access

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b) SCREEN LOCATION

Ambient light rejection and audience coverage are maximized.

FIGUREs D-1 and D-2 show proper screen location.

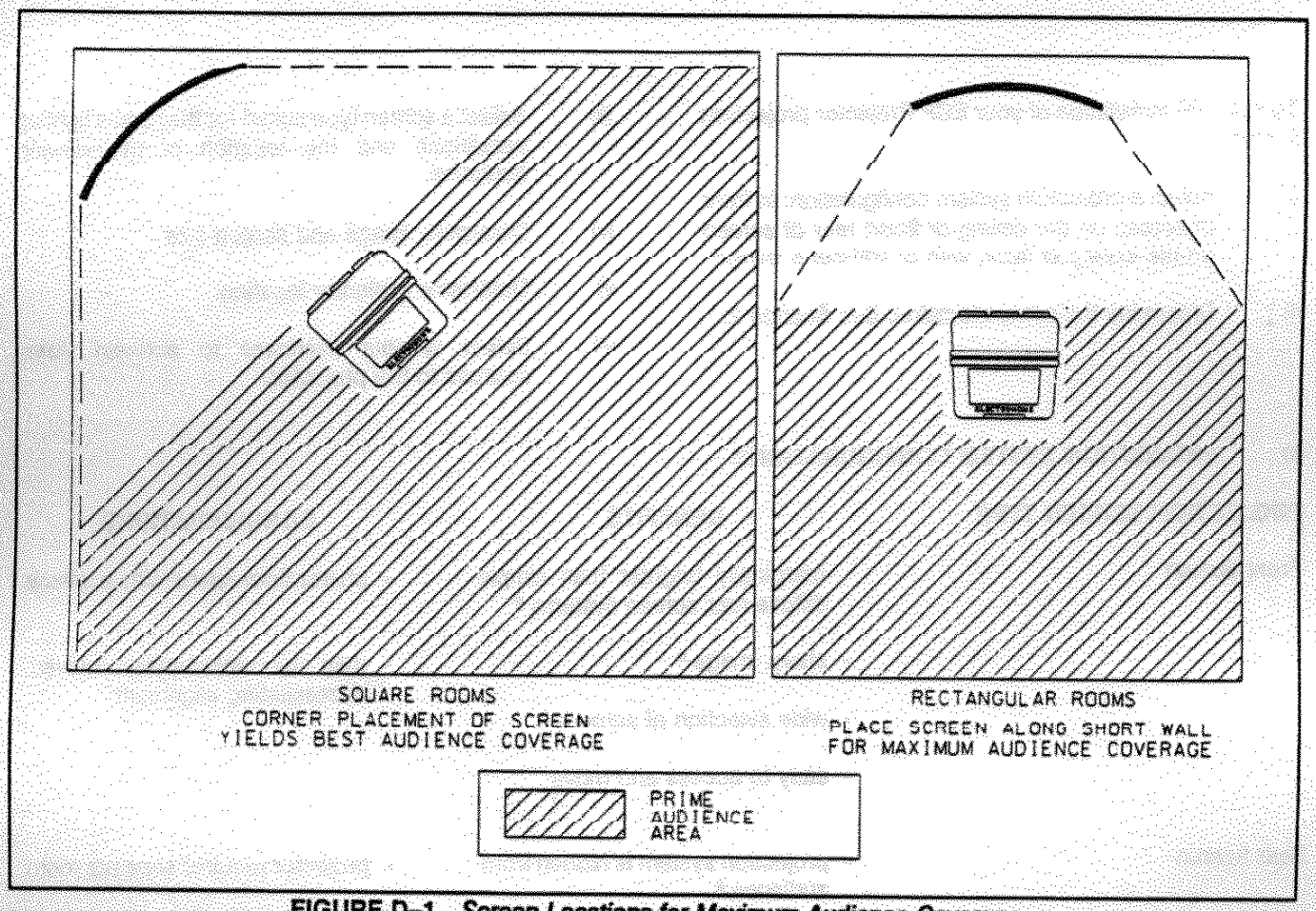

FIGURE D–1. ***Screen Locations for Maximum Audience Coverage***

54-7582-03P/54-7905-04P (06/90)

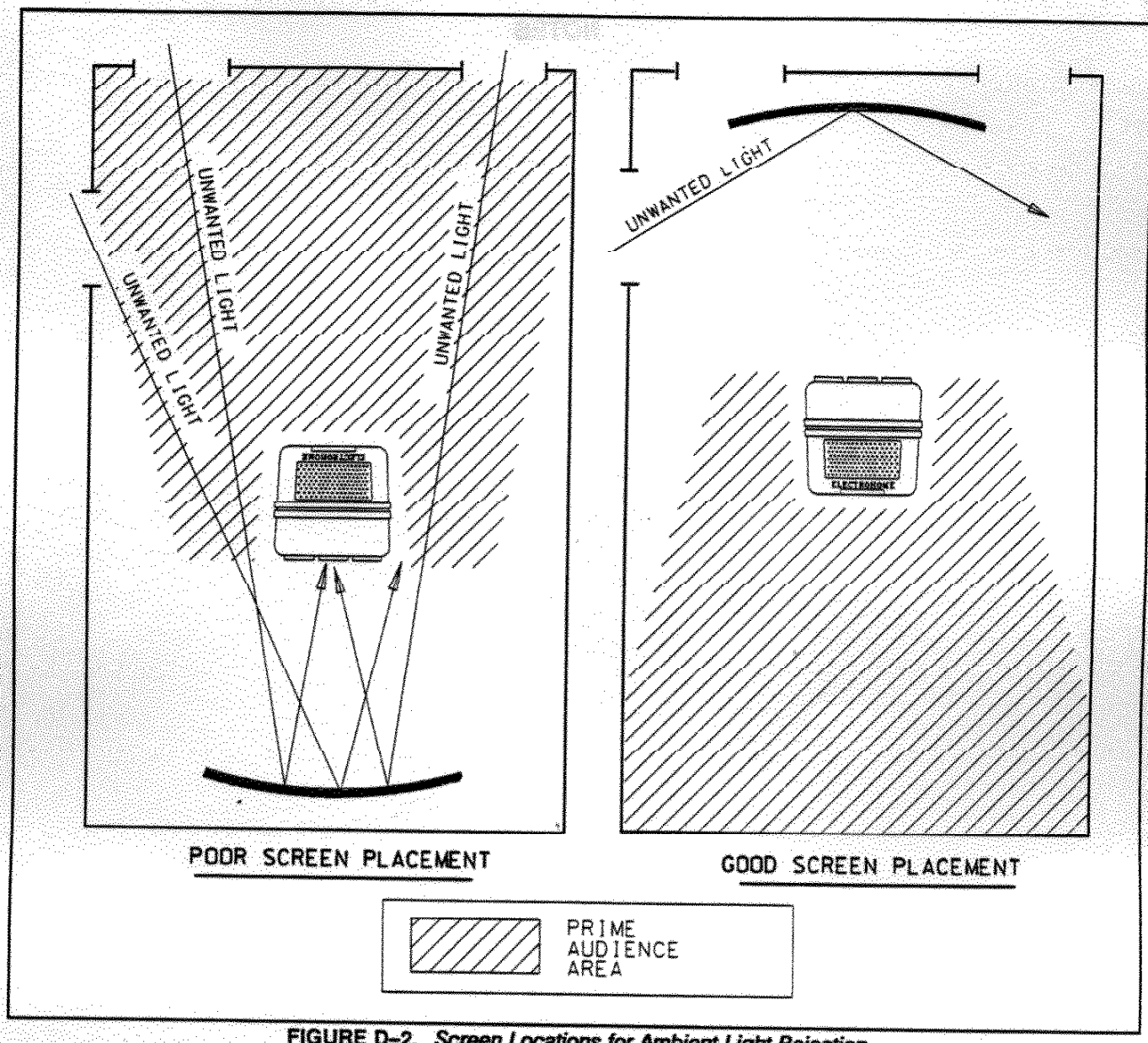

FIGURE D–2. ***Screen Locations for Ambient Light Rejection***

54-7562-03P/54-7905-04P (06/90)

