



ESPRIT

OPERATION MANUAL

ESPRIT SERIES 2000D / 2000G

President's Message



Dear Esprit User:

Congratulations on choosing ESPRIT to fulfill your projection needs!

As a valued customer, we at ESPRIT PROJECTION SYSTEMS take this opportunity to express our appreciation for your choice of an Esprit Large Screen Display System. We are confident it will provide you with many years of superior performance and satisfaction.

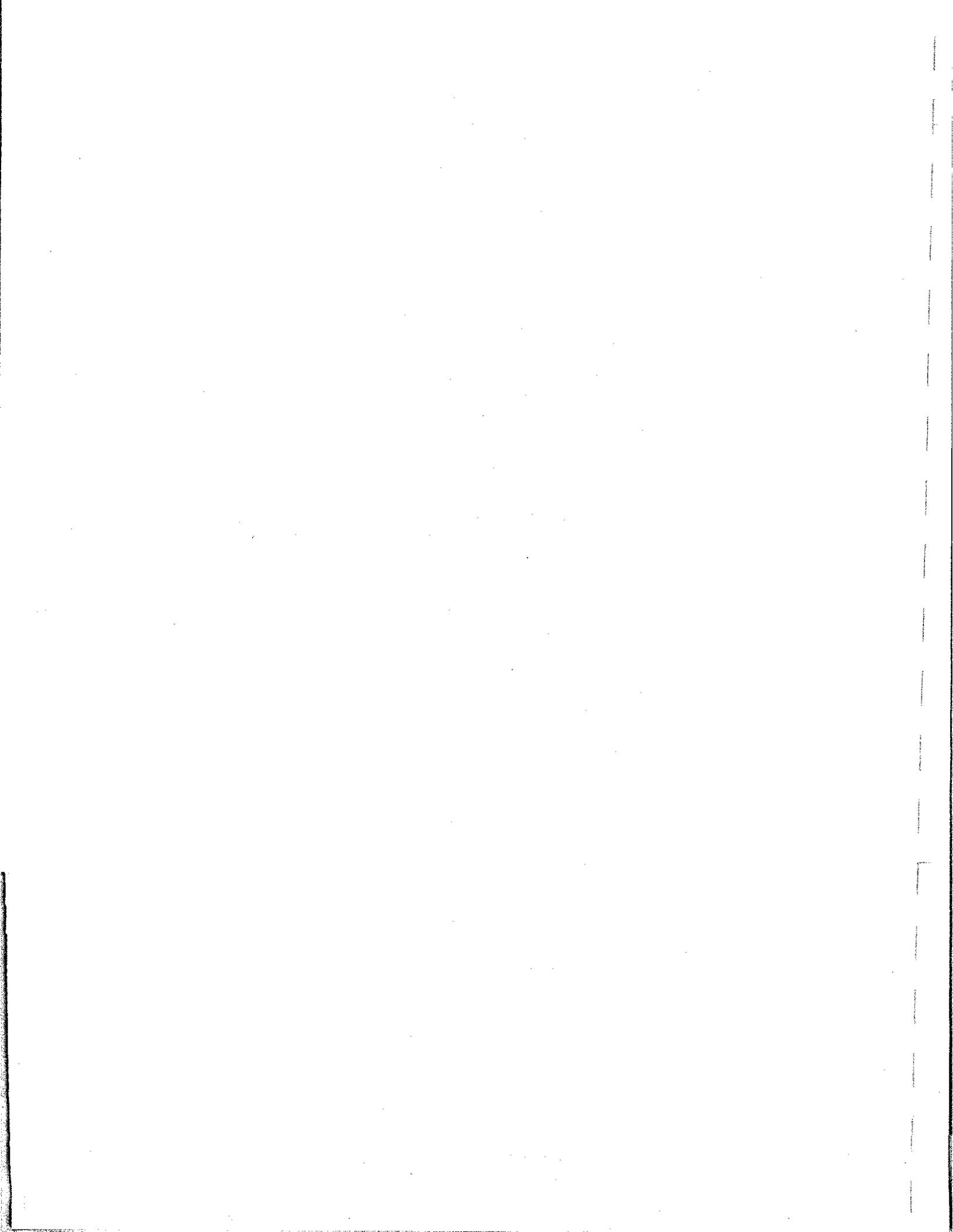
While your Esprit system incorporates many advanced features and is backed by the best warranty in the industry, you should feel free to contact our Customer Service Department or me personally if we may be of assistance in any way.

Your comments and suggestions are encouraged as to how we may better serve your large screen display needs.

Very truly yours,

A handwritten signature in cursive script that reads "David K. Mutchler".

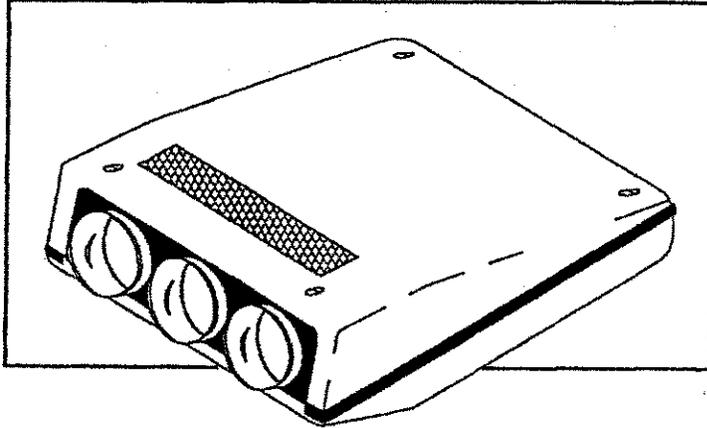
David K. Mutchler
President





ESPRIT
PROJECTION SYSTEMS

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**ESPRIT SERIES 2000D / 2000G
OPERATION MANUAL
MODELS 69202, 69203**

**APRIL 1991 REVISION A
AmPro P/N 71068**

Before operating this Video/Computer Graphics Display System, please read this manual carefully and completely. This manual will provide you with a full understanding of the many functions and special features, and the necessary instructions for adjustments and operation of this equipment.

Please follow all notes and warnings.



Made
in the
U.S.A.

QUICK REFERENCE

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Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution

Shielded interconnect cables must be employed with this equipment to insure compliance with the pertinent RF emission limits governing this device.

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ESPRIT 2000 SERIES ACCESSORIES

TRADEMARKS:®

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NOTES:

Chapter 1

INTRODUCTION / FEATURES / SPECIFICATIONS

The ESPRIT series of Computer Data/Graphics display systems has as standard equipment many functions not found in even the most expensive systems. The ESPRIT 2000Data may be upgraded to the model 2000Graphics as the result of a modular design concept, so that your display system can grow with your requirements. Some of the innovations offered by the ESPRIT 2000D and ESPRIT 2000G are:

1.1 FEATURES:

1.1.1 QUAD STANDARD/S-VHS (OPTIONAL):

This *optional module* has a built in capability which automatically senses and decodes any of the four international standards of video information that is applied to the composite video input. The auto select capability can be manually overridden if desired via the remote control. Another feature of the Quad Standard Module is the S-VHS input. Selection between the Composite Video input and the S-VHS input is accomplished via the remote control.

1.1.2 AUTOLOCK:

The autolock feature is the ability to automatically lock the horizontal and vertical circuits to the input sync signals. This capability is invaluable in any system where more than one signal will be utilized.

1.1.3 REMOTE CONTROL:

The remote control is extremely user friendly, for all ESPRIT Computer Data/Graphics display systems. The microprocessor used in the system allows a vast array of information to be controlled by the remote control. Within the standard remote control is a large 16 X 2 character LCD read-out which gives the operating and diagnostics status of the unit. The remote control is available in three versions: a full function hard-wired with an LCD read-out, a infrared TECHNICIAN, and an infrared EXECUTIVE with On/Off/Standby and eight channel selection only.

1.1.4 STORE/RECALL:

The ESPRIT series of Computer Data/Graphics display systems automatically stores and recalls each of the image, raster alignment, convergence, phasing settings, picture settings, mode of operation and all registration settings via the remote control for ANALOG RGB, TTL, and VIDEO inputs. Any combination of up to 50 ANALOG RGB, TTL and VIDEO inputs may be stored in memory and recalled by the remote control.

1.1.5 SELF DIAGNOSTIC:

The system constantly monitors all major voltages and signals and provides a plain English operational status on a large 16 x 2 LCD display located on the standard hard -wired remote control.

1.1.6 CGA/EGA/VGA (OPTIONAL):

The ESPRIT systems have the capability to include an optional CGA/EGA/VGA (TTL module) which includes two standard *nine* pin "D" connectors. Interface cables are available for various VGA inputs. The system will automatically configure itself to accept either CGA or EGA inputs and can be switched to VGA via the remote control.

1.1.7 SECOND ANALOG RGB (OPTIONAL):

The ESPRIT systems have the capability to include an additional Analog RGB and Composite Sync module in place of the above mentioned TTL/VGA module. The second Analog RGB2 module enables you to switch between two separate Analog RGB sources via the remote control.

1.1.8 RS-232:

The ESPRIT series Computer Data/Graphics display systems offers full duplex RS-232 communications and networking capability. The systems can be controlled from the remote control, a computer keyboard or through a modem using RS-232. Systems can be looped through so that multiple systems can be addressed individually or globally (as one) and controlled by one central source.

1.1.9 LENSES:

The ESPRIT 2000D and ESPRIT 2000G have high resolution, reflective coated, six element , hybrid lenses utilizing both glass and acrylic elements.

Optional eight-element glass lenses are available. The use of these glass lenses reduces the light output of the system, but this slight loss of light is offset by the increase in resolution and contrast.

1.1.10 INTERNAL HELP SCREENS:

The software incorporated into the ESPRIT system allows the user the capability of using the internal help system for instruction on the step-by-step setup, alignment, registration, operation and special features of the ESPRIT Computer Data/Graphics display system.

1.1.11 DIGITAL REGISTRATION:

The ESPRIT system alignment and registration is totally controlled by remote control. The software incorporated in the ESPRIT Computer Data/Graphics display system permits either a controlled (guided) or random static and dynamic convergence of the system. An internal HELP MENU guides the first time user through a step-by step procedure.

All registration settings are channel sensitive, meaning the each individual source may be precisely aligned to its particular parameters.

1.2 SPECIFICATIONS:

1.2.1 GENERAL:

The ESPRIT 2000D and ESPRIT 2000G are small, light, state-of-the-art systems which are designed to blend with the decor where it is utilized. The systems have built-in mechanical 12° lens offset to facilitate mounting close to the ceiling, which places the systems out of the viewing area.

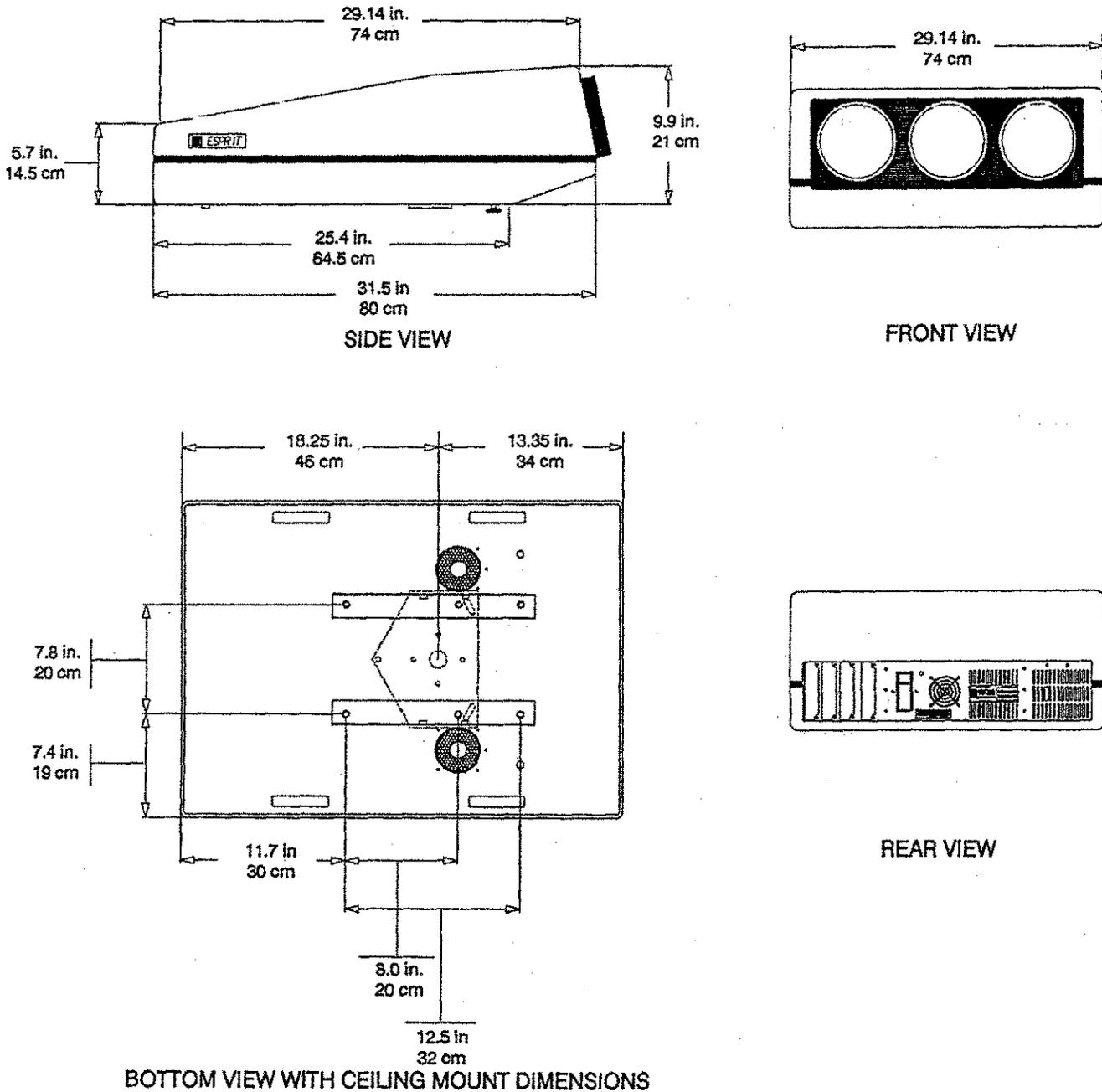


FIGURE 1-1. BASIC CASE DIMENSIONS.

1.2.2 SPECIFICATION CHART:

SPECIFICATIONS		ESPRIT 2000D	ESPRIT 2000G
Rated Light Output	Peaked	600 lumens	600 lumens
	Focused	350 lumens	300 lumens
CRTs		SD187	
Lenses	Standard	6-element, high resolution, coated, F1.01 with center and edge focus	
	Option	8 element, all glass, coated, F1.2	
Resolution	RGB	1,280 lines	
	Video	550 lines	
Screen Size		4 ft.(1.2m) to 20 ft. (6.1m)	
AutoScan Frequencies	Horizontal	14kHz to 56kHz	14kHz to 80kHz
	Vertical	40Hz to 150Hz	40Hz to 150Hz
Minimum Retrace	Horizontal	<3 μ sec	
	Vertical	< 400 μ sec	
Inputs	Standard	Analog RGB1 Channel	
	Options	(1) TTL (CGA/EGA)/VGA, (2) Quad Video/S-VHS , (3) Analog RGB2 Channel, (4) HDTV available upon request	
Remote Control Operates	Standard	Full function hard-wired remote control with 25ft. (2.6 m) cable with LCD	
	Option	Infrared Executive, with ON/OFF/STANDBY and 8 Channel select	
Remote Control Operates		Brightness, contrast, color, tint, detail, size, phasing, raster alignment, stand-by, on/off, blanking, test patterns and all static and dynamic registration, store and recall of all settings, up to 32 channels of Analog RGB, TTL and Video, Optional 4 or 8 channel switcher with RS-232.	
Feature		Upgradable to Esprit 2000G	
Special Features		RS-232 communications for computer control and networking Four sided blanking with variable picture aspect ratio. Microprocessor-based, modular design for ease of servicing. Operational status and error diagnostic LCD display on the remote control, internal Help Menu with set-up and operating instructions. Remote digital registration.	
General Description		RGB/Video/CGA/EGA/VGA, CAD/CAM, High Definition computer graphics	
Dimensions (H x W x D)		9.9 (25.1cm) x 22.5 inches (57.15cm) x 31.5 inches (80cm)	
Net Weight		100 lbs. (45.5kg)	
Shipping Weight		150 lbs. (68.2kg)	
Part Number		69203	69202
Operating Ambient Temperature		+ 32F to 97F (0C to 36C)	
Operating Ambient Humidity		20% to 80%, Non condensing	
Power Requirements	110 VAC	90 VAC to 132 VAC 60Hz/50Hz	
	220 VAC	180 VAC to 264 VAC 50 Hz/60Hz	
Maximum Power		500 Watts	

TABLE 1-1. ESPRIT 2000D/2000G SPECIFICATIONS.

Chapter 2

WARNINGS AND PRECAUTIONS

	<p>CAUTION RISK OF ELECTRICAL SHOCK DO NOT OPEN</p>			
<p>CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK DO NOT REMOVE COVER (OR BACK) NO USER SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED SERVICE PERSONNEL</p>			<p>This symbol is intended to alert the user that parts inside this product are a risk of electric shock to persons.</p>	<p>This symbol is intended to alert the user that important operating and servicing (maintenance) instructions are in the literature accompanying this product.</p>

2.1 X-RADIATION:



During the operation of any solid state Data/Graphics display system, the picture tube is a primary source of x-radiation. The projection tubes in ESPRIT systems incorporate leaded glass to safeguard against the leakage of x-rays. ESPRIT projectors comply with all U.S. Department of Health and Human Services rules governing the emission of x-radiation. **FOR CONTINUED X-RADIATION PROTECTION THE USER SHOULD NEVER ATTEMPT TO REPLACE THE PROJECTION TUBES OR OTHER ELECTRONIC COMPONENTS.** Instead, all service to the system should be performed by a qualified service technician.

**X-RAY SHIELD
DO NOT REMOVE**

"WARNING"
COMPONENTS FOR X-RAY SAFETY ARE CONTAINED IN THIS POWER SUPPLY RETURN COMPLETE HIGH VOLTAGE MODULES TO FACTORY FOR REPLACEMENT AND CONTINUED SAFETY

NOTE

THE DEFLECTION YOKES MUST BE FIRMLY AGAINST THE BELL OF THE CRT TO PREVENT X-RADIATION.

"WARNING"
BACKWARD MOVEMENT OF THE YOKE RESULTS IN PICTURE DEGRADATION AND LOSS OF RADIATION PROTECTION

2.2 HIGH VOLTAGE:



The projection display system contains high voltage derived from supplies capable of delivering **LETHAL** quantities of energy. To avoid serious personal injury, only a qualified technician should service and adjust the internal modules within the unit. There are no user serviceable parts in the ESPRIT system. All internal servicing must be performed by a qualified technician.

HIGH VOLTAGE

THIS UNIT OPERATES AT 34KV MAX

2.3 EXPOSURE TO RAIN OR MOISTURE:



To reduce **FIRE** or **SHOCK HAZARD**, never expose the system to rain or moisture. If this happens inadvertently, do not use the system until it has been inspected and/or serviced by a qualified technician.

2.4 PROJECTION TUBES:



The projection tubes inside the system enclose a high vacuum. Care must be taken to ensure that the system is not dropped or otherwise subject to violent blows.

WARNING

ATTEMPTS TO ALTER THE SEALED FACTORY-SET INTERNAL CONTROLS OR TO CHANGE OTHER SETTINGS NOT SPECIFICALLY DISCUSSED IN THIS MANUAL CAN LEAD TO PERMANENT DAMAGE TO THE PROJECTION SYSTEM AND VOID THE WARRANTY.

2.5 A.C. LINE / ELECTRICAL GROUNDING OF EQUIPMENT:



The ESPRIT projection system is configured for 115V or 230V operation and supplied with one of four standard power cords, as specified at the time the system is ordered. To change configurations, refer to Chapter 5, section 5.8, page 5-8 For your safety and proper operation, the system **MUST** be connected to a properly wired and grounded outlet. An improperly grounded system can place **HAZARDOUS VOLTAGES** on accessible metal parts of the system chassis and voids the Warranty due to potential damage to the system.

FOR INTERNAL ADJUSTMENTS OR SERVICE REFER TO QUALIFIED PERSONNEL. THE POWER CORD PROTECTIVE GROUNDING CONDUCTOR MUST BE CONNECTED TO EARTH GROUND. FOR CONTINUED SAFETY AND PROTECTION REPLACE FUSE WITH SPECIFIED TYPE: 110-120V 5AMP 220-240V 3 AMP
AGC SLO-BLO AGC SLO-BLO

2.6 CRT PHOSPHOR LIFE CRITERIA:



The phosphor coating on the face of the CRT has a given useful life and will provide satisfactory performance under normal usage. Since the phosphor efficiency decreases throughout its use at a rate which is a function of the beam intensity, the useful life of the CRT is determined by the application and the usage at high intensities.

Consequently, the continuous use at high brightness, and in particular prolonged use of a fixed pattern at high intensity, will adversely affect the useful life of the CRT. Continuous or repetitive use with a high-intensity fixed pattern will ultimately result in the "etching" of that pattern into the phosphor as a result of accelerated degradation in the area of the pattern. In the case of fixed pattern applications, the life is optimized by repositioning the pattern from time to time or by limiting the brightness when not in active use.

2.7 CEILING MOUNT PRECAUTION:



In a ceiling-mount application, the strength and rigidity of the ceiling are very important. The location should be carefully checked before hand to determine that the installation will safely support the weight of the system.

NOTE

AmPro Corporation IS NOT RESPONSIBLE FOR INJURY OR DAMAGE CAUSED BY AN IMPROPERLY INSTALLED SYSTEM.

NOTES:

Chapter 3

LIMITED WARRANTY

AmPro Corporation warrants this product to be free from defects in material and workmanship under normal use, subject to the limitations provided below.

3.1 WARRANTY PERIOD:

For the first twelve (12) months after the date of installation, AmPro Corporation will repair or replace any defective part, exclusive of the CRT for degradation of the phosphor coating, without charge for labor or parts. Replacement parts will be covered by this limited warranty for the remainder of the warranty period. This Limited Warranty applies only to parts supplied or designed by AmPro Corporation.

3.2 DATE OF INSTALLATION:

To establish the date of installation, the AmPro Corporation Certificate of Registration should be completed, signed and returned to AmPro Corporation, postmarked no later than thirty (30) days from the date of installation. If the AmPro Corporation Certificate of Registration is not returned within such time, AmPro Corporation will use the date that the system was shipped from the factory as the date of installation.

3.3 ORIGINAL PURCHASER:

This Limited Warranty is limited to the original purchaser (end user) of this product from either AmPro Corporation or AmPro Corporation authorized dealer, distributor or agent.

3.4 WARRANTY SERVICE:

For servicing under this Limited Warranty, this product must be presented to AmPro Corporation, an authorized AmPro Corporation service center or the authorized AmPro Corporation selling dealer.

3.5 SHIPPING:

Prior to shipping this product or any sub-assembly to AmPro Corporation, a Return Authorization Number must be obtained from the AmPro Corporation Customer Service Department. The product must be shipped in the manufacturer's original shipping carton or other AmPro Corporation approved packaging. All freight and shipping charges to AmPro Corporation must be prepaid by the purchaser. Damage resulting from abuse in shipment of this product is not covered by this Limited Warranty. AmPro Corporation approved shipping cartons are available from AmPro Corporation for a nominal charge.

3.6 ENVIRONMENTAL DAMAGE:

This Limited Warranty does not cover damage or repairs that are necessary due to floods, winds, fires, lightning, accidents, corrosive atmosphere, excessive exposure to water (moisture) or heat, or any other conditions beyond the control of AmPro Corporation.

3.7 SERIAL NUMBER DEFACEMENT:

This Limited Warranty is void for the product if the serial number has been changed, removed or defaced.



3.8 MISUSE:

This Limited Warranty does not cover repairs that are necessary due to:

- incorrect installation;
- voltage conditions, blown fuses, open circuit breakers or any other inadequacy or interruption of properly grounded electrical service;
- misapplication, abuse, improper servicing, or any other improper operation, including mis-adjustments of any control;
- defects in or caused by associated equipment; or
- repair and/or modification of a sub-assembly performed by other than AmPro Corporation factory personnel.

Normal maintenance as outlined in the installation and servicing instructions of this Operator's Manual will be the responsibility of the purchaser.

AmPro Corporation MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, IN CONNECTION WITH THIS PRODUCT EXCEPT AS HEREINABOVE PROVIDED. IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ARISING FROM A COURSE OF DEALING OR USAGE OF TRADE ARE SPECIFICALLY EXCLUDED. SHOULD THIS PRODUCT PROVE TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP, THE PURCHASER'S SOLE REMEDY SHALL BE SUCH REPAIR OR REPLACEMENT AS HEREINABOVE EXPRESSLY PROVIDED AND UNDER NO CIRCUMSTANCES SHALL AmPro Corporation BE LIABLE FOR ANY LOSS, OR DAMAGE, DIRECT, INCIDENTAL OR CONSEQUENTIAL, INCLUDING LOSS, OR LOSS OF PROFITS OR BUSINESS OPPORTUNITIES, RESULTING FROM DEALER OR DISTRIBUTOR INSTALLATION OR SERVICES.

Some states do not allow the exclusion of incidental or consequential damages, so the above limitation may not apply to you. This Limited Warranty gives you specific legal rights, and you may also have other rights which may vary from state to state or country. NO other person is authorized to assume for AmPro Corporation any additional obligations beyond those provided herein.



Chapter 4

SYSTEM APPLICATIONS AND SCREENS

4.1 SYSTEM 1/BASIC CONFIGURATION:

This system is the most versatile large screen data/graphic display system in that it enables a large number of people to view.

USED FOR:

- CLASSROOMS
- CONFERENCE ROOMS
- PRIVATE USE

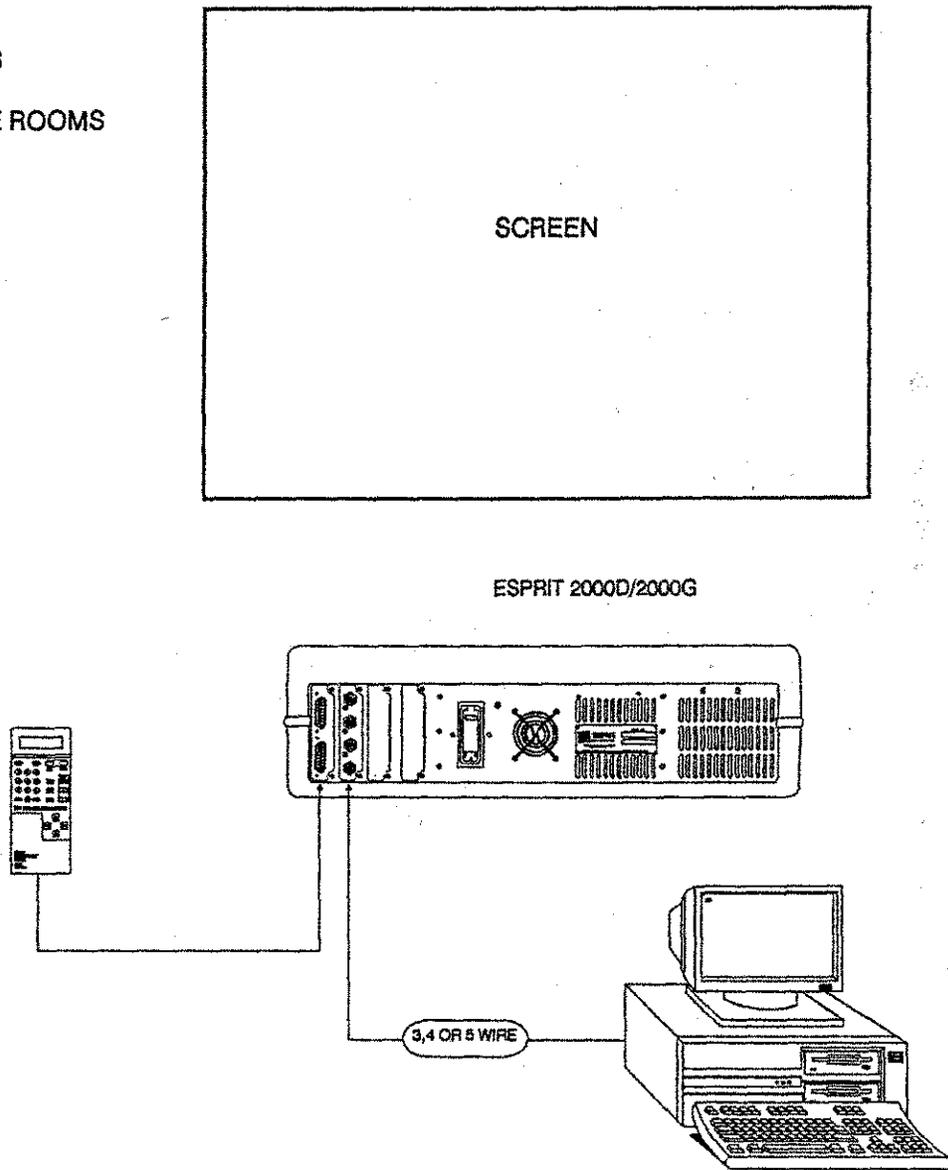


Figure 4-1. Standard (basic) system configuration.

4.2SYSTEM 2/OPTIONAL CONFIGURATION 1:

This system is configured to bring together video and computer graphics and technical presentations for business. Its high resolution and versatility to accept various types of personal computers and workstations make it ideal for conferences, training and diversified graphics/data/video services.

USED IN:

- CONFERENCE ROOMS
- TRAINING AREAS
- INFORMATION DISPLAYS

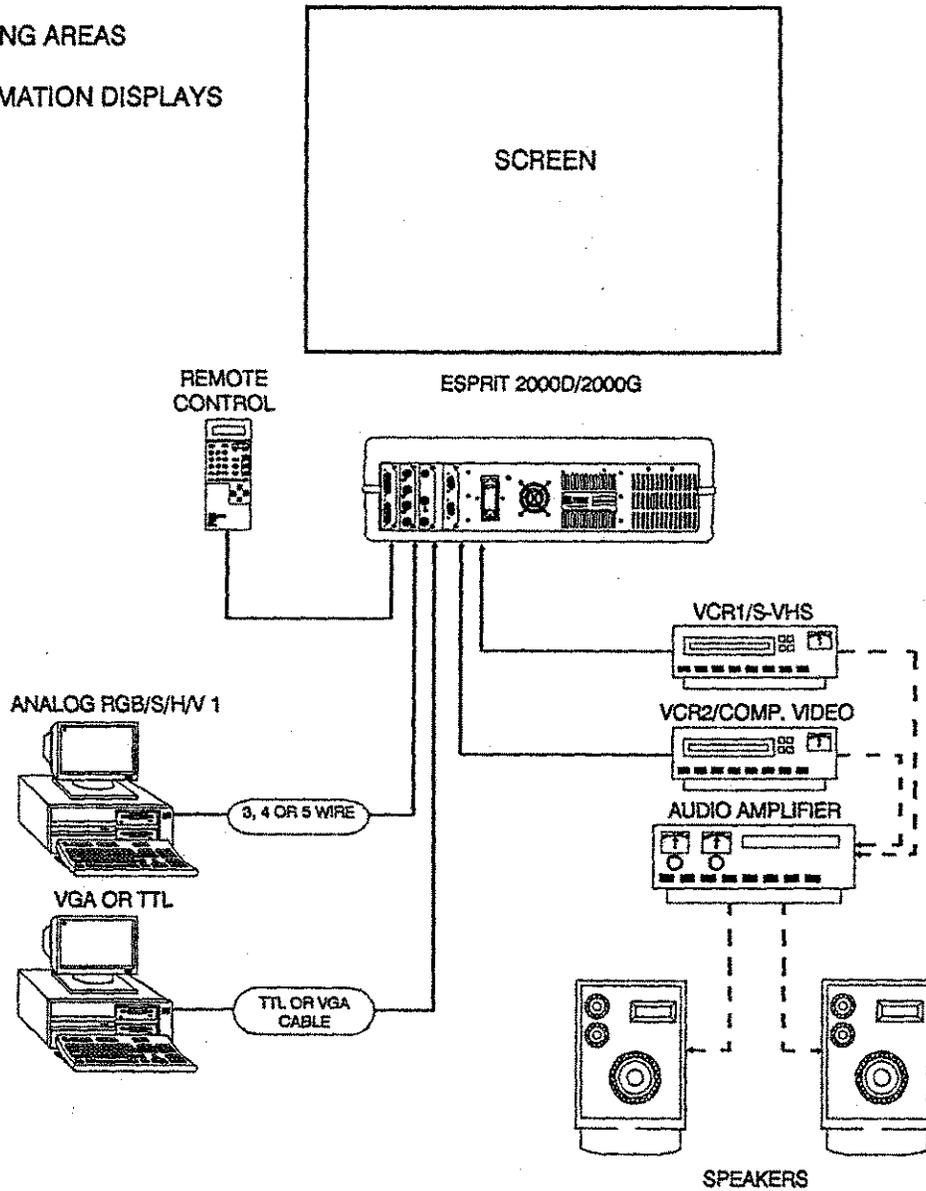


Figure 4-2. Optional system configuration 1.

System's configuration, (1) Analog RGB1 module (standard), (2) Analog RGB2 module (optional), (3) TTL/VGA module (optional), and (4) Quad Video Decoder module (optional).

4.3 SYSTEM 3/OPTIONAL CONFIGURATION 2:

This system is ideal for a wide range of educational activities as an effective teaching aid.

USED IN;

- CLASSROOMS
- AUDITORIUMS
- LECTURE HALLS

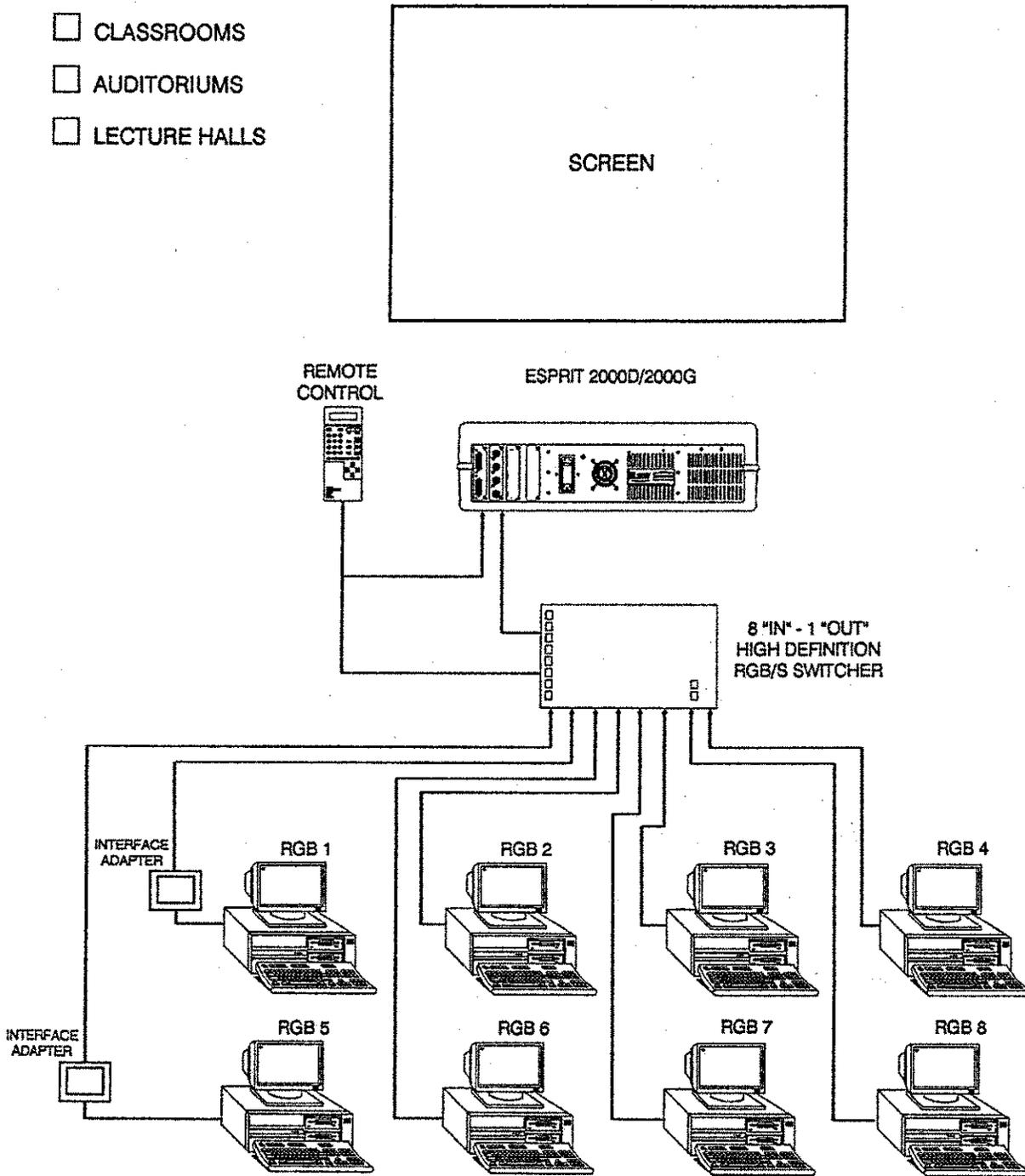


Figure 4-3. Optional system configuration 2.