APPENDIX E

PROJECTOR MOUNTING ACCESSORIES

The ECP Projector may be floor or ceiling mounted The projector cart (38-800618-66) is shown in FIGURE E-1.

The ceiling mount assembly (38-800619-66) is shown in FIGURE E-2.

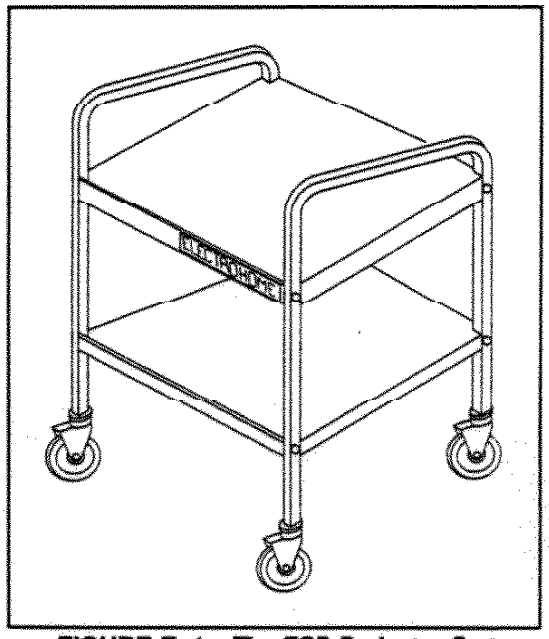

FIGURE E-1. *The ECP Projector Cart*

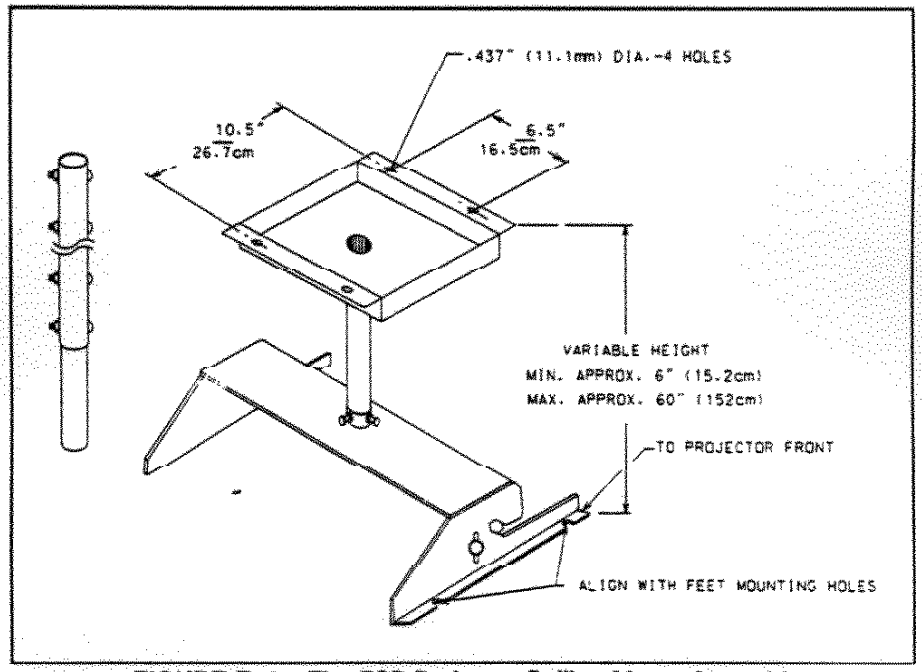

FIGURE E-2. *The ECP Projector Ceiling Mount Assembly*

54-7582-03P/54-7905-04P (06/90)

APPENDIX F

COMMUNICATIONS PROCESSOR MODULE (38–800924–61) – optional

The Electrohome Communications Processor Module expands the capabilities of Electrohome Projectors and IR Switchers to include programmable remote projector control. With either a personal computer, terminal and/or boardroom pushbutton control panel you can execute multiple projector control sequences with the push of a single button. See FIGURE F-1. The Communications Processor Module allows you to co-ordinate a wide range of inputs and outputs to suit any presentation needs.

Up to 30 separate, multiple projector control sequences can be stored in nonvolatile memory; to be later accessed with single button recall, thus providing complete versatility and presentation ease.

Electrohome is continually developing new software for its products. The Communications Processor Module is designed to let you take advantage of the latest software versions available from Electrohome. To do so, simply follow the software replacement instructions in your Communications Processor Module's manual.

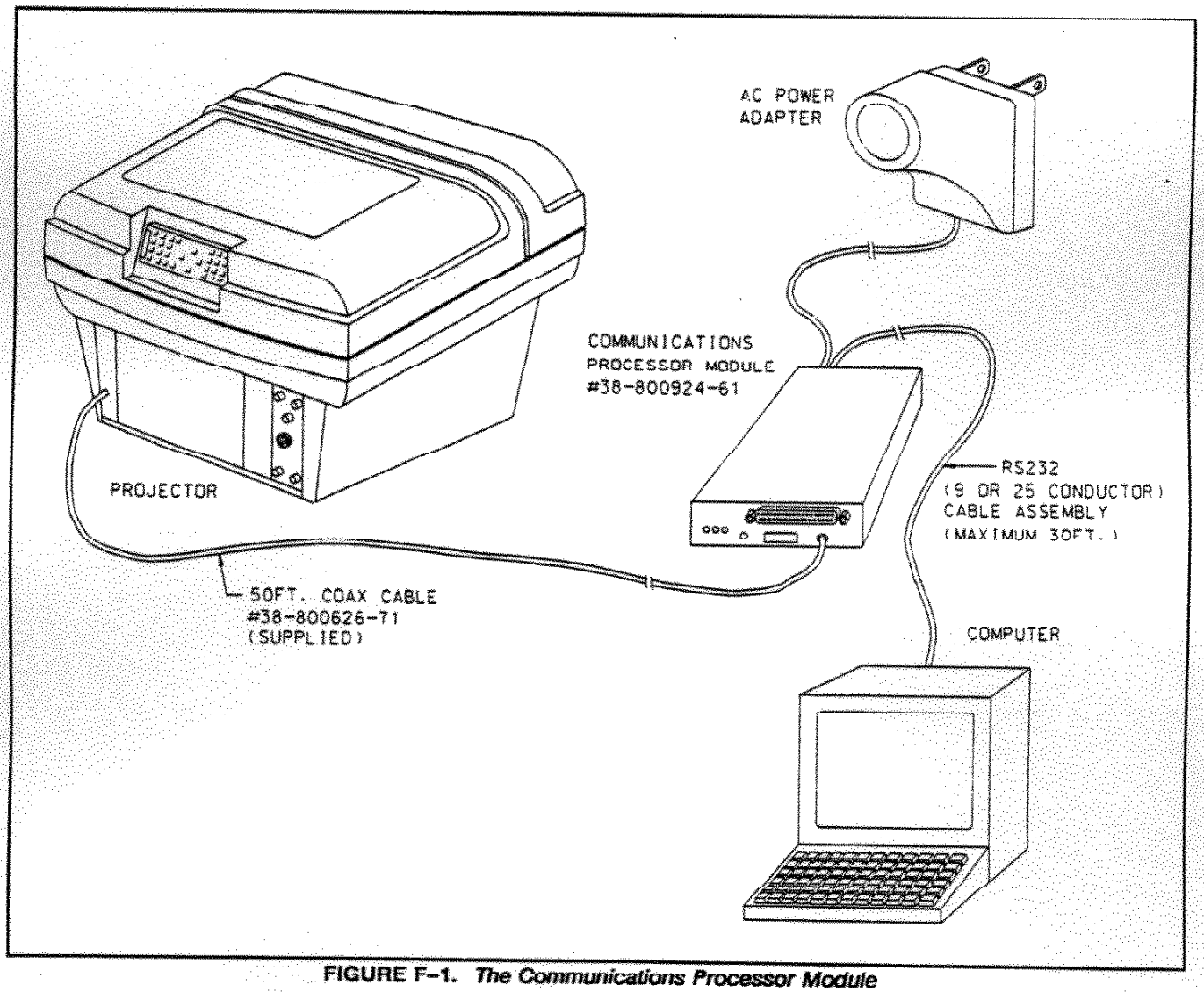

FIGURE F–1. *The Communications Processor Module*

54-7582-03P/54-7905-04P (06/90)

APPENDIX G

INTERFACE MODULES – optional

a) INPUT MODULES

Interface a video source to the projector through an input module. Input module selection and installation are the responsibility of the owner. Different video sources may require different input modules. The length of the connecting cables between the source and the selected input module must not exceed 25 feet (7.6m) for analog video or 6 feet (1.8m) for TTL video. Refer to sub-section i), "CASE/POWER SUPPLY," if the required cable length exceeds the maximum lengths stated.

There are two slots available on the ECP Projector for input modules: SLOT 0 and SLOT 1. The ECP Projector comes with the RGB SYNC 10 PIN input module installed in SLOT 1. Refer to sub-section g) for input module installation.

b) INPUT MODULE SELECTION

The following is a list of input modules divided into 4 categories: Those used with computers having analog video output, those used with computers having TTL video output, those used with video tape and disk players, and those used with the Infrared Remote Switcher. See FIGURE G-1.

c) INPUT MODULES THAT ACCEPT ANALOG VIDEO INPUTS FROM COMPUTERS:

RGB SYNC 2 INPUT module
(38–800913–01) This module accepts 2 inputs. Both inputs accept the following sync configurations: sync on green, separate composite sync or separate horizontal and vertical sync (3 wire, 4 wire or 5 wire analog RGB video). Connect the inputs to the BNC connectors using coaxial cables.

RGB 3, 4, 5 WIRE LOOP input module
(38–800914–01) This input module accepts one input. The input may have the following sync configurations: sync on green, separate composite sync or separate horizontal or vertical sync (3 wire, 4 wire or 5 wire RGB analog video). Connect the input to one of the two columns of BNC connectors using coaxial cables.

NOTE: Terminate the input by connecting the 75Ω terminators supplied with the module to the other column of BNC connectors, if loopthrough is not used.

The input may be "looped" to another display device such as a monitor or another projector. Remove the terminators and replace by coaxial cables connected to the other display device.

RGB SYNC 10 PIN input module
(38–800916–01) This module accepts two inputs.

Input #1 must have composite sync or sync on green (3 wire or 4 wire RGB analog video). Connect the input to the 10 pin connector using the 10 pin video cable. A 10 pin to 4 BNC adaptor is available to connect the 10 pin cable to terminals that have BNC connectors.

Input #2 accepts the following sync configurations: sync on green, separate composite sync or separate horizontal and vertical sync (3 wire, 4 wire or 5 wire RGB analog video). Connect the input to the BNC connectors using coaxial cables.

NOTE: Some computers provide both sync on green and separate composite sync outputs. When all four leads are connected to the RGB SYNC 2, RGB 3,4,5 WIRE LOOP or RGB SYNC 10 PIN input modules, the projector may produce a "green" image. Remove the separate composite sync input to produce a true white image.

2 INPUT MONO input module
(38–800919–01) This input module accepts two monochrome inputs. Connect an input to one BNC connector using coaxial cable. Switch the termination switch to the "75 Ω" position to terminate the input.

Either input may be "looped through" to a monitor or another projector if the termination switch is switched to the "HI-Z" position and a coaxial cable is connected between the other device and the BNC connector.

54-7552-03P/54-7905-04P (06/90)