System's configuration, (1) Analog RGB1 module (standard) (2) High Definition Switcher-Eight "IN" and One "out". Display System and Switcher are controlled via a single Remote Control.

4.5 SCREEN PLACEMENT:

The optimal viewing would be in a darkened room. However, compromises must be made. In order to make the best compromises, the following should be considered. Refer to figures 4-5 and 4-6

- Determine the desired image and screen size when considering the total room area and the size of the text material to be presented.
- Select a screen type suited for the application and the ambient lighting conditions.
- Determine the screen location
- Determine the range from which the screen will be viewed when selecting the screen size.
- Keep the sources of ambient light as far apart as possible from the display system and off the screen area.
- Where there are windows, drape all windows near the projector to avoid any light source between the projector and screen.
- Seat the nearest viewer no closer than to the rear of the projection unit.
- Avoid fluorescent lighting. Use controlled recessed incandescent lighting for optimum lighting condition results.

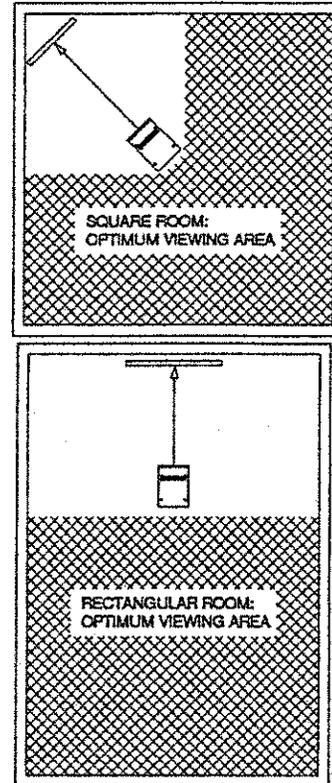


Figure 4-5. Screen placement examples.

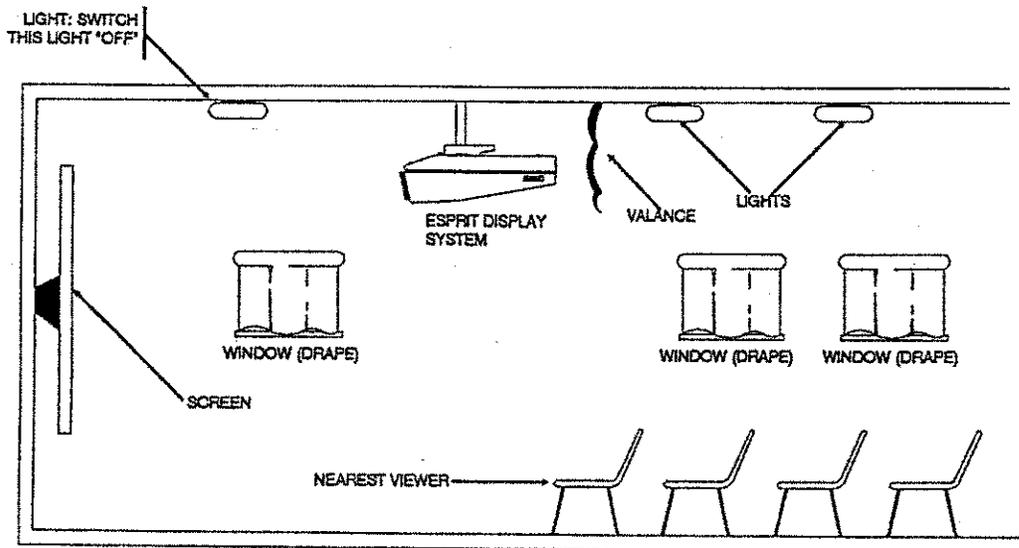


Figure 4-6. Room configuration example.

NOTES:

Chapter 5

CHANGING PARAMETERS

INSTALLATION GUIDELINES

5.1 BEFORE INSTALLATION:

5.1.1 SHIPPING CARTON CONTENTS:

- Save the shipping carton, surrounding foam inserts and lens covers.
- NOTE: Original carton and foam inserts must be used for shipping. It is specifically designed to minimize potential damage during shipment.
- An optional shipping/carrying case is available for mobile applications.

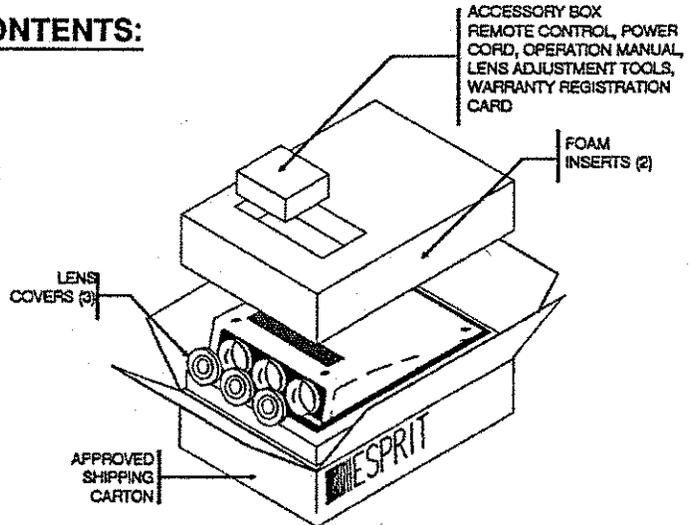


FIGURE 5-1.

SHIPPING CARTON CONTENTS.

The ESPRIT system is factory preset to project a 60" x 80" image at a throw distance of approximately 10 feet when table mounted 12° below the center line of screen.

The system may be re-configured for all front and rear screen applications. Chapter 5 provides the required information on how to change the configuration for your particular needs.

Please consult with your selling dealer, or his authorized representative, concerning the initial installation, set-up and registration of the system. Discuss any non-standard installation with your dealer, prior to the actual installation, to determine the feasibility. Determine the following requirements:

- Computer Data/Graphics projection system location and lighting.
- Screen size, type, and location.
- Projection configuration, i.e.: front/floor mount etc. Note: Refer to section 5.5 to determine sweep configurations from factory settings.
- Operating A.C. line voltage. The system is set for 115V line operation, unless otherwise noted. Refer to Chapter 5, section 5.8 for changing A.C. line voltage.

5.3 INITIAL SYSTEM TEST:

Once the system has been removed for the packaging and placed on a secure surface, perform the following initial system test prior to attempting any changes or installation of the system.

- NOTE: CHECK FOR THE PROPER MAIN AC CONFIGURATION.

There is a main power rocker switch on the rear panel, just above the power cord (figure 5-2). When this switch is "OFF," a "O" can be observed. Turn the switch to the "ON" position. When this switch is turned ON, the LCD on the hard-wired remote should display the message, "ESPRIT 2000D" or " ESPRIT 2000G," depending upon your particular system.

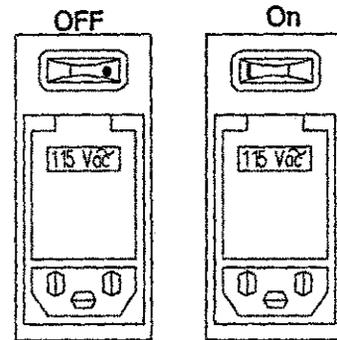


FIGURE 5-2.

MAIN AC ROCKER SWITCH

The next step is to press the **POWER** button on the remote control. When this button is pressed, a sequence of events should occur:

- "INITIALIZING" will be displayed on the LCD.
- The RED LED above the fan on the rear panel should light up and the fans should start running.
- The LCD will then display the mode of operation that the system was in when it was de-energized.

NOTE: Ensure that there is an active source applied to the system and the system is switched to that particular source.

If the above events occur as listed, proceed with the installation of your system and refer to Chapter 5 to perform the necessary mounting requirements for your application.

If for some reason the events do not occur as listed above, proceed to Chapter 12 for aid in determining the cause.

5.4 CHANGING PICTURE SIZE:

To change picture size, the system must be moved closer to the screen for smaller projected images and further from the screen for larger images. When the projected distance is changed, two things happen to the projected image. The first is that the image de-focuses and the second is that the red, green and blue images separate on the horizontal plane. To determine where the system must be mounted for a given size screen, refer to section 5.7. To refocus the projected image and to reconverge the three images, refer to Chapter 9 (LENS FOCUSING AND POSITIONING).

5.5 CHANGING DEFLECTION ANGLE:

Since it is optional to floor or ceiling mount the system, provisions have been designed into the system for off-angle (in the vertical plane) projection. Since off-angle projection produces a different throw distance from the system to the top and the bottom of the screen, typically some top and bottom defocusing will occur. The lenses have an built-in adjustments to compensate for this defocusing. Refer to Chapter 9 section 9.2 (LENS FOCUSING AND POSITIONING.)

The second effect that occurs when the deflection angle is changed from on-axis is known as keystone effect. This effect is observed as a trapezoid shaped image. This condition can be corrected, within a specified range, by the registration controls via the remote control. This is an adjustment that should be made during your initial set-up and registration.

5.6 MOUNTING / SWEEP CONFIGURATIONS:

5.6.1 FRONT TABLE / CEILING MOUNTING:

Front projection provides the brightest image, but the screen is more sensitive to direct ambient light. High image light gain is available with front screens but with a compromise in resolution and viewing angle. Refer to section 4.5. The built-in 12° vertical lens offset places the system approximately at the top (or bottom) edge of the screen as to minimize interference with the viewing audience.

Front/ table mounting requires NO horizontal or vertical sweep deviation from the factory preset conditions. Refer to figure 5-3.

Front/ ceiling mounting of the system moves the unit out of the path of the audience. When the ESPRIT system is ceiling mounted, it will be inverted from the table/floor mounting. This inversion requires that the horizontal and vertical sweeps be reversed (refer to figure 5-3). The ESPRIT logo on the side of the system may be inverted by pulling it out, rotating it, and allowing it to retract. This allows the logo to be read correctly when mounted in any position.

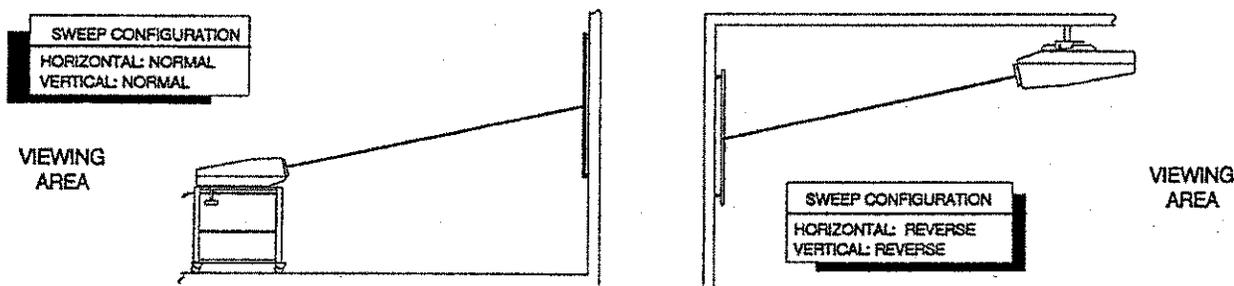


FIGURE 5-3.

FRONT/TABLE AND FRONT CEILING MOUNT SWEEP CONFIGURATION.

5.6.2 REAR TABLE / CEILING MOUNTING:

Rear projection permits higher ambient lighting and physically removes the system from the viewing area. However, it requires either a large area behind the screen or the use of a folded image with a first (front) surface mirror. With rear projection there is some inherent reduction in image brightness. It is recommended that you consult with your dealer or the company if you contemplate a folded image rear screen application.

Rear/table mounting requires only the horizontal sweep being reversed. Please refer to figure 5-4.

Rear ceiling mounting requires only the vertical sweep being reversed from the factory preset. Please refer to figure 5-4.

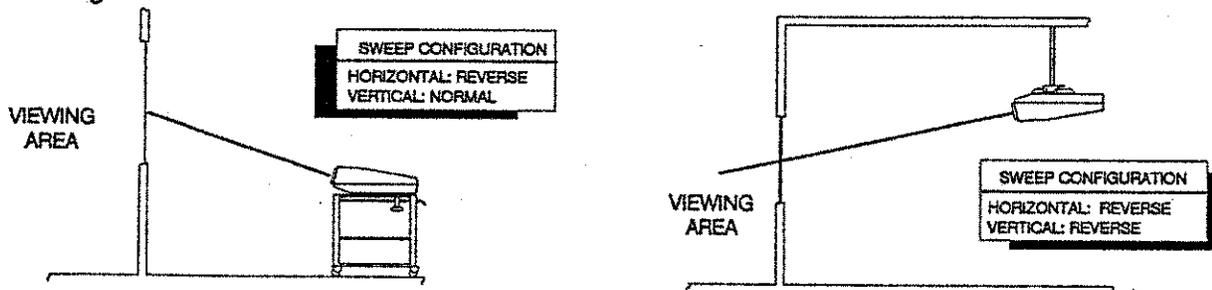


FIGURE 5-4.

REAR/TABLE AND REAR/CEILING MOUNT SWEEP CONFIGURATION.

5.7 SWEEP REVERSAL PROCEDURES:

5.7.1 HORIZONTAL SWEEP REVERSAL PROCEDURE:

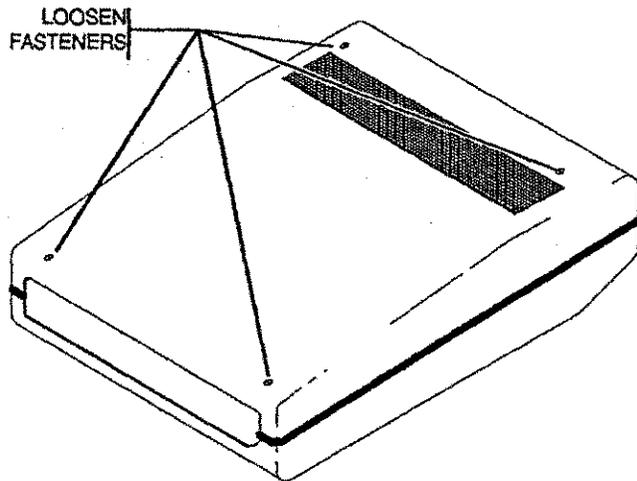


WARNING

DO NOT SERVICE THE HORIZONTAL SWEEP WHILE THE SYSTEM IS ENERGIZED, IF THE SWEEP PLUGS ARE REMOVED WHILE THE SYSTEM IS ENERGIZED, HIGH VOLTAGE SHOCK WILL RESULT AND THE SYSTEM WILL BE DAMAGED.

- To reverse the sweep , turn the system "OFF" and DISCONNECT the power cord.

- STEP 1. Remove the top cover. It is held on by four (4) 1/4 turn fasteners on the top of the system near the front and rear. Refer to figure 5-7.



- STEP 2. Unlock and tilt up the Registration Amplifier board which is across the front of the system. The three Yoke Interface boards under the Registration Amplifier board are now exposed. Refer to figure 5-8.

- STEP 3. Horizontal sweep reversal is accomplished by reversing the horizontal sweep connectors on the three Yoke Interface Boards. Pull the horizontal sweep plug (P-1) out of (J-1), turn it end for end (180 °) and plug it back into (J-1). Remove the horizontal registration plug (P-4) from (J-4) turn it end for end (180 °) and plug it back into (J-4). Refer to figure 5-8.

FIGURE 5-5.

TOP COVER REMOVAL

 Perform STEP 3 on all three Yoke Interface Boards. NOTE: Recheck raster centering.
RECHECK YOUR WORK!

- STEP 4. Lower the Registration Amplifier board and lock it into position.
- STEP 5. Position LK7 and LK8 (Registration Board, lower right hand corner as viewed from the rear) for the proper sweep configuration. Refer to figure 5-7.
 - Normal Sweep Configuration; Position LK7 across pins 1 and 2, LK8 across pins 2 and 3.
 - Reverse Sweep Configuration; Position LK7 across pins 2 and 3, LK8 across pins 1 and 2.
- STEP 6. Replace the top cover, plug in the power cord, and energize the system.

5.7.1.1 SWEEP AND REGISTRATION PLUG LOCATIONS:

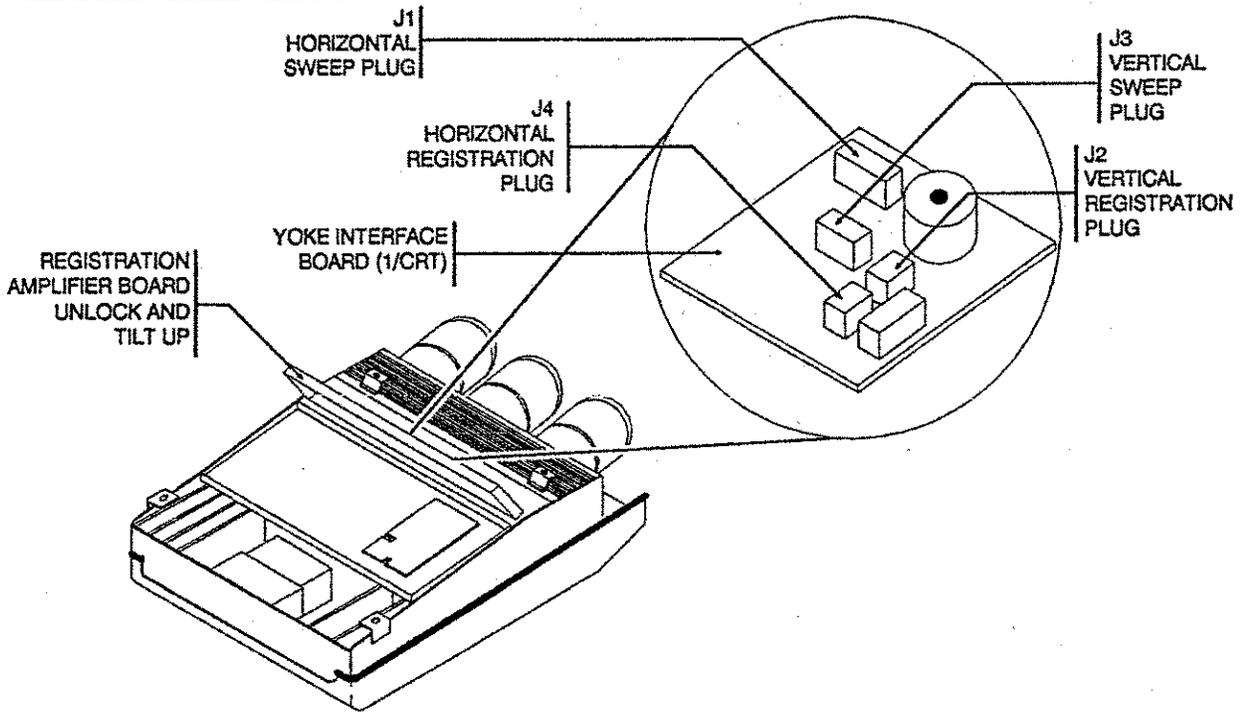


FIGURE 5-6.

YOKE INTERFACE BOARD LOCATION AND PLUG DESCRIPTIONS.

5.7.1.2 LK7 AND LK8 LOCATION AND POSTIONING:

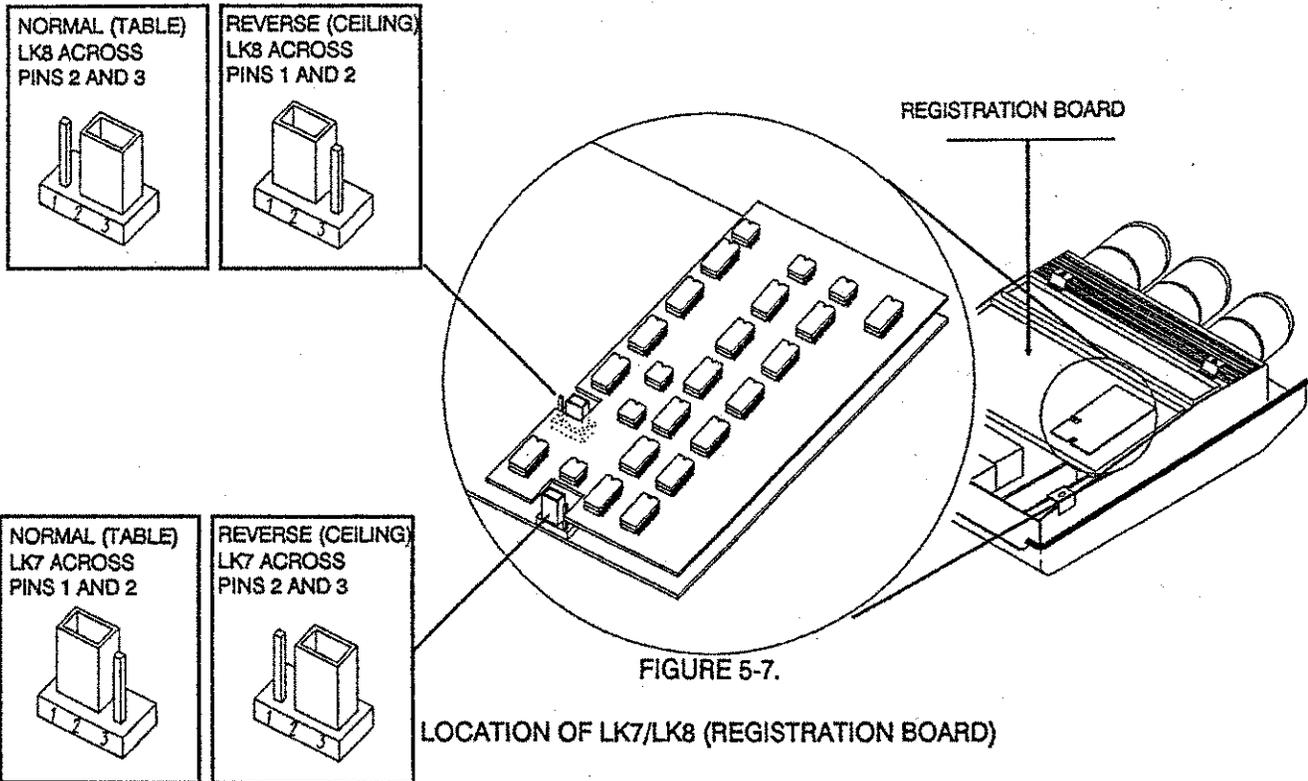


FIGURE 5-7.

LOCATION OF LK7/LK8 (REGISTRATION BOARD)

5.7.2 VERTICAL SWEEP REVERSAL PROCEDURE:

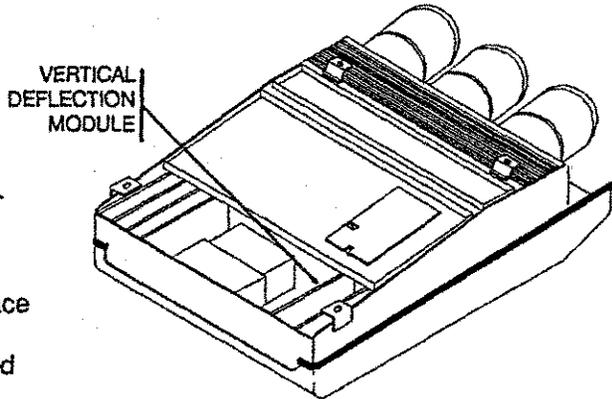
 **WARNING** 

DO NOT CHANGE THE POSITION OF THE VERTICAL REVERSE SWITCH WHILE THE SYSTEM IS ENERGIZED. CHANGING THE POSITION OF THIS SWITCH WHILE THE SYSTEM IS ENERGIZED WILL RESULT IN DAMAGE TO THE EQUIPMENT.

To reverse the sweep, turn the system "OFF" and DISCONNECT the power cord.

- STEP 1. Remove the top cover. It is held on by four (4) 1/4 turn fasteners on the top of the system near the front and rear. See figure 5-5.

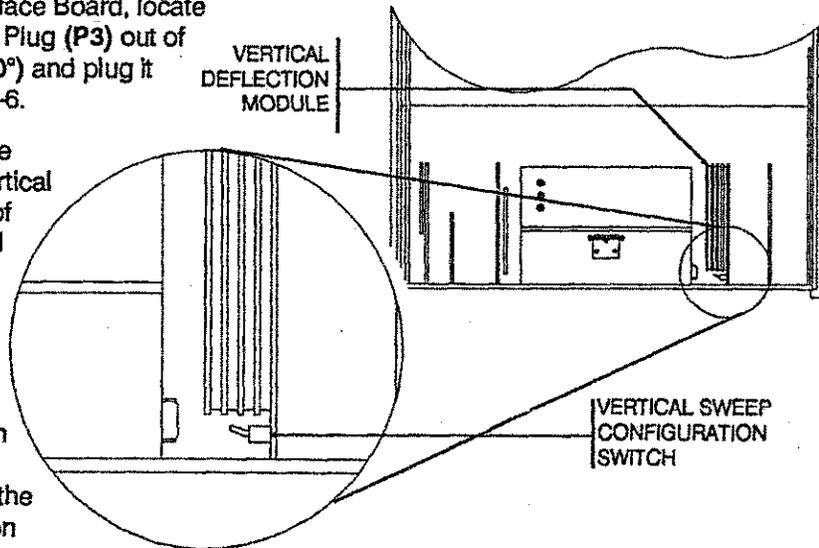
- STEP 2. Unlock and tilt up the Registration Amplifier Board, which is across the front of the system. The three Yoke Interface Boards under the Registration Amplifier Board are now exposed. Refer to figure 5-6.



- STEP 3. The Vertical sweep reversal is accomplished by reversing the Sweep and Registration plugs on the three Yoke Interface Boards and changing the position of the Vertical Sweep Configuration switch, located on the Vertical Deflection Module.

- STEP 3A. On the yoke interface Board, locate and pull the Vertical Sweep Plug (P3) out of (J3) turn it end-for-end (180°) and plug it back into (J3). See figure 5-6.

- STEP 3B. Again on the Yoke Interface Board, pull the Vertical Registration Plug (P2) out of (J2), turn it end-for-end and reinsert it into (J2). See figure 5-6



- STEP 3C. On the Vertical Deflection Module, (third module from the right, when view from the rear), locate and change the position of the Vertical Sweep Configuration Switch. Configure switch for the following

FIGURE 5-8. VERTICAL MODULE & SWITCH LOCATION.

- ☒ NORMAL SWEEP: SWITCH IS UP.
- ☒ REVERSE SWEEP: SWITCH IS DOWN.

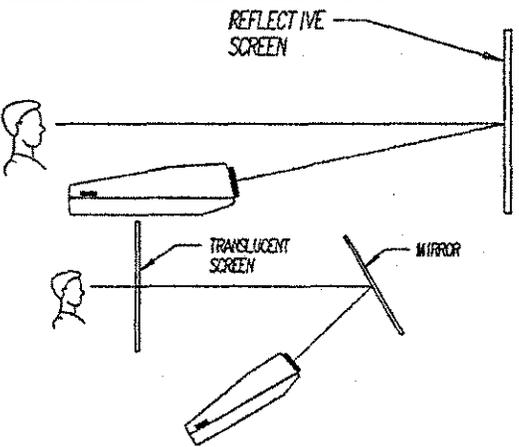
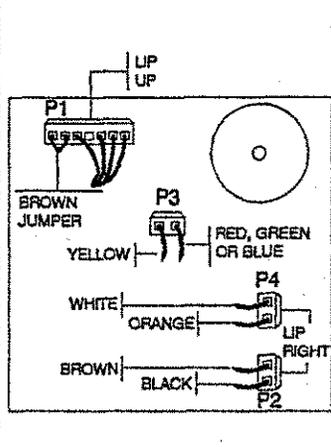
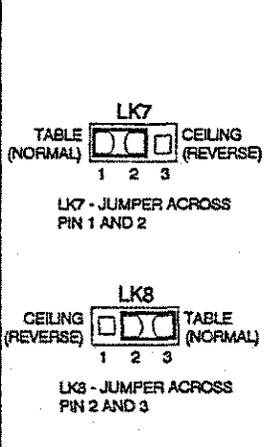
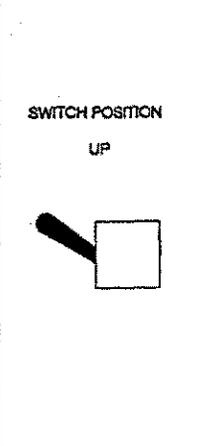
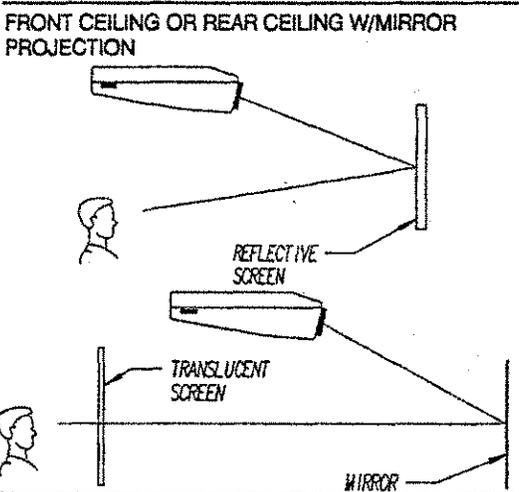
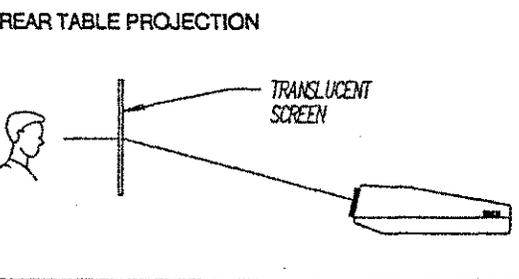
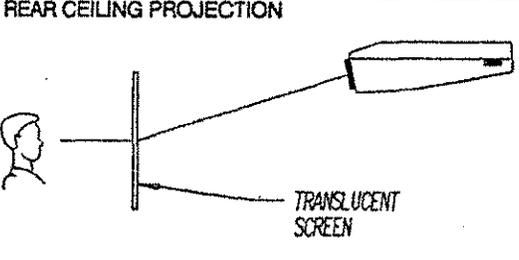


Perform Steps **3A** and **3B** on **ALL Three Yoke Interface Boards**. RECHECK YOUR WORK!

- STEP 4. Replace the top cover, plug in the power cord, and energize the system.

5.7.3 SWEEP REVERSE QUICK REFERENCE: *QUICK REFERENCE*

Using this table, make the necessary changes for your particular projection application.
DOUBLE CHECK YOUR WORK! Refer to sections 5.7.1 and 5.7.2 as required.

FRONT TABLE OR REAR TABLE W/MIRROR PROJECTION (FACTORY PRESET CONFIGURATION)	YOKE INTERFACE PLUG CONFIGURATIONS	REGISTRATION BOARD JUMPER (LK7/LK8) CONFIGURATION	VERTICAL DEFLECTION SWITCH
			<p>SWITCH POSITION UP</p> 
<p>FRONT CEILING OR REAR CEILING W/MIRROR PROJECTION</p> 	<p>ROTATE P1, P2, P3 AND P4 180 DEGREES ON ALL THREE YOKE INTERFACE BOARDS.</p>  <p>CAUTION DO NOT MISPIN PLUGS!</p>	<p>MOVE LK7 AND LK8 JUMPERS TO CEILING (REVERSE) CONFIGURATION.</p> <p>LK7 ACROSS PINS 2 AND 3 LK8 ACROSS PINS 1 AND 2</p>	<p>TOGGLE SWITCH DOWN FROM FACTORY CONFIGURATION</p>
<p>REAR TABLE PROJECTION</p> 	<p>ROTATE P1 AND P4 180 DEGREES ON ALL THREE YOKE INTERFACE BOARDS.</p>  <p>CAUTION DO NOT MISPIN PLUGS!</p>	<p>MOVE LK7 AND LK8 JUMPERS TO CEILING (REVERSE) CONFIGURATION</p> <p>LK7 ACROSS PINS 2 AND 3 LK8 ACROSS PINS 1 AND 2</p>	<p>"SAME AS FACTORY CONFIGURATION"</p>
<p>REAR CEILING PROJECTION</p> 	<p>ROTATE P2 AND P3 180 DEGREES ON ALL THREE YOKE INTERFACE</p>  <p>CAUTION DO NOT MISPIN PLUGS!</p>	<p>"SAME AS FACTORY CONFIGURATION"</p> <p>LK7 ACROSS PINS 1 AND 2 LK8 ACROSS PINS 2 AND 3</p>	<p>TOGGLE SWITCH DOWN FROM FACTORY CONFIGURATION</p>

5.8 CHANGING A.C. LINE OPERATION (115V - 220V):



Unless specified at the time ordered, all ESPRIT systems are shipped from the factory configured for 115 Volt, 50/60 Hz operation with a standard US power cord. To change the system so that you can apply a different line voltage, perform the following steps and refer to Figure 5-9.

- STEP 1. Remove the power cord from the back of the unit.
- STEP 2. Open the door above the power plug. Using a small screwdriver, gently push down on the door latch and pop it open to access the fuse and voltage select barrel.
- STEP 3. The voltage select barrel will indicate the present voltage selected. If it is not the desired voltage, pull the barrel straight out, rotate it and plug it back so that it reads the correct voltage.
- STEP 4. Replace the fuse with the proper size for the voltage selected. (5 Amp ACG Slow blow for 115v and 3 Amp ACG Slow blow for 230v). Ensure arrows line up.
- STEP 5. Ensure that the correct power plug is installed for the respective country.

- STEP 6. Plug the proper cord back into the rear of the system.

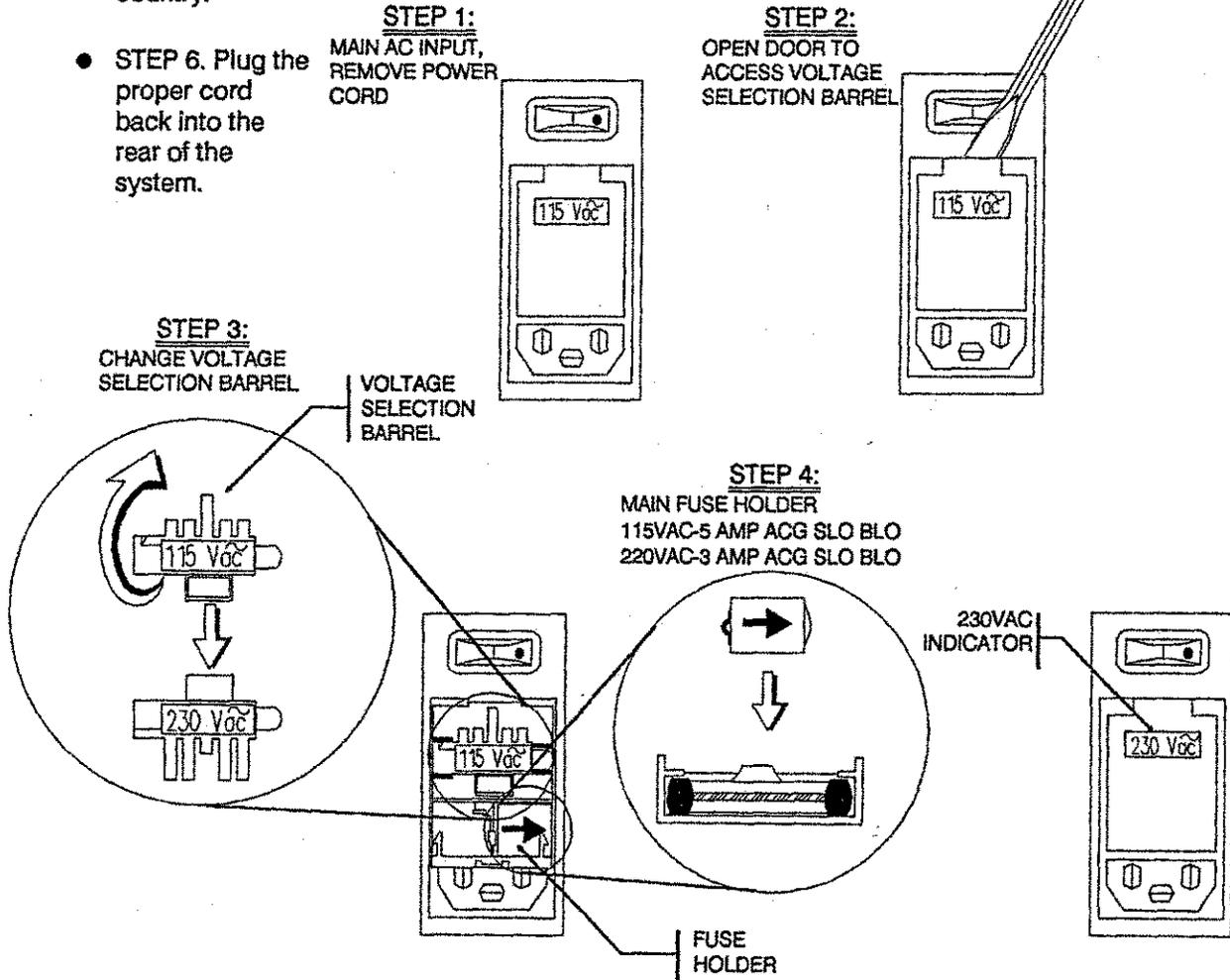


FIGURE 5-9. VOLTAGE SELECTION AND MAIN FUSE CHANGE.

5.9 INSTALLATION GUIDELINES:

This information is for the ESPRIT models 2000D and 2000G series projector installation using either the 6 or 8 element lenses with an aspect ratio of 4:3, an optimum 12 ° off-axis projection and using the NTSC video information to optimize the picture size . Please refer to figure 1, Section 5.9.1 for definitions, Section 5.9.2 for the calculations required and examples provided. Refer to Table 5-2 for some common size screens and mounting distance.

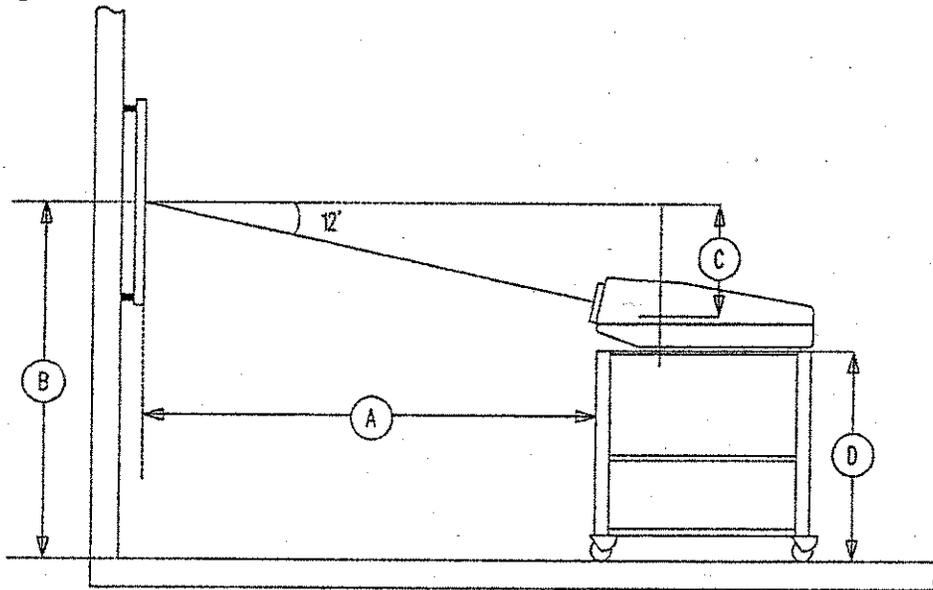


FIGURE 5-10. INSTALLATION MEASUREMENTS.

5.9.1 DEFINITIONS:

- A, refers to the throw distance required.
- NOTE: Table mount reference: front of system, Ceiling mount reference: mounting pipe placement.
- B, refers to the distance from the screen center to the floor or ceiling as the case may be.
- C, is used to determine the required table height or pipe length.
- D, refers to table height or to the pipe length required.

5.9.2 CALCULATIONS:

NOTE 1: All measurements are in millimeters, (convert for inches).

To calculate A for table mount configurations use: $A = \text{Screen Width(mm)} \times 1.4668 + 227.8\text{mm}$.

To calculate A for ceiling mount configurations use: $A = \text{Screen Width(mm)} \times 1.4668 + 566\text{mm}$.

Dimension B indicates the distance from the screen center to the floor or ceiling as the case may be.

To calculate C use: $C = \text{Screen Width(mm)} \times .312 + 97.066\text{mm}$.

To calculate D for table mount use: $D = B - C - 127\text{mm}$.

To calculate D for ceiling mount use: $D = B - C - 179\text{mm}$.

NOTE 2: See examples for further information.

5.9.3 EXAMPLE1- FRONT/ TABLE INSTALLATION:

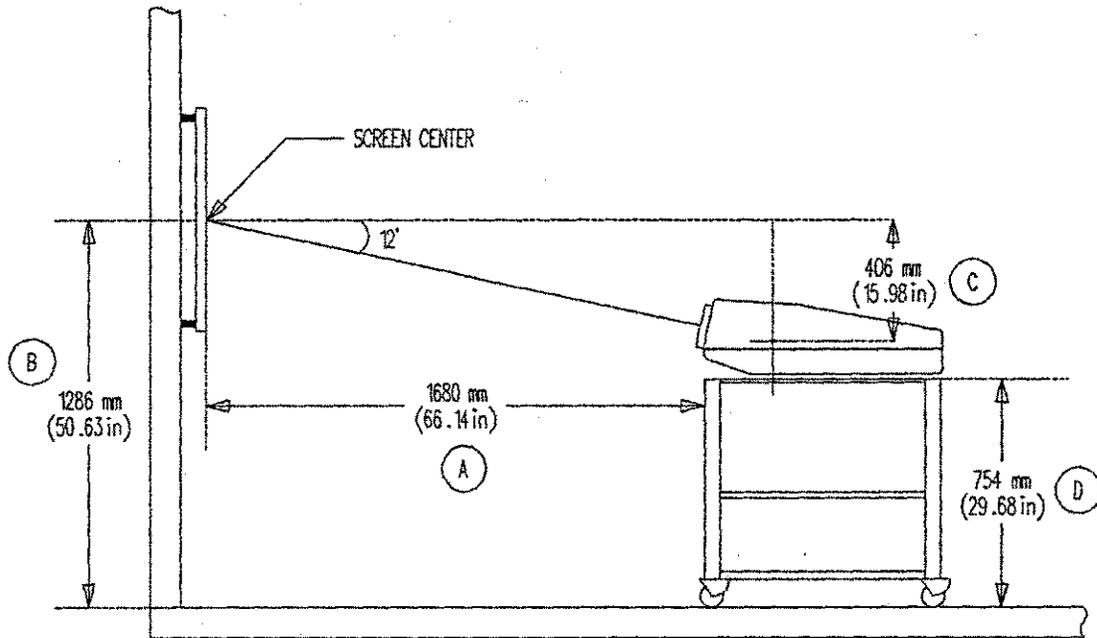


FIGURE 5-11. EXAMPLE 1, FRONT/TABLE MOUNT.

5.9.3.1 CALCULATIONS:

(A) = screen width(mm) x 1.4668 + 227.8
 = 990.6mm x 1.4668 + 227.8mm
 = 1453mm + 227.8mm
 = 1680mm (66.14in)

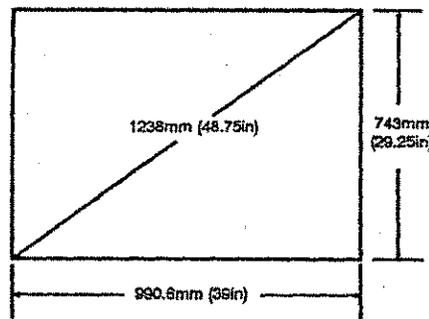
(C) = Screen width(mm) x .312 + 97.066mm
 = 990.6 mm x .312 + 97.066mm
 = 309.06mm + 97.066mm
 = 406mm (15.98in)

(B) = distance from screen center to floor
 = 1286mm (50.63in)

(D) = B - C - 127mm
 = 1286mm - 406mm - 127mm
 = 880 - 127mm
 = 754mm

- (A) = 1680mm (66.14in)
- (B) = 1286mm (50.63in)
- (C) = 406mm (15.98in)
- (D) = 754mm (29.68in)

SCREEN DIMENSIONS



5.9.4 EXAMPLE 2-FRONT/ TABLE INSTALLATION:

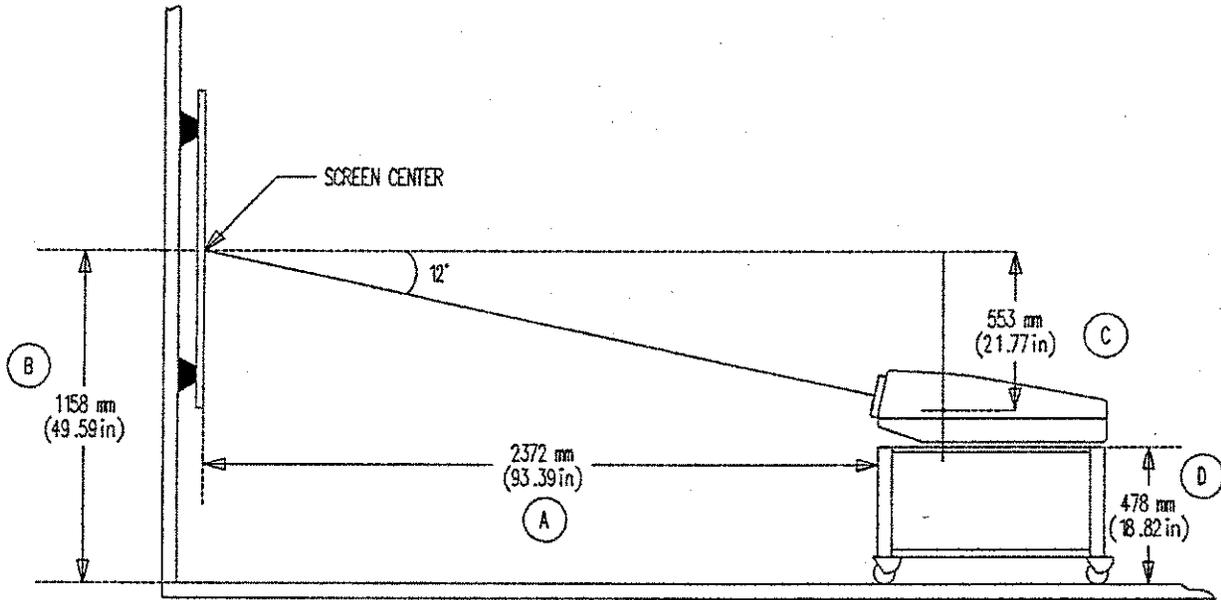


FIGURE 5-12. EXAMPLE 2, FRONT/TABLE MOUNT.

5.9.4.1 CALCULATIONS:

(A) = screen width(mm) x 1.4668 + 227.8
 = 1462mm x 1.4668 + 227.8mm
 = 2144mm + 227.8mm
 = 2372mm (93.39in)

(C) = Screen width(mm) x .312 + 97.066mm
 = 1462 mm x .312 + 97.066mm
 = 456mm + 97.066mm
 = 553mm (21.77in)

(B) = distance from screen center to floor
 = 1158mm (49.59in)

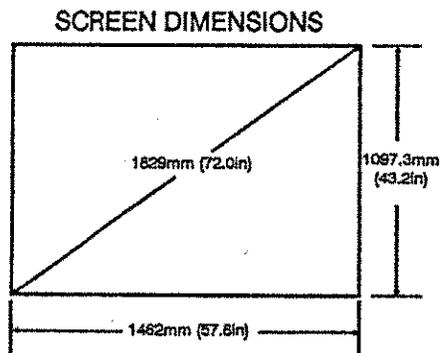
(D) = B - C - 127mm
 = 1158mm - 553mm - 127mm
 = 605mm - 127mm
 = 478mm (18.82in)

(A) = 2372mm (93.39in)

(B) = 1158mm (49.59in)

(C) = 553mm (21.77in)

(D) = 478mm (18.82in)



5.9.5 EXAMPLE 3 REAR /TABLE INSTALLATION:

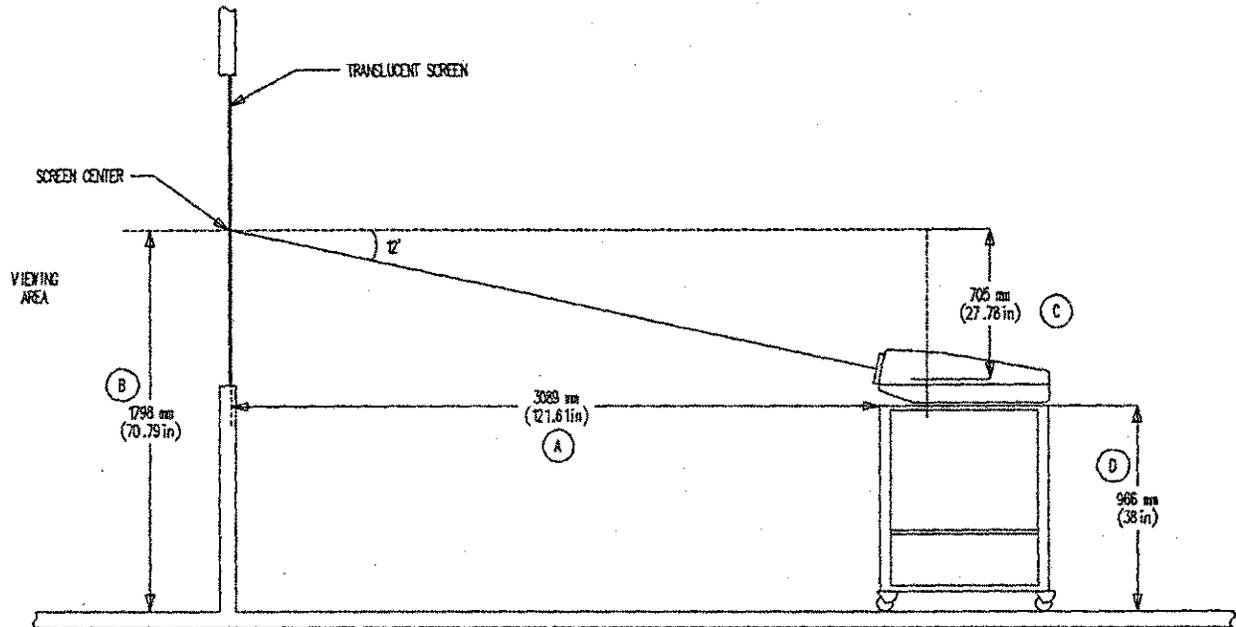


FIGURE 5-13. EXAMPLE 3, REAR/TABLE MOUNT.

5.9.5.1 CALCULATIONS:

(A) = screen width(mm) x 1.4668 + 227.8
 = 1951mm x 1.4668 + 227.8mm
 = 2861mm + 227.8mm
 = 3089mm (121.61in)

(B) = distance from screen center to floor
 = 1789mm (70.79in)

(A) = 3089mm (121.61in)

(B) = 1789mm (70.79in)

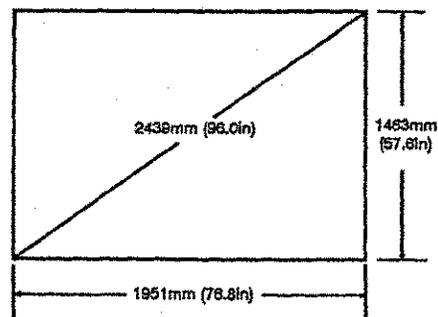
(C) = 705mm (27.78in)

(D) = 966mm (38.0in)

(C) = Screen width(mm) x .312 + 97.066mm
 = 1951mm x .312 + 97.066mm
 = 608mm + 97.066mm
 = 705mm (27.78in)

(D) = B - C - 127mm
 = 1798mm - 705mm - 127mm
 = 1093mm - 127mm
 = 966mm (38.0in)

SCREEN DIMENSIONS



5.9.6 EXAMPLE 4: FRONT/CEILING INSTALLATION

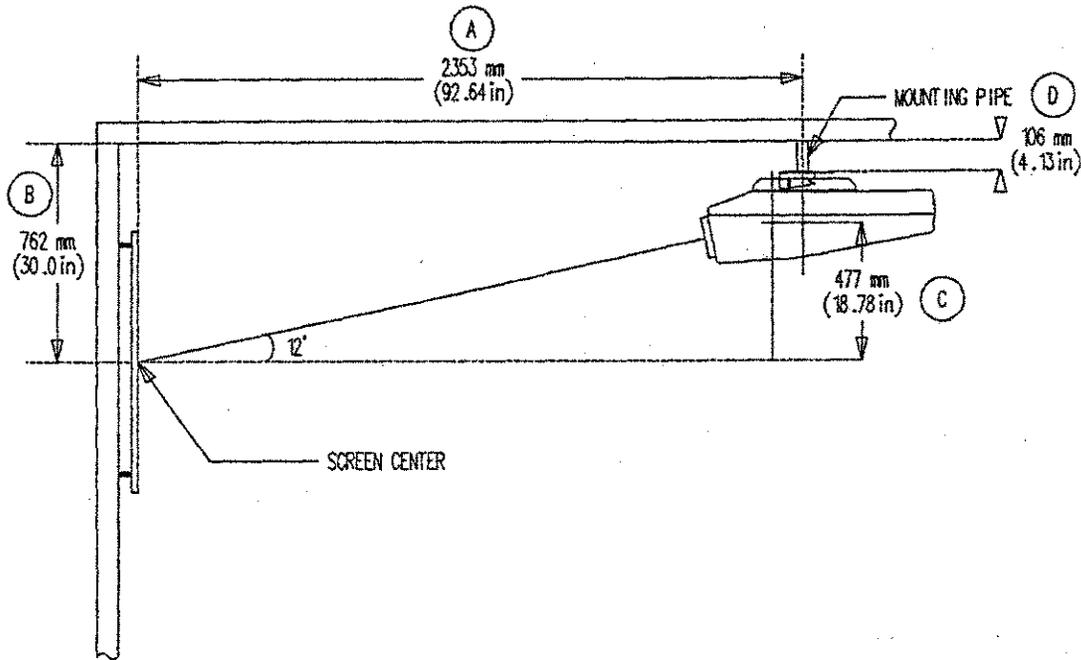


FIGURE 5-14. EXAMPLE 4, FRONT/CEILING MOUNT.

5.9.6.1 CALCULATIONS:

(A) = screen width(mm) x 1.4668 + 566mm
 = 1219mm x 1.4668 + 566mm
 = 1788mm + 566mm
 = 2353mm (92.64in)

(C) = Screen width(mm) x .312 + 97.066mm
 = 1219mm x .312 + 97.066mm
 = 380mm + 97.066mm
 = 477mm (18.78in)

(B) = distance from screen center to ceiling
 = 762mm (30.0in)

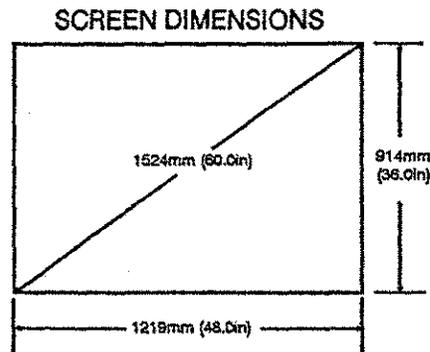
(D) = B - C - 179mm
 = 762mm - 477mm - 179mm
 = 285mm - 179mm
 = 106mm (4.13in)

(A) = 2353 (92.64in)

(B) = 762mm (30.0in)

(C) = 477mm (18.78in)

(D) = 106mm (4.13in)

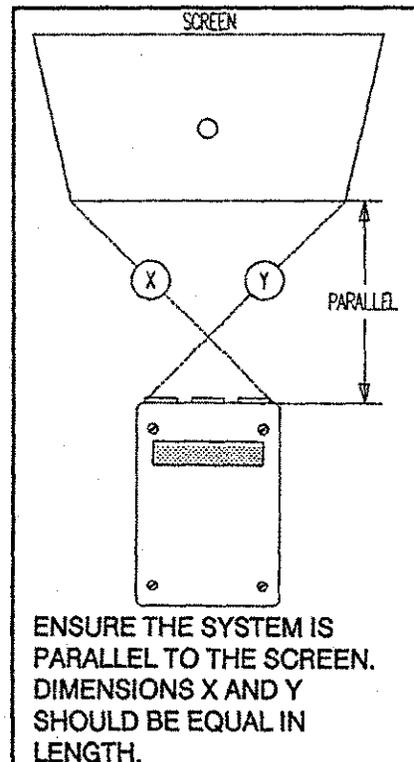
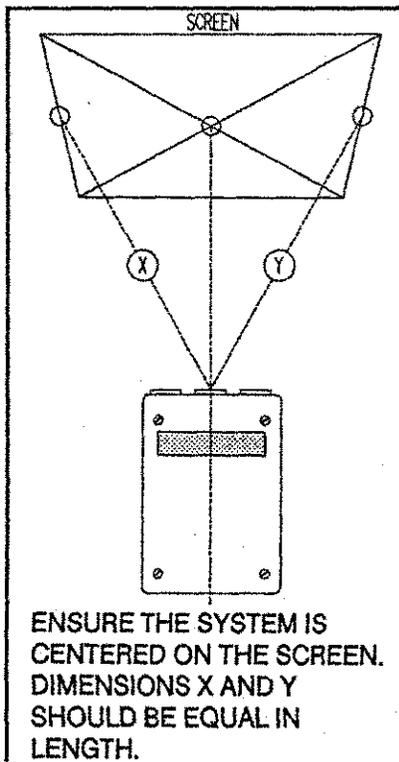
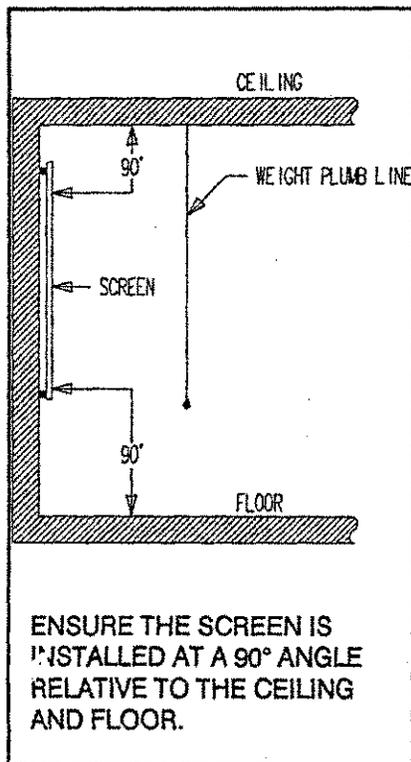


5.9.7 MOUNTING DISTANCE TABLE 5-2:

IMAGE SIZE			*MOUNTING DISTANCE	
Millimeter (Inches)			Millimeter (Inches)	
DIAGONAL	WIDTH	HEIGHT	FLOOR	CEILING
1524 (60.0)	1219 (48.0)	914 (36.0)	2016 (79.4)	2345 (92.7)
1829 (72.0)	1463 (57.6)	1098 (43.1)	2372 (93.9)	2712 (106.8)
2439 (96.0)	1951 (76.8)	1463 (57.6)	3089 (121.6)	3428 (135.0)
3048 (120.0)	2438 (96.0)	1829 (72.0)	3804 (149.8)	4142 (163.0)
3658 (144.0)	2927 (115.2)	2195 (86.4)	4521 (178.0)	4859 (191.3)
4572 (180.0)	3658 (144.0)	2743 (108.0)	5593 (220.2)	5932 (233.5)
6401 (252.0)	5121 (201.7)	3841 (151.2)	7739 (304.7)	8077 (318.0)
7620 (300.0)	6096 (240.0)	4572 (180.0)	9169 (361.0)	9508 (374.3)

* The mounting distance is based on aspect ratio of 4:3, an optimum 12° off-axis projection and using the NTSC video information to optimize the picture size using either 6 or 8-element lenses.

5.10 SYSTEM POSITIONING:



Chapter 6

REAR PANEL CONNECTIONS

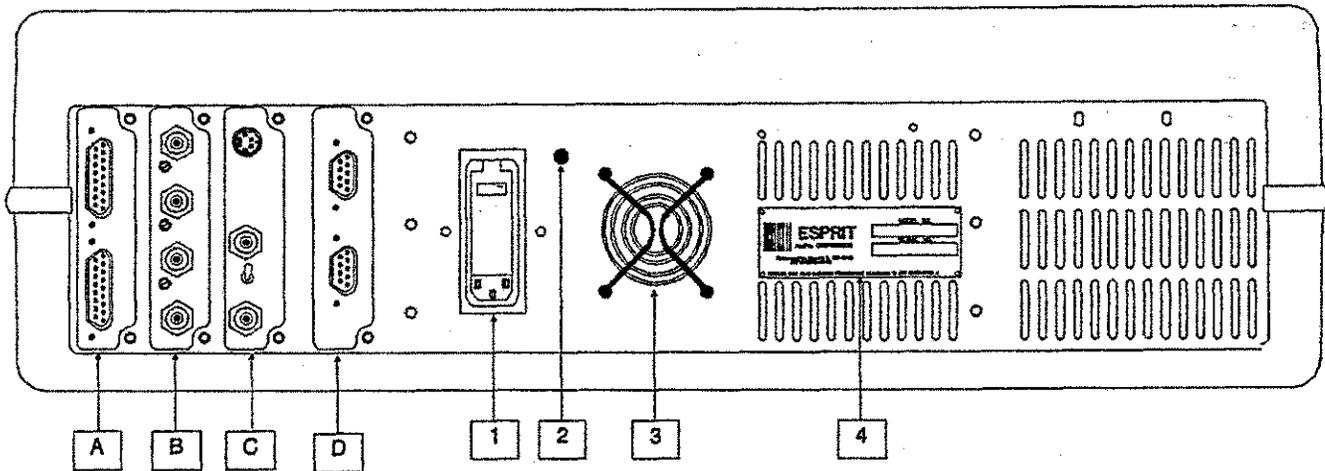
6.1 GENERAL:

This section of the manual will familiarize you with the connections, controls and parameters available for operation of your system. It should be all you need to operate your system once it has been installed and set up (focused and registered).

The way in which your system operates will, in some ways, depend on the application. This means, for instance, that a system installed with direct signal inputs will not operate exactly the same as a system with a special options such as an RGB/VIDEO Switcher. If your installation has special options, refer to the technical data furnished with the options for additional information.

6.2 REAR PANEL DESCRIPTION:

The rear panel of the system is where all connectors are located. Also located on the rear panel are several other devices, such as, the power rocker switch and access to the main power fuse and voltage select barrel , etc. Refer to figure 6-1.



SLOT	STANDARD MODULE	OPTIONAL MODULE	ITEM	DESCRIPTION
A	CPU MODULE	NONE	1	AC LINE FILTER / MAIN FUSE
B	ANALOG RGB1	NONE	2	RUNNING INDICATOR (LED)
C	VERTICAL DRIVE INPUT PANEL	QUAD VIDEO DECODER	3	REAR FAN
D	INTERNAL TEST/TEXT INTERFACE	ANALOG RGB2 OR TTL/VGA	4	SERIAL NUMBER PLATE

FIGURE 6-1. REAR PANEL ILLUSTRATION / CONFIGURATION.

6.3 INPUT SIGNALS:

6.3.1 CPU MODULE (SLOT A):

Located on the CPU module are the remote control MASTER input and SLAVE output. The SLAVE output is utilized for networking, i.e., to control more than one ESPRIT system with one host unit. Refer to Chapter 10 for RS232 interface data.

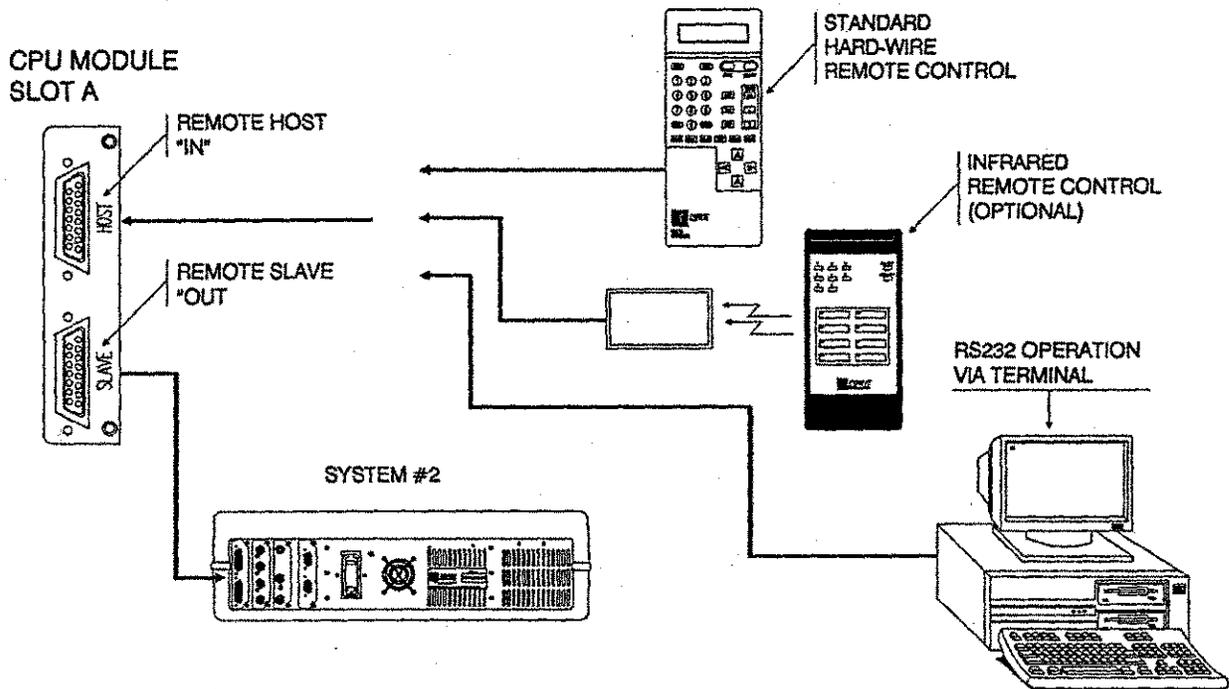


FIGURE 6-2.

6.3.2 RGB1 MODULE / RGB ANALOG INPUT (SLOT B):

The Analog RGB1 input falls into three major categories, three-wire, four-wire and five-wire. The ESPRIT Display System will automatically configure itself properly if the input signals are applied to the proper connectors. An optional Analog RGB2 module is available and can be installed into SLOT D. The second Analog RGB inputs can only be used with three or four-wire RGB sources. Refer to Chapter 7 to access the RGB and optional RGB sources.

SPECIFICATIONS ANALOG RGB VIDEO AND SYNC INPUTS	
• RED, GREEN, BLUE:	RS170 COMPATIBLE: 0.7Vp-p ~ 5Vp-p / 75 OHM
• SYNC:	COMPOSITE HORIZONTAL & VERTICAL, SEPERATE HORIZONTAL AND VERTICAL, OR SYNC ON GREEN: 0.3Vp-p ~ TTL LEVELS / 75 OHM
•	AUTOMATIC SYNC POLARITY SELECT.
•	SELECTABLE SYNC TIP OR BACK PORCH CLAMPING.

6.3.2.1 THREE WIRE RGB:

For three-wire RGB, the signals are Red video, Green video (with Composite Sync), and Blue video. These signals would be applied to the Red, Green and Blue connectors, respectively. Refer to figure 6-3.

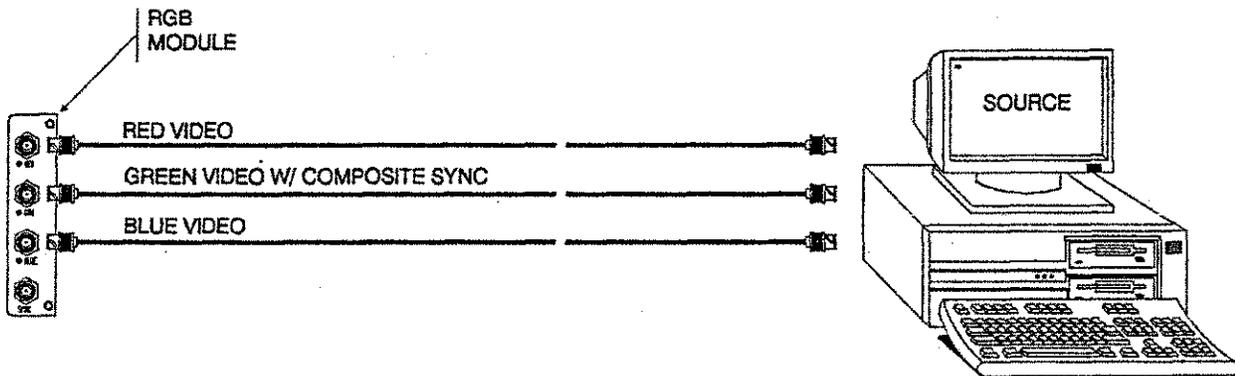


FIGURE 6-3.

NOTE: Ensure that there is no active signal connected to the fourth SYNC BNC connector on the RGB Module and the VERTICAL DRIVE BNC connector on the Quad Video Module (SLOT C) while in this mode of operation. Maintain an equal length for each cable used to avoid an imbalance in the signals.

6.3.2.2 FOUR WIRE RGB:

For four-wire RGB, the signals are Red video, Green video, Blue video and Composite Sync. These signals would be connected to the Red, Green, Blue and Sync BNC connectors, respectively. Refer to figure 6-4.

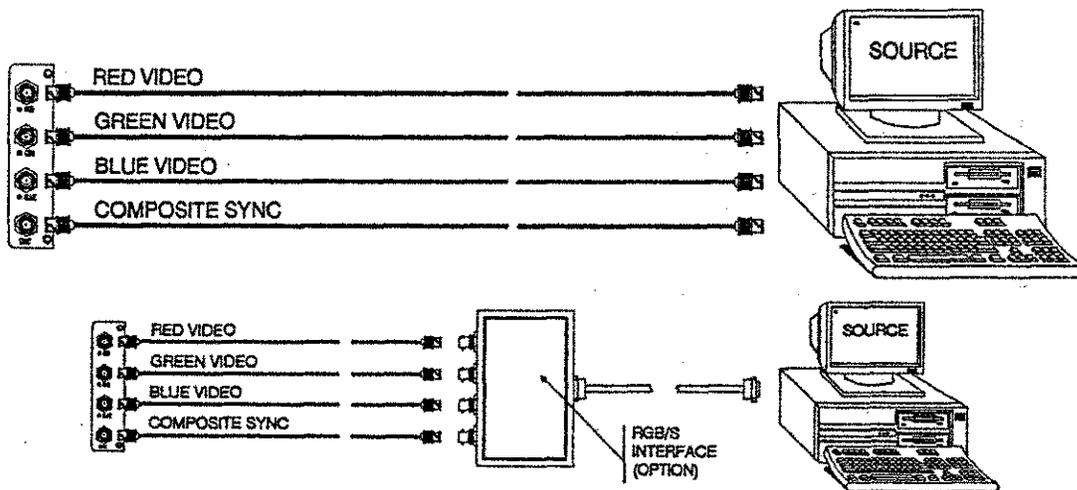


FIGURE 6-4.