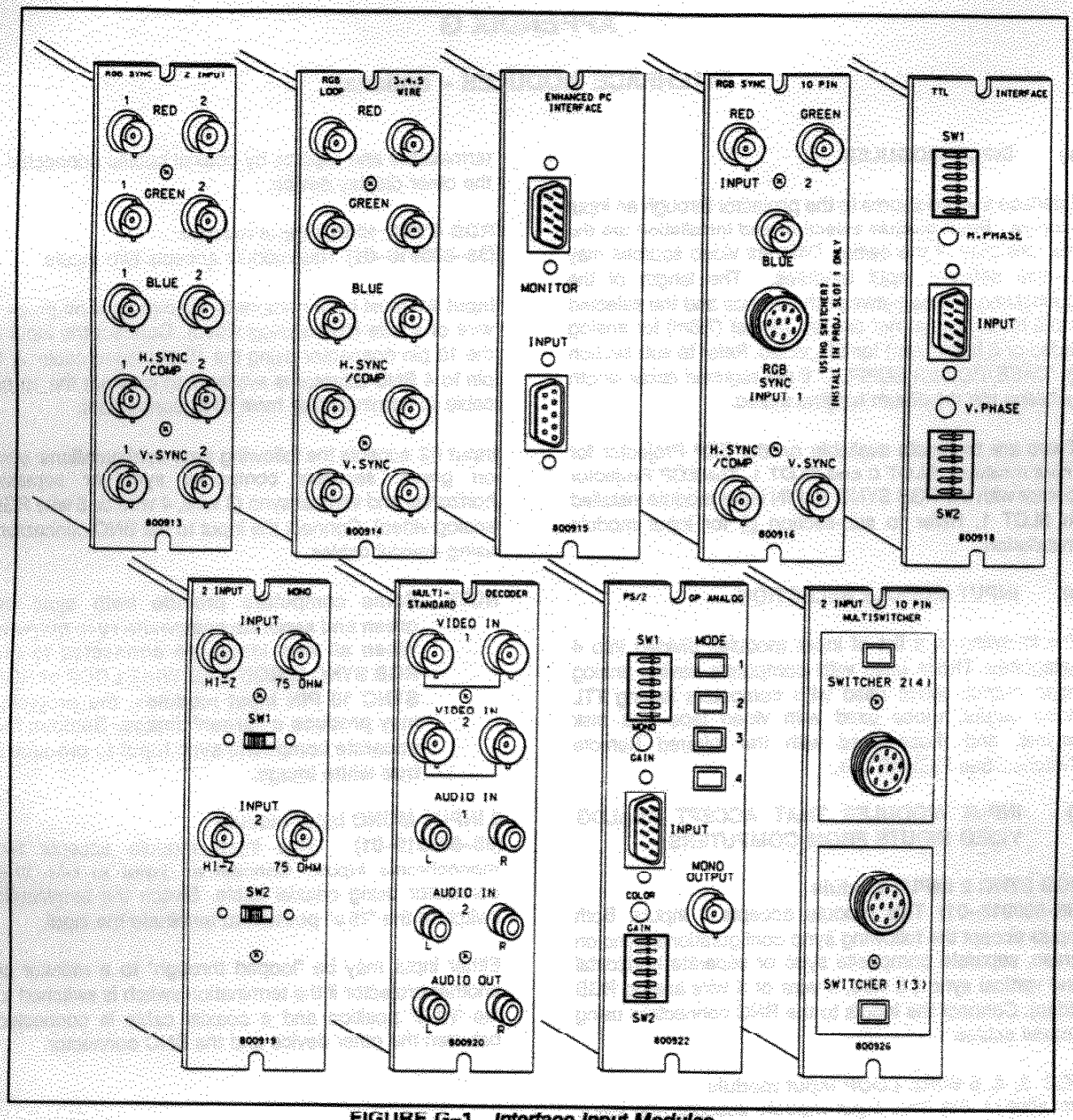

FIGURE G-1. ***Interface Input Modules***

54-7582-02P/54-7805-04P (08/90)

PS/2 INTERFACE Input module
(38–800922–01) This input module accepts one input. Connect the input to the "D" connector on the module using the cable supplied with the module. The two DIP switches located on the module select intensity, composite sync. output polarity. preset delay and enhanced blue.

d) INPUT MODULES THAT ACCEPT TTL (OR DIGITAL) INPUTS FROM COMPUTERS:

ENHANCED PC INTERFACE Input module
(38–800915–01) This input module accepts one input from a PC computer. The module is CGA and EGA compatible. A monitor may also be connected if the cable supplied with the input module is connected between the connector marked **MONITOR** and the monitor.

TTL INTERFACE Input module
(38–800918–01) This input module accepts one input from a computer with TTL video output. Use a wire harness assembly to connect this input module. The two DIP switches on the input module select sync polarity, intensity, composite sync and enhanced blue.

e) INPUT MODULES THAT ACCEPT VIDEO INPUTS FROM VIDEO TAPE AND DISK PLAYERS:

MULTI STANDARD DECODER
(38–800920–01) This input module accepts two inputs from video tape or disk players. It decodes all four commonly used video formats: NTSC, NTSC 4.43, PAL and SECAM. Both inputs may be "looped through" to other video tape/disk players or decoders. Both inputs include a stereo audio pre-amplifier. Connect the stereo audio output to a power amplifier.

f) INPUT MODULES THAT INTERFACE WITH THE INFRARED REMOTE SWITCHER

MULTISWITCHER INTERFACE module
(38–800926–01) The Multiswitcher Interface Module (MIM) allows you to use more video sources than is possible with just one IR Switcher. It does this by allowing your projector to accept up to four IR Switcher inputs. Since each IR Switcher has a maximum of twelve inputs, you get up to 48 video inputs with all four IR Switchers in use. See FIGURE G-3.

The Multiswitcher Interface Module fits into slot 0 or 1 at the back of your ECP Projector. Your projector can accommodate two MIMs and each MIM will take two IR Switcher inputs, thus giving your projector up to 48 video inputs. All 48 possible inputs can be recalled with the built-in or remote keypads.

To simplify your presentation you can pre-program your multiple keystroke input selections with the Communications Processor Module (CPM). That module is featured in Appendix E. The CPM will enable you to access multiple keystroke input selections with the push of a single button; allowing your presentation to flow smoothly.

g) INPUT MODULE INSTALLATION

Reference FIGURE G-2. There are two slots at the back of the projector for input modules. Select one. Remove the two screws that hold the cover plate or an input module in place. Remove the cover plate or pull out the input module. Keep the plate for future use.

Slide the new input module in the tracks until it is flush with the adjacent cover plates. Fasten it to the projector using the two screws removed earlier.

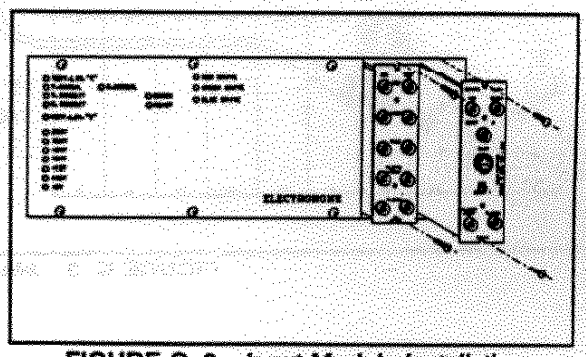

FIGURE G–2. *Input Module Installation*

54–7582–03P/54–7905–04P (06/90)