NOTE: Ensure that there is no active signal connected to the VERTICAL DRIVE BNC connector on the Quad Video Module (SLOT C) while in this mode of operation and maintain equal lengths for each cable used.

6.3.2.3 FIVE WIRE RGB:

For five -wire RGB, the signals are Red video, Green video, Blue video, Horizontal Sync and VERTICAL sync. These signals would be connected to the Red, Green, Blue, Sync and Vertical Drive, respectively. Refer to figure 6-5.

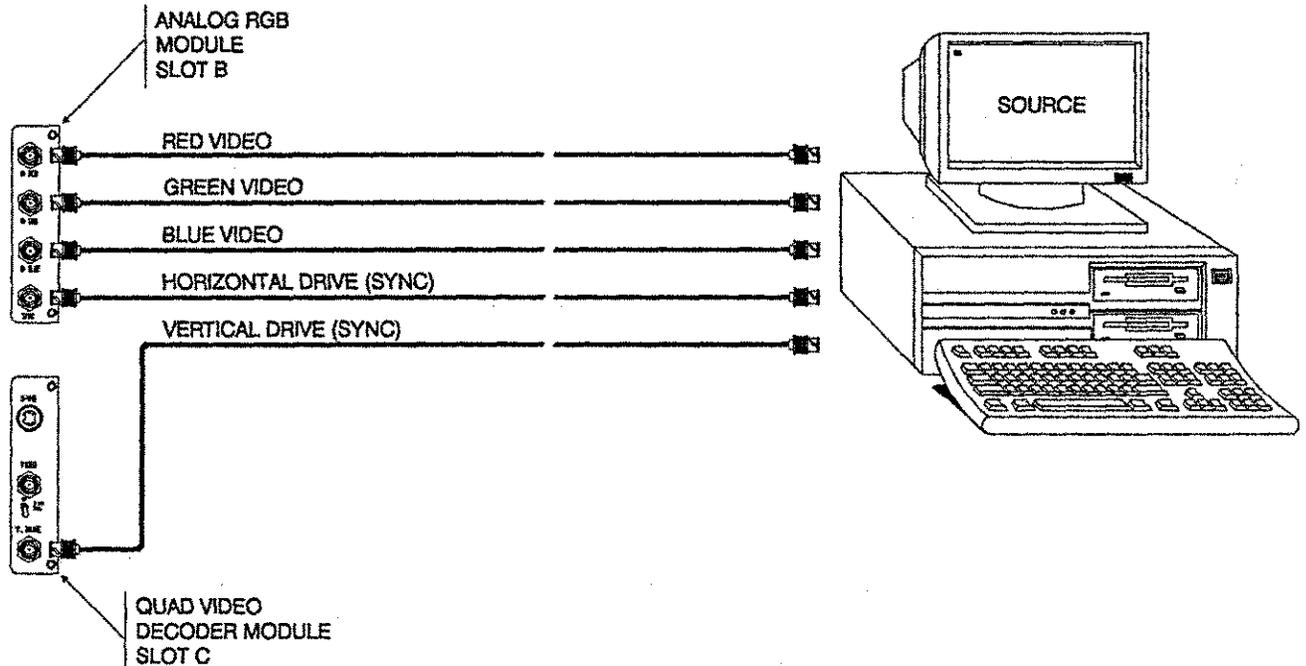


FIGURE 6-5.

The operator controls that affect the ANALOG RGB1 and RGB2 images via the remote control are brightness, contrast controls, red, green and blue registration and phasing, and the R, G, and B gain controls (below their respective BNC connectors) on the RGB1 and RGB2, Modules.

6.3.2.4 RGB LEVEL ADJUSTMENTS:

The level controls are provided to attenuate any signal level above 1Vp-p, and are factory set for unity drive 1 "in" / 1 "out". To adjust the controls, enter the desired RGB mode (RGB1 and/or RGB2) and display a full page of white text ("X's"). Set the brightness and contrast via the remote control to the desired level. Adjust the Red, Green and Blue gain controls as high as possible without causing de-focusing of the image while obtaining the desired grayscale. Refer to figure 6-6 for the control locations.

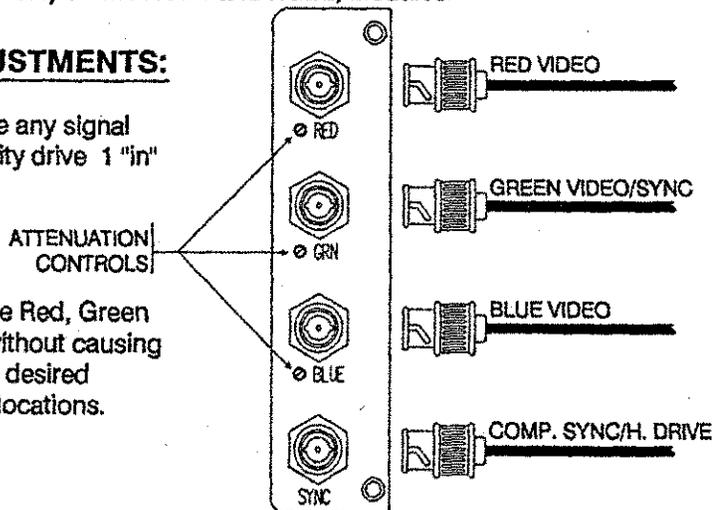


FIGURE 6-6. RGB1 AND RGB2 VIDEO LEVEL ADJUSTMENTS.

6.3.3 VIDEO MODULE (OPTIONAL) (SLOT C):

6.3.3.1 INPUT 1: S-VHS INPUT:

The S-VIDEO/S-VHS input utilizes a mini "D" 4 pin connector which is the standard for this input. The connector and plug are keyed to ensure proper connection. The switching between the S-Video/S-VHS and the composite video input is accomplished by the remote control. Refer to figure 6-7 for the pin-out /description for the female (rear panel) S-Video connector and figure 6-8 for location.

PIN NO.	DESCRIPTION
1	GROUND
2	GROUND
3	"Y" SIGNAL 1Vp-p
4	"C" SIGNAL 0.285Vp-p

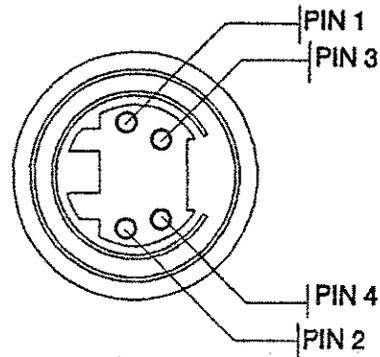


FIGURE 6-7.

S-VHS CONNECTOR PIN-OUT.

6.3.3.2 INPUT 2: COMPOSITE VIDEO INPUT:

The composite video input will automatically decode any of the quad standards. The four standards are NTSC 3.58, NTSC 4.43, PAL and SECAM. The automatic selection process may be overridden via the remote control by pressing the appropriate numeric key followed by the B button. Refer to Chapter 7.

The composite video input is a standard BNC connector with loop through capability. To loop a signal through the system, install a BNC "T" connector to the Video "IN" BNC, switch the termination switch located beneath the Video "IN" BNC from "IN" (down) to "OUT" (up) and connect to any 75 Ω terminated load. If the loop through is not being used, the termination switch must remain in the "IN" position or loss of the picture quality will occur. Refer to figure 6-8.

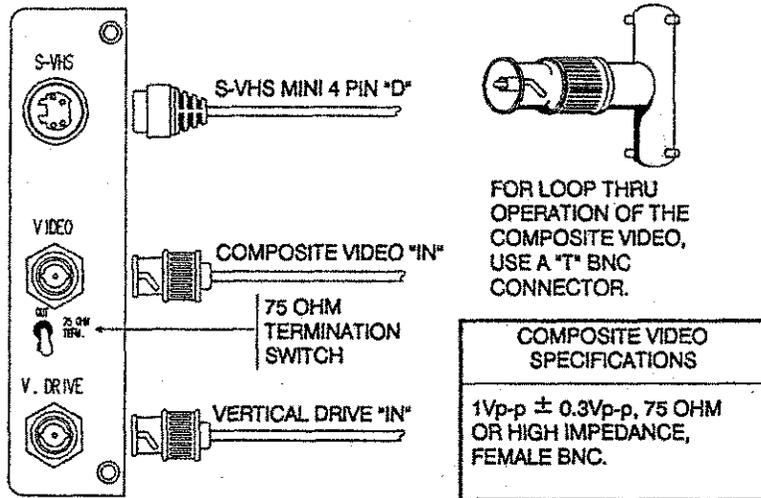


FIGURE 6-8.

S-VHS, COMPOSITE VIDEO AND VERTICAL DRIVE INPUT CONNECTORS.

6.3.3.3 VERTICAL DRIVE INPUT:

This connector is used with an RGB analog input in Slot B that requires a separate vertical sync input (i.e., five - wire RGB). Refer to figure 6-8 for location information. If the Quad Video/S-VHS module is not being utilized, a module with the VERTICAL DRIVE input (only) is provided.

6.3.4 SLOT D:

6.3.4.1 TEST/TEXT INTERFACE MODULE (STANDARD):

The standard module located in the SLOT D position for the ESPRIT system is the TEST/TEXT Interface module. This module provides interfacing from the signals generated from the internal test generator and the the internal Help System to the RGB1 module. This module may be substituted with the TTL/VGA module (section 6.3.4.2) or the Analog RGB2 module at any time without losing the Test/Text interfacing capabilities.

6.3.4.2TTL/VGA MODULE (OPTIONAL):

The inputs for the TTL/VGA module include a 9 pin "D" connector for the CGA/VGA inputs and a 15 pin "high density" connector for the VGA input. The VGA input may be used with any IBM® (VGA) or compatible. The TTL input automatically configures to accept either CGA or EGA, with VGA being selected via the remote control. Pin-out information for the back panel connection are provided below. Refer to figure 6-9 Please refer to Chapter 7, page 7-9 to access the TTL/VGA mode of operation.

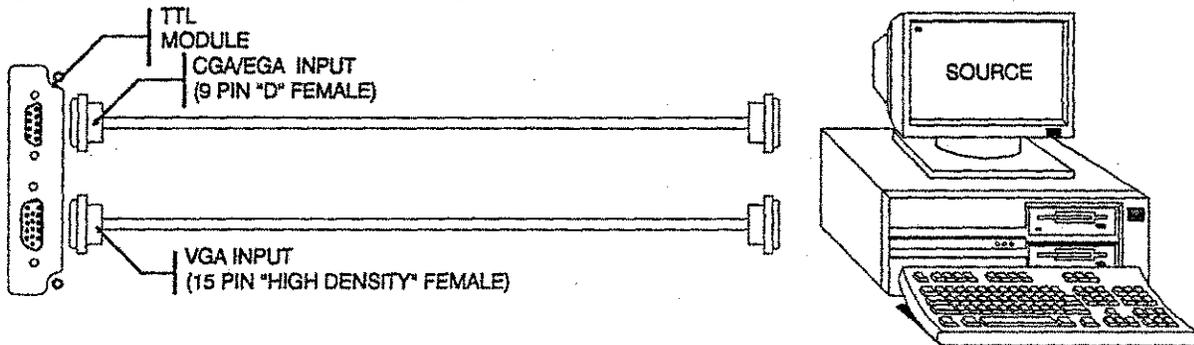
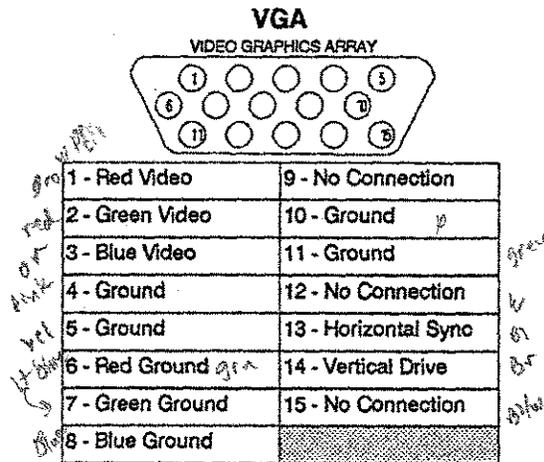
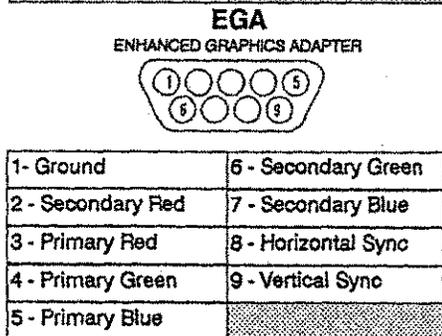
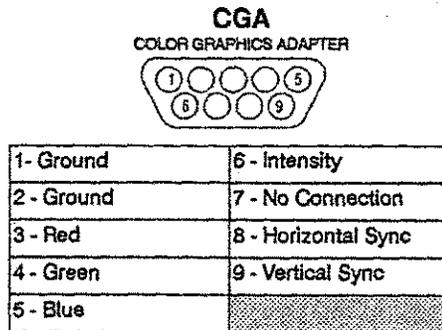


FIGURE 6-9. TTL/VGA MODULE CONNECTIONS.

6.3.4.2.1 . . .CGA/EGA/VGA PIN CONFIGURATIONS:



Chapter 7

REMOTE CONTROL FUNCTIONS

7.1THE REMOTE CONTROL:

This Chapter will familiarize you with the remote control operation and the many features that are available. Please read completely so to avoid any confusion on how the digital remote control operates.

The ESPRIT Hard-Wired Remote Control unit incorporates a 16 X 2 LCD readout which indicates the operation and diagnostic status of the system. The hard wired remote comes standard with a cable length of 25 ft. (7.6 m), which can be extended in increments of 50 ft. (15.2 m) or 100 ft. (30.5 m).

An optional Infrared EXECUTIVE REMOTE, with ON/OFF/, STANDBY and 8 Channel select, is available. Refer to APPENDIX B.

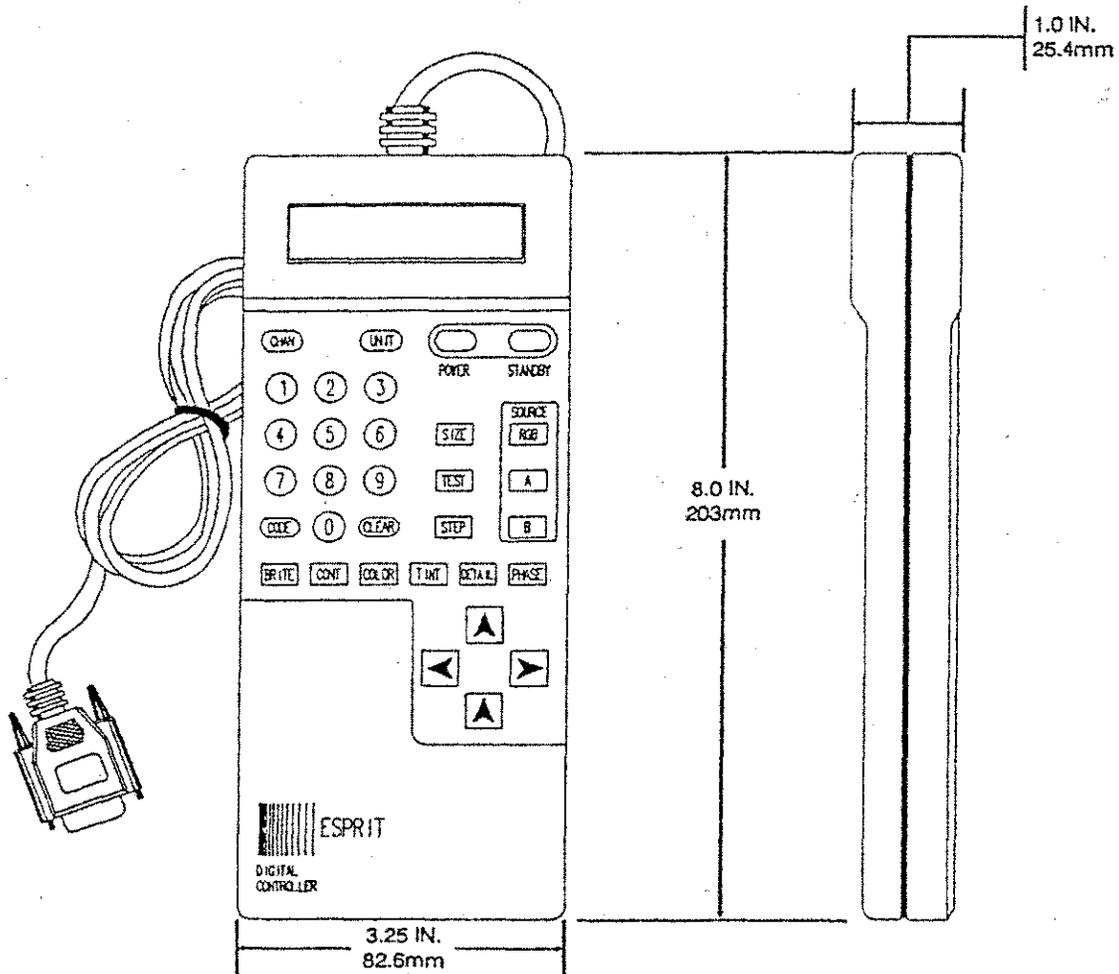


Figure 7-1. Hard-wired Remote Control dimensions.

FOLD OUT TO VIEW THE REMOTE CONTROL KEYPAD DIAGRAM,
KEYPAD SUMMARY AND INDEX.



7.1.1REMOTE CONTROL KEYPAD DIAGRAM:

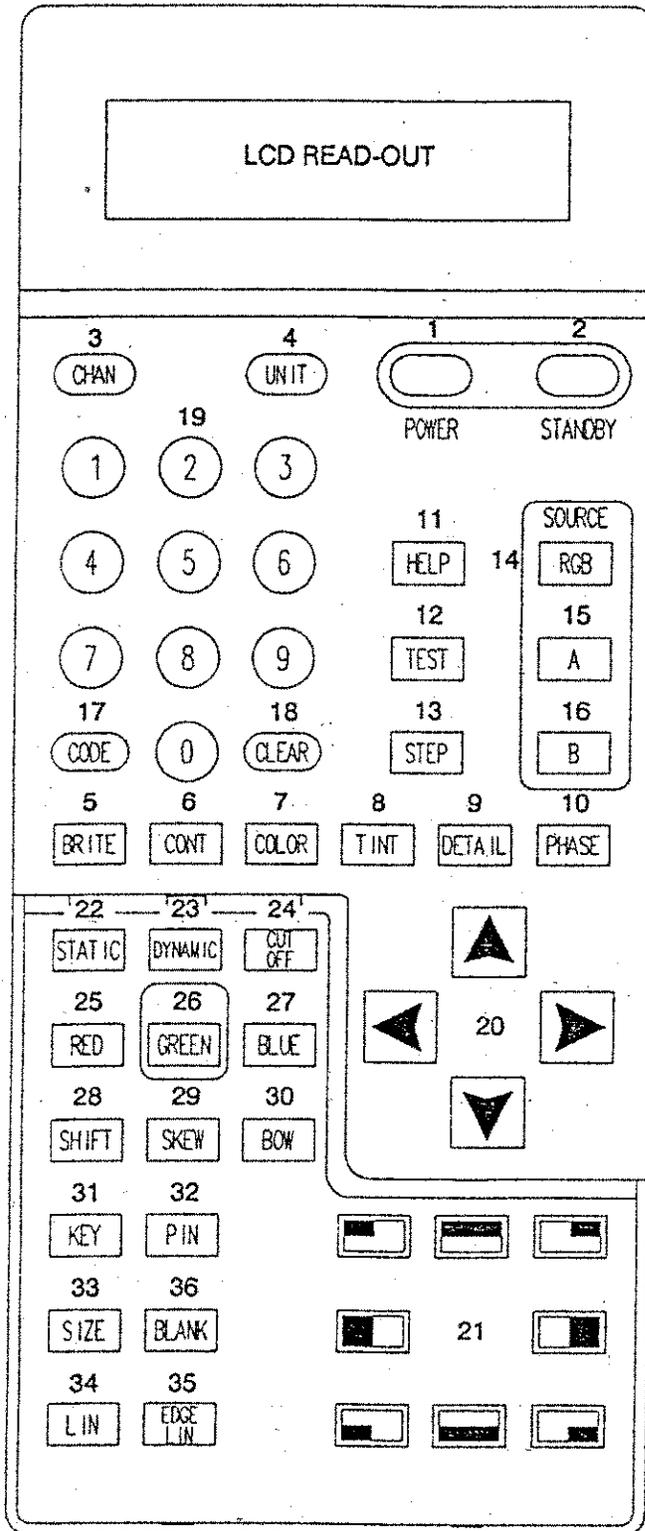


Figure 7-2. Remote Control Keypad diagram.

(ACTUAL SIZE SHOWN)

7.1.2KEYPAD SUMMARY/INDEX:

CONTROL	DESCRIPTION	PAGE	CONTROL	DESCRIPTION	PAGE
1. POWER	Toggles power ON/OFF	7-5	19. NUMERIC KEYPAD	Used in establishing channel / unit numbers and Percentage setting of image controls.	7-15
2. STANDBY	Toggles Stand-by ON/OFF.	7-5	20. ARROW KEYS	Used to adjust image and Registration Settings.	7-15
3. CHANNEL	Inputs channel number.	7-5	21. QUADRANTS / EDGES	Selects desired adjustment area of registration.	7-16
4. UNIT	Inputs unit number.	7-6	22. STATIC	Selects static registration operation.	7-16
5. BRITE	Selects brightness control.	7-6	23. DYNAMIC	Selects dynamic registration operation.	7-16
6. CONT	Selects contrast control.	7-6	24. CUTOFF	Toggles selected color ON/OFF.	7-17
7. COLOR	Selects color control.	7-6	25. RED	Enables red only functions.	7-16
8. TINT	Selects hue control.	7-6	26. GREEN	Enables MASTER functions.	7-17
9. DETAIL	Selects sharpness control.	7-6	27. BLUE	Enables blue only functions.	7-17
10. PHASE	Selects phase control.	7-7	28. SHIFT	Selects shift functions.	7-18
11. HELP	Selects help mode.	7-8	29. SKEW	Selects skew functions.	7-18
12. TEST	Toggles into test mode.	7-8	30. BOW	Selects bow functions	7-19
13. STEP	Advances test patterns.	7-9	31. KEY	Selects keystone functions.	7-19
14. RGB	Selects RGB mode. Selects 62.5 - kHz test frequency.	7-9	32. PIN	Selects pincushion functions.	7-20
15. A	Selects CGA/EGA/VGA mode (opt.) or 2nd analog RGB source (opt.) Selects 31kHz. test frequency.	7-9	33. SIZE	Selects H & V size.	7-21
16. B	Selects video mode (opt.)Selects 15kHz. internal test frequency.	7-10	34. LIN	Selects linearity functions.	7-22
17. CODE	Inputs code assignments.	7-11	35. EDGELIN	Selects edge linearity functions.	7-23
18. CLEAR	Removes an incorrect entry.	7-15	36. BLANK	Selects blanking functions.	7-23

Table 7-1.

Standard Remote Control Summary and Index.

7.2 REMOTE CONTROL FUNCTIONS

1. POWER BUTTON:

FUNCTION: Toggles projector "ON" and "OFF."

LCD: MODEL NUMBER

LCD: MODE OF OPERATION

- OPERATION 1: Once the system has been installed and the main rocker switch on the rear panel is "ON", you are ready for system turn "ON." The  button toggles the projector "ON" and "OFF." In the "OFF" mode with the main rocker switch "ON," the LCD will display the Model number of the projector. When the  button is pressed the system will turn "ON" and the display will indicate the last mode of operation that the system was in when it was de-energized.

2. STANDBY BUTTON:

FUNCTION: Toggles image "ON" and "OFF."

LCD: STANDBY MODE

LCD: MODE OF OPERATION

- OPERATION 1: The system provides the user with the capability of removing the projected image from the screen without changing any of the image settings or cooling down the system. The operator need only to press the  button on the remote control to remove the image. The image is restored to the screen by pressing the  key a second time.

3. CHANNEL BUTTON:

FUNCTION: Selects channel number. See Codes page 7-11 to write protect a channel.

LCD: MODE OF OPERATION : CHANNEL NUMBER:

- OPERATION 1: The  button is provided to automatically store preset image/registration-settings for Video, Analog RGB and TTL RGB. The projector has a capability of storing/recalling a total of 50 different channel settings.
- OPERATION 2: To store data such as brightness, contrast, phasing, blanking, height, width, mode of operation, and ALL Registration Settings for a dedicated channel location, select a channel number and set the parameters for the particular source. All settings will have been automatically stored. Refer to example below.
 - STEP 1. Select number  then  . LCD will display channel # being built.
 - STEP 2. Set the following: brightness, contrast, phasing, blanking, height, width, mode of operation all registration settings and the master shift operation. To recall a channel repeat Step 1.
 - Continue with Steps 1 and 2 to preset other sources into other channels.
- OPERATION 3: To determine a particular channel number for an active source, press the  button. LCD: CHANNEL #

4. UNIT BUTTON:

FUNCTION: Assign/select one or multiple projector operation.

OPERATION 1: In this mode of operation, up to 256 projectors may be networked together and controlled via either the hard-wired remote control or a computer keyboard. Perform the following to select an individual unit in a multiple system operation.

- STEP 1. Select unit's number "N", where "N" equals desired unit number.
- STEP 2. Press the  button.

LCD: UNIT "N" ACTIVE

NOTE 1: It is not required to perform steps 1 and 2 for a single unit configuration. Refer to Chapter 11 for more information on the RS232 operation.

NOTE 2: It is possible to address all the projectors at the same time by entering number 256 on the numeric keypad then pressing  on the remote keypad. This global command will remain in effect until one of the projectors is individually selected.

LCD: GLOBAL LISTEN

NOTE 3: Refer to Chapter 11 for multiple system interconnection/operation, ASCII commands, setting baud rate and address switches of multiple systems.

5-10. IMAGE QUALITY ADJUSTMENTS:

FUNCTION: Control image quality

LCD: SELECTED FUNCTION: HI, LO OR PERCENTAGE NUMBER SELECTED

OPERATION 1: There are six buttons across the center of the remote control that control image quality and may be stored within a *Channel*. The six buttons are described below.

- 5.  (BRIGHTNESS): Operates when in Video, Analog RGB modes, TTL modes, HELP mode and TEST modes. Adjust the brightness level until the black portions of a projected image are black, but detail in shaded areas is not lost.
- 6.  (CONTRAST): Operates when in Video, analog RGB, TTL modes, HELP mode and TEST modes. The contrast button will change the amount of image intensity. If image defocusing or loss of detail occurs, decrease either contrast or brightness or both.
- 7.  Operates when in Video only. The color button controls the color intensity of the video image. If the image appears TOO PALE or weak, increase the color level, and if the image appears FLUSHED or TOO BRIGHT, decrease the color level.
- 8.  Operates when in NTSC video modes only. The tint button controls the hue of the video image. If facial tones or objects appear TOO GREEN, increase the tint setting. If facial tones appear TOO PURPLE, decrease the tint level.
- 9.  Operates when in Video only. The detail button controls the sharpness of the picture in the video modes only. If the image appears soft, increase the detail. If the image appears grainy, decrease the detail setting. The desired setting of detail is as high as allowed without the image appearing grainy.

- 10. **PHASE** One problem frequently encountered is improper horizontal and vertical framing of the projected image on the raster. This is seen as characters lost on either the right, left and/or top, bottom edge of the image due to variations in phasing in computers. The ESPRIT system via the remote control allows the image to moved either left or right, up or down to correct for this variation.

ADJUSTING IMAGE SETTINGS:

There are two ways of setting the image controls;

The first method is by selecting a percentage of the desired level (i.e. 75%) within the range of 0 to 100%.

NOTE: Due to limitations, rounding of the actual entry may occur, i.e. 75% = 74%.

PERCENTAGE SETTING:

- STEP 1. Select function, e.g. ; **BRITE** on the remote control.
- STEP 2. Select a percentage, e.g. ; **7** **5** on the numeric keypad.
- STEP 3. Re-select function, e.g. ; **BRITE** on the remote control.

LCD: BRIGHT LEVEL = 75%

NOTE: STEP 1 is only required to determine the present setting of the function.

The second method of setting the desired level, is by increasing the setting using the arrow keys,

ARROWS KEYS: **▲** **▼**

- STEP 1. Select function, e.g. ; **BRITE** on the remote control.
- STEP 2. Use the up **▲** arrow key to increase level (increment) and the down **▼** arrow key to decrease level (decrement).

LCD: BRIGHT LEVEL = MAX



LCD: BRIGHT LEVEL = MIN

11. HELP BUTTON: **HELP**

FUNCTION: Enters the HELP program at main menu page.

LCD: SELECT SUBJECT

- OPERATION 1: Enters internal help mode at the main menu selections.
- OPERATION 2: Entering selection number of main menu will advance to the first page of the selected subject. Use **◀** and **▶** arrows to turn the pages, **▲** arrow to bring you back to the index page, and the **▼** arrow to exit the HELP mode. These are shown on the help screens for reference.
- NOTE 1: Image Quality adjustments cannot be entered while a MENU is on screen. Once a MENU is active and the LCD displays [SELECT SUBJECT], you may only select a subject or exit.
- NOTE 2: If while in the help mode and other than a menu is being displayed, and one of the image quality buttons is pressed, e.g. **BRITE**, then the arrow keys are reassigned to that function.

LCD: BRIGHT LEVEL = %

You may now use the up **▲** and down **▼** arrows to adjust the brightness level.

- NOTE: Upon completion of making image quality adjustments, the **CLEAR** button must be pressed to allow the arrow keys to resume the functionality in the help mode.

LCD: HELP MODE

12. TEST BUTTON: **TEST**

FUNCTION: Toggles into last selected test mode of operation.

LCD: FREQUENCY:PATTERN:TEST or EXT S: PATTERN: TEST

- NOTE 1: Image Quality adjustments (except phasing) may be adjusted while in the TEST mode of operation.
- OPERATION 1: While in the TEST mode of operation, pressing one of the following will
 - STEP** Cycles through the available test patterns. Available test patterns; (1), Crosshatch 1 (dense-crosshatch), (2) Crosshatch 2 (normal), (3) Crosshair, or (4) Dots.
 - B** OR **1** **TEST** selects 15kHz internal test frequency of operation.
 - A** OR **2** **TEST** selects 31.25kHz internal test frequency of operation.
 - RGB** OR **3** **TEST** selects 62.5kHz internal test frequency of operation.
 - 4** **TEST** selects internal test pattern operation at the operating frequency of the input that was running when TEST was selected, i.e. Video, RGB or TTL.
- OPERATION 2: While in the Guided Registration programs, **TEST** will revert to the previous alignment step

13. STEP BUTTON: 

FUNCTION: Advances sequence of events.

- Operation 1: In the TEST mode,  will sequence to next available test pattern.
- Operation 2: In the Guided Registration programs,  will advance to next step of alignment.

14. RGB BUTTON: 

FUNCTION: Enter the Analog RGB1 mode of operation.

LCD: RGB MODE

- OPERATION 1: In the HELP mode, pressing the  button will exit to the RGB mode.
- OPERATION 2: In the TEST mode, pressing the  button will select the 62.5kHz internal test frequency of operation.

15. A BUTTON: (OPTIONAL INPUT(S)): 

FUNCTION: Enters the last mode of operation used, i.e. TTL (CGA/EGA)/ VGA or RGB2 analog mode of operation.

LCD: TTL MODE

OR

LCD: RGB2 MODE

- OPERATION 1: With the 2nd analog RGB option installed: Pressing  will select this mode of operation.
- OPERATION 2: With the TTL option installed follow Steps 1 and 2 for proper source selection.
 - STEP 1: Press  then  for CGA/EGA mode of operation.
 - STEP 2: Press  then  for VGA mode of operation.
- OPERATION 3: In the TEST mode: Pressing  selects the 31.25 kHz. internal test frequency of operation.
- OPERATION 4: If in the HELP mode: Pressing  will exit to the TTL or 2nd analog RGB mode of operation. If either of the two options are not installed, the system will display error message: [NOT INSTALLED.]

16. B BUTTON: (OPTIONAL INPUT): B

FUNCTION: Enters video mode of operation (last mode used.)

LCD: LAST VIDEO MODE USED

- OPERATION 1: While in the TEST mode, pressing B will select the 15.625kHz internal test pattern frequency of operation.
- OPERATION 2: When in the HELP mode pressing B will exit to the VIDEO mode.
- OPERATION 3: With the Video Module option installed and using the numeric keypad, depress [#], then B to manually select the various video formats and operations.

PRESS	ACTION / LCD DISPLAY
1 then B	QUAD AUTO MODE (Composite Video)
2 then B	PAL MODE (Composite Video)
3 then B	SECAM MODE (Composite Video)
4 then B	NTSC 4.43 MODE (Composite Video)
5 then B	NTSC 3.58 MODE (Composite Video)
6 then B	S-VIDEO QUAD AUTO MODE
7 then B	S-VIDEO PAL MODE
8 then B	S-VIDEO SECAM MODE
9 then B	S-VIDEO NTSC 4.43 MODE
10 then B	S-VIDEO NTSC 3.58 MODE

TABLE 7-1

ENTERING AND SELECTION OF THE VARIOUS VIDEO FORMATS.

17. CODE BUTTON

FUNCTION: Activates the System's special internal commands.

LCD: Refer to tables 3A, 3B, 3C, 3D

OPERATION: 1: Use the numeric keypad to enter the desired command, then press the CODE button to activate the command. **NOTE:** The LCD read-out will prompt you to enter setting, ACC= "N", (where "N" refers to the corresponding entry listed in the following tables).

CODE	FUNCTION	LCD READ-OUT / OPERATION
10	DISPLAY TIME OF DAY	00:00 / 24 HOUR CLOCK FORMAT
11	SET TIME OF DAY	ENTER TIME / H:M (HOUR:MIN.)
12*	ENABLE TIMER OPERATION	TIMER ENABLED / AUTO "ON" ENABLED
13	DISABLE OPERATION	TIMER DISABLED / AUTO "OFF" DISABLED
14	DISPLAY TIMER "ON" TIME	TIME 00:00 / AUTO "ON" TIME
15	SET TIMER "ON" TIME	00:00 / SET AUTO "ON" TIME (DAILY)
16	DISPLAY TIMER "OFF" TIME	TIME 00:00 / AUTO "OFF" TIME
17	SET TIMER "OFF" TIME	00:00 / SET AUTO "OFF" TIME (DAILY)
20	CHANNEL WRITE PROTECT (TOGGLE OPERATION)	CHANNEL WRITE PROTECT ON/OFF / PROTECTS A CHANNEL FROM ACCIDENTAL CHANGES OF PRESET ADJUSTMENTS
21	COPY "BEST-FIT" CHANNEL	COPY IN PROGRESS / AUTOMATICALLY SEARCHES AND RETRIEVES THE CLOSEST CHANNEL SETTINGS FOR THIS PARTICULAR SOURCE INTO THE ACTIVE CHANNEL (INCLUDES MODE OF OPERATION AND ALL IMAGE QUALITY AND REGISTRATION ADJUSTMENTS)
22	COPY CHANNEL TO COMMAND	COPY CHANNEL TO (ENTER 1 - 50) / COPIES THE ACTIVE CHANNEL SETTINGS TO THE DESIRED CHANNEL LOCATION
23	COPY CHANNEL FROM COMMAND	COPY CHANNEL FROM (ENTER 1 - 50) / COPIES CHANNEL SETTINGS FROM THE SELECTED CHANNEL TO THE ACTIVE CHANNEL

TABLE 7-3A. CODE COMMANDS 10 - 23.