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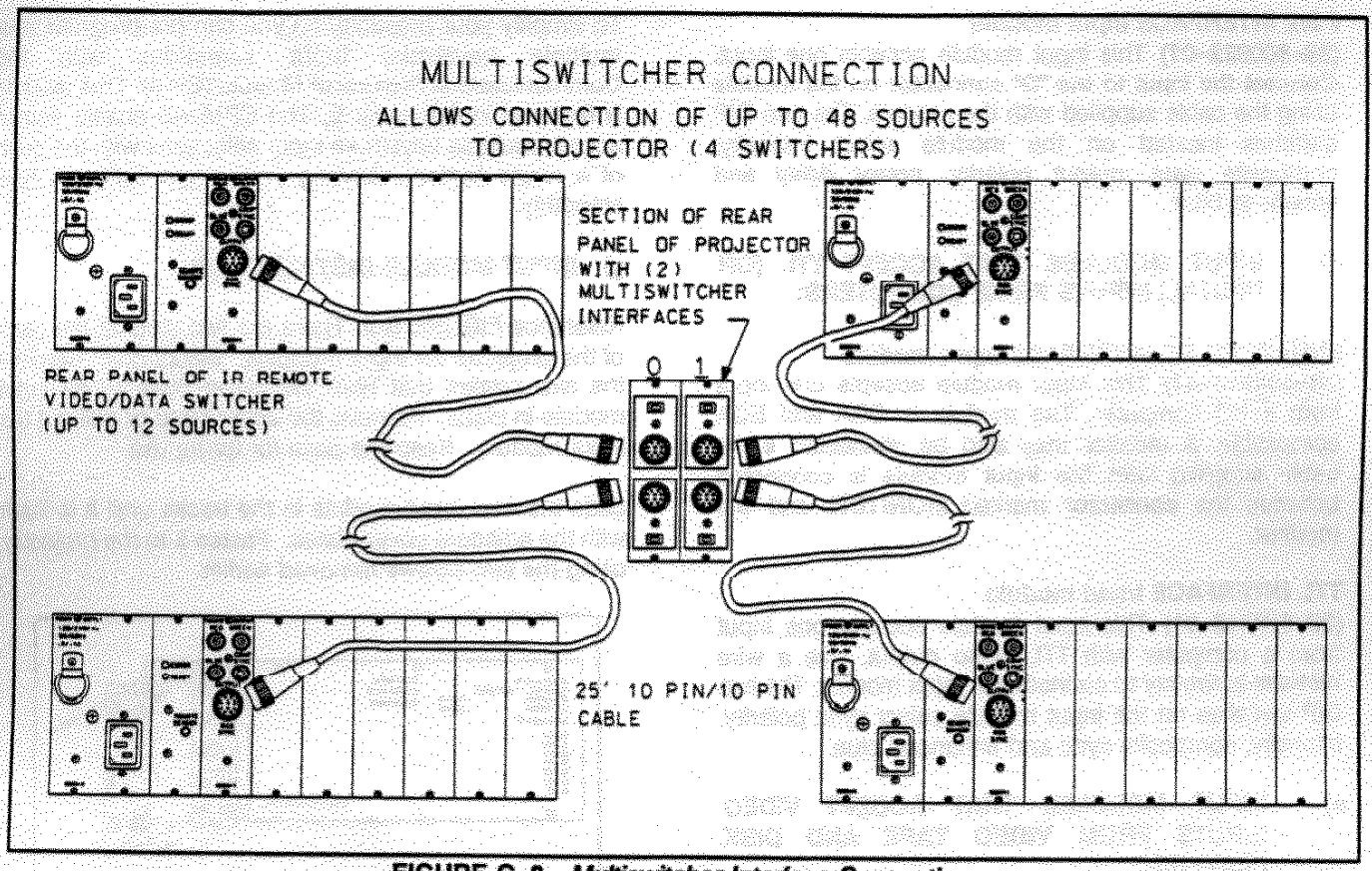

FIGURE G-3. ***Multiswitcher Interface Connections***

54-7582-02P/54-7905-04P (06/90)

h) SIGNAL CONNECTIONS TO INPUT MODULES

Connect analog inputs to input modules through coaxial cables, the 10 pin video cable or through a wire harness assembly. When using coaxial cables, the recommended maximum cable length between the input module and the video source is 25 feet (7.6m). Use RG 59/U coaxial cables or other coaxial cables with equivalent impedance and equivalent or better capacitance/loss characteristics.

Connect TTL inputs to an input module through a wire harness assembly. Harness lengths vary but do not exceed 6 feet (1.8m). When using a harness, locate the input module near the video source. **Wire harness assemblies are available from authorized Electrohome dealers.**

I) CASE/POWER SUPPLY (38-800921-61)

Use the CASE/POWER SUPPLY when the distance between a source and the projector exceeds 25 feet (7.6m). Install the required input module in the case. Place the case near the source. Connect the video from the source to the input module. Use the 10 pin to 4 BNC adaptor to connect the 10 pin cable, or use 4 coaxial cables to connect the output, located on the case, to an analog input module installed in the projector. Cable length must not exceed 50 feet (15.2m). Should the required cable length exceed 50 feet (15.2m), use additional input modules, each installed in a case/power supply, for each additional 50 foot (15.2m) cable run.

The case/power supply cannot be used with the MULTI STANDARD DECODER.

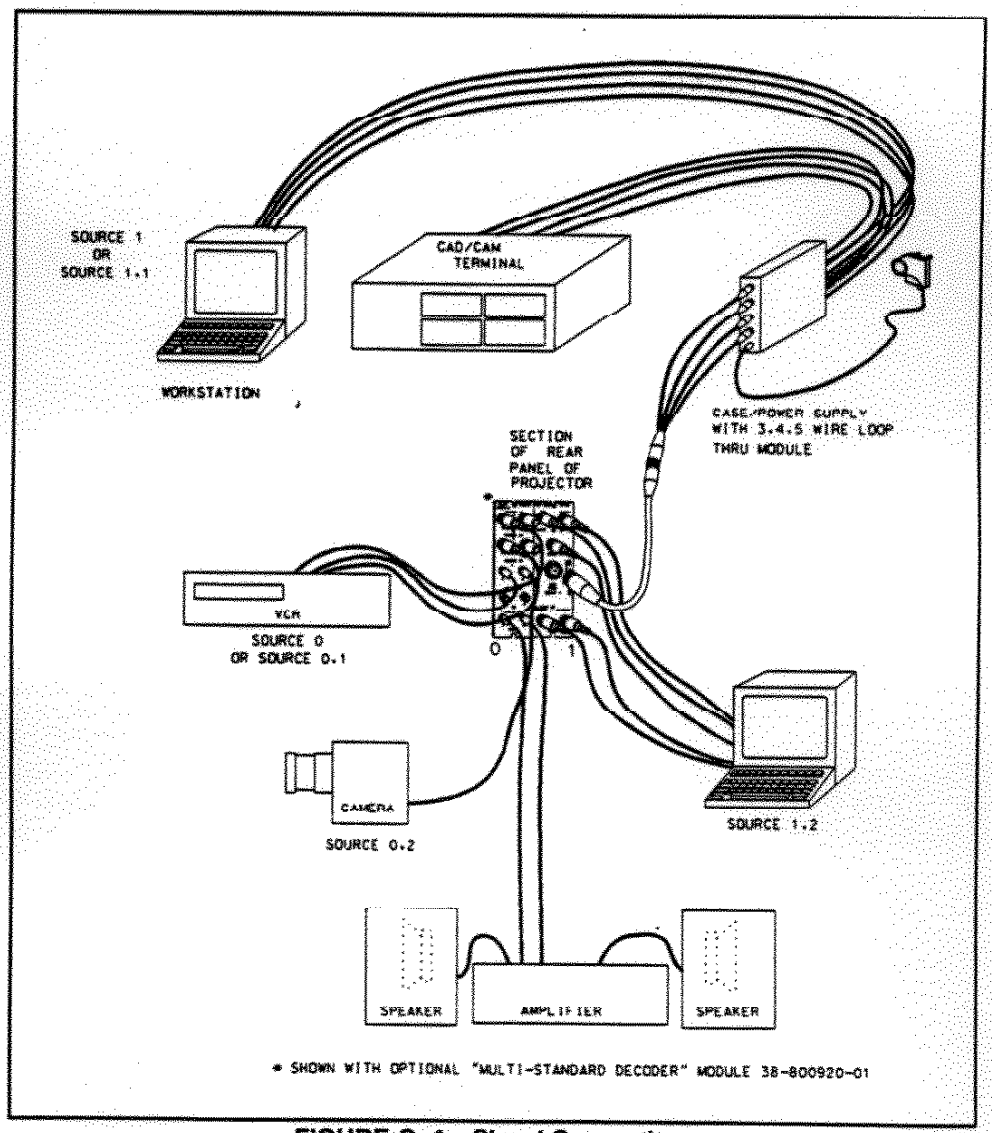

FIGURE G-4. *Signal Connections*

54-7582-03P/54-7805-04P (06/90)

APPENDIX H

INFRARED REMOTE VIDEO/DATA SWITCHER (38–800410–61) – optional

The INFRARED REMOTE VIDEO/DATA SWITCHER (IR Switcher) expands the ECP Projector by accepting a maximum of 6 input modules simultaneously. Each input module accepts two separate video inputs; allowing your ECP Projector to access up to twelve video inputs, while control is maintained with one remote keypad.