CODE	FUNCTION	LCD READ-OUT / OPERATION
24	VALIDATE CHANNEL FREQUENCY	<p>FREQ VALIDATED/ THIS COMMAND IS USED TO CONFIRM THAT A CHANNEL HAS BEEN SET AND ADJUSTED. ONCE VALIDATED, THE CHANNEL MAY BE USED WITH THE BEST FIT COMMAND.</p> <p>IF A CHANNEL HAS NOT BEEN VALIDATED, IT CAN NOT BE USED WITH THE "BEST-FIT" COMMAND</p> <p>NOTE: 24 CODE ADDITIONALLY ACTIVATES THE CHANNEL WRITE-PROTECT COMMAND</p>
25	DISPLAY CHANNEL FREQUENCY	<p>DISPLAYS THE FREQUENCY VALIDATED (STORED) WITHIN THE SELECTED CHANNEL LOCATION. NOTE: IF THE CHANNEL HAS NOT BEEN VALIDATED USING 24 CODE A "NOT VALIDATED" MESSAGE WILL APPEAR ON THE LCD</p>
26	DISPLAY "BEST-FIT" CHANNEL	<p>DISPLAYS THE CHANNEL THAT CONTAINS THE CLOSEST SETTINGS FOR THE PRESENTLY ACTIVE CHANNEL</p>
27	CHANNEL AUTO-SEARCH MODE OF OPERATION (TOGGLE OPERATION)	<p>AUTO SEARCH ON / THIS COMMAND ALLOWS THE SYSTEM TO CONSTANTLY MONITOR THE INCOMING SIGNAL FOR CHANGES. IF A CHANGE IS DETECTED, SUCH AS THE FREQUENCY OF THE INCOMING SIGNAL, THE SYSTEM AUTOMATICALLY RE-CONFIGURES THE CHANNEL PARAMETERS FOR THE BEST POSSIBLE SETTINGS</p>
28	COPY CHANNEL ALL COMMAND	<p>LCD PROMPT: COPY CHAN ALL ARE YOU SURE? PRESS CODE FOR YES PRESS ANY OTHER KEY FOR NO COPIES THE PRESENTLY ACTIVE CHANNEL SETTINGS INTO ALL 50 CHANNEL LOCATIONS</p>
29	CLEAR ACTIVE CHANNEL	<p>LCD PROMPT: CLEAR CHAN ARE YOU SURE? PRESS CODE FOR YES PRESS ANY OTHER KEY FOR NO CLEARS (RESETS TO APPROXIMATELY 50%) ALL SETTINGS OF THE ACTIVE CHANNEL</p>

TABLE 7-3B. CODE COMMANDS 24 - 29.

CODE	FUNCTION	LCD READ-OUT / OPERATION
30	DISPLAY DIAGNOSTICS	ENABLE/DISABLE ERROR DIAGNOSTICS. DISPLAYS ALL APPROPRIATE ERROR MESSAGES OR SIMPLY SYSTEM OK
31	DISPLAY TOT TIME (TOTAL OPERATING TIME)	ELAPSED TOT TIME / DISPLAYS THE TOTAL ELAPSED TIME IN (DAYS : HOURS : MINUTES)
32	DISPLAY CRT TIME (TOTAL CRT OPERATING TIME)	ELAPSED CRT TIME / DISPLAYS THE TOTAL ELAPSED CRT TIME IN (DAYS : HOURS : MINUTES)
33	DISPLAY ORIENTATION	DISPLAYS THE PROJECTION MODE OF OPERATION I.E., FLOOR MOUNTED FRONT PROJECTION
34	DISPLAY BOARD STATUS	DISPLAYS THE INPUT MODULES AVAILABLE (INSTALLED)
35	DISPLAY ROM REVISION	DISPLAY THE CURRENT REVISION LEVEL OF THE OPERATING SYSTEM
36	DISPLAY FREQUENCY COUNTER	DISPLAYS THE HORIZONTAL RATE OF THE INCOMING SIGNAL OF THE ACTIVE CHANNEL
37	ENABLE EXECUTIVE MODE OF OPERATION	EXEC MODE ON / THIS COMMAND ALLOWS THE USER TO LIMIT THE ACTIVE KEYS AVAILABLE TO, POWER ON/OFF, STANDBY AND 8 CHANNEL SELECTION
38	DISPLAY HV FAILURE COUNT	DISPLAYS THE NUMBER OF TIMES HIGH VOLTAGE HAS CYCLED ON AND OFF OR MAY HAVE FAILED
40	ADJUST RVS (RED VERTICAL SHIFT-STATIC)	ACTIVATES THE RED STATIC VERTICAL SHIFT OPERATION MUST BE PERFORMED WITH REGISTRATION OFF-55 CODE
41	ADJUST BVS (BLUE VERTICAL SHIFT-STATIC)	ACTIVATES THE BLUE STATIC VERTICAL SHIFT OPERATION MUST BE PERFORMED WITH REGISTRATION OFF-55 CODE
42	ADJUST LCD BACK LIGHT	LCD PROMPT: ENTER LITE LEVEL (0 OFF / 4 MAX)
43	TEST REMOTE CONTROL	TEST/VERIFY REMOTE CONTROL LCD OPERATION
44	READ SWITCHES	READS / DISPLAY SETTINGS OF THE BAUD RATE AND ADDRESS SWITCHES
45	DISABLE REGISTRATION KEYS (SEE 46 CODE)	KEYS DISABLED / THIS COMMAND ALLOWS THE USER TO LOCK-OUT THE REGISTRATION KEYS WHICH WILL PREVENT ADJUSTMENTS FROM BEING MADE

TABLE 7-3C. CODE COMMANDS 30 - 45.

CODE	FUNCTION	LCD READ-OUT / OPERATION
46	ENABLE REGISTRATION KEYS	KEYS ENABLED / ACTIVATES KEYS PLACED INACTIVE BY 45 CODE
47	ENABLE GUIDED REGISTRATION MODE	ENTERS THE COMPLETE GUIDED REGISTRATION MODE OF OPERATION (PRESS CODE TO EXIT AT ANY TIME)
48	TOGGLE CLAMP POINT	CHANGE BLACK LEVEL CLAMP POINT. SYNC TIP OR BACK PORCH (SYSTEM DEFAULTS TO BACK PORCH CLAMPING)
49	TOGGLE MONOCHROME MODE OF OPERATION	MONOCHROME MODE OR COLOR RESTORED / ENABLES THE USER TO TURN THE COLOR LEVEL ON OR OFF
55	TOGGLE REGISTRATION ON/OFF	REGISTRATION ON OR REGISTRATION OFF / TURN REGISTRATION OFF WHEN PERFORMING THE MECHANICAL (STATIC) ALIGNMENTS AND TURN REGISTRATION ON WHEN PERFORMING THE DYNAMIC ALIGNMENT FUNCTIONS
60	ENABLE MASTER SIZE OPERATION	MASTER H SIZE OR MASTER V SIZE / ACTIVATES THE MASTER SIZE (WIDTH AND HEIGHT) FUNCTIONS
61	ENABLE TOP BLANKING	TOP BLANKING / ACTIVATES THE TOP BLANKING FUNCTION
62	ENABLE BOTTOM BLANKING	BOTTOM BLANKING / ACTIVATES THE BOTTOM BLANKING FUNCTION
63	ENABLE LEFT BLANKING	LEFT BLANKING / ACTIVATES THE LEFT BLANKING FUNCTION
64	ENABLE RIGHT BLANKING	RIGHT BLANKING / ACTIVATES THE RIGHT BLANKING FUNCTION
65	RED CRT CUTOFF	TOGGLES THE RED CRT ON AND OFF
66	GREEN CRT CUTOFF	TOGGLES THE GREEN CRT ON AND OFF
67	BLUE CRT CUTOFF	TOGGLES THE BLUE CRT ON AND OFF
909	DISABLE EXECUTIVE MODE OF	EXEC MODE OFF / EXITS EXECUTIVE MODE OF OPERATION AND RESUMES NORMAL (FULL) REMOTE CONTROL OPERATION

TABLE 7-3D. CODE COMMANDS 46 - 67, AND 909.

18. CLEAR BUTTON: 

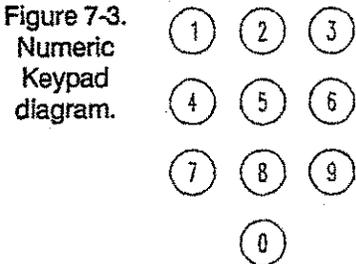
FUNCTION: Resets accumulator to zero (ACC).

LCD: ACC = "N" WHERE "N" EQUALS NUMBER

- OPERATION 1: Removes an incorrect entry from the display when pressed before any function or operation key is pressed.
- OPERATION 2: Resets arrow keys in the Help Mode of operation.

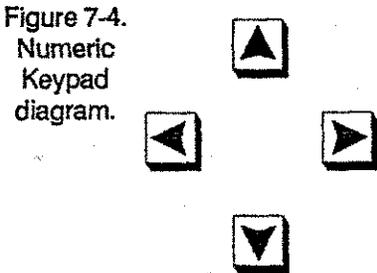
19. NUMERIC KEYPAD:

- OPERATION 1: Used to set and recall channel and unit numbers.
- OPERATION 2: Address internal special features (CODES).
- OPERATION 3: Percentage setting of the image quality functions.



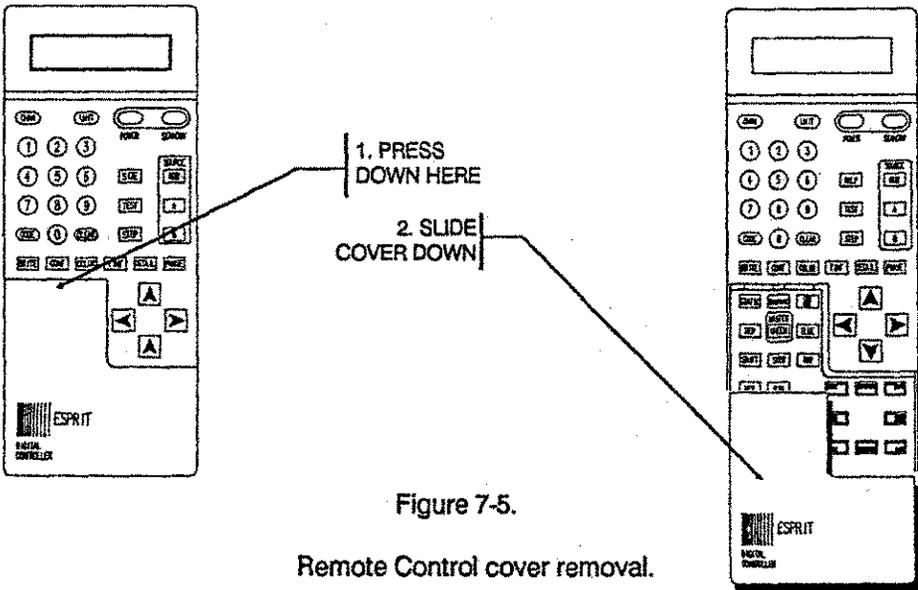
20. ARROW KEYS:

- OPERATION 1: Increment and decrement selected function level.
- OPERATION 2: In the HELP MODE used to advance and regress pages or exit.



REMOTE CONTROL COVER REMOVAL:

- To access the Registration controls, remove the Remote Control cover by pressing on the upper middle portion of the cover and slide the cover down.



21. QUADRANT AND EDGE CONTROLS:

OPERATION 1: Selects a particular registration control location for master or individual Red, Green or Blue image adjustments.

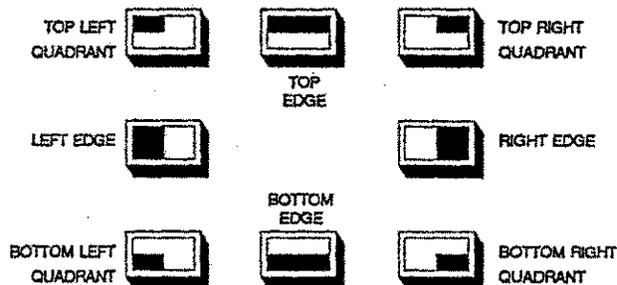


Figure 7-6. Quadrant and Edge controls.

22. STATIC BUTTON: **STATIC**

FUNCTION: Enables all static operations.

NOTE: BEFORE ACTIVATING STATIC REGISTRATION FUNCTIONS DISABLE REGISTRATION WITH 55 **CODE**, THEN PRESS **STATIC** AND PERFORM THE FOLLOWING STATIC FUNCTIONS:

OPERATION 1: Press **KEY**, then use the and arrows to adjust the E-W Keystone.

LCD: STATIC KEY

OPERATION 2: Press **PIN**, then use the and arrows to adjust the E-W Pincushion.

LCD: STATIC PIN

• NOTE: Selection of any function other than **PIN** or **KEY** will result in the following message:

LCD: DYNAMIC FUNCTION

22-A. RED AND BLUE STATIC SHIFT OPERATIONS:

OPERATION 1: With Registration "OFF", enter 40 **CODE** and adjust the RED VERTICAL SHIFT.

OPERATION 2: With Registration "OFF", enter 41 **CODE** and adjust the BLUE VERTICAL SHIFT.

NOTE: AFTER COMPLETING THE STATIC SHIFT FUNCTIONS, ENTER 55 **CODE**, REGISTRATION "ON".

OPERATION 3: Exit STATIC mode by pressing **DYN** or by selecting a color RED, GREEN, or BLUE.

23. DYNAMIC BUTTON: **DYN**

FUNCTION: Enables all dynamic registration operations.

LCD: CURRENTLY SELECTED REGISTRATION FUNCTION

OPERATION 1: If STATIC operation was previously selected then the **DYN** button exits STATIC mode and enables registration functions.

NOTE: REFER TO THE INDIVIDUALLY REGISTRATION FUNCTION TO DETERMINE WHEN EITHER STATIC OR DYNAMIC OPERATIONS ARE REQUIRED.

24. CUTOFF BUTTON : 

FUNCTION: Toggles selected colors "OFF" and "ON."

LCD: SELECTED COLOR: CRT ON

OR

LCD: SELECTED COLOR OFF

25. RED BUTTON : 

FUNCTION: [DYNAMIC] Selects RED Registration or Red cutoff.

LCD: RED: SELECTED FUNCTION

- OPERATION 1: Turns " OFF " RED CRT when preceded by the  button.
- OPERATION 2: If STATIC function was previously selected then the  button additionally exits the STATIC mode and enables DYNAMIC registration mode of operation for Red.

26. GREEN (MASTER) BUTTON: 

FUNCTION: [DYNAMIC] Selects Master Registration (except Static Key And Pin) or Green cutoff.

LCD: MASTER: SELECTED FUNCTION

- OPERATION 1: Turns " OFF " GREEN CRT when preceded by the  button.
- OPERATION 2: If STATIC function was previously selected then the  button additionally exits the STATIC mode and enables DYNAMIC registration mode of operation for Green.

27. BLUE BUTTON : 

FUNCTION: [DYNAMIC] Selects BLUE Registration or Blue cutoff.

LCD: BLUE : SELECTED FUNCTION

- OPERATION 1: Turns " OFF " BLUE CRT when preceded by the  button.
- OPERATION 2: If STATIC function was previously selected then the  button additionally exits the STATIC mode and enables DYNAMIC registration mode of operation for Blue.

28. SHIFT BUTTON :

FUNCTION: [STATIC AND DYNAMIC] Selects shift operations and highlights a center pattern on the screen where active.

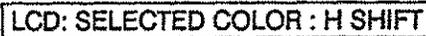
- NOTE 1: See **STATIC** functions for Red Vertical Shift and Blue Vertical Shift per section 22 for proper setting prior to proceeding with the remainder of this section.
- OPERATION 1: [DYNAMIC] Press  ,  or  , then  to select the particular color and SHIFT operation.

28-A. SHIFT OPERATION:

- OPERATION 2:  and  arrows will adjust for the Vertical Shifts.

 LCD: SELECTED COLOR: V SHIFT

- OPERATION 3:  and  arrows will adjust for the Horizontal Shifts.

 LCD: SELECTED COLOR : H SHIFT

- NOTE 2: SHIFT operation is not active in the edge or quadrant controls, only in highlighted center.

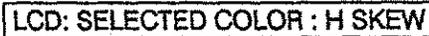
29. SKEW BUTTON :

FUNCTION: [DYNAMIC] Selects skew operations and highlights the center axis of the screen where active.

- OPERATION 1: Pressing  ,  or  then  will select the particular color and the SKEW operation.

29-A. SKEW OPERATION:

- OPERATION 2:  and  arrows will adjust for Horizontal Skew.

 LCD: SELECTED COLOR : H SKEW

- OPERATION 3:  and  arrows will adjust for Vertical Skew.

 LCD: SELECTED COLOR : V SKEW

- NOTE 1: The SKEW operation is not active in any Quadrant or Edge.

- NOTE: STATIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "OFF"
- NOTE: DYNAMIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "ON"

30. BOW BUTTON : 

FUNCTION: [DYNAMIC] Selects the bow operation and highlights the center of the screen where active.

OPERATION 1: Pressing ,  or , then  will select that particular color and the BOW operation.

30-A. BOW OPERATION:

OPERATION 2: The  and  arrows adjust Horizontal Bow

LCD: SELECTED COLOR : H BOW

OPERATION 3: The  and  arrows adjust the Vertical Bow.

LCD: SELECTED COLOR : V BOW

31. KEY BUTTON : 

FUNCTION: [STATIC AND DYNAMIC] Selects keystone (trapezium) operation.

31-A. STATIC KEYSTONE OPERATION:

OPERATION 1: [STATIC] Pressing , then  will select the static keystone operation for Master (GREEN) which provides adjustment of the total image.

● NOTE 1: The quadrant and edge controls are inactive in the static mode.

LCD: STATIC KEYSTONE

31-B. DYNAMIC KEYSTONE OPERATION:

OPERATION 2: [DYNAMIC] Pressing , an EDGE control, then  will select the master keystone operation for the selected TOP, BOTTOM, LEFT or RIGHT edge control of the projected image and Highlight the selected edge of the image.

LCD: MASTER: SELECTED EDGE: KEY

OPERATION 3: [DYNAMIC] Pressing  or , a QUADRANT control then  will select the color and keystone operation for the selected TOP LEFT, TOP RIGHT, BOTTOM LEFT or BOTTOM RIGHT quadrant of the projected image and highlight the selected quadrant.

LCD: SELECTED COLOR : SELECTED QUADRANT: KEY

● NOTE 2: Master keystone in the dynamic mode operates on EDGES. If a QUADRANT is selected for master keystone when in this mode, the display will prompt [CHOOSE EDGE]. Likewise RED and BLUE keys operate on QUADRANTS. Similarly if an EDGE is selected for RED or BLUE key, the display will prompt, [SELECT QUADRANT].

● NOTE: STATIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "OFF".

● NOTE: DYNAMIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "ON".

32. PIN BUTTON :

FUNCTION: [STATIC AND DYNAMIC] Selects pincushion operation.

32-A. STATIC PINCUSHION OPERATION:

OPERATION 1: [STATIC] Pressing , then  will select static pincushion operation for Master (GREEN) which provides adjustment of the total image.

- NOTE 1: The quadrant and edge controls are inactive in the static mode of operation.

LCD: STATIC E-W PIN

32-B. DYNAMIC PINCUSHION OPERATION

OPERATION 2: [DYNAMIC] Pressing , an EDGE control, then  will select master pincushion operation for the selected TOP, BOTTOM, LEFT or RIGHT edge of the projected image and highlight the selected edge of the image.

LCD: MASTER: SELECTED EDGE : PIN

OPERATION 3: [DYNAMIC] Pressing  or , a QUADRANT control, then  will select color and pin operation for the selected TOP LEFT, TOP RIGHT, BOTTOM LEFT or BOTTOM RIGHT and highlight the selected quadrant.

LCD: SELECTED COLOR : SELECTED QUADRANT : PIN

OPERATION 4: The  and  arrows adjust the Vertical Pincushions.

OPERATION 5: The  and  arrows adjust the Horizontal Pincushions.

- NOTE 2: Master pincushion in the static mode operates on EDGES. If a QUADRANT is selected for Master pincushion in this mode, the display will prompt [CHOOSE EDGE]. RED and BLUE pincushions operate on QUADRANTS. Similarly, if an EDGE is selected for RED or BLUE pincushion, the display will prompt [SELECT QUADRANT].

- NOTE: STATIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "OFF".

- NOTE: DYNAMIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "ON".

33. SIZE BUTTON : 

FUNCTION: [STATIC OR DYNAMIC] Selects height and width of image.

OPERATION 1: Press , then  to perform the following:

OPERATION 2: The  and  arrows will adjust the image HEIGHT.

LCD: MASTER V HEIGHT

OPERATION 3: The  and  arrows will adjust the image WIDTH.

LCD: MASTER H SIZE

- NOTE 1: The Master Size highlights the entire image.
- NOTE 2: The quadrant and edge controls are inactive in the Master Size mode of operation.

33-A. RED AND BLUE SIZE OPERATION:

OPERATION 1: [DYNAMIC] Press  or , an EDGE control, then  to perform Red or Blue Size adjustments.

OPERATION 2:  or  EDGE selects Width operation adjusted by the  and  arrows.

LCD: RED or BLUE : RIGHT or LEFT : WIDTH

OPERATION 3:  or  EDGE selects Height operation adjusted by the  and  arrows.

LCD: RED or BLUE : TOP or BOTTOM : HEIGHT

- NOTE 3: RED and BLUE size operates on EDGES. If a QUADRANT is selected for RED or BLUE, the LCD will prompt you to [CHOOSE EDGE].

- NOTE: STATIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "OFF"
- NOTE: DYNAMIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "ON"

34. LIN BUTTON : 

FUNCTION: [DYNAMIC] Selects vertical and horizontal linearity operations.

OPERATION 1: Pressing  , then  will select Master Vertical linearity operation.

LCD: MASTER LINEARITY

OPERATION 2. Master vertical linearity is adjusted by using the  or  arrows.

LCD: MASTER V LIN

- NOTE 1: The master linearity will highlight the entire image and ignore quadrant and edge controls.
- NOTE 2: The master horizontal linearity has been preset at the factory and is not adjustable with the remote control.

34-A. RED AND BLUE LINEARITY OPERATIONS:

OPERATION 3: [DYNAMIC] Pressing  or  ,an EDGE control,  will select individual edge linearity operations.

OPERATION 4: Press  or  to select LEFT or RIGHT edge and adjust horizontal linearity by using the  or  arrow.

LCD: RED or BLUE : RIGHT or LEFT : H LIN

OPERATION 5: Press  or  to select TOP or BOTTOM edge and adjust vertical linearity by using the  or  arrow.

LCD: RED or BLUE : TOP or BOTTOM : V LIN

- NOTE 3: Operation 2 and 3 will highlight the selected edge.
- NOTE 4: RED and BLUE linearity operates on EDGES. If a QUADRANT is selected for RED or BLUE linearity, the display will prompt [CHOOSE EDGE]

- NOTE: STATIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "OFF"
- NOTE: DYNAMIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "ON"

35. EDGLIN BUTTON : 

FUNCTION: [DYNAMIC] Selects edge linearity operations. RED and BLUE only.

OPERATION 1: Press  or  then  or  edge control then, .

LCD: RED or BLUE: RIGHT or LEFT: EDGE

- NOTE 1: The EDGLIN function affects only the OUTER RIGHT or OUTER LEFT edges of RED and BLUE images. Highlights outer edges.

OPERATION 2:  or  edge control selects Horizontal Linearity operation, adjusted by the  or  arrow.

- NOTE 2: If a QUADRANT, TOP or BOTTOM EDGE is selected, in this mode, the LCD will prompt [RIGHT or LEFT EDGE ONLY]. If MASTER is selected, the LCD will prompt [RED OR BLUE ONLY].

36. BLANK BUTTON : 

FUNCTION: [STATIC OR DYNAMIC] Selects blanking operation.

OPERATION 1: Select EDGE, then  to perform the following blanking operations:

OPERATION 2: Press  or  edge control to select horizontal blanking which is adjusted by the  and  arrows.

LCD: RIGHT or LEFT BLANKING

OPERATION 3: Press  or  edge control to select vertical blanking which is adjusted by the  and  arrows.

LCD: TOP, or BOTTOM BLANKING

- NOTE: STATIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "OFF"
- NOTE: DYNAMIC FUNCTIONS ARE PERFORMED WITH REGISTRATION "ON"

NOTES:

Chapter 8

LENS FOCUSING AND POSITIONING

8.1GETTING STARTED:

In order to focus the and position lenses it will be necessary to remove the top cover, which is secured with four 1/4 turn fasteners located on the front and rear of the top cover.

- STEP 1. To remove simply turn the fasteners 1/4 turn counterclockwise with a flat blade screwdriver.
- STEP 2. Pull the top cover upward and lift off.
- STEP 3. Once the top cover has been removed, the lenses will be exposed.



NOTE: The tools required to focus and position the lenses are provided and located within the accessory box. Refer to figure 8-2.

To focus and position the lenses you will use the crosshatch and crosshair test patterns or utilize the internal Help System and screens. See Chapter 9 for more information on the Help System.

If you are not using the Internal help system perform the following steps . Each lens should be focused individually. Use the *CUTOFF* , then the *GREEN*, *RED* and *BLUE* buttons to cutoff the images not being focused. Use the *TEST* and *STEP* buttons for selecting the internal test patterns and frequency (see Chapter 7, section 12.) Turn registration "OFF" using *55 CODE* .

To enter the Internal Help System for a step-by-step instruction, perform the following:

- Press the *HELP* button, then
- Enter subject 3, (*SYSTEM SETUP MENU*), then
- Select (*FOCUSING AND POSITIONING OF THE LENSES*, subject 3). Note: This program will automatically turn Registration "OFF."

This will allow you to focus and position the lenses without having to perform the Complete Guided Setup program.

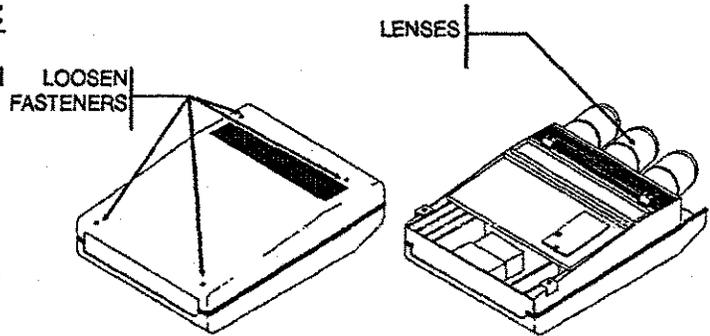


FIGURE 8-1.

TOP COVER REMOVAL AND LENS LOCATION.

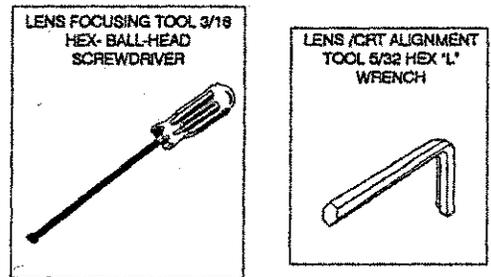


FIGURE 8-2. LENS ADJUSTMENT TOOLS REQUIRED.

(PROVIDED)

Once your unit has been installed for your particular requirements, you are now ready to perform the first stage of alignment, lens focusing and positioning.

8.1.1LENS TYPES:

There are several different types of lenses that may be used on your display system, but they fall into two categories. The first category is a single adjustment lens (8-element lenses, Figure 8-3,) which is adjusted by using one control. The second category is the dual adjustment type lens (6-element lenses, Figure 8-4.) The adjustment that gives the most affect is the primary focus adjustment and the other adjustment is used to equalize focus over the entire image.

8.1.1.1FOCUS PROCEDURE/8-ELEMENT LENSES:

If the lenses are the single adjustment barrel type, adjust the single adjustment for the best focus as outlined in Table 7, Step 1, for your particular mounting configuration.

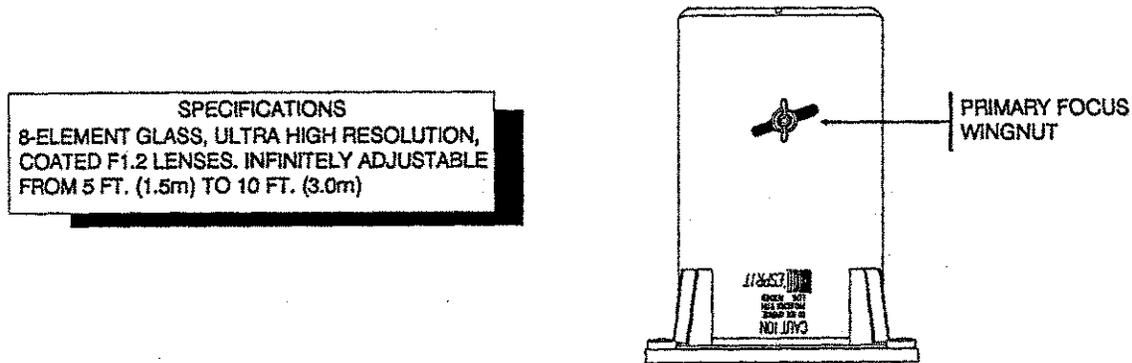


FIGURE 8-3. 8-ELEMENT LENS ADJUSTMENT.

8.1.1.2FOCUS PROCEDURE/6-ELEMENT LENSES:

If the lenses you are using are the dual adjustment type, adjust the primary and secondary focus adjustment for the best focus as outlined in Table 7, Step 1 for your particular configuration. You may be required to go back and forth between the adjustments.

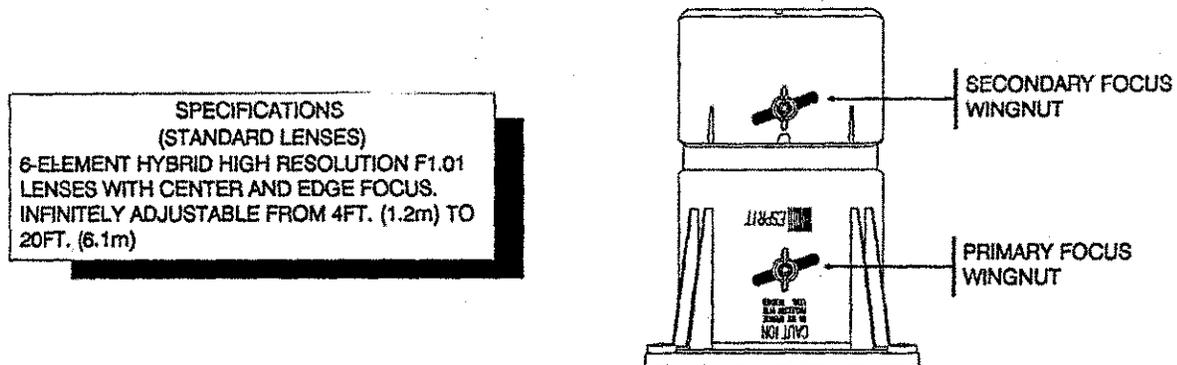
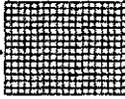


FIGURE 8-4. 8-ELEMENT LENS ADJUSTMENT.

8.2 LENS FOCUS AND POSITIONING:

 **NOTE:** The following procedure is outlined for a **FRONT/CEILING MOUNT INSTALLATION**. Reference is as viewed from the front of the unit. Refer to TABLE 8-1 page 8-5 for procedures on other installation configurations.

- **CROSSHATCH PATTERN REQUIRED.** 

- **STEP 1.** Tighten all three lens adjustments, then turn counterclockwise $\frac{3}{4}$ of a turn. Refer to figure 41.
- **STEP 2A. Single barrel lenses.** Adjust the single lens barrel until the lower right corner of the projected image is focused.
- **STEP 2B. Dual barrel lenses.** Adjust the primary and secondary lens barrel until the lower right corner of the projected image is focused.

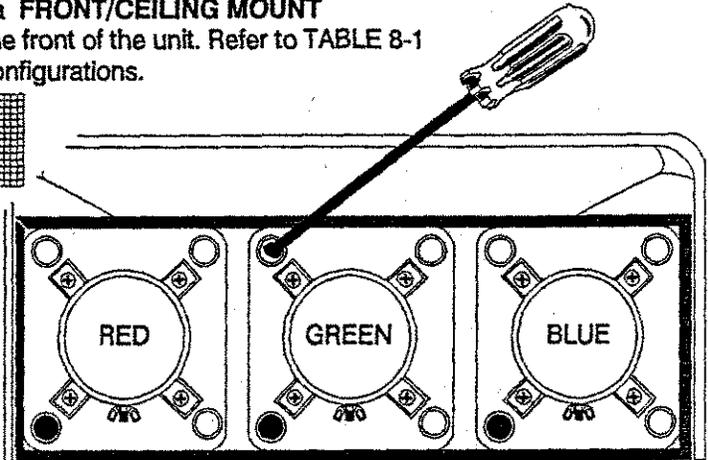
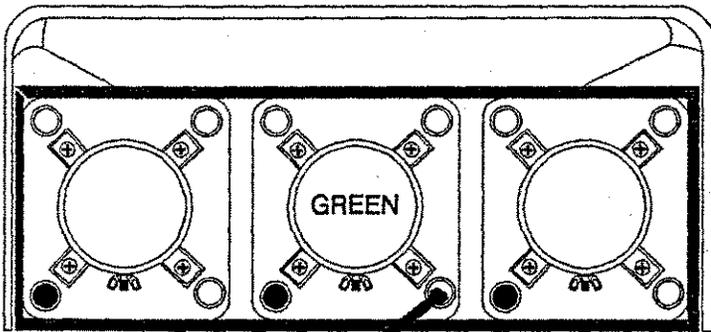


FIGURE 8-5. STEP 1.

Tighten all three adjustment screws on each color, then then CCW $\frac{3}{4}$ of a turn.

FIGURE 8-6. STEP 4-GREEN ONLY!

Adjust lower right adjustment to focus the upper right corner of the projected image.



- **STEP 3.** Repeat step 1 and 2A, (or 2B,) for each color.
- **STEP 4. GREEN ONLY!** Adjust the lower right lens adjustment until the upper right corner of the image is focused. See figure 8-6. Repeat lens focus procedure if necessary at this time.

- **STEP 5. GREEN ONLY!** Adjust the upper left lens adjustment for side to side focus. See figure 8-7.

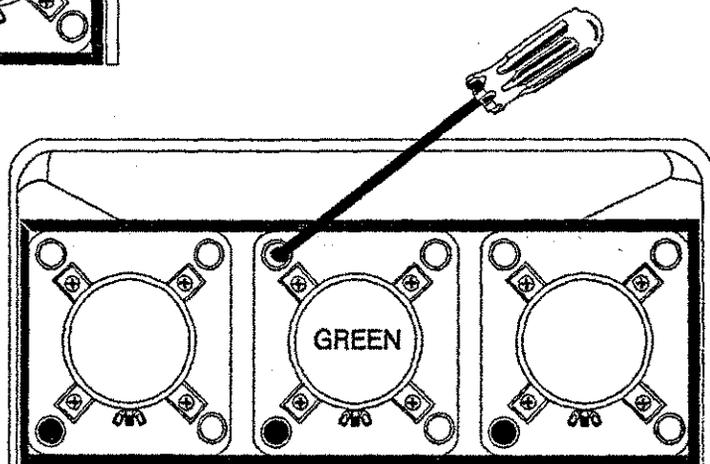


FIGURE 8-7. STEP 5-GREEN ONLY!

Adjust the upper left adjustments to focus the image from side to side.

- CROSSHAIR PATTERN REQUIRED.



- STEP 6. RED to GREEN lens positioning. Loosen the two 5/32 lens positioning hex head screws located directly behind the RED LENS/CRT assembly. Figure 8-8.

- STEP 7. Carefully pivot the RED LENS/CRT assembly until the center vertical line in the RED image exactly overlays the center vertical line in the GREEN image.

- STEP 8. Once the lens is in the proper position tighten the two 5/32 lens positioning hex head screws.