Or, you may install four input modules and up to two output modules in addition to the output module that comes factory installed with your IR Switcher; giving you up to 6 video outputs and 8 video inputs. **Note: Refer to the IR Switcher manual if two output modules are used.** All the while, you maintain control with one remote keypad. However, if independent control of one or more projectors is required other keypads are available.

For a listing of input and output modules available for use with the ECP Projector and the IR Switcher, see the Interfaces Appendix.

100 MHz OUTPUT MODULE (38-800911-01)

The 100 MHz Output Module is available as an option for the IR Switcher. In addition to the 100 MHz Output Module that comes installed with your IR Switcher you can add two more output modules; allowing your switcher to drive up to six projectors or monitors. Each output module has two outputs. The primary output is available at the ten pin video connector and the secondary output is available at the BNC connectors. Ten pin to BNC and BNC to ten pin adapters are available if required.

FIGURE H–1. *The Infrared Remote Video Data Switcher*

54-7562-03P/54-7905-04P (08/90)

GLOSSARY OF TERMS

ACTIVE LINE TIME
The time, inside one SCAN LINE, during which VIDEO is generated.

AMBIENT LIGHT REJECTION
The ability of a screen to reflect ambient light in a direction away from the LINE OF BEST VIEWING. Curved screens usually have good ambient light rejection. Flat screens have poor to fair ambient light rejection.

ANALOG VIDEO
This term refers to the VIDEO output of certain computers such as IBM PS/2, video tapes or the output of most high resolution CAD/CAM workstations. Analog video is a type of RGB video. It can generate a large number of colors.

ASPECT RATIO
The ratio of the width to the height of the image.

AUTOLOCK
The ability of the projector to synchronize to inputs with frequencies within a specified range without user interference.

BACK PORCH TIME
The time from the end of a SYNC pulse till the beginning of the VIDEO. The back porch time is part of the BLANKING TIME.

BANDWIDTH
The frequency at which the output voltage from the video amplifier of the projector is only 70% of its maximum value. Bandwidth is measured using sinusoidal voltage waveforms.

BLANKING TIME
The time inside one SCAN TIME during which VIDEO is not generated. The blanking time must be at least equal to the RETRACE TIME of the projector for proper image.

BOW
The convex or concave curve of a horizontal line on the image.

BRIGHTNESS
Brightness in projection usually describes the amount of light emitted from a surface such as a screen. Brightness is measured in FOOT-LAMBERTS, FOOT-CANDLES or LUX.

CANDELA or CANDLE
The intensity of light is measured in candelas. A point source of one candela intensity radiates one lumen into a solid angle of one steridian.

```
1 candela = 1 lumen (steradian)
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COLOR BALANCE
Color balance refers to the abilty of a projector to maintain correct color temperature, on whites, over low to high picture levels.

COLOR SHIFT
This term refers to the change in the tint of a white field across an image.

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GLOSSARY

COLOR TEMPERATURE
This term refers to the tint of a white image.

COMPOSITE VIDEO
This term usually refers to the output of certain computers and video cassette players. Synchronization and color signals are both encoded on one output cable.

CONTRAST
Contrast indicates how much brighter the white areas of an image are than the black areas.

CONTRAST RATIO
The ratio of brightness of the brightest possible area to the darkest possible area of an image.

CURVED SCREEN
A curved screen is a section of the surface of a large sphere. Curved screens have viewing angles less than 180° and gains greater than 1.

DIGITAL VIDEO
Digital video is a term used to describe the output of some computers. TTL output is a type of digital video.

FLAT SCREEN
A flat screen is a flat reflecting surface. Flat screens have 180° viewing angles and gains approximately equal to 1.

FLICKER
A rapid variation in brightness created when the frame rate is too slow for the eye to integrate from field to field.

FRAME RATE
This term is also called vertical frequency or vertical rate. This is the frequency at which frames are generated. Frame rates vary from 45 Hz to 120 Hz.

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.

FRONT PORCH TIME
The time from the end of an active line till the start of a sync pulse. The front porch time is part of the blanking time.

GAIN or SCREEN GAIN
The ability of a screen to amplify incident light. 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 amplify incident light. 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. Dual purpose rear/front screens often have gains of about 0.5 in each direction.

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GEOMETRY
The ability of the projector to accurately reproduce the border around a rectangular image.

HORIZONTAL SCAN RATE
Also called horizontal frequency or line rate. This is the frequency at which lines are generated.

HOT SPOT
This term refers to 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. Low gain screens and rear screens designed for slide or movie projection, usually have a hot spot.

INTERFACE
A device that converts any type of video into RGB video. RGB video is used by the projector.

INTERLACE
A method used by some computers and video tape players to double the vertical resolution without increasing the horizontal line rate.

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
This term describes the ability of a projector to reproduce equal sized squares all over the screen.

LINE OF BEST VIEWING or ON AXIS
Light from a projector is incident on a screen. 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.

LINE TIME
The time it takes to generate one scan line.

LOOPTHROUGH
Wires connecting one video source with two or more display devices must not be terminated at any device except the last one. Inter-connections are referred to as loopthrough.

LUMEN
The amount of visible light emitted by a light source is measured in lumens. The light output of a projector is specified in lumens.

LUX
The amount of visible light per square meter.

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

MULTI STANDARD DECODER
A device that converts NTSC, PAL, SECAM or NTSC 4.43 video to RGB video.

NTSC DECODER
A device that converts NTSC video to RGB video.

NTSC VIDEO

54-7582-03P/54-7905-04P (06/90)

This term refers to the video output of video tape or disk players used mainly in North America.

NTSC 4.43 VIDEO
This term refers to the video output of video tape or disk players used mainly in Middle East countries.

PAL DECODER
A device that converts PAL video to RGB video.

PAL VIDEO
This term refers to the video output of video tape or disk players used mainly in Europe.

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

PIXEL (PICTURE ELEMENT)
Specifies the number of addressable locations in the video generating circuitry of the computer. It may also be used to assess picture quality. The larger the number of pixels, the finer the lines on the screen. Pixel numbers alone cannot determine required projector resolution.

PROTOCOL
Protocol refers to the type of code format utilized by the keypads. The standard code is Protocol 1. The optional Protocol 2 IR keypad uses a special Protocol 2 code. A projector set for Protocol 2 will ignore all commands received in Protocol 1 format.

REAR SCREEN
A translucent panel. Incident light travels through the incident surface of a rear screen and forms an image on the other surface.

RESOLUTION OF THE CRT
Resolution refers to the maximum number of lines that can be distinguished per picture height (or width).

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 specified resolution is the smaller of the above two resolutions.

RETRACE TIME
The minimum time required for the projector to retrace from the right edge to the left edge. The video source must have a minimum total blanking time equal to or greater than the retrace time.

RISE TIME
The minimum time required by the video amplifier of the projector to increase its output to 90% of the maximum value. Rise time should exceed 1/(pixel clock of computer) if the image is to be resolvable on the screen.

RGB VIDEO
This term refers to the video output of computers. It can be analog or digital. Analog RGB video has 3, 4, or 5 wires; one for the red, one for the green, one for the blue VIDEOs and one or two for the SYNC. Digital RGB video always has 4 or 5 wires.

SECAM
This term refers to the video output of video tape or disk players used mainly in France.

SCAN LINE
One scan line is one horizontal line.

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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 by projectors to stabilize the picture. SYNC can take three forms:
a) "SYNC on green" when the sync is part of the green video.
b) "Separate composite sync" when the sync is on a separate cable.
c) "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.

TERMINATED
A wire connecting a single video source to a display device, such as a projector, must be terminated by a resistor (in video, this resistor has a value of 75 Ω).

TTL VIDEO
This term refers to the video output of certain computers, for example, IBM PC. TTL video can generate a specific number of colors (8, 16 or 64). TTL video cannot be connected to projectors through long wires. TTL video is a type of RGB video.

VARIABLE SCAN
The ability of a projector to synchronize to inputs with frequencies within a specified range.

VIDEO
This term describes the signal that is used by display devices, such as projectors, to generate a picture. This term also refers to the video output of video tape or disk players or computers.

VIEWING ANGLE
Screens do not reflect equally in all directions. Most light is reflected in a conical volume. This cone is centered around the "LINE OF BEST VIEWING" or along the "ON AXIS" line. The apex of this cone is at the surface of the screen and its base is elliptical. A viewer located in front of the screen, "ON AXIS," sees maximum brightness. A viewer located along the surface of the cone sees only 50% of the maximum brightness. A viewer located outside the cone sees less than 50% of maximum brightness. The HORIZONTAL and VERTICAL VIEWING ANGLES are the horizontal and vertical angles of the cone. Curved screens usually have smaller viewing angles than flat screens.

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.

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ECP 3100/3101 PERFORMANCE DATA & SPECIFICATIONS

Optics
- High definition F1.0 hybrid lens

Resolution
- Maximum resolution 1280 x 1024 pixels
- 1000 TV lines

Brightness
Maximum
- 850 lumens peak light output
- 370 foot lamberts on a 8' diagonal 10 gain screen total light output

Focused Data
- 480 lumens peak light output
- 260 foot lamberts on a 6' diagonal 10 gain screen total light output

Display
- Functional 5 lens design allows simple adjustment for flat, curved or rear screens from 5 to 25 feet diagonal