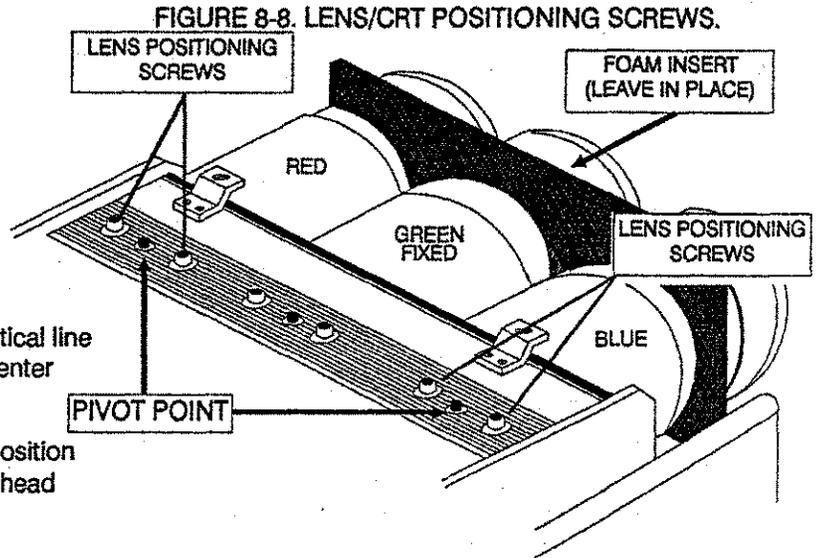
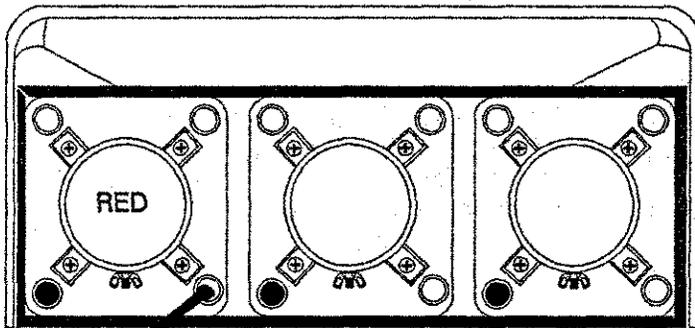
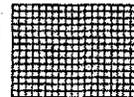


FIGURE 8-9. STEP 9-RED ONLY!

Adjust the lower right adjustment to focus the upper right corner of the projected image.



- CROSSHATCH PATTERN REQUIRED.



- STEP 9. RED ONLY ! Adjust the lower right lens adjustment until the upper right corner of the image is focused. See figure 8-9.

- STEP 10. RED ONLY ! Adjust the upper left lens adjustment for side to side focus. See figure 46.

- STEP 11. Refocus and pivot the lens as required.

- Step 12. Perform the Static Red and Blue Shift operations as required.

40 CODE-Red Vertical Shift (STATIC).

41 CODE -Blue Vertical Shift (STATIC).

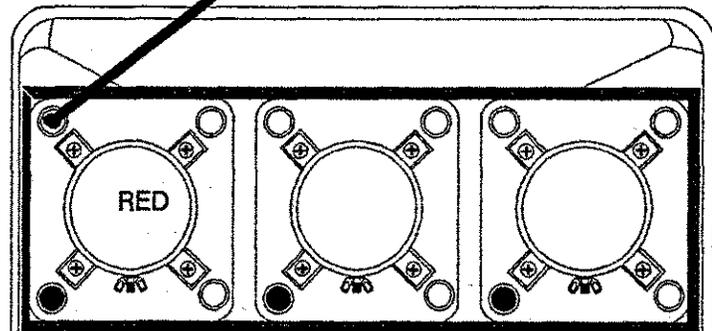


FIGURE 8-10. STEP 10-RED ONLY!

Adjust the upper left adjustment to focus the projected image from side to side.

 REPEAT STEPS 6 THROUGH 12 FOR BLUE TO RED ALIGNMENT.

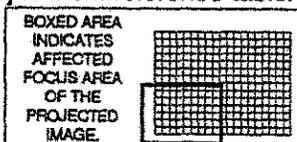
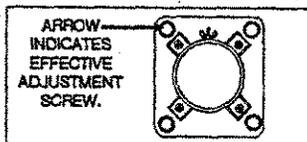
8.3 LENS FOCUS / ADJUSTMENT REFERENCE TABLE:

The following table will indicate the relationship in mounting configurations and lens focus adjustments. Using the following table, "look up" your particular installation. Note the adjustment locations indicated and follow procedure outlined in section 8.2.

STEP	FRONT FLOOR MOUNT	FRONT CEILING MOUNT	*REAR FLOOR MOUNT	*REAR CEILING MOUNT
1. Tighten ALL three lens adjustments. Then turn (CCW) 3/4 of a turn.				
2. Adjust lens focus barrel(s) until the indicated corner of the projected image is optimized.				
3. Adjust indicated screw to optimize corner focus of figure shown below.				
4. Adjust indicated screw to optimize focus from side to side of figure shown below.				

TABLE 6. Lens focus/adjustment reference table.

NOTES:



1. *Rear screen reference of affected focus area is as viewed from the adjustment point; from the rear of the screen area.
2. Repeat above steps for all three colors.
3. Refer to section 8.2, steps 6, 7, and 8 for LENS/CRT positioning.

NOTES:

Chapter 9

INTERNAL HELP MENUS AND REGISTRATION PROCEDURES

9.1 INTERNAL HELP MENUS:

Incorporated in the ESPRIT display systems are several on-board help menus. The internal menus are provided to inform and guide you through the operation and setup of the system. To enable the internal help programs simply press the **HELP** button and select the topic of your choice. Shown below is the main menu and selections with a brief description of each.

9.1.2 MAIN INDEX MENU:

The index menu is provided to select a particular chapter/subject. The main menu contains the following subjects. Refer to figure 9-1.

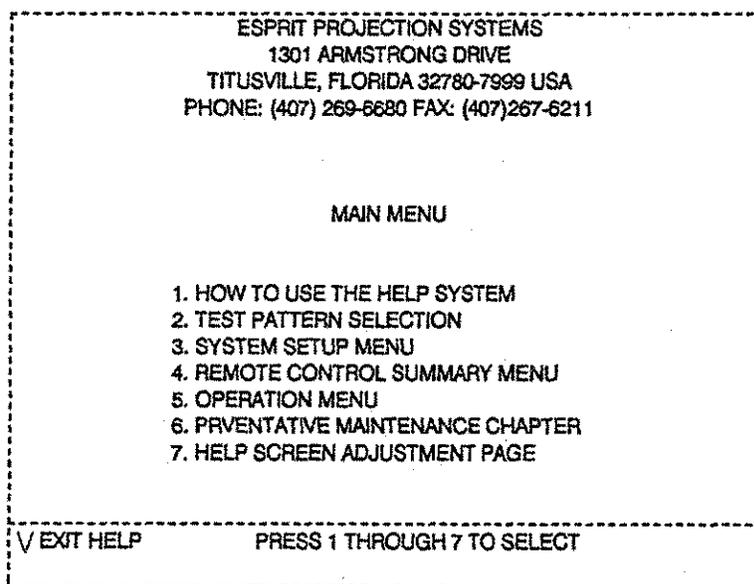


FIGURE 9-1

HELP SYSTEM MAIN MENU AND SELECTIONS.

9.1.3 HOW TO USE THE HELP SYSTEM:(SELECTION 1):

This selection will give you the basic instruction on how to use the internal help system. The active keys in the Help program (except for the Complete Guided Setup program) are;

- key, GO TO INDEX
- key, EXIT HELP
- key, PREVIOUS PAGE
- key, NEXT PAGE

9.1.4TEST PATTERN SELECTIONS (MAIN MENU SELECTION 2):

This page informs you of the available internal test patterns, frequency and the selection of these patterns. See Chapter 7, section 12, page 7-8 for more information.

9.1.5SYSTEM SETUP MENU (MAIN MENU SELECTION 3):

This selection will go to another menu for the selections on various registration operations. While in this sub-menu select one of the following topics. See figure 9-2.

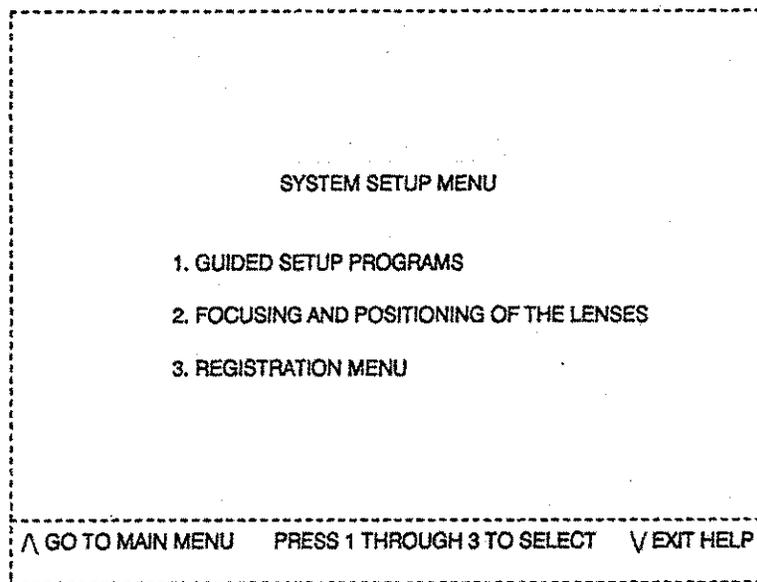


FIGURE 9-2.

SYSTEM SETUP MENU AND SELECTIONS

- 1. GUIDED REGISTRATION PROGRAM: Enables the internal guided setup program menu for a selection of the available programs and instructions. i.e. Complete Guided Setup or Touch Up.
- 2. FOCUSING AND POSITIONING OF THE LENSES: Provides on screen instruction, test patterns and sequence required for proper lens focusing and positioning. NOTE: Uses arrows at bottom legend for directions.
- 3. REGISTRATION MENU: This selection will bring up another menu for your selection of the following subjects. Refer Section 9.1.6 and to figure 9-3.

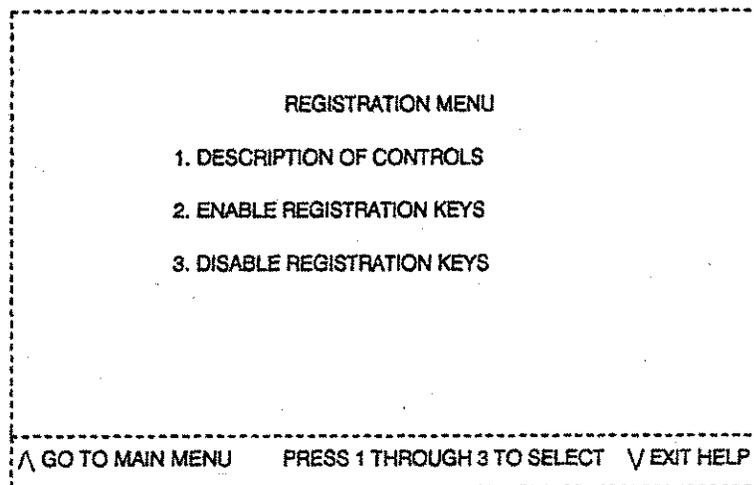
9.1.6 REGISTRATION MENU (SYSTEM SETUP SELECTION 3) :

FIGURE 9-3.

OPERATION MENU AND SELECTIONS

- 1. DESCRIPTION OF CONTROLS: This selection provides information on the registration controls that are available with a brief explanation of their function.
- 2. ENABLE REMOTE REGISTRATION KEYS: This selection will be used in conjunction with selection 4 (below) to exit "LOCK-OUT" function. NOTE: Same as 46 CODE.
- 3. DISABLE REMOTE REGISTRATION KEYS: This selection gives you the ability to "LOCK-OUT" the registration keys to avoid any unwanted registration adjustments. NOTE: Same as 45 CODE.

9.1.7 REMOTE KEYPAD SUMMARY MENU (MAIN MENU SELECTION 4):

This selection provides an additional menu to inform you on the operation of the remote control keypad. Refer to figure 9-4.

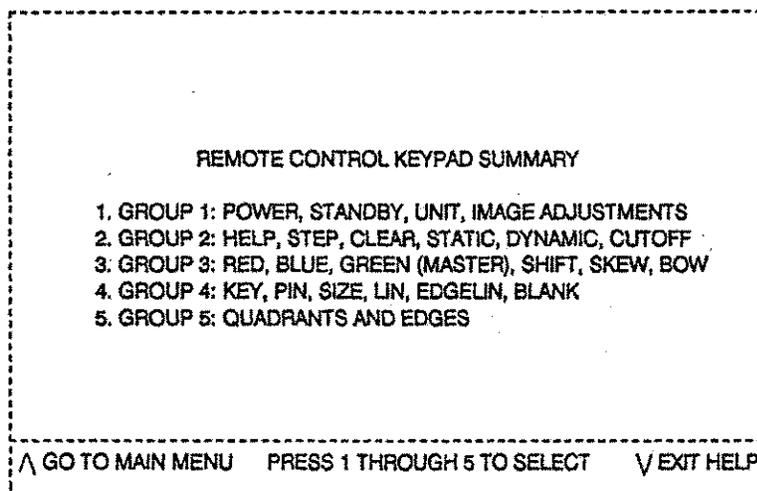


FIGURE 9-4.

REMOTE KEYPAD SUMMARY SELECTION MENU.

9.1.8 OPERATION MENU (MAIN MENU SELECTION 5):

This selection provides information on the special functions and operation of the ESPRIT system. See figure 9-5.

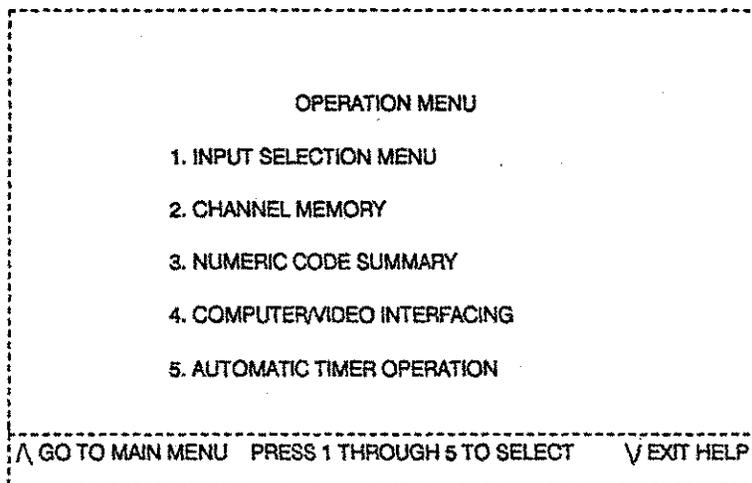


FIGURE 9-5.

OPERATION MENU AND SELECTIONS

- 1. INPUT SELECTION MENU: This selection will switch you to the following on- screen menu for your selection of a brief description of the different modes of operation. See figure 9-6.
- 2. CHANNEL MEMORY: This section is provided to instruct you on dedicating a channel number and pre-setting the appropriate adjustments (*including all registration settings*).
- 3. NUMERIC CODES SUMMARY: This section describes the internal codes, their usage, and the selection of the internal codes.
- 4. COMPUTER INTERFACING: This provides information on the basic requirements for various configurations of the system.
- 5. TIMER OPERATION: This selection instructs you on selecting and setting the internal clock for daily auto "ON"/"OFF" operation.

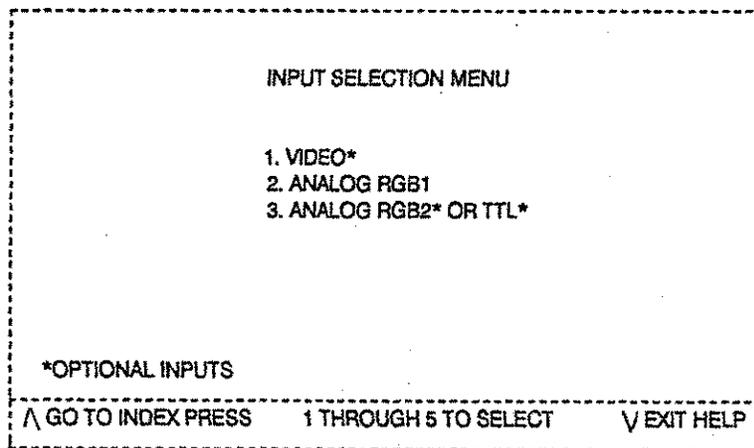


FIGURE 9-6

9.1.9PREVENTATIVE MAINTENANCE (MAIN MENU SELECTION 6):

This chapter is provided to give some guidelines on periodic maintenance.

9.1.10HELP SCREEN ADJUSTMENT PAGE (MAIN MENU SELECTION 7):

The help screens are provided in individual channel locations. For this reason it may become necessary to adjust the help screen parameters. Refer to figure 9-7

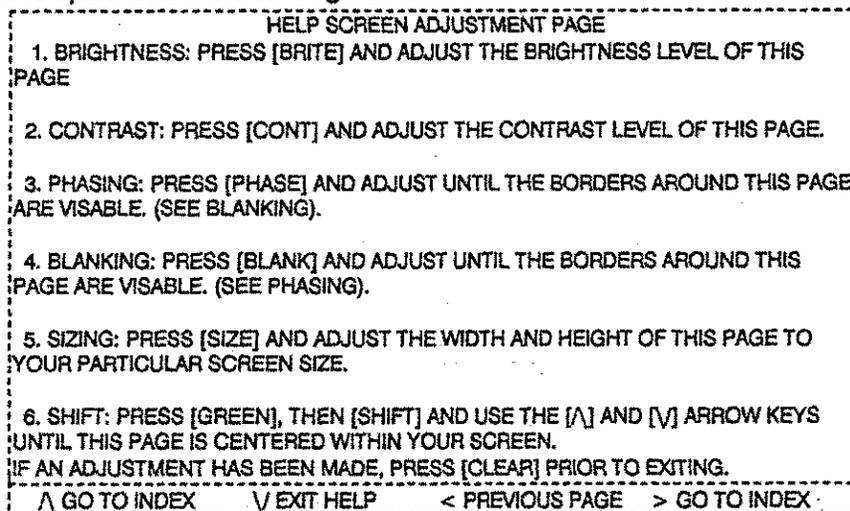


FIGURE 9-7.

HELP SCREENS ADJUSTMENT PAGE

9.2.GUIDED SETUP PROGRAMS (GSP):

The Guided Setup programs are designed to guide you through either a complete or touch-up alignment process, depending on your particular requirements.

9.2.1PROGRAM SELECTION:

- **SELECTION 1.** Selects (COMPLETE) guided setup program. This includes both mechanical/static setup and dynamic convergence procedures. This is necessary when there has been a change of image size or projection angle.
- **SELECTION 2.** Selects (TOUCH-UP) guided setup program. This program bypasses the mechanical setup procedure, going straight to the dynamic convergence procedure. Use this program when there has been no change of image size or projection angle.
- **SELECTION 3.** Selects (TOUCH-UP) RED TO GREEN then BLUE TO RED.
- **SELECTION 4.** Selects (TOUCH-UP) BLUE TO RED.
- **SELECTION 5.** This will exit this menu and return to the main menu.
- **NOTE:** Once activated, the Guided Setup Program (GSP) automatically defaults to the Internal Test/External Sync mode of operation. Meaning that the system will internally generate the required test patterns horizontally and vertically synchronized to that external source that was active at the time GSP was initiated. Prior to entering the GSP mode be sure you are in the particular channel with the desired mode of operation selected, i.e., RGB, you wish to setup and that an active source is applied to that particular channel (mode of operation). See section 9.2.3 for further information.

9.2.3 COMPLETE GUIDED SETUP PROGRAM:

This section covers the sequence of all the functions required to setup and align the system. The registration is divided into four stages. **STAGE 1:** Focus and position the lenses. **STAGE 2:** Size and optimize the geometry of the GREEN (MASTER) image. **STAGE 3:** Align the RED image to exactly overlay the GREEN image. **STAGE 4:** Align the BLUE image to exactly overlay the RED image. **NOTE:** With all three images displayed and converged, using the internal test pattern, the image should appear white throughout the projected image.

While in the complete guided setup program, you will be given the applicable alignment pattern and the area for the given function will be highlighted. Concentrate your adjustments within this highlighted area. Refer to section 10.4 for further guidance. Monitor the LCD read-out to prompt you with the function you are adjusting. If a brief description of the presently active alignment function is desired, press the  button. Note the functional change of the following keys while in the Guided Setup Programs.

ARROW KEYS:     Increase/decrease/adjust alignment function.

Enter/exit context help page for a brief explanation of the control/alignment function.

Advance to next alignment function.

Revert to previous alignment function.

Exits guided registration program.

9.2.4 REGISTRATION AS A CHANNEL PARAMETER:

All registration functions are handled as individual channel parameters. This will allow you to precisely set each individual source for optimum registration. There are several ways in which Registration may be set. (1): Guided Setup (discussed previously) or (2): a random selection and settings of the Registration functions. In either case..... the following conditions must exist prior to building or changing parameters of a channel:

GUIDED SETUP OF A CHANNEL:

- 1. Prior to entering the Guided Setup Program, ensure you have designated a CHANNEL location, i.e., 1,2,3, etc..
- 2. Select the appropriate mode of operation for that channel, i.e. RGB, VIDEO etc., and:
- 3. Have an active source applied to that appropriate slot (input card) and be in that particular channel when help is entered.

With the above conditions met, you may proceed to enter the HELP system and ultimately the Guided Setup Programs. Regardless of which program you select, it will allow you to setup completely or touch-up the last channel that was active at the time Guided Setup was initiated.

RANDOM SETUP OF A CHANNEL:

- 1. Select the channel you wish to adjust, i.e., 1,2,3 etc.
- 2. If the channel had been previously write-protected, enter 20 CODE to toggle the write-protect "OFF" the channel, this will allow you to make the adjustments you want to make.
- 3. Select the test function method, i.e. Internal Test/Internal Sync or Internal Test/External Sync. (See Chapter 7, Section 12, Page 7-8.)
- NOTE: In either the above methods, Channel settings such as brightness, contrast, detail, tint, color and phasing will have to be made while the active source is being displayed.

9.2.5FACTORY ALIGNED CHANNEL SETTINGS

To provide a quick start with your registration alignment and channel settings, several Video/RGB formats have been pre-aligned at the factory. All pre-aligned channels are based on a 60in. H x 80in. W screen size. You can use these pre-aligned channels with the various copy channel commands such as "COPY BEST-FIT CHANNEL" or the copy "TO" and "FROM" commands. See Chapter 7, section 17, page 7-11 for further information on the above Code commands

- NOTE: All factory pre-aligned channels have been validated and write-protected (24 CODE). When using the Channel copy commands, the write-protect command will also be copied along with all of the other channel parameters. Prior to performing adjustments to your new channel enter 20 CODE (write-protect "off"). Upon completion of adjusting your new channel, enter 24 CODE to validate and protect your channel. Continue with procedure to align all of your channels. The following is a list of the factory pre-aligned channels:

CHANNEL NUMBER	CHANNEL PARAMETERS	CHANNEL NUMBER	CHANNEL PARAMETERS
1 - 44	RGB MODE / 31.5kHz	48	RGB MODE / 31.5kHz
45	RGB MODE / 80kHz	49	RGB MODE / 21.5kHz
46	RGB MODE / 64kHz	50	VIDEO MODE (NTSC) / 15.75kHz
47	RGB MODE / 54kHz		

9.3REGISTRATION PROCEDURES:

The registration of the ESPRIT systems falls into two major categories. The first category of alignment is the Mechanical/Static alignment functions (section 9.3.1). The second category of alignment is the Dynamic alignment functions (section 9.3.2).

9.3.1MECHANICAL/STATIC ALIGNMENT FUNCTIONS:

- STEP 1. Be sure you are in the appropriate channel location you want to adjust.
 - STEP 2. Disable the registration using 55 **CODE**
 - STEP 3. Open blanking. See Chapter 7, section 36, page 7-22.
 - STEP 4. Perform the lens focusing and positioning procedure outlined in Chapter 8.
 - STEP 5. Set the following STATIC alignments with the Green crosshatch pattern.
- Press **STATIC**
 - Press **KEY** and align the **right side** of the image.
 - Press **PIN** and align the **right edge** of the image.
 - Press **SHIFT** then **GREEN** and align the image until it is centered on the screen.
 - Press **STATIC** then **RED** and align the center Red horizontal line until it overlays the center horizontal line in the green image. Same as (40 CODE).
 - Press **STATIC** then **BLUE** and align the center Blue horizontal line until it overlays the center horizontal line in the Red image. Same as (41 CODE).
 - Press **GREEN** then **SIZE** and adjust for the desired height and width.

9.3.2 DYNAMIC ALIGNMENT FUNCTIONS:

PHASE 1 . . . MASTER (GREEN) ALIGNMENTS: (EDGES ONLY)

- Enter 55 **CODE** Registration "ON".
- Press **GREEN**
- Press **SKEW** and adjust the horizontal and vertical skews.
- Press **BOW** and adjust the horizontal and vertical bows.
- Press **KEY** and adjust the top, bottom, left and right edges.
- Press **PIN** and adjust the top, bottom, left and right edges.
- Press **LN** and adjust the top and bottom edges. Recheck master shift and size.

9.3.2 DYNAMIC ALIGNMENT FUNCTIONS: (CONTINUED)

PHASE 2: . . RED AND BLUE DYNAMIC ALIGNMENT FUNCTIONS:

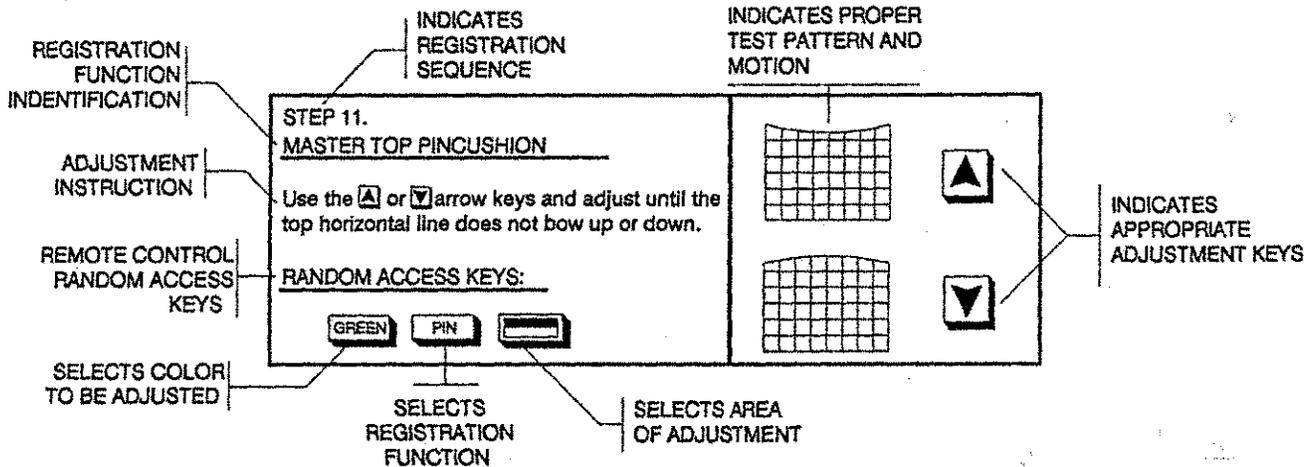
- Red and blue operate on quadrants and edges.

 NOTE: The Red image will be aligned to the Green image with the Blue image cutoff, then the Blue image will be aligned to the Red image with the Green image cutoff.

- Select desired color **RED** or **BLUE**
- Press **SHIFT** and adjust the horizontal and vertical shifts on the horizontal and vertical center lines.
- Press **SKEW** and adjust the horizontal and vertical skews on the horizontal and vertical center lines.
- Press **BOW** and adjust the horizontal and vertical bows on the horizontal and vertical center lines.
- Press **SIZE** and adjust the top, bottom, left and right areas half way outward from the horizontal and vertical center lines.
- Press **LN** and adjust the top, bottom, left and right areas to the edge of the image and recheck the size adjustment.
- Press **EDGE LN** and adjust the left and right extreme edges and recheck the linearity and size adjustment.
- Press **KEY** and adjust the horizontal and vertical keystones within each quadrant.
- Press **PIN** and adjust the horizontal and vertical pincushions within the extreme corner of each quadrant.

9.4GUIDED REGISTRATION PREFACE:

The Guided Setup Program is sequenced in such a way as to optimize the registration operation of this system. The program will, as mentioned earlier, select the proper function, turn registration off and on, highlight the appropriate area of adjustment and if available and required will provide a brief explanation of the active function. Section 9.4.1 provides a hard copy of the sequence used in the Guided mode of operation. Additional information is provided is the Registration sequence block, such as function identification, appropriate adjustment keys, required test pattern and the Remote Control random access keystrokes, refer to example below:

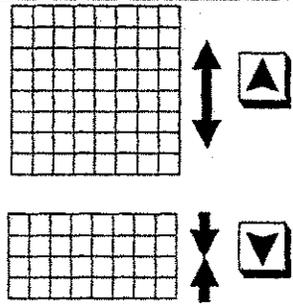
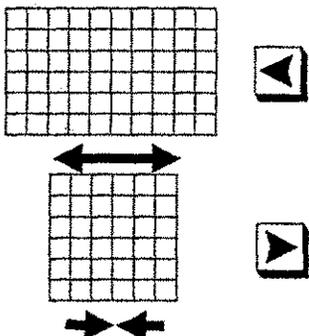
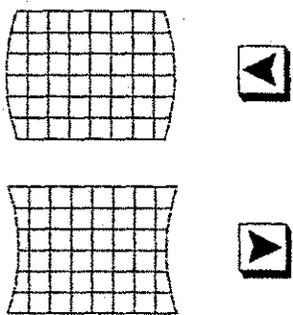
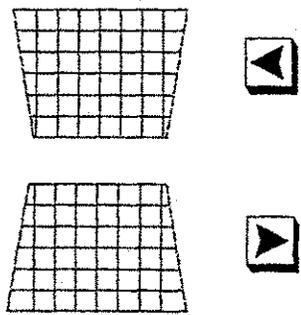


9.4.1GUIDED REGISTRATION PROCEDURE/SEQUENCE:

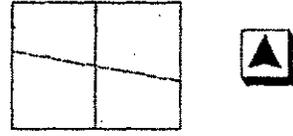
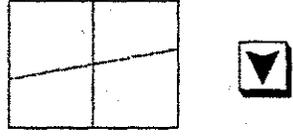
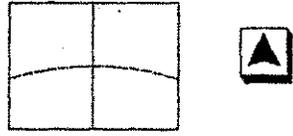
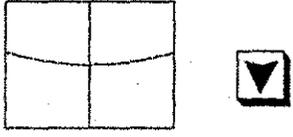
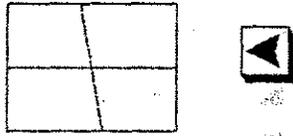
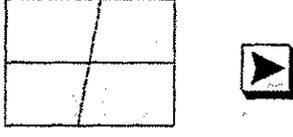
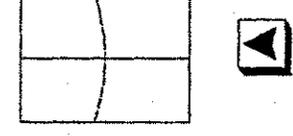
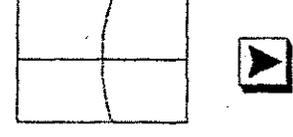
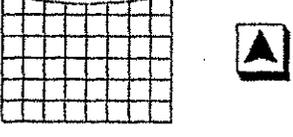
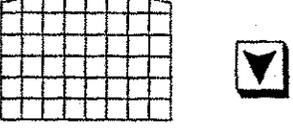
9.4.2 MASTER (GREEN) IMAGE ADJUSTMENTS:

<p>STEP 1.</p> <p><u>MASTER VERTICAL LINEARITY:</u></p> <p>Use the or arrow keys and adjust until the squares from top to bottom of the image are equal in height.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> </p>	
<p>STEP 2.</p> <p><u>MASTER VERTICAL SHIFT¹:</u></p> <p>Use the or arrow keys and adjust the image until it is centered on the screen. DO NOT OVERSCAN THE FACE OF THE CRT.</p> <p><u>RANDOM ACCESS KEYS²:</u></p> <p> </p> <p>NOTE 1: REPEAT STEPS 1 AND 2 AS REQUIRED.</p> <p>NOTE 2: SELECTION OF A COLOR KEY IS REQUIRED ONLY ONCE.</p>	

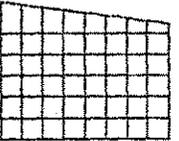
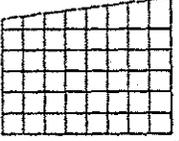
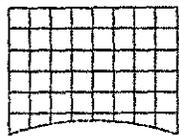
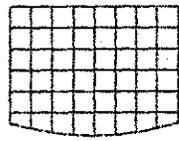
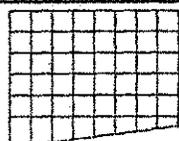
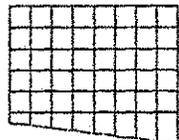
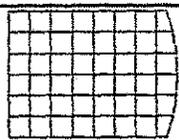
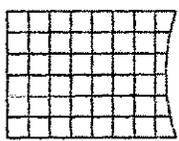
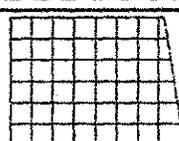
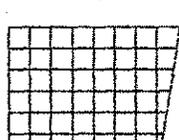
9.4.2. MASTER (GREEN) IMAGE ADJUSTMENTS: (CONTINUED)

<p>STEP 3.</p> <p><u>MASTER VERTICAL SIZE:</u></p> <p>Use the  or  key and adjust until the proper height is achieved. DO NOT OVERSCAN FACE OF CRT!</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> </p> <p>NOTE: TEST PATTERN WILL VARY DEPENDING ON PROGRAM SELECTED .</p>	 <p>VERTICAL SIZE OPERATION IS BEST ADJUSTED WHILE DISPLAYING THE EXTERNAL SOURCE VIDEO.</p>
<p>STEP 4.</p> <p><u>MASTER HORIZONTAL SIZE:</u></p> <p>Use the  or  key and adjust until the proper width is achieved. DO NOT OVERSCAN FACE OF CRT!</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> </p> <p>NOTE: TEST PATTERN WILL VARY DEPENDING ON PROGRAM SELECTED .</p>	 <p>HORIZONTAL SIZE OPERATION IS BEST ADJUSTED WHILE DISPLAYING THE EXTERNAL SOURCE VIDEO.</p>
<p>STEP 5.</p> <p><u>MASTER STATIC E-W PINCUSHION: (REGISTRATION "OFF")</u></p> <p>Use the  or  key and adjust the right edge until it does not bow in or out</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> </p>	
<p>STEP 6.</p> <p><u>MASTER STATIC KEYSTONE: (REGISTRATION "OFF")</u></p> <p>Use the  or  key and adjust the right side of the image until it is parallel with the vertical axis of the screen.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> </p>	

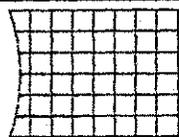
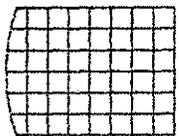
9.4.2. . . . MASTER (GREEN) IMAGE ADJUSTMENTS: (CONTINUED)

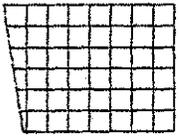
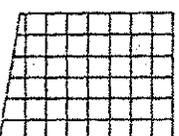
<p>STEP 7.</p> <p><u>MASTER HORIZONTAL SKEW:</u></p> <p>Use the  or  arrow keys and adjust the green horizontal line until it is parallel to the horizontal center line of the screen.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> </p>	 
<p>STEP 8.</p> <p><u>MASTER HORIZONTAL BOW:</u></p> <p>Use the  or  arrow keys and adjust the green horizontal center line until it is straight.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> </p>	 
<p>STEP 9.</p> <p><u>MASTER VERTICAL SKEW:</u></p> <p>Use the  or  arrow keys and adjust the green vertical center line until it is parallel to the vertical axis of the screen.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> </p>	 
<p>STEP 10.</p> <p><u>MASTER VERTICAL BOW:</u></p> <p>Use the  or  arrow keys and adjust the green vertical center line until it is straight.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> </p>	 
<p>STEP 11.</p> <p><u>MASTER TOP PINCUSHION:</u></p> <p>Use the  or  arrow keys and adjust until the top horizontal line does not bow up or down.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p>  </p>	 

9.4.2. MASTER (GREEN) IMAGE ADJUSTMENTS: (CONTINUED)

<p>STEP 12.</p> <p><u>MASTER TOP KEYSTONE:</u></p> <p>Use the ▲ or ▼ arrow keys and adjust the top horizontal line until it is parallel with the top horizontal edge of the screen.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p>  </p>	   
<p>STEP 13.</p> <p><u>MASTER BOTTOM PINCUSHION:</u></p> <p>Use the ▲ or ▼ arrow keys and adjust the bottom horizontal line until it does not bow up or down.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p>  </p>	   
<p>STEP 14.</p> <p><u>MASTER BOTTOM KEYSTONE:</u></p> <p>Use the ▲ or ▼ arrow keys to adjust the bottom horizontal line until it is parallel to the bottom horizontal edge of the screen.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p>  </p>	   
<p>STEP 15.</p> <p><u>MASTER RIGHT PINCUSHION:</u></p> <p>Use the ◀ or ▶ arrow keys and adjust until the right edge of the image does not bow in or out.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p>  </p>	   
<p>STEP 16.</p> <p><u>MASTER RIGHT KEYSTONE:</u></p> <p>Use the ◀ or ▶ arrow keys and adjust the right outermost vertical line until it is parallel to the vertical edge of the screen.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p>  </p>	   

9.4.2. MASTER (GREEN) IMAGE ADJUSTMENTS: (CONTINUED)

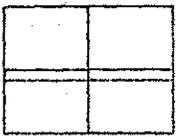
<p>STEP 17.</p> <p><u>MASTER LEFT PINCUSHION:</u></p> <p>Use the  or  arrow keys and adjust the left edge of the image until it does not bow in or out.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p>  </p>	   
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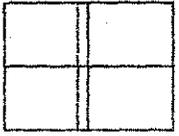
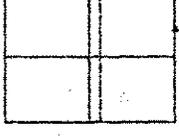
<p>STEP 18.</p> <p><u>MASTER LEFT KEYSTONE:</u></p> <p>Use the  or  arrow keys and adjust the left outer most vertical line until it is parallel to the vertical edge of the screen.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p>  </p>	   
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————— END OF MASTER (GREEN) ADJUSTMENTS —————

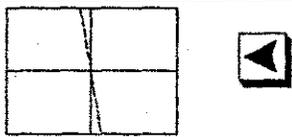
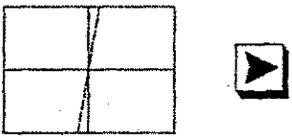
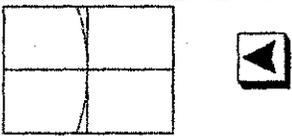
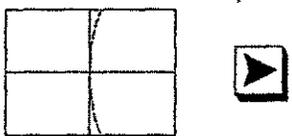
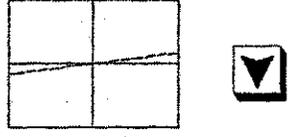
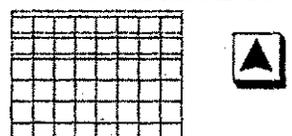
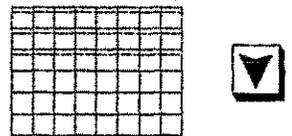
9.4.2.1 RED AND BLUE IMAGE ADJUSTMENTS:

The adjustments used in this section are for both RED and BLUE images.

<p>STEP 1.</p> <p><u>VERTICAL SHIFT</u></p> <p>Use the  or  arrow keys and adjust until the center horizontal line exactly overlays the center horizontal line in the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR  </p>	   
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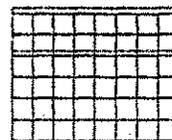
<p>STEP 2.</p> <p><u>HORIZONTAL SHIFT:</u></p> <p>Use the  or  arrow keys and adjust until the center vertical line exactly overlays the the center vertical line of the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR  </p>	   
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9.4.2.1RED AND BLUE IMAGE ADJUSTMENTS (CONTINUED):

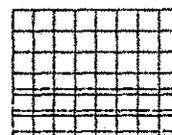
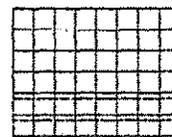
<p>STEP 3.</p> <p><u>VERTICAL SKEW:</u></p> <p>Use the  or  arrow keys and adjust until the center vertical line overlays the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR  </p>	 
<p>STEP 4.</p> <p><u>VERTICAL BOW :</u></p> <p>Use the  or  arrow keys and adjust until the center vertical line is straight.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR  </p>	 
<p>STEP 5.</p> <p><u>HORIZONTAL SKEW:</u></p> <p>Use the  or  arrow keys and adjust until the center horizontal line overlays the center horizontal line of the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR  </p>	 
<p>STEP 6.</p> <p><u>HORIZONTAL BOW:</u></p> <p>Use the  or  arrow keys and adjust until the center horizontal line is straight.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR  </p>	 
<p>STEP 7.</p> <p><u>TOP VERTICAL HEIGHT:</u></p> <p>Use the  or  arrow keys and adjust until the inner 2/3 of the top half overlays the inner 2/3 of the top half of the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR   </p>	 

9.4.2.1 RED AND BLUE IMAGE ADJUSTMENTS (CONTINUED):**STEP 8.****TOP VERTICAL LINEARITY:**

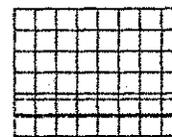
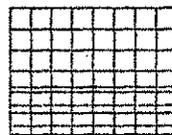
Use the  or  arrow keys and adjust the **top edge** until it overlays the top edge of the reference color. **NOTE:** Repeat steps 7 and 8 to optimize the top center and top edge convergence.

RANDOM ACCESS KEYS:**STEP 9.****BOTTOM VERTICAL HEIGHT :**

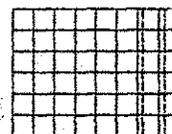
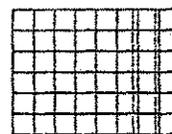
Use the  or  keys and adjust until the inner $\frac{2}{3}$ of the bottom half overlays the inner $\frac{2}{3}$ of the bottom half of the reference color.

RANDOM ACCESS KEYS:**STEP 10.****BOTTOM VERTICAL LINEARITY:**

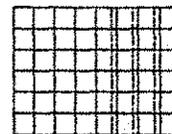
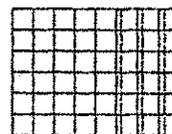
Use the  or  arrow keys and adjust the **bottom edge** until it overlays the bottom edge of the reference color. **NOTE:** Repeat Steps 9 and 10 to optimize the bottom center and edge convergence.

RANDOM ACCESS KEYS:**STEP 11****RIGHT HORIZONTAL LINEARITY:**

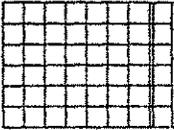
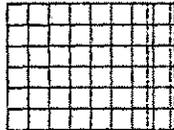
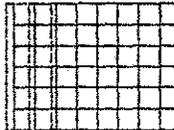
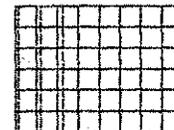
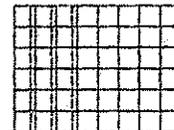
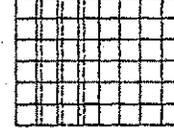
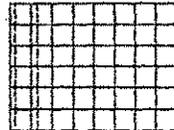
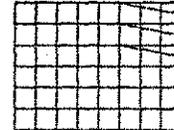
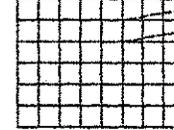
Use the  or  arrow keys and adjust the **right edge** until it overlays the right edge of the reference color.

RANDOM ACCESS KEYS:**STEP 12****RIGHT WIDTH:**

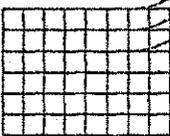
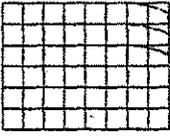
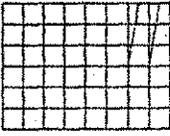
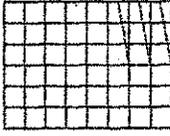
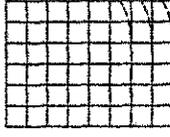
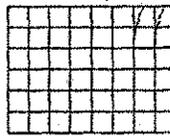
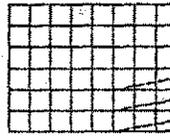
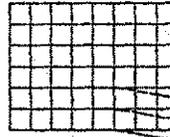
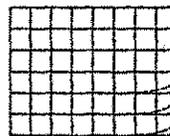
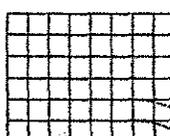
Use the  or  key and adjust the **right inner $\frac{2}{3}$** until it overlays the right inner $\frac{2}{3}$ of the reference color.

RANDOM ACCESS KEYS:

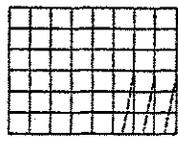
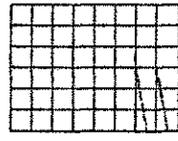
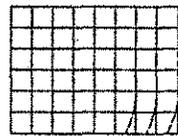
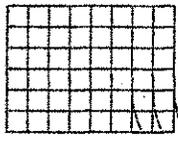
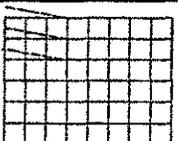
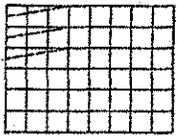
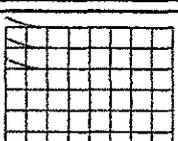
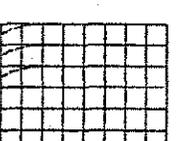
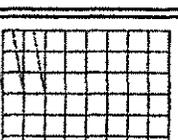
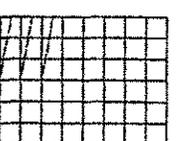
9.4.2.1 RED AND BLUE IMAGE ADJUSTMENTS (CONTINUED):

<p>STEP 13. <u>RIGHT HORIZONTAL EDGE LINEARITY:</u> Use the or arrow keys and adjust the right outer edge until it overlays the right outer edge of the reference color. NOTE: Repeat Steps 11, 12 and 13 to optimize the right center/ edge convergence.</p> <p><u>RANDOM ACCESS KEYS:</u> OR </p>	   
<p>STEP 14. <u>LEFT HORIZONTAL LINEARITY:</u> Use the or arrow keys and adjust until the left edge overlays the left edge of the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u> OR </p>	   
<p>STEP 15. <u>LEFT WIDTH:</u> Use the or arrow keys and adjust until the left inner 2/3 overlays the left inner 2/3 of the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u> OR </p>	   
<p>STEP 16. <u>LEFT HORIZONTAL EDGE LINEARITY:</u> Use the or arrow keys and adjust the left outer edge until it overlays the left outer edge of the reference color. NOTE: Repeat Steps 14, 15 and 16 to optimize the left center/edge convergence.</p> <p><u>RANDOM ACCESS KEYS:</u> OR </p>	   
<p>STEP 17. <u>TOP RIGHT VERTICAL KEystone:</u> Use the or arrow keys and adjust the top horizontal line until it is straight and overlays the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u> OR </p>	   

9.4.2.1RED AND BLUE IMAGE ADJUSTMENTS:(CONTINUED)

<p>STEP 18. TOP RIGHT VERTICAL PINCUSHION:</p> <p>Use the ▲ or ▼ arrow keys and adjust the top horizontal line until it is straight and overlays the reference color.</p> <p>RANDOM ACCESS KEYS:</p> <p>RED OR BLUE PIN </p>	 ▲  ▼
<p>STEP 19. TOP RIGHT HORIZONTAL KEYSTONE:</p> <p>Use the ◀ or ▶ arrow keys and adjust the outermost vertical line until it is straight and overlays the reference color.</p> <p>RANDOM ACCESS KEYS:</p> <p>RED OR BLUE KEY </p>	 ◀  ▶
<p>STEP 20. TOP RIGHT HORIZONTAL PINCUSHION:</p> <p>Use the ◀ or ▶ arrow keys and adjust the outermost vertical line until it is straight and overlays the reference color.</p> <p>RANDOM ACCESS KEYS:</p> <p>RED OR BLUE PIN </p>	 ◀  ▶
<p>STEP 21. BOTTOM RIGHT VERTICAL KEYSTONE:</p> <p>Use the ▲ or ▼ arrow keys and adjust the top horizontal line until it is straight and overlays the reference color.</p> <p>RANDOM ACCESS KEYS:</p> <p>RED OR BLUE KEY </p>	 ▲  ▼
<p>STEP 22. BOTTOM RIGHT VERTICAL PINCUSHION:</p> <p>Use the ▲ or ▼ key and adjust the top horizontal line until it is straight and overlays the reference color.</p> <p>RANDOM ACCESS KEYS:</p> <p>RED OR BLUE PIN </p>	 ▲  ▼

9.4.2.1RED AND BLUE IMAGE ADJUSTMENTS:(CONTINUED)

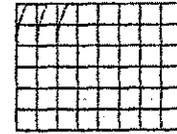
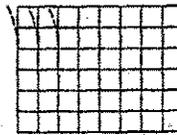
<p>STEP 23.</p> <p><u>BOTTOM RIGHT HORIZONTAL KEYSTONE:</u></p> <p>Use the  or  arrow keys and adjust the outermost vertical line until it is straight and overlays the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR   </p>	   
<p>STEP 24.</p> <p><u>BOTTOM RIGHT HORIZONTAL PINCUSHION:</u></p> <p>Use the  or  arrow keys and adjust the outermost vertical line until it is straight and overlays the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR   </p>	   
<p>STEP 25.</p> <p><u>TOP LEFT VERTICAL KEYSTONE:</u></p> <p>Use the  or  arrow keys and adjust the top horizontal line until it is straight and overlays the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR   </p>	   
<p>STEP 26.</p> <p><u>TOP LEFT VERTICAL PINCUSHION:</u></p> <p>Use the  or  arrow keys and adjust the top horizontal line until it is straight and overlays the top horizontal line in the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR   </p>	   
<p>STEP 27.</p> <p><u>TOP LEFT HORIZONTAL KEYSTONE:</u></p> <p>Use the  or  arrow keys and adjust the outermost vertical line until it is straight and overlays the reference color.</p> <p><u>RANDOM ACCESS KEYS:</u></p> <p> OR   </p>	   

9.4.2.1RED AND BLUE IMAGE ADJUSTMENTS:(CONTINUED)

STEP 28.

TOP LEFT HORIZONTAL PINCUSHION:

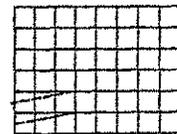
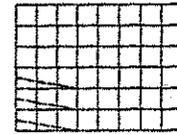
Use the  or  key and adjust the **outermost vertical line** until it is straight and overlays the outermost vertical line in the reference color.

RANDOM ACCESS KEYS:

STEP 29.

BOTTOM LEFT VERTICAL KEYSTONE:

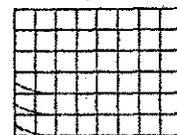
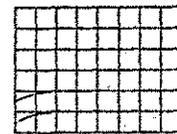
Use the  or  keys and adjust the **bottom horizontal line** until it is straight and overlays the bottom horizontal line of the reference color.

RANDOM ACCESS KEYS:

STEP 30.

BOTTOM LEFT VERTICAL PINCUSHION:

Use the  or  arrow keys and adjust the **top horizontal line** until it is straight and overlays the reference color.

RANDOM ACCESS KEYS:

STEP 31.

BOTTOM LEFT HORIZONTAL KEYSTONE:

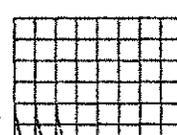
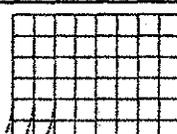
Use the  or  key and adjust the **outermost vertical line** until it is straight and overlays the outermost vertical line of the reference color.

RANDOM ACCESS KEYS:

STEP 32.

BOTTOM LEFT HORIZONTAL PINCUSHION:

Use the  or  arrow keys and adjust the **outermost vertical line** until it is straight and overlays the reference color.

RANDOM ACCESS KEYS:

NOTES:

Chapter 10

RS - 232 INTERFACE DATA

10.1GENERAL:

The ESPRIT Video/Computer Graphics display system features duplex RS-232 communication network capability. The projectors can be controlled from a remote, a computer or modem using RS-232 and ASCII characters. Display systems can be looped together so that multiple display systems and switchers can be addressed and controlled by one central source. Refer to Figure 10-1 for network configuration example.

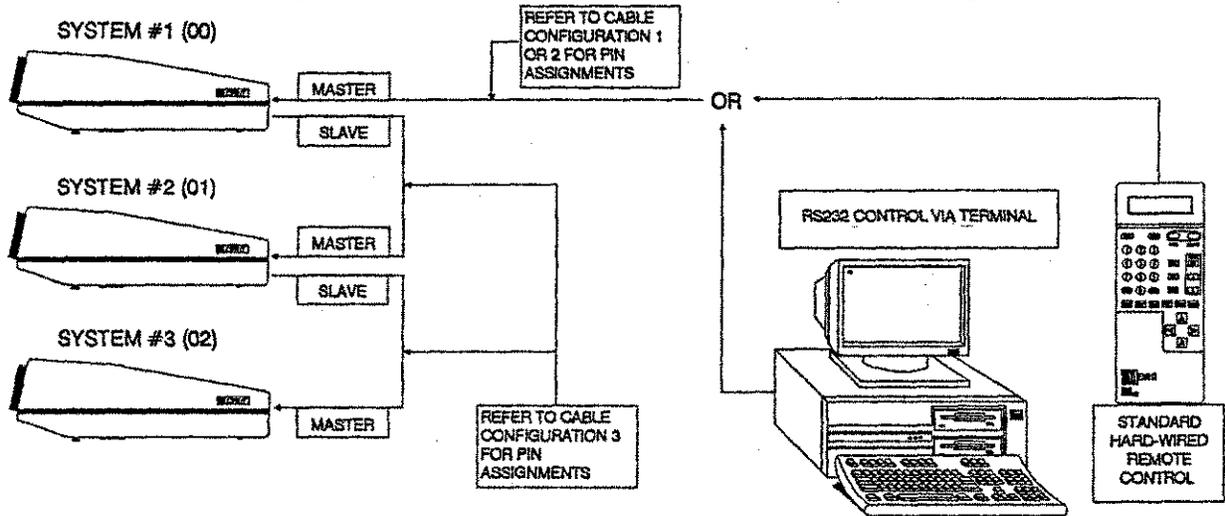


FIGURE 10-1. Multiple system control configuration.

10.2HEXADECIMAL SWITCH CONFIGURATIONS:

The system has three hexadecimal rotary switches located on the CPU module (figure 10-2) These switches may be accessed by removing the top cover. The switches are marked S1, S2 and S3. The switch closest to the rear panel (S1) and the center switch (S2) are used to assign the individual projector number to each unit installed in a network of multiple systems. Refer to Table 10-2 for setting S1 and S2. The third switch from the rear panel is S3 and determines the baud rate. See table 10-1 for baud rate information.

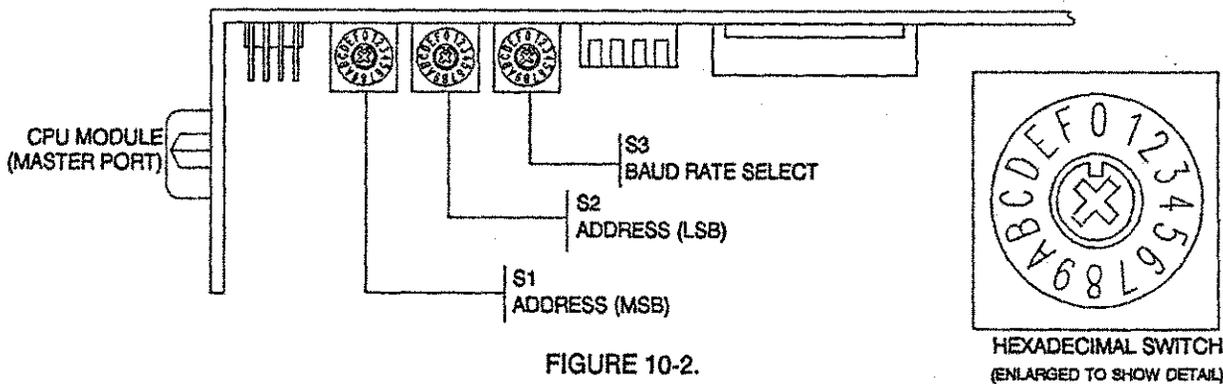


FIGURE 10-2.

HEXADECIMAL SWITCH (ENLARGED TO SHOW DETAIL)

HEXADECIMAL SWITCHES S1 (ADDRESS), S2 (ADDRESS) AND S3 (BAUD RATE).

10.2.1 . . . SWITCH 3 (S3) CONFIGURATION:

S3 POSITION	BAUD RATE	S3 POSITION	BAUD RATE
0	9600 CTS/RTS handshaking disabled	8	9600 CTS/RTS handshaking enabled
1	4800 CTS/RTS handshaking disabled	9	4800 CTS/RTS handshaking enabled
2	2400 CTS/RTS handshaking disabled	A	2400 CTS/RTS handshaking enabled
3	1200 CTS/RTS handshaking disabled	B	1200 CTS/RTS handshaking enabled
4	600 CTS/RTS handshaking disabled	C	600 CTS/RTS handshaking enabled
5	300 CTS/RTS handshaking disabled	D	300 CTS/RTS handshaking enabled
6	150 CTS/RTS handshaking disabled	E	150 CTS/RTS handshaking enabled
7	19.2k CTS/RTS handshaking disabled	F	19.2k CTS/RTS handshaking enabled

TABLE 10-1. BAUD RATE SELECTIONS.

NOTE 1: NORMAL POSITION FOR S3 WHEN USING THE STANDARD HARD-WIRED REMOTE CONTROL IS "0."

NOTE 2: The system will operate reliably with a maximum cable length of 125 ft. (3.8m) at the normal baud rate of 9600 (S3=0). For greater cable lengths contact the factory for special instructions.

10.2.1.1 . . . HANDSHAKE SIMULATION:

Located on the CPU module are two jumpers labeled LK1 and LK2. These jumpers are used for simulating the DTR - DSR handshaking signal. When using one system or in a multiple system configuration, LK1 and LK2 are installed in the individual unit or in the last unit of the network. See figure 10-3 for location of LK1 and LK2.

One example of using LK1 and LK2 in a network is to ensure the integrity of the cabling between systems. With LK1/LK2 installed in the last system of the network and no handshake response is reflected to the host unit, this is seen as a cabling fault within the network.

NOTE: Refer to your particular host unit requirements for the proper LK1/LK2 configuration.

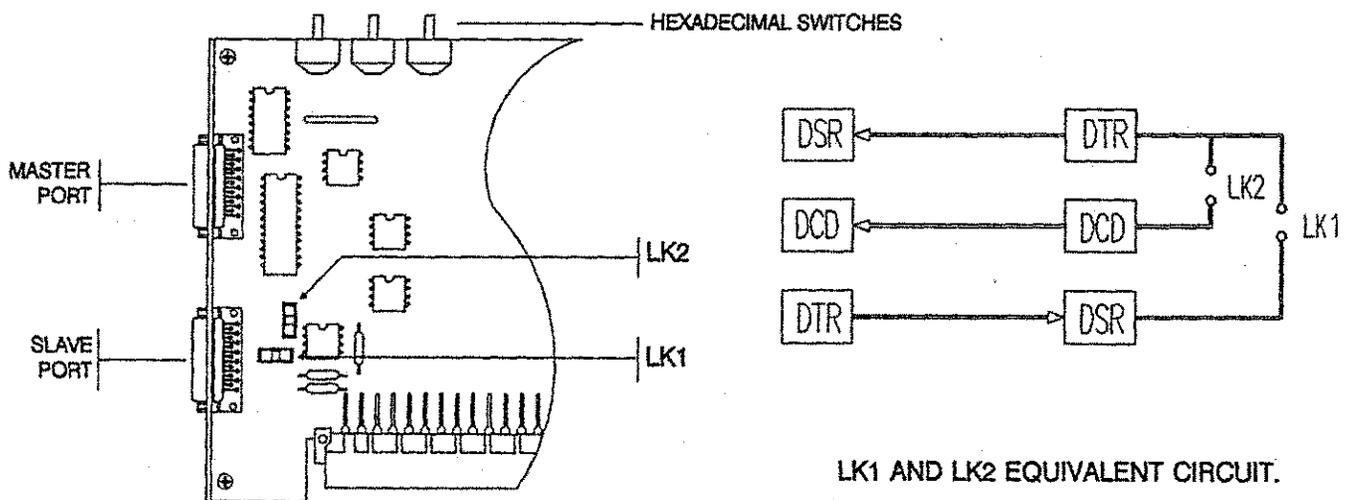


FIGURE 10-3.

JUMPERS LK1 AND LK2 LOCATION (CPU MODULE).

10.2.2 SETTING SWITCH 1 AND 2:

As mentioned earlier, S1 and S2 will select the unit's particular address or unit number, which is a requirement whether using one or multiple systems. In a singular system configuration or a multiple system network the first unit the switches must be set as 0(S1) and 0(S2). Refer to table 10-2 for multiple system operation numbering and figure 10-1 for the COMPUTER - MASTER - PROJECTOR - SLAVE relationship.

NOTE 1: To determine the presently active unit, simply press the **UNIT** button.

NOTE 2: Table 10-2 Indicates a 32 unit numbering sequence out of a maximum of 256 systems in a network. Refer to a Decimal-to-Hexadecimal conversion chart for higher hexadecimal equivalents.

UNIT NUMBER	POSITION										
	S1	S2									
1	0	0	9	0	8	17	1	0	25	1	8
2	0	1	10	0	9	18	1	1	26	1	9
3	0	2	11	0	A	19	1	2	27	1	A
4	0	3	12	0	B	20	1	3	28	1	B
5	0	4	13	0	C	21	1	4	29	1	C
6	0	5	14	0	D	22	1	5	30	1	D
7	0	6	15	0	E	23	1	6	31	1	E
8	0	7	16	0	F	24	1	7	32	1	F

TABLE 10-2. Hexadecimal switches S1/S2 configurations.

10.3 MASTER/SLAVE PORT AND RS-232 CABLE PIN ASSIGNMENTS:

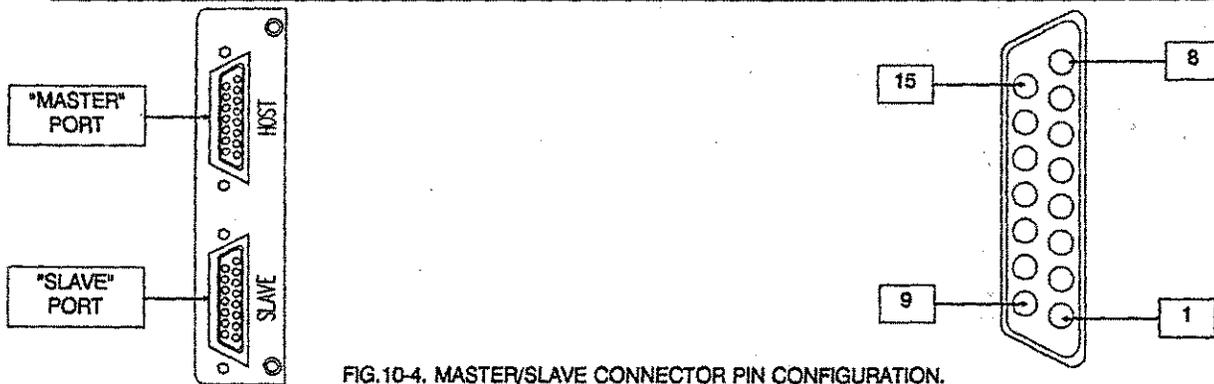


FIG.10-4. MASTER/SLAVE CONNECTOR PIN CONFIGURATION.

PIN	HOST	SLAVE	PIN	HOST	SLAVE
1	GND	GND	9	N/C	NC
2	TXD	RXD	10	N/C	N/C
3	RXD	TXD	11	Vraw	N/C
4	RTS	CTS	12	Vraw	N/C
5	CTS	RTS	13	N/C	N/C
6	DTR	N/C	14	N/C	N/C
7	GND	GND	15	DSR	DSR
8	DCD	DCD			

TABLE 10-3.

Master and Slave connectors (ports) pin assignments.

10.3.1 CABLE CONFIGURATION 1: HOST TO PROJECTOR:

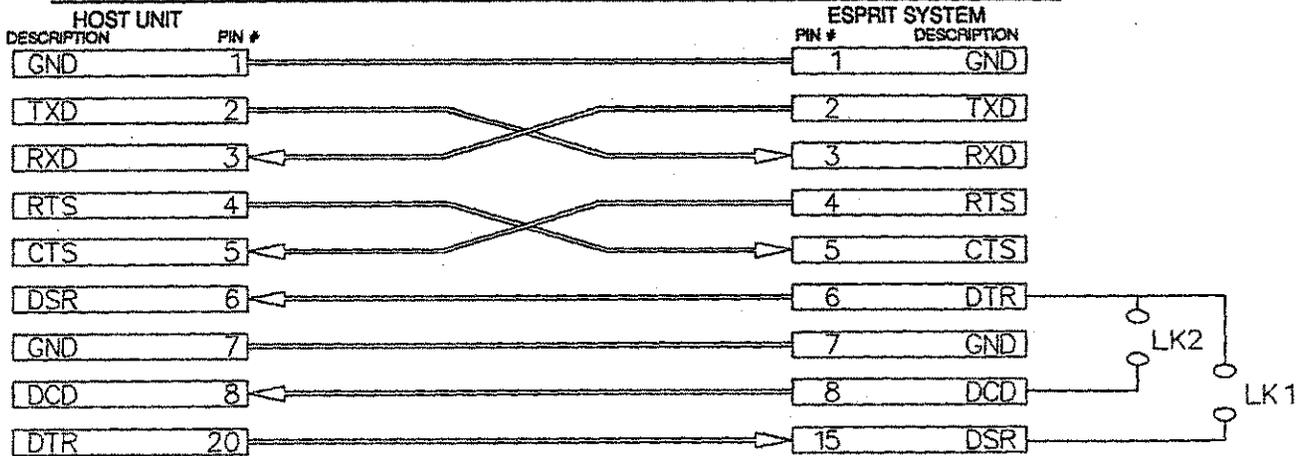


TABLE 10-4. DB25 (HOST) TO DB15 (PROJECTOR) CABLE.

10.3.2 CABLE CONFIGURATION 2: IBM® PC TO PROJECTOR:

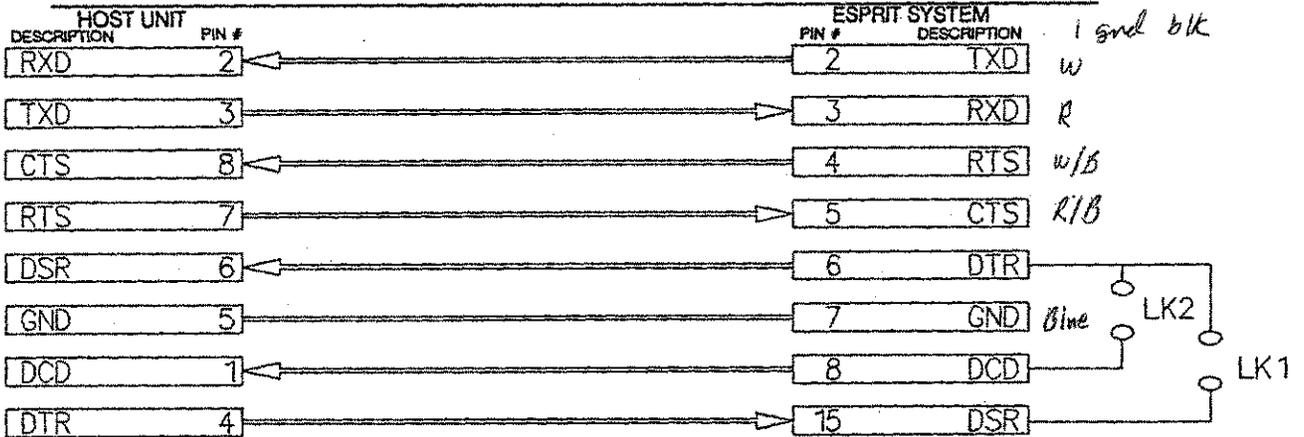


TABLE 10-5. DB9 (HOST) TO DB15 (PROJECTOR) CABLE.

10.3.3 CABLE CONFIGURATION 3: PROJECTOR TO PROJECTOR

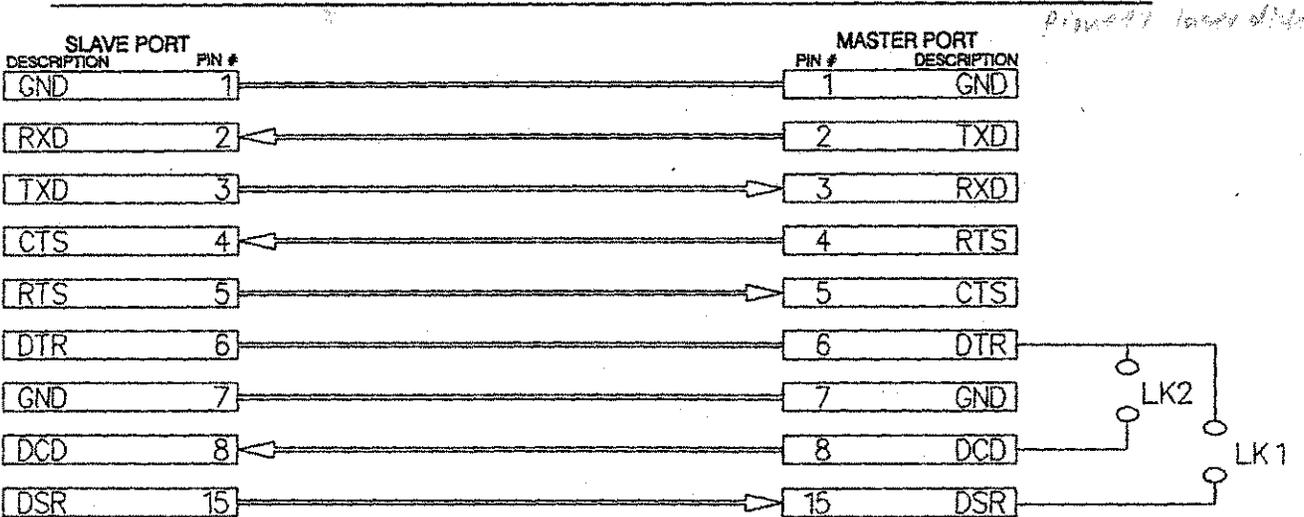


TABLE 10-6. DB15 (ESPRIT) TO DB15 (ESPRIT) CABLE.

10.4 RS-232 OPERATION:

10.4.1 MODE SELECTION COMMANDS:

A Analog RGB mode select command	R Test mode select command
T TTL or RGB2 mode select command	\$ Help mode select command
V Video mode select command	

NOTE: Refer to Chapter 7 for additional information on the above modes of operation.

10.4.2 ADJUSTMENT MODE COMMANDS:

B Brightness adjust mode command	P Contrast adjust mode command
C Color adjust mode command	+ Up arrow command
D Detail adjust mode command	< Left arrow command
E Phase adjust mode command	- Down arrow command
H Tint adjust mode command	> Right arrow command

The adjustment mode commands have two modes of operation. The first uses the arrow keys to increment or decrement the adjustment which has been selected previously by one of the above keys. For example, if you wish to increase the brightness level, transmit a B, then transmit + until you have the desired brightness level.

NOTE: When one of the adjustment mode select commands is received, the system responds by transmitting the present level of the desired adjustment.

The second mode of operation allows you to set the level of the desired adjustment directly by transmitting an integer value in the range 0 - 100 followed by the appropriate adjustment character. For example, to set the tint level to a 75% level, you would transmit 75H. NOTE: Due to limitations, rounding of the actual entry may occur, i.e. 75% = 74% .

10.4.3 TOGGLE COMMANDS:

c Cutoff command. This command is used in conjunction with one of the color keys e.g. **cd**, Cutoff Red CRT. To restore the Red CRT transmit **cd** a second time. Use **ce** for green and **cf** for blue cutoff commands.

K Registration ON/OFF command. With registration on, the first **K** will turn registration "OFF" and the second **K** will turn registration "ON."

O Power ON/OFF command. If the system is "OFF": the first **O** will turn the system "ON" and the second **O** will turn the system "OFF."