- Electronic pincushion circuitry separately corrects top, bottom and sides for flat, curved or rear screen applications
- Keystone circuitry corrects pictures for angles up to ± 15° vertically from screen axis

Video Circuits
Input
- Input level 0.5 to 2.0 volts p-p, 75 ohms ± 1% terminated
- Automatically switches to separate sync or sync on green
- Separate sync is automatically accepted in either polarity

Frequency Response
- 80 MHz bandwidth ± 3 dB
- Linear non-differential video amplifier accommodates 8 nano second pixels and digital clock rates over 130 MHz

D.C. Restoration
- Keyed clamp

Gain
- Minimum video gain 40 dB or 100X
- Maximum video output 130 volts p-p drive

Deflection Circuits
Vertical Deflection
- Size: automatically regulated over frequency range and adjustable from 20% underscan to 10% overscan
- Frequency Range: automatically locks from 45 Hz to 120 Hz
- Retrace Time: less than 300 microseconds

Horizontal Deflection
- Size: automatically regulated over frequency range and adjustable from 10% underscan to 10% overscan
- Frequency Range: automatically locks from 15 kHz to 55 kHz
- Retrace Time: 3.6 microseconds

Geometry Distortion
- Horizontal - less than 1%
- Veritical - less than 2%

Operating and Service Controls
Infrared Remote Control

Primary	Secondary
• Power	• Converge
• Contrast	• Pincushion
• Brightness	• Bow
• Color	• Size
• Tint	• Focus
• Detail	• Keystone
• Volume	• Move
• Mute	• Vert. Blank
• Standby	• Hor. Hold
• Reset	• Vert. Hold
• Recall	• Fast/Slow Sync
• Help	• Projector #
• Source #	• Exit

- Optional remote infrared receiver can be connected to projector for rear screen applications
- On screen menu assists set-up with step-by-step alphanumeric instructions and graphic focus aids

Service Controls
(Screwdriver Adjust)
- RGB Drive Levels
- RGB Screen Controls
- RGB Cut-off Switches
- RGB Electronic Focus
- Vertical Linearity

Indicators

• Power On	• Error
• Ready	• Vertical Scan Fail
• Vertical Hold Manual	• Horizontal Scan Fail
• Horizontal Hold Manual	

High Voltage
- 34.0 kV regulated to better than ± 1%

Power Requirements
- 90 VAC to 132 VAC can be externally reconnected for 180 VAC to 264 VAC
- Line frequency 50 to 60 Hz nominal
- Power 450 watts maximum

Inputs
The ECP 3100/3101 comes with the RGB SYNC 10 PIN input module installed.

Optional Source Selection
The Electrohome IR Video/Data Switcher allows use of 8 additional input modules for master control of projector

Mounting
- The ECP 3100/3101 can be ceiling mounted on its optional yoke or mounted on a castered cart or desk stand for portable applications

Weight
- 99 lbs (45 kg)
- ECP 3100 Shipping Weight 124 lbs (57 kg)
- ECP 3101 Shipping Weight 129 lbs (59 kg)

Accessories Included
- IR remote control keypad
- User's Manual

Environment
Maximum Operating Range
- Temperature: 0 to 35°C (32 to 95°F)
- Humidity: 0 to 90% non-condensing
- Altitude: 0 to 3000m (0-10,000 ft.)

Storage
- Temperature: -30 to 65°C (-22 to 149 °F)

Regulatory Approvals
- Model #XX-BO9955-XX
- Meets FCC Class A, DHHS and HWC requirements
- CSA certified

One year parts and labour WARRANTY

Due to constant research, specifications are subject to change without notice.
ECP is a registered trademark of Electrohome Limited.

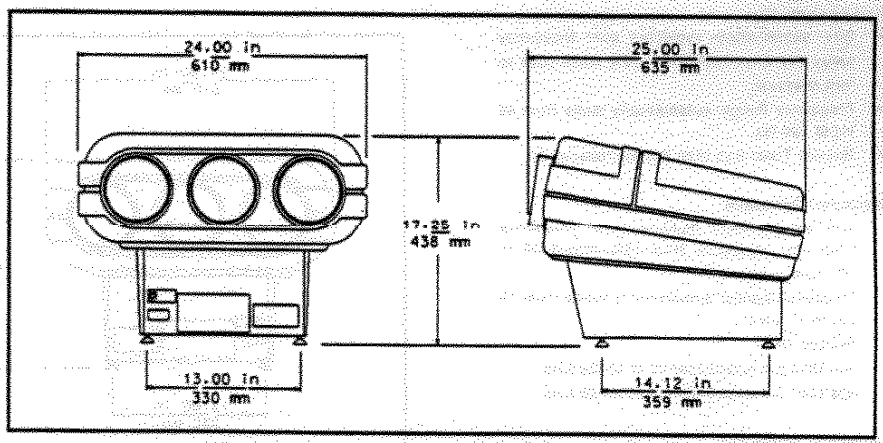

FIGURE SPEC-1. The ECP 3100/3101 Dimensions

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ECP 4100/4101 PERFORMANCE DATA & SPECIFICATIONS

Optics
- High definition F1.0 hybrid lens

Resolution
- Maximum resolution 1280 x 1024 pixels
- 1000 TV lines

Brightness
Maximum
- 650 lumens peak light output
- 370 foot lamberts on a 8' diagonal 10 gain screen total light output

Focused Data
- 480 lumens peak light output
- 280 foot lamberts on a 8' diagonal 10 gain screen total light output

Display
- Functional 3 lens design allows simple adjustment for flat, curved or rear screens from 5 to 25 feet diagonal
- Electronic pincushion circuitry separately corrects top, bottom and sides for flat, curved or rear screen applications
- Keystone circuitry corrects pictures for angles up to ± 15° vertically from screen axis

Video Circuits
Input
- Input level 0.5 to 2.0 volts p-p, 75 ohms ± 1% terminated
- Automatically switches to separate sync or sync on green
- Separate sync is automatically accepted in either polarity

Frequency Response
- 70 MHz bandwidth ± 3 dB
- Linear non-differential video amplifier accommodates 7 nano second pixels and digital clock rates over 140 MHz

D.C. Restoration
- Keyed clamp

Gain
- Minimum video gain 40 dB or 100X
- Maximum video output 130 volts p-p drive

Deflection Circuits
Vertical Deflection
- Size: automatically regulated over frequency range and adjustable from 20% underscan to 10% overscan
- Frequency Range: automatically locks from 45 Hz to 120 Hz
- Retrace Time: less than 300 microseconds

Horizontal Deflection
- Size: automatically regulated over frequency range and adjustable from 10% underscan to 10% overscan
- Frequency Range: automatically locks from 15 kHz to 80 kHz
- Retrace Time:
  less than 5.0 microseconds at 15-36 kHz
  less than 2.5 microseconds at 36-80 kHz

Geometry Distortion
- Horizontal - less than 1%
- Veritical - less than 2%

Operating and Service Controls
Infrared Remote Control

Primary	Secondary
Power	Converge
Contrast	Pincushion
Brightness	Bow
Color	Size
Tint	Focus
Detail	Keystone
Volume	Move
Mute	Vert. Blank
Standby	Hor. Hold
Reset	Vert. Hold
Recall	Fast/Slow Sync
Help	Projector #
Source #	Exit

- Optional remote infrared receiver can be connected to projector for rear screen applications
- On screen menu assists set-up with step-by-step alphanumeric instructions and graphic focus aids

Service Controls
(Screwdriver Adjust)
- RGB Drive Levels
- RGB Screen Controls
- RGB Cut-off Switches
- RGB Electronic Focus
- Vertical Linearity

Indicators

Power On	Error
Ready	Vertical Scan Fail
Vertical Hold Manual	Horizontal Scan Fail
Horizontal Hold Manual	

High Voltage
- 34.0 kV regulated to better than ± 1%

Power Requirements
- 90 VAC to 132 VAC can be externally reconnected for 180 VAC to 264 VAC
- Line frequency 50 to 60 Hz nominal
- Power 450 watts maximum

Inputs
The ECP 4100/4101 comes with the RGB SYNC 10 PIN input module installed.

Optional Source Selection
The Electrohome IR Video/Data Switcher allows use of 6 additional input modules for master control of projector

Mounting
- The ECP 4100/4101 can be ceiling mounted on its optional yoke or mounted on a castered cart or desk stand for portable applications

Weight
- 99 lbs (45 kg)
- ECP 4100 Shipping Weight 124 lbs (57 kg)
- ECP 4101 Shipping Weight 139 lbs (63 kg)

Accessories Included
- IR remote control keypad
- User's Manual

Environment
Maximum Operating Range
- Temperature: 0 to 35°C (32 to 95°F)
- Humidity: 0 to 90% non-condensing
- Altitude: 0 to 3000m (0-10,000 ft.)

Storage
- Temperature: -30 to 65°C (-22 to 149 °F)

Regulatory Approvals
- Model #XX-BC9980-XX
- Meets FCC Class A, DHHS and HWC requirements
- CSA certified

One year parts and labour WARRANTY

Due to constant research, specifications are subject to change without notice.
ECP is a registered trademark of Electrohome Limited.

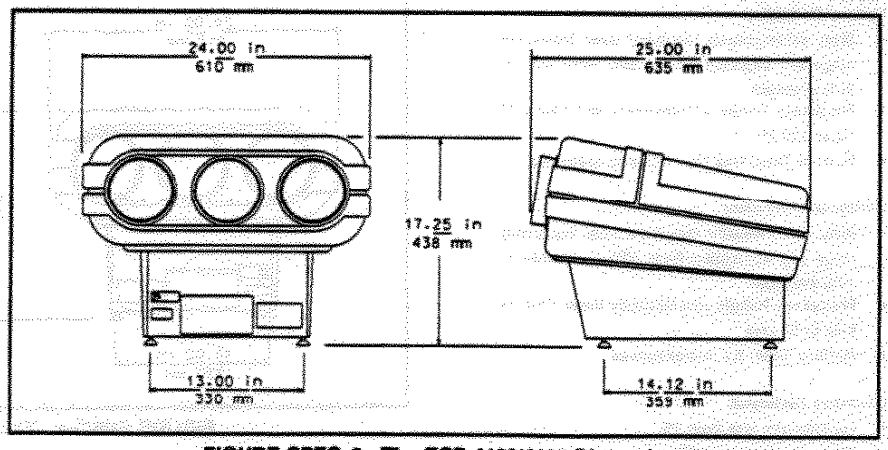

FIGURE SPEC-2. The ECP 4100/4101 Dimensions

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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
Monochrome Projection Monitor	1 Year	1 Year	1 Year
Color Projection Monitor	1 Year	1 Year	1 Year
Interface Devices	1 Year replacement warranty		
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 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, lighting, 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 updating 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 (see back cover).
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 endeavour 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-operated 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 (see back cover).

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ELECTROHOME

ELECTROHOME
PROJECTION SYSTEMS

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Electrohome USA (1989) Inc.
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FAX: (714) 983-9987

Factory Service Depot only:
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Telephone: (716) 874-3630
FAX: (716) 874-4309

Electrohome Europe Limited
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Cheshire, England L65 OAX
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