10.4.3TOGGLE COMMANDS (CONTINUED)

Q Channel protect command. This allows the user to protect the settings stored in a particular channel location. Refer to Chapter 7, Section 3, Page 7-6, for information on setting channel parameters.

X RED CUTOFF command. This command is similar to the previous command **cd**. The first **X** will turn the RED CRT "OFF", presuming it was on, and the second **X** will turn the RED CRT "ON."

Y GREEN CUTOFF command. This is similar to using the **ce** command. Use the **Y** character to toggle the GREEN CRT "ON and OFF."

Z BLUE CUTOFF command. This command is the same as using the **cf** command. Toggle the BLUE CRT "ON and OFF" using the **Z** character.

? Display diagnostic status. This command is used to display the diagnostic capability of the system. Transmit the **?** character a second time to disable the diagnostic display.

10.4.4NUMERIC COMMANDS:

I CHANNEL command. This command is preceded by an individual channel location number. Refer to Chapter 7, Section 3, Page 7-5 for additional information on recalling channels.

CODE command. This command is preceded by an specific code. Refer to Chapter 7, Section 17, Page 7-11, for code identification and operation, e.g. to display time of day, transmit **10#**.

= UNIT command. This command is used to address an individual unit number or use command **256=** to address all systems in a network. Refer to Chapter 7, Section 4, Page 7-6 for additional information and operation.

10.4.5NETWORK COMMANDS:

: Global listen command. Causes all projectors in a network to listen and respond to commands at the same time. This mode of operation continues until another projector is selected to listen, or until a global un-listen command is received. When in the global mode, only the projector with address "01" (switch settings "00") will respond with messages.

; Global un-listen command. All projectors are commanded to not respond until a unit number has been selected or a global listen command is given.

10.4.6EXPLICIT COMMANDS:

(STANDBY "ON" command. This character is used to place the system into a standby mode of operation.

) STANDBY "OFF" command. This character is used in conjunction with the STANDBY "ON" command).

[POWER "ON" command. This command will enable you to turn "ON" the system.

] POWER "OFF" command. This command is used in conjunction with the POWER "ON" command [.

10.4.7REGISTRATION COMMANDS:

The registration commands listed in table 7A and 7B are used in the same manner as outlined in Chapter 7. The lower case letters from "a" through "w" are assigned for registration commands.

The adjustment method is performed by using the +, -, < or > characters, e.g. to adjust the right edge linearity of the red image transmit "dms", then adjust by transmitting "<" or ">" characters (dms<) or (dms>).

- NOTE: When using the registration commands the system will respond with the selected area of adjustment, selected color and selected function.

10.4.8MISCELLANEOUS COMMANDS:

L Display revision level command. With this command it is possible to determine the current ROM revision level and date of the operating system.

N Next test pattern command. This command is used in conjunction with the "R" command (TEST mode of operation.). While in the test mode of operation use the "N" character to step to the next available test pattern.

U Display active unit number. This command allows you to determine the number assigned to a unit, or to determine which unit is active within a network.

\n CLEAR command. This character emulates the CLEAR key on the remote control. Refer to (LINEFEED) Chapter 7, section 18, page 7-15 for additional information on the use of the clear command.

- REFER TO SECTION 10.5 FOR A QUICK REFERENCE TABLE FOR ALL OF THE RS232 COMMANDS.

10.5RS-232 COMMANDS / TABLE 7A and 7B:

ASCII CHARACTER COMMANDS					
ASCII KEY	COMMAND†	REMOTE KEY EQUIVALENT	ASCII KEY	COMMAND†	REMOTE KEY EQUIVALENT
a	STATIC		A	RGB	
b	DYNAMIC		B	BRIGHTNESS	
c	CUTOFF		C	COLOR	
d	RED		D	DETAIL	
e	GREEN		E	PHASE	
f	BLUE		F	RED SHIFT	 
g	SHIFT		G	BLUE SHIFT	 
h	SKEW		H	TINT	
i	BOW		I	Static Blue Vertical Shift	40 
j	KEYSTONE		J	Static Red Vertical Shift	41 
k	PINCUSHION		K	Registration On/Off (toggle)	55 
l	SIZE		L	Display revision level/date	35 
m	EDGE LINEARITY		M	Monochrome mode (toggle)	49 
n	LINEARITY		N	Next test pattern	
o	BLANKING		O	On/Off (toggle)	
p	TOP EDGE		P	CONTRAST	
q	BOTTOM EDGE		Q	Channel protect (toggle)	20 
r	LEFT EDGE		R	TEST	
s	RIGHT EDGE		S	STANDBY (toggle)	
t	TOP LEFT QUAD		T	[A]	
u	TOP RIGHT QUAD		U	Display active unit number	

TABLE 10-7A.

ASCII character commands and remote control equivalent.
†REFER TO SECTION 10.4 FOR OPERATION OF THE ASCII COMMANDS.

10.5RS-232 COMMANDS / TABLE 7A AND 7B (CONTINUED)

ASCII CHARACTER COMMANDS					
ASCII KEY	COMMAND†	REMOTE KEY EQUIVALENT	ASCII KEY	COMMAND†	REMOTE KEY EQUIVALENT
v	BOTTOM LEFT QUAD		V	[B]	
w	BOTTOM RIGHT QUAD		W	NOT USED	NOT USED
x	NOT USED	NOT USED	X	RED CUTOFF (toggle)	
y	NOT USED	NOT USED	Y	GREEN CUTOFF (toggle)	
z	NOT USED	NOT USED	Z	BLUE CUTOFF (toggle)	
\n	CLEAR (LINEFEED)		-	DOWN ARROW	
	CHANNEL		>	RIGHT ARROW	
#	CODE		:	Global listen	256 
\$	HELP		=	UNIT	
(Standby "ON"	NOT USED	?	Display diagnostic (toggle)	30 
)	Standby "OFF"	NOT USED	[Power "ON"	NOT USED
+	UP ARROW	]	Power "OFF"	NOT USED
<	LEFT ARROW				

TABLE 10-7B.

ASCII CHARACTER COMMANDS AND REMOTE EQUIVALENT.

† Refer to section 10.4 for operation of the ASCII commands.

NOTES:

Chapter 11

PREVENTATIVE MAINTENANCE AND SYSTEM TROUBLE SHOOTING

11.1PREVENTATIVE MAINTENANCE:

- 1. Avoid direct sunlight, moisture, heat and improper mounting.
- 2. Provide sufficient ventilation to the rear and bottom two fans to avoid overheating of internal components.
- 3. Clean and maintain the three fans , one on the rear panel and two on the bottom side, to avoid restriction of air flow and overheating of the system.



NOTE: Filters are provided for the bottom fans. Refer to section 11.2 for removing and cleaning of the filter media inserts.

- 4. Adjust your cleaning schedule according to your particular environment.
- 5. The Data/Graphic Display System may be kept in good condition by wiping it with a clean, soft, dry cloth. See section 11.3 for special lens care and cleaning.
- 6. For general safety, the system should be cleaned internally only by an authorized ESPRIT PROJECTION SYSTEMS (AmPro Corporation) service technician.
- 7. Do not place magnetic equipment near the system.

11.1.1PRECAUTIONS:



- 1. Secure service any time the Data/Graphics display system is damaged or fails. An obvious change in performance may also indicate a need for service.
- 2. Do not attempt to service this system yourself by opening or removing covers that may expose you to dangerous voltages or other hazards. Refer all servicing to qualified service personnel.
- 3. Remove the power plug from the wall socket when the Data/Graphics Display System is not functioning properly.

11.2 FAN FILTERS REMOVAL AND CLEANING:

The two filters on the bottom of the system are reusable and are provided to maintain a clean environment within the system. Please check the filters periodically and adjust your cleaning periods accordingly. In areas of heavy dust, smoke, or other environmental contaminants, the system will require more frequent cleaning periods, i.e. weekly, bimonthly, monthly, etc. To remove and clean the filter medias, follow the steps listed below.

- 1. Remove the filter retainer by pulling the sides with the catch apart. Refer to figure 11-1.
- 2. Remove the filter media from between the retainer and the guard. Refer to figure 11-2.
- 3. Clean the filter media by shaking or blowing. Ensure the filter is as clean as possible. DO NOT WASH.
- 4. Repeat steps 1 through 3 for each filter.
- 5. Place the filter media between the filter guard and the retainer. Push the retainer until the catches lock in place.

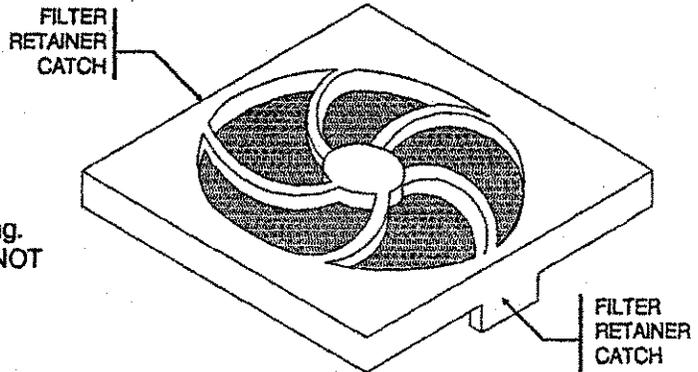


FIGURE 11-1.

FAN FILTER RETAINER, FILTER MEDIA.

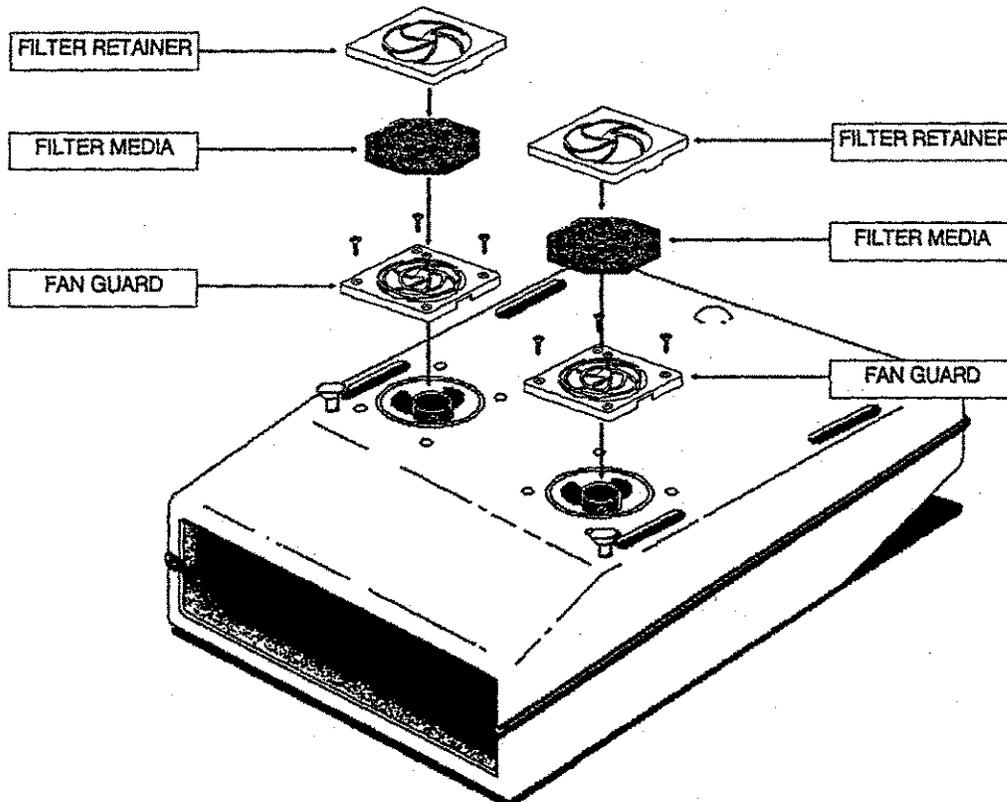


FIGURE 11-2.

BOTTOM FAN ASSEMBLIES (2 EA.).

11.3 LENS CARE AND CLEANING:

When your Video/Computer Graphics display system is not being used for prolonged periods of time, please cover the lenses with the lens covers provided with the system.

To minimize the possibility of damage to the optical coating or scratching the exposed lens surface, we recommend you first try to remove any material from the lens by blowing it off with deionized air or lightly brushing it with a soft camel's hair brush.

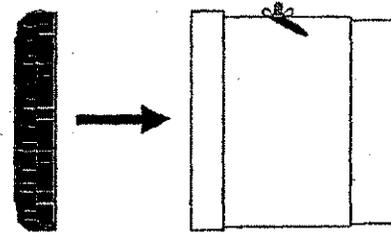


FIGURE 11-3. LENS COVER.

11.3.16-ELEMENT LENS CLEANING:

- 1. Do not spray any type of fluid directly on the lens surface.
- 2. Do not use any dry material to clean the surface (dry rag, tissue, etc.)
- 3. Use a commercial liquid window cleaner (e.g. Windex, Easy Off or Glass Plus). Do not use an aerosol. Other cleaning agents, such as laboratory grade acetone or ethyl-ether (70% - 30%) may also be used. If you are not sure of the cleaning agent, experiment with a small area of the lens first.
- 4. Use a lens tissue, a soft cotton cloth, or any soft facial tissue.
- 5. When using a window cleaner, moisten the tissue or cloth and lightly wipe the surface. Then dry with a new tissue.
- 6. When using acetone or ethyl-ether mixture, proceed as follows:

Fold the tissue or cloth several times to form a pad. Soak the folded end of the pad in the acetone. Starting at the diameter opposite to you immediately wipe the coated lens, with very little pressure, toward you in a straight line equal to the evaporation rate. This is important to prevent streaking and spotting. Start your wiping at one side of the lens and, with successive wipes, move to the other side. Turn the pad over for each wipe, then inside out. Do not make more than one wipe per clean area of pad. Be careful of the painted edge of the lens, since acetone will soften it.

11.3.28-ELEMENT LENS CLEANING:

Use the cleaning compound of ether (80%) plus Methanol (20%). This compound is to include minimum moisture.

- 1. Put the lens on a rotating device (if available.) Refer to figure 11-4.
- 2. Rotate the lens.
- 3. Use a soft lens tissue and apply a small amount of the cleaning compound indicated above.
- 4. Move the tissue straight and slowly from the center to the outer edges.
- 5. Repeat the above two to three times using a new lens tissue each time.
- 6. If you have heavy dirt built up on the lens surface, use acetone and then repeat the above procedure.

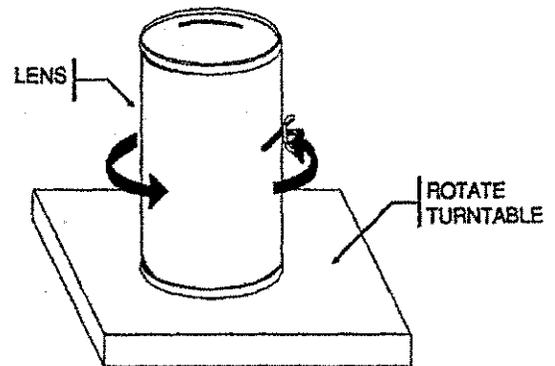


FIGURE 11-4.

8-ELEMENT LENS CLEANING USING A TURNABLE.

11.4TROUBLE SHOOTING:

SYMPTOM	POSSIBLE CAUSE	SOLUTION
The unit is connected to an A.C. outlet. The rocker switch is in the "ON" position. There is no LCD read-out.	Faulty line cord.	Replace line cord.
	Open mains fuse.	Replace mains fuse.
	Wrong voltage selected.	Select proper voltage and mains fuse.
	Hard wired Remote Control is not connected.	Connect remote control to "MASTER" port.
	Faulty Remote control or cable.	If available try another Remote control/cable.
No LCD read-out on Remote control and LCD back light functions properly.	Unit's address switches are not set properly.	Refer to Chapter 11, section 11.2.2
	Baud rate switch (S1) is not set properly.	Refer to Chapter 11, section 11.2.1
The LCD indicates model number. The system does not turn "ON" when the "POWER" button is pressed.	Remote control may be faulty.	If available try another remote control.
	If an extended cable is being used.	Remove extension cable from the circuit.
The projector is "ON". No error messages are displayed. No image is being projected.	Lens covers are still installed.	Remove lens covers.
	Unit is in the "STANDBY" mode.	Press the standby button.
	Wrong mode of operation is selected.	Select the proper mode of operation.
	Source is not turned "ON"	Enable source.
	Contrast level is too low.	Increase contrast level.
Blanking is not set properly.	Adjust top, bottom, left and right blanking levels.	

TABLE 11-1. TROUBLE-SHOOTING CHART.

11.5 ERROR MESSAGES:

The ESPRIT systems provide two sets of diagnostics messages which are displayed on the LCD read-out located on the standard hard-wired remote control to provide information about the projector mode and operational status.

One set of error messages that may be displayed are mode status error messages. Mode status error messages indicate a wrong function has been selected for the current mode of operation or the selected function can not be entered. An example of a mode status error message is as follows. When a particular channel number has been selected and an attempt to adjust brightness is made, an error message "WRITE PROTECTED" is displayed. This error message refers to a particular channel location and that the parameters of this channel has been established and placed inactive to avoid unwanted adjustments. Refer to section 11.5.1, tables 11-2A, 11-2B and 11-2C for additional mode status error messages.

The second set of error messages provided are operational status messages. This type of message provides information about the projector in case of a malfunction for either a voltage or wave form error.

When the system is connected to an active A.C. source and the rocker switch on the rear panel is turned on, the LCD will display "ESPRIT 2000D" or "ESPRIT 2000G" as the case may be. When the POWER button on the remote control is pressed, the system's LCD read-out will display "INITIALIZING," then display the last mode of operation used when the system was de-energized, if there are no malfunctions.

If there is a malfunction of the equipment the system will display an error message. An example of the sequence of messages you would get if the - 20V rail was missing is as follows. After the power button on the remote control is pressed, the first read-out would be "INITIALIZING" then "-20 VOLTS LO". This error process continues to cycle through all error messages applicable.

If for some reason the system has been turned on, the desired mode of operation has been selected and the appropriate source is active; however, no image is being projected and there are no diagnostic error messages being displayed on the LCD, use the enable status command 30 CODE. Refer to section 11.5.2 for additional operational status error messages.

11.5.1 MODE STATUS ERROR MESSAGES

ERROR MESSAGE	POSSIBLE CAUSE	SOLUTION
AUTO RESTART	System has momentarily loss A.C. line voltage or system was de-energized by main rocker switch.	System should power up as normal.
BAD NUMERIC CODE	Numeric code outside of range entered. range.	Enter numeric code within (10-79,909) Refer to Chapter 7, section 17.
BAD TTL MODE	TTL mode of operation outside of range entered .	Enter proper mode of operation. Refer to Chapter 7, section 15.

TABLE 11-2A. Mode status error message chart.

11.5.1MODE STATUS ERROR MESSAGES (CONTINUED)

ERROR MESSAGE	POSSIBLE CAUSE	SOLUTION
BAD VIDEO MODE	Video mode of operation outside of range entered.	Refer to Chapter 7, section 16 for desired mode of operation.
CHOOSE EDGE	Wrong area of adjustment selected for desired function.	Refer to Chapter 7, desired function.
DYNAMIC FUNCTION	Wrong operation for selected function.	Refer to Chapter 7, desired function.
ERROR # AT # (I ² C ERROR) (COMMUNICATION FAILURE)	Communication failure between internal modules.	Contact a service technician
ERROR CODE 1000	Call factory	Call factory
ERROR CODE 1001	Call factory	Call factory
ERROR CODE 1002	Call factory	Call factory
HI BEAM CURRENT	CRT protection mode of operation.	Toggle main power rocker switch OFF/ON. Restart system. If continuous, contact a service technician.
HVPS RESTART	Momentary protection from high voltage arcing occurred.	If continuous, contact a service technician.
HVPS SHUTDOWN	Loss of high voltage occurred.	Contact a service technician.
INVALID	Unrecognized command	Retry command.
INVALID CHANNEL	Channel number outside of range (1-50) entered.	Enter channel number within range.
INVALID TEST	Test number outside of range entered.	Refer to Chapter 7, section 12.
INVALID TIME	Time outside of range entered.	Enter time within range (24 hour clock)
INVALID VALUE	Value outside of range (0-100) entered.	Enter value of 0-100.

TABLE 11-2B. Mode status error message chart.

11.5.1MODE STATUS ERROR MESSAGES (CONTINUED)

ERROR MESSAGE	POSSIBLE CAUSE	SOLUTION
KEYS DISABLED	Registration adjustments are being attempted with "lock-out" feature activated.	To enable registration keys, enter 46 CODE.
MEMORY FAILURE	Loss of data occurred.	Re-enter all settings, channel numbers, registration settings, etc.
MUST BE IN NTSC	Function entered operates in the NTSC modes only.	Refer to Chapter 7, section 5-10, page 7-6
MUST BE IN RGB	Function entered pertains to the RGB mode of operation only.	Enter RGB and retry function.
MUST BE IN VIDEO	Function entered operates in the Video modes of operation only.	Refer to chapter 7, section 5-10, page 7-6
NOT INSTALLED OPEN INTERLOCK	Optional mode selected with no optional module installed. Missing or loose module/connector Install.	Refer to Chapter 1, section 1.1.1 or 1.1.6 Verify or re-seat all modules/ connectors.
OVER FREQUENCY	Source selected outside of specified frequency range.	Refer Chapter 1, table 1.
RED OR BLUE ONLY	Wrong area of adjustment selected for desired color.	Refer to Chapter 7, desired function.
RIGHT OR LEFT ONLY	Wrong area of adjustment selected for desired function.	Refer to Chapter 7, desired function.
SELECT QUADRANT	Wrong area of adjustment selected for desired function.	Refer to Chapter 7, desired function.
WRITE PROTECTED	Attempts to adjust predetermined parameters are being made to a channel location.	Refer to chapter 7 section 17.
WRONG DIRECTION	Wrong adjustment arrow selected for desired function.	Refer to Chapter 7 for desired function.

TABLE 11-2C. Mode status error message chart.

11.5.2 OPERATIONAL STATUS ERROR MESSAGES:

11.5.2.1 . . . HI OR LOW VOLTAGE ERROR MESSAGES:

If any of the following error messages are displayed, contact your selling dealer or the factory for assistance.

-25 VOLTS	+ 190 VOLTS
-20 VOLTS	+ 40 VOLTS
-9 VOLTS	+ 25 VOLTS
HIGH VOLTAGE	+ 20 VOLTS
GRID 2	+ 9 VOLTS

TABLE 11-3. HI OR LOW VOLTAGE ERROR MESSAGES.

11.5.2.2 . . . WAVE FORM ERROR MESSAGES:

If any one of the following wave form error messages are displayed, contact your selling dealer or the factory for assistance.

ERROR MESSAGE	REFERS TO
NO H SYNC	"NO INPUT"
NO V SYNC	"NO VERTICAL SYNC"
H SWEEP FAIL	"HORIZONTAL SWEEP FAIL"
V SWEEP FAIL	"VERTICAL SWEEP FAIL"
NO H RESET	"NO HORIZONTAL RESET PULSE"
NO V RESET	"NO "VERTICAL RESET PULSE"
G1 FAIL LOW	"GRID 1 VOLTAGE"

TABLE 11-4. WAVE FORM ERROR MESSAGES.

11.5.2.3 . . . LED ERROR INDICATORS

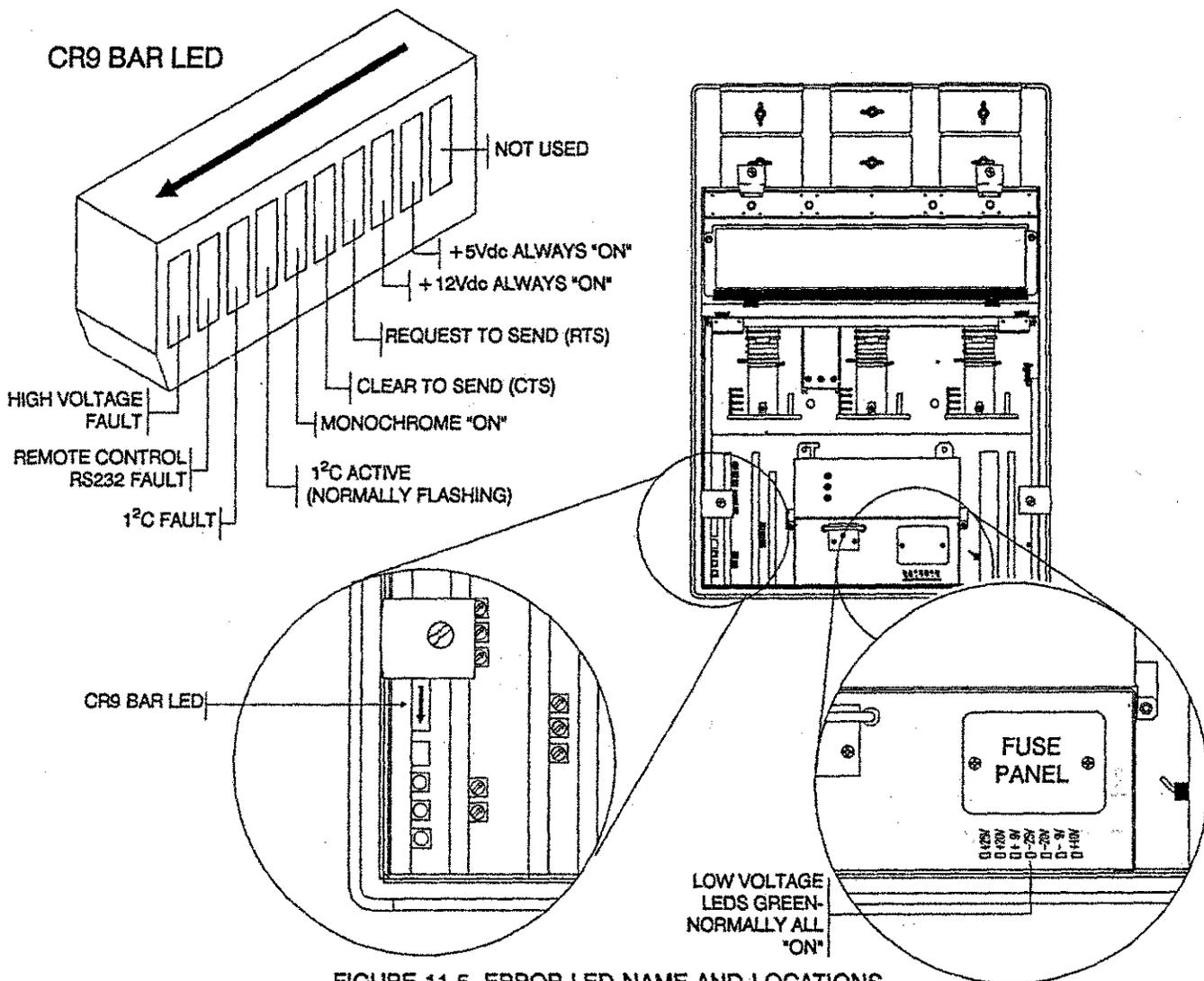


FIGURE 11-5. ERROR LED NAME AND LOCATIONS.

11.6 SERVICING POLICY:

Repair of the ESPRIT modular designed systems shall be accomplished exclusively through a factory sub-assembly module exchange program. Servicing by a ESPRIT PROJECTION SYSTEMS Service Center or by an ESPRIT PROJECTION SYSTEMS selling dealer, is limited to failure diagnostics, registration alignment, and replacement of CRT assemblies, lenses, and sub-assembly modules.

No material and/or labor credit will be granted for an exchange sub-assembly, if it has been repaired, reworked or modified. The warranty is voided if a repair, rework and/or modification of a sub-assembly module is performed other than by ESPRIT PROJECTION SYSTEMS.

To return a sub-assembly module for exchange a Return Authorization number (RA number) must be obtained from the ESPRIT PROJECTION SYSTEMS Customer Service Department. To obtain an RA number for exchange of a sub-assembly module it will be necessary to have the particular symptom, model number and serial number of the system available for the Customer Service Representative.

NOTES:

APPENDIX A

AUTOMATIC TIMER OPERATION

The automatic timer is capable of turning the display system "ON and OFF" at a predetermined time according to your particular requirements. The automatic timer operation is based on a daily occurrence and the 24 hour clock format. If no automatic timer operation is desired the timer may be disabled. The three modes of operation are explained below.

To use this special feature, first you must verify the correct setting of the internal clock for the time zone you are located in.

DISPLAY TIME OF DAY:

- Using the numeric keypad, enter 10 then press the **CODE** button to verify the time of day. If incorrect, refer to the set time of day procedure. If the time of day is correct refer to the desired mode of operation and perform the steps listed for that mode of operation.

SET TIME OF DAY:

- STEP 1. Enter 11 then press the **CODE** button. At the LCD prompt, enter HOUR:MIN, i.e., 2:00 p.m. is entered as 1400.

MODE 1- AUTO "ON" ONLY OPERATION: i.e., (8:00 a.m.)

- STEP 1. Set [TIMER ON TIME], enter 15 then press **CODE**. At the LCD prompt, enter 0800.
- STEP 2. Set [TIMER OFF TIME], enter 17 then press **CODE**. At the LCD prompt, enter 0000 or simply press the **CLEAR** button to reset the display to 0000.
- STEP 3. [ENABLE TIMER OPERATION], enter 12 then press **CODE**.

MODE 2- AUTO "OFF" ONLY OPERATION: i.e., (5:00 p.m.)

- STEP 1. Set [TIMER ON TIME], enter 15 then press **CODE**. At the LCD prompt, enter 0000 or press **CLEAR**.
- STEP 2. Set [TIMER OFF TIME], enter 17 then press **CODE**. At the LCD prompt, enter 1700. Now the system is set to turn "OFF" at 5:00 p.m. daily.
- STEP 3. [ENABLE TIMER OPERATION], enter 12 then press **CODE**.

MODE 3- AUTO "ON/OFF" OPERATION: i.e., ("ON" 08:00 a.m. / "OFF" 5:00 p.m.)

- STEP 1. To set [TIMER ON TIME], enter 15, press **CODE**, then enter 0800.
- STEP 2. To set [TIMER OFF TIME], enter 17, press **CODE**, then enter 1700.
- STEP 3. [ENABLE TIMER OPERATION], enter 12, then press **CODE**.

NOTE 1: To verify your settings:

- STEP 1. [DISPLAY TIMER ON TIME] enter 14, then press **CODE**.
- STEP 2. [DISPLAY TIMER OFF TIME] enter 16, press **CODE**.

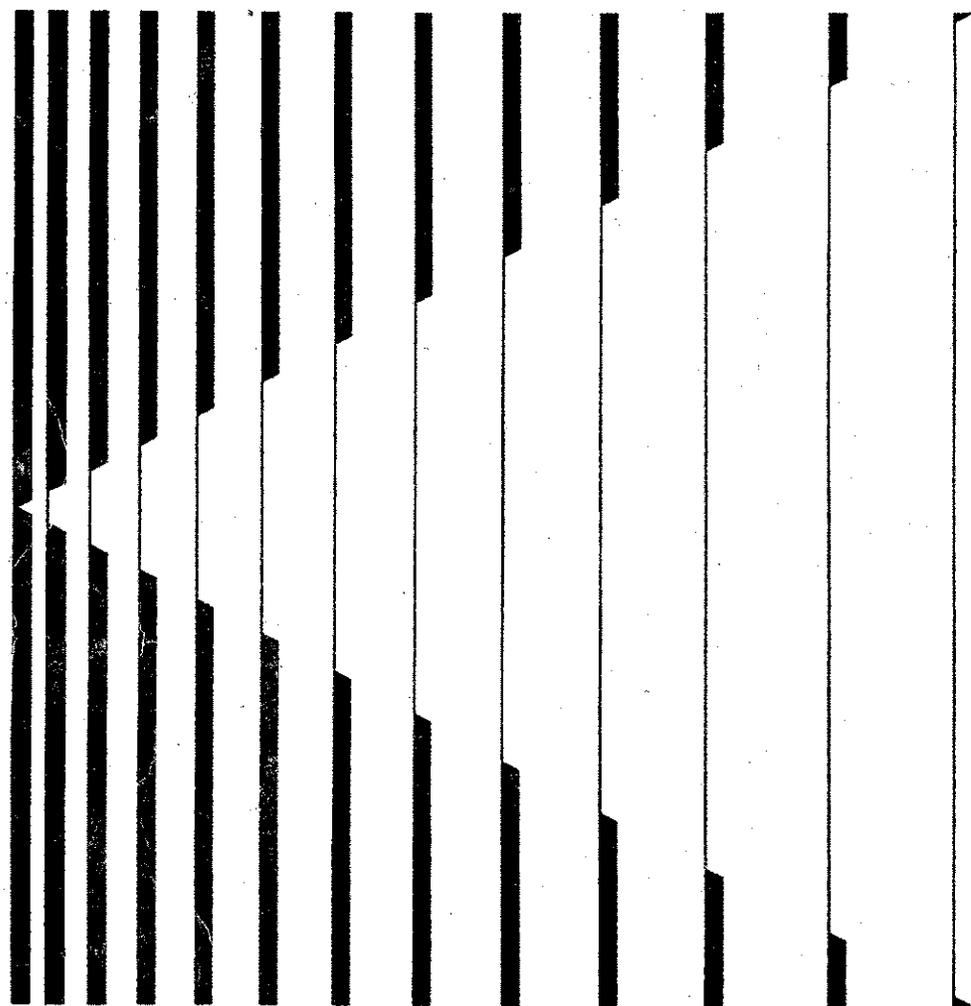
NOTE 2: To completely disable the alarm feature:

- STEP 1. [DISABLE TIMER OPERATION] enter 13, then press **CODE**.

NOTE 3: Ensure to leave the main power switch located on the rear panel in the "ON" position.

Esprit Projection System Accessories, etc. for 2000 Series

Item	Part No.	Description	List Price
Accessories	69140	Projection table with storage shelf and elevating and tilting table top	\$ 695
	69276	Ceiling mount bracket assembly with pair of 2" pipe flange adaptor plates	495
	69194	Ceiling mount bracket with 24" to 46" adjustable telescoping mount (with modification 12" min.)	795
	69117	Ruggedized carrying case	650
Input Options	69175	RGB2 input for Esprit 1500D	495
	69174	CGA/EGA input for Esprit 1500D	395
	69176	VGA input for Esprit 1500D	395
	69128	RGB2 input for Esprit 2000D and 2000G	495
	69129	CGA/EGA/VGA input for Esprit 2000D and 2000G	495
	69127	Quad video/S-VHS decoder for Esprit 2000D and 2000G	495
Special Options	69211	NTSC/PAL scan doubler with composite video, S-VHS and RGB inputs	2,995
	69226	Full convergence on green option for Esprit 2000D and 2000G	995
	69225	Intensity modulation option for Esprit 2000D and 2000G	695
	69286	Full convergence on green with intensity modulation option for Esprit 2000D and 2000G	1,495
	-	Factory pre-adjustment of system to your screen size/type and mounting specifications	275
Switchers	69119	8-channel, RGB/composite video, high bandpass switcher with 6' cable and RS-232 compatibility with all Esprit systems for single-function source selection	3,495
	69118	4-channel, RGB/composite video, high bandpass switcher with 6' cable and RS-232 compatibility with all Esprit systems for single-function source selection	2,495
Computer Interfaces	69079	RGB computer interface with color cable for IBM PC	495
	69080	RGB computer interface with color cable for IBM PS/2	645
	69081	RGB computer interface with color cable for Macintosh II	645
Remote Controls	69124	Executive 8-channel select on/off/standby only infrared remote control transmitter and receiver with 6' cable for use with Esprit 2000D, 2000HD and 2000G	395
	69188	Same as above except for Esprit 2000V and 1500D	395
	69092	Technician infrared remote control transmitter and receiver with 6' cable for use with Esprit 2000D, 2000HD and 2000G	495
	69187	Same as above except for Esprit 2000V and 1500D	495
Extension Cables	69097	50' extension cable for Esprit 2000V and 1500D wired remote	95
	69099	100' version of above	195
	69125	50' RS-232 extension cable for switcher, infrared receiver and Esprit 2000D and 2000G wired remotes	195
	69126	100' version of above	345
	69180	50' RS-232 cable for networking Esprit 2000D and 2000G	145
	69181	100' version of above	345



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